PUB. 163

SAILING DIRECTIONS (ENROUTE)

★

BORNEO, JAWA, SULAWESI, AND NUSA TENGGARA

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Preface

Pub. 163, Sailing Directions (Enroute) Borneo, Jawa, Sulawesi, and Nusa Tenggara, Fourteenth Edition, 2018, is issued for use in conjunction with Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southest Asia. The companion volumes are Pubs. 161, 162, and 164.

Digital Nautical Charts 4 and 11 provide electronic chart coverage for the area covered by this publication.

This publication has been corrected to 9 June 2018, including Notice to Mariners No. 23 of 2018. Subsequent updates have corrected this publication to 12 June 2021 including Notice to Mariners No. 24 of 2021.

Explanatory Remarks

Sailing Directions are published by the National Geospatial-Intelligence Agency (NGA) under the authority of Department of Defense Directive 5105.60, dated 29 July 2009, and pursuant to the authority contained in U. S. Code Title 10, Chapter 22, Section 451 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 the initial letters of the 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.

Charts.—Reference to charts made throughout this publication refer to both the paper chart and the Digital Nautical Chart (DNC).

Corrective Information.—Users should refer corrections, additions, and comments to NGA's Maritime Operations Desk, as follows:

NGA Maritime—Contact Information	
Maritime Operations Desk	
Toll free	1-800-362-6289
Commercial	571-557-5455
DSN	547-5455
E-mail	navsafety@nga.mil
Maritime Safety Office	
DNC web site	https://dnc.nga.mil

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Mailing address	Maritime Safety Office National Geospatial-Intelligence Agency Mail Stop N64-SFH 7500 Geoint Drive Springfield VA 22150-7500

New editions of Sailing Directions are corrected through the date of publication shown above. Important information to amend material in the publication is available is updated as needed and available as a downloadable corrected publication from the NGA Maritime Domain web site.

NGA Maritime Safety Office Web Site
https://msi.nga.mil

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 meridional 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.

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.

Geographic Names.—Geographic names are generally those used by the nation having sovereignty. Names in parentheses following another name are alternate names that may appear on some charts. In general, alternate names are quoted only in the principal description of the place. 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.

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

Internet Links.—This publication provides Internet links to web sites concerned with maritime navigational safety, includ-

ing but not limited to, Federal government sites, foreign Hydrographic Offices, and foreign public/private port facilities. NGA makes no claims, promises, or guarantees concerning the accuracy, completeness, or adequacy of the contents of these web sites and expressly disclaims any liability for errors and omissions in the contents of these web sites.

International Ship and Port Facility Security (ISPS) Code.—The ISPS Code is a comprehensive set of measures to enhance the security of ships and port facilities developed in response to the perceived threats to ships and port facilities in the wake of the 9/11 attacks in the United States. Information on the ISPS Code can be found at the International Maritime Organization web site:

International Maritime Organization Home Page
http://www.imo.org

Lights and Fog Signals.—Lights and fog signals are not described, and light sectors are not usually defined. The Light Lists should be consulted for complete information.

National Ocean Claims.—Information on national ocean claims and maritime boundary disputes, which have been compiled from the best available sources, is provided solely in the interest of the navigational safety of shipping and in no way constitutes legal recognition by the United States. These non-recognized claims and requirements may include, but are not limited to:

1. A requirement by a state for advance permission or notification for innocent passage of warships in the territorial sea.
2. Straight baseline, internal waters, or historic waters claims.
3. The establishment of a security zone, where a state claims to control activity beyond its territorial sea for security reasons unrelated to that state's police powers in its territory, including its territorial sea.

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

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

Telephone and Facsimile Numbers.—Within this publication, the international telephone and facsimile numbers provided as contact information contain the minimum digits necessary to dial. Please note that these contact numbers do not include additional digits or special characters, such as (0) or (+), which may be required when dialing. The necessity of such digits and characters depend upon numerous factors and conditions, such as the user's geolocation and service provider. Mariners are advised to consult their communications equipment and service provider manuals for guidance.

Time.—Time is normally expressed as local time unless specifically designated as Universal Coordinated Time (UTC).

Time Zone.—The Time Zone description(s), as well as information concerning the use of Daylight Savings Time, are included. The World Time Zone Chart is available on the Internet at the web site given below.

Standard Time Zone of the World Chart
https://www.cia.gov/maps/world-regional

U.S. Maritime Advisory System.—The U.S. Maritime Advisory System is a streamlined inter-agency approach to identifying and promulgating maritime security threats. The system replaces Special Warnings to Mariners (State Department), MARAD Advisories (Maritime Administration), and Marine Safety Information Bulletins (U.S. Coast Guard) and consists of the following items:

1. U.S. Maritime Alert—Provides basic information (location, incident, type, date/time) on reported maritime security threats to U.S. maritime industry interests. U.S. Maritime alerts do not contain policy or recommendations for specific courses of information.
2. U.S. Maritime Advisory—Provides more detailed information, when appropriate, through a "whole-of-government" response to an identified maritime threat.

Maritime Administration (MARAD)—U.S. Maritime Advisory System
https://www.marad.dot.gov/environment-and-safety/office-of-security/msci

Winds.—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.

Japanese 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, as follows:

Sabah Ports Authority
http://www.infosabah.com.my/spa

Date of Change: 12 June 2021	
Notice to Mariners: 24/2021	
Sector	**Paragraphs**
Sector 1	Paragraphs 1.1 and 1.79
Sector 2	Paragraph 2.35
Sector 3	Paragraphs 3.7, 3.15, 3.17, 3.20, 3.23, 3.26, 3.39, 3.42, 3.44, 3.48, and 3.70
Sector 4	Paragraphs 4.2, 4.14, 4.15, 4.17, 4.20, 4.26, and 4.40
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Sector 10	Paragraphs 10.13, 10.15, 10.62, and 10.85
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Date of Change: 9 January 2021	
Notice to Mariners: 2/2021	
Sector	**Paragraphs**
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Sector 2	Paragraphs 2.26, 2.35, 2.59, 2.62, 2.77, 2.94, 2.95, and 2.99
Sector 3	Paragraphs 3.15, 3.20, 3.22, 3.25, 3.27, 3.38, 3.39, 3.40, 3.41, 3.47, 3.52, 3.58, and 3.59
Sector 4	Paragraphs 4.2, 4.9, 4.11, 4.13, 4.14, 4.15, 4.16, 4.20, 4.26, 4.40, and 4.41
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Sector 7	Paragraphs 7.12, 7.18, 7.20, 7.23, 7.31, 7.33, 7.34, 7.35, 7.43, 7.49, 7.53, and 7.54
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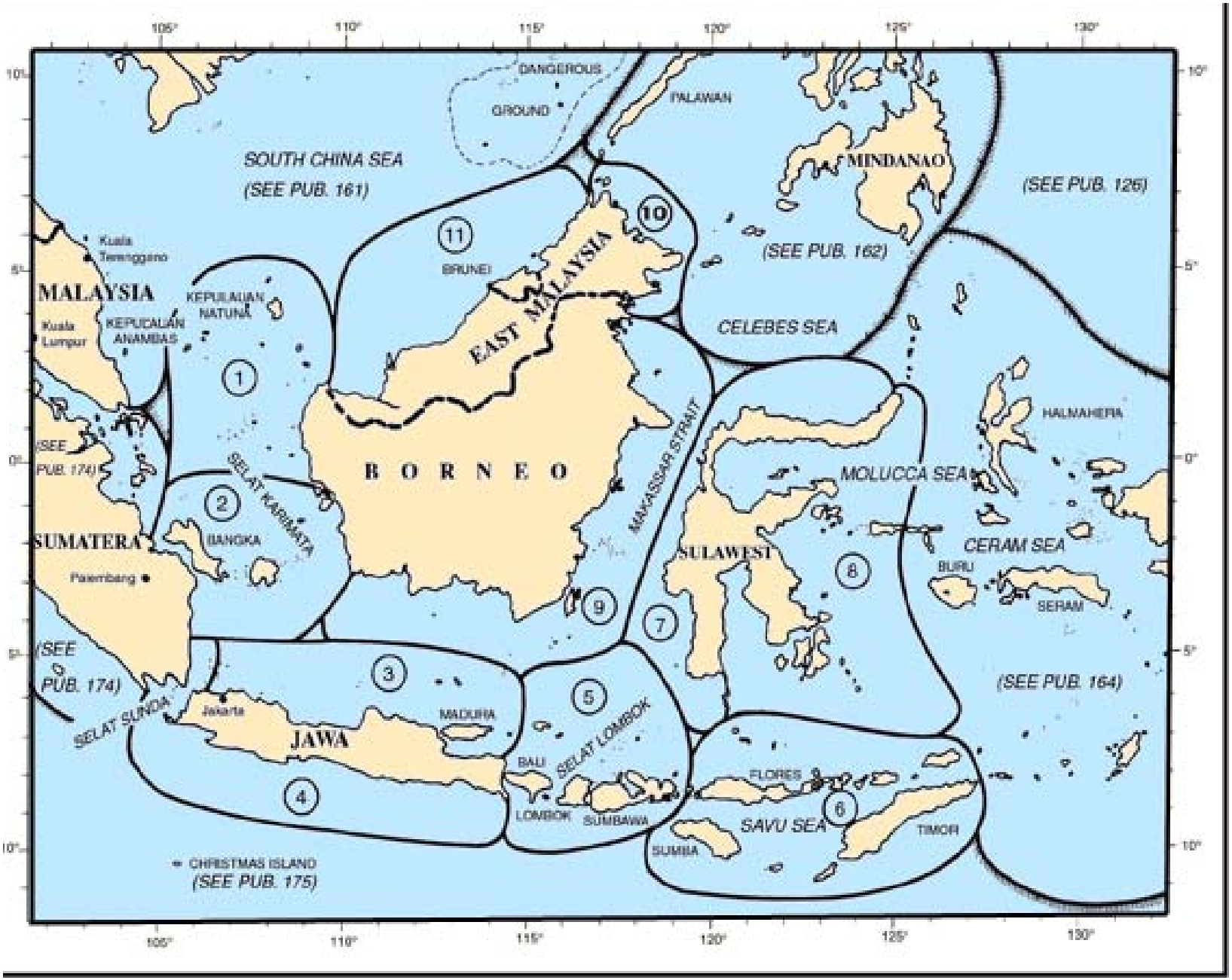
Sector 11	Paragraphs 11.7, 11.13, 11.18, 11.20, 11.23, 11.24, 11.25, 11.35, 11.38, 11.41, 11.56, 11.65, 11.69, 11.70, 11.74, 11.76, 11.79, 11.80, 11.84, 11.99, and 11.101

Date of Change: 26 January 2019	
Notice to Mariners: 4/2019	
Sector	**Paragraphs**
Sector 3	Paragraph 3.25
Sector 11	Paragraphs 11.24, 11.70, 11.74, and 11.101



SECTOR LIMITS—**PUB. 163**

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

Abbreviations

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)
gt	gross tons	nt	net 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	VLOC	Very Large Ore Carrier
Lo-lo	Lift-on Lift-off	FSO	Floating Storage and Offloading
NGL	Natural Gas Liquids	FSU	Floating Storage Unit
FSRU	Floating Storage and Regasification Unit	FPSO	Floating Production Storage and Offloading

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	TFW	Tropical Fresh Water
HWS	high water springs	HAT	highest astronomical tide
LWN	low water neaps	LAT	lowest astronomical tide

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	SBM	Single Buoy Mooring
NAVSAT	Navigation Satellite	SPM	Single Point Mooring
ODAS	Ocean Data Acquisition System	TSS	Traffic Separation Scheme
CBM	Conventional Buoy Mooring System	VTC	Vessel Traffic Center
MBM	Multi-Buoy Mooring System	VTS	Vessel Traffic Service
CALM	Catenary Anchor Leg Mooring		

The following abbreviations may be used in the text:

Miscellaneous

AIS	Automatic Identification System	MMSI	Maritime Mobile Service Identity Code
COLREGS	Collision Regulations	No./Nos.	Number/Numbers
IALA	International Association of Lighthouse Authorities	PA	Position approximate
		PD	Position doubtful
IHO	International Hydrographic Organization	Pub.	Publication
IMO	International Maritime Organization	SOLAS	International Convention for Safety of Life at Sea
IMDG	Intermational Maritime Dangerous Goods Code		
LOA	length overall	St./Ste.	Saint/Sainte
UKC	Under keel clearance	ISPS	International Ship and Port facility Security
ITC	International Convention on the Tonnage Measurement of Ships (1969)	ECDIS	Electronic Chart Display and Information System

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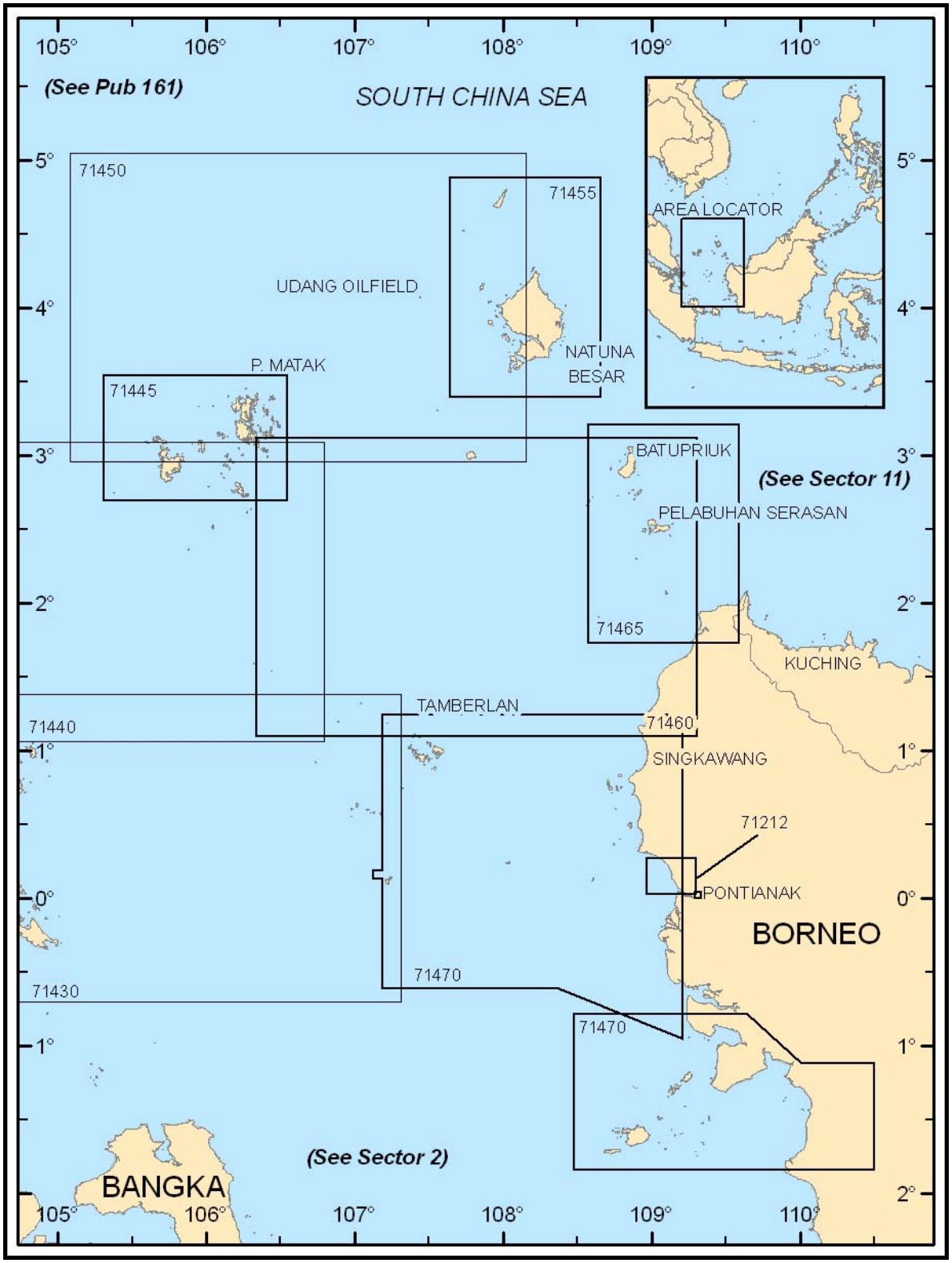


Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 1 — CHART INFORMATION

SECTOR 1

BORNEO—NORTHWEST COAST AND KEPULAUAN TUDJUH

Plan.—This sector describes the four island groups of Kepulauan Tudjuh and the NW coast of Borneo. The general arrangement of each group is from W to E, with each island group described under a separate heading. The coast of Borneo is described from N to S.

General Remarks

1.1 Kepulauan Tudjuh (Tudjuh Archipelago) comprises those islands belonging to the Republic of Indonesia in the Eastern Archipelago, which lie in the S portion of the South China Sea, N of the Equator. The islands are divided into four main groups, consisting of Kepulauan Badas, Kepulauan Tambelan, Kepulauan Natuna and Kepulauan Anambas. All the islands of Kepulauan Tudjuh lie W and NW of the W coast of Borneo.

Most of the islands are covered with dense vegetation, and in relation to their size are fairly high. The NW coast of Borneo described in this sector is that part extending from Tanjong Datu to Tanjung Padangtikar, about 166 miles SSE. The SW extremity of the sector is situated in position 1°04'S, 105°10'E, about 35 miles NW of the NW extremity of Bangka.

Winds—Weather.—The most important characteristic of the climate, is the seasonal change of the winds. It is customary therefore to recognize two seasons only, the Northeast Monsoon and the Southwest Monsoon. From March to May, the Southwest Monsoon extends N, and covers the whole area from June to August. During September to November the airflow is reversed and the Northeast Monsoon spreads S to the Equator, and prevails over the South China Sea from December to January.

The Northeast Monsoon has a significant frequency of N winds over the area, while Southwest Monsoon has a great S component near the equator.

Over this area the average wind speed is 7 to 16 knots in winter, and 4 to 10 knots in summer. During the transition period in spring and autumn the winds are mainly light and variable except in isolated squalls.

The period from May to October is relatively free of gales apart from the localized storms during the passage of tropical storms. Gale force winds are more common during December, with winds of 28 to 33 knots comprising 1 per cent of the total reports.

Rainfall is abundant over the whole area. Borneo has more thunderstorms than any other region in the world. Along the coasts many stations report thunder on 1 day in every three. Inland many places endure thunder on 2 days in 3. Some of the more violent storms cause considerable havoc with severe squalls and torrential rain.

Fog is rare over this area. Poor visibility (less than 5 miles) is reported on less than 5 per cent of the observations, but the increases in frequency is greater during September near the Borneo coast; this haze spreads from the S hemisphere in late summer.

Good to excellent visibility prevails for most of the time, though sudden deterioration occurs in the heavier rainstorms. Patches of fog develop at night in estuaries and sheltered inlets and may be dense for a brief period around dawn.

Tides—Currents.—Currents in the vicinity of Kepulauan Tudjuh are of monsoonal origin and set predominantly in N directions from May to September and in S directions from October to April, with rates of up to 2 knots. The tidal currents have been observed in this area, from mid-July to mid-September and in December during the Northeast Monsoon, to set to windward against the monsoon drift, for a part of each day.

The movement of the surface water over the South China Sea is related, in general, to the monsoons, through the relationship is complex and not direct. The main SW setting current occurs during the Northeast Monsoon (November to March) and the NE setting current occurs during the Southwest Monsoon (May to September). Currents with a velocity of 1 to 2 knots may be encountered.

Depths—Limitations.—In the South China Sea between Singapore Strait and the W coast of Borneo, the depths are generally 38 to 44m.

Belida Marine Terminal (4°8'N., 105°8'E.) comprises an FPSO "Intan" which is moored to an SPM. Shuttle tankers up to 230,000dwt can be accommodated See Pub. 161, Sailing Directions (Enroute) South China Sea and the Gulf of Thailand for details on the numerous platforms that make up the other part of Belida Field located in the Natuna Sea.

Offshore terminals and oil fields situated off the NW coast of Borneo and covered by this sector are the Kakap3 Natuna Oil Field, the Anoa Natuna Oil Field, and the Udang Oil Field. Details on the Kerteh Oil Field, the Tapis Oil Field, and the Tenggol Oil Field are covered in Pub. 161, Sailing Directions (Enroute) South China Sea and the Gulf of Thailand. The Anoa Oil Field and the Udang Oil Field lie 24 miles NNW and 68 miles SSE, respectively, from the Kakap Oil Field. The Tapis Oil Field and the Kerteh Oil Field lie 63 miles WNW and 86 miles W, respectively, from Kakap Terminal.

Regulations.—For information regarding designated Archipelago Sea Lanes, as defined by the United Nations Convention on the Law of the Sea (UNCLOS), passing from the South China Sea through the Indonesian Archipelago, see the Indonesia section of Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Caution.—Numerous oil fields and gas fields exist off the coasts of Sarawak, Brunei, and Sabah. Each field contains clusters of installations, consisting of above-water, awash, or submerged structures; the structures may be permanent or movable and may or may not be lighted. However, most structures exhibit lights, especially platforms. Since not all features are charted or marked, mariners are cautioned to exercise special care when navigating these waters.

A vessel entering a restricted area may be challenged by Indonesian air and sea patrols.

Pipelines lead between structures, within a field, between the

various fields, and to the shore collecting stations. Navigation is restricted and anchoring is prohibited in these areas. Gas pipelines contain high pressure flammable natural gas.

It is advised not to anchor, trawl, or drag near these pipelines. Vessels causing damage to a pipeline by anchoring or trawling risks prosecution, instant fire hazard, and loss of buoyancy to the vessel.

Floating or fixed drilling rigs may be encountered in some areas covered by this volume. The flares from these structures may be seen from distances up to 20 miles. Buoys and lighted buoys associated with drilling operations are frequently moored in the vicinity of the rigs. The positions of these rigs and buoys are subject to change, and where known, the changes are promulgated by NAVAREA Xl radio navigational warning messages.

Permanent platforms, structures, and buoys are mostly charted. These structures usually exhibit lights (Mo (U) 15 seconds) and fog signals (Mo (U) 30 seconds). Selected below-water obstructions are marked by buoys in the gas fields. The limits of the gas fields are charted, but not all the features are contained within a field. Special care should be exercised when navigating in the vicinity. Anchoring within a gas field is prohibited, except where designated.

Submerged or partially afloat drifting logs, roots and palm trees, etc., posing hazard to navigation are usually encountered between Kepulauan Natuna and **Balabac Strait** (7°30'N., 117°00'E.). Numerous dangerous submerged rocks, best seen on the chart, lie in Balabac Strait and off the NE coast of Bornea. Numerous fish havens, afloat and submerged, lie off the coast of Borneo.

Mariners are advised that fish havens or artificial reefs are numerous off the coast of Borneo and may be encountered off any coastline covered by this volume.

Numerous acts of piracy have been reported, usually by small gangs of armed men in fast boats.

Taking photographs of Indonesian harbors and installations is prohibited.

The area described in this volume lies in the middle of one of the earth's most active seismic zones. Most of the islands, with the exception of large parts of Borneo, have been subjected to destructive earthquakes. In recent years, the area was subjected to about 20 earthquakes of moderate to large intensity each year.

The archipelago contains 56 volcanoes that have been active within historic times. Of all these volcanoes, 51 are located on islands, and 5 are in the sea bed. Most of these volcanoes lie along the arc formed by the Indonesian islands.

The most famous volcano in Indonesia is **Pulau Rakat** (Krakatau) (6°09'S., 105°26'E.); it lies between Java and Sumatra in Sunda Strait. The island is about 3 miles in diameter with an active volcano, Gunung Rakata, rising to a height of 813m.

Volcanic activity in the waters between Rakata and Sebesi has been reported to exist. Vessels are advised to avoid this area.

Kepulauan Natuna

1.2 The islands of Kepulauan Natuna are the NE islands of Kepulauan Tadjuh and extend in a NNW direction for 190 miles from **Tanjung Api** (1°57'N., 109°20'E.), the NW extremity of Borneo. They are divided into three main groups and are described from N to S.

Kepulauan Natuna Besar—North Group

1.3 **Pulau Laut** (4°43'N., 107°59'E.) is the largest island in the group, which is comprised of one large island, two small islands, and several off-lying islets and dangers which lie about 30 miles NNW of Pulau Natuna Besar, the largest island in Kepulauan Tudjuh. The island has a length of about 7 miles and a greatest width, near its S end, of about 3 miles. It is generally hilly, rising near its N end to a summit of 286m.

The coast at this point is rather steep, but elsewhere it is low and sandy. The entire island is surrounded by an extensive drying reef, which extends to 2.8 miles off the E side and up to 3 miles off Tanjung Majam. Pulau Sekatung, precipitous and hilly, 223m high, stands on the reef, 0.3 mile NNE of Pulau Laut. Tanjung Sekatung Light is shown from NE extremity of Pulau Sekatung. An obstruction was reported 28.5 miles N of Pulau Sekatung.

Batu Imung (4°38'N., 107°59'E.), a detached rock 18m high, stands S of the coastal reef, 4.5 miles SE of Tanjung Majam. Gloria Reef, with a depth of 2.4m, lies 2.8 miles SSW of Batu Imung. A coral reef, with a depth of 5.8m, lies 3.8 miles SE of Gloria Reef. Laurel Reef with a depth of 11.9m, coral, stone, and shell, lies 8 miles ESE of the NE extremity of Pulau Laut.

There are a number of charted dangers which lie between a line drawn from Laurel Reef SSE to the 5.8m coral reef described above, and the reef which encircles Pulau Laut; their positions may be seen on the chart.

1.4 **Tokong Burung** (4°25'N., 107°41'E.), a group of four rocks lying on a small reef, the highest being 4m, lies 21 miles SW of Tajung Majam. Pulau (Semium) Semiun, a small, rugged, and circular-shaped island marked by a light, lies 6 miles NNE of Tokong Burung. Of the three hills on the island, the one farthest W is the highest and reaches an elevation of 151m. The coast is precipitous except on its E side, where there is a sandy beach. The island is fringed by a steep-to drying reef that extends up to 0.5 mile offshore.

Pulau Burung

Two coral patches, with least depths of 4m and 8.8m lie, respectively, 1 mile SSW and 1.3 miles NNE of the island.

Anchorage.—During the Northeast Monsoon (October to March), vessels can anchor, in 22 to 26m, off the coastal reef, S of Pulau Laut, 2.3miles WNW of Batu Imung.

There is also good anchorage, in 12m, inshore of the detached reefs and close SSE of Tanjung Majam. Vessels proceeding to the inner anchorage steer for the SE extremity of Pulau Laut, bearing 044°, which leads between the reefs to the entrance. When Batu Imung bears 125° alter course gradually NW, keeping that rock astern bearing 134°, and anchor when the SE extremity of Pulau Laut bears 082°.

During the Southwest Monsoon (May to September), good anchorage can be obtained, in depths of 18 to 22m, 1.3 miles NW of the N extremity of Pulau Laut. This group of islands serve as good landmarks. Anchorage is also available E of Pulau Sekatung, in 16m, beyond the dangerous wreck.

Kepulauan Natuna Besar—Middle Group

1.5 Pulau Natuna Besar (Pulau Bunguran Besar) (3°56'N., 108°14'E.), the principal island of the group, is about 36 miles in length. The island is almost divided into two parts by Kuala Bindjei and the Sungai Penarik, which together, extend from the SW coast of Pulau Bunguran Besar to within 0.5 mile of the SE side.

Tanjung Semut (Tanjung Semui) (4°14'N., 108°13'E.), a low point, is the N extremity of Pulua Natuna Besar. From this point, the coast trends SE to Tanjung Datu, a sheer, barren, steep-to cliff, with a wooded summit, 111m high. Teluk Ajer Litjin, a small bay encumbered by reefs, lies between these two points.

From Tanjung Datu, the coast trends SSE about 9 miles to Tanjung Pengedak, a low sandy point, then 5 miles farther SSE to Tanjung Tanjung, another low point. Foul ground extends up to 2.3 miles offshore.

Tanjung Senubing (3°58'N., 108°24'E.), a prominent point, lies 4.5 miles SE of Tanjung Tanjung. Pegunungan Ranai, a mountain 1,035m high, rises 4.6 miles inland. Tanjung Senubing Light is shown from a height of 88m. A prominent radio mast, painted red and white bands, stands about 2.5 miles SW of the light.

Pegunungan Ranai

The coastal waters from Tanjung Semut SE to Tanjung Senubing are fronted by reefs extending up to 1.3 miles offshore. The 20m curve lies from 0.3 mile offshore at Tanjung Datu to 2 miles offshore at Tanjung Tanjung.

Pulau Senua, 2.5 miles NNE of Tanjung Senubing, has three summits. The highest is 115m high. Reefs extend up to 0.4 mile offshore from the S and W sides.

Karang Kring (4°03'N., 108°28'E.), which dries near its center, lies 3.8 miles NE of Pulau Senua; the channel between them is deep and clear.

An oil terminal lies about 1.3 miles SSW of Tanjung Senubing in Teluk Ranai. A tanker of 6,000 dwt may be accommodated at a T-head pier.

From Tanjung Senubing, the coast trends S about 4.5 miles to Tanjung Karang, a barren point, then 5.8 miles SSW to Tanjung Sebintang. The coast trends SW for about 10 miles from Tanjung Sebintang to **Tanjung Pianpadang** (Tanjung Pian Padang) (3°40'N., 108°18'E.), a low sandy point at the SE extremity of Pulau Natuna Besar. The land rises to Pian Padang, a hill 208m high, 0.5 mile inland.

This coast is indented by Teluk Ranai, a bay close S of Tanjung Senubing and by the Sungai Ulu, which discharges between Tanjung Karang and Tanjung Pasir, about 1.3 miles NW. A dangerous wreck lies 2.8 miles NE of Tanjung Karang. The coastal waters are fronted by reefs which extend up to 3 miles E of Tanjung Pasir.

1.6 Karang Karang Penungal (3°52'N., 108°29'E.) are the easternmost of the known dangers lying off Pulau Natuna Besar. Devonport Reef, with a depth of 4m, is the farthest S of these reefs, and a 1.8m reef 2.8 miles N of Devonport Reef lies the farthest N. There are numerous detached shoals between Karang Karang Penungal and the coastal reef, W and SW to Tanjung Pianpadang.

Karang Lamina (Lamina Reef), with a depth of less than 1.8m, lies 4.5 miles E of Tanjung Pianpadang. A detached 11m patch lies about 0.5 mile SE of Karang Lamina.

Tanjung Sekol (3°38'N., 108°10'E.), the S extremity of Pulau Natuna Besar, is a bare rugged point of a lofty mountain range extending N. From Tanjung Pianpadang to Tanjung Sekol, 8.5 miles W, the coast is fringed by a reef that extends as far as 1 mile offshore. A shoal patch with a depth of 5.8m was reported (1955) to lie 2.5 miles SE of Tanjung Sekol.

From Tanjung Sekol, the SW coast of Pulau Natuna Besar trends NW about 5 miles to an unnamed point, which rises to a height of 333m close within.

Komang, an island 186m high, lies on a reef close off the unnamed point described above. It lies on the N side of the W entrance to Selat Lampa. A rock with a depth of 4.9m lies 1 mile N of the W extremity of Komang.

1.7 Kepulauan Bodas (3°37'N., 108°05'E.) is a group of moderately high wooded islands lying close off the SW coast of Pulau Natuna Besar. Pulau Sededap, the SW island of the group, lies about 8 miles SW of Tanjung Sekol. The island consists mainly of a wooded ridge, which rises on its W side to an elevation of 281m.

Pulau Sebangmawang, the largest island of the group, lies 1 mile NE of Pulau Sededap. It has two prominent peaks; the N, 495m high, rises from an elevated ridge on the NE side of the island; the S, 449m high, an isolated sharp peak, stands 1.3 miles SSW. Pulau Kumbik stands 1 mile NW of Pulau Sebang

Mawang. The island consists principally of a hilly ridge, which is 495m high near its center.

There are smaller islands, not described, in this group which may be seen on the chart. A channel, with depths of from 11 to 22m, leads between the reefs S of Pulau Kumbik and those fringing the S islands of the group. This passage should not be made unless the reefs are uncovered.

Good anchorage, during the Southwest Monsoon (May to September), in a depth of 11m, can be obtained in the W entrance of the above channel, about 0.5 mile SSW of the SW extremity of Pulau Kumbik.

Selat Lampa (Straat Laplace) is the channel that separates Kepulauan Bodas from the SW side of Pulau Natuna Besar. A strong current sometimes sets through the strait. Pulau Setahi, a wooded islet, 117m high, lies on the S side of the E entrance to Selat Lampa.

Karang Lampa, a shoal with a depth of 0.3m, lies about 2 miles SE of Komang, near the middle of Selat Lampa.

1.8 Tanjung Belitung (3°53'N., 108°01'E.), on the SW side of Pulau Natuna Besar, is the N entrance point to a bay which opens to the E. Komang, 12 miles SSE, is the S entrance point of the bay. The N and S shores of the bay are fronted by drying reefs which extend 2.3 miles offshore.

Kuala Binjei (Kuala Bindjet) lies at the head of the bay described above, and is formed by the confluence of the Sungai Bindjei and the Sungai Penarik. The entrance to this estuary is encumbered by islets and shoals, through which a channel, marked by beacons, leads to an anchorage off Tanjung Belitung, about 9 miles NE of Komang. The anchorage off Tanjung Blitung and the approach channel are for vessels with local knowledge only.

The islands which lie on the N side of the marked channel are, from W to E, Serungus, 149m high, and Pasir, a small islet which lies 1.3miles WNW of Tanjung Blitung.

Pulau Semarong is a low islet located near the outer edge of a coastal reef, on the S side of the channel, 4 miles NE of Komang. The mouth of the bay and the approach are further encumbered by the following features:

Pulau Burung (3°42'N., 108°02'E.), a rock 27m high, which stands near the center of a coral reef 2 miles WNW of Komang.

Batu Neneh (3°42'N., 107°56'E.), a small reef, with a depth of less than 0.5m over which the sea breaks heavily, lies 6.5 miles W of Pulau Burung.

Karang Serval (Serval Reef), a coral shoal with a depth of 1.8m, lies 3 miles NNW of Pulau Burung. Several shoals, with depths of 0.9 to 4.9m, lie within a distance of 2 miles ESE of this reef. A rock, with depths of less than 1.8m, lies 0.4 mile E of the reef. A light is shown on the reef.

Kembang (3°45'N., 108°04'E.), a narrow double peaked islet 119m high, stands in the mouth of the bay, on the SW extremity of an extensive, detached, drying reef.

Other reefs lie in the immediate vicinity of this island and may best be seen on the chart.

Pulau Sedanau (3°48'N., 108°01'E.), a prominent and hilly island 224m high, is divided into two parts by Selat Pemutus, a narrow creek. The island is surrounded by an extensive reef extending 1.3 miles from its W side. A drying reef lies 2.3 miles NW of Tanjung Tabi, the NW extremity of Pulau Sendanau. This island is located 5 miles NNW of Komang.

1.9 Genteng (3°48'N., 108°02'E.)(World Port Index No. 51545), the principal village of Kepulauan Natuna Besar, is situated at the head of an inlet in a reef, on the E side of Pulau Sedanau. The settlement consists of a group of structures built on piles over the reef and are connected to the village of Sedanau, lying W, by a bridge. An Indonesian administrative officer resides at Ajer Buluh, on the S side of an inlet close to Sedanau.

Genteng is approached from the S through a channel marked by beacons; local knowledge is necessary for the safe navigation of this channel.

Tanjung Belitung (3°52'N., 108°01'E.), a low point 4 miles N of Pulau Sedanau, rises to Sapol, a hill 208m high, 3.3 miles E.

Tanjung Payung (4°00'N., 107°58'E.), 7.8 miles NNW of Tanjung Belitung, is the W extremity of Pulau Natuna Besar. The promontory of Tanjung Pajung is rocky and fronted by a drying reef which extends up to 1.3 miles offshore.

Three hills stand E of Tanjung Payung. Pajung, the highest, 192m high, is 0.5 mile E of the point. Derian, a ridge 179m high, and Sebung, 120m high stand, respectively, 2 miles ESE and 2 miles ENE of Pajung.

Pulau Salor (3°54'N., 107°55'E.) lies 6 miles W of Tanjung Belitung. The island, densely wooded, rises steeply from the sea to a prominent peak 489m high. A drying reef fringes the E side of the island and extends 1.5 miles off the SE side.

Pulau Salor

Two coral shoals, each with a depth of 3.4m, lie 7 and 8 miles WNW of Pulau Salor. A 4.6m shoal lies 2.8 miles NNW of this island. These shoals are not marked by water discoloration.

Numerous islets, shoals, and sunken rocks exist E of Pulau Salor to Tanjung Belitung and NNE of Pulau Salor to Tanjung Payung, and can be seen on the chart.

1.10 Tokong Boro (4°04'N., 107°26'E.) is a group of four above-water rocks, standing close together on a steep-to reef about 0.5 mile in diameter. These rocks are known to the Indonesians as Pyramidaal Rotsen.

The NW coast of Pulau Natuna Besar, from Tanjung Payung, 20.5 miles NE to Tanjung Semut, is low and densely covered with vegetation; it is fringed by a drying reef which extends up to 1.3 miles offshore.

Pulau Sabai, hilly and wooded, is located 0.5 mile WNW of Tanjung Payung. A small rocky islet lies close NW of the island. An isolated 3.0m patch lies 2.8 miles WSW of Pulau Sabai.

Pulau Sedua (4°02'N., 107°54'E.) lies 4 miles WNW of

Tanjung Payung. The N part of the islet is 84m high, bold and rugged. Its S end is low and sandy with some coconut trees.

Pulau Selimu, 112m high, lies about 0.5 mile E of Pulau Sedua. Both islets are fringed by drying reefs. A 3m patch lies 1.5 miles S of Pulau Sedua. A coral shoal with a depth of 1.8m, unmarked by water discoloration, lies 4 miles W of Pulau Sedua.

Pulau Buton, an islet about 0.5 mile long, lies about 5.5 miles NE of Tanjung Payung. It is surrounded by a reef that extends as far as 1 mile from its NE extremity. A narrow detached reef lies about 0.5 mile NW of the islet.

Pulau Samarago (4°06'N., 108°00'E.), a low islet nearly circular in shape, lies about 2 miles NW of Pulau Buton. The islet is surrounded by a reef. A rock with a depth of less than 1.8m lies about 0.4 mile SW of Pulau Samarago and a small drying reef lies 2.3 miles NE of the islet. When the reef is covered, it is marked by water discoloration.

Pulau Bunga lies 1.5 miles offshore, surrounded by an extensive reef, 8 miles ENE of Pulau Samarago. An area of foul ground, about 1.8 miles long, lies nearly 2 miles NE of the islet, and two patches, with depths of 4m and 5.5m lie, respectively, about 0.8 mile NW and 2.3 miles N of the islet. A detached drying reef lies 1 mile SW of Pulau Bunga and two patches with depths of 4.9m and 3m lie, respectively, 1.5 miles and 2.3 miles SW of this reef.

Pulau Panjang (4°15'N., 108°12'E.) is a narrow island about 2.5 miles long. Its NE extremity, Tanjung Kapalapanjang, which is steep-to and rocky, rises to an elevation of 51m. The island is fringed by a drying reef which extends up to 0.6 mile on the E side.

Selat Panjang is a narrow channel with depths from 11 to 14.6m, lying between the reefs fringing Pulau Panjang and Pulau Natuna Besar. It is free of detached dangers, and the reefs on either side can be distinguished by discolored water. There are several shoals with depths of less than 9m in the SW approach to the channel, and a 3m patch lies 1 miles SW of Tanjung Ju, the SW extremity of Pulau Panjang.

Vessels approaching Selat Panjang from W steer for the wooded summit of Tanjung Datu, bearing 090°, until Tanjung Ju bears 022°, alter course to 040° and keep the S extremity of Pulau Panjang on the port bow, until close to the point, then steer about 056° through the middle of the channel.

Vessels from the E steer for the S extremity of Pulau Panjang, bearing 245°, until Tanjung Datu bears 128°, then steer 237°, until the S extremity of Pulau Panjang bears 315°, course should then be altered to 220° until the wooded summit of Tanjung Datu bears 090°. Keep this bearing astern, passing between the shoals in the SW entrance.

Off-lying Islands and Dangers

1.11 Karang Bunta (4°21'N., 107°57'E.), consisting of two coral reefs, separated by a deep, narrow channel, lies 16 miles WNW of Pulau Panjang. The S reef has a least depth of 1.8m and is marked by discolored water. The N reef dries in places.

Semapi, a large reef which dries in places, lies on the NW side of Favorite Passage, with its NE extremity 9 miles WSW of Pulau Panjang. A shoal with a least depth of 2m lies about 3.5 miles NW of the NE extremity of Semapi and another patch with a least depth of 5.7m, lies about 0.5 mile S of the SW extremity of the island.

Pulau Seluan, a hilly, wooded island, 300m high, is located 9.5 miles NW of Tanjung Pajung. From the NW, the SW extremity appears as an islet. A coral reef with a least depth of 3.3m, lies 2 miles W of Pulau Seluan.

Favorite Passage, with a least depth of 16.5m in the fairway, is the channel between Semapi and the dangers close off the NW coast of Pulau Natuna Besar.

The passage is obstructed by the drying reef, 2.3 miles NE of Pulau Samarago.

Pulau Midai (3°00'N., 107°47'E.) is low near the coast and rises gradually towards the center. The summit, 179m high, consists of three peaks of almost equal heights; only two of these are visible from most directions.

The island is fringed by a narrow, drying reef. An islet stands on the reef near the middle of its W side. Numerous detached shoals lie within the 20m curve, extending up to 2.5 miles offshore. Two rocks, with depths of 3m and 2.1m lie, respectively, 0.5 and 0.7 mile SW of the W extremity.

A light is shown from an elevation of 158m about 1.5 miles NE of the SW extremity of, near its summit of Pulau Midai.

At Sabang Barat, near the NW extremity, there is a break in the reef where boats can land continuously. There is a flagstaff at the root of the stone pier. A wreck lies on the edge of the reef at the entrance. A light is shown about 0.5 mile NE of Sabang Barat.

At Seblat, near the middle of the S coast, there is an opening in the reef abreast the village, where there is a good landing for boats. Karang Jackson, with depths of from 4.9 to 11.9m, lie 3 miles E of the SE extremity of Pulau Midai.

A detached, coral shoal, with a depth of 5.8m, lies 1.5 miles NE of Karang Jackson. There is a clear channel between these reefs and the dangers off the E coast of Pulau Midai.

1.12 Karang Diana (3°06'N., 107°45'E.) consists of a number of coral patches in two main groups; the S group, with a depth of 4.9m, lies 2.5 miles N of Pulau Midai.

There is a clear channel between the S group and the shoals N of Pulau Midai. The N group lies 2 miles farther N. The shallowest patch with a depth of 3m, lies 6.5 miles NNW of the NW extremity of Pulau Midai. An isolated coral patch, with a depth of 3m, lies about 12.3 miles NE of Pulau Midai; it does not show by water discoloration.

Timau (North Haycock) (3°18'N., 107°33'E.), a conical shaped islet 65m high, lies 21 miles NW of Pulau Midai.

The islet is located on the NW side of a bank which has depths of 4.5 to 11m. A depth of 5.8m exists on the bank, 3 miles SSW of Timau. The channel between Timau and Karang Diana is clear and deep.

Karang Sedimin, located 18 miles ENE of Timau, consists of two rocks, standing close together, which are 16.4m high. A rock awash lies 0.2 mile SSW of the two rocks. These rocks lie on the W side of a bank, within the 18.3m line, on which there are irregular depths.

Two 7m patches lie, respectively, 1.3 miles NW and SSE of the rocks and a 10m patch lies 2 miles E of them.

Kepulauan Natuna Selatan

1.13 The S group of Kepulauan Natuna consists primarily of two groups of islands and dangers separated from the NW coast of Borneo by Api Passage; of these two groups, the S group is mainly high and rocky while the N group is mainly low and flat.

Pulau Subi Besar (2°56'N., 108°51'E.) is the largest island in the Kepulauan Natuna Selatan group. It lies about 67 miles NW of Tanjung Datu, the NW extremity of Borneo. The island is low and flat and about 10.5 miles in length in a N and S direction. The island is fringed by reefs, which extend up to 4 miles offshore off its E side.

Pulau Subi-Kecil, 80m high at its N end, lies close N of Pulau Subi. A light, shown from a white metal framework tower, 22m high, stands on the N summit of the island. Good anchorage can be obtained N of the light.

There is a sandy beach and landing by boat is always practicable, despite a strong current that sets parallel to the beach.

Batu Priuk (3°01'N., 108°52'E.), the principal village of the Subi group, is situated on the S side of Pulau Subi-Kecil. A natural basin in the coastal reef, approached from the E, affords good anchorage for small craft with local knowledge. There is also good anchorage off the entrance to this passage. Batu Ria, which is white in color and conspicuous, stands on the edge of the reef, 2 miles ENE of Pulau Subi-Kecil Light. A spit, with a depth of 8.2m at its outer end, extends 1.3 miles NE of Batu Ria.

Serdang Reef, with a depth of 6.4m, and Karang Laut, with drying rocks, lie, respectively, 9.5 miles ESE and 11.5 miles SE of Pulau Subi-Kecil Light.

Pulau Tembelai, an islet lying on a drying reef, is located 2 miles SE of the SE extremity of Pulau Subi; the channel between them is foul. Several shoals with depths of 1.8 to 11m extend about 5.5 miles SW of Pulau Tembelai.

1.14 **Pulau Bakau** (2°54'N., 108°44'E.), located about 3 miles W of the W extremity of Pulau Subi Besar, is fringed by a reef. A rock, awash, lies about 0.5 mile NW of its N extremity and a spit with a depth of 3.6m extends 0.5 mile N of its N extremity.

A dangerous wreck was reported (2005) to lie approximately 4.8 miles NE of Pulau Bakau

Pulau Tudang, fringed by a reef, stands 1.3 miles ENE of Pulau Bakau. Pulau Dengayah, low and covered with palm trees, lies on the coastal reef, 3.3 miles NE of Pulau Tudang. A 4.5m shoal patch lies 1.3 miles W of Pulau Dengayah.

Other shoal patches lie between a line extended from Pulau Bakau to Pulau Dengayah and the reef fringing Pulau Subi Besar. This area is foul and unsafe for navigation. A shoal patch, whose position is doubtful, is reported to lie 8 miles W of Pulau Bakau.

Pulau Panjang (2°45'N., 108°55'E.), lying 7 miles SE of Pulau Subi Besar, is a low island completely surrounded by a drying reef which extends 2.3 miles from its SW end. Pulau Kerdau stands near the SW end of the reef, 1.5 miles SSW of Pulau Panjang.

Two patches with depths of 2.7m and 3m lie, respectively, 1.3 and 3.3 miles, WSW of Pulau Kerdau. A depth of 12.8m lies 2.8 miles SSW of the island.

Pulau Sebiang and Pulau Japu are two low islands, covered with coconut trees, located on a drying coral reef, 3.3 miles N and 3 miles NW of Pulau Kerdau.

Pulau Seraya (2°41'N., 108°34'E.), the southwestern most of the Subi Group, lies 16 miles SW of Pulau Subi Besar. It is a hilly island, 3 miles long, with two peaks near its center; the S hill, 253m high, is higher.

The E side is low, sandy, and fringed by reefs. The W side rises steeply from the sea; its N part is fringed by a reef, and foul ground extends 0.4 mile offshore. A 3.7m patch lies 0.5 mile NE of its N extremity.

Karang Dua 19m high, lies 1.5 miles NE of Pulau Seraya; it is surrounded by a reef and should not be approached within 0.5 mile. An 11.8m patch lies 2 miles SE of this rock.

Jaring Reef, with a least depth of 3.6m, coral, lies about 3.5 miles N of Karang Dua. A 9.1m patch lies 3.3 miles NNE of the reef.

Swanley Reef lies 4.3 miles E of Karang Dua. Pumubabung, a reef, awash, about 2 miles in diameter, lies about 4 miles E of Swanley Reef.

1.15 **Jabak** (2°47'N., 108°44'E.), a reef, awash, lies about 3.5 miles N of the W end of Pumubabung. A coral shoal, with a least depth of 3.6m, lies about 2 miles W of Jabak and depths of less than 8.6m extend 0.8 mile W from this shoal.

A rock with less than 2m lies 1.5 miles NW of Jabak. A 8.5m patch lies 1 mile ENE of the rock. Another shoal, with a depth of 2.7m, lies 2.5 miles E of Jabak.

Karang Latu, consisting of a black boulder on a dry sand bank, surrounded by a drying reef, lies 4.8 miles ESE of Jabak. A 5.4m patch lies 0.5 mile SSW of Karang Latu.

Pulau Mambat, low and covered with coconut trees, lies 3.3 miles NE of Pulau Sebiang; the islet lies on a narrow reef, parts of which dry, which extends 1.3 miles NE and SW of the islet. A 9.1m patch lies 2 miles ENE of Pulau Mambat.

Pulau Serasan (2°31'N., 109°03'E.) is one of the most important islands in the S group of Kepulauan Natuna. The island is mountainous, rising near its SW end to a height of 441m. Koti (Kota), a hill 232m high, near the NW extremity of the island is nearly vertical on its W side, with prominent bare, red patches. The E and S coasts of the island are fringed by drying reefs, which extend up to 0.8 mile offshore in the bight near the middle of its S side.

Batuberian Besar (2°30'N., 108°57'E.) is the W island on an extensive reef, lying W of Pulau Serasan, on which are several other islands. This reef is separated from Pulau Serasan by Pelabuhan Serasan (Royalist Haven).

Batuberian Ketjil lies close NE of Batuberian Besar. Two detached portions of the reef, which dry, lie between 0.5 and 1.3 miles S of Batuberian Besar. Pulau Karanghaji (Pulau Haji), the S island, lies on a detached reef 2 miles SE of Batuberian Besar; a 5.8m patch lies about 0.5 mile E of Pulau Karanghaji.

Besar, an island 110m high, lies 2 miles NNE of Pulau Karanghaji. Besar, and four islets, lie on the NE side of the reef E of Batuberian Besar.

A bank, with a depth of 14m, lies 2.3 miles SW of Pulau Karanghaji. Patches and shoals, with depths from 1.7 to 10m, lie about 1 mile from the N coast of Batuberian Besar, in an arc from WSW through N to NE.

A shoal, with a depth of 3.7m, lies 0.5 mile WSW of the NW

extremity of Batuberian Besar.

1.16 Pelabuhan Serasan (Royalist Haven) (2°30'N., 109°01'E.) is the whole of the narrow passage between Pulau Serasan and the extensive reef SW; it affords good shelter in all seasons.

The haven is entered from the S, between beacons marking Batu Patjil and Batu Hol, two shoals lying SW of **Tanjung Ibul** (2°29'N., 109°01'E.), the SW extremity of Pulau Serasan.

Batu Patjil, a detached coral shoal with a depth of 2.4m, lies 0.5 mile SW of Tanjung Ibul. The shoal is marked on its E side by a lighted beacon.

Batu Hol, a coral shoal awash at its W end lies about 0.3 mile SW of Tanjung Ibul. A beacon standing on the W side of the shoal, marks the E side of the fairway. Most of the shoals in the S part of the channel of Pelabuhan Serasan are marked by beacons.

Tanjung Jerpit, 1.3 miles NW of Tanjung Ibul, from close S of which a light is shown, forms the S entrance point of a bay cluttered by reefs which lie on the NE side of the haven extending as far as **Tanjung Tebur** (2°31'N., 108°59'E.).

Pulau Kepala, a low rock, is located 7.3 miles NNE of the NE extremity of Pulau Serasan, and Pulau Perhantuan lies 2.5 miles S of the SE extremity of Pulau Serasan. A chain of islands, which may be seen on the chart, lie between Pulau Kepala and Pulau Perhantuan. From N to S they are Pulau Sedua; Rikel; Banya; Pulau Sempadi, a 2m patch lying 1 mile W; Pulau Peanyamuk, a shoal with a depth of 8m lying 2.5 miles WNW; and Pulau Genting.

A 500m jetty projects NW from the village of Palempak, 1.3 miles NE of Tanjung Jerpit, which can be reached by boat through a narrow channel marked by beacons.

Anchorage, in a depth of 10m, can be obtained during the Southwest Monsoon (May to September), 1.3 miles NW of Batuberian Ketjil with the SW side of this island in line with the summit of Perayun Besar, bearing 129°. Care must be taken to avoid the shoals N of Batuberian Besar.

Anchorage within Pelabuhan Serasan, in depths of 14 to 18m, can be obtained 0.3 mile SW of Tanjung Seranding, a point 1 mile NW of Tanjung Ibul, or further N according to the monsoon.

Directions.—Pelabuhan Serasan should be approached by keeping Tanjung Seganding in range with Kota Hill, bearing 336°, which leads through the shoals in the entrance.

When Tanjung Ibul bears 083° and in range with the SE extremity of Pulau Serasan, alter course to bring the outer detached rock, a little over 0.3 mile S of Tanjung Tebur, just open E of the NE extremity of Besar, bearing 318.5°, which leads between the beacons marking the shoals S of Tanjung Seganding, to the anchorage.

When proceeding to a berth further N, steer between the reefs W of Tanjung Jerpit until the E side of the islets of Besar comes in range with the E side of Perayun Besar, on bearing 206°, and anchor as convenient.

When approaching from the SW, care must be taken not to mistake one of the beacons marking the shoals in the S part of the haven with the beacon marking Batu Patjil.

The harbor is approached by boat through a narrow channel marked by beacons.

Alur Pelayaran Kota is the passage between the Serasan Group and Pulau Pandang, of the Subi Group, 11 miles NNW.

Caution.—Pelabuhan Serasan should not be entered from the W between Tanjung Tebur and Batuberian Ketjil. The passage is unmarked and there are many shallow patches in the entrance and several awash and below-water rocks. The inner harbor has a 500m jetty projecting NW from the village of Palempak, 1.3 miles NE of Tanjong Jerpit.

1.17 Haynes Shoal (2°34'N., 108°51'E.), coral and shell, with a depth of 5.8m, lies in the fairway 8 miles W of Tanjung (Kota) Koti. With the exception of this reef, Alur Pelayaran Kota is deep and free of detached dangers.

Alur Pelayaran Serasan (Serasan Passage), which is free of dangers, lies between Pulau Serasan and its adjacent islands to the N, and Pulau Malu (South Haycock) and Karang Karang Malu on the S side. The channel is about 7 miles wide.

Pulau Perhantuan is located in the E entrance to Alur Pelayaran Serasan, 2.5 miles S of the SE extremity of Pulau Serasan.

Karang Karang Malu, composed of coral, lie with their SW shoal, with a depth of 2.7m, 4.5 miles SE of Pulau Malu. The NE shoal, with a depth of 5m, lies 11 miles ENE of the SW shoal; between them are several detached shoals, three of which have sandy cays, which dry 2.1m.

Pulau Malu (South Haycock) (2°17'N., 108°54'E.) a small island 143m high, lies 11.5 miles SSW of Batuberian (Tebian) Besar. It is fringed by a narrow reef, and an above-water rock lies close SW of the island.

Sembuni Reefs consist of several rocky heads, with depths of less than 5.5m. The westernmost, which dries, lies about 12 miles ESE of Pulau Malu (South Haycock).

From this position, the reefs extend ENE for 8 miles, with a 3.6m patch near the E end. The reefs lie nearly parallel with Karang Karang Malu, to the N, from which it is separated by a channel that is clear.

Pulau Merundung (2°04'N., 109°06'E.) lies 10 miles S of the W extremity of Sembuni Reefs and 16 miles WNW of Tanjung Api. It is a swampy island covered mostly with mangroves, with the exception of two hills covered with trees. The tree tops have an elevation of 36m. A light is displayed on a 30m-high white metal framework tower standing on the center of the W side of the island.

A drying reef lies 0.5 mile off the W side of the island, with a 1.8m patch close NW of the reef. A 5m patch lies 1.3 miles NNE of the N extremity of Pulau Merundung.

Banks, with less than 20m, extend 18 miles NE of Pulau Merundung. A coral patch, with a depth of 7.8m, lies on one of these banks, 10 miles NE of the island.

Muri (Pulau Murih) (1°54'N., 108°39'E.), lying 29 miles WSW of Pulau Merundung, consists of two densely wooded islets joined by a drying reef; a narrow reef fringes both islands. The W islet, the largest, is 102m high; the E islet is 84m high. A light, shown from a white metal tower, 20m high, is situated on the W islet.

Anchorage can be taken N of the reef joining the two islets, in a depth of 29m, or close S of the W islet, according to the prevailing wind. There is a refuge hut near each anchorage which can be reached by a narrow channel through the reefs, which is marked by beacons.

Muri Kecil, 2.4m high and steep-to, lies about 2 miles S of Muri; there is a deep channel between them. Muri Kecil is the

SW extent of the Kepulauan Natuna Selatan group.

Caution.—Muri and Muri Kecil have been reported to lie 0.7 mile SW of their charted positions.

Mariners are advised to keep clear of the dangerous wrecks that has been reported on the following positions:

a. 1°44'N, 108°00'E. (approximate position}.

b. 1°43.6'N, 108°16.8'E.

c. 1°45'.8'N, 108°19.0'E—6m depth 20.8 miles WSW of Muri Kecil.

d. 1°48.6'N, 108°28.9'E—30m depth 10.5 miles WSW of Muri Kecil.

Kepulauan Pengibu

1.18 Kayu Ara (Kaju Ara) (1°32'N., 106°27'E.), a white colored barren rock 23m high, is the southeastern most of the small group forming Kepulauan Pengibu and lies about 110 miles E of the entrance to Singapore Strait. An above-water rock lies several meters off its S side. Pengibu, 96m high, is a small densely wooded island lying 8 miles WNW of Kayu Ara. A stranded wreck lies on the N shore of the island.

Beting Tamar (Hughes Shoal), 0.4 mile in length, with a least depth of 5.8m, lies about 0.5 mile SW of Pengibu, from which it is separated by a deep channel. The sea never breaks over this shoal.

A shoal with a depth of 12.8m, was reported to lie 1.8 miles SE of Pengibu.

Kayu Ara and Pengibu form good landmarks and radar targets for vessels proceeding between Singapore Strait and the NW coast of Borneo. Acasta Rock lies 4 miles N of Pengibu; it is almost awash. In calm weather it can only be distinguished by the discoloration of the water, but it breaks in the slightest swell. A submerged wreck, with a depth over it of 28m, lies in the vicinity of the rock.

Pulau Mendarik (1°19'N., 107°02'E.), 111m high, is located about 38 miles ESE of Kayu Ara (Kaju Ara). It consists of two hills connected by a low ridge and has sandy beaches on its E and W sides. Its N and S sides are rocky and rise steeply from the sea. A narrow reef fringes the E side of the island.

A rock, with a depth of less than 1.8m, was reported to lie 3 miles SE of Pulau Mendarik.

Kepulauan Tambelan

1.19 Kepulauan Tambelan is located between the parallels of 0°40'N and 1°15'N and the meridians of 107°12'E and 107°58'E. The island group is outside the usual track of shipping. The E island of the group lies 60 miles WNW of **Tanjung Batubelat** (0°49'N., 108°51'E.), the W extremity of Borneo.

A fairly clear channel divides the principal islands of this group into two smaller groups with good anchorage throughout the channel.

Kepulauan Tambelan—Northeast Group

1.20 Pulau Tambelan (1°00'N., 107°34'E.) is the SE island of the NE group, and the largest and most important of Kepulauan Tambelan. Three prominent peaks stand on the N side of the island. Bini, with an elevation of 396m, is the highest and W peak. Kotit, a remarkable sloping peak 291m high, stands 1 mile E of Bini and Puter Jala, 290m high, and cone shaped, is 1.5 miles ESE of Kotit.

Tanjung Antju is the NW extremity of Pulau Tambelan. Between Tanjung Antju and Tanjung Kemantau, the E extremity of the island, the coast is generally clear and free of reefs.

Pilang-kecil is an islet lying a few meters off the coast about 2.3 miles ESE of Tanjung Antju, and Pilang-besar, a somewhat larger islet, lies about 0.5 mile off the coast NE Pilang-kecil. An above-water rock lies close N of Pilang-besar. A shoal with a least depth of 5.7m lies about 0.5 mile NNW of Tanjung Antju.

From Tanjung Kemantan to Tanjung Mardi Angin, there are several bays, all encumbered with reefs. A reef extends 0.5 mile S of Tanjung Kemantan. Batu Rakit, a rock awash, with a 7.3m patch close E of it, lies near the outer edge of this reef.

Tanjung Bertumpa (0°57'N., 107°33'E.), 0.5 mile WNW of Tanjung Mandi Angin is the S entrance point of Teluk Tambelan. From Tanjung Bertumpa to Tanjung Antju, 4.8 miles N, the coast is fronted by a reef except in the entrance to the bay. NW of the entrance to Teluk Tambelan, the coastal reef extends about 0.6 mile offshore. The islets of Pulau Kera and Pulau Betunde lie on the reef about 2.3 miles and 2.8 miles NNW, respectively, from Tanjung Bertumpa.

Teluk Tambelan (0°59'N., 107°33'E.) is entered between Tanjung Bertumpa and Tanjung Ayam, 1.3 miles N. The bay nearly divides Pulau Tambelan into two parts.

The entrance to the bay is comparatively free from dangers, but farther in it is encumbered with reefs. Some of the reefs are marked by beacons.

Tanjung Sadap is located 1.3 miles NNE of Tanjung Bertumpa. The coast between the two points is fringed by a reef, with some above-water rocks on it. The NW side of the reef is marked by three beacons, white with truncated cones.

Anchorage can be obtained in the entrance to Teluk Tambelan during the Northeast Monsoon, but this anchorage is unsafe during the Southwest Monsoon, when better anchorage, with local knowledge, can be obtained NW of Tanjung Sadap, in a depth of 16m.

Caution.—A pinnacle rock, with a least depth of 3.6m, lies in the fairway 0.3 mile SSE of Tanjung Ayam.

1.21 Batu Lepu, a village situated near the head of the bay, 2 miles NE of Tanjung Sadap, can be reached by boats through a channel marked by beacons.

A pier, 160m long, with depths of 0.5m alongside stands on the NW shore, 0.4 mile SW of Batu Lepu.

Pulau Bungin (1°02'N., 107°31'E.), 87m high, lies 1.3 miles W of Tanjung Antju.

A reef with a least depth of 3.6m lies about 0.5 mile NE of the island, and two rocky patches with least depths of 7.3m lie, respectively, 0.2 and 0.5 mile SW.

Pulau Sedua-besar, 270m high, Pulau Sedua-kecil, 198m high, Pulau Sendulang-kecil, 91m high, Pulau Sendulang-besar, 241m high, and Pulau Uwi, 333m high, lie, respectively, 1.5, 2.5, 6.5, 6.8, and 8 miles WNW of Tanjung Antju, the NW extremity of Pulau Tambelan.

Each of these islands are steep-to with a fringe of shoal water and are clear of dangers except Pulau Sedua-besar, which has a shoal patch with a depth of 4.2m close off its N extremity.

Pulau Uwi has a reef which extends 0.4 mile off its E side.

Pulau Rakit lies near the SE end of this reef and another islet lies near its NE end.

The narrow channels between the islands of the NE group described above are mostly free from dangers, except those between Pulau Sedua-besar and Pulau Sedua-kecil, and between Pulau Sendulang-besar and Pulau Sendulang-kecil, neither of which should be used without local knowledge.

Off-lying Dangers

1.22 Karang Laut (Karang Robinhood) (1°11'N., 107°26'E.), a shoal with a least depth of 7m, lies about 4.5 miles NNE of Pulau Uwi. The sea does not break over this shoal. A coral reef, with a depth of 1m, lies 2.5 miles W of Karang Laut.

Tokong Belayer, an islet, lies 9 miles ENE of Karang Laut. It consists of two prominent boulders lying on a flat rock; the highest boulder is 37m high. Foul ground extends 0.2 mile S of Tokong Belayer, and depths of less than 10m extends 0.1 mile farther S.

Alida Shoal (0°59'N., 107°52'E.), with a least depth of 3m, stones and steep-to, lies 16 miles E of Pulau Tambelan.

Kepulauan Tambelan—Southwest Group

1.23 Pulau Benua (0°57'N., 107°27'E.) is the largest and highest of the SW group, located 3.8 miles WSW of Pulau Tambelan. The island, fringed by a reef that extends 0.5 mile from its SE side, is nearly 4 miles long and about 2.8 miles wide at its widest point. There is a peak 287m high on the NE side of the island.

Karang Tengah, with a depth of 4.9m, lies 1 mile ESE of Pulua Benua. Pulau Leso lies 0.3 mile W of Pulau Benua and is fringed by a reef. An above-water rock lies on the S end of a spit, which has depths of less than 10m, extending SSW from Pulau Leso.

A bank with a least depth of 4.9m near its outer end extends 0.7 mile from the NE side of the island. Pulau Nangka is located 1 mile NW of Pulau Leso. Pulau Ibul, 162m high, lies 0.8 mile NE of Pulau Nangka; it is fringed by a drying reef on its N side extending 0.4 mile offshore.

Pulau Nibung, fringed by a drying reef, lies 0.2 mile off the SW side of Pulau Ibul. Pulau Peling, fringed by a reef, lies 0.8 mile NE of Pulau Ibul. Pulau Tamban, 86m high, lies 0.5 mile N of Pulau Ibul. A 4m patch lies 0.2 mile S of Pulau Tamban.

Pulau Panyang (1°00'N., 107°23'E.) is located 0.5 mile NW of Pulau Ibul. The island is fringed by a reef and has depths of less than 10m, 0.2 mile NE of the N end of the island. Pulau Lintang lies NW of Pulau Panyang and is separated from that island by a channel 0.1 mile wide. Two islets lie on the reef close SW of Pulau Lintang.

Pulau Mundaga, 212m high, stands 0.5 mile NW of Pulau Lintang and Pulau Genting, 86m high, lies 0.7 mile NE of Pulau Mundaga. Two shoals, with depths of 2.7 and 7.3m, lie near the N end of the channel between Pulau Ibul and Pulau Benua with other shoals possibly lying in the channel. Local knowledge is necessary for the safe navigation of the navigable channels between the islands.

1.24 Pulau Selintang (0°57'N., 107°29'E.), 208m high, lies close E of Pulau Benua. The island is fringed by a narrow reef and has a detached reef, awash, lying near the N end of the channel between these islands. Two rocks, with depths of 0.9m and 3.4m, lie 0.2 mile NW and 0.1 mile NE, respectively, off the N end of the island. A 3.6m shoal lies 0.3 mile NE of the same point. Pulau Jela, 81m high, stands 0.2 mile NE of Pulau Selintang.

The channel between these islands is deep and free of dangers, with the exception of the dangers that lie NE of Pulau Selintang, described above. Burung, an above-water rock, lies on the reef that fringes Pula Jela, 0.2 mile N of its E extremity.

Pulau Bedua (0°57'N., 107°30'E.), 123m high, is located 1.3 miles E of Pulau Benua. It is fringed by a reef with depths of less than 5m, which extends 0.5 mile S and embraces Pulau Untuk. Pulau Lipi, which is fringed by a reef, lies about 0.1 mile S of Pulau Untuk, from which it is separated by a deep channel.

Pulau Batong, an islet 54m high, lies 0.5 mile E of Pulau Bedua and about 1.5 miles W of the SW extremity of Pulau Tambelan. There is a safe channel on either side of Pulau Batong; however, depths of less than 4.9m extend 0.1 mile N of the island.

Kapala Tambelan (0°54'N., 107°28'E.) is an islet lying 1.3 miles SSE of Pulau Benua. Karang Sobatan, a coral shoal with a depth of 4.9m, lies 2.5 miles SE of Kapala Tambelan. It is steep-to on its N, W, and S sides. Depths of 7 to 18m extend 0.6 mile SE of the shoal.

Mengirang-kecil, a hilly islet, lies 3.3 miles SE of Kapala Tambelan. A reef fringes the islet and extends 0.3 mile off its N extremity.

Mengirang-besar is a prominent island, 181m high, near its center, that lies 1.3 miles E of Mengirang-kecil from which it is separated by a deep, clear channel. The island is fringed by a narrow reef.

Tokong Mengirang (0°51'N., 107°37'E.), a conspicuous white rock about 24m high, is located 5 miles ESE of Mengirang-besar. Foul ground extends 0.2 mile SW and W from this rock. Two pinnacle-shaped rocks, each 3.6m high, lie near the SW edge of the foul ground.

A depth of 13.7m was reported to lie 8.5 miles ESE of Tokong Mengirang. A wreck, least depth 14m, lies 4 miles NNE of Tokong Mengirang.

Kepulauan Anambas

1.25 The islands lie in the S part of the China Sea, approximately 130 miles NE of the E entrance of Singapore Strait. The SE island of the group lies about 193 miles NW of the W point of Borneo. Vessels bound from Singapore to Hong Kong usually pass W of this group. All islands in the Anambas group are extremely hilly; most of them are densely wooded. The abundance of coconut plantations is a noticeable feature of these islands.

The Kepulauan Anambas are divided into two groups. Pulau Jemaja, 466m high, is the largest of the SW group and Pulau Siantan, 565m high, is the largest island of the NE group. In general, all of the Kepulauan Anambas N and E of Pulau Siantan are included in the NE group and all others comprise the SW group.

The wider passages between the various islands in this group

are generally free of dangers, but the narrower channels should be avoided, since most of these have not been completely surveyed. Masses of grass, small trees, and other debris from the rivers are sometimes encountered in the vicinity of Kepulauan Anambas. Some of these floating islands attain considerable size.

Kepulauan Anambas—Southwest Group

1.26 Pulau Jemaja (2°56'N., 105°46'E.) is the largest of the islands in the SW group. The island is about 15 miles long in a N and S direction and about 10 miles wide at its widest part. It is densely wooded and mountainous. Gunung Tujuh, its highest mountain, attains an elevation of 466m and is conspicuous from any direction. Gunung Tujuh and Gunung Adong are conspicuous peaks located in the N part of the island. The former, 451m high, rises to a sharp peak, and the latter, 433m high, has a rounded appearance when viewed from the E or W, but appears as a sharp peak when viewed from the N.

The various mountains in the central and S parts of the island, many of them over 305m high, are more uniform in the outline and not as conspicuous as those described above. The coastline of the island is very irregular and is indented by numerous bays and inlets.

The N end of the island consists of two peninsulas projecting in a NW and NE direction. The NW peninsula is high, and has a reef extending 0.5 mile NW from it. The NE peninsula terminates in **Tanjung Mingga** (3°03'N., 105°44'E.), a prominent cape, 107m high. When seen at a distance, this cape appears as an island. There is good anchorage in the bay between these two peninsulas, in a position 1 mile W of Tanjung Mingga, in 29m, sand, away from the strength of the tidal currents.

The E extremity of Pulau Jemaja consists of a peninsula 2 miles wide that terminates in two points; Tanjung Pinanang and Tanjung Jebung, 2 miles S. Teluk Mampo indents the NE coast, between Tanjung Pinanang and Tanjung Mingga, 7.5 miles WNW.

The entrance to the bay lies between Tanjung Mingga and Pulau Ayam, an islet located 2.5 miles WNW of Tanjung Pinanang. The shore at the head of the bay consists of a white sandy beach. Foul ground, with depths of less than 11m, extends from this shore a distance of about 1 mile.

A detached 5.4m patch lies outside the foul ground, about 3 miles WSW of Pulau Ayam. Pulau Gumbong, 97m high, is located in the N part of the bay, 1 mile SE of Tanjung Mingga. An islet, 70m, high is located between Pulau Gumbong and the shore. The general depths in the outer part of the bay are 24 to 28m, decreasing gradually toward the shore.

Anchorage is available near the center of the bay, exposed to the Northeast Monsoon, in a depth of 20m, sand and gravel bottom, 2.5 miles W of Pulau Ayam. Pulau Pinanang, an islet 82m high, is located 1.3 miles ENE from Pulau Ayam.

1.27 Teluk Jebung (2°57'N., 105°50'E.), lying SW of Tanjung Jebung, is fringed by a reef that extends as much as 0.5 mile offshore. The bay affords good temporary anchorage in its center, in a position about 1.5 miles SW of Tanjung Jebung, in depths of 16 to 18m, sand bottom.

Tanjung Linang, a point located 4.5 miles SSW of Tanjung Jebung, is the S entrance point of Teluk Kuala.

The village of Kuala is situated on the N side of Teluk Kuala about 1.5 miles from the entrance. Good anchorage is available in the entrance to this inlet in a position 0.5 mile N of Tanjung Linang, in about 24m, sand. Small vessels with local knowledge can anchor farther in.

Teluk Tiru is a large bay, encumbered by reefs, that lies between Tanjung Linang and Pulau Dayong, an islet 35m high, is located 4 miles SW. Shoal patches of 3.6m lie 0.8 mile N and 1.3 miles S, respectively, of Pulau Dayong. Pulau Punisan, an island 122m high, is located in the N part of the bay, 1.8 miles SW of Tanjung Linang.

Anchorage is available in the entrance to Teluk Tiru, 1 mile NNE of Pulau Dayong, in a depth of 25m, sand and mud. The bay should not be navigated because it has not been accurately surveyed. Westacott Bank, with a least depth of 12.8m, sand, lies about 4.3 miles SE of Tanjung Jebung.

1.28 Tanjung Lelan (2°49'N., 105°44'E.), 3 miles SW of Pulau Dayong, is the S extremity of the island; the hills slope gradually down to this point. A flat-topped rock, 6.1m high, lies close SE of the point and a 3.6m rock lies 2 miles NE. The point is marked by a light.

Tanjung Dayang, is located 3 miles NW of Tanjung Lelan. Gosong Margesson (Margesson Shoal), usually marked by tide rips, lies 5 miles W of Tanjung Dayang. The shoal is composed of sand and coral; the N has a depth of 12.8m, and the S, a depth of 9.1m.

Pulau Daru, a wooded island 194m high, lies close offshore 3.5 miles N of Tanjung Dayang. Pulau Katukan, 33m high, lies close W of Pulau Daru.

Pulau Sibrong (2°58'N., 105°42'E.), 177m high, lies close offshore 2.5 miles N of Pulau Daru. Pulau Tulai, 81m high, lies about 0.5 mile off the NW end of Pulau Sibrong. Courier Patch, with a least depth of 11m, lies about 1.5 miles WNW of Pulau Tulai.

Tanjung Julan is a high point of land that projects from Pulau Jemaja in a WNW direction for about 1 mile. Its extremity is located about 1.3 miles NNW of Pulau Tulai. Pulau Ipan, an islet 24m high, lies about 1.3 mile WNW of Tanjung Julan. A smaller islet lies close S of Ipan.

There is a roadstead lying between Tanjung Julan on the N and Pulau Sibrong and Pulau Tulai on the S. This roadstead indents the W coast of the island for a distance of about 1 mile. A reef extends SE, from the N shore of the roadstead for a distance of about 0.8 mile and embraces the islet of Berala, which is located 0.5 mile E of Pulau Tulai.

1.29 Letong (2°59'N., 105°42'E.) is a village situated on the NE shore of the road-stead about 0.5 mile E of Berala. A passage leads to the pier at Letong, which can accommodate boats even at low water.

Anchorage is available between Berala and Pulau Tulai, in depths of 16 to 20m. Care should be taken to avoid the detached reef, with a depth of 2.7m, which lies about 0.3 mile SE of Berala.

Kepulauan Badas

1.30 Kepulauan Badas are located between the parallels of 0°30'N and 0°39'N, and the meridians of 106°58'E and 107°12'E. The islands, which are outside the usual track of

shipping, lie 35 miles SW of Kepulauan Tambelan.

Pulau Anakawur (0°33'N., 106°59'E.) the SW island of the group, is 94m high and rugged, except on its SW side which is sandy. It is fringed by a narrow reef on its E side.

Caution.—A dangerous rock is reported to lie about 52 miles ESE of Pulau Anakawur.

Pulau Pejamu, 42m high, is located 10.5 miles ESE of Pulau Anakawur. It is densely wooded and has a sandy beach on its E side. White Rock lies near the extremity of a reef extending 0.3 mile NNE of Pulau Pejamu. A detached bank, with a depth of 14m, lies 2 miles ESE of Pulau Pejamu.

Pinangseribu, 122m high, lies 2.5 miles N of Pulau Anakawur. It appears as two islands when viewed from a distance SSE or NNW, due to the depression between the two hills standing on its E and W sides.

Tokong Kangen, 39m high, lies on a reef 0.5 mile N of Pinangseribu and Pinang Seratus. A high rock lies 0.3 mile E of the same island. Pinang Seratus is located on a reef with depths of 0.3m, which extends 0.4 mile N. Tokon Buton, an islet 25m high, lies 0.3 mile S of Pinangseribu, from which it is separated by a deep channel.

1.31 Pulau Kepahiang (0°38'N., 107°01'E.), 252m high, is the largest and N island of the group. The N and E sides of the island are fringed by a drying reef. There is a small bay on the NE side of the island where small craft with local knowledge can obtain sheltered anchorage off a settlement.

Pulau Segun, 44m high, is located about 0.5 mile SE of Pulau Kepahiang. There are several above-water rocks within 0.1 mile of Pulau Segun. A reef, with a depth of 1.8m, lies 1.3 miles ENE of Pulau Segun. Depths of less than 6.4m extend up to 0.3 mile N of the island. Pulau Penau, 3 miles ESE of Pulau Segun, has two hills joined by a narrow neck of low ground; the E hill is 189m high and the W is 101m high. A reef with depths of less than 4m extends up to 0.3 mile off the N coast of the island. Pulau Batu, 96m high, a small islet, thickly covered with vegetation, stands 1.3 miles SE of Pelau Penau.

Pulau Tebon, 2 miles ESE of Pulau Penau, is the most important and most populated island of the group. It has two hills joined by low land. The E hill is 179m high.

A small bay fronted by a barrier reef is located on the N side of the island, but is accessible only to local craft. A detached 10m coral patch lies 0.4 mile NW of the N extremity of Pulau Tebon.

A prominent white rock, 21m high, lies 0.4 mile E of Pulau Tebon. A shoal patch of 11.8m extends 0.5 mile E of this rock. Pulau-pulau Brace consists of three islets.

Pinangkuning (0°35'N., 107°10'E.), the NW islet, 118m high, lies 2 miles E of Pulau Tebon; Its S end terminates in a low sandy point with a conspicuous rock on its end. Rocks awash and below-water extend 0.2 mile N of Pinangkuning. Pulau Tanjaru, an islet 114m high, is located about 0.8 miles SE of Pinangkuning. A reef extends about 0.2 mile from its N side. An above water rock and a rock awash lie on the reef. Pulau Mengegah, 99m high, is a steep-to islet located about 0.2 mile E of Pulau Tanjura; a deep water channel separates the two.

Off-lying Islands and Dangers

1.32 Ebeling Shoal (0°28'N., 107°25'E.), an unmarked steep-to coral patch, with a least depth of 3m, about 0.1 mile in diameter, lies 17 miles ESE of Pulau Pejamu. Pulau Pejantan, 23 miles SSE of Pulau Pejamu, is a hilly island, mostly covered with jungle. The island reaches a height of 228m near its NE extremity. There are rocks and islets in the shoal water in the immediate vicinity of the island. A 14m spot, existence doubtful, lies 18 miles E of Pulau Pejantan.

Pulau Pengiki-besar (0°15'N., 108°03'E.) is the southeastern most island of Kepulauan Tujah. It consists of a conical hill, 198m high, with a small hillock, 76m high, 0.2 mile W of it. A light is shown from the islet.

Pulau Pengiki-kecil, 75m high, is a rugged, precipitous islet lying 0.3 mile W of Pulau Pengiki-besar, from which it is separated by a deep channel.

A coral shoal, with a depth of 11m, lies in the N entrance of this channel. Both of these islands are covered by dense vegetation and are uninhabited.

Good anchorage for vessels with local knowledge, sheltered from the Northeast Monsoon, can be obtained, in a depth of 27m, on the SW side of Pulau Pengiki-besar.

Welstead Shoal (0°33'N., 107°53'E.), a group of pinnacles having a least depth of 4.9m is 0.1 mile wide and 0.3 mile long. A detached shoal, with a depth of 11m, lies 0.2 mile W of this shoal.

Rodger Rock (0°41'N., 107°32'E.) is a dangerous steep-to rock, which never breaks, has a depth of 0.9m.

1.33 Pulau Jangkulan (0°45'N., 107°19'E.) is a low densely-wooded islet. The coast consists of a white sandy beach, fringed by a reef extending 0.2 mile offshore.

Tokong Kemudi (0°56'N., 106°44'E.) is formed by two hills joined by a thickly wooded ridge. The N hill rises in a nearly vertical cliff from the sea to an elevation of 176m. A sugarloaf shaped rock, 37m high, lies on the outer edge of a reef near the SE extremity of Tokong Kemudi.

Pulau Dumdum (1°12'N., 106°53'E.) is densely wooded and rises steeply from the sea in two peaks. The N and more pointed is 190m high. There is a sandy beach on its S side. The island is marked by a light.

Tokong Uwi consists of a group of two large and two small, bare, precipitous rocks. The rocks are lying on a steep-to reef, over which there is a depth of 4.9m. The N of the two larger rocks is 35m high.

Pulau Jemaja—Islands North and Northwest

1.34 Pulau Impul (3°05'N., 105°43'E.), 360m high, lies 1 mile N of Pulau Jemaja. A rock, with less than 1.8m, lies close off the S extremity of the island and a reef, barely awash at high water, lies off the SE extremity of the island.

Pulau Anak, 195m high, lies 0.3 mile NW of Pulau Impul. Several above-water rocks and two islets lie off the NW extremity of the island.

Pulau Mubur, about 0.5 mile W of Pulau Anak, has a ridge of round hills that rise to a height of 247m near the N end of the island. Pulau Datu is a small islet that lies 0.3 mile S of the SE extremity of Pulau Mubur.

Pulau Kramut, 113m high, lies close SW of Pulau Mubur and is joined to it by a mangrove swamp; there is a suitable channel for small boats through the swamp.

A bay, encumbered by foul ground, lies between the SE extremities of Pulau Kramut and Pulau Mubur. Vessels can an-

chor in the outer part of the bay, about 0.3 mile E of the SE extremity of Pulau Kramut, in a depth of 37m, sand and rock.

A small village lies at the head of the bay, which is conspicuous from seaward because of the metal roofs on its buildings.

Pulau Mangkai (3°05'N., 105°36'E.) is the farthest NW of the SW group of Kepulauan Anambas. It is located about 2 miles WSW of Pulau Kramut. The channel between these two islands is deep and free of dangers.

Pulau Mangkai has an almost uniform height of 175m and is densely wooded. Pulau Mangkai-kecil, 61m high, lies close SE of Pulau Mangkai and is connected by a reef that uncovers at low water. The coasts of both islands are fairly steep-to. A light is shown from a white iron framework tower situated on a summit near the center of Pulau Mangkai.

Caution should be observed in the approach to Pulau Mungkai, as the light is frequently obscured by heavy rain squalls.

Impul Passage is the channel between Pulau Jemaja and the islands N and NW. It is about 1 mile wide and the only dangers are McCaulay Bank, with a least depth of 9m, lying about 1.8 miles WNW of Pulau Jemaja and Bunker Patch, with a least depth of 9m, lying 0.8 mile SE of the SE extremity of Pulau Impul.

A shoal, with a depth of 16.4m, lies in Impul Passage, 1.5 miles NW of Tanjung Mingga.

The tidal currents set E and W through Impul Passage, with a greatest velocity of about 1.5 knots at springs.

Pulau Jemaja—Islands Northeast and Southeast

1.35 Pulau Telaga (3°03'N., 105°59'E.), an island 4 miles long, is located 8 miles NE of the E extremity of Pulau Jemaja. The island consists of a ridge of densely wooded hills and has a height of 530m near its N end.

Foul ground extends 0.3 mile from its S extremity and a rocky islet is located near the S extremity of a reef 0.8 miles W of the foul ground. There are several villages on the island, most of them on its W side. Pulau Buton, a narrow islet, 110m high, is 0.5 mile W of the S part of Pulau Telaga.

A reef with several above-water rocks, extends 0.3 mile from the S end of the island and another reef extends 0.8 mile from the N end of the island. Pulau Dinkor, with white cliffs, stands near the N end of this reef.

A detached drying reef, about 0.65 mile in extent, lies 0.5 mile N from Pulau Dinkor. A group of four small islands lie close off the NW side of Pulau Telaga. Pulau Telaga-kecil, 178m high, is the largest of this group. The other islands of the group are Pulau Lima, Pulau Midai, and Pulau Pasu.

Tokong Blinau, a rock 1.9m high, lies 2.8 miles WSW of Telaga-kecil. Foul ground extends for a distance of 0.5 mile N, E, and S of the rock.

Pulau Durai (3°20'N., 106°03'E.), 15 miles NNE of Pulau Telaga, is 152m high. It is about 1 mile long and densely wooded. Several rocks, with less than 1.9m, lie close off the NW end, and a detached group of dangerous below-water rocks lie about 0.8 mile farther NW. Batu Mamong, 1m high, lies 0.5 mile SW of Pulau Durai.

Tokong Nanas, 21.3m high, is located on the E extremity of a reef, 1 mile extent, which lies 5.5 miles W of Pulau Durai.

Pulau Gentingunyut (3°08'N., 106°05'E.) is located 6.3 miles ENE of Pulau Telaga. A ridge of wooded hills, the highest of which is 290m, extends along the center of the island. A reef extends about 0.35 mile off the N end of the island and a rock, 1.5m high, is located on the reef.

Pulau Linggai, 290m high, lies 1 mile ESE of Pulau Gentingunyut. Pulau Semisak lies close off the N end of Linggai and Pulau Musuh lies close off the S end. Both of these islets are connected to Pulau Linggai by reefs. Pulau Nawan, an islet 82m high, lies 1 mile E of Pulau Linggia.

Shoal water, with depths of less than 9.1m, extends 0.5 mile W from this island. Karang Singka, a rock awash, is located on a shoal 0.8 mile in length, about 1.3 miles NNE of Pulau Nawan.

Barnes Bank, with a least depth of 12m, sand and coral, lies 2 miles SSE of Pulau Nawan.

1.36 Pulau Telibang (3°00'N., 106°09'E.) is 17.5 miles E of Tanjung Pinanang and 7 miles S of Pulau Nawan. The island, 186m high, is the farthest N of the Telibang Group.

Pulau Dikar lies 0.5 mile W of the island and stands on an irregularly-shaped reef that extends from the islet 1 mile NNE. A reef extends 0.5 mile W. Several above-water rocks lie on the W side of the reef. Detached reefs lie N of the islet.

A 5.4m patch and a 9.1m patch lie 1.3 miles NNE and 0.8 mile NW, respectively, from Pulau Dikar.

Pulau Lubang Taban and Pulau Ujung are two islands lying 1.3 and 2.5 miles SE, respectively, of the S extremity of Pulau Telibang. Each island is surrounded by a coastal reef. Several detached reefs lie close off the W side of Lumbang Taban, and a rock stands on the reef 0.3 mile S of the SE extremity of Pulau Ujung.

Pulau Taloyan, an islet 87m high, lies 5 miles NE of Pulau Telibang and is the farthest island NE of the Telibang Group. Bennet Rock, with a depth of 3m, lies 1 mile E of the S extremity of Pulau Taloyan. A coral patch with a depth of less than 9.1m lies 0.5 mile NNE of Bennet Rock.

Pulau Buan, a wooded islet 76m high, lies 5.5 miles E of Pulau Telibang. A detached reef, parts of which are above water, lies close off its W side. Its SE side is fringed by a reef that extends as far as about 0.3 mile offshore. Two rocks, 0.4 mile off the island's S extremity, stand on this reef. The higher one is 4.2m. Pascu Rock, with a depth of 5m, lies 2 miles ENE of Pulau Buan.

1.37 Pulau Temiang (2°56'N., 106°08'E.) is 2.3 miles S of Pulau Telibang, and is the farthest N of the Temiang Group. The island, about 2.3 miles long, is rather low in the central part, but there are broad flat-topped hills near either end.

The hill near the W end has a height of 262m. A coastal reef surrounds the island and extends 0.3 mile off its SE extremity. The channel that lies between Pulau Temiang and the islands to the NE is clear and free of dangers.

Pulau Mangkudu, 30m high, and Pulau Telaga Cina, 40m, are islets lying 1 mile and 1.3 miles, respectively, off the SE extremity of Pulau Temiang.

The two islets are connected by a reef. A detached reef, with a head above water, lies in the channel midway between Pulau Temiang and Pulau Mangkudu. A small detached drying reef lies 0.7 mile S of Pulau Mangkudu.

Pulau Mangkait, 44m high, lies 1 mile S of Pulau Temiang. A narrow reef projects in a WNW direction from this islet for a distance of 0.3 mile.

Pulau Mentanyu, 99m high, and Pulau Genting, 96m high, are small islands that lie 3 and 4.5 miles, respectively, S of Pulau Temiang. Pulau Mentanyu has a reef 0.8 mile wide that extends in a NE direction, 0.7 mile. An islet stands near the N edge of this reef. A 10.9m patch lies close N of the reef that surrounds Pulau Genting.

A patch of coral and sand, with a depth of about 23m, lies 1.8 miles W of Pulau Genting. Pulau Serak, a small wooded island, 123m high and marked by a light, lies 7 miles SW of Pulau Genting. It is surrounded by a narrow reef, and is steep-to, except off its N and S sides where shoal water extends for a distance of 0.1 mile.

1.38 Pulau Ayerabu (Pulau Airabu) (2°46'N., 106°14'E.) is a large island about 7 miles SSE of Pulau Temiang. It is about 6.5 miles long and consists of a ridge of hills which attains an elevation of 486m near its NW extremity.

This peak is conspicuous from all directions. Another prominent peak, with a flat-topped summit 482m high, is located near the center of the island.

The N side of the island is fronted by a reef; its E side is indented by several small bays. A rock awash lies about 0.3 mile E of the central part of the island. A reef extends 0.5 mile E from the SE extremity of the island, and an isolated 5.4m patch lies 1 mile NE of this reef.

A bay indents the NW side of the island to a distance of 1.5 miles.

The S shore of the bay is encumbered by a reef, which extends 0.5 mile NW of the S entrance point. Vessels having local knowledge can anchor in the middle of the bay, in depths of 22 to 27m, mud. In foul weather a better anchorage can be found in the NE part of the bay, in a depth of 36m.

Pulau Lintang (2°43'N., 106°16'E.), an island 190m high, lies close SE of Pulau Airabu (Pulau Ayerabu), from which it is separated by a narrow boat channel. An islet lies 0.3 mile off its W side. A group of six islets extends about 1.5 miles in an E and NE direction from the island. The passages between these islets should not be attempted.

1.39 Batuputih (2°42'N., 106°17'E.) consists of a group of rocks lying 0.8 mile SE of Pulau Lintang. The S rock of the group is flat-topped and 14m high. Pulau Gembili, an island 324m high and 2 miles long, lies about 1 mile off the W side of Pulau Airabu. Its summit, located near the center of the island, is sharp and prominent. A reef awash lies about 0.3mile off its NE side.

Tokong Dahan (2°49'N., 106°10'E.), a dangerous rock with a least depth of 2m, lies 1.8 miles WNW of the N extremity of Pulau Airabu. The sea occasionally breaks over the rock. Tokong, an islet 30m high, lies 1.8 miles NNE of Tokong Dahan. This islet is steep-to and covered with trees.

Pulau Ritan, 137m high, is located 5.8 miles S of Pulau Lintang. It is surrounded by a reef that projects 0.5 mile E from its N part. An islet, 85m high, stands on the E edge of this reef. A conspicuous white rock, 12.2m high, lies on the reef off the W side of Pulau Ritan. A reef extends 0.5 mile S of the S extremity of the island.

An islet, 61m high, which has an extensive reef extending 0.5 mile from its W through N to NE sides, is located 1.3 miles NE of Pulau Ritan. A light, which has an elevation of 17m, has been established on the islet.

A flat rock, 9.1m high, marks the extremity of the reef extending from its W side. Brownrigg Rock, with a least depth of 3.6m, lies 2.5 miles NE of Pulau Ritan.

Tide rips have been frequently observed in the area S of Pulau Ritan, but a thorough survey of the area disclosed no dangers. It is believed that the irregular depths are responsible for such tide rips.

Off-lying Islands and Dangers

1.40 Damar (2°45'N., 105°23'E.) is a steep-to, almost barren rock, 82m high and marked by a light. It lies 20 miles WSW of Pulau Jemaja. A rock, with less than 1.8m, lies close S of Damar. Katoaka-besar, a coral reef with a least known depth of 8m, lies about 19 miles SSE of Damar. Less depths may exist on this shoal.

Tokong Malangbiru (2°18'N., 105°36'E.) lies 29 miles SSE of Damar. It is a white rock 34m high and almost barren. The rock, the farthest SW of this group, is steep-to all around except near its SW extremity, where shallow water extends for a short distance.

Tokong Malangbiru

Pulau Repong, a small island, 212m high and marked by a light, is located 17 miles ENE of Tokong Malangbiru. The two peaks on the island form a saddle, the E peak being the higher. The S and E sides of the island are steep-to. The island is fringed by a narrow reef, the edge of which is steep.

Pulau Bawah is a group of two small islands and several rocks lying 13 miles NE of Pulau Repong. This group lies on an almost continuous reef about 2 miles long and is fairly steep-to. The N and larger island has a wooded summit, 134m high. A pyramidal-shaped rock, 67m high, lies close off the N end of this island. The S island is 125m high and is connected to the N island by a reef having several low bushy rocks on its edge.

Kepulauan Anambas—Northeast Group

1.41 Pulau Pahit (3°24'N., 106°09'E.), the NW islet of the

NE group of Kepulauan Anambas, is an island nearly 1 mile long, lying 6.5 miles NE of Pulau Durai. This island can be recognized by its comparatively isolated position and its flat wooded summit, 213m high.

Tokong Belayar (Telok Belajar), the northernmost of Kepulauan Anambas, is a conspicuous light green pillar-shaped rock, 20.7m high, lying 7.5 miles ENE of Pulau Pahit. A steep-to reef extends NE from this rock for a distance of 0.5 mile and S from it for about 0.1 mile.

Pulau Mubur (3°20'N., 106°12'E.), 405m high and densely wooded, lies 3 miles SE of Pulau Pahit. It is one of the four large islands of the NE group; the NW coast of this island is foul. Teluk Ajer Bandong indents the S coast of Pulau Mubur to a distance of 1.8 miles.

Pulau Mantas, 158m high and 1 mile long, lies close E of the SW extremity of Pulau Mubar, and forms the W entrance point of Teluk Ajer Bandong. Good anchorage is available 1.3 miles within the bay, in a depth of 31m, mud.

Pulau Rinyi, an islet 50m high, lies 0.3 mile off the coast of Pulau Muber, about 1 mile NW of Mantas. This islet has black cliffs, about 15m high, on its S end. Pulau Pejantai, a flat-topped islet, 66m high, lies about 1 mile N of the W extremity of Pulau Mubur. Pulau Noran, an islet 49m high, lies on the reef close N of Pulau Mubur.

1.42 Pulau Matak (3°18'N., 106°16'E.) lies close E of Pulau Mubur. The island is about 9.5 miles long and 3.5 miles wide. Its conspicuous summit, 416m high, is near the S extremity of the island. The entire coastline of the island is mountainous, but its interior is low and flat.

Selat Matak separates Pulau Matak and Pulau Mubur. Its S end is about 2.3 miles wide and narrows to 0.3 mile at its N end where it opens into Teluk Matak. The channel is deep and free of dangers. The tidal current sets N and S and obtains a velocity of 1 to 2 knots in its narrowest part.

Teluk Matak is a large bay located between the N parts of Pulau Matak and Pulau Mubur; its greatest width is 2.5 miles. Pulau Ucing, 73m high, is the farthest E of several rocks and islets that lie in the NW corner of the bay. Vessels entering Teluk Matak should pass E of Pulau Ucing. A small islet and a reef are located close offshore in the E part of the bay.

Pulau Semut (3°24'N., 106°17'E.) is separated from Pulau Matak to the S by a fouled channel less than 0.1 mile wide at its narrowest point. The wooded island is 216m high. Tanjung Pandan, the N extremity of Pulau Semut, forms the N entrance point of Teluk Matak. A 5.5m patch lies 1.3 mile SE of Tanjung Pandan. Teluk Niulwan is a narrow, shallow inlet of little navigational importance that divides the SE part of Pulau Matak into two peninsulas.

1.43 Pulau Siantan (3°10'N., 106°15'E.), the largest and most important island of the NE group, is about 10.5 miles long and 5.5 miles wide. It lies S of Pulau Matak, from which it is separated by a channel 0.3 to 2.5 miles wide.

The island is mountainous throughout and densely wooded. It attains an elevation of 565m near the middle of the W side of the island. This peak is conspicuous but the general outline of the mountain ridges in the wider parts of the island is smooth and rounded.

The coastline is irregular and is indented by several bays, some of which afford good anchorage.

From Tanjung Pedas, the NW extremity of Pulau Siantan, the coast trends in a general S direction for a distance of about 7 miles to Tanjung Mandi Angin. Between these points the W coast is fairly steep-to and is free of reefs. Several sunken rocks lie off this section of the coast within the 11m line.

Teluk Rambutam is a narrow bay that lies E of Tanjung Mandi Angin; it is too narrow to afford a secure anchorage.

Teluk Ayer Bini (3°06'N., 106°15'E.) lies 3 miles SE of Tanjung Mandi Angin and is entered between Tanjung Baik and Tanjung Maluat, 1.8 miles ESE. Pulau Sui, 91m high, is located in the SE entrance of the bay.

Several white rocks lie about 0.8 mile WNW of Pulau Sui. A 3m patch, marked by discoloration, lies in the bay 0.8 mile N of Sui.

Good anchorage is available in Teluk Ayer Bini, in a position 0.5 mile N of Pulau Sui, in 29m, mud.

Between Tanjung Maluat and Tanjung Kretang, the SE extremity of Pulau Siantan, the coast recedes 1.3 miles forming an inlet whose shores are fronted by a reef.

The SE part of Pulau Siantan consists of an irregularly shaped peninsula that terminates at Tanjung Kretang. A sharp, conspicuous peak, 235m high, is the summit of this peninsula and is located about 0.8 mile N of Tanjung Kretang.

Pulau Berhala, an islet 43m high, with a reef projecting 0.3 mile from its W side, lies 0.5 mile ESE of Tanjung Kretang.

From Tanjung Kretang, the coast trends in a N direction for about 2.5 miles to the N end of the peninsula, which forms the SE part of Pulau Siantan; there are two small inlets W of the peninsula. From this point the coast continues in a generally N direction for about 3.5 miles to the entrance of a narrow reef-strewn inlet, which has two waterfalls close together on its W side.

From the N entrance point of this inlet, the coast trends in a NW direction for about 4.5 miles to Tanjung Momang, which is the N extremity of Pulau Siantan.

Most of the E and N coast of Siantan is fronted by a reef that extends up to 0.5 mile offshore; there are islets located on these reefs. Tanjung Angkak is located about 0.5 mile SW of Tanjung Momang. It is the E entrance point of Teluk Terampa, whose W entrance, Tanjung Baruk, is located 0.8 miles farther W.

Teluk Terampa, about 0.8 mile long, lies 1.3 miles SE of Tanjung Pedas, the NW extremity of Pulau Siantan.

The bay has a sandy beach at its head; however, both sides are fringed by reefs that extend as far as 0.15 mile offshore. A light is shown from Tanjung Pedas; another light is shown 1.5 miles SE of Pedas Light.

1.44 Tarempah (Terampa) (3°13'N., 106°13'E.) (World Port Index No. 51500), the principal village in Kepulauan Anambas, is situated on the sandy beach at the head of Teluk Terampa. A government official resides at Tarempah and the government offices are situated near the E side of the village.

A pier, with a depth of 1.2m, is situated near the government offices and a pier, 95m in length, that will accommodate vessels drawing up to 3.9m, is situated 91m farther W.

Anchorage can be taken near the head of the bay, in a depth of 17m, sand and mud.

Selat Peninting separates Pulau Siantan from Pulau Matak. Its W entrance lies between Tanjung Pedas and Tanjung Yang, the W extremity of Pulau Matak. At this point the channel is

about 2.5 miles wide, but narrows to 0.35 mile, about 3.3 miles within its entrance.

The W entrance is deep and free of dangers but at its narrow point it is encumbered by reefs and sunken rocks. There is a narrow passage between the reefs that front the N and S shores.

Thetis Channel

1.45 The NE group of Kepulauan Anambas is divided into two smaller groups by Thetis Channel. The three large islands of the NE group, previously described beginning in paragraph 1.41, lie on the W side of Thetis Channel. The other islands and dangers that lie on the W side of the channel and those islands and dangers that are adjacent to it are described below, beginning in paragraph 1.46.

Thetis Channel—West Side

1.46 Pulau Batu Garam (3°22'N., 106°20'E.), 235m high, lies on the W side of Thetis Channel and is located 1 mile E of the NE extremity of Pulau Matak. From Tanjung Kepinis, the N extremity of Batu Garam, a ridge of densely wooded hills extends nearly the entire 6 miles of its length to its S termination at Tanjung Muning. Snul, an islet 91m high, lies 0.3 mile off the central part of its E coast.

There are a number of small islands in the shallow reef strewn passage that lies between Pulau Matak and Pulau Batu Garam. This area cannot be navigated. Pigus, 53m high, Pulau Pidi, 70m high, Pulau Mantang-besar, 72m high, and Pulau Mantang-kecil, 61m high, extend 2 miles SSE of Tanjung Muning. Reefs extend W from these islets 0.3 mile.

Foul ground extends E from Mantang-besar and SSW from Mantang-kecil for about 0.3 mile. Pulau Beliba, an island 93m high and surrounded by reefs, lies about 0.8 mile SW of Tanjung Muning.

Pulau Lidi, a narrow, wooded island 67m high and about 1 mile long, is located 1 mile S of Pulau Beliba.

The reef that surrounds the island extends 0.6 mile from its NE extremity. Selat Tebang lies between Pulau Beliba and Pulau Lidi on the W and the chain of four islets extending S from Pulau Batu Garam on the E.

A coral patch, with a least depth of 10.9m, is located in the channel entrance, 0.5 mile S of Pulau Mantang-kecil.

Vessels can anchor near the middle of Selat Tebang in a position about 0.8 mile W of Pulau Mantang-besar, in 23m, mud.

Pulau Air Asuk (3°15'N., 106°18'E.), a narrow wooded islet 2.5 miles long, is located 0.3 mile W of Pulau Lidi and is separated from Pulau Matak on the W by the N continuation of Selat Peninting, which has been previously described in paragraph 1.44.

A reef, about 2.5 miles in length, extends S from Pulau Lidi and along the E coast of Pulau Air Asuk. Several islets lie on this reef. Pulau Tobing, 44m high, is located at the SE extremity of the reef.

A 3.6m patch lies 0.5 mile SE of Tobing. Pulau Teluk Pau, an island 168m high and 1.3 miles long, lies close S of Pulau Air Asuk. Several detached patches of reef lie near the middle of Selat Peninting between Teluk Pau and Pulau Matok.

Numerous reefs lie within a radius of 2 miles from NE through SE of the S extremity of Pulau Teluk Pau; a number of islets lie on these reefs. Passage between these reefs is possible for small craft with local knowledge.

1.47 Pulau Masabang (3°10'N., 106°18'E.), 133m high and Batu Belah, 117m high, are small islands located, about 0.5 and 0.65 mile off the middle part of the E coast of Pulau Siantan. Both are surrounded by reefs that extend as much as 0.8 mile N and E from Batu Belah and 0.5 mile NE from Pulau Masabang. Two detached reefs lie 1.8 miles NNE and 1.3 miles NE, respectively, of Pulau Masabang.

Selat Batu Belah is the channel between Pulau Siantan and its off-lying reefs on the W, and Batu Belah and Pulau Masabang on the E. Its N entrance is at its junction with the E part of Selat Peninting. The channel, about 0.2 mile wide, has small detached reefs in the fairway and should only be used by vessels with local knowledge.

Pulau Bajau (3°08'N., 106°19'E.), a large irregularly-shaped island about 5 miles long, lies close off the SE coast of Pulau Siantan from which it is separated by a narrow channel. There are two conspicuous peaks on the W side of the island about 1 mile apart; the SW peak is 239m high, the other is 238m high.

The E and W sides of the island are fairly steep-to but its N and S sides are fringed by reefs and are indented by several bays and inlets.

These bays and inlets are fringed by reefs; there are several detached reefs in the vicinity of the island, which may best be seen on the chart. Tanjung Suka, the S point of the island, has several rocks, the highest being 21m high, lying close S.

Between Tanjung Suka and Tanjung Dumang, a point about 1.3 miles to the NW, there is a bay fringed by reefs; several detached reefs and sunken rocks lie near the center of the bay. The one farthest S is located about 0.3 mile NE of Tanjung Dumang.

Anchorage can be obtained near the entrance to this bay in a position about 0.3 mile SSE of Tanjung Dumang, in a depth of 27m, sand.

Pulau Bajau is separated from Pulau Siantan by three channels that range from 0.1 to 0.6 mile in width. From N to S they are Selat Taburik, Selat Semanggi, and Selat Berawa. Tidal currents up to 1 knot may be encountered in the channels.

Pemutus Group

1.48 Pemutus (3°05'N., 106°20'E.), 79m high and about 1.5 miles long, is situated 1.3 miles E of the S extremity of Pulau Bajau; it is surrounded by a narrow reef. Two small islets lie 0.3 mile WSW and 0.5 mile SW of the S extremity of Pemutus.

Two small islands, joined by a reef, lie 0.5 mile E of the N extremity of Pemutus. Pengelat, an island 76m high, lies 1.3 miles farther NE. Two small islets lie, respectively, 0.3 mile WSW and 0.8 mile SW of the S extremity of Pemutus.

Selat Tanjung Suka is the name of the channel between the islands just described and the SE coast of Pulau Bajau. The fairway has an average width of 0.5 mile and is free of dangers except for the detached reef which dries 0.9m, lying 0.8 mile NNW of the N extremity of Pemutus.

The tidal currents, which are diurnal, set through the channel with a velocity of 1.5 to 2 knots; the flood sets SW and the ebb NE. A S wind and current often produce tide rips and overfalls

in the S part of the channel.

Walsh Bank (3°02'N., 106°18'E.), with a least depth of 11m, coral bottom, lies in the fairway between the SW and NE groups of Kepulauan Anambas, about 2.5 miles SSE of the S extremity of Pulau Siantan. The 40m line is not more than 0.5 mile from this patch.

Pulau Memperuk Group

1.49 Pulau Memperuk (3°04'N., 106°21'E.), an island 232m high and about 2.8 miles long, lies 0.5 mile E of Pemutus. Its N and S extremities are fairly steep-to but the remainder of the island is fringed by a narrow reef. Rocks, the highest of which is 2m, extend 0.3 mile E from the middle of Memperuk.

Pulau Abang, an islet 105m high, lies close W of the S part of Memperuk. A rock, 4.5m high, stands on the reef that projects from the W side of the islet. The channel between Memperuk and the islands that lie to the W and NW is narrow and not recommended.

Pulau Akar Group

1.50 Pulau Akar (3°02'N., 106°24'E.) is the largest and farthest E of the Pulau Akar group. It is 160m high and 1.5 miles in length. Pulau Semut, an island 73m high and about 0.5 mile long, is the W extremity of the Pulau Akar group. It lies 1.3 miles SE of the S extremity of Memperuk.

Other islands of the group are located between Pulau Semut and Pulau Akar, 1.3 miles SE. They are: Pulau Teluk Bakau, 69m high; Baba, 41m high, and Bate 82m, high. Tjatu (Catu), an islet 58m high, lies about 0.1 mile SW of Pulau Akar.

An isolated 10m patch lies 0.8 mile NNW of Pulau Semut. A rock, 0.9m high, is on the S extremity of the patch, and a rock, which dries 0.9m, is on the N extremity.

Pulau Nunsa (2°59'N., 106°25'E.), the S island of the NE group of Kepulauan Anambas, is located 1.3 miles SSE of Pulau Akar across a deep channel which frequently develops tide rips. This narrow island is 0.8 mile long and attains an elevation of 60m near its N end. Pulau Nunsa is marked by a light.

A small bank, with a least depth of 24m, lies 1.5 miles S of Nunsa. The tidal currents in this vicinity, which are diurnal, attain a velocity of 1 knot; the flood sets SW and the ebb sets NE.

Thetis Channel—East Side (Pulau Penjalin-Besar Group)

1.51 Pulau Penjalin-besar (3°23'N., 106°26'E.) is 5 miles E of Pulau Batu Garam and marks the NE entrance of Thetis Channel; its rounded summit is 131m high.

Pulau Setuju, 66m high, lies at the extremity of a reef 0.5 mile NE of Pulau Penjalin-besar; an islet 38m high is located on the same reef 0.3 mile S of Pulau Setuju.

Pulau Penjalin-kecil, an island 98m high, is separated from the SE extremity of Pulau Penjalin-besar by a narrow channel. The island is fringed by a reef, and two rocks, one of which is 0.6m high and is on the S edge of the reef 0.5 mile S of its S extremity.

Pulau Pasu, an islet 61m high, lies about 0.2 mile E of Pulau Penjalin-kecil; it is joined by a reef. Two smaller islets lie on this reef.

Vessels can anchor N of Pulau Penjalin-kecil with the E extremity of Pulau Penjalin-besar bearing 220°, distance 0.5 mile, in a depth of 27m, coral.

Alarm Bank (3°23'N., 106°29'E.), a sand and coral shoal having a least known depth of 8.5m, lies about 0.8 mile ENE of Pulau Pasu. An 11m patch is located 0.5 mile NE of this shoal and a 20m patch lies 0.5 mile farther E.

Alarm Bank and the two patches just described are marked by heavy tide rips, and navigation in this vicinity should be avoided.

Manda Riouw Group

1.52 Pulau Manda Riouw Darat (3°18'N., 106°24'E.), an irregular-shaped island, 142m high, is located 3.8 miles SSW of Pulau Penjalin-besar.

Pulau Nyamuk, 55m high, and 0.5 mile long, is located 1.8 miles NNW of Manda Riouw Darat and is the N island of the Manda Riouw group. It is free of reefs, but there are depths of less than 11m around the island that extend as far as 0.5 mile SSW of it.

A small islet, 9.1m high, is located 0.8 mile SSW of Pulau Nyamuk and an island 61m high is located 0.8 mile farther SSE.

Pulau Manda Riouw Laut is 102m high and 2 miles long. Its N extremity is located 0.1 mile E of the SE extremity of Pulau Manda Riouw Darat and the SW side of the island is connected to the S extremity of Manda Riouw Darat by a shallow reef. An islet lies on the edge of a reef that extends 0.2 mile S from the S extremity of Pulau Manda Riouw Laut.

Pulau Mangkian, 43m high and cultivated with coconut trees, lies 1.3 miles SW of Pulau Manda Riouw Laut. The entire island is surrounded by a reef, which extends as much as 0.2 mile offshore on its W and SE sides.

A shoal with a depth of 4.5m lies 0.6 mile S of Pulau Mangkian. Two patches with depths of 9.4m and 7.6m lie, respectively, 1 mile SSE and 1.5 miles S of the 4.5m shoal.

Pulau Sagu Dampar Group

1.53 Pulau Sagu Dampar (3°15'N., 106°27'E.), 152m high and 1.5 miles long, is located 2 miles SE of Pulau Manda Riau Laut.

A reef extends 1 mile N from the island and Sama, an islet 69m high, and a smaller islet 12.2m high are located on this reef; a small islet lies on the reef close S of Sama. Three detached reefs, the center one drying 1.2m, lie 0.3 mile off the SW side of the island.

Pulau Selai Group

1.54 Pulau Busung (3°14'N., 106°28'E.), a wooded island 102m high and 0.5 mile long, is located 0.8 mile E of the S extremity of Pulau Sagu Dampar. A conspicuous boulder 15.2m high lies in the shallow water that extends 0.3 mile from the E side of the island. Several above-water boulders lie close S of this boulder. A detached patch, awash, lies 0.3 mile S of the island. A rock, with a depth of less than 1.8m, lies in mid-channel between the S extremities of Pulau Sagu Dampar and Pulau

Busung. Penilan, a narrow island 93m high and 1 mile long, is located 0.65 mile SE of Pulau Busung.

Kudok, a 26m high islet, lies 1.3 miles W of the S extremity of Penilan. A detached reef, about 0.3 mile in diameter, which dries 1.5m, lies 0.8 mile W of Kudok.

A smaller reef lies close NW, and two patches, with least depths of 6.7m and 9.1m, lie, respectively, 0.5 mile NW and 0.3 mile N of this drying reef. Four small reefs, two of which uncover, lie within 1.3 miles SW of the large reef.

Pulau Selai (3°12'N., 106°29'E.), the farthest E of Kepulauan Anambas, is located close SE of Penilan from which it is separated by a narrow boat channel. Its summit, which is 162m high, appears as a sharp peak when viewed from N or S but from other directions it has the appearance of a wide ridge.

The coasts of the island are indented by several bays; those on the S and E side are encumbered by reefs and sunken rocks. Anchorage, which is sheltered from S winds, can be taken near the center of the bay on the N side of the island, in a depth of 23m.

Teluk Risan Group

1.55 Pulau Teluk Risan (3°11'N., 106°27'E.), an irregular-shaped island 174m high, is located 1.8 miles SW of Pulau Selai. Except for a portion of its E side, the island is surrounded by a reef that extends as far as 0.35 mile from its S side. A rock stands on the reef close E of its N extremity, and another rock stands on a detached reef 0.1 mile E of its S extremity. An islet, 46m high, lies near the edge of the reef, S of the island's S extremity. An area of foul ground 0.5 mile long, lies 0.5 mile off the W side of Pulau Teluk Risan.

A patch, with a least depth of 4.5m, lies about 0.5 mile W of the foul ground, and a detached drying reef lies 1.3 miles WNW of the foul ground. Temuruk, an island 85m high, lies 0.1 mile S of Teluk Risan. A reef extends N along the W side of Temuruk to the S extremity of Teluk Risan. Nibung, an islet 41m high, lies 0.15 mile SE of Temuruk.

Pulau Punjung Group

1.56 Pulau Punjung (3°09'N., 106°25'E.), the largest island of the group, is located 0.5 mile S of Temuruk. This island is about 2 miles long and has two prominent peaks near its center; one of them rises to 348m high.

The E side of the island is steep-to but the remainder of it is fringed by a narrow reef.

An islet, 58m high, lies 0.3 mile S of the SE extremity of the island and another islet, 29m high, lies close off the SW side.

Pempang, a narrow island 140m high and about 1 mile long, is located 0.5 mile SE of Pulau Punjung. This inhabited island is fairly steep-to and densely wooded. Pulau Mentalak, an island, 91m high and 1.3 miles long, is located 0.65 mile S of the SW extremity of Pulau Punjung; it is partially cultivated with coconut trees.

Pejaul Group

1.57 Pulau Pejaul (3°09'N., 106°23'E.), 231m high, is about 1.3 miles long and lies 0.3 mile W of Pulau Punjung.

Two islets, 46m and 55m high respectively, are located close off the NW side of the island. A rock, 0.9m high, lies 0.2 mile SW of the 46m islet. Two 11m patches, 0.5 mile apart, lie 0.3 mile off the S side of Pejaul.

Pengending, an island 248m high, lies 0.3 mile NE of Pulau Pejaul to which it is connected by a reef. An islet, 49m high, lies on the edge of a reef close N of the island.

A rock, awash, lies 0.15 mile N of the islet and another rock 1.2m high lies between them. An islet, 35m high, lies 0.5 mile NW of the 49m islet. There is an anchorage, sheltered from S winds, with the 49m islet bearing 095° and the 35m islet bearing 034°, in 24m, sand and coral.

Selat Teluk Dalam is the channel between the Pulau Punjung group on the E and the Pulau Pejaul group on the W. The channel, which has a least width of 0.1 mile, is deep and free of detached dangers although its N end is somewhat encumbered by the reef that extends NE from Pengending.

The channel between the Pejaul group and the Pulau Punjung group, on the S and Temuruk on the N, is about 0.4 mile wide and is deep and clear.

Pulau Luyung Group

1.58 Pulau Luyung (3°11'N., 106°22'E.), a narrow wooded island about 1.8 miles long, is located 1.8 miles NW of Pulau Pejaul. It consists of two well-defined peaks separated by a narrow strip of low land. The N peak, which is higher, is 114m high. A shoal with a lest depth of 5m lies 1.3 miles NNW of the island.

A patch, with a least depth of 3.6m, lies 0.5 mile W of the island. Pulau Getah, 88m high, lies SE of Pulau Luyung and is connected to that island by a reef 0.1 mile in extent.

Esperance Reef, an isolated reef having a sand bank that dries 1.8m on its S end, lies 1 mile NE of Pulau Luyung. Shallow coral patches, with depths of less than 10m, lie within 2 miles NE from the reef. Depths less than charted may exist over these shoals.

Thetis Channel—Islands and Dangers

1.59 Hooper Bank (3°20'N., 106°21'E.) is two detached shoals which lie E and SE of the S extremity of Pulau Batu Garam. The N patch, with a sand and coral bottom, has a least depth of 9.1m and lies 1.3 miles E of Batu Garam. The S patch, with a depth of 11m, lies 0.8 mile S of the N patch.

Hale Bank (3°17'N., 106°22'E.), a coral shoal having a least depth of 6m, lies nearly in the middle of Thetis Channel in a position 1.5 miles SW of Pulau Manda Riouw Darat.

Thetis Reef (3°15'N., 106°21'E.), lying near the middle of Thetis Channel, is a coral reef about 0.5 mile long. It is located 2 miles WSW of Pulau Mangkian. A 7m patch lie about 0.8 mile WNW of the reef. Patches with depths of 5 to 9m lie within 1 mile N of Thetis Reef. A narrow reef, about 1 mile long, is located about 1 mile SW of Thetis Reef. There is a sand cay on the middle of the W side of this reef which dries 1.5m.

1.60 Pulau Mangkian Pandak (3°12'N., 106°21'E.), an island 49m high, is located 1.3 miles NW of Pulau Luyung. Two wooded islets 24m and 49m high lie, respectively, 0.3 mile ESE and 0.5 mile SSE of the island.

A coral head, with a depth of 6.4m, lies 1 mile NNE of Pulau

Mangkian Padak and a coral shoal, with a least depth of 5m lies 0.6 mile NE of it.

Chabroi Bank (Chabrol Bank) (3°08'N., 106°22'E.), two in number, lies 1 mile W of Pulau Pejaul. The E patch has a least depth of 6m and the W has a least depth of 8m.

Howard Rock (3°05'N., 106°22'E.), with a depth of 3.6m, lies 0.8 mile ESE of the N extremity of Pulau Memperuk.

Egeria Rock (3°02'N., 106°27'E.), a coral head with depths of about 4m, lies in the S approach to Thetis Channel in a position about 2 miles E of Pulau Akar. A 6m coral patch lies 0.5 mile W of the rock.

1.61 Udang Marine Terminal (4°02'N., 106°30'E.) lies 40 miles NNE of Kepulauan Anambas and 20 miles SE of the main route between Singapore and Hong Kong. The oil field consists of Udang A and B production platforms and a storage tanker moored 1 mile ESE of Udang A.

A pipeline connects the platforms to the storage tanker. Areas within 1.8 miles of the storage tanker and 1 mile of each platform are restricted and anchoring is prohibited.

Depths—Limitations.—Tankers up to 93,000 dwt, with a maximum length of 260m and a draft of 15m, can use the terminal. Vessels berth at the storage tanker port side-to.

Tankers must arrive with clean ballast. There are no port facilities available at Udang Terminal.

Anchorage.—The recommended anchorage is 3.5 miles WNW of Udang A.

Pilotage.—Pilotage is compulsory when mooring and unmooring, the mooring master acts as pilot. Vessels will normally moor during daylight hours, but may unmoor at any time, weather permitting.

Caution.—A rectangular shape restricted area of 3 miles by 2 miles has been established surrounding the terminal. Vessels are not allowed to enter a prohibited area, within the restricted area around the terminal, without the berthing master onboard. Anchoring within the restricted area is prohibited. There are no facilities for bunkers, fresh water, provisions, or reception of dirty ballast.

Kakap Natuna Oil Field is about 63 miles ESE of Tapis A platform, and about 68 miles NNW of Udang Marine Terminal. It also lies 30 miles NW of the main shipping lane between Singapore and Hong Kong.

1.62 Kakap Marine Terminal (5°01.7'N., 105°55.9'E.) is a floating production, storage, and off-loading vessel (FPSO). Kalap Natuna is a converted tanker permanently moored to a single point mooring (SPM) buoy. A vessel up to 100,000 dwt and 300m long can be brought alongside to the FPSO in a depth of about 29m.

A production platform, about 1 mile WNW, is connected by a pipeline to the SPM. The SPM displays a yellow Morse (U) light, the bow of the FPSO displays a white Morse (U) light, and the bridge displays a red Morse (U) light. A flare on the wellhead platform is visible at considerable distances.

Pilotage is compulsory and berthing is restricted to daylight hours only. The berthing master boards vessels in the anchorage area. Night berthing may be allowed under special circumstances at the discretion of the Operations Superintendent. Vessels should send their ETA on departure from the last port-of-call and thereafter 72 hours, 48 hours, and 24 hours in advance to Kakap Natuna Marine Terminal. Tankers must arrive with clean ballast. There are no facilities for bunkers, fresh water, provisions, or reception of dirty ballast. Several oil platforms stand 9 miles SSE of the terminal and they are connected to it by a submarine pipeline. Anchoring is prohibited within 500m of the pipeline.

Vessels loading at Kakap Terminal must comply with the latest Safety of Life at Sea (SOLAS) conventions and Maritime Pollution (MARPOL) Protocols. Any vessel found deficient to comply with these regulations will be refused mooring and loading.

Anchorage is designated for vessels awaiting to load, within a radius of 1 mile centered on position 5°02.9'N, 105°58.5'E.

Restricted and Prohibited Areas.—The platforms and well heads in Kakap Oil Field are contained within the restricted area, best seen on the chart; unauthorized vessels should not enter this area. Vessels are not allowed to enter a prohibited area within a radius of 1 mile from the SPM buoy and 500m from the well head platform without the Berthing Master on board.

Anoa Natuna Marine Terminal (5°13'N., 105°36'E.) consists of a lighted production platform and a floating production, storage, and off-loading vessel (FPSO), which is anchored 1 mile SE. They are connected by a submerged pipeline. A pipeline also runs from the facility to Jurong Island S of Singapore. The FPSO vessel is 182m in length and can accommodate tankers of 160,000 dwt in tandem.

The terminal operates 24 hours, but operations may be terminated in the event of adverse weather.

Pilotage is compulsory. A Berthing Master boards within the anchorage area, radius 0.75 mile, centered on position 5°12'N, 105°38'E. Mooring is restricted to daylight hours only. Vessels may unmoor at any time.

Borneo—Northwest Coast—General Remarks

1.63 The NW coast of Borneo extends from Tanjong Datu, a salient headland, to Tanjung Padangtikar, about 166 miles SSE. Except for a few bold headlands and a short stretch at the extreme N end, this coast is low and densely wooded. The S part is occupied by the swampy delta of the Sungai Kepuas, and detached hills some distance inland; the delta mouths form the only landmarks along this part of the coast.

The mountains backing the N portion of the W coast of Borneo are more rugged and rise closer to the shore.

The entire coast is fronted by the shoal waters of the South China Sea, the 20m line lying as much as 10 miles offshore and the 40m line lying about 75 miles off the S part of this coast.

Tanjong Datu to the Sungai Sambas-Besar

1.64 Tanjong Datu (2°05'N., 109°39'E.) is the termination of a mountainous peninsula projecting about 6.8 miles in a NNE direction from the coast.

The peninsula is distinguished by two peaks. Gunung Datu, 550m high, stands 2.5 miles S of Tanjong Datu. Gunung Malaka, 540m high, stands 1 mile farther S. Gunung Pangi, 240m high, is an isolated peak rising from the low ground 2.5 miles S of Gunung Malaka and has been reported to be a good radar target at distances up to 21 miles. The mountainous terrain commences 11 miles S of Gunung Pangi.

During June, the current off Tanjong Datu was observed to set SSW for 15 hours consecutively at an average rate of 1.5 knots.

The W side of Tanjong Datu is fringed by a narrow bank marked by some drying rocks. Four drying rocks lie within 0.5 mile N of the extremity of the point. A dangerous wreck lies 33 miles NE of Tanjong Datu, and another wreck lies 4 miles NW of it.

Tanjong Datu Light, a metal tower, stands on the point at an elevation of 171m. Close SE and N are, respectively, a wind generator (metal tower) 6m high, and the old light, now reserved for emergency use.

The entire coastline of the peninsula terminating at Tanjong Datu is steep-to and is fronted by a reef and by many above-water rocks. There are strong eddies off the point.

A small shoal area, with a least depth of 6.1m, lies about 2 miles E of Tanjong Datu.

Anchorage can be obtained, in depths of 11 to 14m, about 1 mile off the W side of the peninsula.

1.65 From Tanjong Datu to Tanjung Api, about 20 miles WSW, the coast is low and sandy. A few rocks lie close offshore along this section of the coast.

A shoal with a least depth of 8.2m lies close within the 10m line 9.3 miles NE of Tanjung Api.

Niger Bank (Permatang Naga) (2°09'N., 109°39'E.), with a least depth of 7.9m, lies 4.5 miles N of Tanjong Datu and is separated from it by a clear channel. Three 11m patches lie 3.3, 3.8, and 4.5 miles NW of Tanjong Datu.

With fresh N winds and a N current there are tide rips on this bank, which from a distance resemble breakers. There are strong eddies off Tanjong Datu. A stranded wreck lies 12.5 miles NE of Niger Bank.

Shoal patches with depths of 12.8 to 18.2m extend 16 miles W of Niger Bank. They may best be seen on the chart. A shoal with a least depth of 9.1m lies close within the 18.3m line (10 ftm curve), 9.5 miles NE of Tanjung Api.

1.66 **Api Passage** (2°02'N., 109°12'E.), the channel separating the S group of Kepulauan Natuna from the NW coast of Borneo, is relatively deep and clear of dangers.

Two shoals, each with a depth of 8.8m, sand, lie 7.8 and 9.5 miles NE of Tanjung Api. A shoal, with a depth of 14m lies 10.5 miles NNE of Tanjung Api with a 15.8m patch lying 2 miles W.

A 14.6m patch has been reported (1980) approximately 10.3 miles NNW of Tanjung Api. A bank, with depths of 12.8 to 18m, lies with its shallowest part 17.5 miles NE of Tanjung Api. It extends 4 miles SW and 1.5 miles NE from this position.

Two shoals lie 1.5 miles WSW and 2.5 miles NE of this bank with depths of 16.7m and 17.3m, respectively.

1.67 **Tanjung Api** (1°57'N., 109°20'E.) is a low sandy point covered with virgin forest. From this point the land trends 1.8 miles SW to Tanjung Mungguresak (Moenggoe Resak), a low, sandy point, then SSW 8.5 miles to Tanjung Blimbing. A bight lies between Tanjung Mungguresak and Tanjung Blimbing; the shore of the bight is low and sandy.

A shoal ridge begins 1.3 miles N of Tanjung Api with depth of 4.8m. The shoal continues SW for 2.5 miles where it terminates at a depth of 0.9m. The outer side of the shoal is steep-to.

Bukit Mungguresak, 70m high, and Bukit Tjermai, 75m high, are located, respectively, 0.8 mile and 3.8 miles SE of Tanjung Api. Another prominent landmark on this coast is Gunung Asu Ansang (Asoe Ansang), 600m high, located 11 miles SE of Tanjung Api.

From Tanjung Mugguresak to Tanjung Blimbing, the 5.4m line extends from 0.5 mile offshore at the N end to 2 miles offshore at Tanjung Blimbing. A spit, with 1.8m depth, extends 2.8 miles N from Tanjung Blimbing. A bank, with depths from 1.2 to 5.5m, lies close inside the edge of the coastal bank, 5 miles W of Tanjung Blinbing.

The Sungai Paloh is of little importance to shipping. Its normal entrance is between Tanjung Blinbing and the islet 0.2 mile S, with some high casuarina trees, and then W of Pulau Tua.

Pulau Tua (Pulau Toea) (1°45'N., 109°16'E.) lies 0.5 mile offshore, S of the entrance to the Sungai Paloh. It is low with very tall trees on it. The N part of the island at one time had been washed away and in the same period the sea broached Tanjung Blimbing in two places leaving openings about 0.3 mile wide. Vessels should not attempt to enter the Sungai Paloh without local knowledge.

From Pulau Tua, the coast trends SW 20 miles to Tanjung Bayung, then SSW 19 miles to Tanjung Kalang Bau, the N entrance point of the Sungai Sambas-besar.

With the exception of Gunung Raya located 14 miles SSW of Tanjung Bayung, this entire portion of the coast is low and flat.

The most prominent of the landmarks on this coast is Gunung Melintang, 345m high, 8 miles ESE of Tanjung Blimbing. Other peaks stand in the following positions relative to Gunung Melintang:

1. Gunung Belau Tunggal, 500m high, 4 miles E.
2. Bukit Sagu, 245m high, 1.5 miles W.
3. Bukit Se Tengah, 245m high, 2.5 miles WNW.

Bukit Ambawang, 160m high, is located 4 miles SE of Tanjung Blimbing. Gunung Raya, 124m high, is located close inshore, 14 miles SSW of Tanjung Bayung.

From Pulau Tua to Tanjung Bayung, the 5.4m line lies up to 5 miles offshore and close off the point. West of Gunung Raya, the 20m line is only about 0.5 mile outside the 5.4m line; vessels should not approach within the 20m line.

Pulau Pontianak, 55m high, a conspicuous islet, lie about 0.5 mile SW of Gunung Raya. Anchorage may be had in the bight formed between Gunung Raya and Tanjung Bayung, mud.

1.68 The **Sungai Sambas-besar** (1°11'N., 108°57'E.) is entered between Tanjung Kalang Bau, 83m high, and Tanjung Bila, a low flat point, 3.3 miles SW. There are numerous villages and settlements on both banks of the river as far as Kartijasa, about 25 miles inland.

The mouth of the river is easily identified by Bukit Penibunga, 78m high, which is a spur extending N from Gunung Pemangkat, 395m high. Tanjung Kalang Bau is prominent, as is Gunung Raya, 5 miles NNE.

Pulau Pekak, 32m high, lying 0.5 mile NNW of Tanjung Kalang Bau is also prominent.

The entrance of the river is fronted by a bar, which is steep-to on its seaward side. The least depth on the bar was reported

to be 2.1m. The depths in the river from inside the bar to its confluence with the Sungai Sambas-kecil, 15 miles upstream, were not less than 2m. The least depth in the fairway to Kartijasa, 10 miles farther upstream, is 5.9m. Range lights lead across the bar to the entrance to the river.

The river entrance is generally obstructed by fishing stakes and net floats. Two obstructions lie in the entrance, one on each side of the channel. The W obstruction lies 1.5 miles WSW of Tanjung Kalang Bau. Within the N entrance point, an islet, 15m high, with a rock close S which dries 0.9m, is located close SE of Tanjung Kalang Bau. Only those vessels with local knowledge should transit the Sungai Sambas-besar.

In the Sungai Sambas-besar, the tidal currents are semi-diurnal and attain a rate of about 2 knots in the entrance at springs. Off the entrance, tidal currents are N and S and attain a rate of 1.5 knots.

Kampung Pemangkat is on the S side of the river, close to Gunung Penibungan, where there is a wharf 44m long with depths alongside of 0.8m. The harbor and customs offices are situated here.

Anchorage is available abreast the village. The anchorage limits are defined on the W by a line joining Tanjung Bila and Tanjung Kalang Bau and on the E by a line drawn 146° from Gunung Raya.

Vessels are cautioned that the mud bank fringing the S bank of the river between Tanjung Penibungan and Tanjung Parakan, about 1.5 miles NE, is very steep-to and caution must be exercised by vessels anchoring in this area.

1.69 Tanjung Parakan (1°12'N., 108°59'E.) is a point on the S side of the river, 1.3 miles E of Tanjung Kalang Bau. Tanjung Semperiuk and Tanjung Rambajan are on the N side of the river, 5.5 and 11.3 miles, respectively, above Tanjung Kalang Bau.

The mouth of the Sungai Sambas-kecil is on the SE side of the Sungai Sambas-besar, about 3.5 miles NE of Tanjung Rambajan. The Sungai Bantanan flows into the Sungai Sambas-besar about 8 miles farther upstream, then 2 miles further to Kartijasa. A canal connects Kartijasa to Sambas which is navigable by local craft.

The **Sungai Sambas-kecil** (1°18'N., 109°10'E.) leads to the town of Sambas 11 miles above its confluence with the Sungai Sambas-besar. The river is narrow and winding, with depths in the fairway of not less than 6.1m, except on the inner bar.

The inner bar, about 6 miles within the mouth of the river, has a least depth of 2.7m, and a channel width across the bar of 25m. A wreck which dries 0.9m and is marked by a beacon which also covers, lies on the rocks on the W side of the channel that crosses the bar.

It is not advisable to pass the wreck at highest high water due to it and the beacon being covered at such time.

Strong tidal currents exist near the wreck during times of low water.

1.70 Sambas (1°22'N., 109°18'E.) is a town about 13 miles upstream from the mouth of the Sungai Sambas-kecil and about 26 miles from the mouth of the Sungai Sambas-besar. A Government Administrative Officer resides at Sambas. There is a quay, 38m long, which can accommodate vessels up to 600 dwt drawing 4m at all stages of the tide.

Pilotage is not available. Only those vessels with local knowledge should transit Sungai Sambas-kecil. The coast should be approached outside the 10m line to avoid the numerous fish traps which exist in this vicinity.

The Sungai Sambas-besar to the Sungai Kepuas-kecil

1.71 From **Tanjung Bila** (1°10'N., 108°55'E.) to Tanjung Batubelat, about 22 miles SSW, the shoreline is, low and flat. Tanjung Gunung, 156m high, is 4.3 miles SSE of Tanjung Bila and Tanjung Bajau, a high, precipitous point, which is located 13.8 miles farther SSW. From Tanjung Bajau the coast trends SW 4.5 miles to Tanjung Batubelat, the W extremity of Borneo, which is a prominent point.

The N coast of the area described above is backed by Gunung Serindung, 252m high, and Gunung Simpadang, 276m high, located, respectively, 7.3 and 14 miles SE of Tanjung Bila, with neither one being particularly valuable as a landmark.

Gunung Sekunang, 99m high, is a conspicuous hill 0.8 miles inland, 8.5 miles SSE of Tanjung Bila. Gunung Syakok, 303m high, also conspicuous, is 1.5 miles inland, 9.3 miles S of Gunung Sekunang.

Between Tanjung Bila and Tanjung Bajau the coast recedes about 4 miles forming Teluk Singkawang. The Sungai Sebangkau and the Sungai Selakau flow into Teluk Singkawang about 3 and 6.5 miles, respectively, SSE of Tanjung Bila. The Sungai Singkawang flows into Teluk Singkawang, 5 miles NE of Tanjung Bajau.

The Sungai Singkawang entrance is encumbered by a bar that almost dries; passage over the bar is difficult, even for small vessels.

The village of Singkawang is 2 miles upstream from the mouth of the river and is the residence of a government official. A group of above-water rocks lies off Tanjung Merah, 2.5 miles SE of Tanjung Bajau.

Tanjung Batubelat (0°49'N., 108°51'E.) is the W extremity of Borneo and it rises to Gunung Batubelat, 210m high, which lies 1 mile E. Tanjung Bajau rises to Gunung Besar, 306m, about 1.5 miles inland, 4.5 miles NE of Tanjung Batubelat.

The coast from Tanjung Batubelat trends S for a distance of about 29 miles to Tanjung Bangkai. It is low and wooded and has trees extending down to the water's edge. A coastal bank, with depths of less than 5.3m, extends as far as 2.5 miles from this part of the coast.

1.72 Tanjung Teranjun (0°43'N., 108°52'E.), located 6.8 miles S of Tanjung Batubelat, is high and cliffy. Gunung Bunga, 0.5 mile inland, is 195m high. Gunung Haur, 140m high, stands 4 miles ESE of Tanjung Teranjun. Gunung Batubaya, 350m high, standing 9 miles SE of Tanjung Teranjun, is prominent, as is Gunung Raya, 942m high, located 13.5 miles NE of the same point.

Tanjung Sanggau, 12.5 miles S of Tanjung Teranjun, has a hillock near its extremity which terminates in a low cliff. Gunung Kebangsi, 150m high, and Gunung Bangkam, 155m high, lie, respectively, 2.5 miles E and 3.5 miles ENE of this point.

Penibungan (0°24'N., 108°56'E.), 54m high and formerly an island, now forms a projection and is situated 6.3 miles S of Tanjung Sanggau. Tanjung Bangkai, a low flat point, lies 4

miles SSW of Penibungan. A radio transmits from a position 2 miles NE of Tanjung Bankai.

Pulau Semesa (0°43'N., 108°52'E.), 110m high, is on the coastal bank 0.8 mile W of Tanjung Teranjun. Pulau Tempurung is close N of Pulau Semesa and Pulau Keran, a high rock, lies close S of Tanjung Teranjun.

From Tanjung Bangkai, the coast curves SE for a distance of about 24 miles to the mouth of the Sungai Kepuas-kecil. There are three prominent landmarks on this sector of the coast. Lontjit, 470m high, and Gunung Raya, 615m high, are located, respectively, 16.5 and 19 miles E of Tanjung Bangkai; Gunung Peniraman, 231m high, is located 0.5 mile inland, 15 miles SE of the same point. The Sungai Mempawah, a small river, discharges 3.5 miles SE of Tanjung Bangkai. Vessels drawing 1.5m can reach the village of Mendialin, 20 miles upstream, at high water.

Anchorage can be obtained, in depths of 9 to 14m, anywhere between the mouths of the Sungai Mempawah and the Sungai Kepuas-kecil.

1.73 Pulau Datu (Pulau Datuk) (0°08'N., 108°36'E.), 306m high, steep-to and marked by a light, lies about 22 miles SW of Tanjung Bangkai.

Kepulauan Burung (Pulau-pulau Burang) are a group of steep-to, densely-wooded islands, lying within 10 miles of the coast, between Tanjung Batubelat and Tanjung Bangkai. Tidal currents around Kepulauan Burung set NE and SW at a maximum rate of 2 knots, and are always noticeable in spite of the monsoon current.

Pulau Kabung (0°50'N., 108°47'E.), 297m high, the N island of the group, lies 3 miles WNW of Tanjung Batubelat. A wreck lies 0.6 mile N of the island. There are two shoals with depths of 3.9 and 8m in the fairway between Pulau Kabung and Tanjung Batubelat.

Pulau Kabung

Pulau Penata-kecil, 105m high, lies on a ridge of the coastal bank, 4 miles S of Pulau Kabung. Pulau Seluas (Seluwas) lies on the same ridge about 0.4 mile NE of Pulau Penata-kecil. Detached shoals, with depths from 4.5 to 8.2m, lie within 1.8 miles N of these islands.

Pulau Penata-besar, 102m high near its N end, lies 1 mile E of Pulau Penata-kecil; a clear channel separates these islands. Some above-water rocks lie 0.2 mile N of Pulau Penata-besar.

1.74 Pulau Lemukutan (0°46'N., 108°43'E.), the largest and W island of Kepulauan Burung is 2 miles W of Pulau Penata-besar. The channel between these two islands is deep and clear of dangers. Pulau Lemukutan consists of a ridge of hills. The highest, near the S end is 366m high. The coast in the middle of the E side is cliffy.

A light stands 1.3 miles S of the N end of the island.

Pulau Randayan, 22m high, lies on a bank with depths of 11 to 15m, 0.8 mile S of Pulau Lemukutan. A 6.8m shoal, not marked by discoloration, lies 4.8 miles ESE of Pulau Randayan.

Pulau Baru, 69m high, lies 6.5 miles SSE of Pulau Randayan. A reef fringes the islet and extends 0.3 mile S and NW from it. A small steep-to shoal, with a depth of 7.3m, extends about 0.5 mile NW of the island.

Pulau Temaju, 240m high, is located 3 miles W of the mainland from which it is separated by a channel 1 mile wide, with a depth of 11m in the fairway. The island is steep-to except on the N part of the E side, where a reef extends 0.2 mile offshore. There is good anchorage for small vessels with local knowledge during the Southwest Monsoon, May to September, in a depth of 9m, in the W of two bays which form the N coast of the island. There is anchorage anywhere off this island, in depths of 11 to 13m.

Pulau Damar lies 9 miles offshore, 6.5 miles SSW of Pulau Temaju. The islet, 24m high is steep-to, with few trees.

Pulau Sitinjan (0°22'N., 108°45'E.), 48m high, the S island of the group, lies 10.5 miles W of Tanjung Bangkai and 3 miles SW of Pulau Damar. Anchorage may be obtained, in depths of 13 to 16m, on the bank extending S from the island during N winds or at the change of the monsoon.

Pulau Sitinjan

Directions.—When proceeding N from the vicinity of Tanjung Bangkai steer to pass 0.5 mile W of Pulau Temaju. Then pass E of Pulau Baru and proceed through one of the channels separating the islands or between these islands and the mainland, keeping in depths of not less than 13m, and guarding against the shoal patches W of Tanjung Batubelat.

1.75 The Sungai Kapuas-kecil (0°03'N., 109°11'E.), one of the branches of the delta of the Sungai Kapuas leading to Pontianak, is entered between Tanjung Intan, upon which stands the

prominent house of the Sultan (0°02'N., 109°11'E.), and a point 2 miles N. The entrance is fronted by a bar of soft mud which extends 5 miles offshore through which a channel 137m wide has been dredged. In prior years, it was reported that a vessel with a draft of 5.3m and length 115m could enter over the bar.

There are alternative inner routes to Pontianak that are entered well S of the entrance to the Sungai Kapuas-kecil.

These alternative routes enter the Sungai Kapuas-kecil above Pontianak.

Pontianak Road, off the entrance of the Sungai Kapuas-kecil, is open to the prevailing winds. Due to the outflow of the river, vessels always lie with the wind and sea on the beam.

Pilotage is compulsory and is available by day only. A 24 hour advance notice is required. Vessels awaiting a pilot may anchor SW of the outer buoy, clear of the prohibited anchorage. Anchorage may be obtained in Pontianak Road, about 6 miles W of the river's mouth, in a depth of 20m, mud. In this depth the ground swell is less than closer in. In gale winds, vessels should anchor farther out to avoid the heavy seas that break in the shallow water. There is a prohibited anchorage area charted in the N part of Pontianak Road.

The entrance to the river is marked by buoys, beacons, and lighted beacons. The dredged channel to Pontianak, in which there was a least depth of 3.9m reported, is marked by range lights in line bearing 103°30'.

A danger, marked by a buoy, lies 17 miles W of the front range light, and an unmarked dangerous wreck lies on the N side of the entrance channel, 8 miles WNW of the same range light. There is a Customs Station at Kampung Jungkat on the N side of the river entrance.

Pulau Panjang (0°02'N., 109°13'E.) lies on the S side of the river entrance. Selat Bantan runs S of it.

Pulau Duwit lies close N of Pulau Panjang. Close off the E end of Pulau Panjang are Pulau Babi, Pulau Bumin, Pulau Baharu, and another small islet W of these.

Batu Layang (Batu Lajang) is an islet off the N side of the river 3.8 miles ESE of the E end of Pulau Panjang. A stony spit, with depths from 0.8 to 0.5m, extends from the N bank to about mid-channel, 0.15 mile SW of the W end of Batu Layang. The banks of the river from its mouth nearly to Pontianak are overgrown, but there are few high trees. Some small settlements are situated on the N bank, but the S bank is almost uninhabited.

Directions.—Vessels should steer to a position about 2.5 miles W of the outer beacons, then steer for the outer beacons and enter on the range lights. Before entering the river, vessels should make certain that passage over the bar is all clear as there is insufficient room for passing in the dredged channel. Outbound vessels take precedence.

Proceed through the dredged channel on the range line. When the leading range light is 1 mile away, change course and steer for the customhouse at Kampung Jungkat.

After passing the rear range lighted beacon, keep to the N side of the channel until a beacon on the N side of the river, 1.3 miles WNW of Batu Layang, is reached. This beacon has a notice board painted "menjeberang" (cross over).

Steer across the river to a position 0.4 mile SW of Batu Layang and keep 183m offshore until clear of the spit, about 1 mile ESE of Batu Layang. Finally, steer mid-channel to the anchorage off Pontianak.

Dredges operate on the bar of the Sungai Kepuas-kecil. Vessels should always pass S of the dredges. This may entail keeping S of the range line. In these circumstances, a vessel should sound two long blasts, suggesting the dredge will then move to the N side of the channel. The vessel should regain proper alignment as soon as possible after passing the dredge.

1.76 Pontianak (0°01'S., 109°20'E.) (World Port Index No. 51941), the principal town on the W coast of Borneo, is situated about 10 miles from the entrance of the Sungai Kepuas-kecil and is near the confluence of this river with the Sungai Landak. The town stands on low and marshy ground which is partially inundated at high water.

Winds—Weather.—Frequent showers between August and February may affect the working of cargo.

Tides—Currents.—The tide is usually diurnal. The average range of the tide at full moon is 1.28m and at a new moon is 2.4m.

Off the mouth of the river, the ebb current sets 285° with a maximum general velocity of 2.5 knots. The flood current sets 110° with a maximum general velocity of 0.6 knots. These figures may differ because the current is greatly influenced by the wind. The ebb current at Pontianak is stronger and of longer duration than the flood, especially at night, due to the land breezes.

Pontianak—Berth Information			
Berth	**Length**	**Draft (HW)**	**Remarks**
Dry Cargo Terminals			
No. 01	125m	5.0m	Fast ferries, ro-ro, and passengers/vehicles/rail.
No. 02	75m	5.0m	Fast ferries, ro-ro, and passengers/vehicles/rail.
No. 03	117m	5.0m	—
No. 04	100m	5.0m	—
No. 05	100m	5.0m	Containers.
No. 06	90m	5.0m	Containers.
No. 07	103m	5.0m	Containers.
No. 08	102m	5.0m	Containers.

Pontianak—Berth Information			
Berth	**Length**	**Draft (HW)**	**Remarks**
Pertamina Tanker Terminal			
No. 1	18m	—	Clean products and bunkers. Berthing length of 135m (including dolphins).
No. 2	15m	—	Clean products and bunkers.
PT. Indo Container Line			
Container Berth	127m	—	Containers.
Pertamina Bitumen Terminal			
Pertamina Berth	37m	—	Dirty products.
Shell Bitumen			
Bitumen Berth	25m	—	Dirty products. Berthing length of 67m (including dolphins).

A tide gauge, with a flagstaff above it, is situated on Government Wharf. The following tidal signals are displayed:

1. Flood current—Red flag.
2. Ebb current—Blue flag.
3. Slack water—White flag.

Depths—Limitations.—The depths alongside the wharves range from 1.4m alongside the Government Wharf to 4.3m alongside the wharf on the N side of the river. The largest vessel entering the harbor was 5,750 dwt, with a length of 109m and 5m draft. For additional detail about the berths in port see table titled **Pontianak—Berth Information**

Pilotage.—The sea buoy in the entrance channel to Pontianak is approximately 17 miles. Pilotage is compulsory, should be ordered 24 hours in advance and is available 24 hours. Furthermore, vessels should advise ETA via agent 10 days 72 hours, and 48 hours prior to arrival to include providing estimated arrival draft. Pilot should also be notified 12 hours before arrival and 6 hours before departure. Pilot boards at the river entrance.

Regulations.—Vessels should advise their ETA through agents 10 days, 72 hours, 48 hours, and 24 hours before expected arrival, including expected arrival draft.

Local regulations for the channel in the Sungai Kepuas-kecil place the following restrictions on vessels over 500 gross tons:

Pontianak—Contact Information	
Port Operations	
Telephone	62-561-732-181
	62-561-734-472
	62-561-732-094
	62-561-733-674
Facsimile	62-561-732-612
Web site	https://www.pontianakport.co.id
IPC Terminal	
Telephone	62-741-732-181
	62-741-732-094
Facsimile	62-561-732-612

Pontianak—Contact Information	
E-mail	corp_sec@ipctpk.co.id
Web site	https://www.ipctpk.co.id
VTS	
Call sign	VTS Pontianak
VHF	VHF channels 12, 14, and 16
Telephone	62-561-882-383
Facsimile	62-561-882-386
E-mail	vtsptk@gmail.com

1. Vessels approaching Pontianak must enter the channel between 0600 and 1200 local time.
2. Vessels leaving Pontianak must enter the channel between 1200 and 1800 local time.

Contact Information.—See the table titled **Pontianak—Contact Information**.

Anchorage.—Anchorage at Pontianak is abreast the town, in depths of 16 to 18m. There is room for vessels to swing in the anchorage; however, they should keep well clear of the government pier.

Caution.—Due to submarine cables, vessels are cautioned against anchoring in two areas situated, respectively, close NW and SE of the entrance to the Sungai Landak, nearly opposite Pontianak. The limits of each area are marked by a red triangular board from which a light is shown.

1.77 The Sungai Kepuas-kecil trends 28 miles SE of Pontianak to **Suka Lating** (0°19'S., 109°35'E.) where it joins the Sungai Kepuas and the Sungai Pungar-besar. This portion of the river is navigable by vessels drawing not over 3m and there are no dangers. However, the sharp turns at Telukkumpai and Tanjung Selebes, 10 and 27 miles respectively, above Pontianak, should be approached with caution.

The **Sungai Kepuas** (0°19'S., 109°35'E.), the principal river on the W coast of Borneo, trends generally E from its junction with the Sungai Kepuas-kecil for a distance of about 620 miles.

From the Sungai Kepuas-kecil the coast trends S about 45 miles to Tanjung Padangtikar. This low marshy coast forms the N part of the delta of the Sungai Kepuas. It is broken into sev-

eral islands by the various streams discharging through it.

Tanjung Putus (0°17'S., 109°05'E.) is located 20 miles SSW of Tanjung Intan, the site of the Sultan's house. Other points along this sector of the delta are Tanjung Bunga, Tanjung Burung, and Tanjung Padangtikar, located respectively, 4.5, 18, and 24.5 miles SSE of Tanjung Putus. There are a few detached hills which, together with the mouths of the rivers, form the only landmarks along this coast.

Gunung Batuwangkang (0°23'S., 109°19'E.), 450m high, is the highest of the three peaks of Gunung Ambawang, located about 15 miles SE of Tanjung Putus. The other two peaks, Gunung Resam, 360m high and Gunung Laut, 315m high, stand 2.3 and 3.5 miles WNW of Gunung Batawangkang.

1.78 Gunung Radak (0°33'S., 109°26'E.), an isolated table-shaped hill, 204m high, is located 15.8 miles E of Tanjung Burung, and Gunung Turjun, 75m high, is located 2.5 miles SW of Gunung Radak.

From Tanjung Saleh, about 6 miles S of Tanjung Intan, to Tanjung Putus, 14 miles SSW, the coast consists of several islands which form the delta of the Sungai Pungur-besar, a continuation of the Sungai Kepuas.

The Sungai Ambawang, one of the mouths of the Sungai Kupuas, flows into the sea close N of Tanjung Bunga; its mouth is encumbered by a bar.

The Sungai Padangtikar is entered between Tanjung Burung and Tanjung Padangtikar, 6.5 miles SE, and has the deepest entrance of any river on the W coast of Borneo.

The least depth in the channel over the bar off the river mouth is 5.8m.

The 5.5m line varies from 5 miles off the entrance to the Sungai Kepuas-kecil to 9 miles W of Tanjung Padangtikar. Vessels approaching the Sungai Padangtikar should make for the lighted buoy (safe water) which is moored 10 miles W of Tanjung Padangtikar.

A stranded wreck is situated 4.5 miles SW of Tanjung Burung. There are no other charted dangers along this section of the coast.

1.79 The **Sungai Padangtikar** (0°37'S., 109°12'E.), whose head lies in an ESE direction, connects with Selat Lida by means of Selat Paduampat. The mouth of the Sungai Padangtikar is also the starting point of Inner Route 3 and Inner Route 4 to Pontianak. An obstruction, with a depth of 16.5m, lies 45 miles offshore of Tanjung Padangtikar.

Pulau Telukayer (0°43'S., 109°33'E.), a loading place for timber, lies up river 19 miles ESE of Tanjung Padangtikar and can be reached by vessels drawing 7.3m.

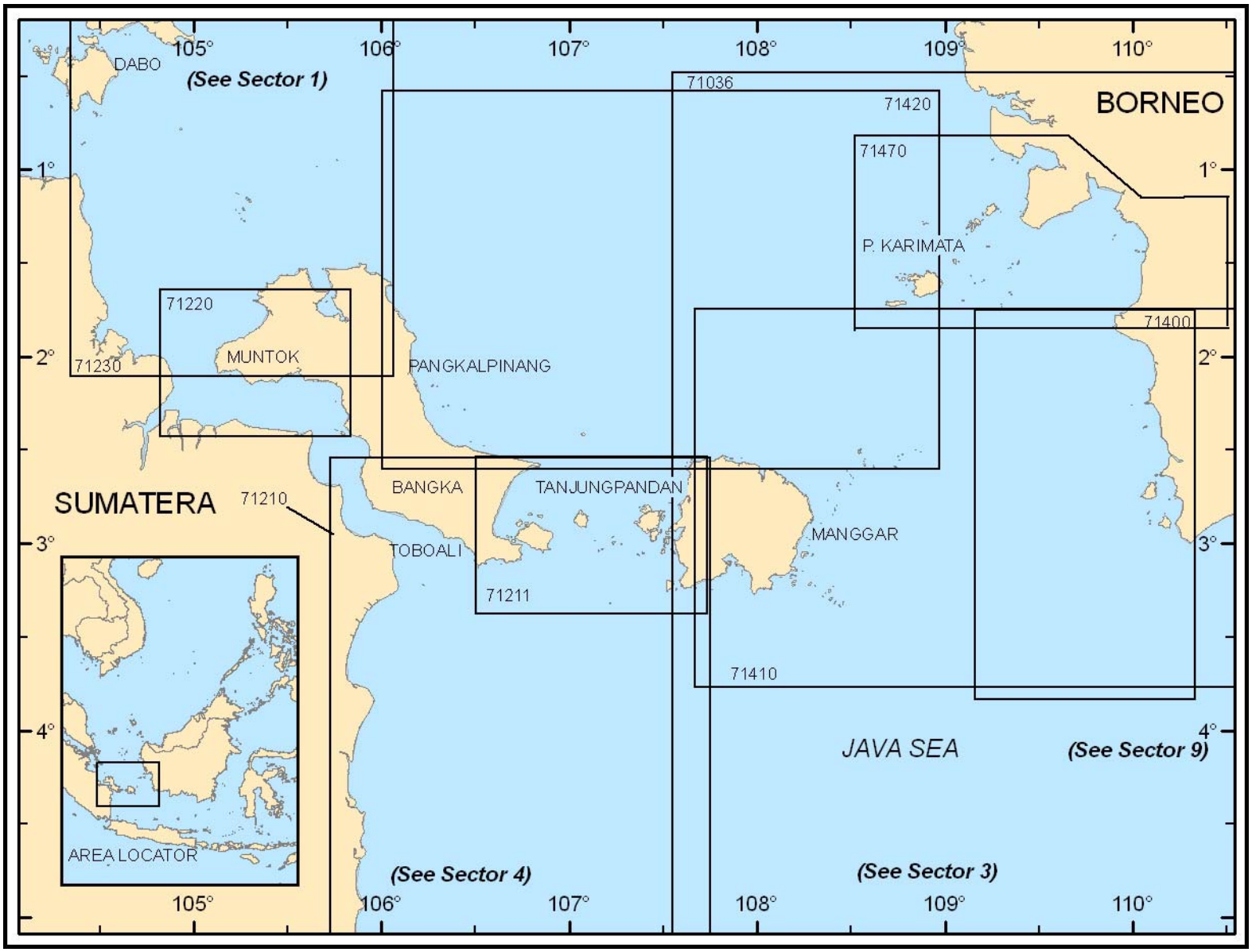
Selat Panjang joins the Sungai Padangtikar 2.5 miles ENE of Tanjung Padangtikar. The Sungai Kubu joins the N side of Selat Panjang, 4 miles farther NE.

Directions.—When approaching the Sungai Padangtikar, vessels should stay close to the lighted buoy, moored 10 miles W of Tanjung Padangtikar, and cross the bar on an E course, and then pass about 0.8 mile N of Tanjung Padangtikar. Care should be taken to clear the 4.9m patch, located about 1.5 miles ESE of the lighted buoy. After passing Tanjung Padangtikar, vessels bound for Selat Panjang or Selat Kubu should steer in the buoyed channel. Fishing stakes are found on the bar and in the river on both sides of the fairway.

Anchorage may be obtained in the W entrance to Selat Panjang about 2.5 miles ENE of Tanjung Padangtikar. Pilotage is compulsory for vessels of more than 200 dwt.

Local pilots are available daily up to 1900 local time. They embark in a position 1 mile W of the fairway lighted buoy, 10 miles W of Tanjung Padangtikar.

For vessels with local knowledge, there are four inland water routes through the delta of the Sungai Kepuas, which lead to Pontianak.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **2** — CHART INFORMATION

SECTOR 2

BANGKA, BELITUNG, AND KEPULAUAN KARIMATA

Plan.—The general description of this sector is from W to E and N to S, with the associated passages and dangers described in sequence with the islands and coast lines.

The principal passages and order of descriptions are Selat Bangka, Selat Gaspar, and Selat Karimata. Minor passages will be described with the appropriate geographic area.

The W boundary of this sector is the E coast of Sumatera between the parallels of 2°00'S and 4°30'S. The sector is bound on the E by the W coast of Borneo between the parallels 0°40'S and 3°00'S. The N and S boundaries, may, in general, be described as the area which lies between the E and W boundaries described above, and the parallels of 0°28'S and 4°30'S.

General Remarks

2.1 Winds—Weather.—The most important characteristic of the climate, is the seasonal change of the winds. It is customary therefore to recognize two seasons only, the Northeast Monsoon and the Southwest Monsoon. From March to May, the Southwest Monsoon extends N, and covers the whole area from June to August. During September to November the airflow is reversed and the Northeast Monsoon spreads S to the Equator, and prevails over the South China Sea from December to January.

The Northeast Monsoon has a significant frequency of N winds over the area, while Southwest Monsoon has a great S component near the equator.

Over this area the average wind speed is 7 to 16 knots in winter, and 4 to 10 knots in summer. During the transition period in spring and autumn the winds is mainly light and variable except in isolated squalls.

The period from May to October is relatively free of gales apart from the localized storms during the passage of tropical storms. Gale force winds are more common during December, with winds of 28 to 33 knots comprising 1 per cent of the total reports.

Rainfall is abundant over the whole area. The average annual total is between 292 and 390cm. Borneo has more thunderstorms than any other region in the world.

Along the coasts many stations report thunder on one day in every three. Inland many places endure thunder on 2 days in 3. Some of the more violent storms cause considerable havoc with severe squalls and torrential rain.

Fog is rare over this area. Poor visibility (less than 5 miles) is reported on less than 5 per cent of the observations. Fog is most frequent during September near the Borneo coast; this haze spreads from the S hemisphere in late summer.

Good to excellent visibility prevails for most of the time, through sudden deterioration occurs in the heavier rainstorms. Patches of fog develop at night in estuaries and sheltered inlets and may be dense for a brief period around dawn.

Tides—Currents.—The movement of the surface water over the South China Sea is related, in general, to the monsoons, through the relationship is complex and not direct. The main SW setting current occurs during the Northeast Monsoon (November to March) and the NE setting current occurs during the Southwest Monsoon (May to September). Currents with a velocity of 1 to 2 knots may be encountered.

The predominating influence of weather conditions in the sector are the monsoons. In the summer the winds are S to SE and in the winter they are from the N to NW. The period of the S to SE winds is usually termed the dry season although it is dry only in comparison to the N to NW winds.

The area encompassed by this sector is relatively small but because the land masses in the vicinity of the several passages have a diverse effect on the prevailing winds, each area will be described on an individual basis.

The currents in this sector alternate in direction twice yearly, in phase with the monsoons. During the Northeast Monsoon (November to March) the flow is SE and during the Southwest Monsoon (May to September) the general flow is toward the NW. Since the currents are controlled by oceanographic and meteorological conditions, both within and outside the area, which vary from day to day as well as season to season, the current in any particular location varies both in direction and rate.

The constancy of the predominant directions at the height of the monsoons is high, but it is low in the transition months and only moderate in the months immediately preceding and following the height of the monsoons.

The tidal currents will be further described with each channel.

Regulations.—For information regarding designated Archipelagic Sea Lanes, as defined by the United Nations Convention on the Law of the Sea (UNCLOS), passing through Selat Karimata, see the Indonesia section of Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Selat Bangka

2.2 Selat Bangka, 120 miles long, is the strait which separates Pulau Bangka from Sumatera. It lies in a general NW and SE direction and is the best route between Singapore and Selat Sunda.

The coast of Sumatera, which forms the W side of Selat Bangka, is low, densely wooded, and affords no useful landmarks other than several points which can be distinguished only from short distances. The entire coast of Sumatera forming the W side of Selat Bangka is bordered by a mud flat, narrow by the points but extending from 1 to 7.5 miles offshore, with depths of less than 4.8m in the bays between them. Towards the Bangka side, the bottom becomes harder and even rocky.

The Pulau Bangka side of the strait, in contrast to the Sumatera side, has hills and numerous mountains. It is remarkable that although the latter attains no great elevation, the summits are generally obscured by clouds.

The principal rivers which flow into the strait are the Sungai Banyuasin (Air Banyuasin) and the Sungai Palembang (Air Musi) in Sumatera, which are navigable for a considerable distance.

A number of unimportant streams flow through the Bangka coast into the strait by way of generally marshy outlets.

Kepulauan Nangka, a group of coral islets and rocks, lies close off the Bangka coast about midway through the strait and a number of detached islets and rocks lie in the strait.

Winds—Weather.—In Selat Bangka, the general wind direction from April to October is a steady SE; from January to March, the Northwest Monsoon is relatively constant. Squally weather is most marked in the Northwest Monsoon, with the greater activity at night. Appreciable seas occur when fresh winds oppose the tidal currents.

Tides—Currents.—From November to April, the current sets SE through the strait at a rate of up to 1 knot.

The SE set persists on the Sumatera side of the strait throughout the Southeast Monsoon. At the height of this monsoon, in July, a NW set of up to 0.25 knot prevails off the Bangka coast up to and beyond Gosong Amelia. In other months the current off the Bangka coast is light and variable.

The tidal currents flow into Selat Bangka from both ends, meeting in the neighborhood of Kepulauan Nangka.

There is usually only one strong incoming current, separated by a slack period from two weak outgoing currents.

Tide rips are frequently found abreast Kepulauan Nangka during the Southeast Monsoon and are probably due to the meeting of the current setting SE along the Sumatera shore in the N part of the strait with the current setting NW along the Bangka shore in the S part of the strait.

Vessels should guard against being set in or out of the mouth of the Sungai Palembang (Air Musi).

In the S approach to Selat Bangka, there is sometimes a S flow for days on end, with a maximum rate of 2.25 knots at the height of the Northwest Monsoon. At other times, the weak N flow lasts only a maximum period of 4 hours and reaches a rate of only 0.5 knot, the flow being S for the rest of the day. It thus appears that during the Northwest Monsoon there is a S current of 1 to 1.5 knots.

Between Ujung Batakarang and Tanjung Limaubungkuk, 30 miles SE, after heavy rains the ordinary currents are considerably accelerated and diverted by the freshets from the many rivers in this vicinity.

The flow is toward Tanjung Kelian, on the N shore, until they reach mid-channel. These currents should be carefully guarded against at night.

Caution.—There are numerous dangerous wrecks in the S and N entrance to the strait and their approaches; the positions of known wrecks may be seen on the chart.

Selat Bangka—North Entrance

2.3 Ujung Batakarang (2°05'S., 104°53'E.), on the W side of the N entrance to Selat Bangka, is the general name of the rounded part of this section of the Sumatera coast. It is made prominent by the trees on it; they are high right down to the sea and give it a jagged appearance.

The mud bank which extends from the coast is continually extending, generally narrowing the passage between the point and Karang Ular; the depths are regular and the coast can be approached to within depths of 10m. It was reported that the coast has extended nearly 1 mile E of its charted position.

Tanjung Ular (1°58'S., 105°07'E.), a rocky point, 48m high, is located on the Bangka side of the entrance to Selat Bangka. A prominent sandy beach fronts the high trees N and S of the point.

A light is shown from a metal framework tower, with an elevation of 40m, situated on Tanjung Ular. It was reported that by day, the light structure was obscured by trees when S of Tanjung Besayap.

Tanjung Besayap, 51m high, 4 miles SSW of Tanjung Ular, is also rocky.

The coast between Tanjung Ular and Tanjung Besayap is fringed by a reef. The 5.5m line lies up to 2 miles offshore in this area and is steep-to. This part of the coast must be given a wide berth of at least 2.5 miles, owing to the reefs off it.

A rock, awash, lies 2.5 miles SW of Tanjung Ular and between this rock and the coastal reef are several drying reefs.

Bangka Marine Terminal (1°50'S., 105°09'E.) is a single marine buoy where a FPSO tanker vessel is moored.

Caution.—Vessels are advised to give a wide berth when passing in the area.

Tanjung Berani (2°04'S., 105°07'E.) is a moderately-high rocky point located 3.5 miles S of Tanjung Besayap.

Karang Ular (1°58'S., 104°57'E.) lies near the middle of the N entrance to Selat Bangka, 7 miles NE of Ujung Batakarang and 10 miles W of Tanjung Ular. It consists of two rocky patches, with a depth of 2.2m over the N patch and less than 1.8m over the S patch.

A light is shown from the N patch. In 1991, it was reported that a crude oil storage tanker was situated 3.8 miles S of Karang Ular, in a depth of 22m.

Caution.—Less water than charted has been reported (1998) about 2.5 miles NE of Karang Ular.

Tanjung Kelian (2°05'S., 105°08'E.), on the Bangka coast, is a low sandy point 1 mile S of Tanjung Berani; it is subject to constant erosion. A light, shown from a stone tower, 53m high, with the upper part red and the lower part white, is situated on the point.

Tanjung Kelain Light

A ferry pier, 117m long, with a depth of 7m at its head, extends SE from a position on shore 0.1 mile E of the lighthouse.

The pier is privately maintained and is not for public use.

2.4 Muntok (2°04'S., 105°10'E.) (World Port Index No. 50140) stands at the mouth of the Sungai Muntok, 2 miles ENE of Tanjung Kelian. A flagstaff is situated 0.25 mile NNE of the river's mouth. A prominent tower is located 0.4 mile NE of the river's mouth; a radio mast is located 0.5 mile NW of the town.

A dredged channel with a depth of 1.5m leads across the shore bank, between two breakwaters, to a small basin off the town.

Muntok

Pilotage.—No pilots are reported to be available at the port of Muntok.

Anchorage.—Anchorage for large vessels, having good holding ground, may be obtained, in depths of 10 to 22m, soft mud, from 1 to 1.8 miles offshore with the summit of Menumbing bearing 012° and Tanjung Kelian bearing between 282° and 293°.

Vessels are cautioned not to anchor within an area of 0.5 mile radius centered 2.3 miles SE of Muntok; this area being designated for the topping off of tankers from Palembang.

The coast between Tanjung Kelian and Tanjung Punai, 11.5 miles ESE, is being washed away at an appreciable rate and is marked by trees standing in the water.

Tanjung Punai is low and rounded, but Tanjung Sukal and Tanjung Seribu, 2.25 miles and 5 miles ENE of Tanjung Punai, respectively, are high, rocky points.

Tanjung Sukal is easily identified by its two prominent conical hills, the highest of which is 71m. Karang Seribu, a reef with several above water rocks, lies 0.8 miles S of Tanjung Seribu.

Tanjung Tada (Tanjung Tadah)(2°08'S., 105°26'E.), 3 miles E of Tanjung Seribu, has a hill on it 57m high and is prominent from S.

Between Tanjung Tadah and the W entrance point of the Sungai Jering (Sungai Mancong), 8 miles ENE, the coast is low and fronted by a coastal bank with depths of less than 2m which is narrow off Tanjung Tadah and widens to 4 miles off the river's mouth.

The W bank of the Sungai Jering is low and covered with mangroves; the E bank is high and fringed with rocks. Tanjungniur is situated on its E bank.

Tanjung Resang is situated 2.8 miles SSE of Tanjungniur.

2.5 Tanjung Raya (2°08'S., 105°40'E.), a high rocky point, is located 4.5 miles E of Tanjung Resang; the intervening coast is high. Pulau Bembang (Simonbong), 1.5 miles W of Tanjung Raya, is a rocky islet, 52m high, lying on the coastal reef which extends 0.8 mile offshore here. It does not show plainly against the land behind.

From a position 3 miles E of Tanjung Raya to the mouth of the Sungai Sembulan, 16 miles SSE, the coast is mostly marshy and covered with mangroves, then 2 miles SSW to Tanjung Batu, the shore is sandy.

A group of rocky islets lies on the drying coastal bank extending 2.8 miles offshore, midway between Tanjung Raya and Tanjung Batu. Pulau Medang, 42m high, is the highest islet and can be seen for a considerable distance. Pulau Terumbu lies at the seaward edge of the bank with three drying rocks close W of it.

Menumbing (2°01'S., 105°11'E.), 445m high, 5 miles NE of Tanjung Kelian, is the highest peak of the range of hills and is a useful landmark. The slopes of the hills are covered with imposing masses of granite, with vegetation between. Radio masts are situated on its summit.

Gunung Belo, 236m high; Gunung Panjang, 233m high;, and Bukit Batu, 216m high, lie 10 miles ENE, 11.8 miles ENE, and 16.5 miles NE, respectively, of Tanjung Kelian.

Other landmarks along this coast are Bukit Asam, 201m high, located 10.5 miles N of Tanjung Tadah; Gunung Pandan, 173m high, located 4 miles NNW of Tanjung Raya; and the Maras Range, the highest range on Pulau Bangka, with three peaks which rise to a height of 699m, 19 miles NE of Tanjung Raya. This range gives the appearance of a crown when seen from Selat Bangka.

Caution.—In addition to Karang Ular, previously described in paragraph 2.3, other dangers exist along this sector of Selat Bangka. Numerous fishing stakes, not all of which are close inshore, and numerous wrecks, both stranded and dangerous, are best seen on the chart.

2.6 Karang Haji (2°06'S., 105°06'E.), which has some black rocks on it, lies 1.3 miles SW of Tanjung Kelian.

An isolated shoal patch, with a least depth of 3m, lies 1.3 miles W of Tanjung Kelian; a shoal patch, with a least depth of 4.5m, lies 1.3 miles S of the same point.

Dangerous wrecks lie 2 miles S and 2.5 miles SSW of Karang Haji.

Selat Kelian, a deep pass with a least width of 0.5 mile, lies between the above dangers and Tanjung Kelian.

Gosong Muntok (2°09'S., 105°12'E.), an extensive bank, lies in a NW to SE direction. It has a least depth of 3m, located 6.5 miles W of Tanjung Punei.

Gosong Amelia (2°13'S., 105°15'E.), with a least depth of 4.5m located 5 miles SSW of Tanjung Punei, lies on the SE part of an extensive bank that extends NW and encompasses Gosong Muntok. Gosong Amelia and Gosong Muntok are composed of hard sand; passage between them should not be undertaken.

Karang Haji, Gosong Muntok, and Gosong Amelia lie between the main fairway and a channel, with depths of 18 to

57m, which extends from a position 3 miles SW of Tanjung Punei to 1 mile WNW of Tanjung Kelian and includes Selat Lalang.

The passage between these banks and the Bangka coast is safe and is used by vessels proceeding to and from Teluk Muntok, which lies off the town of Muntok.

Karang Brombrom (2°13'S., 105°20'E.), a shoal which dries in places, is about 3.5 miles in length in an E-W direction. The W end of the shoal is located about 4 miles SSE of Tanjung Punai. A light has been established on the S side of the reef.

There is a channel, with depths of from 11 to 24m, between the N side of the shoal and the coastal bank which extends along the Bangka shore. This channel is frequently used by low-powered vessels proceeding W during the Northwest Monsoon.

An isolated 8.5m patch lies in mid-channel 7.5 miles S of Tanjung Tadah.

Sungai Banyuasin (Air Banyuasin), a broad river with its many tributaries, flows into Selat Bangka between Tanjung Kempeh and Tanjung Apiapi, about 6.8 miles SSW. A survey beacon stands in shallow water 1.5 mile NE of Tangung Kempeh and a light is shown from 0.9 mile S of the beacon. The greater part of the Sungai Banyuasin (Air Banyuasin) estuary is occupied by shoals, leaving a narrow channel along the SE side past Tangung Apiapi.

Caution.—Attention is drawn to a dangerous mine area in Sungi Banyuasin. See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia for details. Numerous wrecks, best seen on the chart, lie in the waters adjacent to Karang Brombrom.

2.7 At **Tanjung Serah** (2°23'S., 104°44'E.), 8.3 miles SW of Tanjung Api Api, the river divides into two branches. The N branch is Air Lalang; the Banjuasin continues S for 30 miles where the two tributaries flow into it, dividing Air Liman to SW and Air Senda to WNW. The Senda leads into **Air Teluktengguland** (2°37'S., 104°17'E.) which becomes **Air Dawas** (2°36'S., 104°11'E.). Air Tjalik, a branch from the Senda, joins Air Lalang in position 2°23'S, 104°38'E.

Ramba (2°37'S., 104°08'E.), an oil terminal on the Dawas River provides facilities for the loading of crude oil. Vessels of up to 10,000 dwt and 90m overall length can berth there in brackish water. A depth of 6.0m was reported alongside the jetty.

Pilotage.—Pilotage is compulsory but berthing and unberthing operations are limited to daylight hours only.

Air Lalang is navigable by vessels not exceeding 5.5m draft, with local knowledge up to the first 100 miles of its 130 mile length. There are several oil wells along the course of this river, connected by pipeline to Palembang.

2.8 The **Sungai Palembang** (Air Musi) (2°18'S., 104°55'E.) flows into Selat Bangka at its junction with Sungi Banyuasin Air Banyuasin. The river is entered between Tanjung Carat and Tanjung Gedeh, 3 miles SSE.

Tanjung Carat is located 8.5 miles SSE of Tanjung Kampeh. The river trends in a SSW direction and is navigable by ocean-going vessels to 6 miles above **Palembang** (2°59'S., 104°46'E.), situated 54 miles up river.

It was reported that there was a least depth of 7.5m over the outer bar off the mouth of the river.

Pulau Payung, a short way within the entrance, divides the river into two navigable channels. A drying sand bank lies near the center of the W channel.

Restricted area.—The Sungai Palembang (Air Musi) has been declared a restricted area by the Indonesian government. Ships must call at Tanjunguban, Tanjungpinang, or Pontianak before entering and on leaving this area.

Tide gauges are situated in the approach and within the entrance of the Sungai Palembang (Air Musi). Odd-numbered gauges are situated on the W side of the channel and even numbered on the E side. The gauges are graduated in decimeters, the lower edge of a number indicating the depth. A correction must be applied to the reading of each gauge to obtain the least depth in the relevant part of the channel.

No. 2 tide gauge (for vessels entering) is situated 0.5 mile S of Tanjung Gedeh. A correction of 13.75 decimeters is to be added to the readings to give least depth in the channel E of Pulau Payung.

No. 3 tide gauge (for vessels entering) is attached to the leading range light structure situated about 2.75 miles N of Tanjung Carat. A correction of 4.5 decimeters is to be added to the readings to give least depth on the outer bar.

No. 4 tide gauge (for vessels leaving) is situated 0.8 mile SE of the S end of Pulau Payung. A correction of 3 decimeters is to be subtracted from the readings to give least depth in the channel W of Pulau Payung.

No. 7 tide gauge is situated 0.25 mile SW of the S end of Pulau Payung.

Tides—Currents.—Tidal currents in the Sungai Palembang (Air Musi) are of a mixed character, sometimes semi-diurnal but frequently diurnal; there is, however, insufficient information available to give an accurate description.

The average rate of the ebb current is 2 knots and of the flood current from 1 to 1.5 knots; slack water is of short duration.

The flood current is frequently felt as far up as Palembang and vessels lying off the city usually swing 30 minutes after high or low water by the shore.

The surface of the water changes direction first, so that shallow-draft vessels swing before those of deeper draft. If little rain falls in the interior there are sometimes two tides a day, although this is exceptional as the city lies too far from the mouth of the river.

During the rainy season, from November to March, there is sometimes no flood current at Palembang for days at a time. Several years ago, a vessel did not swing to the flood current during a visit of 3 days.

Pilotage.—Pilotage is compulsory, with few exceptions; river pilots maintain a 24 hour service. At Palembang, it is compulsory to take a harbor pilot.

Vessels bound for the Sungai Palembang (Air Musi) should inform the Harbormaster at Palembang by radio 24 hours in advance giving the draft of the vessel and ETA at the outer bar.

Ships awaiting the pilot may anchor, in a depth of about 16.4m, about 4 miles NE of the prohibited anchorage.

A pilot and customs station, equipped with radio, is situated at Tanjung Bujut, on the W side of the river 2 miles S of Tanjung Carat.

A pier, 45m long with a least depth alongside of 4.6m, is situated abreast the pilot station. Pilots are usually embarked and disembarked in the vicinity of the outer lighted buoy.

Communications may be established by radio, using VHF channel 12 for the pilot and VHF channel 14 for the harbormaster.

During the long dry season, which occurs every few years, visibility is reduced to 25m by fog. Throughout this period, pilotage is conducted one day for outbound vessels and inbound on the following day, alternately. This period is reported to end with the return of the rainy season.

Regulations.—Regulations require inbound vessels to use the channel E of Pulau Payung. They may use the channel W of the island if their draft exceeds 3.4m, provided permission has first been obtained from the Harbormaster at Palembang.

Outbound vessels must use the channel W of Pulau Payang, passing W of the sand bank.

It was reported recently that the channel E of Pulau Pajung, formerly used by inbound vessels, was closed to navigation and that both inbound vessels and outbound vessels should use the channel W of the island.

Time	Meaning
2 hours to 1 hour before HW	Inbound vessels have priority
2 hours to 45 minutes before HW	Outbound vessels wait between Tanjung Gedeh and Tanjung Carat
At other times	Outbound vessels anchor abreast the numbered anchor berths indicated by notice boards, 2.5 miles S of Pulau Payang

Anchorage.—Anchorage is prohibited in an area, with a radius of 0.25 miles, about 6 miles bearing 018° from Tanjung Carat.

Directions.—Directions from Selat Bangka are to steer a SSW direction from the N entrance, then a S direction according to courses established by the ranges; these courses lead across the outer bar.

Due to the possible existence of mines, vessels should keep to the range lines, taking care not to be W of the inner range N of 2°17.2'S, 0.4 mile NE of Tanjung Carat. See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia for details.

Caution.—There are numerous stranded and dangerous wrecks in the approach to the port. Several of the wrecks are situated very close to each side of the 212.5° range line and W of the 005.5° range line. Most of the wrecks are unmarked; however, their positions, a number which are approximate, may be seen on the chart. The remaining wrecks are marked by lighted buoys but are reported to be unreliable. The N wreck is marked close NW by a buoy.

Palembang (2°59'S., 104°46'E.)

World Port Index No. 50330

2.9 The city of Palembang, which is the local administrative center, is built along both banks of the Sungai Palembang (Air Musi) about 54 miles above the river's mouth. There are berths at Sungaigerong, Plaju, Bagus Kuning, and Kertapati on the S side of the river; the other principal piers are on the N side of the river where the Harbormaster, Customhouse, and Pilot's Office are situated. Container facilities are available at Palembang. With the exception of Belawan, this is the most important port on the E side of Sumatera. Vessels up to 18,000 dwt can make the journey up the river from sea.

Indonesia Port Corporation II (Branch Palembang)
http://www.palembangport.com/english/index.html

Tides—Currents.—The tides are usually diurnal. Average heights at mean high water are 2.1m and about 2.7m at high water springs near the solstices. Maximum tidal height at Palembang is 4 hours later than high water at the outer entrance of the Sungai Musi. The maximum velocity of the combined tidal and non-tidal currents is 2 to 3 knots.

Depths—Limitations.—There are berths on each side of the river in the areas previously discussed. The maximum size of vessel that can be accommodated is 185m in length, with a maximum draft of 7.3m.

Aspect.—On the S side of the river, downstream from the mouth of the Air Komering, there are several prominent landmarks.

There is the post office, a square five-story building about 0.8 mile ENE of the E point of Air Komering. About 0.2 mile ESE of the post office is the porch of the swimming pool, very prominent and illuminated at night. Three metal chimneys, 52m high, stand on the E entrance point of Air Komering. About 0.2 mile farther E, there is a group of 12 metal chimneys of the same height.

On the N bank, opposite Sungaigeroung, are the buildings of the ferry landing, which are blue in color

The Ampera Bridge over the Sungai Palembang (Air Musi)

The two commercial parts of the town are connected by the Ampera Bridge, a road bridge with a central lifting section of 71.9m in length. The vertical clearance above normal water level when the section closed is 9m over a width of 60m. When raised, the section offers a maximum clearance height of 44.5m above normal water level.

Pilotage.—It is compulsory to take a harbor pilot at Palembang. Pilots require 12 hours prior arrival notice and 6 hours prior departure notice.

The pilot can be contacted at Palembang Coastal Radio Station on VHF channels 12, 14, and 16.

Anchorage.—Vessels anchor between Kundur, 1.8 miles downstream from Air Komering, and Plaju while awaiting berths at Plaju, Sungaigerong, Palembang, or Kertapati. Frequently, as many as six vessels may be at this anchorage where they may have to spend several days waiting for a favorable tide before proceeding down river. In this anchorage the depth is 6 to 10m, mud and sand, good holding ground.

If the anchorage is congested, large vessels may lack swinging room. Violent squalls are common occurrences during the late afternoon and vessels are liable to drag their anchors at these times. Smaller vessels may anchor anywhere in the channel except in the prohibited anchorages.

Caution.—Submarine pipelines and cables cross the Sungai Palembang (Air Musi), 1.5 miles below, and 2.5 miles above the mouth of Air Komering and in the vicinity of the lift bridge at Palembang. Their landing places are marked by notice boards and anchorage is prohibited in their vicinity.

2.10 The coast of Sumatera between Tanjung Gedeh and **Tanjung Limaubungkuk** (2°20'S., 105°13'E.), 18 miles E, is fronted by a bank of hard sand covered by a thin layer of mud, with depths of less than 5m. This bank extends 8 miles offshore near Tanjung Gedeh.

Near Tanjung Gedeh the depths over the bank decrease gradually toward shore but the E part is steep-to and soundings of 13m can be obtained close to its outer edge.

Air Upang and Air Saleh flow into Selat Bangka, 7.8 miles and 11.5 miles, respectively, ESE of Tanjung Gedeh.

Tanjung Selokan (2°23'S., 105°37'E.), 24 miles E of Tanjung Limaubungkuk, is somewhat higher than the coast to the W. The coast between these two points is covered with moderately-high trees.

Several small rivers discharge into Selat Bangka on this stretch of coast. The principal one, the Sungai Buluranriding, (Sungai Sugihan) discharges close W of Tanjung Selokan. A wreck lies approximately 2.5 miles NNW of Tanjung Selokan.

A shoal patch, with a depth of 5.7m, is located 4 miles NE of Tanjung Limaubungkuk. Depths of 8.2m extend 1.3 miles SE and WNW, respectively, from its shallowest part.

Selat Bangka—Middle Part

2.11 **Tanjung Tapa** (2°41'S., 105°47'E.), on the E coast of Sumatera, 20 miles SSE of Tanjung Selokan, has trees on it. The bay between Tanjung Selokan and Tanjung Tapa is entirely occupied by a soft, fairly steep-to mud bank. A shoal patch, with a least depth of 11.9m, is located 2.5 miles ENE of Tanjung Tapa. A lighted beacon has been established 0.5 mile NE of Tanjung Tapa.

A dangerous wreck lies about 8.5 miles NNW of Tanjung Tapa. The entire coast from Tanjung Selokan to Tanjung Koyan, 19 miles SSE of Tanjung Tapa, is low and covered with mangroves, except for the trees on the various points.

Tanjung Koyan has trees on it 30m high. There is a bay formed between Tanjung Tapa and Tanjung Koyan which should not be approached within the 20m line.

Tanjung Tedong (Tanjung Batu) (2°22'S., 105°48'E.), on the Bangka coast, has a prominent hill on it 72m high.

Between Tanjung Tedong and Tanjung Berdaun, 14.5 miles SSE, there is a shallow bay which is of no importance to shipping. The Sungai Selan flows into the N part of the bay, 6 miles SE of Tanjung Tedong. Kampung Sungaiselan is a town lying about 10 miles up river and is important as the headquarters of a tin-mining district.

Vessels usually anchor, in a depth of 12m, clay, W of the S point of Pulau Nangka-besar and 6 miles W of the mouth of the Sungai Selan. Cargo and passengers are conveyed to the village by small craft but in the Southeast Monsoon communication in such small craft is usually dangerous. A 4.8m patch lies 1.3 miles WSW of Tanjung Bedawu.

2.12 **Tanjung Bedawu** (2°35'S. 105°53'E.), high and thickly wooded, has a conspicuous white rock 14m high close off it.

Pegunungan Permisan, 491m high, is the highest peak of a range of hills, located 3 miles E of Tanjung Bedaun.

Tanjung Berani and Tanjung Parici, 3 miles and 4.8 miles S of Tanjung Bedawu, respectively, are both high and thickly wooded; there is a sandy beach between these two points.

Limaha, 158m high, is a conical hill located 1 mile ESE of Tanjung Berani; a range of hills extends E from it. Tanjung Mentigi is located 9 miles SSE of Tanjung Bedaun. Riting, a sharp pointed hill, 101m high, lies 3 miles E of Tanjung Mentigi.

Tanjung Lelari (Tanjung Lalari) (2°49'S., 105°57'E.), a sharp, steep point, 23m high, with a conspicuous white beach, is located 5 miles SSE of Tanjung Mentigi. The intervening coast is sand. Bukit Balar, 78m high, an isolated rounded hill 6 miles ENE of Tanjung Lelari, is prominent. A light is shown from a red metal framework tower, 12m high.

Selat Bangka—Middle Part—Islets and Dangers

2.13 **Kepulauan Nangka** (2°24'S., 105°47'E.) are three hilly islets lying on a coastal bank which extends 4 miles SW of Tanjung Batu.

Pulau Nangka-besar, the largest of the group, lies with its N extremity 2 miles SSW of Tanjung Batu. Its summit, 87m high, can be seen for a considerable distance.

A sand bank which dries extends 2 miles SE from Pulau Nangka-besar and a reef which also dries and has some above-water rocks on it, extends up to 0.4 mile from the N and E sides of the islet. Several dangerous rocks lie off its W side.

Pulau Pegadung, 29m high, 1.5 miles WNW of Pulau Nangka-besar, consists of two islets connected by a ridge of sand which only covers at exceptionally high water. It is fringed by a drying reef which extends 0.3 mile N and SE from the islets. A rock 11m high, lies 0.5 mile SE of Pulau Pegadung.

2.14 **Pulau Pelepasan** (2°23'S., 105°45'E.), 42m high, lies 0.5 mile WNW of Pulau Pegadung (Pulau Gadung). It is steep, rocky and difficult to approach. A light, shown from a white metal tower, 35m high, is situated on the island.

A reef which dries lies about 0.2 mile W of Pulau Pelepasan. A wreck, with a least depth of 4.8m, is situated 1.3 miles farther WNW.

An isolated shoal patch, with a depth of 5m, is located 1.8

miles SSE of Pulau Pelepasan; other shoal patches lie between the patch and the island.

Pulau Pemain, an islet consisting of two dark masses of rock difficult to identify from the NW, lies inside the 5.5m line, 2 miles NNW of Tanjung Bedawu.

Karang Tembaga (2°41'S., 105°51'E.), a reef with three drying rocks on it, lies 3 miles SSW of Tanjung Berani. A shoal of sand, stones, and coral, which has a least depth of 0.3m, extends 2.8 miles WNW of Karang Tembaga. The NW extremity of the shoal is marked by a lighted buoy. A steep-to bank of hard substance, with a least depth of 0.3m, extends 3.3 miles SSE of Karang Tembaga.

Selat Bangka—South Entrance

2.15 The Pulau Bangka coast trends 12.5 miles ESE from Tanjung Lelari to a position abreast Pulau Besar.

This section is marshy and the foreshore is nearly 1 mile wide in places. Radar navigation in this area is reported to be difficult due to the lack of good radar targets.

Pulau Besar (2°53'S., 106°08'E.), a small islet, 19m high and surrounded by rocks, lies close offshore on the drying coastal bank. This bank extends 0.25 mile S from the coast.

A light shown from a octagonal metal framework tower, 61m high, with a white cupola.

Pulau Besau Light

A useful mark in the vicinity is Pandjang is a summit 96m high, located 3 miles ENE of Pulau Besar.

Pulau Batubedaun is a small rocky islet 9m high which lies on the edge of a drying bank 5 miles ESE of Pulau Besar. There are numerous rocks between it and the shore.

Tanjung Limau is located 1 mile E of Pulau Batubedaun. Between Tanjung Limau and Tanjung Labu, 7 miles SE, the coast is low and fringed by a bank which dries 1.5 miles offshore in places. Large, white above-water rocks which lie on this bank give the appearance of houses when seen from the W.

Tanjung Labu (2°58'S., 106°20'E.) is the W extremity of a rocky hilly area that extends 3.5 miles E to Tanjung Gosong. A hill, 70m high, rises 1.3 miles E of Tanjung Labu. The Sungai Gosong flows out close E of Tanjung Gosong.

Punal (Pulau Mempunzi), 15m high, lies 1.5 miles ESE of Tanjung Labu 0.5 mile offshore. Rocks awash, lie 0.25 mile off the seaward side of the islet and between it and the coast.

The coast between Tanjung Gosong and Tanjung Ketapang, 4 miles SE, is marshy and uniformly covered with vegetation. There are numerous prominent white above-water rocks located 1 mile NNW of Tanjung Ketapang on a drying bank which extends 0.8 mile from the coast.

Gadung, 180m high, is a prominent hill, conical in shape, located 3.5 miles NE of Tanjung Ketapang.

Gunung Toboali, a hill 1.5 miles SE of Gadung, has a double peak and is very steep on its W side. Gunung Muntzi, 1 mile E of Toboali, also has a double peak. The higher peak which is 292m high slopes gradually on its SE side. A radio mast is situated on Muntai.

2.16 **Toboali** (3°01'S., 106°27'E.) (World Port Index No. 50120), the capital of a mining district, is situated on a hillock, 12m high, close E of Tanjung Ketapang. A fort stands on the SE side of the mouth of a small stream which flows out here; the red roof of the barracks, W of the flagstaff, is visible for a considerable distance.

A pier, 320m long, with a depth of 1.5m alongside its head, is used for working lighters and praus.

Tin Pier, Tobali

Anchorage may be taken, in a depth of 7m, mud, with Gadung in range with the fort, bearing 039°. From this position, the depths decrease regularly toward the shore.

At times a heavy swell, with S and SW winds, makes landing troublesome.

The transport of cargo between the shore and anchorage is carried out by praus and lighters; it is advisable to give notice of the vessel's arrival.

Tanjung Saranglayang (3°05'S., 106°29'E.), 5 miles SSE of Toboali, is easily identified as it has a rounded hill, 53m high. The coast between Toboali and the point is marshy and covered with mangroves, except for a sandy beach at Toboali.

Tanjung Langgan (Tanjung Paku), 2.3 miles SE of Tanjung Saranglayang, is fringed by several high rocks which from 7 to 10 miles have the appearance of a large town on the coast. Gunung Lama is a prominent, pyramidal shaped hill 156m

high, 1.3 miles NNE of Tanjung Langgan.

Pulau Dapur (3°08'S., 106°31'E.), two small islets rising from a steep-to bank with depths less than 5m, lies about 1 mile S of Tanjung Paku, the S extremity of the island. A light, from which a RACON transmits, is shown from a white iron framework structure 14m high on the S islet. The channel between the islets and the Pulau Bangka mainland is obstructed.

2.17 Tanjung Koyan (2°57'S., 105°58'E.) is located on the Sumatera coast and is characterized by a steep-to mud bank, which fronts this coast for a distance of about 11 miles SSE. Tanjung Koyan and Tanjung Jati, 6 miles SE, should not be approached in depths of less than 22m.

From a position 5 miles S of Tanjung Jati to Tanjung Kait, 8 miles farther S, the mud bank, with depths of less than 5m extends 1 to 2 miles from shore. The bank is extending but soundings here give due warning when a vessel is near the mud bank.

Selat Bangka is entered from the S between **Tanjung Kait** (Lucipera Point) (3°14'S., 106°05'E.) and Pulau Dapur, 26.5 miles ENE. The entrance is divided into a W channel, Lucipara (Maspari) Passage, and an E channel, Stanton Passage, by Pulau Lucipara (Maspari) and the various banks lying N of that islet. The two passages unite about 30 miles within the entrance abreast Tanjung Koyan on the Sumatera side and Tanjung Lelari on the Bangka side.

Pulau Lucipara (Maspari)

Lucipara Passage has a least depth of 7m in the fairway and is available for vessels of moderate draft but is not recommended. The W side of the channel is bound by the mud flat which extends from the Sumatera shore; on the E side of the channel, from N to S are Nemesis Bank, Merapi Shoal, Hindostan Bank, and Pulau Lucipara.

2.18 Nemesis Bank (2°53'S., 105°59'E.), with a least depth of 2.7m, 4 miles SSE of Tanjung Lelari, forms the N side of Lucipara Passage close S of its junction with Stanton Passage. A lighted buoy is moored near the NW end of the bank. A detached shoal, with a least depth of 10.9m, lies SE of Nemesis Bank and 8.3 miles SE of Tanjung Lelari.

Merapi Shoal, hard sand with a least depth of 5.5m, lies 3.5 miles SE of Tanjung Jati. The shoal which is extending W toward Sumatera, narrows Lucipara Passage to a width of 2 miles.

Hindostan Bank, with a least depth of 1.3m near its N end, extends about 4 miles SSE from a position about 6 miles SSE of Tanjung Jati. There are several ridges of hard sand and stone, with shallow water over them, lying E of Hindostan Bank and parallel with Lucipara Passage. The passages between these ridges are unsafe for navigation.

Pulau Maspari (Lucipara) (3°13'S., 106°13'E.), a thickly wooded islet 41m high, lies 8 miles E of Tanjung Kait. It is visible in fine weather from distances up to 15 miles and is reported to give good radar return up to a distance of 11 miles. A light is shown on the E side of the islet. The islet rises from a fringing reef that dries 1.2m.

Shoal ground with depths of less than 5m extends 2.8 miles SSE and 1.5 miles NNW from the island. A drying reef lies 1.5 miles SE of the islet and a detached shoal with a least depth of 5m lies about 1.3 miles farther SE.

Stanton Passage, the E and principal entrance to Selat Bangka from the S, has a least depth of 8.5m. The passage is marked by navigational aids and is considered to present no particular problem.

The SW side of Stanton Passage is bound by Nemesis Bank, Smiths Bank, and Gosaong Melvill.

Smiths Bank, with a least depth of 0.4m, lies parallel to Stanton Passage and is formed in part by the hard sand ridges previously described above with Hindostan Bank.

Gosong Melvill could be regarded as the SE part of the sand banks that form Smiths Bank. Gosong Melvill, with a least depth of 0.9m, is 6.5 miles SW of Tanjung Labu and is marked by a light.

The NE side of Stanton Passage is bound by the coast of Pulau Bangka and Eastern Bank.

Eastern Bank, with a least charted depth of 1.8m, lies parallel to Stanton Passage. Its shallowest part is located 3 miles SSW of Tanjung Labu. A light has been established on the bank 2.8 miles SSW of Tanjung Labu.

In the S entrance of Stanton Passage, there are two patches, each with a depth of 9.1m, located 7 miles S and 8.5 miles SW from the light on Pulau Dapur.

There are charted dangerous wrecks as well as an obstruction lying 5 miles SE of Gosong Melvill. There are also dangerous wrecks and an obstruction charted S of Pulau Dapur in the S approach to the passage.

Anchorage can be obtained anywhere in Stanton Passage, but vessels should always have a second anchor ready as heavy squalls may arise suddenly. Squalls are especially common in the transition months between the Northwest Monsoon and Southeast Monsoon.

Directions.—The mariner must bear in mind that the charts, as far as the Sumatera coastline is concerned, may not accurately represent the contour off this coast. The mud banks are continually changing, as are the shapes of the banks and the depths over the banks which lie in Selat Bangka. Vessels should determine their position mainly by landmarks on the Bangka side.

The tidal currents set strongly off the various points in the strait. None of these must be rounded closely.

During the rainy season, driftwood heavy enough to damage the bows of vessels is often met in the strait.

South through Selat Bangka.—A vessel which has passed Kepulauan Tujuh, located 45 miles NNE of the N entrance to Selat Bangka, can easily fix the position in clear weather by bearings on Menumbing, the light on Tanjung Ular, and other

prominent landmarks on the N and NW coasts of Pulau Bangka.

Ordinarily the strait is entered by passing E of Karang Ular. In thick weather, however, frequently no land can be seen until the vessel is close off the entrance to the strait. In such cases, and for vessels without radar, it is advisable to make for the Sumatera coast by sounding and follow the edge of the coastal bank, sounding continuously, in depths of 10 to 15m. Bearing in mind that the bank off Udjung Batakarang is extending E. The wrecks charted NW and SSW of Karang Ular must be avoided.

A vessel which has passed E of Karang Ular can steer SSE taking care to avoid the 11m patch 5 miles SSE of these rocks. When Menumbing is in line with the light structure on Tanjung Kelian, bearing 037°, a SE course should be steered, making due allowance for the tidal currents which set across the channel between Ujung Batakarang and Tanjung Katimabongko.

Care should be taken to avoid the dangerous wreck charted 4 miles SW of Tanjung Kelian and the 11.9m depths charted SSW and S of the wreck.

When **Menumbing** (2°01'S., 105°11'E.) bears 000°, steer an E course to pass S of Gosong Amelia and NE of the light situated N of Tanjung Selokan, bearing in mind the shoal patches which lie 4 miles NE of Tanjung Katimabongko. When past the light steer to pass midway between Tanjung Selokan and Pulau Pelepasan. Then steer SSE to pass midway between the mud bank off Tanjung Tapa and the buoy marking the shoals NW of Karang Tembaga, taking into account the 12.2m patch 2.5 miles ENE of Tanjung (Tapah) Tapa.

From Tanjung Tapa, continue on a SSE heading until about 4.3 miles W of Tanjung Lelari Light; then steer ESE and enter Stanton Passage. Pass N of Nemesis Bank, taking care to clear the 11.3m patch about 2 miles S of Tanjung Lelari. Maintain this heading until the light on Pulau Besar is abeam, and keep this course passing between Eastern Bank and Gosong Melvill, Taking care to clear the 10m patch about 2 miles S of Eastern Bank.

When abeam Pulau Dapur, at the S entrance of Selat Bangka, set course as required, bearing in mind the wrecks and the 9.1m patch, which lie about 7 miles S of Pulau Dapur.

North through Selat Bangka.—When approaching the entrance to Selat Bangka from S, vessels will find it difficult to identify any of the landmarks shown on the chart except the summits of Gunung Muntzi, Gadang, and Gunung Namak, located close NNE of Tanjung Paku.

As soon as Gunung Namak is identified, it may be steered for on a NNE course, keeping clear of the dangers 7 miles S of Pulau Dapur, which have been previously discussed in paragraph 2.16. Gunung Namak has been identified at a distance of 30 miles.

When 4 miles SSE of the light on Pulau Dapur, steer a WNW course for Stanton Passage and proceed following the directions given above, in reverse.

Lucipara Passage is unmarked and is not recommended.

Sumatera—East Coast—Tanjung Kait to Tanjung Serdang

2.19 The coast of Sumatera described in this sector trends S from Tanjung Kait, 75 miles, to **Tanjung Serdang** (4°27'S., 105°54'E.).

The 10m curve lies as much as 24 miles offshore in places. A bank of drying soft mud, 0.5 miles wide in places, extends nearly the entire length of this coast except off the outlets of the rivers, and at other places marked by sandy beaches. Outside the mud bank the depths increase gradually, at times irregularly, seaward, and good anchorage can be taken almost everywhere. The bottom usually found in depths suitable for anchoring is clay with a layer of mud.

Steep-to shoals of small extent, lie in various places as far as 16 miles from the coast. Off Tanjung Lumut, about 38 miles S of Tanjung Kait, shoals are found up to 35 miles seaward. Sounding gives little or no warning of approach to these shoals.

Several rivers discharge between Tanjung Kait and **Tanjung Lumut** (3°49'S., 105°57'E.); their mouths can generally be identified from a considerable distance, owing to the higher growth of trees there.

The Sungai Lumpur flows out about 17 miles S of Tanjung Kait; it is of some local importance, in that small vessels can enter and proceed over it and its tributaries to Palembang. Nipa palms growing on the broad mud banks flanking the outlet are a mark for the river.

The channel between the mud banks has a depth of 1.8m, and leads to depths of 4.8 to 8.8m inside, where the river is about 0.1 mile wide.

The bends inside the lower reach of the Sungai Lumpur are slight, but some miles upstream they become short and sharp.

Anchorage can be taken 8 miles off the mouth of the river, in a depth of 4.8m, with the mouth of the river bearing 305°.

Caution.—Caution must be exercised as a mud bank, with a depth of 4.9m, lies on this bearing 14.5 miles from the river mouth.

2.20 Two small rivers flow into the sea by the way of outlets lying 5 miles and 7 miles NE of the Sungai Lumpur. There are also other small rivers which flow into the sea between the Sungai Lumpur and Tanjung Lumut.

Teluk Berugu is a shallow bay immediately NW of Tanjung Lumut. The shore of the bay is alternately sandy beach and swamp; boats can land on the sandy portions. Kuala Sondan, a creek in the S part of the bay, dries.

The coast trends about 21 miles SSW from Tanjung Lumut to Tanjung Pasir; this section of the coast is low.

Air Mesuji (4°10'S., 105°49'E.) flows into the sea close S of Tanjung Pasir. Tanjung Tawar, 1.8 miles S of Tanjung Pasir, forms the S entrance point of the river.

The least depth on the bar at the mouth of Air Mesuji is 1.5m soft mud. Within the entrance the depths vary from 9 to 11.9m and vessels with a length of 45m and a draft of 2.4m can easily reach a point 80 miles above the mouth, where the flood current is still noticeable.

Passage up the Air Mesuji should not be undertaken without local knowledge.

Anchorage.—Anchorage can be taken, in a depth of 7m, 5 miles SE of the mouth of Air Mesuji, which will then be seen entirely open. The anchorage can be approached with the mouth of the river bearing 293°, until in a depth of 9m, then steer W to a position about 5 miles SE of the entrance.

2.21 **Tanjung Bubuayang** (4°23'S., 105°51'E.), the N entrance point of Wai Tulangbawang, is located 13 miles SSE of

Tanjung Tawar. Tanjung Tmak, 2.5 miles farther S, is the S entrance point of the river.

From Tanjung Tmak the coast trends about 3 miles SE to Tanjung Serdang. A drying mud flat lies about 1 mile off the coast.

The Wai Tulangbawang, one of the largest rivers in the S part of Sumatera, has a bar across its mouth, with a depth of 1.2m; the rise of the tide is usually less than 1.5m.

Just within the entrance the depths are 11m and the width is less than 0.2 miles. The depths gradually decrease to 3.5m and the width to about 46m in a position about 60 miles upstream.

The approach to the river is marked by two beacons. One lies 3 miles NE of Tanjung Tmak, and another stands on the inside of the bar 0.9 miles NE of Tanjung Tmak.

Anchorage may be obtained off the mouth of Wai Tulangbawang, N of the banks which extend from the coast NE of Tanjung Serdang. The anchorage should be approached from the E on the parallel of latitude 4°15'S.

Vessels coming from the S should stay in depths of not less than 16m until this parallel is reached. When Tanjung Serdang bears 225° care must be taken to be in no less than 13m. In this position portions of the land will become visible.

The high trees between the mouths of Wai Tulangbawang and Air Mesugi are the first landmarks to be sighted. The S end of these trees and the trees on Tanjung Pasir are good landmarks. When Tanjung Bubuayang bears 202°, and the depths decrease to 9m, course should be altered to 180° and anchorage taken when the same point bears 225°, in depths of 6 to 7m.

Vessels capable of proceeding over the bar across the entrance to the river should not proceed without local knowledge.

2.22 Off-lying banks.—Beting Menjangan Bank (3°47'S., 106°12'E.), 15 miles ENE of Tanjung Lumut, with a least depth of 5.5m, is the SE extremity of the bank which extends from the coast N of that point. It has a hard bottom of sand and mud and soundings give little or no advance warning.

The tops of the highest trees on Tanjung Lumut are generally just visible from the bank, but as the recommended route for deep draft vessels lies E of this shoal, these trees should not be sighted.

Five Fathom Banks (3°48'S., 106°28'E.) occupy a circular area about 8 miles in diameter, centered in a position about 31 miles E of Tanjung Lumut. The least depth over these patches of hard sand and mud is 6.8m.

Vessels of deep draft should pass E of these banks. Two wrecks with masts visible lie NW of Five Fathom Banks, approximately 11.5 miles NE and ENE of Beting Mangangang Bank. Dangerous wrecks lie within 30 miles NE, E, and S of the Five Fathom Banks and 29 miles ENE of Tanjung Menjangan.

Four Fathom Banks (4°13'S., 106°12'E.), consisting of a number of patches of mud and sand, with a least depth of 7.3m, lie about 23 miles E of the mouth of Air Mesugi.

Intan Oil Field (4°34'S., 106°39'E.) lies 32 miles SE of Four Fathom Banks, and Widuri Terminal is situated 6 miles S of Intan. A submarine pipeline is connected between the two oil fields. Numerous wrecks and obstructions lie within the range of 20 miles from the terminals.

Widuri Marine Terminal (4°41'S., 106°39'E.) consists of two SBMs and Maxus Widuri, a storage tanker for the loading of crude oil. The terminal is approached from the SE by an unmarked channel, that leads to an anchorage area, in a depth of about 20m, situated 2 miles SE of the storage tanker.

Vessels between 20,000 and 175,000 dwt displacement may use No.1 SBM, moored NE of the storage tanker and No. 2 SBM, to the SW. The terminal operates 24 hours; the vessel's ETA should be sent 72 hours, 48 hours, 24 hours, 12 hours, and 4 hours in advance or any time a change of 1 hour in the original ETA occurs. Berthing is limited to daylight hours only, and is subject to weather conditions and storage containment. Unberthing can be done at any time. The mooring master boards in the anchorage area.

A submarine pipeline leads 35 miles SSW to **Zelda Oil Field** (5°11'S., 106°23'E.). From Zelda, the pipeline leads 17 miles SSW to Cinta Terminal.

Bangka—Northwest and North Coasts

2.23 The coast of Bangka trends about 38 miles NE from Tanjung Ular to Tanjung Melala and then 19 miles E to Tanjung Samak, the NE extremity of Bangka.

Two large bays, Teluk Kampa (Teluk Bulu) and Teluk Klabat, indent this section. Teluk Kampa is entered E of Tanjung Biat, and Teluk Klabat is entered close E of Tanjung Melala.

Tanjung Biat (1°56'S., 105°09'E.) is located 2.8 miles NE of Tanjung Ular. The coast for 7 miles E of Tanjung Biat is rocky, then as far as Tanjung Genting is mainly sandy. It is muddy at the mouths of the Sungai Bulu and the Sungai Kampa, 5 and 6 miles, respectively, SE of Tanjung Genting.

The coast is fringed by a coastal bank which dries, extending as much as 1 mile offshore in places, and having numerous rocks on it.

Karang Sebidunguma (1°56'S., 105°08'E.), 2 miles N of Tanjung Ular, is a steep-to reef with some rocks awash on it. The reef is not marked by discoloration, and soundings give no warning of approaching it. A shoal with a depth of 3.2m lies 1 mile N of the reef. A 5m shoal, lies 2 miles NNW of Tanjung Biat. Kamudi, a rock which almost dries at low water, lies 5 miles SSE of Tanjung Genting, 2 miles offshore.

Exspan Marine Terminal (1°50'S., 105°08'E.), 5.5 miles N of Karang Sebidunguma, consists of an SPM where the FSO Laksmati is moored.

Vessels should contact the terminal 2 hours before arrival on VHF channel 16. The recommended anchorage area is 2 miles NE of the SPM.

2.24 Jebus (1°45'S., 105°27'E.) (World Port Index No. 50160), the center of a tin mining district, is situated 3 miles inland on the Sungai Jebus, a tributary of the Sungai Kampa; only flat-bottomed craft can proceed upriver to Jebus.

Anchorage can be taken, in a depth of 9m, soft mud, with Tanjung Genting bearing 018°, 1.5 miles distant, and the mouth of the Sungai Bulu bearing 098°. There is a 5.5m patch located E of the anchorage.

Tanjung Genting (1°42'S., 105°19'E.) is a rocky point. Numerous rocks rise from the coastal bank, which extends a short way from the point. A steep-to shoal, with a depth of 1.5m, lies 0.8 mile to the NW. A shoal 3 miles in extent, not marked by discoloration, lies in the NE part of Teluk Bulu (Teluk Kampa), with a shallow spot of 4.8m lying 5 miles S of Tanjung Genting.

From Tanjung Genting to Tanjung Melala, the coast trends in a NE direction. There are several coves and bays, of no particular importance, on this coast. The most prominent points are Tanjung Lesum, Tanjung Pemuja, and Tanjung Kelayang, located 3.5 miles NNE, 6.8 miles NNE, and 11 miles NE, respectively, from Tanjung Genting.

Within this part of the coast are three prominent hills, which from 20 miles offshore appear as islands. Gunung Mempari, 235m high, the farthest S of these hills, lies 4 miles E of Tanjung Genting.

Gunung Penyabung, 223m high, is located 2.8 miles NW of Gunung Mempari, close S of Tanjung Lesum. Gunung Besukan (Gunung Pesukan), 209m high, is located 3.8 miles NNE of Gunung Mempari.

Gunung Ganten, 176m high, 6.5 miles ENE of Gunung Mempari, is noticeable from a short distance only.

2.25 Pulau Pemuja (1°36'S., 105°23'E.) lies on the coastal bank, close N of Tanjung Pemuja. Pulau Perut is located 0.5 mile offshore close W of Tanjung Kelayang.

There are rocks and a wreck 1.5 miles offshore between Pulau Pemuja and Pulau Perut. There are other rocks charted 1 mile W, and 1 mile and 1.8 miles N of Pulau Perut.

Malang Iyu consists of two rocks, awash, lying close to each other in a position 2.8 miles N of Tanjung Kelayang. Malang Doyang, 4 miles ENE of Malang Iyu, is a conspicuous grayish-yellow rock which resembles a vessel floating bottom up. A coral reef, with a depth of 0.9m, lies 1 mile S of Malang Doyang. A 5.9m depth lies 1 mile farther S.

Malang Guntur, located 2.5 miles NW of Tanjung Melala, consists of several rocky heads, awash, and one above water. A 4.8m depth lies 2.8 miles NE of Malang Guntur and a 10m patch lies 0.5 mile farther NE.

Vessels proceeding along this coast should keep outside a depth of 20m.

Teluk Klabat is entered between Tanjung Melala and Tanjung Penyusu, located 6 miles to the E. The bay, which indents the N coast of Bangka a distance of 17 miles, is divided into an outer and inner bay by Tanjung Rau (Ruh), which lies 7 miles S of Tanjung Penyusu.

The greater part of the outer bay is occupied by a mud flat, with depths of less than 2m, and numerous above and below-water rocks, leaving a channel along the E side with steep-to banks.

The shores of the outer bay consist mainly of sandy beaches with large blocks of granite and a drying reef which extends as much as 0.8 mile from the W shore.

The head of the inner bay is bordered by a mud bank, with trees on them standing in the water at high tide.

Several rivers discharge into this bay; the largest, the Sungai Layang, flows into the SE corner.

Tanjung Melala, the W entrance point to Teluk Klabat, is a rocky point. A useful mark for the point is Bukit Melala, 106m high, on the W side of the point.

A wreck lies 1.5 miles ENE of Tanjung Melala. Numerous above-water rocks lie within 1.3 miles of Tanjung Melala and should be given a wide berth.

Tanjung Penyusu, the E entrance point of the bay is a low point, from which a spit with depths of 2.4m or less, extends 2 miles W and WNW. Pulau Penyusu, a low islet, is located on this spit, 0.8 mile W of Tanjung Penyusu.

A light, shown from a white iron framework structure 20m high, stands on the island.

Anchorage may be obtained N of Teluk Klabat, in a depth of 13m, with Pulau Penyusu Light bearing 110°, distant 3 miles.

The Maras Range, previously described in paragraph 2.5, located at the head of the bay, rises in the midst of a waste and almost impenetrable district.

A narrow channel trends along the E side of Teluk Klabat; vessels of moderate draft and with local knowledge can proceed through this channel to a roadstead near the entrance to the inner bay. The least depth in the fairway is 5.6m, near its N entrance. The bottom of the channel is formed of granite in places, and the W side is formed by a ridge of hard sand that has drying patches. The channel is marked by buoys, odd numbered on the W side and even numbered on the E.

Dangers in the approach are Karang Trasi Laut, with a least depth of 0.5m and Karang Trasi Darat, with a least depth of 1.5m located 2.8 miles NNW of Pulau Penyusu Light. These dangers are not marked by discoloration.

A drying rock is located 0.8 mile W of Pulau Penyusu on the drying spit, and a rocky shoal with a least depth of 2m, is located 0.8 mile farther W. The W side of the shoal is steep-to. The chart is the most concise guide to the numerous rocks, shoals, and islets in the bay.

2.26 Blinyu (Belinyu) (1°38'S., 105°47'E.) (World Port Index No. 50180) is the capital of the mining district of the same name. The town is situated on the Sungai Belinyu about 1.5 miles inland.

The entrance to the inner harbor and anchorage of Belinyu is between Tanjung Rau and Tanjung Mantong (Mantun) the E entrance point, located 1 mile NE of Tanjung Rau. Batu Merlang, an above-water rock, is on the E side of the entrance to the inner bay, 0.6 mile ENE of Tanjung Rau. The Asphalt Jetty, 102m in length, handles dirty products cargo.

A rock awash lies 0.2 mile NW of Batu Merlang and there are several other rocks off the E side of the channel.

Anchoring with enough room to swing, can be obtained S of Tanjung Rau, in depths of 5 to 11m. Vessels wishing to unload by praus can anchor in a depth of 15m, mud and sand, with Batu Merlang bearing 000° and Tanjung Rau bearing 300°.

Vessels are cautioned not to anchor in an area bound N by a line drawn in a 031° direction from Tanjung Rau to the N extremity of Tanjung Mantun, and S by a line drawn in a 050° direction from Tanjung Rau to the root of the pier S of Tanjung Mantun. Two cables cross the channel in this vicinity.

Tides—Currents.—Tidal currents in Teluk Klabat, in general, follow the deep channel, but at Tanjung Mantun, the flood current sets into the E shore and the ebb current into the W shore. The currents change direction at approximately the times of high and low water. Both currents are strong at springs, especially in the narrow passage between Tanjung Rau and Tanjung Mantun, where a maximum rate of 3 knots has been observed.

Several islands are located in the S part of the inner harbor. Their position may be seen on the chart.

The N coast of Bangka between Tanjung Penyusu and Tanjung Mengkudu, a rocky point 11 miles E, is fronted by a sandy beach. Several rocks lie close off the W part of this coast. Pulau Mengkudu is the largest of two islets which lie 0.5 mile N of Tanjung Mengkudu.

There are two villages on this coast visible from seaward. They are situated 4.5 miles and 8 miles E of Tanjung Penyusu.

A dangerous shoal, with a depth of 5.4m, lies 2.5 miles offshore, 4.3 miles W of Pulau Mengkudu.

Tanjung Grasak (Samak) (1°30'S., 105°55'E.), a rocky point 2 miles E of Tanjung Mengkudu, is the N extremity of Pulau Bangka.

Islands North of Pulau Bangka

2.27 **Pulau-pulau Tuju** (Tudju Eilandan) (KepulauanTuju) (1°13'S., 105°16'E.) lies N of Bangka in the NE approach to Selat Bangka. The S island is 26 miles N of Tanjung Genting. The island group is generally visible at a distance of 25 to 30 miles. The islands are occasionally visited by coasters and praus. Passage between the islands, for vessels of shallow draft, is for the most part safe, but caution is necessary as the islets are fringed by reefs and the shoals are not generally marked by discoloration.

Pulau Penyaman (Pulau Penjaman) the S island of the group, is 95m high. Depths of less than 10m extend 1 mile S of the island; an area of discolored water lies with its center 1.5 miles SE of Pulau Penjaman.

Pasirkeliling, an inhabited islet covered with coconut trees, is about 1 mile NNW of Pulau Penjaman. Depths of less than 10m extend 3.3 miles ENE of the islet.

Pulau Lalang lies 1.8 miles NNW of Pasirkeliling and Pulau Yu, lying nearly 2 miles NW of Pulau Lalang, attains a height of 36m.

Pulau Cebia (Tjebia), about 3 miles N of Pulau Penjaman, has a peak 108m high; a reef surrounds the island.

Pulau Pekacang (Pekatjang) (1°10'S., 105°18'E.), the largest and NE island of the group, rises to an elevation of 170m.

Off the SE extremity of the island, the reef border is 0.5 mile wide; several small islets are on the reef, with elevations up to 50m.

Pulau Tokong Kembang, a small islet attaining a height of 54m, lies 2.5 miles NW of Pulau Pekatjang. There is a rock 10m high, surrounded by a reef, 0.8 mile NW of Pulau Tokong Kembang.

Observations of the tidal currents have been made in a position 13 miles SSW of Kepulauan Tujuh. In this position, the currents run NE and SW and are mainly diurnal. The maximum rate of the current running NE can be expected to average about 1 knot in June and July, and also in December and January.

The maximum rate of the current running SW can be expected to average 1.25 knots from November to January, and from May to July. In addition to the currents setting NE and SW, a current setting across these directions, with a maximum rate of 1.25 knots, has been observed.

Tide rips and strong whirlpools have often been observed SW of Pulau Cebia.

Pulau Dokan (0°58'S., 105°39'E.), an islet 24 miles ENE of Pulau Pekatjag, is 118m high; it is visible from 32 to 36 miles in clear weather. A hill on the islet appears pointed when seen from the N but appears rounded when seen from the E. It is surrounded by a reef which extends 1 mile from its N side, with some above and below-water rocks on it. An islet 30m high is located close N of Pulau Dokan. A detached reef, with a least depth of 0.4m, extends 1.5 miles S from Pulau Dokan.

Pulau Toty, 7.5 miles ENE of Pulau Dokan, is 113m high; its summit appears rounded when seen from the N and pointed when seen from the E. The islet is surrounded by a reef which extends 0.5 mile NW and 0.3 mile SE.

The channel between Pulau Dokan and Pulau Toty is clear. The reefs around these islands are not marked by discoloration.

Pulau Bangka—Northeast Coast

2.28 The NE coast of Pulau Bangka is about 86 miles long between Tanjung Samak, the N extremity of the island and Tanjung Berikat, the E extremity. This section of the coast is low and wooded with a few low hills near the waters edge. The inland mountains however, are visible a considerable distance from seaward. A few small rivers flow out here.

A great number of islets, banks, and reefs lie off the coast, up to a distance of 30 miles. There are two safe, buoyed channels, leading between these offshore formations to Pangkalpinang. No vessel should attempt to proceed between these reefs by any other route.

A number of new dangers were found during the last survey of these waters, and even the most accurate survey does not exclude the possibility of the existence of further dangers.

The reefs are all steep-to, and owing to the somewhat troubled water, are only slightly marked by discoloration in the most favorable circumstances. Soundings do not give adequate guidance to the existence of these offshore dangers.

Note that only the islets and reefs near the channels mentioned above are described. The chart should be studied for other formations.

In fixing position by bearings, it should be kept in mind that muddy points and islets may have worked out E since the last survey.

Tanjung Ponggul (Tuing) (1°37'S., 106°03'E.), which exhibits a light from a 12m white structure, is a high, rocky point located 11 miles SE of Tanjung Samak. This section off the coast is high and rocky, with an occasional sandy beach.

Bukit Tuing is a 249m hill, located close NW of Tanjung Ponggul. Tanjung Layang is a rocky point with a low ridge of hills on it, which slopes gradually down to the point and terminates in a flat point. Layang is situated 12 miles SSE of Tanjung Tuing. The intervening coast is indented by small bays.

Tanjung Raja (Tanjung Raya) is located 7 miles SSE of Tanjung Layang. It is a prominent point marked by a conspicuous white tower, rising close within to Raja, a conical hill 199m high. The Sungai Liat flows out 1.5 miles SSW of Tanjung Layang; the roadstead is off its mouth.

There are several prominent landmarks along this coast in addition to Maras Range. Bukit Besar, 218m high, is a conical mountain with a rounded summit, which appears as a sharp peak when seen from N or S; there is a lower ridge of hills on its SW side.

Bukit Besar is located 15 miles SSE of Tanjung Samak. Bukit Pandjar, 257m high, is located 5 miles SSE of Bukit Besar.

Bukit Betong, 5 miles W of Raya, has a flat summit 235m high, but is not prominent. Puak, 1.5 miles WSW of Raya, is 307m high. It is steep on its E side and its sharp summit is prominent.

The coastal waters from Tanjung Samak SSE to Tanjung

Raya are encumbered with several islets and reefs which lie inside the 9.1m line; this line extends 7 miles offshore in the vicinity of Tanjung Raya.

A shoal patch with a depth of 2.2m and a drying rock lie 2 miles E and 3 miles ESE, respectively, of Tanjung Samak.

2.29 Karang Laut (Liat) (1°50'S., 106°10'E.), 3 miles ESE of Tanjung Layang, has two rocks awash on it. An obstruction exists 2.5 miles E of the same point.

Shoal patches with depths of 2.4m and 4.9m lie, respectively, 1.5 miles and 2.5 miles SE of Tanjung Layang. A 4.5m patch is located 3 miles ESE of Karang Liat.

A depth of 10.5m was reported to exist 14 miles E of Tanjung Layang.

Karang Timur Laut, a coral patch with a least depth of 5.8m, lies 7 miles SE of Tanjung Layang.

2.30 Off-lying reefs.—Severn Shoal (1°37'S., 106°31'E.) lies 27 miles E of Tanjung Ponggul and consists of coral with a depth of 3m. Sounding gives no warning of this reef, but in fine weather, Bukit Tuing and the summit of Raja are visible from this vicinity.

Iwan Reef (1°40'S., 106°18'E.), a coral reef with a depth of 3m, is steep-to and lies 15 miles ESE of Tanjung Tuing. The Bangka coast can generally be seen from near this reef. A 5m shoal exists about 3.8 miles SE of Iwan Reef.

Karang Laut, with a depth of 7m, is located 5 miles ENE of Tanjung Layang.

The coast between Tanjung Raja and **Tanjung Lanka** (Tanjung Langka) (2°28'S., 106°27'E.), 37 miles SSE, is low with occasional rocky points and sandy beaches. The coast between Tanjung Langka and Tanjung Berikat, 25 miles ESE, is low and swampy in places.

Tanjung Bunga (2°08'S., 106°11'E.), a projecting point about 13.5 miles S of Tanjung Raya, is conspicuous. The Sungai Baturusa flows into the sea 3.3 miles N of Tanjung Bunga.

Tanjung Udang, a high rocky point 4 miles SSE of Tanjung Bunga, is the end of a spur of the range that extends SW. Tanjung Lempuyang is a rocky point about 3 miles S of Tanjung Udang. Tanjung Pinyak, a point 11 miles SSE of Tanjung Lempuyang, has a village near it.

Tanjung Langka is located 9 miles SE of Tanjung Penyak. The Sungai Koba flows into the sea by way of an outlet 2.5 miles W of Tanjung Langka.

2.31 Gunung Mangkol (Gunung Mangol) (2°14'S., 106°06'E.), 420m high, is the highest and most prominent summit of a range of mountains located 7 miles inland, in a WNW direction from Tanjung Lempujang. Gunung Pau, 280m high, is located at the N end of the mountain range 3.5 miles N of Gunung Mangkol (Gunung Mangol). Bukit Lali, 4.8 miles NE of Gunung Mangkol (Gunung Mangol), is 200m high. A television tower was reported to stand on Gunung Mangkol (Gunung Mangol).

The coastal waters from Tanjung Raya SE to Tanjung Langka are fronted by numerous reefs and islets. The 10m curve extends up to 16 miles offshore E of Tanjung Lempuyang.

Karang Pedis Selatan (1°53'S., 106°15'E.), a coral head with a depth of 2m lies 3.5 miles E of Tanjung Raya.

It is marked on its SE side by a lighted buoy. Another coral patch, with a depth of 5.5m, lies 1 mile N of Karang Pedis Selatan. Karang Fokke, a reef which dries, lies 2 miles SW of Karang Pedis Salatan.

There are some above-water rocks located about 0.8 mile SW of Karang Fokke, which are sometimes visible from a distance of 5 miles.

A reef consisting of coral and stone, with a depth of 1.8m, lies 10 miles ESE of Tanjung Raya. A drying reef lies 5 miles SSE of Tanjung Raya and a drying reef lies 5 miles NE of the mouth of the Sungai Baturusa.

2.32 Karang Elliot (Elliot Reef) (2°04'S., 106°19'E.), which dries, is located 9 miles NE of Tanjung Bunga. A light, shown from a white metal framework tower, 13m high and equipped with a radar reflector, is situated on the S extremity of the reef.

Several shallow patches with depths of less than 4.8m lie within 1.5 miles of the light. Karang Palmer (Palmer Reef), a group of coral heads, which has one head awash, lies 7 miles NE of Karang Elliot. Karang Miang, which dries and is marked by a light from which a racon transmits, lies 2 miles SW of the light.

Pulau Panjang (2°09'S., 106°16'E.), 5.5 miles ESE of Tanjung Bunga, is one of several islets that lie off this coast. Pulau Panjang and Pulau Bujur, 1.5 miles to the E, are covered with palms and lies on extensive drying coral reefs.

Karang Gading, a drying coral reef, is located 3.5 miles NE of Pulau Panjang. A patch with a depth of 3.4m lies 1.8 miles WSW of Pulau Panjang. Foul ground extends SSE from Karang Gading for 8 miles to the E side of Gosong Asam, an extensive drying reef with two islets on it.

Palau Panjang

Pulau Bebuar, 12.5 miles SE of Pulau Panjang, is a sandy islet covered with tall trees, and is surrounded by an extensive reef which dries; foul ground extends 2.8 miles WSW, 2 miles E, and 3.5 miles NE from the islet. Pulau Bebuar was reported to lie 1.8 miles S of its charted position. A lighted beacon is situated on the islet.

Horse Reef, 4 miles E of Pulau Bebuar, is on the SW edge of a foul area which extends 3 miles NE from this reef. A reef, with a depth of 2.1m, lies 2.8 miles SSE of Horse Reef.

Pulau Ketawi, 7 miles SSE of Pulau Panjang, is covered with coconut palms. Drying reefs lie 2 and 2.8 miles NW of Pulau Ketawi.

2.33 Karang Hidrograf Barat (West Hydrograff) (1°56'S., 106°25'E.), with a depth of 3.4m, lies 14 miles E of Tanjung Raja (Tanjung Raya) and is one of the outer dangers along this coast.

A 10.5m shallow spot has been reported to lie 8 miles NNW of the coast. Karang Hidrograf Timur (East Hydrograff) lies 9.3 miles SE of Karang Hidrograf Barat, is marked by a light, and has a depth of 0.3m.

Karang Noordziek, a reef with a rock awash, lies 1.5 miles SW of Karang Hidrograf Timur and Keuchenius, 5 miles ESE of Karang Hidrograf Timur (East Hydrograff), has a depth of 7.9m.

Karang Smit van de Broecke (2°04'S., 106°32'E.), has a least depth of 4m, located 3.5 miles SSW of Karang Hidrograf Timur. A 5.5m patch lies 1 mile W of Karang Smit van de Broecke.

Karang Diederika (Jederika), a group of rocks with one rock which breaks, is located 7 miles W of Karang Smit van de Broecke.

A patch of coral and stone, with a depth of 1.8m, lies 1 mile ENE of this danger. There is a coral patch, with a depth of 3.5m, lies 3.8 miles NE of Karang Diederika.

Karang Lombok Barat (West Lombok Reef), 7 miles SW of Karang Smit van de Broeckem has a depth of 5m; a 6m patch lies 2.8 miles E of this reef.

Karang-karang Lombok (Lombok Reef) consisting of three shallow patches with depths of 3, 2.5, and 4m, lie respectively, 7 miles ENE, and 7 and 8 miles ESE of Karang Lombok Barat.

Goat Reef (2°12'S., 106°29'E.), with a depth of 0.9m, lies 6 miles SE of West Lombok. The shallow ground extending NE from Pulau Bebuar extends to a position 1.3 miles S of this reef. Scotia Reef, with a depth of 4.9m, lies 6.5 miles ESE of Goat Reef.

Karang Von Sittard (2°12'S., 106°45'E.), the SE of the outer dangers, lies 25 miles NE of Tanjung Langka, is marked by a light, and has a depth of 2.4m. A depth of 8.5m was reported to lie 7 miles SW of Von Sittard Reef.

A coral reef with a least depth of 5.5m was reported to lie 5.5 miles N of Van Sittard Reef and a shoal with a depth of 0.4m was reported to lie 5 miles farther N.

There are several reefs which front the coast in the vicinity of Tanjung Langka; from W to E the largest are, Karang Perlang, 1.5 miles NE of Tanjung Langka, and Karang Timor, 5.5 miles E of the same point. A light shown from a white beacon stands on Karang Perlang.

2.34 The **Sungai Liat** (1°51'S., 106°06'E.), the headquarters of the district, is situated on the W bank of the river, 2 miles within its entrance. The town can only be reached by small craft at high water. The channel to the river runs between numerous rocks and is constantly shifting.

Anchorage is available about 1 mile off Sungai Liat, in a depth of 7m, with Gunung Tuing in line with the outer rocks off Tanjung Layang bearing 337°.

Vessels bound for the Sungai Baturusa from the Sungai Liat anchorage should pass N of the buoy, as described above. When Tanjung Raja bears 180° it should be brought ahead. Steer on that course until W of Karang Timur Laut, when course should be altered to SSE to pass midway between Pedis Selatan and Fokke.

From this position bring **Karang Elliot** (2°04'S., 106°19'E.) ahead bearing 156°. Steer this course until Gunung Pau bears 230°, then steer 230° and proceed to the anchorage 3.5 miles E of the mouth of the Sungai Baturusa.

Anchorage.—In calm weather during the Southeast Monsoon, between May and October, anchorage may be obtained by vessels with local knowledge, in a depth of 6m, mud, with the N entrance point of the Sungai Baturusa bearing 270° and the NE extremity of Pulau Panjang bearing 135°.

During the Northwest Monsoon, between November and April, there is sheltered anchorage S of Pulau Panjang, in a depth of 5m, mud and sand, with Bukit Lali bearing 254° and the E extremity Pulau Panjang bearing 005°.

Vessels, when coming from N, steer to pass 7 miles E of Tanjung Raja, and when that point bears 270°, steer for Karang Elliot Light and then follow the channel from the Sungai Liat to the desired anchorage.

Directions.—When making for the anchorage off the Sungai Liat, vessels from the N do not pass less than 2.5 miles E of Tanjung Layang, because of the dangers lying off that point.

2.35 Pangkalpinang (Pangkal Balam) (2°07'S., 106°07'E.) (World Port Index No. 50210) is situated about 3.5 miles inland on a small tributary of the Sungai Baturusa. The administrator of Pulau Bangka and Pulau Belitung is situated here. There was a depth of 0.4m on the bar off the mouth of the Sungai Baturusa. The port serves international cargo, containers, passengers, ro-ro and liquid cargo.

Range lights situated on the S side of the river entrance in line bearing 284° lead into the river. No pilots are available and entry over the bar is limited to vessels with a maximum draft of 4.8m during daylight hours only.

There is a Harbormaster, Customs Officer, Immigration Officer, and a Port Medical Officer here.

Pangkal Balam—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			LOA	Size	
Port of Pangkal Balam Terminal					
General Cargo	—	—	—	—	Ro/Pax, containers, and breakbulk.
BBM Pangkal Balam Terminal					
Oil Jetty	28m	4.0m	60m	1,800 dwt	Dirty products and bunkers.

Pangkal Balam—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			LOA	Size	
GML Terminal					
Jetty 01	8m	—	—	—	Vegetable oils (by barge).
Jetty 02	14m	—	—	—	Vegetable oils (by barge).
Palm Oil Terminal					
Oil Berth	70m	—	—	—	Vegetable oils.

Depths—Limitations.—Vessels up to 2,000 dwt, with a maximum draft of 5m and a maximum loa of 140m, can use the port. For additional details see table titled **Pangkal Balam—Berth Information.**

Directions.—The inshore route from the Sungai Baturusa to Koba is only suitable for vessels of fairly light draft. It was reported that a vessel with a draft of 6.4m passed inside the reef in both directions at about the time of high water, following the directions given here.

From the anchorage off the entrance to the Sungai Baturusa, steer SSE to pass W of the beacon situated about 2.8 miles SSE. When past the beacon, steer to bring the beacon and the NE slope of the hill Sambongiri in line astern bearing 325°, which leads SW of Pulau Panjang, in a least depth of 4.9m. Steer course 145° until the E extremity of Pulau Panjang bears 000° when course 180° should be steered, passing W of the beacon marking a reef located 3 miles NW of Pulau Ketawi. Give this beacon a good berth as the reef projects some distance NW of it.

When Tanjung Bunga bears 322°, steer course 142°, bringing this point astern. Care must be taken to avoid the fishing stakes in the channel situated 3 miles S and 2 miles SSW of Pulau Ketawi. When Gunung Mangol bears 287° steer for the anchorage off Koba or for Selat Gelasa as desired.

2.36 **Koba** (2°29'S., 106°25'E.) is situated on the E side of the Sungai Koba, a short distance within its entrance. The Harbormaster is also the Customs Officer. The usual landing place, marked by a flagstaff, is 0.5 mile E of mouth of the Sungai Koba.

Anchorage during the Southwest Monsoon may be taken outside the reef about 3 miles NW of Tanjung Langka, in a depth of 6m, mud bottom.

The most direct route from Selat Gelasa to Pangkalpinang, according to the chart, trends generally NW between the reefs and islets, from the vicinity of Tanjung Berikat toward Karang Elliot, and then W and SW to the anchorage.

The initial course is 312° for the hill Puak. This course leads NE of the foul ground extending NE of Horse Reef. Care must be taken to clear Goat Reef and West Lombok, which lie near this track.

The passages described above are only for those vessels with local knowledge.

Tides—Currents.—Currents off the NE coast of Bangka originate both as tidal and monsoon drift phenomena. They are variable, particularly along the outer edge of the reefs and in the open sea, so that no reliance can be placed on positions determined by dead reckoning. Off Tanjung Berikat, the monsoon drift may attain a considerable rate.

Selat Gelasa and Approaches

2.37 Selat Gelasa, the strait between Bangka and Belitung, is divided by several small islands into three principal passages, which from W to E are named Selat Leplia (Selat Macclesfield), Selat Limende (Selat Clement), and Selat Baur (Selat Stolze).

Selat Gelasa is considered neither as safe nor as well lighted as Selat Bangka, but is frequently used by vessels proceeding from Selat Sunda to Singapore or from the W part of Jawa to the China Sea.

Selat Baur is the broadest of the channels apart from the rock awash W of Teree Reefs, there is no known dangers in the fairway. It is the most preferred channel, but vessels of low power should use Selat Leplia during the Northwest Monsoon and Selat Baur during the Southeast Monsoon, as the currents are more favorable. Selat Limende is seldom used.

The drying reefs, when covered, are nearly always discernible by the brown or green color of the water. The other reefs are usually difficult to see, as the water in the strait is somewhat muddy, and they are only recognizable when current and wind cause tide rips and surf. Large brown patches of fish spawn, often seen in and near the strait, may be mistaken for the discoloration of reefs.

Winds—Weather.—In Selat Gelasa, light variable winds prevail in April and November. The Southeast Monsoon prevails from May to October and the Northwest Monsoon from December to March. WNW winds predominate in December veering to NW in January with increasing force and consistency, persisting to March.

Squalls are most frequent in November and December. A moderate swell develops during Northwest Monsoon in January and February.

Tides—Currents.—The currents in Selat Gelasa set SE in the Northwest Monsoon and NW in the Southeast Monsoon. There is little information on rates, but it is probable that the currents occasionally exceed 3 knots in some of the narrower passages.

The tidal currents are strong in the three straits, but their directions are somewhat difficult to foretell. The following information, obtained near **Pulau Langkuas** (2°32'S., 107°37'E.), applies to Selat Leplia and Selat Limende only. The directions of the tidal currents perform a complete circle clockwise, in one lunar day. The maximum rate always occurs twice each

day, when the currents run either in a NNE or a SSW direction. The currents which run ESE or WNW are about half the maximum rate.

Pilotage.—Pilots can be obtained at **Tanjungpandan** (2°45'S., 107°38'E.), on the W coast of Belitung. Vessels without local knowledge visiting any of the islands in the strait are always advised to employ a pilot.

Caution.—Reports indicate that the existence of uncharted coral heads in the area N of Selat Gelasa is likely.

2.38 Karang Celestial (1°13'S., 106°47'E.), with a depth of less than 2m, is the farthest E of the group, lying 17 miles ESE of Enslie Reef. Numerous shallow reefs, with depths ranging from 0.9 to 8.8m lie between Enslie Reef and Karang Celestial. These may best be seen on the chart. A shoal depth of 11.9m was reported 20.5 miles E of Karang Celestial.

Caution.—Between latitudes 1°04'S and 1°14'S, and longitudes 106°30'E and 106°48'E, in the NW approach to Selat Gelasa, there is a group of small steep-to reefs not marked by discoloration. **Enslie Reef** (1°07'S., 106°31'E.), the westernmost of these, lies 43 miles NE of Tanjung Samak and has a depth of 9m.

Islands North of Selat Gelasa

2.39 Karang Lanrick (1°53'S., 106°57'E.), with a depth of 2.5m, is located 42 miles N of Tanjung Berikat.

The reef is not marked by discoloration or ripples. A reef with a least depth of 4m lies about 36 miles ENE of Karang Lanrick. A shoal, with a depth of 14.1m, was reported to lie 7.5 miles NW of the 4m shoal.

Karang Magdalena, a steep-to reef not marked by discoloration or ripples, about 9 miles SSE of Karang Lanrick, has a depth of 4m. A depth of 12.8m was reported to lie about 33 miles NE of Karang Magdalene.

Karang Belvedere, 10 miles S of Karang Magdalena, is a black rock 3m high surrounded by a coral reef. Karang Teree, 2 miles S of Karang Belvedere, is a drying bank with some rocks on it and is surrounded by a coral reef which extends 0.2 mile from the drying portion. Karang Tiung, which is awash, lies 2 miles SW of Karang Teree, and is barely visible.

Pulau Gelasa (2°25'S., 107°04'E.), 16.5 miles NE of Tanjung Berikat, may be seen in clear weather from a distance of 30 miles. It is a thickly-wooded island with a sharp summit 236m high and is surrounded by a coral reef. Batu Gelasa, 1 mile W of Pulau Gelasa, is a bare rock 8m high.

Warren Hasting Reefs consist of a group of six coral patches with reported depths from less than 2 to 4.9m. They are reported to be barely visible. The SW patch, which is awash, lies 8.5 miles WNW of Pulau Gelasa.

Karang Caning, 10 miles ENE of Pulau Gelasa, has a least depth of 5m coral,. The rock is steep-to and is not marked by discoloration or ripples.

Pulau Berikat (Boompjes Island) (2°28'S., 106°58'E.) lies about 10 miles NE of Tanjung Berikat. It is a bare rock 11m high, surrounded by a coral reef which extends 0.5 mile off its SE side. The island has been reported to be a good radar target at a distance of 20 miles. A lighted beacon stands on the S part of the reef.

Caution.—It has been reported that Pulau Gelasa may lie up to 1 mile E of its charted position.

Selat Gelasa—West Side

2.40 Tanjung Berikat (2°34'S., 106°51'E.), the E extremity of Pulau Bangka, may be identified by Berikat, a hill 119m high, located 0.8 mile SW of the point.

A light is shown from Tanjung Berikat. Telok Batu, 4.3 miles WSW of Tanjung Berikat and Gunung Sapat, 199m high, 5.8 miles farther WSW, are isolated peaks which are an E continuation of the Pegunungan Pading.

Between Tanjung Berikat and Tanjung Ru, 27 miles SSW, is a wide bay frequented by coasters and praus, in which the depths are reported to be mostly less than 5m, soft mud.

The 11m line extends in a SSE direction for 27 miles to the SE extremity of Pulau Lepar, an island which forms the S side of the bay. There are several islets located inside the 11m line.

The most prominent are Pulau Kelapan, 96m high, which lies 2.5 miles NNE of the N extremity of Pulau Lepar and Pulau Tinggi, which lies 0.8 mile SSW of the W extremity of Pulau Lepar.

Pulau Tinggi, which lies in the strait that separates Pulau Bangka and Pulau Lepar, has a conical hill which is prominent when seen from the SSE.

The shore of the N bay of Pulau Lepar is low and has stretches at sandy beach broken by areas overgrown with mangroves.

The E shore of Bangka trends 4.5 miles S from Tanjung Ru to Tanjung Baginda and then 14 miles W to Tanjung Paku. The coast between Tanjung Baginda and Tanjung Paku consists mainly of rocky points with low coastal land, covered with tall trees, between them.

Tanjung Baginda is a steep point, 119m high. Baginda, a hill 118m high, is located 2 miles WNW of the point. Tanjung Dua and Tanjung Bantil, respectively, 5 miles and 11.3 miles W of Tanjung Baginda, are both fairly high.

Islands South of Selat Gelasa

2.41 Numerous dangers, with depths of from 13 to 18m between them, and dangerous wrecks lie in the S approach to Selat Gelasa. These dangers are described from N to S.

Pulau Simedang (3°19'S., 107°12'E.) is covered with trees and can be seen from a distance of 15 miles. Pulau Simedang Kecil (Little Showalter Islet), covered with palms, lies 0.8 mile NNE of Pulau Simedang.

Both islands are fringed by reefs and foul ground. A light, shown from a 57m high white tower, is situated in the center of Pulau Simedang.

Pulau Simedang must be given a berth of 3 miles on the W and N sides and 2 miles on the E side, as there are numerous reefs in the vicinity. Karang Embleton, a drying reef 2 miles NW of Pulau Simedang, can be seen up to 3 miles away at low water.

A 0.9m patch lies 0.5 mile N of the reef. Karang Blis, 2.5 miles N of Pulau Simedang, has a depth of 0.3m. A patch of sand, with a least depth of 6.8m, lies 0.5 mile ESE of Karang Blis.

Anchorage.—Anchorage can be obtained, in depths of 13 to 15m, clay with sand, on the E part of the bank which extends S from Pulau Simedang, provided the island bears less than 359°. An obstruction, dangerous to navigation, exists about 3 miles S

of the island. A dangerous wreck, with a depth of 16m over it, was reported to lie (2004) 3.1 miles SSE of Pulau Simedang.

2.42 Karang Medang (3°22'S., 106°56'E.) is a coral patch with a least depth of 3m, marked by a light, located 17 miles WSW of Pulau Simedang; it is seldom marked by discoloration. From this reef Pulau Simedang is visible, as are the hills on the S side of Pulau Lepar and the hills near Tanjung Beginda.

Karang Kait, 6.5 miles SSE of Karang Medang, has a depth of 0.9m, and is sometimes marked by water discoloration. An 11m patch lies 1.5 miles NW of the rock.

Karang Pasir (3°29'S., 107°10'E.), 10 miles SSW of Pulau Simedang, is a small sand bank, which dries, and is identifiable within 3 miles. There are several reefs around Karang Pasir, the farthest W at 3 miles, has a depth of 4.5m.

A wreck, with its mast exposed 2m above water, was reported to lie about 3.5 miles ESE of Karang Pasir; another wreck, with its mast exposed 5m above water, was reported to lie 3.5 miles further E.

A 10m patch was reported to lie 14 miles ESE of Karang Pasir. Karang Padang, with a depth of 1.8m, Karang Tengah which dries, and Karang Ombak, two small reefs awash lie, respectively, 1.5 miles WNW, 2 miles NNE, and 3 miles N of Karang Pasir.

A bank, with depths of less than 11m, extends 1.5 miles SW from Karang Ombak.

Karang Hancock (Hancock Shoal) (3°34'S., 107°05'E.), 16.5 miles SSW of Pulau Simedang, is a small coral reef with a depth of 5.5m. A reef, with a rock awash on it, is located 2 miles ENE of Karang Hancock. Karang Larabe, 3.8 miles farther ENE, is a small coral reef with a depth 4.5m. These three dangers are surrounded by depths of 12m and more, and are not marked by discoloration.

Karang Suji (3°34'S., 106°55'E.), the farthest SW of the dangers in the S approach to Selat Gelasa, lie 23 miles SW of Pulau Simedang. They consist of four coral patches with a least depth of 0.3m, and are sometimes marked by tide rips; birds are frequently seen hovering over them. These reefs lie outside the visibility of Pulau Simedang Light, and the island can not be seen from them.

Soundings give little indication of the vessel's position, as the depths in the vicinity are fairly regular.

Selat Leplia

2.43 Selat Leplia (Selat Macclesfield) is bound on the W side by the E coast of Pulau Bangka, Pulau Lepar, and the several shoals lying both N and S of Pulau Lepar. The E side is formed by Pulau Liat and a number of shoals and islets S of that island.

There are many conspicuous landmarks for determining a vessel's position, except in the S approach, where some dangers lie out of the sight of land. The narrowest part of the channel, between Pulau Lepar and Pulau Liat, is restricted to a width of 3 miles by shoals lying off the coasts of these two islands.

Caution.—A 10m patch of coral, the E danger is this part of the strait, lies about 10 miles SE of Tanjung Berikat.

2.44 Gosong Raya (2°40'S., 106°53'E.), 6.5 miles SSE of Tanjung Berikat, has a least depth of 3m. Gosong Nutshorn, W of Gosong Raya, is a projecting spit of the coastal bank, 6 miles S of Tanjung Berikat. A detached shoal with a depth of 10m, lies in mid-channel 4 miles SE of Gosong Raya.

The greater part of Pulau Lepar which forms the W side of the narrows, is low and wooded, but a ridge of hills extends W along the S side of the island from Tanjung Murung, the island's SE extremity.

Tanjung Labu (2°56'S., 106°55'E.), the NE extremity of Pulau Lepar, is low and fringed by a coastal reef on which there are numerous above-water rocks. A white iron framework structure 22m high, stands on the point.

Bakung, a hill 106m high, is located 2 miles W of the point. Klippige Reef, parts of which dry, lies within a distance of 2 miles ENE of Tangung Labu.

2.45 Discovery Rocks (2°53'S., 106°56'E.), awash and steep-to, lie 3.5 miles NNE of Tanjung Labu, close W of the fairway.

Pulau Liat (2°52'S., 107°03'E.), a reef-bordered island on the E side of the narrows, is low, flat, and wooded, except on a ridge of hills in the S part. Keladi, 137m high, is one of the highest peaks of this ridge, but is not easily recognized.

A spit that partly dries extends 2.8 miles S from Tanjung Batu Tambun, the SE extremity of Pulau Liat.

Pulau Celaka (2°52'S., 107°01'E.), a rocky islet covered with vegetation, lies on the coastal reef that extends from the W extremity of Pulau Liat. A light is shown from a beacon on Pulau Celaka.

There are several reefs W and NW of Pulau Celaka and it should be given a berth of 2 miles. A white metal framework structure 14m high, stands on the NW side of the islet.

Alceste Reef, a coral formation with numerous drying heads, lies parallel to the NW side of Pulau Liat, about 0.8 mile offshore.

Depths—Limitations.—Gosong George, with depths of less than 10m, extend 9 miles SW from a position 2.3 miles SW of Tanjung Murung. The least depth in the NE part is 3m.

A shoal area with a least depth of 4m, lies on the W side of Selat Leplia, 6.5 miles S of Tanjung Murung, the SE extremity of Pulau Lepar; irregular depths of from 7.9 to 11m extend 9 miles WSW and 2 miles NE from this bank.

Depths of 7.6 to 31m are found between Gosong George and a shoal area about 5.5 miles SE.

2.46 Karang Karang Baginda (3°07'S., 107°05'E.), marked by a light, lies on the E side of Selat Leplia, 12.5 miles S of Pulau Liat. The reefs, about 6.5 miles long in a N and S direction, have patches which dry and others which are awash. The W reef of the group, with a depth of 0.9m, lies 11.5 miles SSE of Tanjung Murung. It is the outermost danger on the E side of the S part of Selat Leplia.

An 11m depth is located on the E side of the strait, 8.8 miles ENE of Tanjung Murung.

Directions.—Coming from the N, clear weather and good visibility are essential for this route, otherwise it is advisable to proceed through Selat Bangka. However, once Tanjung Berikat is sighted, the entrance to Selat Leplia presents no difficulty.

From NE of Pulau Gelasa or N of Tanjung Berikat, a course

should be shaped for a position about 4.5 miles W of the N extremity of Pulau Liat. Care should be exercised to clear Karang Caning, about 10 miles ENE of Pulau Gelasa, and the 10m coral patch 10 miles SSE of Tanjung Berikat.

With the N extremity of Pulau Liat bearing 090°, steer S between Discovery Rocks and Pulau Celaka, giving the latter a berth of 2 miles, to position 3°10'S, 106°59'E, about 9.5 miles SE of Tanjung Murung.

Take care to avoid the rock with a depth of 1m, which lies about 11.5 miles SE of Tanjung Murung. Steer SSW to pass W of Karang Medang, then steer 195° for a position 4 miles W of Karang Karang Suji. When W of Karang Karang Suji, steer according to destination.

Coming from the S, in thick weather, it is advisable to find anchorage on the bank near Karang Karang Suji, in depths of 13 to 18m, and await more favorable conditions. When coming from the Java Sea, vessels which are uncertain of their position should proceed with caution when in depths of less than 20m.

Vessels proceeding directly through Selat Leplia from S may follow the directions given above in the reverse order, but on no account should Pulau Simedang be sighted by day or its light by night.

Selat Limende

2.47 Selat Limende (Selat Clement) is bound on the W by Pulau Liat, Pulau Kueel, Pulau Kalangbahu, and Karang Karang Baginda. Pulau Kelemar and Pulau Aur form the E side of the strait.

Karang Pandan (2°53'S., 107°12'E.), marked by a light and lying on the E side of Selat Limende, 7.5 miles E of the SE extremity of Pulau Liat, is a steep-to coral reef with a least depth of 3.6m; it is not marked by discoloration.

Karang Koral, which dries, lies 1.5 miles ENE of Tanjung Batutambun, the SE extremity of Pulau Liat, a reef which partly dries and is marked by discoloration, lies 2.8 miles SE of Tanjung Batu Tambun. A ridge of sand and clay, with depths of 11 to 15m, extends 1.5 miles S from this reef.

Terumbu Berbahaya, with a depth of 1.2m, lies in the fairway of Selate Limende, 7 miles SE of Tanjung Batutambun.

Pulau Kelemar (2°58'S., 107°14'E.) and Pulau Aur, 9 miles and 9.8 miles SE of Tanjung Batutambun, respectively, are hilly islands covered with large trees.

Pulau Kelemar is 65m high, and Pulau Aur has a peculiar sharp summit 52m high. Both islands are surrounded by reefs and foul ground which extends 1 mile S from Pulau Aur.

Pulau Kueal (2°59'S., 107°08'E.), 47m high, 5 miles SE of Tanjung Batutambun, is covered with tall trees and is surrounded by a reef. Foul ground extends 1.8 miles SSW from Pulau Kueal, but it is always marked by discoloration and parts of it is dry.

A 4.5m patch lies 0.5 mile N of the island. Pulau Selemar, located 1.5 miles W of Pulau Kueal, is similarly covered with tall trees and surrounded by reefs.

2.48 **Pulau Bakau** (3°02'S., 107°09'E.) lies 8.3 miles SSE of Tanjung Batutambun; it is low, covered with vegetation, and is surrounded by a coral reef which is steep-to on its W side. There are several detached reefs which extend up to 0.8 mile from its SE side. Pulau Kalangbahu, 0.8 mile ENE of Pulau Bakau, is saddle-shaped when seen from N or S. The E peak is 79m high.

Karang De Brauw, a small portion of which dries, lies 0.8 mile NE of Pulau Kalangbahu and is separated from it by a narrow passage with depths of 24m.

Directions.—When making for Selat Limende from the N, steer to clear **Beting Akbar** (2°39'S., 107°15'E.) and pass W of Karang Pandan.

When clear of Karang Pandan, steer 170° and pass midway between Pulau Kelemar and Terumbu Berbahaya to a position about 2.3 miles E of Pulau Kalangbahu.

When Pulau Kalangbahu bears 270°, bring Pulau Simedang ahead bearing 180°, and maintain course until well clear of Pulau Kalangbahu, then steer SSE to a position 6 miles E of Pulau Simedang, then as directed for the S approach to Selat Baur in reverse. When approaching from the S, follow the directions given above in the reverse order.

Selat Limende is seldom used and should not be transited at night.

Middle Passage is a channel connecting Selat Leplia with Selat Limende. On the N side of the channel are dangers extending S from Pulau Liat and Tominkor; on the S side are Pulau Selemar and Pulau Kueal.

Vessels proceeding E through Middle Passage can clear the dangers extending S from Pulau Liat by keeping Pulau Kelemar bearing not more than 090° until Pulau Selemar bears more than 135°.

There is another channel S of Middle Passage connecting Selat Leplia and Selat Limende that has Pulau Selemar and Pulau Kueal on the N and Pulau Bakau and Pulau Kalangbahu on the S side.

To proceed NE through this channel, keep the N extremity of Pulau Bakau in range with the S extremity of Pulau Kalangbau, bearing 089°, until Pulau Selemar bears 000°, when a fairway will open to the NE.

Caution.—A dangerous wreck lies 8 miles due S of **Pulau Kalangbahu** (3°02'S., 107°10'E.).

Selat Baur

2.49 Selat Baur is the preferred channel of the three passages through Selat Gelasa. The narrowest part of the strait, between Pulau Geresik on the W, and Kepulauan Lima on the E side, is 4 miles wide.

At night, the lights on Tanjung Ayerlancur and Pulau Simedang are visible when navigating this part of the strait.

Beting Akbar (Akbar Shoal) (2°39'S., 107°15'E.) is a small, steep-to shoal of sand and coral, with a least depth of 1.2m, 15.5 miles NE of Pulau Liat. It is very dangerous, as it is not marked by discoloration and soundings give no warning.

There is a dangerous wreck which lies 8 miles NNE and a stranded wreck lies 5.5 miles NE of Beting Akbar.

Aspect.—There are few landmarks in the N approach to Selat Baur; however, there are peaks on Pulau Belitung that are conspicuous.

Pulau Batudinding (2°49'S., 107°24'E.), with an elevation of 79m is hilly on the W side, which is indented by a shallow bay, and low on the E side.

Reefs extend up to 1.5 miles off the E side of the island and shallow spots, with depths less than 5.7m, lie up to 4 miles E of

the island.

Pulau Langir is a high rocky islet lying off the entrance to the bay on the W side of Pulau Batudinding; it is surrounded by a drying reef. A wreck is stranded on the W extremity of the reef S of the island.

2.50 Pulau Mendanau (2°53'S., 107°25'E.), on the E side of Selat Baur, is the largest of the islands fronting the W coast of Pulau Belitang. The island is wooded throughout and is hilly in the W and NW portions.

Petaling, a hill 207m high, is near the middle of the island. The shores of the island are generally low with a rocky point here and there.

Tanjung Ayerlancur is a high blunt point from which a steep-to reef extends about 200m W.

A light, shown from a white metal tower 27m high, is on the point. The entire coast of the island N and S of the point is fringed by reefs and rocks, some of them lying as much as 1.5 miles offshore.

Pulau Mendanau is separated from the S coast of Pulau Batudinding by Selat Nasi, a narrow channel only navigable by praus.

Pulau Peling is a small islet, which lies on a drying reef 2.5 miles SSE of Tanjung Ayerlancur and about 1 mile offshore. Pulau Kembung, 60m high, is 1.3 miles N of the same point.

There is convenient anchorage for vessels with local knowledge, in a depth of 14m, hard sand, with Pulau Kembung bearing 215°, distant 1 mile, also 0.5 mile E of the islet in a depth of 20m. Care must be taken to avoid the reefs in this locality.

Pulau Nado is a low wooded islet separated from the SE shore of Pulau Mendanau by Selat Nado, which is available only to small native craft.

Pulau Gersik (3°00'S., 107°16'E.), on the W side of Selat Baur, 8 miles SSW of Tanjung Ayerlancur, is a low thickly wooded island surrounded by a steep-to reef. There are depths of less than 5.8m, as far as 0.5 mile N through E, to 0.5 mile SSE of the islet. A shallow spot, depth 2.2m, lies 1 mile WNW of the island.

Good anchorage, in a depth of 15m, sand and coral, may be obtained on the ridge which extends S from Pulau Gersik, with the E extremity of the islet bearing 355° and the S extremity of Pulau Aur bearing 293°.

Caution.—Pulau Mendanau and Pulau Nado should not be approached inside the 20m curve due to the many dangers present offshore.

2.51 Kepulauan Lima (3°03'S., 107°23'E.), a group of six islets, on the E side of the narrows of Selat Baur, vary in height from 13 to 52m.

The islets are covered with tall trees and are surrounded by drying coral reefs; there are deep, narrow passages between the islets.

Pulau Kasenga, Pulau Benolo, Pulao Bago and Pulao Bamijo are on the W side of a deep channel which separates them from Pulau Buyut (Pulau Bujut) and Pulau Lima.

There is a stranded wreck on Pulau Bamijo; a dangerous wreck lies 4.3 miles S of the same island.

Pulau Kasenga, the NW islet of the Kepulauan Lima group, lies 6.5 miles SW of Pulau Nado and exhibits a light.

Anchorage may be obtained, in a depth of 15m, sand and coral, with the E side of Pulau Lima bearing 000° and Pulau Bamijo bearing 298°, 0.8 mile S of the reefs lying S of Pulau Lima.

Karang Lumba, a drying reef, lies 0.7 mile ESE of Pulau Bamijo.

A reef, which has a least depth of 1m, lies 0.5 mile SW of Pulau Kasenga, and with the exception of this reef and the one W of Pulau Bamijo, the W side of Kepulauan Lima is clear.

Eastward of a line joining Pulau Kasenga and Tanjung Ayerlancur, there are dangers, numerous enough to warrant avoidance.

Selat Baur—South Part

2.52 Pulau Simedang, on the W side of Selat Baur, has been previously described in paragraph 2.41. Karang Ombak and Karang Larabe, also on the W side of Selat Baur, have been previously described in paragraph 2.42.

Karang Selatan (3°07'S., 107°25'E.), 4 miles SSE of Pulau Lima, dries. When covered, it is marked by dark brown discoloration and tide rips.

Karang Karang Teree (Karang Karang Jeree), lying 3.8 miles SE of Karang Selatan consists of a sand bank with drying rocks.

Anchorage may be obtained W of Karang Karang Teree, in depths of 15 to 16m, with Pulau Lima bearing 340° at 6 miles. A rock awash, lies approximately 8 miles W of Teree Reef.

Karang Nyera, 2.5 miles S of Karang Karang Teree reefs, is a small drying reef, located close inside the 11m line.

2.53 Batu Malang (White Rock) (3°15'S., 107°28'E.), 8.5m high, 3 miles S of Karang Nyers, lies at the N extremity of a large drying reef. A bank of hard sand, with depths of 5.5 to 8.8m, extends 3 miles SE of this reef.

Pulau Seliu (3°13'S., 107°32'E.) lies 4 miles W of Tanjung Genting, the SW extremity of Pulau Belitung. The island is low, except for Marangbolo, a hillock 69m high, on Tanjung Marangbolo, the S point of the island.

The trees are lower between Marangbolo and the N part of the island. From a distance of 12 to 16 miles, it has the appearance of two islands. Pulau Saribu is surrounded by a reef which partially dries with several above-water rocks.

Pulau Saribu is a small islet in the channel between Pulau Seliu and Pulau Belitung; this channel is navigable only by praus. Batu Saribu is a white rock about 0.6 mile SSE of Pulau Saribu.

Quarter-Fathom Reef, with a depth of 0.5m, lies 4 miles S of Tanjung Marangbolo.

2.54 Karang Cooper (Cooper Reef) (3°22'S., 107°35'E.), 7.5 miles SSW of Tanjung Genting, has a depth of 0.9m, and cannot be recognized by sounding or discoloration. Midway between Karang Cooper and Quarter-Fathom Reef, there is a shoal with a least depth of 7m. A patch with a depth of 5.5m, charted as 9m, lies 3.5 miles NW of Karang Cooper.

Gosong Awal, lies about 2.5 miles SSE of Karang Cooper; consisting of two drying patches. The E patch, part of which remains exposed at high water, is composed of sand. The W patch is made of large black rocks, some of which are above water and may be seen from a distance of 4 miles at low water.

Karang Naga (3°27'S., 107°37'E.), 12.5 miles S of Tanjung Genting, is a small formation of coral and large rocks, and has

a least depth of 0.9m. The reef is frequently marked by breakers and tide rips, but seldom by discoloration.

Karang Genting (Carnbee) (3°34'S., 107°41'E.), the SE danger in the S approach to Selat Baur, is located 20 miles SSE of Tanjung Genting. The danger consist of three small steep-to coral reefs lying within a distance of 1.3 miles of each other and surrounded by irregular depths.

The W reef is awash. At high water and with a calm sea, it is difficult to locate the group by eye from distances of more than 200m; however, the mountains of Pulau Belitung can be seen from S of these reefs.

Directions.—Vessels approaching from the N, especially if the position is not certain, must give consideration to the reefs and dangers lying between 40 and 50 miles NE of Pulau Bangka.

Attention must be paid S to the dangers lying off the N entrance to Selat Gelasa, towards the E is Karang Caning. The isolated reef, with a least depth of 3.6m, lies about 47 miles N of Pulau Langkuas.

When S of the line joining Tanjung Berikat and Pulau Langkuas, the only danger in the N part of the strait is Beting Akbar. Vessels passing E of this shoal and near Pulau Langkuas must guard against the peculiar nature of the tidal currents in the vicinity of the islet.

When the vessel has cleared Beting Akbar, course should be changed to pass not less than 3 miles W of Tanjung Ayerlancur, avoiding the isolated 22m depth, 2 miles W of that point, then steer S and pass about 2 miles E of Pulau Gersik and continue on this course to a position 6 miles E of Pulau Simedang.

When the vessel has reached the position E of Pulau Simedang, course may be changed according to destination, bearing in mind that Karang Larabe lies about 13 miles SSW of Pulau Simedang and Carnbee Reefs lie about 32 miles ESE of the same islet.

Vessels approaching the strait from the SSW, change course for Karang Larabe in the Northwest Monsoon and for Carnbee Reefs in the Southeast Monsoon. In clear weather, the mountains in the SW part of Pulau Belitung will be sighted some distance S of these dangers.

2.55 Gunung Ludai (3°09'S., 107°44'E.) may be sighted from positions as far as 12 miles S of Carnbee Reefs, then shortly afterward, Gunung Beluru, 3.5 miles WSW of Ludai, will be sighted.

From positions near Karang Larabe, other mountains on Belitung should be sighted as well as Pulau Simedang. In clear weather there should be no difficulty in making the strait.

When the vessel's position has been determined, a N course may be steered to a position 6 miles E of Pulau Simedang. The directions given for Selat Baur from N can then be followed in reverse order.

During poor visibility, vessels must depend on soundings. In such cases, it is advisable to make the S edge of the bank which extends about 28 miles S of Pulau Simedang. When depths from 13 to 18m, clay with sand are reached, immediately steer E until in depths of more than 18m, then steer N taking care to stay in depths of more than 18m.

When passing E of Pulau Simedang, keep in depths of not less than 30m. If depths of over 36m have been obtained when making for the S entrance, it may be presumed that the vessel is well over on the E side of the channel, and a NW course may be steered in order to keep in these depths.

If there exists any doubt as to which side of the strait the vessel is on, it is advisable to anchor. It is of interest to note that poor visibility conditions do not usually last for any length of time.

A dangerous rock was reported 12 miles ESE of Pulau Simedang, and a dangerous wreck is 12 miles SSE.

At night, in clear weather, the strait can be approached from S without danger, as the light on Pulau Simedang is visible up to 3 miles S of Karang Hancock, the danger on the W side of the approach. When this light is sighted, a course should be steered to pass 6 miles E of Pulau Simedang and then proceed N.

When the light on Tanjung Ayerlancur is sighted, it must be kept between the bearing of 003° and 022°. When Pulau Gersik is sighted, the vessel's position can be fixed and course may be changed to pass either side of Karang Akbar, according to destination.

Selat Gelasa—East Side

2.56 Pulau Belitung (2°54'S., 107°55'E.), an island forming the W side of Karimata Strait, is roughly circular in shape. It is wooded and rather flat, with a few hills, but no mountain ranges. Tin is dredged in many parts of the island and is shipped from Tanjungpandan.

Tides—Currents.—The horizontal movement of water close to the coast of Pulau Belitung is diurnal, while in the fairway of Karimata Strait, it is mainly monsoon current. In the narrow passages between the islets and reefs, the tidal current may attain a rate of from 2 to 3 knots. The directions in which the currents set are, as follows:

Locality	Directions
Off the S coast	W and E to SE
Off the E coast	N to NNW and S to SE
Off the NE coast	NW and SE
Off the N coast	W to WNW and E to SE

Aspect.—There are few landmarks on the N part of the W coast of Pulau Belitung, between Tanjung Kelayang, the NW extremity of the island, and Tanjung Kubu, a rocky point 10 miles SSW.

The most noticeable mountain is Gunung Tajem, a double-peaked mountain nearly in the middle of the island, 16 miles ESE of Tanjung Kubu. Gunung Tobalo, 4.5 miles S of Tanjung Kelayang and 1.5 miles inland, has three peaks.

The S peak, 164m high, is the highest; they are prominent when seen from the W and in clear weather are visible from a distance of 28 miles but are not easily identified from N. Buling, a hill 113m high, 2 miles NW of Gunung Tobalo, is dome-shaped when seen from N or W.

2.57 Tanjung Binga (2°36'S., 107°38'E.) is a high point 4 miles SW of Tanjung Kelayang. From Tanjung Binga to Tanjung Kubu, 6 miles S, the coast is low and fringed by a bank which dries as much as 1.3 miles offshore in places.

A number of islets, mostly hilly and with many reef patches

around them, lie off Tanjung Kelayang.

Pulau Langkuas (2°32'S., 107°37'E.) is one of outermost islands off Tanjung Kelayang. It lies 3 miles WNW of this point. A light is near the E end of the island.

Batu Alwina, a shoal with a depth of 3m, lies 1.3 miles NNE of Pulau Langkuas. This danger, the northernmost in the area, is not marked by surf or discoloration. It is recommended that vessels not approach Pulau Langkuas within 3 miles from the N.

There are other islets on the coastal reef which extends 2 miles from the coast between Tanjung Kelayang and Tanjung Binga, about 4 miles SSW.

Pulau Kepayang, the farthest N of these islets, lies 1 mile NW of Tanjung Kelayang; the islet is surrounded by a drying reef and off the N end of this reef is an islet with a high rock close off it. Further SW are Pulau Pegadur, Pulau Burung, Pulau Lutung, and Pulau Kera, which is the farthest S of this group.

Melang Besar, about 2 miles W of Pulau Kepayang, has a conspicuous tree. Melang Kecil, 0.5 mile W of Melang Besar, is a smooth shining white-colored rock just above water. A rock, awash, lies 183m W of Melang Kecil.

Several reefs lie within a distance of 1.5 miles SSW of Melang Kecil.

Anchorage.—Anchorage may be obtained, in depths of 15 to 16m, sand, 0.5 mile S of Pulau Langkuas. This anchorage may be approached from W by steering for the summit of Pulau Kepayang, bearing 090°, which leads mid-channel between Pulau Langkuas and Melang Kecil, keeping in mind the shoal with a depth of 5.5m, lying 0.45 mile SSE of Pulau Langkuas.

Care should be taken not to confuse the islet, 0.3 mile N of Pulau Kepayang, with Pulau Kepayang itself. The islet appears as two hillocks with a low peak in the center, when approaching from the W, while Pulau Kepayang is difficult to see against the land.

The outermost shoals and reefs which lie off the bank S of Tanjung Binga are described from N to S.

2.58 Srimanggar (Sri Manggar) (2°37'S., 107°34'E.), 3.5 miles WSW of Tanjung Binga, has two heads with depths of 5.8 and 7m. Sritajem (Sri Tajem), 1.3 miles SW of Srimanggar, has a depth of 4.9m.

There is a depth of 7m, 0.8 mile SSW of this reef and a shoal patch with a depth of 4.2m lies 0.65 mile ESE of same reef.

Karang Karang Argo (Argo Shoals) are a number of shoal patches with a least depth of 0.4m, lying 1 to 1.5 miles SSE of Srimanggar.

Sriblitong (Sri Blitong) (2°39'S., 107°33'E.), with a least depth of 3m, is 5 miles NW of Tanjung Kubu. A 9.1m patch lies 1.3 miles SW of this reef and a 4.5m patch lies 0.6 mile SSE.

Baka Reef, with a least depth of 0.3m, is close N of Tanjungpandan Road, 3 miles WNW of Tanjung Kubu.

There are several shoal patches and reefs E of the above named reefs and shoals.

The chart is the best guide for the positions, dimensions, and for the depths over these various formations.

Between Tanjung Kubu and Tanjung Tikar, 5.5 miles SSW, the coast is indented by a bay into which the Sungai Cerucup flows. Tanjungpandan Road is the roadstead off the entrance to this river. Except for a narrow channel leading to the mouth of this river, almost the entire bay is occupied by a coastal reef, which dries, and which extends 3 miles W from the river entrance.

Outside the coastal reef are numerous detached reefs.

Pulau Kelemoa (Pulau Kalmoa) is an islet on the S side of the channel, 1 mile W of the river entrance; a pier extends from the N side of the islet.

Batu Kijang is the NW extremity of the coastal reef which extends from the S entrance point of the river.

A light is shown from a white metal framework tower with black bands, 9m high, on the coastal reef, 1 mile NW of Pulau Kelemoa.

A fairway lighted buoy is moored close W of a 7.6m shoal, 5 miles WNW of the light.

A shoal, with a least depth of 3m, lies on the N side of a swept channel 4 miles NW of the light, and a shoal, with a least depth of 6.7m, lies 3.3 miles WNW of the same structure on the S side of the swept channel.

Karang Tengah (2°43'S., 107°33'E.), with a depth of 5.2m, lies 2.8 miles WNW of the light. Mangkok Besar, with a least depth of 3m, lies on the N side of the channel, 1 mile ENE of Karang Tengah.

A 2.7m shoal of sand and coral lies 0.4 mile SE of Mangkok Besar, and a 4.9m patch lies on the S side of the channel, 0.8 mile SW of the same shoal.

2.59 Tanjungpandan (2°45'S., 107°38'E.) (World Port Index No. 50250) stands on the N bank of the Sungai Cerucup, 3 miles inside the swept channel. It is the capital of Pulau Belitung and the port is managed by a harbormaster. There is also a customs officer here.

The port serves an inland area that includes oil palm estates, kaolin, granite, and quartz sand. The wooden dock has been upgraded to concrete, a passenger waiting room has been built, and the roads around the terminal have been repaired.

Three piers make up the port, as follows:

1. The West Pier is 324m long with depths of 3.0-5.5m, and can accommodate a maximum vessel length of 65m.
2. The East Pier is 416m long with a depth alongside of 1.5m.
3. The Oil Berth, 63m long, can accommodate vessels up to 1,500 dwt, with a maximum draft of 4mt.

The maximum vessel size which can use the inner anchorage is approximately 3,000 dwt. Vessels over 3,000 dwt should anchor in the outer anchorage.

A swept channel, 0.3 mile wide and with a least depth of 7.6m, trends ESE from a position 5 miles WNW of the light-structure toward the outlet of the river. Across the entrance of the river is a bar of hard sand and stones with a least depth of 0.3m, which extends 0.5 mile NW from Pulau Kelemoa.

Ocean-going vessels do not enter the river, but anchor either in the swept channel or in the inner anchorage. A prohibited anchorage is situated in an area bound by a line joining Tanjung Kubu, a point 4 miles W of Tanjung Kubu, and Tanjungpandan.

Outer anchorage for large vessels of deep draft may be obtained, in a depth of 15m, 0.25 mile N of Karang Tengah. Vessels of moderate size can anchor 1.3 miles WNW of the light, in a depth of 12m, sand.

This anchorage is unsafe in the Northeast Monsoon; vessels can anchor near Pulau Sebongkok, in the N part of Selat Mendanau.

When there is a Southwest Monsoon, vessels should anchor at the N entrance of Mendanau Strait. The inner anchorage is a fairly wide basin, with a least depth of 5.8m, mud and sand, close E of the light. It is comfortable for two vessels, 120m long with a draft of less than 5.7m, and affords good shelter in Southeast Monsoon.

Due to limited room, extreme caution is necessary when anchoring, and the use of both anchors is recommended.

To use the channel and anchorages, make the fairway lighted buoy then steer SE to the outer anchorage. If proceeding farther in, pass between the buoys and beacons marking the channel to the anchorage desired. Pilotage is not available.

2.60 Selat Mendanau (2°55'S., 107°30'E.), the inshore passage E of Kepulauan Lima, Pulau Nadak, and Pulau Mendanau, is marked by buoys and beacons. It can safely be used by vessels with local knowledge proceeding to Tanjungpandan, from the S part of Selat Baur. The bottom in the shallower parts consists of hard sand and in the deeper parts, soft clay.

The W coast of Pulau Belitung, between Tanjung Tikar and Tanjung Borong, 9 miles SSW, is low and wooded with some sandy beaches and a couple of hillocks near the coast. It is fringed for 2 or 3 miles offshore by a drying reef, with some foul ground.

Pulau Kelmanbang (2°47'S., 107°32'E.) is among the islets and dangers that lie on the E side of Selat Mendanau, off the W side of Pulau Belitung. The island lies with its E extremity 2.8 miles WNW of Tanjung Tikar, and is covered with vegetation.

There is a hill on the island, 49m high, and the island is surrounded by a reef. Jumangin, a rock awash, with a patch 4m deep, 0.2 mile NW, lies 0.5 mile W of Pulau Kelmanbang.

Batu Tuku, a drying reef, lies 0.5 mile N of Pulau Kelmanbang, and a shoal with a depth of 4m, lies 0.6 mile NW of Batu Tuku.

Several shallow patches extend 3 miles NW from Batu Tuku on the NE side of the entrance to Selat Mendanau.

Batu Pinang, a reef which dries, is 2.5 miles W of Tanjung Tikar. A drying rock with a depth of 3.9m, close W, lies 0.5 mile W of Batu Pinang.

2.61 Pulau Tikus (2°51'S., 107°32'E.) is a small rocky islet on the NW edge of a coral reef, which dries, and is 4.5 miles SW of Tanjung Tikar. There is a sand patch covered with low coconut palms on the S extremity of the reef, about 0.8 mile S of Pulau Tikus; drying and below water rocks extend for 0.8 mile farther S. Two rocks, both awash, lie 0.8 mile and 1.5 miles NE of Pulau Tikus.

Perlak Reefs, part of which dries, are a cluster of reefs on the N side of Selat Mendanau, 2.5 miles NNW of Tanjung Kulit. Reefs and shoal patches extend SW from Perlak. Passage should not be attempted W of the cluster.

Pulau Hoorn (2°50'S., 107°29'E.) and Pulau Sebongkok are two islands off the E side of Pulau Mendanau. Pulau Hoorn has a prominent hill, 40m high, near its NE extremity.

Tanjung Kulit, close E of the hill, is the E extremity of Pulau Hoorn. Selat Perlak separates Pulau Hoorn from Pulau Sebongkok, and Pulau Sebongkok from Pulau Mendanau; it is only navigable by praus. The passage between Pulau Hoorn and Pulau Mendanau is closed by a drying reef.

Pulau Sikindang is on the W side of Selat Mendanau, 2.5 miles S of the S extremity of Pulau Sebongkok. A rock awash lies 0.3 mile N of the N extremity of Pulau Sikindang.

Karang Gusung Plandok, a reef which dries in places, lies 1.8 miles SSE of Tanjung Burung Gantung, the S extremity of Pulau Naduk (Pulau Nado). A reef, which dries, lies 1 mile S of Karang Gusung Plandok.

A narrow ridge, with depths of 4.8 to 7.9m, extends S from Karang Gusung Plandok, across Selat Mendanau, to Karang Rangas.

2.62 Pulau Ringgit (2°57'S., 107°31'E.) is on the E side of Selat Mendanau, 0.3 mile SW of Tanjung Borong.

Pulau Ru is a low island 1.8 miles SSW of Pulau Ringgit; S of this island are Pulau Keringan and Pulau Mendulu. These three islands all lie on a coral reef which dries. E of Pulau Ru lies Pulau Koedoes, Pulau Klebong, Pulau Mantara, and Pulau Batang. A stranded wreck has been reported 1.3 miles W of Palau Mendulu. Mariners are advised to navigate with caution in the area.

Directions.—Vessels making Selat Mendanau from the S, proceed N to pass W of the beacon marking Karang Rangas. When the S extremity of Pulau Mendulu bears 040°, steer for it and pass between the beacon and South Reef.

Maintain this bearing until the ridge between Karang Rangas and Karang Gusuk Plandok has been crossed in a least depth of 7.9m.

After crossing the ridge, steer 005°. The beacons, about 1 mile ESE and 1.3 miles ESE, will soon be seen. Pass between the beacons, then steer NNE to pass midway between Pulau Sikindang and Pulau Ringgit, then midway between Pulau Sebongkok and Pulau Tikus, taking care to avoid the 5.8m patch which lies 0.3 mile off the E coast of Pulau Sebongkok.

Pass W of the beacon 0.8 mile SW of Batu Pinang, and then W of the shoal patches about 3 miles NW of Batu Tuku. If bound for Tanjungpandan Road, steer ENE after rounding this shoal and head for the swept channel.

Vessels desiring to make a S passage through Selat Mendanau follow the above directions in reverse order.

Pulau Belitung—West Coast

2.63 The W coast of Pulau Belitung is generally low and wooded, with a few mountains inland which form useful landmarks.

Tanjung Borong (2°56'S., 107°32'E.) is 9 miles SSW of Tanjung Tikar. The coast between Tanjung Borong and Tanjung Tambelan, 16 miles S, is fronted by banks, reefs, and low islands extending several miles seaward.

Teluk Brang, a large shallow bay, navigable only by praus, immediately S of Tanjung Borong, is entered by a narrow passage between Pulau Ru and Pulau Batang. The N extremity of Pulau Batang is 2 miles S of Tanjung Borong.

The village of **Berempun** (3°09'S., 107°37'E.) lies 5 miles N of Tanjung Genting and 1.5 miles S of the mouth of the Membalong River. Fishing praus anchor near the shoreline in this area.

From Tanjung Tambelan, which is connected to the shore by a narrow neck of land, the coast extends SSE 3 miles to Tanjung Genting, a rocky point, which is the SW extremity of Pulau Belitung. Pulau Genting and some rocks, above-water and

awash, lie close S of Tanjung Genting.

2.64 **Bagienda** (3°13'S., 107°37'E.), 1.8 miles NNE of Tanjung Genting, is a rocky hill with two summits. The W summit, 156m high, is fairly sharp. The E summit is 162m high. Gunung Beluru, 361m high, 4.5 miles NE of Bagienda, is a long narrow ridge.

The highest peak is rendered prominent by a small area of woods on the N side of the ridge, especially when seen from E or W.

Kura, 1 mile ESE of Gunung Beluru, is 205m high. Gunung Ludai, 3.5 miles E of Gunung Beluru, and Gunung Gedeh, 0.5 mile farther NE, are 332 and 381m high, respectively.

The latter can be distinguished from a distance of 40 miles in clear weather. Gunung Kubing, 341m high, 7 miles N of Gunung Beluru, has a ridge extending 5 miles NE; there are a few prominent peaks on the ridge. Gunung Agung, at the NE end of the ridge, has two peaks; one reaches a height of 363m.

Belitung—North Coast

2.65 The N coast of Pulau Belitung is about 40 miles long between Tanjung Kelayang and Tanjung Burungmandi.

This entire coast is fringed by coral reefs, sand banks, and rocks. There are some small isolated coral reefs, dangerous to shipping, which lie up to 11.5 miles offshore. These dangers are steep-to and are not marked by discoloration.

It is possible that a number of undiscovered dangers may lie off this coast. The usual route to and from Selat Karimata leads N of Karang Florence Adelaide, and the coast of Pulau Belitung is not sighted.

Tanjung Siantu (2°32'S., 107°49'E.), the N extremity of Pulau Belitung, lies 9.5 miles ENE of Tanjung Kelayang, the NW extremity of the island. Tanjung Siantu can be easily identified by the conical hill, 52m high, near the point, and by Pulau Siantu, 30m high, close NW of the point.

The coast between Tanjung Siantu and Tanjung Kelayang is fronted by reefs and above water rocks, and should be given a berth of 4 miles. The outermost reef has a depth of 4.9m and lies 3.5 miles offshore, 4 miles WNW of Tanjung Siantu. A 2.7m patch lies 1.3 miles NNE of Tanjung Siantu.

Kampung Sijuk, the capital of the district, is 3 miles SSW of Tanjong Siantu; a dangerous wreck lies 3 miles NNE of the point.

Tanjung Krupit (2°35'S., 108°01'E.) lies 12 miles ESE of Tanjung Siantu; a low ridge of hills runs close to the coast. A number of rocks, islets, and reefs lie off this section of coast, and form a chain separated from the coast by a narrow channel. Pulau Keran is the farthest E of the islet in this chain.

Pulau Bulu, a vegetation-covered reef-fringed islet, rises to a height of 4.9m, 3 miles E of Tanjung Siantu.

Pulau Mulut is a small rocky islet that rises to a height of 67m, 4 miles E of Pulau Bulu; it appears as a rounded hillock when seen from seaward. A rocky formation, which uncovers, lies about 4.5 miles N of Pulau Mulut.

A ridge of rocks and reefs, with some awash, covers a distance of 3.5 miles in an E and W direction, 1.5 miles N of Pulau Mulut. There is a deep channel between them and Pulau Mulut. A 4m patch lies 4 miles NE of Pulau Mulut.

2.66 **Tanjung Boeding** (Tanjung Batu) (2°36'S., 108°03'E.), the E entrance point of Teluk Buding, is 2 miles ESE of Tanjung Krupit.

Teluk Buding indents the coast to a distance of 3 miles; it is important locally, as Buding, the district capital, is on the Sungai Buding, about 4 miles from its mouth.

Numerous reefs lie off the entrance to a bay, which can only be entered by small vessels with local knowledge. The outermost reef, with a depth of 2.7m, is nearly 4 miles N of Tanjung Boeding. A narrow passage, marked by privately maintained beacons, leads along the E side of Pulau Keran and Tanjung Krupit.

There is good anchorage for vessels with local knowledge in the entrance to Teluk Buding, with Tanjung Krupit in line with the E extremity of Pulau Keran, bearing 330°, in a depth of 6m, mud.

The coast between Tanjung Boeding and Tanjung Burungmandi, 17 miles SE, is fringed by a coral reef, which extends about 1 mile offshore NE of Tanjung Boeding. There are many dangers outside the reef.

Teluk Pering (2°40'S., 108°09'E.), a small bay midway between these two points, is entered between Tanjung Sengaran on the N, and Tanjung Kluang; the greater part of the bay dries.

There are several useful peaks for fixing a vessel's position along this coast. Gunung Mang (Kelapa Kampit), 12 miles WNW of Tanjung Burungmandi, is a prominent conical hill, 216m high.

Gunung Sekaju, 170m high, 16 miles WNW of Gunung Mang, has a crater-shaped summit and a prominent patch of red rock on the E slope; its W slope is rugged.

Off-lying dangers.—Pulau Kanis (2°38'S., 108°12'E.), 3.8 miles NE of Tanjung Kluang, is a low islet from which a reef extends 1 mile ESE and WNW. A light, shown from a white metal tower, 10m high, is on the islet.

2.67 **Karang Tri** (2°43'S., 108°16'E.) is a small islet, practically awash, lying 7 miles SSE of Pulau Kanis.

A number of reef patches lie between Pulau Kanis and Karang Tri. The outermost, in a position 4 miles ESE of Pulau Kanis, has a depth of 3.6m.

Karang Busungserlang (Pulau Busung Serlang) (2°35'S., 108°19'E.), 7 miles ENE of Pulau Kanis, has a yellowish-brown sand bank above water on its NW part, which is usually visible from a distance of 4 miles.

A reef with a depth of 1.8m, lies 4 miles SE of Karang Busungserlang. Two other reefs are reported to lie between them.

A dangerous reef, with a depth of 0.9m, lies 8 miles NNE of Pulau Kanis. A rock, with a depth of 3.6m, lies 9 miles NNW of Pulau Kanis. Patches, with depths of 4.5m and 0.9m lie, respectively, 4 miles WNW and 7.5 miles NW of Pulau Kanis.

Belitung—East Coast

2.68 The E side of Pulau Belitung is fronted by numerous islands, islets, and reefs which extend up to 45 miles NE and 65 miles SE from this coast. Vessels should not leave the recommended routes through this area except in case of emergency. Local knowledge is essential for safe navigation in these channels. Pilots for these waters can be obtained at Tangpandan.

Tanjung Samak (2°53'S., 108°17'E.) is 8 miles S of Tanjung

Burungmandi. A small hill,72m high, is near the point and has a building with a small conical tower on it. The lights of the settlement on the hill can be seen from a distance of 20 miles. A white power station on the N side of the hill is prominent by day.

From E, it is recommended not to approach closer than 10 miles to Tanjung Samak and not to navigate in depths of less than 18m.

The low coast trends irregularly SSW from Tanjung Samak to Tanjung Batuhitam (Tanjung Batu Hitam), a distance of about 25 miles.

There are two landmarks along this coast. Gunung Slumar, 166m high, lies 7.5 miles WSW of Tanjung Samak; Gunung Bolong (Boleng), 341m high, lies 9 miles NNW of Gunung Slumar; both appear as isolated cones.

The Sungai Linggang and the Sungai Manggar flow into the sea 9.8 miles SSW and 2.5 miles NNE, respectively, from Tanjung Samak. Muara Putus, the mouth of the Sungai Londji, lies 1.5 miles N of the mouth of the Sungai Manggar.

There is a roadstead, 1 mile E of Muara Putus, where anchorage can be taken, in a depth of 6m. Local knowledge is necessary, both in approaching the roadstead, and in taking anchorage.

Another anchorage is about 5 miles NE of Muara Putas, in depths of 18 to 38m, stones, between Busung Madau and a 3m patch, about 2.5 miles SW.

Directions.—Directions which follow are for a coastwise passage from Linggang Roadstead N to Manggar Roadstead, and are not to be attempted without local knowledge.

Follow directions given for Linggang Roadstead from S, until in a position 2 miles E of Pulau Melidang. From this position steer 030° until the N extremity of Pulau Sukun is in line with the N extremity of **Karang Busungjong** (2°59'S., 108°20'E.), bearing 238°. This range, in line astern, leads in a least depth of 9m between two reefs, and close NW of a 4.9m patch lying 4.5 miles ENE of Karang Busungjong.

Attention must be paid to the tidal currents which set N and S across these reefs. When the W edge of Pulau Bukulimau bears 342°, steer 322° to pass W of the sandy cay which lies 2 miles SSW of that island.

When the S edge of Pulau Bukulimau bears 065°, steer for Busung Madau. The pilot should be embarked about 2 miles SSW of that danger.

When coming from N, steer to pass W of the lighted buoy moored 2.5 miles NW of Gosong Madau (Busung Madau), then E of the black buoy, where the pilot will be embarked. This route has not been swept and the possibility of uncharted dangers exist.

The roadstead is approached through a channel, with a least depth of 4.6m, which runs parallel with the coast. It is entered from the N, passing close E of the buoy moored on the 3m patch, described above. The channel is buoyed, but dredging is continuous and positions of the buoys may change.

An oil pier, with a depth of 8.8m at its head, extends from the coast about 0.8 mile NE of Tanjung Samak.

Mooring buoys are situated off the head of the pier. Vessels cannot lie alongside the pier during the height of the Southeast Monsoon. Dredges operate close to the buoyed channel leading to the pier. This channel has a least depth of 4.3m.

2.69 **Manggar** (2°53'S., 108°18'E.) stands on the S bank of the Sungai Manggar, 2.5 miles within the mouth of the river. Manggar is the capital of the district of Linggang.

The mouth of the river has been dredged to a depth of 3m. Coastal vessels can proceed up the river to a berth at a quay, 45m in length, and cargo praus may proceed as far as Manggar.

The ebb current may attain a rate of 3 knots. From May to September inclusive, the N current is stronger and of longer duration than the S current October to April the flow is almost always S. There may be a strong current by the oil pier.

Pilotage.—Pilotage is available; the pilot meets vessels in the vicinity of the buoy SW of Gosong Madau. Requests for the pilot, stating the probable time of arrival at the buoy, should be made to "Constanno," Tanjungpandan.

Between Tanjung Samak and Tanjung Medong, 6 miles SSW, the coast is fronted by numerous coral reefs and sand ridges, extending SE from Tanjung Samak. The reefs and sand ridges extend to within 3 miles of Protet Reefs.

Caution.—Vessels passing along the coast must keep NE of Karang Karang Protet (Protet Reefs) and give Tanjung Samak a berth of 12 miles when SE of it and 10 miles elsewhere, as numerous dangers lie close inshore.

Kepulauan Momparang

2.70 Kepulauan Momparang lies NE of the NE extremity of Pulau Belitung. It consists of a number of small islands, sand banks, and coral reefs which extend over an area 30 miles long in an E and W direction and are 10 miles wide. The islands are uninhabited, but are visited by fishermen from Pulau Belitung.

Pulau Mempirak (2°43'S., 108°26'E.), the S island of the group, lies 10 miles ENE of Tanjung Burungmandi. The island is thickly wooded and has some very tall trees which show plainly above the others. A reef, with a depth of 3.7m, lies 2.5 miles SW of Pulau Mempirak.

Some reefs, which dry and are generally marked by surf, lie between it and Pulau Mempirak. There is a reef, with a least depth of 0.9m, 3 miles ESE of Pulau Mempirak.

Except for these reefs, the channel between Pulau Mempirak and Pulau Siadung, 5 miles SSW, is clear and deep, and can be used by vessels bound for Teluk Buding, from SW.

Pulau Bakau (2°41'S., 108°25'E.), a low flat island 1.3 miles NW of Pulau Mempirak, has some below-water rocks and a drying sand bank within 1 mile NE and within 0.5 mile of its SW side. A reef extends 1 mile from the SE side of the island.

Pulau Sadung, 4 miles E of Pulau Bakau, is low and covered with vegetation.

Pulau Maranai (2°38'S., 108°30'E.) is a thickly wooded island, visible 14 miles in clear weather, which can be readily distinguished from the other islands by its peculiar round shape. The area around and between Pulau Sadung and Pulau Maranai is foul and should be avoided.

A sandy cay with a few trees on it is 1 mile E of Pulau Maranai.

2.71 **Karang Hydrograaf** (Hydrograaf Reef) (2°35'S., 108°25'E.), 4.5 miles NW of Pulau Maranai, has a depth of 3.7m, and is not marked.

Pulau Telagapahat (2°34'S., 108°34'E.), 5 miles NE of Pulau Maranai, is low except for two rocky hillocks near its S end. There are two small islets 1.5 miles N of the N extremity of Pulau Telagapahat. All three islets are thickly wooded and are visible 12 miles.

A reef, with a depth of 0.9m, lies 2 miles W of Pulau Telagapahat. Foul ground, with some above-water reefs and sand cays, lies 1.25 to 3 miles E and 1.25 to 5 miles SE of the island.

Pulau Nangka (2°30'S., 108°32'E.), 4 miles N of Pulau Telagapahat, is the only high island of Kepulauan Momparang. The island rises in two peaks; the S peak, the highest, rises to a height of 180m, and during clear weather may be seen up to 32 miles.

From the E or W, these two summits appear as two detached islets. There is a small islet on a drying reef 0.5 mile W of the S point of Pulau Nangka. A 1.2m patch lies 1.5 miles to the SW.

Karang Corcyra (Corcyra Reef), with a least depth of 2.1m, lies 3.5 miles W of the S extremity of Pulau Nangka. The reef is not marked by surf or discoloration.

Karang Telegapahat (Warren Reef) (2°33'S., 108°39'E.), lying 5.5 miles ENE of Pulau Telegapahat, is a low sand bank 2m high. A small drying reef lies 1 mile S. Shallow areas, with depths of 6.7 and 2.1m, lie 2 miles WSW and 1 mile N, respectively, of Karang Telegapahat.

Shoals, with depths of 1.2 to 3m, lie up to 3 miles W of Karang Telegapahat.

Pulau Karangraja (2°35'S., 108°44'E.), a low flat island, lies 4.5 miles SE of Karang Telegapahat. Pulau Belian, 2 miles ENE of Pulau Karangraja, 51m high and covered with tall trees, is visible up to 16 miles away.

Reefs extend up to 3 miles NNW from Pulau Belian, terminating in Pulau Gubbins (Reef), a 2m high sand bank.

Other dangerous below-water rocks and reefs lie 3 miles N, up to 0.8 mile N, 3 miles WNW, and 2.5 miles NE of Pulau Gubbins.

Pulau Pesemut (2°30'S., 108°51'E.), the E island of Kepulauan Momparang, lying 6 miles NE of Pulau Belian, is a sand cay with trees, 39m high. A light is shown from Pulau Pesemut; a radiobeacon is located on the island.

Pulau Tuan and Pulau Yustina (Justina Reef), awash, lie 1.8 miles SSW and 1.5 miles ESE, respectively, of Pulau Pesemet.

Karang Wittingham (Whittingham Reef), with a depth of 3.7m, lies 1.5 miles N of Pulau Yustina (Justina Reef).

Karang Tenang (Catherine Reef), with a depth of 1.5m, lies 3 miles E of Pulau Yustina. These two reefs are not marked by surf or discoloration. A 1.5m patch lies 0.8 mile SW of Pulau Yustina.

2.72 Karang Condor (Condor Reef) (2°25'S., 108°41'E.), the N danger of Kepulauan Momparang, lies 10.5 miles WNW of Pulau Pesemut. It consists of two small patches of coral with a depth of 4.5m. The reef is not marked by breakers or discoloration, but there are frequent tide rips.

The area E of Pulau Telegapahat to Pulau Pesemut is encumbered with reefs, and it is possible that other dangers, besides those shown on the chart, may exist.

The passages between the islands and reefs of Kepulauan Momparang are very dangerous to large vessels. Small vessels can, in the case of an emergency, make use of a few of them. The best channel is between Pulau Maranai and Pulau Telegapahat.

From S, steer to pass midway between these two islands on course 302°, taking care to avoid a 7.6m patch, 3.5 miles N of Pulau Maranai. When Pulau Maranai bears 180° change course slightly N to pass between a 4.9m patch, lying 2.3 miles ENE of Karang Hydrograaf (Hydrograaf Reef), and Karang Corcyra (Corcyra Reef).

Another channel leads from E toward the N coast of Pulau Belitung. To use this channel, keep the S peak of Pulau Nangka bearing between 248° and 258°. When past Karang Condor (Condor Reefs) and approaching Pulau Nangka, steer to pass not less than 1.5 miles N of the latter.

Off-lying Islands and Reefs

2.73 Gosong Madau (Busung Madau) (2°46'S., 108°22'E.), about 6 miles E of Tanjung Burungmandi, a sand cay covered with shrubs and some palms, is visible 10 miles.

A reef, with a depth of 1.2m, lies 1.5 miles NW of Gosong Madau. A lighted buoy is moored about 0.8 miles NNW of the reef.

Pulau Bukulimau (2°49'S., 108°24'E.), 9 miles NE of Tanjung Samak, is a low tree-covered islet visible 15 miles. Foul ground extends 1.3 miles SE from the islet. A sand cay, covered with shrubs, lies 2 miles SSW of Pulau Bukulimau.

Pulau Siadung, 1 mile NNE of Pulau Bukulimau, is low and thickly wooded. A drying sand bank lies 0.5 mile E.

The **Sungai Linggang** (3°02'S., 108°12'E.), the most important river on the E side of Pulau Belitung, flows into the sea 9.5 miles S of Tanjung Samak. The river has scoured a channel through the coastal bank of sand and coral, which extends 0.8 mile E from the S entrance point of the river.

The channel and the river as far up as Gantung, 6 miles above its mouth, are marked by beacons which are privately maintained. There is a least depth of 1.2m on the bar, but the river depths increase to 1.8m and more.

Owing to various sand ridges, it is only navigable by small craft with a draft of 1.2m, after half flood tide.

Tanjung Tepox (Tanjung Tapok) (3°08'S., 108°12'E.) is 8 miles S of the mouth of the Sungai Linggang. Tanjung Batubujong, the S entrance point of a shallow bay, is 7.5 miles SW of Tanjung Tepox. Tanjung Batuhitam (Tanjung Batu Hitam) lies 2 miles further S.

Pulau Selandu (3°04'S., 108°15'E.) lies 1.3 miles offshore, 4.8 miles NE of Tanjung Tepox (Tanjung Tapok). The island is hilly and is almost connected to the main coastal reef, which dries. Pulau Melidang lies 1.8 miles E of Pulau Selandu.

From the E the islet appears as a rugged ridge of hills and is visible 20 miles. There are two small islets in the channel between Pulau Selandu and Pulau Melidang.

Pulau Sukun is a small islet 2 miles NE of Pulau Selandu. It is fringed by a drying reef which extends 0.8 mile SE. A drying reef is 2.5 miles SE of Pulau Sukun; an isolated coral head, awash, lies 0.5 mile NNE of the drying reef.

2.74 Pulau Sekapar (3°09'S., 108°14'E.) lies 2.3 miles E of Tanjung Tepox. Several reefs awash, or with depths of less than 0.7m, lie about 2 miles E and 1 mile S of Pulau Sekapar.

A chain of islands extend 5 miles S from Tanjung Tepox, which is almost joined to the point by a drying bank. Pulau Te-

pi is the S island of this group.

Pulau Serukat-besar (3°11'S., 108°07'E.) lies 5 miles NE of Tanjung Batuhitam, and 0.3 mile offshore. In the Northwest Monsoon there is good anchorage 1.5 miles S of this islet, in a depth of 9m, mud and sand. This position can easily be approached from S.

Karang Karang Protet (Protet Reefs) (3°03'S., 108°29'E.) are two steep-to reefs lying 2.5 miles apart in an ESE and WNW direction.

Karang Timur (East Protet Reef) lies 17 miles SE of Tanjung Samak and has a depth of 1.2m. It is steep-to and generally breaks. Karang Barat (West Protet Reef) has a depth of 2.7m, coral.

Pulau Rotan (3°13'S., 108°16'E.) lies 4.5 miles E of Pulau Tepi. The channel between them is divided into two parts by a shoal, which has several above and below-water rocks. The channel W of the shoal has been swept and is the recommended inshore route.

A reef, with a depth of 0.9m, lies 2 miles SSW of Pulau Rotan and a rock, with a depth of 1.5m, lies 3.5 miles SSE of the island. Reefs and submerged rocks extend 6 miles NE and 3 miles SE from the island.

2.75 The **Schaarvogel Islands** (3°17'S., 108°25'E.) occupy an area approximately 8 miles in diameter, about 20 miles E of Tanjung Batuhitam (Tanjung Batu Hitam). The group of islands are all low and thickly wooded and there are reefs and sand banks around them. Nearly all the reefs are steep-to and soundings give no warning.

Pulau Ayermasin (3°15'S., 108°23'E.), the NW islet of the group, lies 6 miles ESE of Pulau Rotan. A prominent tree, standing near the center, is visible 18 miles.

Although it has been swept over a width of 1.3 miles, the channel between Pulau Rotan and Pulau Ayermasin is not recommended because of reefs in the S entrance. Pulau Marai lies 2 miles SSE of Pulau Ayermasin. The passage between these islands is foul.

Pulau Penerus lies 3 miles SSE of Pulau Ayermasin, in the middle of the group. There is a narrow, deep channel on the W side of Pulau Penerus; the channel on the E side is wider, but coral patches and detached rocks, marked by surf or discoloration, lie on either side of the channel.

Pulau Pengaplt, 2 miles SE of Pulau Penerus, consists of two islets separated by a narrow, drying channel.

Pulau Beluput (3°20'S., 108°27'E.), the highest of three islets which lie close together on the E side of the group, can be readily identified when seen from the E as a hump.

Several dangers lie S of Pulau Pengapit, the outermost being a rock, awash, 4 miles S of that island.

It should be noted in connection with the channels through the island group, that the tidal currents are strong and there is little shelter in either monsoon.

Karang Tiung (Osterly Reefs) (3°20'S., 108°37'E.) lie about 11 miles E of Pulau Beleput. Karang Utara is farthest N of the group; the reef nearly dries and is often marked by breakers and tide rips.

A 6.7m patch lies 2.5 miles W of Karang Utara, and 2 miles farther W is a reef with a depth of 1.2m.

The latter reef can usually be detected by tide rips. With a moderate breeze, no surf or discoloration has been observed. Karang Timur, 3 miles S of Karang Utara, has some drying reefs. Karang (Selatan) Salatan, 1.5 miles SW of Karang Timur, the farthest S of the group, is a coral reef with a few patches of sand, 1m high; it is marked by a light.

Tidal currents between the Karang Tiung (Osterly Reefs) are diurnal and run NW and from SSE to ESE; a very slight current has been observed setting NW in November, and in December a constant current setting SSE, only occasionally diminishing in force.

2.76 **Karang Bower** (Bower Reef) (3°28'S., 108°37'E.), 6 miles S of Karang Selatan, is a small steep-to coral reef with a depth of 2.1m, lying in the middle of a narrow sand ridge 13 miles long in a N and S direction.

This reef is never marked by discoloration, but there are sometimes eddies. Less water than charted has been reported (1997) SSE of Karang Bower.

Within the triangular area bound by lines joining Pulau Rotan, Karang Karang Protet, and Karang Bower there are numerous dangers in addition to those described. On the various ridges of sand are scattered rocks and small patches of coral, some of them are above water.

Reliable landmarks can only be seen in clear weather, and even then are difficult to identify. The tidal currents are strong, and the water is usually so turbid that the bottom cannot be seen even at a depth of 4m. This area should be avoided except in case of necessity.

Directions.—It is not advisable to approach Linggang Roadstead from E as there are reefs and other dangers difficult to detect.

When approaching from S, use the swept channel between Pulau Tepi and the group of islets and reefs 1 mile E. Steer for the E extremity of Pulau Tepi, bearing 010°, and when 1 mile S of it, steer NE to pass 2 miles SE of Pulau Sekapar and 0.5 mile SE of the reef, awash, lying 2 miles E of that island. Maintain this NE course until 3.3 miles SE of Pulau Melidang, then steer for a position 0.8 mile NE of Pulau Melidang.

Pass midway between the island and the drying reef, 1.5 miles NE, then a WNW course can be steered for the anchorage, 2 miles E of the mouth of the Sungai Linggang.

Anchorage can be taken N of Pulau Selandu, in depths of 4.3 to 6.1m.

Belitung—South Coast

2.77 From **Tanjung Batuhitam (Tanjung Batu Hitam)** (3°15'S., 108°04'E.), the E point on the S coast of Belitung, the coast trends 6 miles SW to Tanjung (Klumpang) Kelumpang, a rocky point. The land between the two points is low and densely wooded.

Mengarun (3°04'S., 107°59'E.), 12.5 miles N of Tanjung Kelumpang, consists of three ridges close together which rise to a height of 237m. Tiung is an isolated conical hill, 192m high, 4.5 miles ESE of Mengarun.

Some islets and rocks lie on the coastal reef, which dries and extends 0.5 mile offshore between Batuhitam and Tanjung Kelumpang.

Some small islets or rocks lie close off Tanjung Batuhitam.

A reef, with a depth of 0.5m, is 0.5 mile off this point. There are some above-water rocks, 1 mile SE of Tanjung Kelumpang,

and a reef with a depth of 1.2m, 1.5 miles SSE of the same point. There is a 3.7m patch, 2.5 miles WSW of Tanjung Kelumpang.

Pulau Kebatu (3°48'S., 108°04'E.), 31 miles S of Tanjung Kelumpang, is a bare conical shaped islet, 105m high. The islet is steep-to except at its NW side where there is a sandy beach, and a reef with some above-water rocks, which extends 0.2 mile offshore. It is considered a good mark and can be recognized up to 22 miles.

White Rocks (Pulau Putih) is a grayish-white rock formation, 17.4m high, visible up to 12 miles, which lies 1 mile SW of Pulau Kebatu. A reef, with a depth of 0.3m, lies 0.5 mile NE of White Rocks. At times, the reef is marked by brown discoloration. Zephyr Reef (Karang Bali) (Karang Beli) lies about 1 mile W of Pulau Kebatu. It is marked by a light and by breakers and has some drying rocks. A shoal, with a depth of 22m, lies 17 miles SW of Pulau Kebatu. A dangerous wreck, with a depth of 29m and best seen on the chart, lies 42 miles SE of Pulau Kebatu.

Grace Reefs (3°43'S., 108°06'E.) are two reefs which lie NE of Pulau Kebatu. Karang Mandi, the SW reef, which is awash, lies 4 miles NE of Pulau Kebatu. The N reef, Karang Kawat, which has a few rocks which dry, lies 2 miles farther NE. Both of these reefs are steep-to and are usually marked by surf or tide rips at high water.

Pulau Ketapang (3°25'S., 107°57'E.), a low islet lying about 8.5 miles S of Tanjung Kelumpang, is swampy and wooded. There are two above water rocks, on the N side of the reef, which surrounds the islet.

2.78 **Teluk Balok** (3°14'S., 107°53'E.) is entered between Tanjung Kelumpang and Pulau (Keramiah) Kramiah, a small islet surrounded by reefs, 14 miles W.

The bay is important for local vessels. Dendang, the capital of the district, is on the E side of the head of the bay. The bay can only be entered by vessels with light draft and local knowledge. It is encumbered with reefs which dry; some beacons are privately maintained.

Pulau Umpang (3°17'S., 107°52'E.), a small islet covered with shrubs, lies in the middle of the entrance to the bay, 7.5 miles W of Tanjung Kelumpang. There are several reefs within 2.5 miles NE and 2 miles SW of the islet. Swept channels, which pass E and W of these reefs, join N of Pulau Umpang to form a common channel leading N to the anchorage that lies E of Pulau Kampak.

Pulau Berumput is a small islet in the E part of the bay, 6.5 miles NNW of Tanjung Kelumpang. Tanjung Rising is a point on the E shore, 5 miles NNW of Pulau Berumput. Pudak, a hill on the E shore, about 9 miles N of Tanjung Kelumpang, forms a useful range with Pulau Berumput.

On the W shore are Tanjung Rusa, 6.8 miles NNE of Pulau Keramiah, and Palau Kampak, 3.5 miles farther NNE. A beacon stands on a reef patch 0.5 mile E of Palau Kampak.

Anchorage can be taken 1.3 miles SW of Dendang, between Tanjung Rising and Pulau Kampak, in a depth of 4.6m. With strong S winds, the water at the head of the bay sometimes rises 0.3m above the usual level. The bay may be entered by passing on either side of Pulau Umpang. It is recommended that only those vessels with local knowledge enter the bay.

2.79 From **Tanjung Rusa** (3°10'S., 107°50'E.), the coast trends 14 miles WSW to Tanjung Genting, the SW extremity of Pulau Belitung; the mountains lie close to the coast in this area.

Tanjung Batu Penju is a point 11.5 miles WSW of Tanjung Rusa. Tanjung Batu Tungku is 1.3 miles farther WSW; both points are rocky. The coast from Tanjung Rusa to Tanjung Batu Tungku is fringed by a narrow drying reef.

Pulau Kramiah (Pulau Keramiah) (3°15'S., 107°45'E.), the W entrance point of Teluk Balok, is the farthest E of two small islets surrounded by reefs. Patches of drying reef extend 1.5 miles W and 1 mile ESE of Pulau Kramiah.

Pulau Blatok, a small islet 4 miles E of Tanjung Genting and 1 mile offshore, is on the W part of a large drying reef. A drying reef lies 0.5 mile E and a reef, awash, lies 1.8 miles S of Pulau Belatuk.

Pulau Ketupai is 2 miles SW of Pulau Kramiah and is surrounded by reefs. There is foul ground N of a line joining Pulau Kramiah and Pulau Blatok.

Pulau-Pulau Masar are four thickly-wooded islets about 8 miles SE of Tanjung Genting; the islets are visible 12 miles.

Pulau Kennedy (3°21'S., 107°42'E.) is a small islet with a lighted beacon. There is a small islet located 1 mile NW of the above islet. Pulau Utan, 1.5 miles ESE of Pulau Kennedy, is surrounded by a reef, which has a small islet on the W extremity that is connected to Pulau Utan by a drying part of the reef. Pulau Kennedy is also surrounded by a reef which extends 0.5 mile from its SE side. There is a least depth of 10m between the islands and in their immediate vicinity.

Selat Karimata

2.80 Selat Karimata lies between the coast of Borneo on the E and Pulau Belitung on the W side. This strait is the customary route taken by vessels bound to or from Malaysia, or the S part of the China Sea from the E part of the Java Sea.

The main route lies E of a line joining **Ontario Reef** (1°59'S., 108°39'E.), Karang Tenang (Catherine Reef), a position 20 miles E of Terumbu Manggar (Cirencester Shoal), and **Gosong Mampango** (Discovery East Bank) (3°35'S., 109°10'E.).

This line must be considered as the W limit for safe navigation for large vessels passing through the strait, as uncharted dangers may exist W of the line.

Winds—Weather.—Local weather conditions in Selat Karimata vary with the monsoon. Light variable winds prevail in April and November. The Southeast Monsoon prevails from May to October, and the Northwest Monsoons from December to March. WNW winds predominate in December, veering to NW in January with increasing force and constancy and persisting to March. Squalls are most frequent in November and December. A moderate swell develops during the Northwest Monsoon in January and February.

Tides—Currents.—The tides in Selat Karimata are principally of monsoonal origin; the tidal currents are diurnal, but their influence is felt only adjacent to the coasts of Borneo and Pulau Belitung, so that they are of little importance to vessels passing through the strait. In the open part of the strait the mean rate of the current is 0.5 knot in the Southeast Monsoon, and 1 knot in the Northwest Monsoon. These rates are subject to considerable variation which cannot be predicted; a maximum rate of 2 knots has

been measured during the Southeast Monsoon and 1.5 knots during the Northwest Monsoon. The direction of the current depends on the predominating wind therefore the direction of the current is practically that of the direction of the channel itself. In the narrower passages, it is probable that the currents may exceed a rate of 3 knots.

Only during the change of seasons should extra attention be paid to the tidal currents, and even then these currents are not strong in the open parts of the strait. Their directions at such times have been observed as indicated below:

1. West of Karang Cina (China Reef)—NE and SW.
2. West of Pulau Serutu—E and W.
3. Between Kepulauan Karimata and Kepulauan Momparang—NW and SE.
4. Between Tanjung Sambar and Gosong Mampango—NW to WNW and SE.

A survey party, when lying at anchor near Kepulauan Karimata, frequently observed a sharply defined line of current rips, extending to the limit of visibility. This line shifted slowly N or S across the direction of the tidal current.

With rising water there appeared to be two tidal currents here, one setting N and the other S, which curved W after meeting; the color of the water was different on either side of the rips.

It is presumed that this boundary disappears when the monsoon current becomes strong.

Caution.—On several occasions vessels in Selat Karimata have observed driftwood and debris, held together by floating masses of growth, so large and dense as to be mistaken from the distance for rocks or sand banks. Some of these have been reported to be visible for 5 to 8 miles.

2.81 Karang Florence Adelaide (2°04'S., 108°04'E.), 31 miles NNE of the N extremity of Pulau Belitung, is a steep-to coral reef with a depth of 3m, that is not marked by breakers or discoloration. It lies in a dangerous position out of sight of land but marked by a light; soundings give no warning.

An 18.3m patch lies 28 miles WSW of Karang Florence Adelaide, and a 9.4m patch was reported to lie 12.5 miles NW of the same reef. An 8m shoal lies 10.5 miles E of Karang Florence Adelaide. A 9.5m shoal is reported (2005) to lie 5 miles NE of Karang Florence Adelaide; an 8.2m shoal is reported (1989) 11 miles NE of Karang Florence Adelaide.

A light was reported to be shown from an oil drilling structure about 21 miles W of Karang Florence Adelaide. The existence of this rig is now doubtful.

Karang Ontario (1°59'S., 108°39'E.), 35 miles E of Karang Florence Adelaide, is a coral reef with small patches of yellowish-brown sand that dries. When covered it shows as a light green patch, but is seen only at a short distance. The reef is marked by a light.

Two groups of off-lying reefs lying 70 and 125 miles WNW of Karang Ontario. These are located in inadequately surveyed areas.

The line joining Karang Florence Adelaide and Ontario Reef must be considered the S limit of safe navigation for large vessels in the N approach to Karimata Strait.

Karang Flying Fish (Flying Fish Reef) (2°13'S., 108°37'E.), 14 miles S of Ontario Reef, consists of a number of coral patches lying close together with depths of 2m or less; the reefs are never marked by discoloration.

A 7.6m patch lies about 3.5 miles NE of Karang Flying Fish. Two patches, one 18.2m and the other 16.9m, lie 5 miles and 6 miles E of Karang Flying Fish, respectively.

Terumbu Manggar (Cirencester Shoal) (2°55'S., 108°56'E.), 24 miles S of Karang Tenang (Catherine Reef), is a small reef with a least depth of 3m. It is seldom marked by surf or discoloration, but there are frequent tide rips. A small sand bank, with a depth of 8.5m, lies 1.3 miles SSW of Terumbu Manggar.

Broken water, about 183m in diameter, indicating the possibility of a shoal patch, was reported to lie 5.5 miles ESE of Terumbu Manggar.

Karang Batuan (Cirencester Bank) (3°16'S., 108°58'E.), 22 miles S of Terumbu Manggar (Cirencester Shoal), is a coral reef which has a large black boulder, and a small brownish-yellow coral patch on it that dries. The boulder only covers at high water springs.

Gosong Kalumpang (Lavender Bank), 8.5 miles S of Karang Batuan, is a large reef with a number of black boulders which uncover at half tide. It is plainly marked by discoloration.

Gosong Mampango (Discovery East Bank) (3°35'S., 109°10'E.), 15 miles SE of Gosong Kalumpang, is a steep-to coral reef with a patch of sand, 2m high, in the middle. A light consisting of an iron framework tower, standing on piles 20m high, is situated on the bank.

Caution.—It was reported (1992) that the light and its associated reefs lie 0.9 mile E of their charted positions.

2.82 Karang Sambat (Discovery Reef) (3°36'S., 108°50'E.), 21 miles W of Gosong Mampango, is a steep-to coral reef with a few above water rocks; at low water it dries over a length of 0.3 mile. It usually breaks heavily and the surf can be seen for a considerable distance.

Karang Discovery Barat (Gosong Abadi) (3°39'S., 108°45'E.), a narrow reef with a few above water rocks, is marked by a light. The reef is 5.5 miles SW of Karang Sambat and about 47 miles SE of Tanjung Batuhitam, the SE extremity of Pulau Belitung. A narrow ridge on the formation, 0.5 mile in length, dries. This reef is always marked by discoloration and it always breaks.

Most of the reefs and dangers in the N approach to Selat Karimata lie within an area about 5 miles wide, which extends for a distance of about 14 miles S from a position 44 miles WSW of Tanjung Padangtikar on the W coast of Borneo. Most of these dangers are not marked by surf or discoloration and can be best seen on the chart.

Karang Greig Utara (North Greig Shoal) (0°52'S., 108°33'E.) is the farthest N of these dangers. The shoal has a depth of 9m.

Karang Greig Tengah (Middle Greig Shoal), with a depth of 5m, and Karang Greig Selatan (South Greig Shoal), with a depth of 9m, lie 1.8 mile and 3 miles, respectively, SSW of Karang Greig Utara.

Karang Cina (China Reef), with a depth of 1m, lies 2.3 miles S of Karang Grieg Selatan. Karang Twilight (Twilight Reef), with a depth of 2.5m and Karang Erikson (Erikson Rock), a coral reef with a depth of 7m, lie 6.5 miles SE and 6 miles S, respectively, of Karang Cina.

Karang Gwalia (1°06'S., 108°34'E.), a reef with a depth of

1m, occasionally breaking, lies 2.5 miles SSE of Karang Erikson. It is the farthest S of this group of dangers.

Selat Karimata—East Side

2.83 Kepulauan Karimata lies on the E side of the N part of the main route through Selat Karimata, and consists of the large islands, Pulau Karimata and Pulau Serutu, as well as smaller islets and reefs. Pulau Karimata, Pulau Serutu, and their off-lying islets are designated as a conservation area.

Pulau Karimata (1°37'S., 108°53'E.), the largest island of the group, is 32 miles SW of Tanjung Pasir, on the W coast of Borneo. Gunung Cabang (Gunung Tjabang), 1,030m high, is a rugged peak, frequently enveloped in clouds, in the center of the island. In clear weather it can be distinguished from a distance of 48 miles.

There is a village on the SE coast near the mouth of a stream. The SE coast between Tanjung Serunai, the E extremity of the island, and Tanjung Dungu, the S extremity of the island, is bordered by shallow water and reefs, which extend 2 to 3 miles offshore.

Foul ground extends SSE from Tanjung Dungu for 6 miles to a depth of 11.9m. Two drying reefs lie 4.8 and 5.5 miles S of Tanjung Serunai. Foul ground extends for 6 miles SE of Tanjung Serunai.

Pulau Besi lies near its outer end. Foul ground extends along the coast for 3 miles NW of Tanjung Serunai, with some drying reefs up to 1.3 miles offshore.

During the Northwest Monsoon, there is good anchorage, in depths of 11 to 15m, 4 miles SE of Tanjung Dungu. During the Southeast Monsoon, there is good anchorage about 2.3 miles W of Tanjung Senna (Tanjung Sena), the N extremity of Pulau Karimata, in a depth of 24m, mud.

In the area W of Tanjung Sena, vessels should not proceed farther S than a bearing of less than 079° on that point, because of the reefs in the bay SW of Tanjung Sena.

Several islets lie off the W side of Pulau Karimata. The highest of these, Pulau Begunung, is 0.5 mile off the W extremity of Pulau Karimata. It is easily distinguished by its sharp conical summit, which rises to a height of 394m; the islet is visible from a distance of 32 miles.

Pulau Surungading, 240m high, and Genting, 57m high, are islets which lie 1.3 miles and 0.5 mile W, respectively, of Pulau Begunung.

Pulau Penangis, 20m high and Pulau Bulu, 120m high, lie 1.5 miles NW and 1 mile N, respectively, of Pulau Beguning. Pulau Kepajang is 1.3 miles E of Pulau Bulu. Pulau Lintang lies 0.4 mile S of Pulau Bulu, and Pulau Kra lies 1 mile E of Pulau Kepajang and close off the N coast of Pulau Karimata.

Vessels should not attempt to pass between any of these islets, as the adjacent reefs are steep-to and there is usually a strong current.

Kepulauan Sarangburung, formerly known as Vogelnest Eilanden, lies 21 miles ESE of Pulau Karimata and consists of five steep islets surrounded by coral reefs.

Caution.—A stranded wreck lies at the SW approach to Selat Karimata at 1°48.03'S 108°50.66'E.

Pulau Krawang (1°44'S., 109°20'E.), 27m high, the E islet of the group, lies 4.5 miles SSW of Pulau Papan.

Pulau Pelubang, 45m high, Pulau Uma, 48m high, Pulau Ayer, 37m high, and Pulau Sumur, 26m high, lie 2.5 miles NW, 2.3 miles WNW, 2.5 miles WNW, and 2 miles WSW, respectively, of Pulau Krawang.

A rock, with a depth of 0.6m, lies 5.3 miles WNW of Pulau Krawang. An exposed wreck lies 1 miles W of Pulau Krawang.

Tokongperangin (Tokong Perangin) (1°47'S., 109°15'E.) is a steep bare rock, 16m high, of dark color, that appears as a cone when seen from a distance of 8 miles. Tokongperangin, 6 miles WSW of Pulau Krawang, forms a good landmark when approaching from the S. There is a reef with some above water rocks, 0.5 mile SE of Tokongperangin and a shoal, with a depth of 3m, lies 8.3 miles WSW of the rock.

Pulau Macan (1°39'S., 109°20'E.), Pulau Tawas and Pulau Papan are three rocky islets surrounded by coral reefs; Pulau Papan, 70m high, is the largest islet of the group. The three islets lie 5 miles N of Pulau Krawang.

Islets North of Pulau Karimata

2.84 **Kepulauan Leman** (1°17'S., 108°53'E.) consists of five rocky islets, surrounded by reefs. Pulau (Leman Paku) Lemanpaku, the E and largest islet, is 54m high, and lies 14.5 miles N of the N extremity of Pulau Karimata.

Pulau Gua, 35m high, and Pulau Leman Tukung, lie close together on a reef with some above-water rocks, 0.5 mile NW of Pulau Lemanpaku.

Pulau Tiku, 23m high, lies 1.3 miles W of Pulau Lemanpaku and Pulau Lemanbudi (Pulau Leman Budi), 31m high, lies 1 mile NW of Pulau Tiku. A light is shown from Pulau Lemanbudi.

Caution.—A rock has been reported at 1°16.06'S 108°53.86'E and can best be seen on the chart.

Karang Yamsecie (Yamcesie Reef) (1°24'S., 108°51'E.), with a depth of 9m, lies 8.5 miles NNW of the N extremity of Pulau Karimata. At a distance of 1 mile from the reef, there are depths of 24m, sand and mud, and within that distance, on the SE side of the reef, there are depths of 16 to 20m, sand and stone.

Islets East and Southeast of Pulau Karimata

2.85 **Pulau Bakung-kecil** (1°35'S., 109°12'E.), 49m high, is 13 miles E of the E extremity of Pulau Karimata. It is wooded, with steep rocky sides. Pulau Bakung-besar, 0.8 mile SW of Pulau Bakung-kecil, is a rounded islet, 72m high.

Pulau Pandan (1°34'S., 109°10'E.), 29m high, 2.3 miles WNW of Pulau Bakung-besar, is a small rounded rock covered with vegetation. It can be seen from a distance of 8 miles and is a useful landmark. There are other rocks on the reef surrounding Pulau Pandan. Pulau Lising (Pulau Lesing), 119m high, has a flat top and is surrounded by a reef; it lies 1.5 miles S of Pulau Pandan.

A 4.6m patch lies 1.3 miles SE of Pulau Lising. The area between this islet and Pulau Karimata is obstructed by reefs and should be avoided. A wreck lies 0.5 mile W of Pulau Lising.

Pulau Mentangor (1°42'S., 109°06'E.), 63m high, lies 8.5 miles SE of the E extremity of Pulau Karimata. Pulau Geresik, 38m high, and Pulau Genting, 38m high, lie 1 mile E and 0.5 mile W, respectively, of Pulau Mentangor. These three islets are thickly wooded and rounded in shape. A 3m shoal lies 7.8 miles SSE of Pulau Mentangor.

Pulau Besi (1°39'S., 109°03'E.), an islet 4 miles NW of Pulau Mentangor, has a conspicuous tower-shaped peak, 47m high, which rises above the flat, lower parts of the islet.

During the Northwest Monsoon good anchorage can be found between Pulau Besi and Pulau Genting, in a depth of 12m, mud. This anchorage can only be approached from the S.

2.86 Pulau Serutu (1°43'S., 108°44'E.) is the farthest SW of the islands of the Kepulauan Karimata. It is mountainous with a steep rocky coast. Its highest peak, 480m high, is near the center of the island.

The coasts are practically clear of dangers, but small bays and inlets are foul. The NW extremity of the island is a rocky peninsula, which appears as an islet when seen from the W. Near the N coast, heavy squalls come from the land in the Southeast Monsoon.

Pulau Serutu Light, with a racon, is situated on an iron skeleton structure, 25m high, situated on a hill 1 mile inland from the W extremity of the island. An isolated depth of 25.6m was reported 9 miles WSW of the light.

Between Pulau Serutu and Pulau Karimata there is a deep, navigable channel, which has a width of 2.5 miles between the 11m lines. The E side of this passage is formed by a ridge of sand which extends 5 miles S from Tanjung Dungu. There is a depth of 1m, 1.5 miles S of Tanjung Dungu. The ridge of sand is generally marked by light green discoloration.

A local magnetic anomaly causing an increase of up to 2°E over the normal variation was reported to exist from 17 miles W to 13 miles S of Pulau Serutu Light.

Directions.—Vessels approaching the strait from the N should steer S along the meridian of 108°E until W of Karang Gwalia, taking care to avoid the 4.9m reef which lies 27 miles NNW of Karang Greig Utara (North Greig Shoal). Vessels should steer between Pulau Serutu and Ontario Reef on a SE course to pass Pulau Serutu Light at 5 miles distance.

Vessels whose destination is the W part of the Java Sea, when E of Kepulauan Momparang, steer S to pass E of Gosong Mampango Light and then change course, as required, to their destination. Vessels whose destination is the E part of the Java Sea, should proceed as above, and when E of Kepulauan Momparang, steer SSE for position 4°00'S, 110°00'E, passing W of Gosong Aling (Fox Banks) and the reported shoal of 7.8m, which lies 17 miles WNW of Gosong Aling Light, then to their destination.

Caution.—Fishermen with lamps frequent the S approach to Selat Karimata.

Tanjung Pandangtikar to Tanjung Sambar

2.87 The W coast of Borneo, from Tanjung Pandantikar to Tanjung Sambar, 155 miles SE, is mostly low and marshy. The rivers which discharge have banks of sand and mud at their mouths so even light-draft vessels can scarcely enter except at high water. The coast is sparsely populated.

Tides—Currents.—Currents on and W of the line joining Pulau Maya and Gosong Jelai are caused by the Northwest Monsoon and Southeast Monsoon, which are the predominant currents; these drift currents are affected somewhat by tidal currents. E of this line and farther inside Teluk Sukadana the diurnal currents predominate.

The currents close off the coast of Borneo flow in the following directions:

1. East of Karang Greig Utara (North Greig Shoal) with a rising tide the current sets S and with a falling tide the current sets N.
2. West of Pulau Maya with a rising tide the current sets S to SSE and with a falling tide the current sets N to NW.
3. Between Tanjung Sambar and Teluk Sukadana with a rising tide the current sets N to NNW and with a falling tide the current sets S to SSE.
4. South of Tanjung Sambar with a rising tide the current sets W and with a falling tide the current sets E to NE.

In the channel between Kepulauan Pelapis and Kepulauan Layah on the NE and Kepulauan Karimata on the SW, the monsoon currents predominate, running with increased force in the narrower parts. Between Pulau Maya and Pulau Panebangan, the tidal currents predominate.

The tidal currents predominate off the river mouths N of Pulau Maya. The monsoon winds have little effect on the currents in this area.

Local weather features light and variable winds off the W coast of Borneo in March and November. In the other months there may be varying periods of either E or W winds, which are also mainly light. The highest wind, force 3 or 4, occurs on June afternoons.

Short spells of drier weather are enjoyed when the main airflow crosses the mountainous interior. The number of rain days along the coast during the three months, July to September, is about half the number of rain days in other months. Rainfall decreases S toward the SW extremity of Borneo.

The coast between Tanjung Padangtikar and Tanjung Terung, 19 miles SSE, is formed by the W side of Pulau Padangtikar. The low coast is fronted by an extensive mud bank, with a few sandy ridges running nearly parallel to the coast. Vessels should keep in depths of not less than 10m, and give this coast a berth of 9 miles.

2.88 Gunung Sarat (0°51'S., 109°29'E.), 227m high, is on Pulau Padangtikar, 7 miles NE of Tanjung Terung. Other landmarks in this area are; Gunung Bongkok, 330m high, 1 mile NNE of Gunung Sarat; Gunung Nuri (Noeri), 192m high, and; Gunung Rumbur (Entjemanan), which has three prominent peaks, the highest one being 259m high. Nuri and Entjemanan are 6 miles and 11.5 miles, respectively, ESE of Gunung Sarat.

Teluk Nuri (0°56'S., 109°30'E.) is entered between Tanjung Terung and Tanjung Capbelanda, 5.5 miles ESE. The bay is bound by Pulau Padangtikar on the N and Pulau Maya on the S. The W arm of Selat Maya is entered from the head of the bay.

Pulau Masatiga (0°57'S., 109°15'E.), 120m high, on the N side of the approach to Teluk Nuri, lies 9.3 miles W of Tanjung Terung and is visible up to 20 miles away. A light, shown from a white metal tower 20m high is exhibited from this island.

An islet, 119m high, lies 0.5 mile E of Pulau Masatiga. Pulau Meresak, 60m high, and Pulau Dua (Pulau Doea), 29m high, lie 2.8 miles WSW and 2 miles SW, respectively, of Tanjung Terung.

2.89 Pulau Hantu (1°03'S., 109°18'E.) is thickly wooded and lies in the middle of the approach to the bay, 9.5 miles SW of Tanjung Terung. In clear weather the islet is visible 12 miles

and appears as a small hummock.

The entrance channel to Teluk Nuri runs for about 10 miles in a NE direction from a point 4 miles E of Pulau Hantu, then gradually curves E, then SE, to the entrance to the W arm of Selat Maya. There is a bar, with a least depth of 3.9m, about 3 miles SE of Pulau Hantu.

Directions.—When approaching Teluk Nuri from the W, steer for the highest peak of Gunung Dusun, 6 miles S of Tanjung Capbelanda, bearing 080°. When Pulau Hantu is in line with the middle part of Pulau Masatiga, bearing about 336°, a NE course should be steered over the bar.

Driftwood and heavy tree trunks are frequently found embedded in the flat NW of the channel.

Small craft, with local knowledge, bound for Pontianak, can proceed into the W arm of Selat Maya and then follow the inland waterway routes.

2.90 **Pulau Maya** (1°08'S., 109°35'E.) is separated from the W coast of Borneo by Selat Maya. The SE coast of this island forms the NW side of Teluk Sukadana. The island is mostly low and marshy except in the NW part, where Gunung Dusun, 529m high, with two summits.

Between **Tanjung Capbelanda** (0°58'S., 109°30'E.) and Tanjung Pasir, the W extremity of Pulau Maya, 18 miles SSW, the coast is low and marshy.

Other landmarks, in addition to Gunung Dusun, are Sebiau, 212m high, 2.3 miles S of Tanjung Capbelanda, and a hill, 118m high, 1 mile NE of Tanjung Gunung. Gunung Berantak, 101m high, is 2.8 miles N of Tanjung Kluang (Tanjung Kloeang), the S extremity of the island.

A rocky hillock, 49m high, stands on Tanjung Satai, 13 miles ENE of Tanjung Kluang.

Pulau Nenas, a small islet, lies close offshore 3.5 miles SSW of Tanjung Capbelanda. Pulau Perling, 42m high, 2 miles NNE of Tanjung Pasir and Pulau Aroh, 60m high, 1 mile SE of Pulau Perling, are two rocky islets which appear as hills on the coast.

A mud bank, with depths increasing seaward, extends from the S side of Pulau Maya. Off Tanjung Pasir, the bank is steep-to within a depth of 4m.

Many fishing stakes may be encountered in an area extending offshore between Tanjung Keluang and Tanjung Satai, inshore of a position 10 miles E of Tanjung Keluang.

Teluk Sukadana

2.91 Teluk Sukadana, entered between **Tanjung Kluang** (1°18'S., 109°30'E.) and Tanjung Berasbasah, 40 miles SE, is important for local navigation between Pontianak, Sukadana, and Ketapang, through Selat Maya.

Selat Maya is the narrow channel between Pulau Maya and the mainland; the S entrance is 3 miles wide, but the navigable channel is reduced to 0.5 mile by mud flats which extend from either side. Tanjung Turun, 7 miles ENE of Tanjung Satai, is the W entrance point.

Kumbang (Koembang) (1°05'S., 109°49'E.), 90m high, is a prominent hillock on the E entrance point of Selat Maya. The land on both sides of Selat Maya is low, and a large portion of the E side of Pulau Maya is submerged at high water.

A least depth of less then 1m lies on the extensive bank off the S entrance to the channel; within the strait there are depths of 6.7 to 11.9m.

The bank off the S entrance consists mostly of soft mud, but that which extends from Tanjung Turun is steep-to, rather hard, and its edge is sometimes marked by surf.

The Sungai Simpang flows into the NE part of Teluk Sukadana, 8 miles E of Kumbang, but can only be entered by vessels of light draft as there is an extensive flat of soft mud off the mouth.

The channel over the flat, which is not marked, has a depth of 0.8m. The village of Telukmelano, the capital of the district, is on the N bank of the river 2 miles within its mouth.

2.92 The **Sungai Sukadana** (1°14'S., 109°57'E.) flows into a small bay, 7.5 miles S of the Sungai Simpang. Some above-water and sunken rocks, and the small islet Pulau Salahnama, lie close off Tanjung Krunut, the S entrance point of the bay. Sukadana, a local administrative center, is on the N side of the mouth of the Sungai Sukadana.

From Tanjung Krunut, visible up to 36 miles, the E shore of Teluk Sukadana trends 2.3 miles SSE to Tanjung Penaga, then 5 miles SE to Tanjung Gunung, a prominent rocky point.

From Tanjung Gunung to the Sungai Kandang Karbau, 32 miles SSW, the E shore of Teluk Sukadana is low, marshy, and thickly wooded.

There are several mountains around Sukadana, the most prominent being Lobang Tedong, 551m high, 4.5 miles NW of Tanjung Gunung and Gunung Pekajang, 515m high, 5 miles farther NW. Both are conical.

Other prominent peaks on this coast are **Gunung Palung** (1°12'S., 110°09'E.), 1,116m high, a table-topped mountain 9.5 miles NE of Tanjung Gunung, and Gunung Seberuang (Gunung Seberoeang), 743m high, 6.8 miles S of Gunung Palung, which has a small nipple on its summit. BA NP

2.93 **Pulau Juanta** (1°21'S., 109°45'E.) is a rocky thickly-wooded islet, 150m high, which lies 8 miles WSW of Tanjung Gunung. It has a conical summit visible up to 24 miles and is a good landmark for the channel to Selat Maya. Pulau Katung, 52m high, is 1 mile SW of Pulau Juanta; it is rocky and thickly wooded. There is a reef, which usually breaks, 0.5 mile NW of Pulau Katung. Some above water rocks lie between the two islets and some above and below-water rocks lie 1.3 miles ESE of Pulau Juanta.

Several above and below-water rocks and rocky islets lie within 2 miles off Tanjung Gunung, making navigation in depths of less than 5m very dangerous.

Pulau Sempadeh-besar, Pulau Sempadeh-kecil, and Pulau Tjempedak, 94m, 90m, and 93m high, respectively, are thickly-wooded islets with rocky sides, lying near the coast 7 miles S of Tanjung Gunung.

2.94 The **Sungai Kandang Karbau** (1°46'S., 109°56'E.) and the Sungai Ketapang, 3 miles farther SW, are the two principal arms of the delta of the Sungai Pawan; the channel across the drying bar is marked by privately maintained beacons. Vessels without local knowledge should not attempt to enter without a local pilot.

Tanjung Bawang (1°47'S., 109°55'E.) is the S entrance point of the Sungai Kandang Karbau, and Tanjung Adung, 2 miles ENE, forms part of the N entrance. The flats, within the

5m line, extend 2.8 miles W of Tanjung Adung; the drying shore bank extends 2.3 miles W from the same point. A reef was reported (1993) 8 miles WNW of the point.

Ketapang, the headquarters of a government official, is 3 miles up the Sungai Ketapang, but power vessels can only reach the place through the Sungai Kandang Karbau. The port mainly handles wood chips, forest products, breakbulk, cement, sand, LPG and liquid cargo. For berthing details see table titled **Ketapang—Berth Information.**

The channel leading to the Sungai Kandang Karbau may shift according to the prevailing monsoon; there is often a considerable sea here. The bottom consists of mud and sand. Tidal currents set across this channel at a rate of from 2 to 2.5 knots with the ebb tide; there is little or no current with the flood tide.

Anchorage may be obtained, sheltered from the SW swell, N of Tanjung Adung, in depths of 3.5 to 5m.

Tanjung Berasbasah, the S entrance point of the Sungai Ketapang, is a low muddy point fronted by a coastal bank, which is not easily recognized, and which dries for a distance of 0.5 to 1 mile W of the entrance to the Sungai Ketapang. This point is 3 miles SSW of Tanjung Bawang.

Channels East of Kepulauan Karimata

2.95 Between Kepulauan Karimata and the W coast of Borneo there are several groups of islands, and between these there are three channels:

1. The Inner Route leads between Pulau Maya and Pulau Panebangan and then E of Kepulauan Layah.
2. Greig Channel leads between Pulau Panebangan, Kepulauan Pelapis, E of Kepulauan Gurung, W of Kepulauan Layah, and then E of Pulau Papan.
3. There is a broad channel between Kepulauan Pelapis and Pulau Buan, 10 miles SSW.

Inner Route.—This route is usually taken by small vessels proceeding from Selat Karimata to Pontianak through the delta of the Sungai Kapuas, via Inland Waterway Route II.

There is less sea here than in Selat Karimata and vessels have the opportunity of anchoring if necessary. This channel can be navigated at night, by soundings, with local knowledge; less water than charted may be found in this channel. There are several islands and dangers near the channel.

Pulau Panebangan (1°13'S., 109°15'E.), with a height of 525m, is 7.5 miles WNW of Tanjung Pasir, the W extremity of Pulau Maya; it is thickly wooded. Pulau Aur, 52m high, with a small islet 0.25 mile S, are two wooded islets 3.3 miles E of the highest summit of Pulau Panebangan. Pulau Julai, 0.8 mile NW of Pulau Aur, is also wooded. Pulau Terusanhaji is a high islet lying 0.5 mile off the E extremity of Pulau Panebangan, and there are some above-water rocks 0.5 mile NE of it. The tidal currents are usually strong along the E coast of Pulau Panebangan. It has been reported (1957) lesser depths than charted depth are located about 4 miles NE of Pulau Panebangan.

Ketapang—Berth Information		
Berth	**Length**	**Remarks**
General Cargo Terminal		
Berth	13m	Cement, others, sand, wood chips, and breakbulk. Berthing length of 54m (including dolphins).
KBS PT.SISM		
Dry Bulk Berth	15m	Breakbulk and bulk cargo. Berthing length of 56m (including dolphins).
Floating Pontoon	38m	Breakbulk and bulk cargo.
PLTU Tembilok		
Berth	25m	Wood chips.
PT. Alas Kusuma Terminal		
East Berth	46m	Wood chips and breakbulk.
West Berth	40m	Wood chips and breakbulk.
PT. Garyber Link Group Terminal		
Berth	30m	Breakbulk and bulk cargo.
Pertamina Sauk		
East Berth	21m	Dirty products. Berthing length of 96m (including dolphins).
West Berth	30m	Dirty products and fertilizer.
PLTD Ketapang KalBar		
Berth	14m	Clean products.
SPBE Ketapang		
LPG Berth	—	LPG. Berthing length of40m (including dolphins).

2.96 Pulau Sireh (1°14'S., 109°12'E.), 120m high, 0.8 mile W of the W extremity of Pulau Panebangan, is on the E side of the N entrance to Greig Channel. A low islet lies close off its N point and an above-water rock lies close off its W extremity. There is a safe passage between Pulau Sireh and Pulau Panebangan.

Pulau Burung, a wooded islet 53m high, is 5.3 miles WSW of Tanjung Pasir.

Greig Channel, a deep 2 mile wide channel separating Kepulauan Pelapis from Pulau Panebangen, is frequently used by vessels proceeding between Pontianak and Jawa.

Kepulauan Pelapis consists of five high thickly-wooded, rocky islands and two islets on the W side of Greig Channel. During clear weather they may be seen up to 32 miles.

Pulau Dua (1°17'S., 109°12'E.), the farthest E of Kepulauan Pelapis, lies 1.5 miles SSW of Pulau Sireh.

The islet is 108m high. It has two conspicuous summits, and when seen from a distance appears as two islets. A depth of 6.7m lies 0.4 mile S of Pulau Dua.

Pulau Balai (1°17'S., 109°10'E.) is separated from Pulau Dua by a deep channel about 0.6 mile wide. Pulau Genting, 324m high, lies close SW of Pulau Balai.

Pulau Kelawar (1°18'S., 109°08'E.), about 1 mile W of the summit of Pulau Genting is the western island of the group. There is a small islet, 42m high, 0.3 mile SW of its S extremity.

Pulau Aermasin (1°17'S., 109°08'E.) is about 0.5 mile NNW of Pulau Kelawar. A rock, awash, lies 0.2 mile off its W extremity.

Anchorage may be obtained in a bay, in depths of 12 to 16m, mud, 0.8 mile N of the N extremity of Pulau Genting. This anchorage is sheltered in the Southeast Monsoon. East and SE of this anchorage is a coral reef, with some above-water rocks, which extends 0.3 mile from the W side of Pulau Balai.

During the Northwest Monsoon, good anchorage can be obtained about 0.5 mile SSW of the S extremity of Pulau Balai, in depths of 10 to 12m, mud.

2.97 Pulau Suka (1°20'S., 109°07'E.), 1.5 miles SW of the S extremity of Pulau Genting, is a thickly-wooded islet, 88m high, with steep, rocky sides. A light is shown from the islet.

Karang Talack (Karang Tallack), a steep-to coral reef with a depth of 3m, lies 1.8 miles SSE of Pulau Suka. In calm weather and with a strong tidal current, it is marked by tide rips.

Kepulauan Burong (Kepulauan Gurung) (1°25'S., 109°13'E.) are two rocky wooded islets lying close together on a reef 6.8 miles SE of Pulau Genting. The W islet is 96m high.

A coral reef, with a depth of 2.1m, lies 0.5 mile ESE of the E islet. The reef is not marked by discoloration or surf, but there are usually tide rips.

2.98 Kepulauan Layah (1°30'S., 109°21'E.) consists of several rocky thickly-wooded islets. Pulau Meledang, the largest islet of the group, 129m high, is 12.5 miles SSW of Tanjung Kluang, the S extremity of Pulau Maya. Pulau Bulat, a small islet 48m high, is 0.8 mile N of Pulau Meledang, and two small islets lie within 0.5 mile WSW of it. Pulau Mensigi is 1.5 miles W of the S extremity of Pulau Meledang.

A deep channel lies between the two islets. Rob Roy Rock, a small coral reef with a depth of 4.6m, steep-to on its N and W sides, unmarked in any way, lies in mid-channel 1 mile NE of Pulau Mensigi.

Kate of Auckland Rock, with a depth of 2.1m, is on the W side of the channel, 1 mile NW of Pulau Mensigi. The rock is sometimes marked by breakers and more frequently by tide rips, but there is no discoloration.

There is usually a monsoon current with a rate of 1.25 to 2 knots during the strength of the monsoon. In the Northwest Monsoon it sets SE; in the Southeast Monsoon, it sets NNW.

Pulau Lajah Besar, 100m high, lies 2.3 miles SW of Pulau Meledang. Pulau Lajah Kecil, the SW island of the group, is 0.5 mile SW of Lajah Besar. It is 51m high, and is completely covered with coconut trees. A light is shown from this islet.

The broad channel between Pulau Suka and **Pulau Buan** (1°29'S., 109°03'E.), 8.8 miles SSW, is seldom used. Pulau Buan has a prominent conical summit, 311m high; the N side of the island, where there is a narrow, foul bay, is steep-to.

A light is shown from the N point of the island. Pulau Nibung, 26m high, 1 mile E of Pulau Buan, and Pulau Ular 21m high, 1.3 miles W of Pulau Buan, are two rocky islets with a few trees. A reef, which dries and usually breaks, lies 1.8 miles ESE of Pulau Nibung.

The channel continues in a SE direction from Pulau Buan and passes W of Kepulauan Layah, E of the dangers that lie E of Pulau Karimata, then E of Pulau Macan.

Tanjung Berasbasah to Tanjung Sambar

2.99 The coast between Tanjung Berasbasah and Tanjung Pagarantimun, 27 miles SSE, is low and densely wooded.

The Sungai Pesaguan flows out through the coast, 17.5 miles SE of Tanjung Berasbasah. The maximum depth over the bar off the mouth of the river is 0.9m.

Tanjung Bengkuang (2°11'S., 110°05'E.) lies 9 miles S of the mouth of the Sungai Pesaguan.

Tanjung Pagarantimun (2°15'S., 110°04'E.) lies 3.5 miles SSW of Tanjung Bengkuang; it is a hilly peninsula, 83m high, with rock sides. The point is visible from a distance of 20 miles, where it appears like a small mountain with a gentle slope on its W side.

The coast between Tanjung Berasbasah and Tanjung Pagarantimun should not be approached within the 11m line, as the depths inside this line are irregular and there are sand ridges in the area.

Pulau Cebe, a low islet, lies 1 mile N of Tanjung Bengkuang. There is foul ground between the islet and the point.

A reef, with some large drying rocks, usually unmarked by breakers, lies 2 miles NW of Tanjung Pagarantimun.

Pulau Mengkudu (2°15'S., 109°59'E.), 4.5 miles W of Tanjung Pagarantimun, is a steep rock, 8m high, sparsely covered with vegetation, with a few trees. The rock is surrounded by a steep-to reef, which has some above-water rocks.

The coast from Tanjung Pagarantimun to Tanjung Gangsa, 12 miles SSE is low. The Sungai Tengar discharges 8.5 miles SSE of Tanjung Pagarantimun.

Kendawangan (2°22'S., 110°8'E.) lies 4 miles N of Tanjung Gangsa and supports the operation of Smelter Grade Alumina (SGA) in the loading and unloading of alumina.The port consists of two berths at the Alumina Terminal. The East Berth is 295m long; the North Berth is 134m long.

Tanjung Gangsa (2°26'S., 110°09'E.) is a high, rocky point. The land in the vicinity is hilly. Foul ground extends 1 mile S.

From Tanjung Gangsa, the coast trends 6.3 miles SSE to the mouth of the Sungai Kendawangan.

From the Sungai Kendawangan the coast trends SSW 6.3 miles to Tanjung Batujurung, a high, rocky point. The coast for 3 miles NE of Tanjung Batujurung, is high and rocky.

2.100 Gunung Kedijo (2°21'S., 110°18'E.), 492m high, is a prominent landmark 10.5 miles NE of Tanjung Gangsa. Gunung Panjang, a hilly and rugged ridge with three prominent summits, lies between Tanjung Gangsa and Gunung Kedijo. The highest of the three summits rises to a height of 245m, and is 3 miles SW of Gunung Kedijo.

A narrow ridge of hills, which attains an elevation of 204m in a conical peak 3.5 miles NE of Tanjung Batujurung, extends 4 miles farther ENE to the S bank of the Sungai Kendawangan.

The 11m line lies about 9 miles offshore along this coast. Onrust Reef, 7 miles SW of Tanjung Pagarantimun, has a small patch of light brown sand and white coral which dries 0.6m; it appears as a small sand bank when seen from a distance. A lighted beacon is shown from this reef.

Pulau Sawi (2°23'S., 110°04'E.), 7.8 miles S of Tanjung Pagarantimun, is low. There are some tall trees, which are visible from a distance of 12 miles. The islet lies inside the 5.5m line, and is fringed by rocks except on the N side. Depths of less than 2m extend 2.5 miles E of the island.

The coast between Tanjung Gangsa and the mouth of the Sungai Kendawangan, is foul for 1 mile offshore in places. Pulau Kucing (Pulau Kutjing) lies 3.5 miles SSE of Tanjung Gangsa and Pulau Jambat lies 1.5 miles S of Pulau Kutjing.

Batu Buaya, awash, lies near the extremity of foul ground which extends W for 1.3 miles from the N entrance point of the Sungai Kendawangan.

A spit, with depths of less than 2m, extends 0.8 mile S from Batu Buaya. A rock, with less than 2m, lies 0.4 mile SE of Batu Buaya.

A drying shore bank extends 0.8 mile W from the S entrance point of the Sungai Kendawangan, and extends about 4 miles S along the coast.

A dangerous rock lies 2.3 miles offshore, 3.3 miles NNE of Tanjung Batujurung.

The Sungai Kendawangan can be distinguished from a distance of 4 miles, when still in a depth of over 5m. Closer in the depths are irregular.

Several years ago, the bar at the mouth of the Sungai Kendawangan was dredged to a depth of 1.5m at LW.

Within the entrance, the river is broad and deep and is navigable by small power vessels about 22 miles upstream. The village of Kendawangan is on the N bank of the river, just within its entrance.

The coast from Tanjung Batujurung trends in a SSE direction about 8 miles to Tanjung Simbar; the intervening area is wooded and marshy.

2.101 Tanjung Kepala (2°53'S., 110°14'E.) lies 9 miles S of Tanjung Simbar. The shore between these two points is indented by a bay with a sandy beach.

From Tanjung Kepala, the coast continues in a SSE direction 8 miles to Tanjung Sambar, the SW extremity of Borneo.

There are several islands and islets within the 11m line, which lies 16 miles offshore, W of Tanjung Simbar.

Pulau Cempedak (2°38'S., 110°07'E.), a low thickly-wooded island almost entirely surrounded by reefs and rocks, is 1.5 miles W of Tanjung Batujuring. It has a rocky coast, except on the SE, where there is a sandy beach.

The W side of the island should not be approached within a distance of 0.6 mile. Pulau Tating and Pulau Iras are two rocky islets which lie close offshore between Tanjung Batujuring and Pulau Cempedak.

Pulau Bawal (2°43'S., 110°05'E.) is a large densely-wooded island, 6 miles W of Tanjung Simbar. The island is mostly low but there are two hills.

One hill, 88m high, is near the center of the island and the other hill, 67m high, is in the NE part of the island. Off the N extremity there are some small islets. Pulau Tanahmerah, the highest of these, is reddish in color and rounded in shape. The SW extremity of Pulau Bawal is marked by a light.

Anchorage, sheltered in both monsoons, may be obtained E of Pulau Bawal, in depths of 7 to 13m, mud.

This anchorage can be reached through the channel between Pulau Cempedak and Pulau Tamah Merah, or through the channel between Pulau Cempedak and Pulau Iras.

Both of these channels are very narrow. Local knowledge and extreme caution are necessary for their safe navigation.

2.102 Coreyra Bank (Gosong Corcyra) (2°49'S., 110°01'E.), with a depth of 3m, lies 4.5 miles SSW of the W extremity of Pulau Bawal, and is not marked by surf or discoloration. All this area is dangerous due to rocks and sandy shoals. Depths of less than 10m extend up to 4 miles W of Coreyra Bank.

Pulau Perantung, a low rocky islet, lies 4 miles E of Coreyra Bank. Pulau Magnin, 0.8 mile SE of Pulau Perantung, is a prominent rock covered with vegetation.

Pulau Langau, 2.3 miles S of Pulau Magnin, is a moderately high, rocky islet with a rugged appearance, which is visible 14 miles.

Pulau Gambar, 0.8 mile S of Pulau Langau, consists of two vegetation-covered rocks, standing close together. Strong tidal currents are reported between these islands.

2.103 Pulau Gelam (2°53'S., 110°10'E.), 1.5 miles W of Tanjung Kepala is low and densely wooded. It is difficult to distinguish from W as it appears as a long slightly darker strip against the coast behind.

Foul and rocky ground extends for a considerable distance N and S from the island, and patches, with depths less than 10m, extend for 7 miles SW and 9 miles W.

There are depths of 5m, 1 mile off the NW sides of Pulau Gelam, where anchorage may be obtained by small vessels, with local knowledge.

Karang Karysfort (Carysfort Reef) (2°40'S., 109°49'E.), which has a least depth of 3.7m, live coral, is 21 miles W of Tanjung Batujurung.

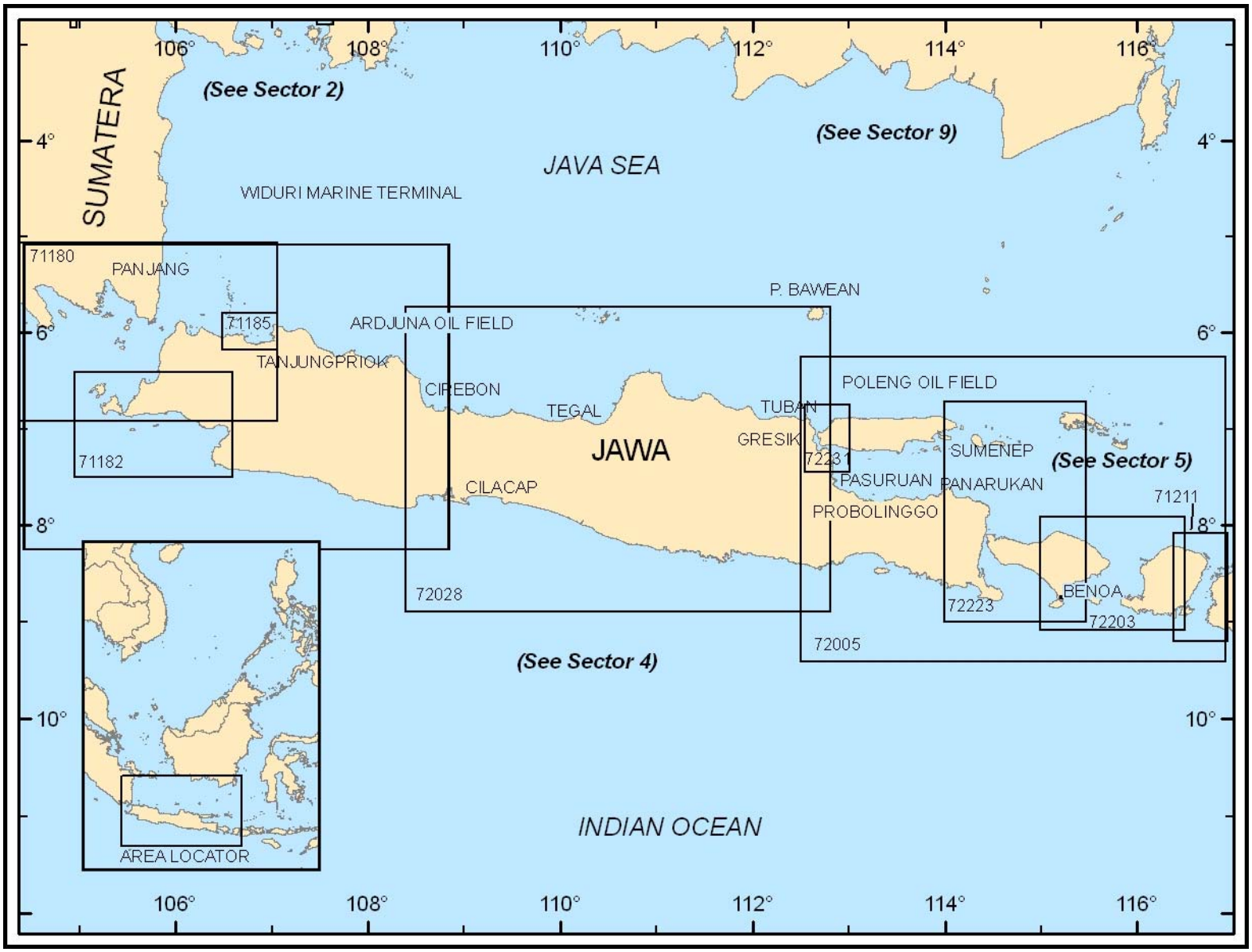
The reef lies on the center of a bank with depths of less than 20m, which is 2.3 miles in extent. A dangerous coral rock lies 8 miles S of Carysfort Reef.

The area for a distance 40 miles S of **Tanjung Sambar** (3°00'S., 110°19'E.), the SE extremity of Borneo, embracing Gosong Aling (Fox Banks) and Gosong Jelai (Clemencia Bank), is encumbered with ridges of sand, marked by tide rips

and overfalls, and is not navigable.

Vessels should pass well S of these dangers, out of sight of land, and those approaching from N should allow for the strong E set across the banks.

The dangers S and E of Tanjung Sambar are discussed beginning in paragraph 9.2.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **3** — CHART INFORMATION

SECTOR 3

JAWA—NORTH COAST AND MADURA

Plan.—This sector describes the N coast of Jawa from Tanjung Pontang to Tanjung Sedano, including the Java Sea and islands and dangers that lie N of Jawa. The descriptive sequence is from W to E.

General Remarks

3.1 The N coast of Jawa is low, marshy, thickly wooded, and generally devoid of landmarks. In places it is indented by bays which do not penetrate the island deeply.

The high mountains that lie inland are usually only visible in the monsoon but are occasionally seen for a few hours in the morning during the hazy atmosphere of the Southeast Monsoon.

As all the rivers on the N coast of Jawa flow into the sea between points of land, bringing down a considerable amount of debris with them, both the land and coastal banks may be extending seaward at these places; such points, therefore should never be rounded by bearing and distances, but by sounding, keeping in depths of over 11m.

Winds—Weather.—In the W part of the Java Sea, during the months April to November, the Southeast Monsoon will blow from ESE, in the center part it will blow E, and over the E portion it will blow ESE to SE. In the Java Sea, the Northwest Monsoon, blowing from WNW to W, is stronger in force than the Southeast Monsoon and lasts from December to March.

In the sea, along the N coast of Java, between Selat Sunda and the meridian of 111°E, during the Northwest Monsoon, the sea breeze adds strength to the wind and draws it into NW or N during the daytime, but the land wind is seldom felt. Both land and sea breezes occur during the Southeast Monsoon, but seldom extend more than 15 miles off the coast.

In the vicinity of Kepulanan Karimunjawa, the monsoon winds are more regular and stronger than those along the Java coast.

Between the monsoons, calms are common, with occasional squalls associated with thunderstorms, especially in March and April.

Tides—Currents.—The horizontal movement of water in the Java Sea N of Java is mainly caused by the wind, and is, therefore, monsoon current; the maximum rate seldom exceeds 2 knots. A weak current setting constantly SSW has been noticed. Along the N coast of Java, the monsoon current sets W from May to October, inclusively; December is the month of transition.

In January and February, the current set E. At the end of March and in the first part of April the transitional period occurs again. Land and sea breezes influence the direction. The tidal currents were not observed to have any effect on the monsoon currents, except perhaps close offshore. Only the currents produced by the monsoon are felt at the various roadsteads. The current set with some force around the salient points and in general follows the contour of the coast.

The E current in and around Kepulaun Karimunjawa during January and February is stronger on the average than the W current in July and August.

Restricted areas.—Numerous oil fields have been discovered and established within 50 miles N of Selat Sunda and 35 miles E of the coast of Sumatera. The oil fields lying on the main shipping routes between Selat Sunda and Singapore are being rapidly extended.

Numerous structures, not all of these are charted, exist in these areas. The locations of features, markings, and established oil terminals are made known as the information becomes available.

Restricted areas have been established surrounding these oil fields. Vessels are prohibited from approaching or anchoring within 500m of any platform or submerged feature. A vessel entering a restricted area may be challenged by Indonesian air and sea patrols operating in this part of the Java Sea.

A conservation area is established among Pulau-pulau Seribu. Entry is controlled in the vicinity of **Ranget** (5°28.3'S., 106°28.6'E.), **Pancalirang Kecil** (5°27.6'S., 106°33.2'E.), **Bira** (5°36.7'S., 106°34.6'E.), and **Pulau Sangiang** (5°58'S., 105°51'E.).

Facilities, including air communication in support of tourism, were being developed.

Submarine exercises.—Surface vessels exercising with submarines display a red flag at the masthead. All shipping should keep well clear of an exercising vessel.

If necessary, a slow approach should be made to such a vessel, until the vessel indicates that the submarine is clear from its vicinity.

Piracy.—It has been reported that attacks on vessels by armed thieves have occurred in the areas covered by this text. Masters of all vessels are advised to take all possible security measures.

Ships are advised to maintain a strict piracy watch and anti-piracy measures and report all attacks and suspicious sightings to the local authorities and the IMB Piracy Reporting Center.

IMB Piracy Reporting Center		
Helpline (24 hours)	Telephone	603-2031-0014
	Facsimile	603-2078-5769
E-mail	imbk@icc-ccs.org	
	piracy@icc-ccs.org	

Caution.—Numerous oil and gas fields exist off the N coast of Jawa. Each field contains clusters of installations, consisting of above-water, awash, or submerged structures; the structures may be permanent or movable and may or may not be lighted. New platforms are routinely being added. Most structures exhibit lights, especially the platforms. Since not all features are charted or marked, mariners are cautioned to exercise special care when navigating these waters.

Tanjung Pontang to Tanjung Krawang

3.2 **Tanjung Pontang (5°56'S., 106°16'E.)**, a low, wooded point with high trees, is formed by the delta of a river that runs into the sea; the E side of this point appears to be extending N. An exposed wreck lies 0.75 mile N of Tanjung Pontang.

Between Tanjung Pontang and Tanjung Kait, 17 miles ESE, the coast recedes to form a shallow bay, with depths of less than 5m, mostly muddy bottom, extending 2.5 miles offshore in places. There are four villages on the shore of the bay; a river flows into the sea 7.5 miles W of Tanjung Kait. A prominent group of trees, visible 8 miles, stands close E to the mouth of the river. The position of these trees has not been accurately determined. Another group of trees is near the village, Mauk, about 3.5 miles SSW of Tanjung Kait.

Pulau Tunda (5°49'S., 106°17'E.) is a low tree-covered island lying 7.5 miles N of Tanjung Pontang. A light is shown near the SE coast of the island. A wreck, covered by a depth of 7m, lies 3 miles S of the SE point of Pulau Tunda. A depth of 20.1m was reported about 1.3 miles SSW of Pulau Tunda Light.

Pulau Tunda

Tanjung Kait (6°01'S., 106°32'E.) is a low point difficult to identify from W, but plainly discernible from E. A prominent tree, visible from all directions, stands 0.6 mile S of the point.

Karang Pulaulaki (Menschemtu Reef), a coastal bank, extends 3.5 miles from the point, and has depths of less than 2m at its N and E extremities. The reef breaks at times and has a least depth of 0.4m.

Pulau Laki is a low wooded islet with high trees 3 miles NNW of Tanjung Kait.

Tanjung Pasir (6°01'S., 106°41'E.), 8.5 miles E of Tanjung Kait, is low and difficult to identify from the uniformly low coast on either side. Coconut trees grow around the village of Tanjungpasir Timur, which lies on the W side of the point.

Untungjawa Reef extends about 1.75 miles NNE from Tanjung Pasir. Near the outer extremity of the reef, which is steep-to, are two patches of hard sand and stones which usually break at high water.

3.3 Between Tanjung Pasir and Tanjung Krawang, about 20 miles ENE, the coast recedes to form a bay with a low and uniformly-wooded shore. The country inland from the bay is hilly.

The depths increase gradually off the shore of this bay; in places the depths are less than 5.5m as far as 1 mile.

Bima Oil Field, consisting of a number of production platforms and other oil installations, is between 7 miles and 15 miles NNE of Tanjung Krawang.

Bima Marine Terminal (5°45'S., 107°05'E.) has been closed for commercial operations since 1992.

Restricted area.—Bima Oil Field is protected by a restricted area about 7.5 miles long and 3.5 miles wide, which falls mostly within the extensive restricted area shown on the chart.

Unauthorized entry into the area is prohibited. Pipelines are within the restricted area.

Anchorage.—There is an anchorage area off the NE end of the restricted area; it is bound by the following positions:

a. 5°43'00"S, 107°06'00"E.
b. 5°41'30"S, 107°07'10"E.
c. 5°42'50"S, 107°08'37"E.
d. 5°44'20"S, 107°07'28"E.

Caution.—A dangerous wreck lies 4 miles WNW of the anchorage area.

3.4 **Tanjung Krawang** (5°56'S., 107°00'E.), the E entrance to the bay, is low and difficult to identify, unless locally acquainted. Trees growing in the flat tidelands NE of Tanjung Krawang are visible from distances up to 13 miles.

A lighted beacon stands about 2 miles NNE of Tanjung Krawang. A bank of mud encircling the point is extending seaward, and in general, the depths in the SE part of the bay, within a line joining Tanjung Krawang and Tanjungpriok, appear to be decreasing.

Near the head of this bay is the city of Jakarta. Tanjungpriok, about 5.5 miles E of Jakarta, is the port of that city.

Numerous fishing stakes and fish traps lie between Pulau Damar-besar and the shore E and SE. It has been reported that the traps are moved frequently and their charted positions are not indicative of their actual positions.

Western channels leading to Jakarta and Tanjungpriok are Outer Channel and Inner Channel. Vessels bound for Jakarta and Tanjungpriok from Selat Sunda usually pass S of Pulau Tunda, then by the preferred channel. Inner Channel can only be used in daylight.

Nearly all the islands adjacent to the channels are low and flat, but can usually be seen by their thick vegetation; there is also some vegetation on the broad reefs that fringe the islands.

The many reef patches, which are on each side of the channels, are usually marked by discoloration when the depths are 5.5m or less. In general, the water in Inner Channel is not so clear as that in Outer Channel.

3.5 **Outer Channel.—**Outer Channel trends E to pass S of Pulau Tunda, then between Kepulauan Ayer Besar and Kepulauan Tidung, and then generally SE to pass N of Pulau Damar-besar.

Kerbau Reef (5°46'S., 106°26'E.), with a depth of 1.5m, lies 9.75 miles ENE of Pulau Tunda Light, but it is well N of the fairway through Outer Channel.

Kepulauan Ayer Besar (5°48'S., 106°31'E.), 12 miles N of Tanjung Kait consists of three islands. Pulau Tidung-besar and Pulau Tidung-kecil, the two W islands, rise from a long, narrow, partly drying coral reef.

A number of dangers, with depths of as little as 1.5m, lie between Pulau Tidung-besar, the W island, and Kerbau Reef, 5.5 miles WNW.

Pulau Payung Besar (5°49'S., 106°33'E.), the third island of Kepulauan Ayer Besar, lies 1.3 miles SE between the reefs which border the two islands.

Pulau Payung Light is a white metal framework tower, 10m high, standing near the SE end of the island. A conspicuous wooden jetty was reported to extend about 350m SSE from the SE point of the island. Pulau Payung Kecil lies on a detached reef 0.3 mile N of Pulau Payung Besar; there is a clear channel between the reefs bordering it and those bordering Pulau Tidung-kecil.

The coconut palms on Pulau Tidung-besar and Pulau Tidung-kecil can usually be seen from a distance of 10 miles.

3.6 Karang Besar (Struisvogel Klipper) (5°53'S., 106°28'E.) is a group of six small coral reefs which shows discoloration, on the S side of Outer Channel, 8.5 miles NNW of Tanjung Kait; the extent of the rocks is about 1 mile in a N and S direction. The least depth over the reef is 3.4m.

Karang Laut, a steep-to reef, with a least depth of 5.8m, lies 2 miles E of Karang Besar; both of these dangers flank the N side of Inner Channel.

Kepulauan Tidung (Pulau Pulau Tidung), a group of low, thickly wooded islands, rise from a steep-to reef marked by numerous drying patches, trees standing in the water, and discoloration at the edges.

The group is centered 3.5 miles SE of Pulau Payung Light, the deep intervening channel is about 2 miles wide between the reef fringing Pulau Payang and the reef from which Kepulauan Tidung rises.

Pulau Tikus is near the W extremity of the reef and Pulau Pari, the largest island in the group, lies near the E end of the group.

Karang Jong (5°51'S., 106°39'E.), a tiny islet of sand and coral rising from a steep-to reef patch, lies 1 mile E of Pulau Pari. The light on the islet is a green tower standing on piles. A 5.1m patch lies 1.3 miles NE of Pulau Jong.

Caution.—A dumping ground for ammunition exists off the S side of Kepulauan Tidung. Between this area and Pulau Rambut, 7 miles SE, lie numerous reefs. Vessels are cautioned to avoid this area.

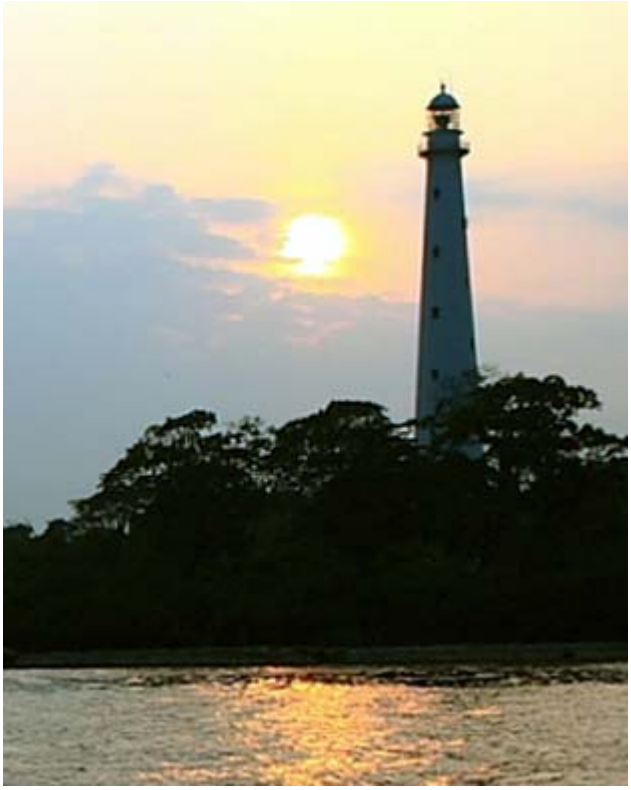
3.7 Gosong Dapur (5°55'S., 106°44'E.), a reef with a depth of less than 2m, lies 6 miles SE of Karang Jong, with another reef, having a depth of 2.7m, close W.

A 10.7m patch of coral exists 0.35 mile NW of Gosong Dapur. A light is shown from a position close to the center of Gosong Dapur.

Palau Damar-Besar (5°58'S., 106°51'E.), 7 miles ESE of Gosong Dapur, is covered with tall trees; it lies on the W limit of a prohibited anchorage. A light is shown from a white metal tower, 50m high, standing near the W extremity of the island; a racon is situated with the light.

A steep-to reef, with a depth of less than 2m, and a drying sand bank on its S side, lies 0.5 mile N of Pulau Damar-besar.

A wreck, marked close NW by an isolated danger buoy, lies 2.3 miles E of Pulau Damar-besar. Two other wrecks, best seen on chart, lie just E of this island. Three additional wrecks, best seen on the chart, lie close N of the island within 0.5 mile of the shoreline.



Palau Damar-Besar Light

Karang Susuh, a 16.2m coral patch, is 3.75 miles N of Pulau Damar-besar. A depth of 12.8m was reported 2.5 miles ENE of Karang Susuh and a depth of 9m was reported 3 miles ENE of the same reef.

Pulau Wanara (Damar-kecil), 1.5 miles S of Pulau Damar-besar, is wooded. Pulau Wanara (Damar-kecil) is 1.5 miles SSW of Pulau Damar-kecil.

Pulau Nirwana (Nyamuk-besar) 1.5 miles SSE of Pulau Talak (Nyamuk-kecil), is fringed by a reef. Fish traps extend up to 0.5 mile E and S of Pulau Nirwana. Amstel, a 3m patch, lies 0.2 mile ESE of Pulau Nirwana.

Directions for Outer Channel.—When approaching Tanjungpriok from W, pass S of Pulau Tunda, and proceed S of Pulau Payung, continuing E until clear of Kepulauan Tidung and Pulau Jong. Then alter course direct for Pulau Damar-besar Light, passing NE of Pulau Damar and adjacent reefs.

When near Pulau Damar-besar, steer SE to pass between Pulau Wanara (Damar-kecil) and Pulau Talak (Nyamuk-kecil) and then E of Nirwana and Karang Timbul to the harbor. Numerous fish traps may be encountered S and E of Pulau Damar-besar.

Caution.—When S of latitude 5°55'S, a vessel is advised not to approach Tanjungpriok from E of longitude 106°55'E, since numerous fish traps and settlement of huts are encountered up to 5 miles off the coast between Tanjung Krawang and Muara Bekasi, 7 miles to the south.

Numerous fish traps were reported in the approaches to the E

entrance of the harbor extending N almost to the 20m depths.

Work was reported in progress to the E of the E entrance. The construction of a berth inside the harbor is for handling iron scrap.

Unexploded ordinance is reported to lie 1.7 miles E of Pulau Talak.

3.8 Inner Channel.—This route from Selat Sunda to Jakarta leads between the coast of Jawa and the northern islands and reefs.

Karang Besar and Karang Laut, previously described in paragraph 3.6, are the two W dangers bordering the N side of Inner Channel.

Tongara (5°55'S., 106°32'E.) is a small steep-to reef, which has a depth of 5.5m, lying about 1.5 miles SE of Karang Laut. It is not always marked by discolored water.

Pejinab Reef, with a depth of 0.9m, is 5 miles NNE of Tanjung Kait and close W of the dangerous reef bordering Pulau Lancang.

Pulau Lancang (5°56'S., 106°35'E.) is formed by a group of three low wooded islands visible from 9 miles. The reef surrounding this group dries in places, and is marked with patches of vegetation. Some of the rocky heads are awash. The W edge of the reef, which has a depth of 0.3m, extends almost to Pejinab Reef. A light is exhibited from the S point of Pulau Lancang.

Pulau Bokor, a low reef-fringed islet, lies 1.75 miles ESE of the SE island of Pulau Lancang. The high trees on the islet are visible from 12 miles.

Hordyk, with a least depth of 4m, and Lumbang, with a depth of 3m, are patches that lie 1.3 miles WSW and 0.75 mile SW, respectively, of Pulau Bokor. A patch with a depth of 5.2m, lies 0.2 mile NNE of Lumbang.

Pari, a patch with a depth of 7.6m, and Karang Tiga, a patch with a depth of 6.1m, lie 0.75 mile and 1 mile, respectively, S of Pulau Bokor. A patch, with a depth of 7.9m, lies 0.35 mile ESE of Pari.

Gosong Pulau Bokor, 2 miles ESE of Karang Tiga, has a depth of 3m.

A group of detached reefs lies between Gosong Pulau Bokor and Pulau Rambut, 1.75 miles E. Karang Ayer, with a depth of 4.9m, lies midway between the two.

Karang Ketapang, with a depth of 4.9m, lies 0.35 mile SSW of Karang Ayer and Sonko, a reef with a depth of 7m, lies 0.15 mile SSW. Wrange Rock, with a depth of 3m, lies 0.15 mile W of Pulau Rambut.

3.9 Pulau Rambut (5°58'S., 106°41'E.) lies 1.75 miles E of Gosong Pulau Bokor. Pulau Untungjawa, similar to Pulau Rambut, lies 0.5 mile E of that island. The remains of a sunken dock, which must be given a wide berth, lies off the S side of the island.

A conservation area is established around Pulau Rambut, as a rare species of bird is found there.

Cenkareng Oil Terminal (5°58'S., 106°44'E.) is situated about 1.5 miles ENE of Pulau Untungjawa. The terminal consists of an SPM which is connected, by a submarine pipeline extending SE, to a position onshore 1.5 miles SE of Tanjung Pasir.

Vessels up to 36,500 dwt and 200m in length can be accommodated; the depth at the SPM is about 21m. Berthing is restricted to daylight hours only but unberthing may take place at any time. A dangerous wreck, marked by a buoy, lies 0.75 mile N of the terminal.

Ayer-kecil, a wooded islet encircled by a wide drying reef, lies 3 miles E of Pulau Untungjawa. Ayer Sedang (Monnikendam Reef), a reef which has a patch of drying sand, lies 1 mile E of Ayer-kecil. A 3m patch lies 91m E of Ayer Sedang.

Ayer Reef, with a least depth of 1.5m, lies on the N side of Inner Channel, 0.75 mile SSW of Ayer Sedang.

Pulau Ayer-besar (6°00'S., 106°47'E.), a reef-fringed islet marked by tall trees, lies 1.5 miles SE of Ayer-kecil.

Pulau Ubi-kecil (6°00'S., 106°44'E.), a reef with a small cay, lies on the S side of Inner Channel, 3 miles E of Tanjung Pasir. Pulau Ubi-besar, a wooded reef-fringed islet, lies 0.5 mile E of Pulau Ubi-kecil. Ubi, a reef with a depth of 2m, lies 0.3 mile E of Pulau Ubi-kecil. A number of other reefs lie S of Pulau Ubi-kecil and Ubi.

Karang Jalan, a reef with a least depth of 0.9m, lies 3 miles SE of Pulau Ubi-besar.

Other islets and dangers lie W of Karang Jalan and will be discussed with Jakarta Roadstead.

Directions for Inner Channel.—Mariners are advised that passage to Tanjungpriok from W by way of Inner Channel should be undertaken only during day and by those with local knowledge.

When approaching from W, steer to pass S of Pulau Tunda. When the E extremity of Pulau Tunda bears NNW, the prominent tree S of Tanjung Kait and Pulau Laki will be sighted at about the same time.

The prominent group of trees close SW of Tanjung Kait has occasionally been mistaken for Pulau Laki, and the trees on Pulau Laki have also been mistaken for Pulau Lancang; the latter island is generally sighted about the same time as Pulau Bokor.

After passing S of Pulau Tunda, steer to pass S of Karang Besar, then N of Pulau Laki and the N extremity of Menscheneter Reef and S of Pejinab Reef. Then the track is towards Pulau Rambut, keeping clear S of the shallow patches between Penjinab Reef and Gosong Pulau Bokor.

After passing the beacon on the S edge of Gosong Pulau Bokor, the channel leads through the narrow passage, marked by beacons, between the SW edge of the reef bordering Pulau Rambut and the outer extremity of Untungjawa Reef, extending N from Tanjung Pasir.

This narrow passage may be approached by passing between Karang Ayer and Karang Ketapang, or by passing S of Sonko. When past Pulau Untungjawa, course should be set to pass between Ayer kecil and Ubi, then SW of Ayer Reef, Pulau Ayer besar, and Pulau Talak, then to the harbor entrance, passing E of Karang Timbul.

Approach to Jakarta and Tanjungpriok

3.10 From Tanjung Pasir to Tanjungpriok, 13 miles ESE, the coast is low, uniformly wooded and backed by mountains, far inland. The town of Jakarta stands 10 miles SE of Tanjung Pasir.

Karang Perut (6°02'S., 106°43'E.), a small stone reef with a depth of 3.9m, lies 2.75 miles ESE of Tanjung Pasir. Karang

Pulau Kelor, a reef with a depth of 3.7m, lies 0.4 mile ESE of Karang Perut.

A 5.2m patch lies 0.15 mile N of Karang Pulau Kelor, and several shoals, with depths of less than 5m, lie between this reef and Pulau Kelor, a low, wooded islet 1 mile E.

Pulau Gipir (Pulau Cipir), 1 mile SE of Karang Perut, is surrounded by a reef on its N, E, and W sides. A pier, off which there are some mooring buoys, extends from the SW side of the island and a long barge pier extends from the NNW side toward Pulau Kapal. The disinfecting station is maintained on Pulau Gipir.

3.11 Pulau Kapal (6°02'S., 106°44'E.), a low wooded islet 0.2 mile NNW of Pulau Gipir (Cipir), has two piers off its S side with reported depths of 6.1 to 7.6m. The Quarantine Station is situated on Pulau Kapal.

Pulau Sakit, another low reef-fringed islet, lies less than 0.75 mile ESE of Pulau Kapal. A small detached reef, with a depth of 1.8m, lies 0.35 mile SE of Pulau Sakit.

Another shallow spot with a least depth of 2.7m lies about 0.3 mile W of Pulau Sakit. Karang Pulau Sakit, with a depth of 1.5m, lies 0.4 mile SSE of Pulau Sakit.

Karang Bangau (Reigersdaal Shoal) lies 1.3 miles S of Karang Pulau Sakit. This reef should be given a clearance of 91m.

Anchorage for the Quarantine Station or the Disinfecting Station is close SW of Pulau Gipir pier.

Prohibited area.—Anchoring and fishing are prohibited within an area extending between Pulau Kapal and the W mole of Jakarta Canal. Karang Bangau lies at its SW corner, and Karang Tahan, 3 miles E, at its NE corner.

Mariners are cautioned that the oil and gas pipelines, laid in the SE part of the prohibited area, extend beyond the area limits. The position of the pipelines may be seen on the chart.

An offshore oil terminal is situated about 0.5 mile W of Karang Tahan. A mooring buoy, available to tankers of up to 30,000 tons, is moored at the seaward end of a pipeline running N from the shore.

The terminal lighted buoy is moored about 0.3 mile NNW of the lighted terminal mooring buoy. Anchoring is prohibited in the vicinity of the terminal and the pipeline.

3.12 Karang Tahan (6°04'S., 106°48'E.), the westernmost danger in Jakarta Roadstead, is a reef with a depth of 4m, lying 3 miles NNW of Jakarta.

Karang Pasir, 1.5 miles ENE of Karang Tahan, is a drying reef. Karang Tenggelam, with a depth of 4.2m, lies 0.4 mile SW of Karang Pasir. Karang Pipa, with a depth of 3.8m, lies 0.2 mile SSW of Karang Tenggelam.

Karang Lamteri (Neerstuk), a drying reef, lies about 0.9 mile E of Karang Pipa.

Anchoring and fishing are prohibited in an area commencing on shore, at Jakarta and extending about 14 miles NNE. The limits of the area may best be seen on the chart.

Mariners are cautioned that gas pipelines are laid across and outside the prohibited anchorage area. The position can be best seen on the chart.

Two lighted buoys and a lighted beacon are situated near the pipelines.

Islands and Dangers North of Jakarta and Tanjungpriok

3.13 Pulau Jagautara (Jaga Utara) (Pulau Tuguan) (5°12'S., 106°28'E.), described in paragraph 4.5, may be said to mark the dividing point between the route leading W of Kepulauan Seribu toward Selat Sunda and the route leading E of that island group toward Jakarta and Tanjungpriok.

Beting Raja (5°13'S., 106°44'E.), about 17 miles E of Jaga Utara, is a steep-to coral patch, with a small drying bank of white coral sand. The light, a black and red framework tower 12m high from which a racon transmits, is practically the only means of recognizing the patch. The light has been reported to be a good radar target at a distance of 12 miles.

A 14.6m depth was reported to lie 9 miles WSW of Beting Raja. A dangerous wreck lies 0.5 mile SSW of Beting Raja.

Discolored water lies 11 miles NNE of Beting Raja. Beting Eka, 11.5 miles SE of Beting Raja, is a steep-to coral reef, with a depth of less than 1.8m. It was reported that shoal water existed within a radius of 3 miles of this reef. A black and red beacon, 15m high, stands on Beting Eka.

Obstructions lie 8.5 miles ESE and 37 miles ENE of Beting Eka. Wrecks lie 0.5 mile S and 5.5 miles SSE of Beting Eka. Dangerous wrecks also lie 24 miles N, 36.5 miles NNE, and 32 miles NE of Beting Eka.

Kepulauan Seribu (5°35'S., 106°34'E.), about 80 islands in number, in addition to many reefs, rocks, and drying banks, are centered about 24 miles N of Tanjung Kait.

The islands, which are wooded, are not easily distinguished one from another. It is advisable not to attempt to pass through the group.

Winds are stronger amongst Kepulauan Seribu than along the Jawa coast, especially in the Southeast Monsoon and are then often strongest and least steady during the night. There are appreciable land and sea breezes from and towards Jawa.

The description given here is principally to point out conspicuous features of possible use as landmarks to vessels and to point out dangers that lie on the E side of Kepulauan Seribu.

Pancalirang Besar Timur (5°27'S., 106°34'E.), the N island of the main group of Kepulauan Seribu, lies 16.5 miles SSE of Jaga Utara. It is densely wooded with tall trees.

A dangerous wreck lies 3 miles NE of Pulau Panjaliran Timur.

Pancalirang-kecil lies 0.75 mile SW of Pancalirang-besar. A patch of coral rocks extends 1.3 miles W of Pancalirang-kecil.

Pulau Jagung, 2.5 miles SW of Pancalirang-besar, is thickly wooded with high trees. Karang Mayang, a rocky patch with a depth of 7.9m, lies 2.5 miles SE of Pancalirang-besar.

Pulau Buton, 1 mile W of Pancalirang-besar, is 0.2 mile within the W end of this coral patch. A detached rock, with a depth of 2.4m, lies 1.75 miles W of Pulau Buton. Another rock, with a depth of 3m, lies 1 mile NNE of Pulau Buton.

Pulau Ringit, densely wooded, with high trees, lies 2 miles SSE of Pancalirang-besar. Kepulauan Serabu lies 1.5 miles SW of Pulau Ringit.

Pulau-pulau Petudang (5°35'S., 106°36'E.), densely wooded with high trees, lies 5 miles SSE of Pulau Ringit. Pulau-pulau Laga, covered with bushes and surrounded by an extensive reef, lies midway between.

Pulau Belanda, about 1.3 miles SSE of Pulau-pulau Petudang, is conspicuous by a group of causarina trees. Pulau Pemadaran, about 2 miles farther SW, is covered with low trees.

A lighted buoy is moored 1.5 miles ENE of Pulau Pema-daran. A channel leads through the islands, marked by two sets of buoys.

Pulau Opak-kecil, about 2.75 miles S of Pulau Pemadaran, is reported to have two trees with fan-shaped tops.

Pulau Conkak and Simpit, islets 4.5 and 6 miles S, respectively, of Pulau Pemadaran, and near the S limit of Kepulauan Seribu, are not conspicuous, but the reefs surrounding them are noticeably colored and break with any sea.

Pulau Lang, nearly 7 miles SSE of Pulau Pemadaran, abounds with coconut trees. Sekati, 0.75 mile S of Pulau Lang, has a high conspicuous tree on its SW side. Pulau Karangbras, about 3 miles WSW of Pulau Lang, is covered with undergrowth. Ayer is about midway between these two islets.

Caution.—Submarines frequently exercise within the area bounded by the parallels 5°34'S and 5°49'S, and the meridians 106°15'E and 106°25'E, to the W of Kepulauan Seribu.

There are three sea conservation areas in the Seribu Islands. These areas are prohibited to all vessels, with the exception of naval, government, and local vessels:

1. Area 1—bounded by lines joining the following positions:
   a. 5°27'00"S, 106°26'00"E.
   b. 5°27'00"S, 106°28'00"E.
   c. 5°29'00"S, 106°28'00"E.
   d. 5°29'00"S, 106°26'00"E.
2. Area 2—bounded by lines joining the following positions:
   a. 5°26'30"S, 106°32'00"E.
   b. 5°26'30"S, 106°35'00"E.
   c. 5°29'00"S, 106°35'00"E.
   d. 5°29'00"S, 106°32'00"E.
3. Area 3—bounded by lines joining the following positions:
   a. 5°36'00"S, 106°33'36"E.
   b. 5°36'00"S, 106°36'42"E.
   c. 5°36'42"S, 106°36'42"E.
   d. 5°36'42"S, 106°33'36"E.

3.14 Pulau Peniki (5°42'S., 106°43'E.) is an isolated tree-covered island that lies about 7 miles E of the S part of Kepulauan Seribu. The island is visible from a distance of 14 miles. An obstruction lies 3.3 miles S of Pulau Peniki. A light with a racon is shown from a metal framework tower on the island.

Tohor Jantan (Nassau Reef) (5°49'S., 106°49'E.), with a depth of 3m, lies 9 miles SE of Pulau Peniki, and is near the route usually followed by vessels bound for Tanjungpriok from the vicinity of Jaffa Utara.

The discoloration marking Tohor Jantan can be seen from distances up to 0.5 mile. Three detached reefs, having a least depth of 12.5m, and four wrecks exist within 6 miles W of Tohor Jantan.

The old harbor, N of Jakarta, is now a new fishing harbor, and named Muara Baru. There is a wharf 1,500m long with extensive cold storage facilities as well as a fish processing plant, where fishing vessels of up to 1,500 gt. berth alongside. At its NE corner, a yacht harbor is situated, 1 mile E of the canal.

Three submarine cables land at the SW section of the yacht harbor.

Karang Jawiel, 1.5 miles SSW of Tohor Jantan, has a depth of 6.7m.

Directions.—Vessels bound for Tanjungpriok from Selat Bangka should steer toward Jaga Utara, and after passing that island, steer to pass E of Kepulauan Seribu and about 1 mile W of Pulau Peniki.

After passing Pulau Peniki steer direct for Pulau Damar-besar so as to pass well clear W of Tohor Jantan and Karang Jawiel. Deep-draft vessels should bear in mind the existence of the shoals, previously mentioned, that lie W of Tohor Jantan.

Should a vessel, however, be well E of Kepulauan Seribu, steer on a course to pass 10 miles E of Pulau Peniki. With Pulau Damar-kecil bearing 184°, clear 2.5 miles E of Tohor Jantan and Karang Jawiel.

At night, without local knowledge, it is recommended that a vessel should make for Beting Eka reef, giving a berth of at least 3 miles, then change course to pass E of Tohor Jantan and Karang Jawiel on a line of bearing to Pulau Damar-besar Light. This track will pass near Susuh and the obstruction about 1.3 miles NNE of Pulau Damar-besar.

Caution.—To minimize difficulties with fish traps and stakes, it has been reported that some vessels proceed to a position 1.5 miles E of Pulau Damar-besar and then proceed on a course S toward Tanjungpriok.

Numerous wrecks, best seen on the chart, lie in the approaches and adjacent to the entrance channels to Tanjungpriok. Mariners are urged to use caution. A dangerous wreck (6°05.6'S., 106°51.7'E.) lies 274 meters S of the lighted buoy within Lighter Anchorage.

Jakarta Roadstead, lying N of the city, is no longer used to any extent.

The best anchorage in the roadstead, in depths of 9 to 10.9m, mud, lies N of the two moles that form the canal that leads to Jakarta.

Karang Puluputri (Pulau Puteri) (6°04'S., 106°51'E.), a reef, with a least depth of 2.8m, lies 3.5 miles NE of the head of the moles. Other dangers in the roadstead have been described.

The canal leads from Jakarta Roadstead to the old town of Jakarta. Before the construction of Tanjungpriok, about 4.5 miles E, it was the highway for inland traffic and is still used by small craft.

The canal is formed by two moles projecting 1.5 miles N from the high water line. When it is dangerous to enter or leave the canal, a blue flag is hoisted at the lookout tower in Jakarta.

Sail Regata is a set of eight conspicuous buildings located on the N end of the peninsula W of the moles.

Tanjungpriok (6°06'S., 106°53'E.)

World Port Index No. 50970

3.15 Tanjungpriok is part of the city of Jakarta. and the port for the capital of Indonesia. Tanjungpriok, the principal Indonesian port, is formed by an artificial harbor situated approximately 5.5 miles E of Jakarta. The port may be considered as consisting of three principal parts, as follows:

1. Jakarta Roadstead, lying N of the city.

Jakarta—Sail Regata

Approaches to Tanjungpriok

2. New Roadstead, lying N of Tanjungpriok.
3. Tanjungpriok Harbor, comprised of an outer harbor and by a series of inner harbors.

Dangerous cargo must be discharged into lighters outside the harbor area.

Port of Tanjungpriok
http://www.priokport.co.id

Winds—Weather.—Tanjungpriok is influenced by both land and sea breezes. The sea breeze sets about 1000; the Southeast Monsoon brings the wind NE until 1800, with the land breeze coming off about 2000 or 2100.

In the Northwest Monsoon, the sea breeze deflects the W wind into the NW. The effect of the land breeze shows as a backing wind, only 1 or 2 points S of W at night.

The time of the monsoon change and the duration of the monsoons show some variability from year to year. When the Southeast Monsoon sets in late, and is below the normal devel-

opment, the rainfall is usually in excess.

Occasionally, at the change from the Southeast Monsoon to the Northwest Monsoon, fairly strong SW or WSW winds, usually accompanied by dry weather, are experienced at Jakarta.

Haze, which is common during the Southeast Monsoon, may, on rare occasions, cause the visibility to fall to 1 mile or less in the vicinity of Jakarta and Tanjungpriok.

Tides—Currents.—The spring rise of tides in the harbor of Tanjungpriok is 1.1m.

There is almost no current in the roadsteads and off the entrance to the Outer Harbor. A weak current constantly flows out of the harbor and sets across the fairway; it poses no problem for entering vessels.

Depths—Limitations.—Tanjungpriok is divided into an Outer Harbor and Inner Harbor, which are protected by breakwaters. Changes to charted depths have taken place within the port of Pelabuhan Tanjungpriok and its approaches. The most significant depth changes are alongside depths of 7.5m to 10.4m within the Pelabuhan No. 1 and Pelabuhan No. 3, as well as the KOJA Container Terminal. Depths of 3.2m to 3.7m, best seen on the chart, lie approximately 1.6 miles NW of the Indonesian Hydrographic Office.

Outer Harbor is entered between two moles which extend 0.9 mile N from Inner Harbor and are almost awash at high water; the sea frequently breaks over them in the Northwest Monsoon.

The entrance, marked by beacons, is 183m wide, but quickly opens to a width of 0.3 mile between the breakwaters. The channel through Outer Harbor trends between lines of mooring buoys. It is maintained at a depth of 11.7m by dredging; the least charted depth was 10.8m. It was reported (1996) that the entrance channel was dredged to a depth of 12m.

Inner Harbor will accommodate vessels with a maximum draft of 10m and a maximum length of 170m. Inner Harbor consists of the prau harbor and five basins; the basins are numbered from W to E.

The prau harbor, known as Pelabuhan Nusantara, is the W of the inner harbors. It has direct communication with the old town of Jakarta by means of the ship canal, which is entered from the W side of Pelabuhan Nusantara and is available for small vessels. It is 676m, concrete, with a least charted depth of 3.8m alongside.

No. 1 Basin is used mainly by inter-island vessels. The depths in the basin range from 4.5 to 40.3m. The maximum length allowed for vessels berthed at this basin is 225m.

No. 2 Basin is used by ocean-going vessels up to 195m in length. Depths range from 4.8 to 10.5m. Tugs are essential when mooring and unmooring in this basin. Indonesian authorities report depths greater then 12m along the N end of the pier separating No. 1 Basin and No. 2 Basin.

No. 3 Basin is used by ocean-going vessels. Two container terminals, with a total berthing length of 920m and which can accommodate vessels up to 10,000 dwt, are situated on the E side of No. 3 Basin. Charted depths for No. 3 Basin are 4 to 12.8m. The passenger terminal has depths greater than 13m according to local authorities.

Oil Basin has four T-headed oil piers on its W side and can accommodate vessels with drafts up to 8.8m. Another wharf fronts a grain terminal on the E side of the basin, with depths of 4.9 to 7m alongside. The KOJA Container Terminal is located along the NE side of the Oil Basin. Depths along the N side of the terminal are reported (2008) dredged to a depth of 14m.

Sarfindo Berth lies close SSW of the E harbor entrance. This berth has a length of 220m and alongside depths to 10m. A car terminal fronts the harbor close E of the Sarfindo Berth.

A breakwater or training wall was at the E end of the harbor. It is understood that this area is being developed for tanker berths.

Tanjungpriok—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Bogasari Flour Mills Terminal						
Bogasari Flour Mills Jetty	205m	11.0m	—	—	—	Grain and flour. Berthing length of 236m (including dolphins).
Bogasari Jetty	174m	9.0m	—	—	—	Grain.
Domestic Container Terminal (Operations III)						
No. 207	144m	—	—	4.0m	—	Breakbulk.
No. 208	172m	—	—	12.0m	—	Containers and reefer. Continuous berthing length of 1,035m.
No. 209	172m	—	—	12.0m	—	
No. 210	172m	—	—	12.0m	—	
No. 211	172m	—	—	12.0m	—	
No. 212	172m	—	—	12.0m	—	
No. 213	172m	—	—	12.0m	—	

Tanjungpriok—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
IPC Car Terminal						
Berth 01 and LCT	88m	6.0m	—	—	—	PCC.
Berth 02	220m	12.0m	—	—	—	
Berth 04	148m	8.0m	—	—	—	
Berth 05	304m	12.0m	—	—	—	
Jakarta International Container Terminal 1 (JICT 1)						
No. 01	208m	—	—	11.0m	—	Containers and reefer. Continuous berthing length of 1,040m.
No. 02	208m	—	—	11.0m	—	
N.o 03	208m	—	—	11.0m	—	
No. 04	208m	—	—	11.0m	—	
No. 05	208m	—	—	11.0m	—	
No. 06	360m	—	—	11.0m	—	
No. 07	360m	—	—	11.0m	—	
Jakarta International Container Terminal 2 (JICT2)						
No. 01	255m	9.0m	—	8.6m	—	Containers and reefer. Continuous berthing length of510m.
No. 02	255m	9.0m	—	8.6m	—	
Koja Container Terminal						
Koja Container Berth	650m	14.0m	—	13.0m	2,000 dwt	Containers and reefer.
Mustika Alam Lestari (MAL) Terminal						
No. 214	150m	10.5m	—	10.0m	—	Containers, multipurpose, and reefer. Continuous berthing length of 300m.
No. 300	150m	10.5m	170m	10.0m	—	
New Priok Container Terminal 1 (NPCT1)						
Container Berth	850m	16.0m	—	—	150,000 dwt	Containers.
Nusantara Passenger Terminal						
Passenger Berth	180m	—	—	—	—	Cruise, ro-ro passengers/vehicles/rail, containers, breakbulk, multipurpose, and reefer.
PBM Olah Jasa Andal (OJA)						
No. 301	290m	—	270m	12.0m	—	Containers, breakbulk, and reefer. Continuous berthing length of 580m.
No. 302	290m	—	270m	12.0m	—	
Serbaguna Terminal						
No. 009	400m	9.0m	—	8.0m	—	Containers and reefer.
Tangguh Samudera Jaya (TSJ) Terminal						
No. 303	150m	—	—	12.0m	—	Containers, breakbulk, and reefer. Continuous berth length 450m.
No. 304	150m	—	—	12.0m	—	
No. 305	150m	—	—	12.0m	—	

Tanjungpriok—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Adipurusa Terminal						
No. 100	64m	—	—	—	—	Chemicals, clean products, cement, ro-ro passengers/vehicles/rail, container, breakbulk, multipurpose, reefer, and livestock.
No. 101	180m	—	—	—	—	Chemicals, clean products, cement, ro-ro passengers/vehicles/rail, containers, breakbulk, multipurpose, reefer, and livestock. Continuous berthing length of900m.
No. 102	180m	—	—	—	—	
No. 103	180m	—	—	—	—	
No. 104	180m	—	—	—	—	
No. 105	180m	—	—	—	—	
Conventional Cargo Terminal (Operation 1)						
No. 001	285m	6.0-8.0m	—	—	—	Chemicals, clean products, cement, ro-ro passengers/vehicles/rail, containers, breakbulk, multipurpose, and reefer. Continuous berthing length of 1,140m.
No. 002	285m	—	—	—	—	
No. 003	285m	—	—	—	—	
No. 004N	240m	—	—	—	—	
No. 004S	285m	—	—	—	—	
No. 005	175m	—	—	—	—	Chemicals, clean products, ro-ro passengers/vehicles/rail, containers, breakbulk, multipurpose, and reefer.
No. 005S	280m	5.0-8.0m	—	—	—	
No. 006	184m	—	—	6.0m	—	Chemicals, clean products, cement, ro-ro passengers/vehicles/rail, containers, breakbulk, multipurpose, and reefer. Continuous berthing length of 368m.
No. 007	184m	—	—	6.0m	—	
No. 007U	75m	—	—	—	—	Chemicals, clean products, cement, ro-ro passengers/vehicles/rail, containers, breakbulk, multipurpose, and reefer.
Conventional Cargo Terminal (Operation II)						
No. 107	190m	—	—	—	—	Chemicals, clean products, cement, ro-ro passengers/vehicles/rail, breakbulk, multipurpose, and livestock.
No. 108	168m	—	—	—	—	Chemicals, clean products, ro-ro/passenger, container, breakbulk, multipurpose, reefer, and livestock.
No. 109	160m	—	—	—	—	Chemicals, clean products, cement, ro-ro passengers/vehicles/rail, breakbulk, multipurpose, and livestock.
No. 110	160m	—	—	—	—	Chemicals, container, breakbulk, multipurpose, bunkers, reefer, and livestock.
No. 111	160m	—	—	8.5m	—	Chemicals, clean products, and containers.
No. 112	160m	9.0m	180m	—	30,000 dwt; 38,000t	Chemicals, clean products, ro-ro passengers/vehicles/rail, container, breakbulk, multipurpose, bunkers, and reefer. Maximum beam of 30m .

Tanjungpriok—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
No. 113	160m	8.0m	180m	—	25,000 dwt; 33,000t	Chemicals, clean products, cement, ro-ro passengers/vehicles/rail, container, breakbulk, multipurpose, bunkers, reefer, and livestock. Maximum beam of 30m.
Note.—Berth No. 109, Berth No. 110, Berth No. 111, Berth No. 112, and Berth No. 113 have a continuous berthing length of 802m.						
No. 114	350m	—	—	14.0m	—	Chemicals, aggregates, cement, ro-ro passengers/vehicles/rail, steel products, breakbulk, multipurpose, bunkers, and livestock.
No. 115	250m	—	—	12.0m	—	Chemicals, clean products, cement, ro-ro/passenger, containers, breakbulk, multipurpose, bunkers, reefer, and livestock.
No. 200	140m	7.0m	—	—	25,000 dwt; 33,000t	Chemicals, clean products, container, breakbulk, multipurpose, bunkers, and livestock. Maximum beam of 30m.
No 201.	163m	—	—	—	—	Chemicals, crude products, ro/pax, containers, breakbulk, multipurpose, bunkers, reefer, and livestock.
No. 202	163m	—	—	—	—	Chemicals, ro/pax, containers, breakbulk, multipurpose, bunkers, reefer, and livestock.
No. 203	163m	—	—	—	—	Chemicals, clean products, ro-ro/passenger, containers, breakbulk, multipurpose, bunkers, reefer, and livestock.
Note.—Berth No. 201, Berth No. 202, and Berth No. 203 have continuous berth length 490m.						
Marunda Center Terminal						
East Pier	815m	9.5m	—	—	40,000 dwt	Chemicals, clean products, vegetable oils, cement, coal, sand, ro-ro/lo-lo, project/heavy cargo, steel products, breakbulk, and bunkers.
West Pier 1	200m	9.5m	—	—		
West Pier 2	615m	9.5m	—	—		
Dharma Karya Perdana (DKP) Terminal						
DKP Berth	212m	8.0m	170m	7.0m	13,000 dwt; 20,000t	Chemical gases, chemicals, clean products, and bunkers.
Muara Karang (PLTUG) Terminal						
MBM Muara Karang	—	—	—	—	30,000 dwt	Clean products.
Murara Tawar Power Station (PLTGU)						
CBM Muara Tawar	—	—	—	—	—	Clean products.
Pertamina Terminal						
PMB I	—	9.0m	165m	8.9m	18,000 dwt	Aviation fuel, clean products, LPG, and bunkers. Berthing length of 250m (including dolphins).

Tanjungpriok—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
PMB II	—	12.0m	180m	10.3m	22,000 dwt	Aviation fuel, clean products, dirty products, and bunkers. Berthing length of 275m (including dolphins).
PMB III	—	12.0m	185m	10.3m	30,000 dwt	Aviation fuel, clean products, dirty products, LPG, bunkers. Berthing length of 282m (including dolphins).
PMB IV	—	9.3m	185m	9.0m	35,000 dwt	Clean products, dirty products, LPG, bunkers. Berthing length of 250m (including dolphins).
Vopak Terminal Jakarta (VTJ)						
Jetty 01	116m	13.6m	210m	12.6m	65,000 dwt; 84,500t	Clean products. Berthing length of 207m (including dolphins).
Jetty 02	30m	7.6m	100m	6.6m	5,000 dwt; 7,706t	Clean products. Berthing length of 117m (including dolphins).

There are six floating docks available, with lifting capacities of up to 12,000 tons. Berth information is shown in the table titled **Tanjungpriok—Berth Information**.

Aspect.—A chimney, standing 2.3 miles S of the canal entrance to Jakarta, and a conspicuous white monument on shore, 2.7 miles farther E, provide useful landmarks. The cathedral, 4.5 miles S of the canal entrance, is a prominent edifice with two spires. A white stone tower is situated about 0.3 mile SW of the cathedral. A conspicuous silo, bearing the marking "INDO CEMENT," stands about 200m S of the harbormaster's office.

Pilotage.—Pilotage is compulsory for vessels entering Tanjungpriok. Pilots board in the following positions:

1. Area A (vessels less than 100m long)—1 mile from the harbor entrance in position 6°03.8'S, 106°52.9'E.
2. Area B (vessels between 100m and 200m long)—2 miles from the harbor entrance in position 6°02.8'S, 106°52.9'E.
3. Area C (vessels greater than 200m long)—3 miles from the harbor entrance in position 6°01.8'S, 106°52.9'E.

The Port Administration should be notified 24 hours prior to arrival. Requests for pilots are required 6 hours prior to arrival and 3 hours prior to departure. The pilot may be notified on VHF channels 12 and 14.

Anchorage.—Designated anchorage areas range in depth from about 10 to 14m and are best seen on the chart. Unexploded ordnance has been found (2004) located 400m W of the charted Tanker Anchorage Area. All vessel should avoid this area. Piracy incidents have occurred while vessels were at anchorage. Mariners are urged to exercise caution.

Indonesian Marine Police have recommended ships to anchor where they conduct patrol in the vicinity of 6°00S, 106°54'E.

Caution.—Target practice may be conducted in the bay area N of Jakarta. A restricted military area has been established within the breakwater close SE of the Lighter Anchorage.

Two shoals lie NE of the new E entrance to Tanjungpriok. Karang Cikasi (Brunda Reef), with a depth of 4.5m, and Karang Prigem (St Nicholas Shoal), with a depth of 7.6m, lie about 2.3 miles ENE and NE, respectively, of the E entrance to Tanjungpriok. A depth of 5.2m lies about 0.2 mile NE of the same entrance.

Jalasveva Jayamahe Monument

There are significant charted hazards and wrecks in the approach to Jakarta and unexploded ordinance lies between the two northern anchorages. These hazards are best seen on the chart.

A gas pipeline, best seen on the chart, extends N from shore close W of Tanjungpriok. These pipelines may not be buried and charted depths may be decreased by up to 2m. Anchorage is prohibited within 500m of these pipelines.

A submarine oil pipeline has been established within the KOJA Container Terminal basin between PMB2 and PMB3 extending NE close N of the floating docks on the E side of the basin.

Mariners are advised to navigate with caution in the area and consult the local port authorities for the latest information.

Tanjung Krawang to Tanjung Tanah

3.16 The N coast of Jawa from Tanjung Krawang to Tanjung Tanah, 100 miles ESE, is low, flat and covered with large trees. Several conspicuous mountains, located from 25 to 50 miles inland, are often visible during the Northwest Monsoon, but rarely are seen during the Southeast Monsoon due to haze.

Caution.—A restricted area, which can best be seen on the chart, extends offshore between meridians 106°59'E and 108°46'E. Unauthorized entrance into this area is prohibited.

Gunung Pangrango (6°47'S., 106°56'E.), located about 50 miles S of Tanjung Krawang, is a dome-shaped mountain, 3,019m high. Gunung Gede, 2,958m high, is close SE of Gunung Pangrango. A column of white smoke is often seen to rise from the N side of the W peak of Gunung Gede.

Gunung Sanggabuana, 19 miles NE of Gunung Pangrango, is a round saddle-shaped mountain 1,291m high. Gunung Parang, 7 miles farther E, attains an elevation of 966m, and is the highest peak of a rugged group of mountains.

Gunung Tangkubanprahu, 18 miles SE of Gunung Parang, is 2,081m high. It has an extinct volcanic crater on its E side, which has some resemblance to a capsized vessel. Gunung Bukittunggul, 8 miles ESE of Tangkubanprahu, is connected to that peak by a lower ridge; it has a somewhat bare summit, 2,209m high.

Gunung Tampomos, an isolated conical peak with a round top 1,684m high, is located 14 miles ENE of Gunung Bukittunggul. Gunung Kromong, located 18 miles SSW of Tanjung Tanah, is in a chain of low peaks standing close together; it rises to a height of 587m.

Gunung Ciremay (Tjareme) (6°54'S., 108°24'E.), 10 miles S of Gunung Kromong is 3,078m high. It consists of a truncated conical-shaped volcano, from which smoke occasionally rises. The nearly topped flat volcano rises slightly higher on its W side.

From Tanjung Krawang the coast trends ESE, about 20 miles, to Tanjung Sedari. The 20m line lies from 1.5 to 8 miles offshore along this coast. A dangerous wreck lies 12.5 miles NNE of Tanjung Krawang.

Sedari Reef (5°54'S., 107°25'E.), with a least depth of 7m, lies 6 miles offshore, NNE of Tanjung Sedari. A 9m patch lies 2 miles WNW of Sedari Reef and a ridge with a depth of 4.9m, lies between Sedari Reef and the shore. A passage leading between the two dangers is about a mile wide with a least depth of 10.1m.

Tanjung Bobos (6°11'S., 107°49'E.), a low point backed by high trees, is about 31 miles SE of Tanjung Sedari. The coast between the points is low and is intersected by a number of small streams.

The 20m line lies 6.5 miles off Tanjung Sedari and 2 miles off Tanjung Bobos. A dangerous wreck lies 11 miles NNW of Tanjung Bobos.

Sedulang Reefs lie within the 10m curve, with the W reef 13.5 miles SE of Tanjung Sedari. These reefs stretch along the coast for a distance of 7.5 miles, with their outer extremity 4.5 miles offshore in places. Pulau Tjiparage is an above-water sand bank lying 1.3 miles inside the W edge of the reef.

Caution.—A petroleum platform, best seen on the chart, lies 4 miles NE of Pulau Tjiparage.

3.17 Patimban (Pamanukan) (6°14'S., 107°54'E.) lies about 62 miles E of the Port of Tanjungpriok and is reported to be a deep-sea port developed with the intention of reducing congestion at Tanjungpriok. Patimban is still under development, but open for limited operations (2020). The port is expected to be fully completed by 2027.

Depths—Limitations.—The approach channel is dredged to 10m (2020). The channel extends the length of the harbor from 1.5 miles NNE of the breakwater to the wharf. Charted depths outside the channel and in the turning basin are 5 to 10m.

A wharf stands at the SW end of the harbor. Two berths extend from it in an L-shape, both with a depth alongside of 10m. The E berth has a length of about 440m and the S berth has a length of about 300m.

Aspect—The harbor of Patimban is sheltered by two breakwaters at its NNE end and comprises a narrow dredged channel leading towards a turning circle and wharf. The wharf, joined to the shore by narrow causeways, has two berths extending NNE and ESE respectively.

Regulations—Vessels entering port should follow the 26-mile long, two-way route entry system established for traffic navigation through the restricted area and offshore platforms of Ardjuna Oil Field.

Anchorage.—Outer anchorages are situated on both sides of the approach channel. See the table titled **Patimban—Outer Anchorages.**

Caution.—Major land reclamation is in progress (2020) within the breakwaters on both sides of the dredged channel and wharf.

3.18 Teluk Ciasem (6°12'S., 107°40'E.) is a bay which lies E of Sedulang Reefs. Ciasem, with a depth of 4.5m, is a small coral reef lying in the middle of the bay.

Several small rivers, navigable only by praus, discharge into Teluk Ciasem. An oil platform lies in the middle of the bay.

Pamanukan Rock (6°01'S., 107°53'E.), 10 miles NNE of Tanjung Bobos, is formed of coral and is steep-to.

Patimban—Outer Anchorages

Zone	Latitude	Longitude	Depths	Seabed	Remarks
Zone A	6°09'30.6"S	107°56'04.8"E	17.0-20.0m	Mud	Laid-up vessels
Zone B	6°10'17.4"S	107°55'42.0"E	8.0-15.0m	Mud	Emergency anchorage
Zone C	6°10'18.0"S	107°57'30.6"E	17.0-19.0m	Mud	Post panamax container vessels

Patimban—Outer Anchorages					
Zone	**Latitude**	**Longitude**	**Depths**	**Seabed**	**Remarks**
Zone D	6°10'53.4"S	107°57'13.2"E	14.0-17.0m	Mud	Panamax container vessels
Zone E	6°11'29.4"S	107°56'56.4"E	11.0-14.0m	Mud	Container vessels
Zone F	6°11'55.8"S	107°56'14.4"E	8.0-10.0m	Mud	Tugboats
Zone G	6°12'00.6"S	107°56'42.6"E	10.0m	Mud/Sand	Quarantine
Zone H	6°10'43.8"S	107°58'23.4"E	17.0m	Mud	Post panamax quarantine
Zone I	6°11'36.6"S	107°57'57.6'E	11.0-16.0m	Mud/Sand	Long-term development

Ardjuna Oil Field contains numerous crude oil production platforms, natural gas liquids processing facilities, and other oil installations, extending 22 miles offshore. Its central gathering platform, B Field, lies 17 miles NNW of **Tanjung Bobos** (6°11'S., 107°49'E.).

Its outlying platforms span up to 28 miles ESE and 34 miles W of the central gathering platform, and they are connected by pipelines. Lights are shown from the platforms. New platforms may be encountered.

Restricted area.—Ardjuna Oil Field is protected by a restricted area, the limits of which can be seen on the chart. Unauthorized entry in the area is prohibited.

Gas pipelines contain flammable natural gas at high pressure. A ship damaging a pipe could be faced with an instantaneous fire or lose its buoyancy. Mariners are advised not to engage in anchoring, trawling, or other seabed activities within 1 mile of a submarine pipeline.

3.19 Ardjuna Marine Terminal (5°54'S., 107°44'E.) (World Port Index No. 50340) consists of six lighted Single Buoy Moorings (SBMs), close N of the central gathering station. Three SBMs are occupied by the following moored storage tankers:

1. SBM No. 1—Arco Ardjuna.
2. SBM No. 3—Cempaka Nusantara.
3. SBM No. 5—Ardjuna Sakti.

Arco Ardjuna

SBM No. 2 and SBM No. 4 are used for loading crude oil by vessels of up to 100,000 dwt and 200,000 dwt, respectively, and can be loaded to a maximum draft of 30.2m.

SBM No. 6 is used by vessels up to 50,000 dwt for loading liquid butane.

The general depth of water in the vicinity is 38m.

Pilotage.—Pilotage is compulsory within the terminal limits. Pilots board vessels in the anchorage area at position 5°50.5'S, 107°47'E. Mooring launches assist vessels to secure to a berth. Heavy weather can delay vessel berthing, and usually there is no berthing at night; however, unberthing may be conducted at any time.

Vessels are recommended to use VHF channel 16 or 156.8 MHz when within range and on approaching the terminal. The initial contact is made by the approaching vessels.

Regulations.—Tankers with dirty ballast are not permitted to berth. Indonesian laws are in force at the terminal and the Indonesian flag must be flown by day during a vessel's call. There are no port facilities or medical assistance available.

Anchorage.—There is an anchorage area about 1.5 miles square, centered 2.5 miles N of the terminal.

Another recommended anchorage area is centered at position 5°50.5'S, 107°49.0'E, approximately 6 miles NE of the SBMs.

Vessels should transmit their ETA 72 hours, 24 hours, and 12 hours before arrival. A dangerous wreck lies 4 miles WNW of the anchorage area.

Caution.—An explosive dumping area is located NW of the terminal in position 5°51'S, 107°41.4'E.

The vessel Bina Bakti was reported sunk (2004) between two oil platforms located approximately 6 miles NE of Tanjung Sedari.

Numerous platforms, wrecks and submarine pipelines has been reported between Ardjuna Oilfields S and Tanjung Karawang N; they are best seen on the chart.

3.20 Pulau Rakit (5°56'S., 108°23'E.), 19 miles NNE of Ujung Indramayu, is densely wooded and fringed by a steep-to reef, which partly dries. A light is shown from a white metal framework tower, 50m high, on the S side of the island. A sunken vessel was reported (2021) lying 19 miles NNW.

Krang Rakit Utara (Candikian Reef) lies 8 miles NNE of Pulau Rakit, with Gosong Reef midway between. Both of these reefs consist of steep-to coral atolls and are usually marked by discoloration.

A clear channel exists between the two reefs as well as between Gosong Reef and Pulau Rakit, but vessels generally pass S of the island. A dangerous wreck lies 5.5 miles SSW of Pulau Rakit, and another is situated 17.5 miles SE of the same island.

Between Tanjung Bobos and **Ujung Indramayu** (6°14'S.,

108°18'E.), about 29 miles E, the coast is wooded, and some small rivers, with villages in the vicinity, discharge into the Java Sea.

Tanjung Kentong (Tanjung Sentigi), 8 miles WSW of Ujung Indramayu, is fronted by a bank of sand and mud, which extends about 1 mile seaward and is marked by brown discoloration.

A canal for praus and small vessels is entered about 2 miles S of Ujung Kentong. The villages of Cimara and Losarang are on the canal about 2 and 6 miles, respectively, within the entrance. The entrance of the canal is marked by a flagstaff and a beacon.

Anchorage can be obtained off the entrance to the above canal, but the depths decrease rapidly within the 5m line.

Vessels anchoring should not approach closer than 2 miles, nor in depths of less than 8.5m.

Indramayu Road is between Ujung Kentong and Ujung Indramayu, 8 miles ENE. These points are low and form the SW and NE points of Ci Manuk delta.

The coastline in the vicinity of Ci Manuk had extended 1.5 miles seaward from its charted position. A buoy with red and white stripes is moored off the mouth of the river.

The town of Indramayu is 10 miles up river from the mouth of Ci Manuk, but can only be reached by small craft.

Anchorage may be obtained in Indramayu Road, but deep draft vessels should not approach within depths of 22m.

3.21 **Balongan** (6°20'S., 108°22'E.), a small harbor protected by two breakwaters extending 200m from the shore, is backed by a tank farm and lies 9 miles SE of Tanjung Indramayu. There are two inshore berths, 80m in length, with depths of 3.8m and 4m alongside, for coasters. Jetties have been constructed in the inner sides of the breakwaters enclosing the harbor on its NW and SE sides.

A light is shown from each breakwater head. A lighted beacon stands on the coast, 1 mile NW of the harbor, and a tower marked by a red light stands near the inshore end of the pipeline, which leads 7 miles NE to the main offshore oil terminal. There is a coastal radio station at the port.

Balongan Oil Terminal (6°16'S., 108°28'E.) consists of three SBMs and a group of four conventional mooring buoys. A safe water lighted buoy is moored 2.5 miles NE of the export SBM (Balongan Terminal); the anchorage lies 3 mile N of the terminal.

Vessels of up to 150,000 dwt, with a length of 290m, can berth at the export terminal, in a depth of 22m.

The domestic SBM and four mooring buoys lie 2.5 miles SW of the export terminal. Vessels of up to 36,500 dwt, with a length of 200m, can berth at the domestic SBM, in a depth of 14.5m.

Pilotage is compulsory; the pilot boards in the vicinity of the SBMs. Vessels berth and unberth during daylight only.

Arimbi Oil Field (6°20'S., 108°40'E.) contains two production platforms, about 20 miles ESE of Tanjung Indramayu. An oil pipeline joins the two platforms and leads 15 miles W to Balongan.

The platforms, connected by a pipeline which runs in a 256° direction to Balongan, are surrounded by a restricted area. This area extends 1 mile from the platforms and pipeline.

Between Ujung Indramayu and **Tanjung Tanah** (6°29'S., 108°33'E.), 20 miles SE, the coast is wooded, but there are many villages visible from the sea. The most prominent object is a tall white chimney of the sugar factory in the village of Karangampel. The chimney stands 5.5 miles W of Tanjung Tanah.

Anchorage may be obtained S of the pipeline restricted area, in depths of 5 to 9m, with Karangampel chimney bearing 200°.

Tanjung Tanah to Tanjung Blenderan

3.22 Between Tanjung Tanah and Tanjung Blenderan (Ceteng), 147 miles E, a number of rivers flow into the sea. They are only navigable for any distance by praus.

The coast between Tanjung Tanah and Cirebon (Tjirebon), 14 miles S continues to be flat, then the mountains approach nearer the sea. In the vicinity of **Tanjung Celong** (Tjelong) (6°55'S., 109°56'E.), 83 miles E of Cirebon, several stand within 2 miles of the coast.

From Tanjung Celong to Semarang, 29 miles E, the mountains recede, but there are a few isolated hills within 5 miles of the coast.

At Semarang, the coast turns NNE for 35 miles to Tanjung Jati (Tanjung Djati), then E again 13 miles to Tanjung Blenderan (Tanjung Beteng). For the first 26 miles NE of Semarang, this stretch of coast is swampy.

The land within for 15 miles, is low; thereafter it is backed by Gunung Muryo (Gunung Murjo), which attains an elevation of 1,602m.

An elongated ridge of mountains, lying nearly parallel to the coast, extends E from the S slope of **Gunung Ciremay (Gunung Tjareme)**(6°54'S., 108°24'E.), at a distance of 20 miles from the coast. The ridge terminates in Gunung Kumbang, a prominent round summit 1,219m high, located 21 miles WNW of Gunung Slamet. Gunung Tapak rises to a height of 340m, 17.5 miles WNW of the same peak.

Gunung Slamet (7°14'S., 109°13'E.), a 3,420m high flat-topped mountain, has a prominent peak, formed by the edge of an old crater, on its NE side. A thick column of smoke is often seen rising from an active crater on the SW side of the mountain.

Gunung Gajah, 13 miles SE of **Tegal** (6°51'S., 109°08'E.), is an almost bare rock, 309m high, in the middle of a thickly-wooded ridge. It resembles a gigantic elephant with its head to the W.

Two wooded hills, located on the same ridge 2 miles E of Gunung Gajah and of approximately the same elevation, are shaped like coffins.

Gunung Sendoro (7°18'S., 110°00'E.), a symmetrical peak with an elevation of 3,136m, lies 32 miles SW of Semarang.

Gunung Ungaran, 15 miles SSW of Semarang, has a round undulating summit 2,050m high. It is connected by a ridge to Gunung Merbabu, 17 miles S.

From Tanjung Tanah to Ujung Brebes, 32 miles SE, the coast recedes to form a bay. The 10m curve lies up to 17 miles offshore along this coast.

Tanah Reef, with depths of less than 5m, extends 10 miles ESE from Tanjung Tanah. It is composed of sand and mud, mixed in places with shells. The N edge of the reef is steep-to. The depths increase rapidly to 10m.

Cirebon Reef (Tjirebon Reef), with a width of 4 miles, extends 13 miles SE from Tanah Reef. Except for an isolated 5.5m patch,

10 miles NE of the entrance to Cirebon, the depths over this flat deepen gradually from 5.8 to 7.9m, until in the vicinity of the delta off Tanjung Sanggarung. In its N part, the bottom is mostly hard sand and mud, but farther S, this changes to soft mud.

A 7m shoal lies 5 miles SW of the 5.5m patch mentioned above.

An Ammunition Dumping Ground is 10 miles ESE of Tanjung Tanah and another, with a radius of 3 miles, is centered 12 miles ENE of the entrance to Cirebon.

3.23 Cirebon (Tjirebon) (6°43'S., 108°34'E.) (World Port Index No. 51010) stands at the head of a basin which is entered between two moles extending in a NE direction from the shore.

Winds—Weather.—Weather conditions in the vicinity of Cirebon Road vary with the seasonal monsoons. During the Southeast Monsoon (May to October), a very dry local wind from S to SW generally begins between 1900 and 2100, lessening in force at sunrise and ceasing entirely between 0900 and 1000. About 2 hours later a NE to E breeze sets in, usually weak, but occasionally increasing in force in the afternoon; when the latter is the case, it usually shifts to E.

There is often a swell from ENE, usually increasing towards evening and diminishing in the morning.

Frequently during the Northwest Monsoon, thick white clouds gather in the afternoon on the slopes of Gunung Ciremay and Gunung Slamet. In the afternoon these clouds pack together in a heavy, dark sky and about sunset discharge heavy rain, with squalls from W and SW.

Sometimes the weather remains squally throughout the night; at other times, after a heavy shower, it is calm for a considerable time with a light breeze from SW to W. In the latter part of the night, the wind may blow hard again from NW, generally shifting towards morning to WNW, increasing in force in the morning or afternoon and shifting again to NW.

These strong NW winds continue for days in February, and are mostly coupled with dry weather, but occasionally with showers.

Depths—Limitations.—The entrance channel to a position abeam the root of the N breakwater was dredged to about 7m, with a least depth of 6.2m close W of the fairway lighted buoy. The inner basin is known as No. 1 Basin; the outer basin is known as No. 2 Basin. Entrance to the inner harbor, which was open 24 hours, with movements controlled from the signal station, was limited to maximum draft of 4m.

Quays extend along the NE and NW sides of No. 2 Basin. The largest quay is 275m long, with a depth of 6.0m alongside, and can accommodate vessels up 150m in length, with a maximum draft of 6.0m. A second jetty, lying along the S shore of the bay between Tanjung Jaga and Tanjung Bangkaderes, extends 1.5 miles offshore in a NNW orientation.

Aspect.—Range lights, in line bearing 258°, lead into the harbor between the head of the moles.

Two prominent aluminum-colored tanks stand close together close S of the harbor basin. Other prominent marks are the spire of the Roman Catholic Church, 0.3 mile S of the two tanks mentioned above; the water tower, standing 0.75 mile W of the two tanks; and Bukit Jati (Bukit Djati), a round wooded hill 60m high, 3 miles NW of the harbor entrance.

Pilotage.—Pilotage is compulsory. There is a traffic signal station at the root of the S breakwater.

Anchorage.—There are four designated anchorage areas on the roadstead fronting Cirebon, within the harbor limits of 6°40'S, 108°40'E, and 6°44'S.

Anchorage Area A is for vessels with a draft between 8 and 10m. The greatest depth within this area is 11.2m, in a position about 6 miles E of the harbor entrance at the E limit.

Area B, lying W of Area A, is designated for vessels carrying dangerous cargo and tankers, with the greatest depth is 8.8m. A dangerous wreck lies 2.5 miles NNE from the harbor entrance.

Area C lies S of Area B and the safe water lighted buoy moored 1 mile E of the harbor entrance.

Area D, lying S of Area C, is for vessels awaiting to dock, and has a greatest depth is 8.2m. There is a pipeline leading to the shore, marked by a can buoy, which lies close S of Area D.

Ujung Brebes (6°46'S., 109°01'E.), 26 miles ESE of the entrance to Cirebon, is a low, wooded point that has been formed by silt from the rivers which flow out in this vicinity.

A light is shown from a white structure, 20m high, on Tanjung Brebes.

3.24 Tegal (6°51'S., 109°08'E.) (World Port Index No. 51020), 5 miles SE of Ujung Brebes, is a lighterage port unsuitable for deep-draft vessels, entered between two breakwaters which lead to a small harbor. Molasses is the major export. Tegal Main Harbor Light stands about 0.3 mile SSE of the E breakwater head.

The depth in the entrance and close within the harbor is dredged to between 3.0 and 3.5m. There are pilots available and no restrictions on night entry. A blue flag is displayed from the Customs House when entry is dangerous.

Anchorage can be taken in Tegal Road, in depths of 5 to 7m, between 1 and 1.5 miles N of the breakwater heads. Vessels up to 26,000 dwt, with a length of 150m and a draft of 7m, have been accommodated.

Vessels with drafts exceeding 7.6m should anchor 2.5 to 3 miles offshore. Fish traps are charted in Tegal Road.

Karang Jeruk (6°49'S., 109°12'E.), a steep-to coral reef, with an above-water rock, lies outside the 11m line, 4.5 miles NE of the entrance to Tegal Harbor. A lighted beacon stands on the W side of Kerang Jeruk.

Sugali Rock and Pemalang Rock, 1 mile apart and marked by discoloration, with depths of 4.3m and 4.5m, lie outside the 20m curve, 4 miles NW of Ujung Pemalang.

Ujung Pemalang (6°48'S., 109°32'E.), a low wooded point, lies 25 miles E of Tegal. This area should not be approached in depths of less than 20m, as it is extending N.

Tanjung Gunung (6°53'S., 109°48'E.) rises to a small hillock with trees, whose tops attain an elevation of 83m, about 16 miles ESE of Ujung Pemalang. A buoy is moored 3 miles N of Tanjung Gunung, and a dangerous wreck lies 6.75 miles ENE of the same headland.

Tanjung Celong, a high wooded point, lies 7.5 miles E of Tanjung Gunung. The coast is closely backed by a hilly ridge. Gunung Priska, 367m high, is the most remarkable summit on this ridge.

Tanjung Korowelang (6°51'S., 110°12'E.), 17 miles ENE of Tanjung Celong, is a low point formed by the silt deposit from Kali Bodri, which has a delta mouth. Two chimneys stand on the W side of this river, 4 miles and 6.5 miles, respectively, S of the point.

Semarang Approaches

Korowelang, a steep-to reef with a least depth of 3m, lies 3 miles NNW of Tanjung Korowelang. The usual route leads N of this danger; it is seldom marked by discoloration. A lighted buoy marks the reef. A dangerous wreck is situated approximately in position 6°48'S, 110° 08'E.

Karang Bapang (6°34'S., 109°50'E.), a steep-to reef with a least depth of 3.3m, lies 19 miles NNE of Pekalongan Light. It is seldom marked by discoloration, and the coast is difficult to identify when in its vicinity. A rock, with a similar depth, is 2.5 miles SSW of Karang Bapang. A light is shown from Karang Bapang.

3.25 **Pekalongan** (6°51'S., 109°42'E.) (World Port Index No. 51030) has an open roadstead which offers little protection from either monsoon. The harbor is formed by the mouth of the Kali Pekalongan which flows out between two concrete moles. The harbor is only suitable for small vessels employed in local trade.

The Customs House stands close within the harbor entrance, and 0.5 mile farther upstream, a bridge, with a fort adjacent to it, spans the river.

A light is shown from a white metal framework tower, 14m high, on the W bank of the river, close within the harbor entrance.

Anchorage can be obtained, in depths of 5 to 7m, soft mud, 1 mile offshore, with the light bearing between 160° and 200°. When approaching from E, a group of casuarina trees, 91m S of the light, are easier to identify.

Between Tanjung Korowelang and Semarang, 14 miles ESE, the coast is mostly marshy.

All the dangers along this sector of the coast are contained within the 20m line, which lies up to 5.5 miles offshore. The coastal reef projects 0.5 mile from the coast in places.

Semarang (6°57'S., 110°25'E.)

World Port Index No. 51040

3.26 Semarang harbor is entered from the N and is protected by several detached breakwaters.

The harbor, formerly suitable only for small vessels and praus, has undergone extensive development. The harbor now functions as a sizable port with container, bulk, and oil terminal facilities.

Semarang—Tanjung Emas Port
http://tgemas.pp3.co.id/english

Winds—Weather.—During the Northwest Monsoon, it either blows hard accompanied by rains or it is almost completely calm; there is seldom any intermediate phase.

The finest weather is often replaced, without warning, by squally weather. The monsoon wind is never S of WSW; the main direction of the sea wind during this monsoon is NW and the land wind is reduced in strength.

During the Southeast Monsoon, the land wind usually blows regularly from ESE to SE throughout the night until 0900; then the force diminishes and backs to ENE about 1200.

Until 1400 there are light variable winds and then the sea breeze arrives suddenly from NNE, quickly raising a swell and sea, blowing with great regularity until about 2000.

The wind then veers to ESE, being less regular for a short period and becoming steady again at 2100. Around sunrise, the atmosphere is very hazy, but after a couple of hours of sunshine it becomes clearer, although the land in the interior often remains obscured; towards afternoon it becomes hazy again. During the monsoon, not more than 2 hours a day of even moderately-good visibility can be expected.

Tides—Currents.—Mariners are cautioned, especially during the Northwest Monsoon, to stay close to the W breakwater as the tidal current sets across the entrance.

Depths—Limitations.—The harbor area has been dredged to 9m and can accommodate vessels up to 10,000 tons.

Tanjung Emas Ocean Terminal (6°56'S., 110°25'E.), about 450m in length, lies at the seaward end of the E side of the harbor. A turning area, 350m in diameter, lies off the terminal.

An oil terminal lies about 4 miles offshore NNE of the harbor. Pipelines are laid N from a position 1 mile E of the harbor to mooring buoys. The E pipeline extends 3.75 miles NE to buoys marked close seaward by lighted buoys; tankers of 15,000 to 30,000 tons can be accommodated. The W pipeline extends 3 miles NNW to a lighted SBM, moored in a depth of 11.6m, about 2 miles NNE of the head of the W breakwater; tankers up to 36,000 dwt, with a maximum length of 185m, can be accommodated.

Vessels over 800 tons, with a draft and length exceeding 3.5 and 82m, respectively, must anchor in Pelabuhan Semarang.

Aspect.—In addition to Melaya, a hill 56m high, lying about 2.5 miles SW of Semarang, and Semarang light, the railway station, a long white-roofed building close SE, is a useful landmark.

Pilotage.—Pilotage for all vessels entering the harbor over 177gt is compulsory. A pilot can be obtained on request to the harbormaster. Pilots should be requested 6 hours before arrival and 3 hours before ETD. Pilots are available 24 hours, however, berthing is restricted to the hours between 0600 and 1800.

Pilots board in the following positions:

a. 6°52.00'S,110°25.01'E.

4. 6°53.98'S, 110°24.49'E (in the anchorage).

b. In the lee of the W breakwater during the NW monsoon season.

During the Northwest Monsoon, the pilot boards under the lee of the W breakwater or a vessel may be led in by the pilot boat.

Signals.—During inclement weather, entrance to the harbor is frequently dangerous, in which case a blue flag is hoisted from the flagstaff near the lighthouse and also from the signal mast of the lookout station.

When communication with the shore is suspended due to bad weather, vessels can make contact with the shore by radio via the harbormaster.

The following signals are displayed from a flagstaff at the harbormaster's office for guidance of vessels entering or leaving the harbor:

1. Two cones, points together with a ball between, vertically displayed—Entrance permitted. Praus are forbidden to leave.

2. Two balls, with a cone point up between them, vertically displayed—Departure permitted. Praus are forbidden to enter.

Contact Information.—See the table titled **Semarang—Contact Information**.

Anchorage.—Large vessels anchor, in depths of 9 to 11m, 1.4 miles NW of the end of the W breakwater. Small vessels anchor, in depths of 5 to 7m, 1 mile from the head of the W mole.

An SPM (6°46'55.2"S., 110°25'53.4"E.) lies about 6 miles N of the harbor entrance in depths of about 20m; tankers up to 50,000 dwt can be accommodated.

Directions.—From the safe water buoy (6°52'S., 110°25'E.), proceed with the range lights, in line bearing 176°, through the breakwater and onto the berth.

Caution.—Two pipelines are located between 0.3 and 0.6 mile from the E boundary of the anchorage in a N to S orientation extending up to 6 miles offshore.

During the Northeast Monsoon, the anchorage area may be used for loading logs.

A dangerous wreck is situated in position 6°53'15"S, 110°21'54"E.

Semarang—Contact Information	
Port Operations	
Telephone	62-24-3580668
	62-24-3565695
	62-24-3565696
	62-24-3565697
Facsimile	62-24-3586219
E-mail	tpk.semarang@tpks.co.id
Web site	https://www.tpks.co.id/new/home/index
Vessel Traffic Service	
Call sign	VTS Semarang
VHF	VHF channels 68 and 72
MMSI	005251572
Telephone	62-24-3542039
Facsimile	62-24-3567731
E-mail	semarangvts@gmail.com

The safe water buoy (6°52'S., 110°25'E.) is reported missing.

A submarine cable, best seen on the chart, extends offshore from a position about 21 miles E of Semarang NNE for 18 miles, then diverts ENE for 60 miles around Tanjung Betong, generally following the coastline 24 miles offshore before turning S towards the shore close E of Unjung Pangkah.

Semarang—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			LOA	Size	
PT Pupuk Sriwidjaja					
Cargo Jetty	20m	—	—	—	Fertilizer and urea.

Semarang—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			LOA	Size	
Terminal Petikemas Semarang (TPKS)					
Container Berth	—	10.0m	—	—	Containers and reefer. Berthing length of 635m.
Port of Tanjung Emas Semarang					
Nusantara	490m	7.0m	—	—	Fast ferries, PCC, coastal vessels, breakbulk, and livestock.
Samudera	570m	10.0m	—	—	Clean products, cruise vessels, ro-ro passengers, breakbulk, and livestock.
Sriboga Terminal					
Liquid Cargo Dock	16m	8.0m	—	—	Vegetable oils. Berthing length of 110m (including dolphins).
Sriboga	180m	10.0m	—	—	Grain.
Semarang/Tanjung Emas					
SBM Pertamina	60m	11.6m	185m	36,000 dwt	Clean products.
Tanjung Emas					
SBM PLTU	90m	11.5m	175m	18,000 dwt	Clean products
Terminal LPG Tanjung Emas Semarang					
LPG Jetty	10m	—	—	24,000 dwt	LPG. Berthing length of 57m (including dolphins).

3.27 Pulau Penganten (Karang Boker) (6°38'S., 110°36'E.), 2.3 miles WSW of Ujung Telukawur, is a reef which has rocks 1.5m high. It was originally an island, but due to erosion it is now a reef. A reef extends about 0.5 mile offshore in the vicinity of Ujung Telukawuri.

Between Ujung Telukawuri and Tanjung Kelor, 2 miles N, the coast recedes to form a bay. Houses can be seen on the shores of the bay among the coconut palms.

Ujung Nyamplung (Njamploeng) lies 1.5 miles N of Tanjung Kelor. It is a low flat spit of coral and sand, covered with brushwood, but some tall coconut palms stand 0.5 mile within it. Care must be taken not to confuse the coconut palms with the point.

Teluk Kesembu is formed between Tanjung Kelor and Ujung Nyamplung. Pulau Pandjang, a low island covered with coconut palms, lies in the entrance to the bay, about 0.75 mile NW of Tanjung Kelor.

A light is shown from Pulau Pandjang. It can usually be sighted from a distance of 10 miles, where its long low appearance and dark color can easily be distinguished from the coast behind.

Anchorage can be taken in Teluk Kesembu, in depths of 6 to 8m, soft mud, with Tanjung Kelor in line with Ujung Telukawur, bearing 190°. Do not anchor too close to Tanjung Kelor, as a reef extends 0.3 mile from its N side.

The anchorage may be approached between Pulau Pandang and Ujung Nyamplung, or vessels from the S can pass between Pulau Pandang and Tanjung Kelor, by keeping Ujung Nyamplung on a bearing of 018°. This track leads over a least depth of 7.6m.

3.28 The town of **Japara** (6°35'S., 110°40'E.) is on the SE part of Teluk Kesembu, 0.5 mile within the mouth of Kali Japara. Very little of the town is seen, but a fishing village at the mouth of the river is easy to identify. The river is only navigable by small praus.

Between Ujung Nyamplung and Tanjung Blenderan, 19 miles NE, the coast is rocky and irregular with sharp projecting points. The coast NE of Japara is covered with dense forests, and rises rapidly to the mountains.

The coast between Ujung Nyamplung and **Ujung Piring** (6°30'S., 110°40'E.), 3 miles NNE, is indented by three bays, with low rocky points, and white sandy beaches between them. Ujung Piring is a low, flat, prominent point covered with low shrubs, and bordered by a white sandy beach.

Tanjung Jati (Djati), 5 miles NE of Ujung Piring, is a wooded point with tall trees to the waters edge; it can only be identified when seen clear of the land behind it. Tanjung Jati serves as a coal-fired power station and consists of two coal-unloading berths branching off the same pier. A small berth 0.5 mile E of the pier is used for unloading limestone by barge. Vessels up to 95,000 dwt, with a maximum loa 250m and a maximum draft of 13.2m draft, can be accommodated.

Karang Ombo, a small shoal with a depth of 7.9m, lies close outside the 10m curve, in a position about 1.5 miles N of Ujung Piring. This is the only danger, apart from a dangerous wreck 7 miles farther NE and a 8m patch 1.5 miles NNE of Tanjung Tuwesi.

Tanjung Tuwesi (6°25'S., 110°51'E.), 7 miles ENE of Tanjung Jati, rises abruptly from the sea and is densely covered with trees. A below-water rock lies 0.75 mile offshore, 2 miles W of Tanjung Tuwesi.

Tanjung Blenderan (Betong) (6°24'S., 110°55'E.), 5 miles E of Tanjung Tuwesi, has a rounded hill, 50m high with a transmitting radiobeacon. A hill, 64m high, lies 0.5 mile W of Tanjung Blenderan, and together with the hill on that point, assist in identifying the point when approaching from W.

Pulau Mondoliko (Mandlika) (6°23'S., 110°55'E.) a rocky, wooded island rising steeply from the sea, is 74m high and lies within the 10m curve, 1.3 miles N of Tanjung Blenderan. A light is shown from a white metal framework structure, 16m high, on the summit of the island.

Small vessels wishing to use the narrow channel between the island and Tanjung Blenderan should stay in mid-channel and not approach the SE coast of the island too closely.

The usual track is N of the island, taking care to stay in depths of not less than 10m, but it was reported that less water than charted existed on this side of the island.

Kepulauan Karimunjawa

3.29 Kepulauan Karimunjawa (5°49'S., 110°25'E.) are a group of 25 islands and other dangers lying off the N central part of Jawa, 42 miles NW of Pulau Mondoliko. Pulau Karimunjawa, the largest island of the group, together with Pulau Kemujan, close NE and Pulau Genting, 7.5 miles E, are probably of volcanic origin.

The remainder of the islands are generally flat and of coral formation, with the exception of Pulau Parang, 11 miles WNW of Pulau Karimunjawa, which is rocky on the N side and rises to a height of 80m.

All the islands are thickly wooded, the lower ones mostly with shrubs and coconut palms. The reefs surrounding these islands can be readily seen by the discoloration of the water.

Trade is principally carried out with Semarang and Japara by small ships and praus. Trade is also conducted with Bali, Timor, and islands farther E.

A conservation area is established throughout the archipelago from parallel 5°40'S to parallel 5°59'S and between meridians 110°05'E and 110°31'E.

A lighted beacon is exhibited from Pulau Sintok.

Unexploded ordinance is reported to lie 17 miles N of Pulau Benkoang and 14 miles E of Pulau Gundul.

3.30 Pulau Karimunjawa (5°51'S., 110°27'E.), the largest and most important island of the group, can be identified from a considerable distance owing to its mountainous character. The highest peak of the island rises to an elevation of 506m, close to the center of the island.

Spurs branch off from the peak to the various points of the island, which are mostly composed of large boulders.

A light is shown from Tanjung Pudak.

The island is fringed by a stone and coral reef with several detached patches of coral outside it, especially on its W and N side.

It was reported that Pulau Karimunjawa was a good radar target at a distance of 20 miles.

Tanjung Pudak slopes gradually to its outer extremity. A prominent round-topped tree stands about 0.3 mile within the point and affords an excellent mark for making the anchorage on the SW side of the island.

Pulau Batu is a bare rock lying in the middle of a bay, 1 mile NNE of Tanjung Pudak, and is connected to the island by a reef.

Tanjung Benteng lies about 1 mile NW of Tanjung Pudak, and Tanjung Gelam, the W extremity of the island, lies 3.75 miles NNW of Tanjung Pudak.

Pulau Menjangan-besar fronts the stretch of coast between Tanjung Pudak and Tanjung Benteng, and is less than 0.5 mile offshore in places; the W side of this island is low and is extending seaward.

There is a narrow channel between the reefs fronting Pulau Menjangan-besar and the main island, with depths of 7 to 18m, but there is a 0.5m patch in the NW entrance of the channel. The current in the channel is often strong and sometimes there are eddies.

Pulau Menjangan-kecil lies a little more than 0.5 mile W of Pulau Menjangan-besar and is separated from that island by a channel with depths of 18 to 21m. A 3.5m patch lies in the fairway, 0.25 mile SE of the N extremity of Pulau Menjangan-kecil.

Patches with depths of 3.5m and 4.9m lie about 0.3 mile N and 0.25 mile NNE, respectively, of this same point. Karang Wangkang is the largest of several reefs which front the NW entrance of the channel; it lies 0.65 mile N of Pulau Menjangan-kecil. Local knowledge is essential to transit this channel.

Karimunjawa consists of a few houses on Tanjung Benteng; a boat pier projects from the W side of the point and a flagstaff stands near the pier.

Anchorage during the Southeast Monsoon may be obtained 1 mile N of Pulau Menjangan-kecil, in depths of 26 to 27m, sand. To make this anchorage from S, pass at least 0.5 mile W of Pulau Menjangan-kecil until the prominent tree on Tanjung Pudak bears 114°, then steer for this tree and anchor when Tanjung Gelam and the E extremity of Pulau Bengkoang are in line bearing 002°.

During the Northwest Monsoon, fairly good anchorage can be obtained 0.5 mile SW of Tanjung Pudak, in depths of 27 to 31m, sand. The bottom is uneven and frequent eddies cause a vessel to swing violently.

To make this anchorage, keep Pulau Tjemara-kecil in line with Tanjung Benteng, bearing 313°, and anchor when Pulau Genting disappears behind Tanjung Pudak.

There are better berths close under the coast of Pulau Karimunjawa, in depths of 20 to 22m, but it is essential that the edges of the reefs are visible or that the assistance of a local fisherman be obtained.

3.31 Pulau Kemujan (Kemudjan) (5°48'S., 110°29'E.), close NE of Pulau Karimunjawa, is separated from that island by a narrow channel. The only hill on the island is 114m high and stands close within its S coast. A few headlands are rocky and attain elevations from 24 to 30m; elsewhere, the island is low and wooded.

The coastal reef extends, in places, 1 mile off the W side of the island. The sea area SE of the narrow passage separating the two main islands is foul.

Pulau Sintok is 1.5 miles ESE of the N extremity of Pulau Kemujan. It is low and covered with coconut palms and casuarina trees. This islet lies at the N end of a chain of islets and reefs lying roughly parallel to the coast of Pulau Kemujan, as far as the SE extremity of that island. A light is reported exhib-

ited from Pulau Sintok.

Unexploded ordinance is charted 47 miles NNE and 54 miles NE, respectively, from the N extremity of Pulau Kemujan.

Pulau Kembar (5°44'S., 110°11'E.), 15 miles WNW of Pulau Karimunjawa, is the NW island of the group. It is covered with bushes and fringed by a reef; there is a drying sand bank on the N end of the reef.

Karang Besi is the N part of an extensive reef that lies 3 miles SSW of Pulau Kembar. Karang Katang is the S part of this reef; there are drying sand banks on the reef. Drying wrecks lie 1 mile W and 1.3 miles WSW of Karang Katang.

Pulau Katang and Pulau Njamuk lie 4 miles SSW and 4 miles S, respectively, of Pulau Kembar. They are small wooded islets surrounded by reefs. A light is shown from the N side of Pulau Njamuk from a 30m high framework tower.

Gosong Selikur is a small reef on which there is a drying sand bank, 1 mile NE of Pulau Kembar.

3.32 Pulau Parang (5°45'S., 110°14'E.) is a rocky wooded island, 80m high in its N part; its S part is low. The entire island is fringed by a reef. Pulau Kumbang, a small islet, lies 0.5 mile SW of the S extremity of Pulau Parang.

Gosong Kumbang, 2.5 miles SSE of Pulau Parang, is a small above-water sand bank, surrounded by a coral reef with some drying rocks.

Pulau Karkal-besar and Pulau Karkal-kecil lie 3.5 miles and 4 miles SSW, respectively, of Gosong Kumbang.

Karang Kapal (5°54'S., 110°14'E.), the SW danger of the group, an extensive reef which partly dries, lies 2 miles S of Pulau Karkal-kecil and 13 miles W of the S extremity of Pulau Karimunjawa. A light stands on the W side of the reef.

Karang Bengkoang (5°44'S., 110°25'E.) is a low wooded island fringed by a reef 5 miles NW of the N extremity of Pulau Kemujan. Taka Menjawakan is a small reef, with a depth of 1.5m, 5 miles WSW of Pulau Bengkoang. The reef can only be seen from a short distance, as there is no discoloration of the water. A light is exhibited from the N side of Karang Bengkoang.

Pulau Cemara-besar (Tjemara-besar) and Pulau Cemara-kecil (Tjemara-kecil) are low reef-surrounded islets lying 3 miles NW and 2 miles WNW, respectively, of the W extremity of Pulau Karimunjawa. Pulau Menjawakan, a reef-encircled islet, lies 2 miles WNW of Pulau Cemara-besar.

Pulau Gelean and Pulau Burung are flat islets, 5.5 miles WNW and 6.3 miles W, respectively, of the S extremity of Pulau Karimunjawa.

3.33 Pulau Gundul (5°47'S., 110°35'E.), a mass of rock 45m high, is 5.75 miles ESE of the N extremity of Pulau Kemujan. It is almost bare, but scantily covered with low brushwood; its fringing reef, which projects 45m offshore, is steep-to.

Caution.—A naval gunnery and torpedo practice area exists within a 3-mile radius of Pulau Gundal. Unexploded ordnance also exists 7.5 miles N of this island.

Pulau Cendiakian (Tjendiakian) is low, wooded, and encircled by a reef which stretches almost halfway to Pulau Gundul, 1 mile NE.

Pulau Genting (5°51'S., 110°36'E.), the E island of Kepulauan Karimunjawa, lies 8 miles E of Pulau Karimunjawa and is marked by a light. The island is covered with tall trees, and reaches a height of 100m on its E side.

A coral reef encircles the island and extends 1.5 miles off its NW side. A small islet is on the reef, 1.3 miles NW of Pulau Genting. Pulau Seruni is on the reef, 0.75 mile W of the SW extremity of Genting.

An unexploded ordinance was reported to lie 8 miles E of the N extremity of Pulau Genting. An unexploded ordnance has also been reported to lie between 10 and 20 miles NE of Pulau Genting.

A dangerous rock, with a depth of less than 2m, was reported to lie 0.5 mile SE of the S extremity of Pulau Genting.

Sverre Reef (6°02'S., 110°21'E.) has a least depth of 4.9m and consists of large boulders, surrounded by broken coral and sand.

The reef, 10.75 miles SSW of Pulau Karimunjawa, can be recognized by the light color of the water surrounding it.

Gosong Jag Vijay (5°09'S., 111°24'E.), with a least depth of 7.6m, lies 65 miles ENE of Pulau Kemujan.

An obstruction lies 2.5 miles SE of Gosong Jag Vijay; shoals of 9.1m and 12.8m depths are located 5 miles WSW and 16 miles SW, respectively, of Gosong Jag Vijay.

Tanjung Blenderan to Ujung Pangkah

3.34 The coast from Tanjung Blenderan to Tanjung Api Api Anom, 8 miles E, is low and covered with vegetation. Depths of less than 2.4m extend 4 miles NE of Tanjung Api Api Anom.

From Tanjung Api Api Anom to Ujung Pangkah, the W entrance point to the N entrance to Selat Surabaya, 96 miles ESE, the coast has a wooded and fertile appearance. It is formed by sandy beaches fronted by sand and stones.

Good holding ground exists everywhere, the bottom near the coast being soft gray mud. Farther seaward, the bottom is blue mud and black sand, frequently mixed with broken shell; there is an underlayer of thick clay.

A dangerous wreck was reported to lay in the middle of the bay, about 9.5 miles offshore, 16.5 miles SE of Tanjung Api Api Anom.

The coast trends E from Tanjung Blenderan, 8 miles to **Tanjung Bugel** (6°25'S., 111°03'E.), a low point which is hard to identify but is marked by a light.

Between Tanjung Bugel and Tanjung Bendoh, 29 miles SE, the coast recedes and forms a bay. Juwono and Rembang Roads are at the head of this bay.

3.35 Gunung Niangu (Gunung Nglangu) (6°57'S., 111°08'E.), 453m high, 31 miles S of Tanjung Bugel, is prominent. Gunung Lasem rises to a height of 806m, 4.5 miles SSE of Tanjung Benda. Its two highest peaks are 1 mile apart. Gunung Lasem is connected to mountains farther S by a lower ridge.

Bugel Bank, an extensive mud bank, steep-to on its N side, stretches 4 to 5 miles offshore between Tanjung Api Api Anom and Tanjung Bendoh, with depths of less than 5m.

It has been reported that this bank has been extending seaward. Vessels rounding this bank should keep at least 1 mile clear of its edge, in depths of not less than 18.3m.

Juwana Road (6°39'S., 111°12'E.) is an open roadstead 16 miles SSE of Tanjung Bugel. The town of Juana is about 3 miles upriver and is not visible from the sea.

Only the red and white roofs of the warehouses are sometimes seen, and the chimney of the sugar mill, situated about 5 miles NW of Juana is sometimes visible when the sun shines on it.

Vessels can anchor according to draft, with the mouth of Kali Juana bearing between 210° and 225°. Care must be taken to avoid the wreck, with mast showing, marked close N by a buoy.

Vessels approaching Juwana Road from W, after rounding the steep-to N extremity of Bugel Bank in not less than 18.3m, can steer for the anchorage, as the E side of the bank is very flat and can be easily sounded.

Vessels coming from E, after passing Tanjung Bendoh at a distance of 2 to 3 miles, can steer due W for the road.

The 5.5m line lies about 5 miles NE of the mouth of Kali Juwana. Between Juwana and Rembang are a number of islets, reefs, and rocks.

3.36 Karang Juwana (6°40'S., 111°13'E.), 2.3 miles ENE of the mouth of Kali Juwana, dries in places. There is a large rock on the reef covered by a bush. A light is shown at a height of 5m, 0.75 mile N of the rock. Karang Laut, which dries, lies 1 mile NW of the mouth of Kali Juwana, 2.5 miles WNW of Karang Juana.

Pulau Marungan, 3 miles E of Karang Juwana, has some coconut palms. The island is bordered on its N side by a drying reef which extends 0.5 mile offshore. Penowo Reef lies outside the 5.5m line, 1.75 miles NNE of Pulau Marungan; the reef dries, and is marked by discoloration when covered, and by breakers in bad weather.

Pulau Masaran, a patch of sand with some below-water rocks within 0.2 mile N and NE of it, is 3.3 miles SE of Penowo Reef. There are several reefs and islets within an area formed by a line joining Pulau Marungan, Penowo Reef, Pulau Masaran, and thence 3.3 miles W to Pulau Marungan. Other shoals are charted close S of this area.

Seliro, a submerged rock, lies 0.5 mile offshore, 1.3 miles SE of Pulau Masaran.

3.37 Rembang Road (6°41'S., 111°21'E.) (World Port Index No. 51070) is a lighterage port open to NE and NW winds. The town of Rembang lies 10 miles WSW of Tanjung Benda and is unmistakable. A clump of trees stands on the foreshore near the W end of town. The high red roof of the former residency and the white buildings of the nearby club are readily identifiable. A flagstaff is near the clump of trees.

When approaching the road, keep in depths of not less than 10m until the residency or the club bears 180°, then proceed to anchorage on this bearing.

Anchorage can be obtained N of the town in any suitable depth; mud bottom. It is calm here during the Southeast Monsoon, but there is some sea in the Northwest Monsoon.

Pulau Sualang (6°41'S., 111°23'E.) is 2.75 miles ENE of the flagstaff at Rembang. It has some above-water rocks on its N side. Karang Gurian, a small reef with a drying patch of sand near the middle, lies 0.75 miles offshore, 1.75 miles WSW of Pulau Sualang.

Jetah lies within the 5.5m line, 1.75 miles E of Pulau Sualang. There is an above-water rock on this small reef.

Lasem is a town standing on the Kali Lasem, 1.5 miles inland, about 6 miles E of Rembang.

Gosong Reef (6°39'S., 111°26'E.), partly dry at high water, lies outside the 5.5m line, 2 miles NE of Jetah.

3.38 Tanjung Benda (6°37'S., 111°30'E.) is devoid of vegetation and is difficult to identify. A village, about 0.3 mile S of the point, can be recognized by the conspicuous and isolated coconut palms, which appear as an island when seen from the E. A light is exhibited from this point.

From Tanjung Benda, the coast trends in an ESE direction to Tanjung Awarawar, about 30 miles distant.

Tanjung Petakol, a rocky point 17m high, can be identified by the dark trees; the point has been reported as a good radar target at 21 miles.

Tanjung Kapal is a low point, 4.5 miles ESE of Tanjung Benda. From Tanjung Kapal to Tanjung Petakol, 14 miles SE, the coast is marked by a line of coconut trees.

Tanjung Awarawar (6°46'S., 111°57'E.) is a low point, 11 miles E of Tanjung Petakol, reported to be a good radar target at 15 miles.

A petrochemical terminal is located 10 miles NW of Tuban at Tanjung Awarawar. The terminal consists of three berths and an SPM (6°43'S, 111°58'E). A pipeline runs from the SPM to the shore in position 6°45.6'S, 111°56.7'E.

Pilotage is compulsory and available 24 hours, subject to weather conditions. The pilot boards just E of the fairway buoy or within the anchorage.

Tugs are available. It has been reported that there is a VTS in operation.

Anchoring is prohibited within 1,200m of the SPM and within 200m of the pipeline. There is an anchorage area bound by lines joining the following positions:

a. 6°38'S, 111°56'E.
b. 6°39'S, 111°56'E.
c. 6°39'S, 111°58'E.
d. 6°38'S, 111°58'E.

From Tanjung Bendoh to Tanjung Awarawar, the 20m line lies up to 5 miles offshore, and along this same stretch, the coastal bank extends up to 0.75 mile offshore.

Sarang is a village, 8.75 miles SE Tanjung Kapal. There is a small fishing harbor here, sheltered by two stone breakwaters.

Bancar (Bantjar) is a village close E of Tanjung Petakol. Good anchorage can be obtained during the Southeast Monsoon off this village.

A shoal, with a depth of 4.5m, lies 3.75 miles E of Tanjung Petakol and 1.75 miles offshore.

From Tanjung Awarawar to Tanjung Batu Sawang, 19 miles ESE, the coast recedes and forms a bay, then the coast trends in a general E direction 16 miles to Ujung Pangkah.

There are no known dangers outside the 10m line, except for the dangerous wrecks that may be seen on the chart. The coast may be safely approached by sounding, but for details concerning mined areas, see Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Between Tanjung Awarawar and Tuban, 10 miles SSE, the coast is low and backed by paddy fields.

Pelabuhan Semen Tuban (6°47'S., 111°54'E.) is a small

port lying 3.5 miles WSW of Tanjung Awarawar. The port consists of a pier approximately 0.5 miles in length. The pier is used by a local cement company. The berth lies at the N end of this pier and is 425m in length with a depth of 10m alongside.

3.39 **Tuban** (6°54'S., 112°04'E.) (World Port Index No. 51100) is an open road that is bound on the N by the parallel of 6°50'S, and on the E by the meridian of 112°07.5'E, and on the S and W, by the coast. The road is open to the NE and NW winds and there is always a swell.

The village of Tuban is recognizable by some large dark trees and the white chimney of a factory. A pier, 0.4 mile long with a depth of 2.5m alongside, fronts Tuban. A flagstaff stands near the root of the pier.

Anchorage may be taken with the flagstaff bearing 203°, 4 miles distance, in 9.1m, sand and mud bottom.

Tuban Oil Terminal, a moored storage tanker, lies about 10 miles NE of Tuban. Vessels anchor about 3 miles N of the storage tanker; pilots board at the anchorage.

A dangerous wreck lies 10 miles NE of Tuban Oil Terminal in position 6°39.5'S, 112°17.8'E.

Tanjung Batu Sawang (6°52'S., 112°17'E.) is located 8.5 miles ENE of Palang. An above-water rock lies 0.4 mile N of the point.

The village of Brondong, with a prominent white house and a mosque, stands 0.5 mile SE of Tanjung Batu Sawang.

Tanjung Pakis, a steep point, 7.75 miles E of Tanjung Batu Sawang, rises to a wooded hill, and 2.5 miles SSW is a hill 152m high.

The coast between Tanjung Pakis and Ujung Pangkah, 8 miles E, is backed by hills.

The highest summit is Gunung Malang, 131m high, which rises 6 miles SW of Ujung Pangkah.

Ujung Pangkah (6°51'S., 112°33'E.) is low and not easily distinguished.

The white stone houses and the mosque in the village of Pangkah, 4.3 miles S, are plainly visible against the high coconut palms in the vicinity.

It was reported, that due to a landslide, Tanjung Pangkah has extended 1.5 miles seaward of its previously charted position. Two wrecks lie 1 mile apart, approximately 4.75 miles ENE of the N extremity of Ujung Pangkah; another wreck lies 1.5 miles N of the point. A spoil ground, best seen on the chart, lies 8.5 miles ENE of Ujung Pangkah.

Caution.—It is reported (1997) that less water exists NE of Ujung Pangkah. Numerous submarine pipelines lie offshore of Ujung Pangkah between the coast and the Poleng Oil Field.

Poleng Oil Field (6°40'S., 112°55'E.) is about 15 miles NNE of Tanjung Modung. Numerous structures, not all of which are charted, some marked by lights, other unlit objects and submerged obstructions, sometimes marked by buoys, exist in the field.

Poleng Oil Field is an Entry Restricted Area. An oil-loading terminal is within the field. Vessels proceed alongside the tanker Lynda (72,000 dwt) moored stern-to at an SBM. Vessels berth port side-to. Pilotage is mandatory; the master of the Lynda acts as a pilot.

Anchorage is possible 1 mile N or W of the SBM, clear of field installations. There are no facilities available at the terminal.

Caution.—There is construction of an offshore pipeline in the Sidayu Saka Oil Field N of Ujung Pangkah. Vessels transiting S of the Poleng Oil Field should pass S of a dangerous wreck, the position which is approximate, situated 1 mile E of the S extremity of the restricted area of the oil field, and N of a dangerous wreck reported in position 6°47.3'S, 112°57.7'E.

Selat Surabaya

3.40 Selat Suribaya separates the NE coast of Java from the large island of Madura. This waterway is approximately 50 miles long and about 1 mile wide at its narrowest point.

The N entrance of Selat Surabaya is between Ujung Pangkah and **Tanjung Modung** (6°55'S., 112°49'E.), the NW extremity of Madura, 18 miles ESE of Ujung Pangkah. This area is almost entirely occupied by an extensive shoal flat.

The E entrance of Selat Surabaya is reached through Selat Madura and a buoyed channel that connects Selat Surabaya and Selat Medura.

Caution.—Areas within the approaches to Selat Surabaya remain dangerous due to bottom mines. See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia for details.

Several dangerous wrecks lie throughout Selat Surbaya and are best seen on the chart. Mariners are advised to transit the area with caution.

Selat Surabaya—North Approach

3.41 Between Ujung Pangkah and Tanjung Sau (Tanjung Sawo), 14 miles SSE, the land is low with a few round-topped trees. Gunung Malang serves as a good landmark for identifying Ujang Pangkah. An anchorage area lies 5 miles NE of Pulau Karangjamuang.

During the Northwest Monsoon, vessels approaching the channel should sight this hill before sundown.

Between Tanjung Sau (Tanjung Sawo) and the town of Gresik, 5.5 miles S, the overgrown low coast recedes. There are many fish ponds with several small streams flowing out. Manyar Terminal lies 1.5 miles S of Tanjung Sawo.

Leleng Barat, a narrow ridge which dries in places, lies 9 miles SE of Ujung Pangkah. Lereng Tengah, lying 2 miles E of Lereng Barat, is also a narrow ridge of hard sand, with least depths of less then 5m.

Caution.—A submarine pipeline is laid on the W side of the channel, which follows the general line of the approach from N of No.1 Buoy to Gresik. An additional submarine pipeline laid on the W side of the channel extends WNW. A submarine pipeline lies close W of the entrance and generally trends S following the W side of the channel. A dangerous wreck lies on the W side of the channel, 3 miles S of Tanjung Sau (Tanjung Sawo). Numerous wrecks, best seen on the chart, lie in the Northern approaches to Surabaya.

A former mined area, best seen on the chart, lies close to the E entrance of the channel and borders the channel heading S.

3.42 **Gresik** (7°09'S., 112°39'E.) (World Port Index No. 51120), which is under the Surabaya Port Authority, was formerly the main port in Selat Surabaya before the construction

of Tanjungperak. The port is situated on the western outskirts of Surabaya. There are several old massive stone warehouses in the town.

Depths—Limitations.—The port consists of a small craft and ferry harbor and six privately-operated facilities. The port can accommodate vessels up to 60,000 dwt, with a maximum loa of 200m and a maximum draft of 9.5m at HW. For more details on berths available in the port see the table titled **Gresik—Berthing Information.**

A conspicuous chimney, with red and white bands, stands along with industrial buildings, 0.5 mile WNW from the root of the pier. A small mole, which forms the N side of a boat harbor, 0.5 mile S of Dermaga Petrokimia, fronts Gresik.

A new L-shaped pier was constructed 0.5 mile N of Pertamina Wharf. Construction has been completed on a new pier and jetty approximately 1.5 miles NNW of Petrochemical Wharf.

Pilotage.—Pilotage is compulsory. Notification of arrival should be sent 24 hours in advance.

Gresik—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Gresik Cement Terminal						
Cement Berth East	122m	—	—	—	—	Cement. Berthing length of 150m (including dolphins).
Cement Berth West	155m	—	—	—	—	Cement.
PT Smelting Terminal						
PTS Berth	120m	12.0m	200m	—	35,000 dwt	Fertilizer and copper. Berthing length of 300m (including dolphins).
Gresik Port Terminal						
Dry Bulk & Log Jetty	53m	6.0m	—	—	—	Coal. By barge.
International Liquid Bulk Jetty	198m	9.0m	—	—	—	Chemicals, breakbulk, and multipurpose. Berthing length of 198m (including dolphins).
International Liquid Bulk Jetty 02	149m	12.0m	—	—	—	Chemicals, breakbulk, and multipurpose.
Jetty 70	70m	6.0m	—	—	—	Breakbulk by barge.
Jetty 78	-	7.0m	—	—	—	By barge.
Nusantara Jetty	276m	6.0m	—	—	—	Breakbulk.
Petrokimia Gresik Terminal						
Coal Jetty	40m	—	—	—	—	Coal by barge. Berthing length of 140m (including dolphins).
Inner Berth (Middle)	252m	—	—	—	30,000 dwt	Fertilizer and breakbulk. Continuous berthing length of 504m.
Inner Berth (North)	252m	—	—	—	30,000 dwt	
Inner Berth (South)	225m	—	—	—	30,000 dwt	Chemicals, LPG, fertilizer, breakbulk, multipurpose. Berthing length of 255m (including dolphins).
Outer Berth (Middle)	275m	—	—	—	60,000 dwt	Fertilizer, breakbulk, chemicals, multipurpose. Continuous berthing length of 825m.
Outer Berth (North)	275m	—	—	—	60,000 dwt	
Outer Berth (South)	275m	—	—	—	60,000 dwt	
Siam Maspion Terminal						
Jetty 01	74m	—	240m	10.5m	100,000 dwt	Chemical gases, chemicals, dirty products, and LPG. Berthing length of 178m (including dolphins). Minimum freeboard of 1m.

Gresik—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Jetty 02	16m	—	190m	10.5m	30,000 dwt	Chemicals and LPG. Berthing length of 210m (including dolphins). Minimum freeboard of 1m.
Jetty 03	15m	—	—	—	—	Chemicals. Berthing length of 110m (including dolphins.)
Jetty 04	200m	—	—	—	—	Breakbulk.
Wilmar Terminal						
Wilmar Jetty	300m	—	—	—	—	Fertilizer and breakbulk.
Wilmar Nabaty Inner Jetty	52m	—	—	—	—	Fertilizer and breakbulk. Berthing length of 95m (including dolphins).
Wilmar Nabaty Jetty 01	204m	—	—	—	—	Chemicals, fertilizer, breakbulk, and multipurpose. Berthing length of 240m (including dolphins).
Wilmar Nabaty Jetty 02	—	—	—	—	—	Chemicals. Berthing length of 164m (including dolphins).
Pertamina Hulu Energy West Terminal						
DABN Jetty	50m	8.8m	135m	8.3m	10,500 dwt	Chemicals and clean products.
Pertamina Lubricant Terminal						
Asphalt Jetty	40m	8.6m	100m	8.1m	5,000 dwt	Clean products and dirty products, Berthing length of 192m (including dolphins).
PLTU Gresik						
PLTU Jetty	53m	14.6m	150m	14.1m	16,000 dwt	Chemicals and clean products. Berthing length of 300m (including dolphins).
PT. Karyalndah Alam Sejahtera Terminal						
Oil Berth	350m	—	—	—	—	Clean products and vegetable oils.

Gresik Power Plant

Regulations.—Ships are advised to maintain a strict piracy watch and ant-piracy measures and report all attacks and suspicious sightings to the local authorities and the IMB Piracy Reporting Center. For **IMB Piracy Reporting Center** contact information, see paragraph 3.1.

Anchorage.—Designated anchorage areas are best seen on the chart.

Indonesian Marine Police has recommended ships to anchor where they conduct patrol on the vicinity of 7°09S, 112°40'E.

Caution.—Four submarine power cables cross the fairway in an ENE direction, with three extending between Dermaga PLTU Jetty and Tanjung Tanjungan and the remaining extending between Cement Wharf and Tanjung Tanjungan. Anchorage is prohibited in the vicinity of these cables.

A submarine pipeline, best seen on the chart, lies offshore Ujung Pangkah with unlit platforms located 2.3 miles and 3.5 miles NE of Ujung Pangkah.

A dangerous wreck, which is unmarked, lies in the S approach to Dermaga Semen, about 0.4 mile SE of the pier head. Another dangerous wreck, best seen on the chart, lies in the channel close

NE of Lamong Bay. A third dangerous wreck, best seen on the chart, lies on the E side of the channel 1.5 miles NW of Tanjung Tanjungan. A new wharf is under construction adjacent to Tepen.

3.43 Tanjung Semambung (7°11'S., 112°40'E.), 1.5 miles SSE of Gresik, is the SE extremity of a promontory and rises in Gunung Petukangan, 125m high, 1.8 miles W.

Between Tanjung Semambung and Tanjung-perak, 4.5 miles SE, the coast recedes and forms a shallow, mud and sand filled bay.

Between Tanjung Modung and **Ujung Piring** (7°02'S., 112°41'E.), 11 miles SW, the coast is low and wooded. There are several towns, the largest is Bangkalan.

Gunung Geger (7°02'S., 112°56'E.), 284m high, 11 miles E of Bangkalan, is a prominent, densely-wooded, and flat-topped hill, with light patches. Gunung Kampek, 138m high, 6.5 miles W of Gunung Geger, is less identifiable, and another hill, 64m high, which is precipitous on its N side, rises 3.3 miles NW of Gunung Geger, and is marked by light patches.

Karang Jamuang (6°56'S., 112°44'E.) lies close E of the navigable channel, about 5.5 miles WSW of Tanjong Modung. A light, with a racon and beacon, is close NW of Karang Jamuang. A training wall, awash at high water, extends 6.75 miles SSW from Karang Jamuang to Ujung Piring.

Caution.—Numerous dangerous wrecks are found N and S of Karang Jamuang, as best seen on the chart. Works in progress have been reported (2010) in the fish trap area off of Tanjung Semambung.

3.44 Ujung Piring (7°02'S., 112°41'E.) is the N extremity of a low island, 16m high near its center. The island is covered by paddy fields with several villages, and is separated from Madura by fish ponds.

From Ujung Piring, the coast trends 2.5 miles SSW to Tanjung Bulu, then SSE 1.75 miles to Tanjung Junganyar.

A dangerous wreck lies 2.5 miles WSW of Tanjung Junganyar. Van Drieen, a stone reef with a depth of 2.5m, is located near mid-channel 2.3 miles SW of Tanjung Junganyar.

From Tanjung Junganyar, the S extremity of the low island, to Tanjung Tanjungan, 3.5 miles S, the coast is fronted by fish ponds. Tanjung Kamal is located 2.3 miles SE of Tanjung Tanjungan. Tanjungperak is located across the strait, 1.5 miles S of Tanjung Kamal.

Along the coast, between Tanjung Modung and Ujung Piring, the mud bank extends as much as 0.75 mile offshore. From Tanjung Butu to Tanjung Tanjungan, mud and sand banks extend up to 1.75 miles offshore; along this stretch there are many fish traps.

From Tanjung Modung, the road follows the coast to the town of Bangkalan. A conspicuous white mosque stands in the vicinity of Sebaneh, about 6.5 miles SW of Tanjung Modung.

Two large rocks lie on the N side of the channel, 1.3 miles W of Tanjung Kamal. Several dangerous wrecks lie in the approaches to Kamal. Pisang Reef, with a least depth of 1.2m, lies on the S side of the channel, 1.3 miles SW of the rocks, and is steep-to on its E side.

Winds—Weather.—During the Southeast Monsoon, the sea breeze is N and commences about noon, decreasing toward evening. Near sunset the land breeze is from the S. It is frequently hazy in the early morning.

During the Northwest Monsoon, the wind usually blows strongly during the forenoon from NW and WNW. It remains from this direction throughout the day and then gradually changes over to a light SW wind, 4 to 10 knots, at night.

Tides—Currents.—Currents throughout Selat Surabaya are tidal, but the Southeast Monsoon forces water up in the channel sufficiently to cause a noticeable strengthening of the N current and a weakening of the S current.

The direction of the current is N and S, and the current runs twice daily in each direction. The N current may attain a rate of 2.5 knots.

Depths—Limitations.—It was reported, that the channel across the bar was dredged to a minimum depth of 8.8m.

It was reported that the maximum draft permissible over the bar was 8.5m, but the usual draft was 7.3m.

Pilotage.—Pilotage for passage through Selat Surabaya is compulsory for vessels of over 500 tons. Arrangements should be made through the vessel's agent or the harbormaster at least 48 hours in advance and repeated 24 hours before arrival. Under certain circumstances, such as weather, vessels of less than 3,500 tons may proceed without a pilot.

One of the following signals should be displayed:

1. Pilot service flag—A blue flag with a star in its center.
2. Pennant 1 and flags DO.

The pilot station, a prominent white building with an orange roof, stands on Karang Jamuang. Pilots are available 24 hours and board vessels about 4 miles NNE of the Pilot Station, in the vicinity of Lighted Buoy No. 5.

Regulations.—Deep-draft vessels must use a tug between Lighted Buoy No. 5 (6°52'S., 112°45'E.) and the SSW end of Lereng Tengah.

Signals.—There is a radio station at Karang Jamuang, and the Surabaya Port Office may be contacted on VHF channel 16.

Overtaking or passing another vessel between Lighted Buoy No. 5 and the SSW end of Lereng Tengah is not permitted, nor is it permitted to overtake or pass another vessel between Lighted Buoy No. 8, moored 2.5 miles SW of Tanjung Junganyar, and Lighted Buoy No. 19, moored 1.75 miles SSW of Tanjung Kamal.

Anchorage.—Anchorage for vessels awaiting the pilot or tide, may be taken in an area about 6.5 miles NW of Tanjung Modung, in 28m, mud. Foul ground is charted in the designated anchorage area.

The anchorage space in Tanjungperak roads is limited. Large vessels should enter Selat Surabaya only at such times as to insure that the roadstead is not reached in a strong E current.

Directions.—The best time to enter the swept channel is prior to slack water in Tanjungperak roadstead. During the Northwest Monsoon, there is little difficulty in making the entrance. During the Southeast Monsoon, especially in the morning, the prevailing mist and haze frequently hide the coastal hills of Jawa and Madura, but the coast can be approached until within a depth of 20.1m.

Vessels approaching from W can obtain a position by bearings on the hills SW of Ujung Pangkah, and those approaching from E can obtain a position by bearings on the hills of Madura.

When the vessel's position has been fixed, the swept channel

should be approached from a position 2 miles NE of Lighted Buoy No. 1, moored 10 miles NW of Tanjung Morong and a course of 180° steered, about 6 miles, to the anchorage area or to the pilot boarding area.

The buoys marking the channel over the bar are laid in a SSW direction from a position approximately 5 miles WNW of Tanjung Modung. These buoys are moved as necessary to conform with the constant changes in depth and direction of the channel.

A range, bearing 200°, aligned on **Mapia** (6°59'S., 112°42'E.), Ujung Piring, and Ujung Slempit should be followed until Lighted Buoy No. 11. Thereafter, follow the marked channel. The channel buoys and lighted buoys are marked in accordance with IALA Maritime Buoyage System (Region A).

Caution.—In the approach to Selat Surabaya and within the strait, there are many dangerous and stranded wrecks which may best be seen on the chart.

Depths in the N and NE approaches to Selat Surabaya may be less than charted.

A danger area, which extends from Ujang Pangkah E to the N coast of Madura, and then 10 miles N, is situated at the entrance to Selat Surabaya. See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia for details.

Selat Surabaya—East Approach

3.45 The E approach to Selat Surabaya is through Selat Madura and a buoyed channel that connects Selat Surabaya and Selat Madura. The approach to Surabaya is through a swept channel marked by a lighted buoy (7°23'S., 113°00'E.), then over a bar which extends from **Kali Porong** (7°32'S., 112°51'E.), to a position on Madura 25 miles NE.

The least depth over the bar in the SE approach through Selat Madura was reported to be 3.1m, soft mud.

The S coast of Madura, between **Tanjung Batu Putih** (7°13'S., 113°09'E.), a steep rocky light-colored point, 12m high, and Tanjung Gumong, 11 miles WNW, is formed by a sandy beach for the first 3 miles, then by a drying reef.

The most noticeable village along this coast is Kadungdung, 6.5 miles W of Tanjung Batu Putih, where the road and railroad reach the coast.

From Tanjung Gumong to Tebul, 8.5 miles WNW, the coast is low and fronted by a drying mud bank. Kesek, a town 4 miles W of Tebul, exhibits a light from a height of 23m, 0.5 mile SW of the town.

Behind this stretch of coast, there is a prominent bare range of hills about 5 miles inland which are useful when approaching Surabaya from SE.

3.46 **Gunung Telok** (7°07'S., 113°00'E.), 265m high, is the E summit of this range, with Gunung Seleret, which has four knobs close together, 3 miles W of it. Gunung Kemere, saddle-shaped and 205m high, stands at the W end of the range, 4.5 miles farther W.

The coast on the W side of the approach is low. Inland, the low plain S of Surabaya has many villages standing amongst paddy fields, and has no noticeable features.

The entrance to Kali Porong is formed by a delta of low sandy marshy islets. Within the entrance, the river is embanked through the fish ponds, extending for 6 miles.

Between the entrance to Kali Porong and **Tanjung Tambahagung** (7°27'S., 112°50'E.), 5.3 miles NNW, the coast is fronted by a drying bank. Behind the low, narrow, sandy coast, there are marshy islets backed by fish ponds.

At Sukolilo, 13 miles NNW, the coast is similar, with fish ponds extending 4.5 miles inland at the S end, decreasing to 1 mile inland at the N end. The village of Kedung, on the coast about 1.75 miles NNW of Sukalilo, trends NW 1.5 miles to a point close E of the Naval Basin.

Anchorage is prohibited in the vicinity of the submarine cable which extends from shore, 0.75 mile NW of Kedung, in a NNE direction to the S coast of Madura, 0.5 mile WSW of Kessek Light. The landing places are marked by notice boards.

Karang Conkeh (Congkeh) (7°29'S., 113°11'E.), the E danger in the SE approach to Selat Surabaya, is a steep-to rock with a depth of 0.9m.

Zwaantjes Reef (Karang Koko), 3.75 miles WNW of Karang Conken, consists of coral, rock, and sand, with an above-water sand cay on its W side.

A light is shown from a white tower. Bura, which dries, is a small reef lying 5.5 miles WNW of Zwaantjes Reef.

Sirumpa (7°25'S., 113°04'E.), a steep-to rock, exhibiting a light, lies 4.5 miles NNW of Zwaantjes Reef.

The reef dries on its SE side. Manila, a steep-to drying rock, lies 6.5 miles NE of Sirumpa.

Pulau Kambing (7°18'S., 113°13'E.) lies on the N side of a drying reef, about 5 miles off the S coast of Madura.

3.47 **Karang Kleta** (7°19'S., 112°52'E.) with a depth of 0.3m, stones and sand, is not marked by discoloration. The reef, which seldom breaks, is about 3 miles off the Jawa coast, 5 miles within the 5.5m line.

The Tongue, a bank of very hard sand, which dries near its NW end, lies on the E side of the channel, 2 miles NE of the village of Sukolilo.

Tides—Currents.—The tidal currents flow into the channel with a rising tide and outward on the falling tide. The times of change are near the times of high and low water, but may be irregular due to influence by the prevailing monsoon.

In the vicinity of the outer lighted buoy, the rate of the current is about 2 knots. In the vicinity of Surabaya roadstead, the current is about 4 knots and may exceed this considerably in the narrow parts of the channel.

Outside the fairway, on the banks and under the shore, the current seldom exceeds 1 knot. The rate is stronger at spring tides than at neaps.

Depths—Limitations.—The 20m curve, which lies up to 2.5 miles off the S coast of Madura and the same distance off the coast of Jawa, crosses the SE entrance of Selat Surabaya in a SW direction from a position S of Tanjung Batu Putih, to a position near the mouth of Kali Porong.

The SE entrance of Selat Surabaya is shallow. There was a least depth of 2.1m, soft mud, in the fairway over the bar.

Pilotage.—Pilotage is compulsory. The estimated time of arrival should be radioed at least 24 hours in advance to Surabaya Radio Station.

The boarding ground is in the vicinity of No. 1 Lighted Buoy (7°24'S., 112°57'E.). The pilot, sent from Surabaya by launch, will wait no more than 2 hours for a ship's arrival.

Inbound vessels can anchor seaward of the outer lighted buoy while awaiting the pilot, but may proceed to meet the pilot vessel between the outer lighted buoy and No. 1 Lighted Buoy.

Vessels desiring to anchor should check Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia, for possible existence of mines.

Regulations.—Overtaking or passing another vessel between the outer lighted buoy and Tanjungperak roadstead is not permitted until No. 7 Lighted Buoy (7°11'S., 112°46'E.) has been passed.

Directions.—As soon as Zwaantjes Reef Light is sighted, steer for the outer lighted buoy. Steer as necessary to clear Bura and Sirumpa.

A dangerous wreck is reported to lie approximately 1.5 miles ESE of the outer buoy. From the outer lighted buoy, steer in a WSW direction for No. 1 Lighted Buoy, 3.3 miles distant.

Vessels should not enter Tanjungperak via the E approach without the use of a pilot, due to the existence of dangerous wrecks in the channel and the unreliability of aids to navigation.

Port of Tanjungperak (Surabaya) (7°12'S., 112°44'E.)

World Port Index No. 51130

3.48 Tanjungperak, situated on the S side of Selat Surabaya, is second only in importance in Jawa to Tanjungpriok, the port for Jakarta.

Port of Tanjungperak
http://www.maritimindo.com/PelabuhanIII/PelabuhanTgPerak.html

The town of Tanjungperak (Surabaya) stands on the banks of Kali Mas, which is navigable by small vessels. The old or lower part of the town is situated between the entrance to the river and a conspicuous tower on a government building (7°15'S., 112°44'E.); it contains the principal government and commercial buildings. The upper or new town lies S of the conspicuous tower.

Tanjungperak stands on the NE extremity of a low plain covered with villages standing amongst paddy fields. The plain extends W for 25 miles to some moderately-high wooded hills, and SSW to Gunung Ardjuna.

Tanjungperak, running from E to W, consists of the TSP Container Pier, the Tanjungperak Basin and the Naval Basin.

Tides—Currents.—Tidal currents in Tanjungperak roads are mixed, with a predominating semi-diurnal character. The duration of slack water varies considerably.

As a general rule, the stronger the stream, the shorter the period of slack water and vice versa. Close inshore, the current changes direction 1 to 1.5 hours earlier than in the roadstead.

The consequence of the water piling up in the W part of Selat Madura is the same here as occurs in Selat Surabaya. During the Southeast Monsoon, the W current in the roadstead is stronger on the average than the E current.

Depths—Limitations.—The maximum draft for vessels entering the access channel to the port is 9.5m, with a maximum length of 210m. The the channel width is 100m.

The 2.8-mile long Suramadu Bridge, a fixed bridge with a vertical clearance of 34m, spans the SE entrance of Selat Surabaya in a general N-S direction between Sekarbungu and Tambakwedi.

When passing under the Suramadu Bridge there is an administrative change in the direction of buoyage markings.

Pertamina Quays (Jambatan Minyak), lying just E of the entrance to the Naval Basin, is an oil-discharge pier. The depth at the W end is 14.9m; the alongside depth at the E end is 17.2m. The naval basin has depths ranging from 3.7 to 7.6m.

Bogarsari Wharf (Government Oil Wharf), a dolphin berth extending NNW from the W side of the entrance to Tanjungperak Basin, has an alongside depth of 9m.

In Tanjungperak Basin, the alongside depths at the wharves range from 3.3 to 9m.

The Domestic Container Terminal and the International Container Terminals, W of Tanjungperak Basin, have reported depths alongside of 7.5m and 10.5m respectively. The berths lie along the end of a 0.6-mile long jetty. Caution is necessary when approaching the terminals as depths may differ from those charted. The basin is comprised of five separate terminals, which are named as Nilam, Berlian, Intan, Mirah, and Jamrud. A passenger terminal is located on the Berlian Pier.

Berths for small ships and praus may also be found along the banks of the Kali Mas at depths of 3 to 5m. For more details on berths available in port see table titled **Tanjungperak—Berthing Information**.

Aspect.—On the S coast of Madura, just over 1 mile E of Tanjung Kamal, a hospital serves as a prominent landmark. The tower of the government building, situated 4.5 miles S of Tanjung Kamal, is also prominent.

A tower, 50m high, stands near the S side of the Naval Basin. The harbormaster's office and signal station are situated on the NE corner of Pangkalan Jamrud.

Developmental work, in progress, is forecast to continue. Construction will include the building of new berths and facilities to accommodate expected traffic flow.

Tanjungperak—Berth Information

Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
TTL Container Terminal							
International Berth	500m	10.5m	294m	—	32.2m	65,038 dwt	Containers and reefer.

Tanjungperak—Berth Information							
Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
Domestic Berth	450m	9.0m	215m	—	30.4m	45,734 dwt	Containers and reefer.
Jamrud Terminal							
East Berth	200m	—	335m	—	39.7m	15,370 dwt	Ro-ro passengers/vehicles/ rail. Continuous berthing length of 1,200m.
Jamrud North Berth	800m	9.0m	230m	9.1m	38.0m	88,279 dwt	Breakbulk. Continuous berthing length of 1,200m.
Jamrud Ro-Ro Berth	138m	7.5m	85m	—	32.2m	18,686 dwt	Ro-ro/lo-lo and breakbulk.
Jamrud South Berth	800m	7.0m	200m	7.5m	40.3m	68,955 dwt	Breakbulk.
Jamrud West Berth	156m	6.0m	200m	—	32.2m	81,541 dwt	Breakbulk.
West Berth	200m	—	335m	—	39.7m	15,370 dwt	Ro-ro passengers/vehicles/ rail. Continuous berthing length of 1,200m.
Berlian Terminal							
West	730m	8.2m	215m	—	29.8m	38,122 dwt	Containers, breakbulk, and reefer.
East	780m	9.7m	231m	—	32.2m	42,004 dwt	Clean products, containers, breakbulk, multipurpose, and reefer.
North	140m	7.0m	177m	—	32.2m	42,004 dwt	Containers, breakbulk, and reefer.
Nilam Terminal							
East Berth	320m	8.0m	206m	—	29.8m	33,891 dwt	Cement, containers, breakbulk, and reefer.
Mirah Terminal							
East Berth	320m	6.0m	162m	—	25.6m	17,791 dwt	Breakbulk.
South Berth	320m	6.0m	162m		25.6m	17,476 dwt	Breakbulk.
Bogasari Terminal							
Bogasari Bulk Berth	243m	9.0m	230m	—	36.9m	92,832 dwt	Grain.
Dry Bulk Terminal							
Dry Bulk Jetty	245m	—	235m	—	32.2m	84, 094 dwt	Grain.
TPS Container Terminal							
Wharf No. 1	250m	10.5m	294m	—	40.0m	73,235 dwt	Containers and reefer. Continuous berthing length of 1,000m.
Wharf No. 2	250m	10.5m	294m	—	40.0m	73,235 dwt	
Wharf No. 3	250m	10.5m	294m	—	40.0m	73,235 dwt	
Wharf No. 4	250m	10.5m	290m	—	45.0m	175,607 dwt	
Domestic Wharf	450m	7.5m	150m	—	25.0m	15,428 dwt	Containers and reefer.

Tanjungperak—Berth Information							
Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
Koarmatim Terminal							
Koarmatim Pier	438m	12.0m	122m	—	16.5m	5,880 dwt	Clean products, breakbulk, and multipurpose. Bunkering wharf for Navy fleet. Can be used in exceptional circumstances by commercial vessels with prior permission of Harbor Authority.
Intan Terminal							
Intan Berth	170m	—	69m	—	21.8m	8,351 dwt	Clean products, breakbulk, and multipurpose.
AKR Bunker Terminal							
AKR Jetty	17m	7.0m	125m	6.5m	25.0m	10,000 dwt; 15,000t	Clean products and dirty products. Berthing length of 118m (including dolphins).
BBM Semampir Terminal							
East Jetty	20m	—	200m	—	—	35,000 dwt	Aviation fuel, clean products (CPP), dirty products, and bunkers. Berthing length of 220m (including dolphins).
East Jetty (Outer)	40m	—	180m	—	—	35,000 dwt	Aviation fuel, clean products, and dirty products. Berthing length of 245m (including dolphins).
Pertamina LPG Deport Terminal							
Gospier Jetty	106m	9.5m	180m	8.9m	—	35,000 dwt	**Closed.** Clean products, dirty products, crude, LPG, and bunkers.
Bulk Liquid Berth	26m	—	160m	—	25.6m	23,333 dwt	Clean products, LPG, and breakbulk. Berthing length of 230m (including dolphins).
Perak Grati Power Plant							
Power Plant CBM	—	18.0m	185m	—	—	30,000 dwt; 38,000t	Clean products.

Pilotage.—Pilotage is compulsory. The pilot station at Karang Jamuang is manned 24 hours. Pilotage is available for tankers during daylight hours only, but is available 24 hours for other vessels. The pilot boards near No. 5 Lighted Buoy. A harbor pilot is available if required and boards at the Inner Roads. The pilot should be requested 24 hours in advance.

The Port Administration provides seven tug boats, four pilot boats, and five mooring boats.

Special pilots are required for the Naval Basin.

A vessel requiring a harbor pilot should display the pilot service flag or pennant 1 and flag R.

Contact Information.—See the table titled **Tanjungperk—Contact Information**

Tanjungperak—Contact Information	
Harbormaster	
VHF	VHF channels 16, 20, and 22

Tanjungperak—Contact Information	
Telephone	62-31-3291194
	62-31-3291364
Port Authority	
Telephone	62-31-3291992
	62-31-3291993
	62-31-3291994
	62-31-3291995
	62-31-3291996
Facsimile	62-31-3293994
E-mail	tu.perak@pp3.co.id
Terminal Petikemas Surabaya	
Telephone	62-31-3283265
	62-31-3283266
	62-31-3283267
	62-31-3283268
	62-31-3283269
	62-31-3283270
Facsimile	62-31-3291628
E-mail	cs@tsp.co.id
Web site	https://www.tsp.co.id
Berlian Jasa Terminal	
Telephone	62-31-3291596
	62-31-3291597
	62-31-3287120
	62-31-3287121
Facsimile	62-31-3291598
E-mail	info@bjtiport.co.id
Web site	https://www.bjtiport.co.id
Teluk Lamong Terminal	
Telephone	62-31-99001500
	62-81-13531222
	62-81-55260000
	62-81-13252665
	62-81-13521222
E-mail	terminal@teluklamong.co.id
Web site	https://www.teluklamong.co.id
Pilotage	
Call sign	Surabaya Pilots (PKW)
VHF	VHF channels 6, 8, and 12
Telephone	62-31-3294065

Tanjungperak—Contact Information	
Vessel Traffic Service	
Call sign	VTS Surabaya
VHF	VHF channels 68 and 83
MMSI	005251570
Telephone	62-31-3291755
Facsimile	62-31-3291717
E-mail	surabayaradio@yahoo.com
Tugs	
VHF	VHF channels 10, 12, 14, and 16

Signals.—Special signals are used for vessels approaching Tanjungperak and are displayed from the signal station at the harbormaster's office:

Signal	Meaning
Cone, point up	A vessel must await the harbor pilot
Cylinder	A vessel must anchor
Two cylinders, disposed vertically	A vessel must moor
Two red lights at the harbormaster's office	Firing practice is taking place in the SE entrance to Selat Surabaya

Anchorage.—Tanjungperak roadstead is bound on the W by the meridian of Buffels and on the E by the meridian of the beacon atop a hill, 85m high, 1.75 miles ENE of Tanjung Kamal.

Anchorage areas for commercial vessels have been designated to the N and NW of Tanjungperak and are best seen on the chart. Anchorage A, situated N of the Commercial Basin, has depths of about 4 to 21m; however, numerous wrecks and shoals are charted within this area.

A naval anchorage has also been designated N of the Naval Basin. This area is restricted and permission must be obtained from the harbormaster. Shoals, with depths of less than 1m, and marked by No. 17 Lighted Buoy, lie in the N part of this anchorage.

The roadstead normally affords safe anchorage in both monsoons, in depths of 20m, mud and sand. When strong winds and tidal stream combine, a vessel may occasionally drag.

The presence of foul ground and wrecks encumbers the anchorage areas and caution must be observed.

Vessels at anchor in the vicinity can be affected by the stream setting out of Kali Mas and usually lie heading S.

Anchorage may not be taken within about 0.2 mile of the harbor entrance or Dermaga Jamrud.

Prohibited anchoring and fishing exists N of the mouth of Kali Mas, near the middle of the roadstead. Another prohibited area lies in the SW extremity of the roadstead. The limits of these areas may be seen on the chart.

Caution.—It has been reported that buoys and other aids to

navigation in the approaches to Surabaya are missing or unreliable. Several prohibited areas, best seen on the chart, exist in the vicinity.

Numerous wrecks, best seen on the chart, lie in the approaches and adjacent to the port. Mariners are advised to navigate with caution in the area.

Madura—North and South Coasts

3.49 The N and S coasts of Madura are described in a clockwise direction from Tanjung Modung, the NW extremity of the island to Tanjung Batu Putih, on the S coast of Madura. The W extremity of the island has been described with the N approach to Selat Surabaya beginning in paragraph 3.40.

Madura has an undulating surface. The hills in the W part seldom exceed 244m, while those in the E range between 305m and 477m. The E end of the island is well cultivated but the interior of the island is, to a great extent, barren.

The S coast of Madura is irregular in contour and in the SE part, it is fronted by numerous off-lying islands and reefs. There are no large ports but Teluk Sumenup, situated W of Pulau Puteran, is of some importance.

Caution.—An Entry Restricted Area exists off the NW shore of Madura between 5 miles NE of Tanjung Modung and 1 mile NW of Labuan. The area is similar to that surrounding Poleng Oil Field (see paragraph 3.38).

An unexploded depth charge is reported to lie on the N limit of the area in approximate position 6°49'S, 112°55'E.

A storage tanker (7°17'S., 113°21'E.), with a depth of 21.3m alongside, is permanently moored to an SBM, about 3.5 miles NW of Labuan, within the charted restricted area.

A berthing master boards at the anchorage to assist berthing of the vessel to the storage tanker, port side-to. Vessels are taken to berth during daylight hours only; tugs are available.

The largest vessel loaded at this terminal was 250m long with a displacement of 105,000 dwt.

An anchorage is situated about 2 miles farther N. Dangerous wrecks lies 0.5 mile and 1 mile SSW of the SBM, within the restricted area.

Tanjung Bulupandan (6°54'S., 112°51'E.), about 1 mile NE of Tanjung Modung, is low and covered with shrubs. It can be identified by high trees standing about 0.3 mile ENE.

Between Tanjung Bulupandan and the village of Ketapang, 26.5 miles E, there are many rocks along the steep coast. Ketapang stands at the junction of the coastal road and the road heading S to Sampang, on the S coast of Madura. A waterfall tumbles into the sea about 1.5 miles E of the village.

The village of **Pasongsongan** (6°53'S., 113°40'E.) is situated on the coast, 21 miles E of Ketapang. It may be identified by a prominent dark red building. The village of Ambunten, 5 miles E of Pasongsongan, is remarkable for its stone buildings and the flat cultivated land in its vicinity.

3.50 **Tanjung Lapa** (6°59'S., 114°07'E.), the E extremity of Madura, is a low promontory covered with coconut palms. It lies 23 miles E of Ambunten.

The coast of Madura, from Ketapang to Tanjung Lapa, is straight and monotonous. Several villages are situated along this coast.

There are some prominent peaks inland along the N coast of Madura which provide landmarks. A range of hills run parallel with the shore, about 2.5 miles inland, and gradually increase in height to the E.

Gunung Bangsereh (6°56'S., 112°58'E.), 173m high, about 9 miles ESE of Tanjung Modung, with a round-topped tree on the NW slope, is prominent from the E, close inshore.

Gunung Berukung (6°56'S., 113°07'E.), a bare, sloping hill, 229m high, 8 miles E of Gunung Bangsereh, has an isolated stand of high trees on the summit.

Gunung Batu Putih, a conical hill, 191m high, is 5 miles E of Gunung Berukung. The hill has a broad gap on the E side, and four detached groups of trees on the summit, which appear as two thick trees when seen from the W.

Gunung Kumbang (6°56'S., 113°24'E.) is a flat-topped hill, 270m high, covered with vegetation. Gunung Waru, 389m high, is a table-topped hill, which rises 9 miles E of Gunung Kumbang.

3.51 **Gunung Pola** (Merangan) (6°56'S., 113°42'E.), 398m high, rises 8.5 miles E of Gunung Waru and is the highest peak on the N coast of Madura. Gunung Podjok, 167m high, 4.5 miles ENE of Gunung Pola, appears as a small conical peak from W, but is difficult to distinguish from E.

Gunung Buruan, 285m high, 12 miles WNW of Tanjung Lapa, is an isolated peak with a slightly jagged summit. Gunung Lapa, 2 miles NW of the same point, is a detached hill, 81m high.

With the exception of a wreck lying 18 miles NNW of Pasongsongan, the N coast of Madura is clear of dangers. The depths decrease gradually as the shore is approached.

The 20m line lies up to 3.5 miles off the N coast and up to 6.5 miles off the NE coast. The mud bottom affords good holding ground everywhere. Inside the 10m line, the mud is mixed with sand. There are several rocky patches close under the shore rendering landing difficult, but at high water, the coast is accessible everywhere.

A reef, with above and below water rocks, extends 1 mile E of Tanjung Lapa. A ridge of sand, with a least depth of 2.4m, lies with its S end 1.3 miles NNE of Tanjung Lapa, and extends 2 miles NNW. The coast in this vicinity should not be approached within 2 miles.

It should be noted that irregular depths of less than 18.3m extend 7 miles off Tanjung Lapa. An obstruction has been reported 7 miles NE of that point. A wreck, marked by a buoy, lies 17.5 miles NNE of Tanjung Lapa.

From Tanjung Lapa, the coast trends in a WSW direction, 12 miles to the village of Kalianget, which is on a point at the NE extremity of Teluk Sumenep.

From Tanjung Lapa to the village of **Langos** (7°00'S., 114°00'E.), the coast is rock fringed, then to Kalianget, the coast is low, sandy, and marshy. A shallow bay lies between Tanjung Lapa and Kalianget, bound on the S by Pulau Puteran.

The bay has depths of less than 5.5m extending 1.5 miles E of a line joining Tanjung Lapa and Tanjung Sarotak. The E extremity of Pulau Puteran is entered between these two points.

3.52 **Gili Iyang** (6°59'S., 114°11'E.) is a rocky island, 33m high near its SW end, with steep cliffs on its E side, and a clump of trees in the middle of its N part. The island is separated from Tanjung Lapa by Selat Gili Iyang, which is of little im-

portance as there are shoal patches with depths of 7.3 to 11m in the fairway.

Pulau Puteran (7°05'S., 114°00'E.), separated from Madura by the narrow Selat Kalianget, is wooded and rather steep-to on its S side. The N side slopes downward toward the coast, which is low and marshy in places. A peak, 104m high, is located 2 miles E of the SW extremity. A peak, 130m high, is located 1.75 miles WNW of the SE end of the island.

From Kalianget, the coast trends SSW 6 miles to Tanjung Tanjung, a low, rocky point covered with a thick strand of trees. A conspicuous grove of trees, 104m high, stand on the E extremity of a range of hills, in a position 1.5 miles NW of Tanjung Tanjung.

Kalianget Road comprises Teluk Sumenep and the area S, enclosed by the N coast of Gili Genteng and lines drawn from the NW and NE extremities of that island to Tanjung Tanjung and Tanjung Padike (7°05'S., 113°56'E.), the SW extremity of Pulau Puteran, respectively.

Teluk Sumenep is entered between Tanjung Padike and Tanjung Tanjung. Tanjung Padike, 3m high, has a round tree on its rocky extremity that appears as an island when viewed from the E.

Teluk Sumenep is usually filled by a bank of soft mud. The depth over the entrance bar is 2.7m and gradually shoals to the head of the bay.

Kali Saroka (Sokrok) enters the bay 2.75 miles NW of Tanjung Tanjung. A bar which dries, fronts the river. Kali Marengan has its origin near the town of Sumenep and discharges into the NW corner of the bay; its entrance is closed by a mud bar. The coast between the two rivers is low and marshy, consisting mainly of salt pans.

3.53 Sumenep (7°00'S., 113°52'E.) stands on the banks of the Kali Marengan, about 4 miles inland.

The village of **Kalianget** (7°35'S., 113°57'E.) (World Port Index No. 51202) is situated on the N side of the narrows, which separates Pulau Puteran from Madura. There is a large salt factory and power house at the NW end of the village.

A concrete wharf, 80m long, lies W of the factory. Another concrete wharf, lying SE of the factory, is 100m long, with a depth of 1.0m alongside. Vessels up to 2,500 dwt, with a maximum loa of 90m and a maximum draft of 5.0m, can be accommodated.

Kalianget

The harbormaster's office stands close E of the concrete wharf; a mooring buoy lies mid-channel S of the same wharf.

Tidal currents in the narrows of Kalinget set NE and SW, attaining a rate of 4 knots at new and full moon.

A wreck lies in the channel N of Kalianget.

Pilotage is not available. Vessels should send their ETA to their agent 10 days, 3 days, 48 hours, and 24 hours prior to arrival.

There is anchorage and shelter in Kalianget Roads for vessels of light draft, with local knowledge. Range lights lead to the pier and anchorage off Kalianget.

From Tanjung Tanjung, the S coast of Madura trends in a WSW direction, 22.5 miles to **Tanjung Padelegan** (7°15'S., 113°32'E.).

On this segment of the coast, the shoreline recedes and forms a shallow bay; the land here is wooded and has a fertile appearance.

Many small villages stand along the shores of the bay and several small rivers intersect the coast. The only river of any importance is the Kali Bunder which flows 4.5 miles NE of Tanjung Padelegan.

3.54 Gunung Tambuku (7°01'S., 113°38'E.), 471m high, the highest peak on Madura, rises 17 miles WNW of Tanjung Tanjung. Gunung Rompeng, 433m high, stands at the W end of the ridge, 7 miles W of Gunung Tambuku, with Gunung Sekaran, 380m high, midway between. Gunning Pajudan, 449m high, lies 0.75 mile W of Gunnung Tambuku.

Except for these three peaks, a ridge to the S obscures most of the N ridge.

The 11m line fronts the N shore of the bay to a distance of 4 miles. A mud bank and shoal ground, defined by the 11m line, lies up to 9 miles E of Tanjung Padelegan. Depths of 3.6 to 5.5m are found in the entrance of the Kali Bunder, as far as the harbor office, situated about 1 mile up river. However, the channel through the drying bank of mud and sand, leading to the river entrance, has a depth of only 0.3m.

There are several islands and dangers fronting this stretch of coast.

Karang Gemer (7°10'S., 113°56'E.) is a coral reef well marked by discoloration.

Gili Genteng (7°12'S., 113°55'E.), 45m high, is 2.5 miles S of Tanjung Tanjung. The SE extremity of the island rises to a rocky point 25m high. The point is connected to the main island by a low narrow neck which appears as two islands from a distance. A light is displayed from a white metal framework tower,12m high, on the edge of the reef, close off the W end of the island.

Gili Lawak (7°12'S., 114°03'E.), 21m high, lies 5 miles E of Gili Genteng. Two steep-to drying coral reefs lie 2 miles W of Gili Lawak and a steep-to coral reef with a depth of 2.4m, lies 2 miles farther W.

An isolated patch with a depth of 13.7m was reported to lie 6 miles SSW of Gili Lawak.

3.55 Gili Raja (7°13'S., 113°47'E.), fringed by a reef, lies 4 miles W of Gili Genteng; it is well wooded, and fertile. The island rises to a height of 54m near the middle of the S side and is marked by a light.

Gili Gilingan, a reef fringed islet, 10m high, lies 2.5 miles SW of the W extremity of Gili Raja. A reef, which dries 0.3m, lies 1.75 miles SSE of Gili Gilingan, and is plainly marked by discoloration. A reef fringed islet, 0.6m high, lies 1.5 miles WNW of Gili Gilingan.

Gili Dua (7°15'S., 113°40'E.), with Gili Pandan 1 mile NE, lies on a reef with above and below-water rocks. Both islets are about 0.6m high and covered by bushes.

Takat Wedi is a coral reef, with a small white cay, that lies 2.5 miles WNW of Gili Dua.

A reef similar to Takat Wedi, lies about 1 mile NW. Several dry rocks lie between this reef and the shore.

Bunder Road lies off the entrance to Kali Bunder. The road affords safe anchorage during the Northwest Monsoon. The recommended anchorage, in a depth of 7m, lies 4.75 miles NW of Gili Dua Light.

During the Southeast Monsoon, there is a considerable sea in the roadstead, making it unsafe for anchorage.

Vessels approaching the anchorage should pass between Gili Gilingan and the islet 1.5 miles WNW or between Gili Gilingan and Gila Raja.

Two prohibited areas, each with a radius of 2.5 miles, are centered about 3.5 miles SE of Gili Gilingan and 3.5 miles WNW of Gili Dua, respectively.

Two obstructions, 1.5 miles apart in an E and W direction, were reported to lie about 6.5 miles SSE of Tanjung Padelegan.

Tanjung Padelegan, which is low and marshy, is not easily identified. The coast to Tanjung Batu Putih, 22 miles W, is hilly.

Between Tanjung Padelegan and the village of **Tambakan** (7°13'S., 113°20'E.), 12 miles W, the coast is rock fringed from a position 3 miles W of Tanjung Padelegan. Camplong Light is shown near Tambakan. A small tank farm is located on the coast close W of Camplong Light.

Camplong Light

A mosque stands on the coast, 2 miles E of Tambakan, and a another mosque is situated on the coast, 2.5 miles W of the village.

Between Tambakan and the entrance to Kali Sampang, the coast is rock fringed.

A hill, 85m high, rises 3.5 miles WNW of Tambakan and has some trees on its NW slope. A tree that makes a good mark stands on its SE slope.

Kali Sampang, 4 miles W of Tambakan, enters the sea near the E end of the narrow strip of sand. The town of Sampang, which is not visible from seaward, stands 1.5 miles above the entrance of the shallow river.

The only house visible from seaward is the harbormaster's office, a white building with a red roof, situated on the W bank of the entrance to the river.

Anchorage can be taken, in 15 to 18m, mud, about 1.75 miles from shore, with the harbor office bearing 330° and a bare hillock E of the town bearing 023°. During the Southeast Monsoon, vessels can anchor under the lee of Pulau Kambing, previously described in paragraph 3.45.

From the mouth of Kali Sampang, the coast of Madura trends W to the mouth of Kali Baliga, about 6 miles distance.

The coast is fronted by a low, narrow strip of sand and a steep-to sand spit, most of which dries, that extends 3 miles S from the entrance to Kali Baliga. There are brown patches outside the spit caused by the flow of the river.

Tanjung Batu Putih, the W entrance point to Kali Baliga, has been described with the E approach to Selat Surabaya in paragraph 3.44.

Kali Porong to Tanjung Sedano

3.56 The NE coast of Jawa, described here from W to E, forms the S side of Selat Madura. The SE entrance to Surabaya is approached through Selat Madura.

The ports of importance on this coast are, Pasuruan Road, Pelabuhan Probolinggo, Besuki Road, and Panarukan Road.

There are several peaks on Jawa which provide good landmarks and are also described in sequence from W to E.

From Kali Porong, the coast trends in a SE direction about 6 miles to Pasuruan Road. The coast is fronted by a chain of low, narrow, sandy islets. Inland, there are fish ponds, also separated by sandy islets; the paddy fields extend to the foothills of the mountains.

At the S end of the plain, extending S of Surabaya, is **Gunung Penanggungan** (7°37'S., 112°37'E.), 1,653m high, and conical shaped when viewed from the E. Gunung Ardjuno rises to a height of 3,339m, 9 miles SSW of Gunung Penanggungan; from the E, it appears as a broad ridge with three summits differing little in height.

Fronting the outer islets, there is a drying bank of mud and sand which extends 1 mile off Pasuruan. The 5.5m line lies up to 2 miles offshore.

3.57 **Pasuruan** (7°37'S., 112°55'E.) stands on the banks of the Kali Gembong, 27 miles SSE of Surabaya. A light, shown from a white mast, 12m high, stands at the entrance on the E side at Keli Gembong.

Pasuruan Road provides shelter during the Northwest Monsoon, but is open to N and E winds.

During the Northwest Monsoon, communication with the shore is seldom interrupted, although it sometimes blows hard from the NW and SW. A shoal with a least depth of 3.7m, lies

less than 1 mile N of the tide gauge hut.

Anchorage may be obtained, in a depth of 9m, 2 miles NNE of the disused lighthouse on the W side of the mouth at Kali Gambong. Due to the proximity of Tanjungperak, the anchorage is only used by coasters conducting local trade.

From Pasuruan, the coast trends ESE, 7 miles to **Tanjung Warangan** (7°39'S., 113°01'E.), a low rounded point with tall trees that provide a good mark from the W; they are less clearly defined from E. Fishponds front the coast, from Pasuruan 4.75 miles E and up to 1.75 miles from it.

Fronting the fishponds, there is drying sand and a mud bank which extends 0.75 mile seaward. It is advisable to keep in depths of not less than 22m when rounding Tanjung Warangan.

The coast trends 7 miles SE to Tanjung Taju, then 4 miles E to Probolinggo; there are several villages along this section of the coast. A white stone pyramid stands 2 miles SE of **Tanjung Taju** (7°43'S., 113°09'E.), and marks the SW boundary of Pelabuhan Probolinggo. A similar pyramid marks the SE boundary, 4.5 miles E.

The inland mountains provide good landmarks when approaching Probolinggo or when in transit of Selat Madura.

3.58 Gunung Tengger (7°58'S., 112°57'E.), one of the most remarkable volcanoes on Jawa, is located 18 miles SSW of Tanjung Warangan. The central crater is lower than the surrounding peaks which vary in height from 2,295 to 2,780m.

Between Tanjung Warangan and Probolinggo, the summit of Gunung Mahameru may be seen appearing above the slopes of Gunung Tengger.

Gunung Argowulan (7°54'S., 112°58'E.), 2,725m high, is the NE peak of Gunung Tengger and Pundak Lembu, 2,635m high, is the E peak of the same group. Gunung Pulsari, 1,450m high and Gunung Penawungan, 520m high, are located 8 miles ESE and 13 miles ENE, respectively, from Pundak Lembu.

Gunung Lamongan (7°59'S., 113°20'E.), which rises in two peaks to a height of 1,670m, is an active volcano with smoke constantly rising from it. This volcano is 16 miles SSE of Probolinggo.

Gunung Hiyang rises rapidly from the S to a prominent summit, **Gunung Argopura** (7°58'S., 113°34'E.). This peak is 3,088m high and slopes down gradually to the N, with several summits.

Gunung Loros (7°44'S., 113°35'E.) is a prominent cone, 539m high. It is visible great distances, from E,W, and N.

Near the coast, there are some conspicuous hills that form excellent landmarks when the mountain peaks are obscured.

Gunung Semongkrong (7°41'S., 113°01'E.), a ridge 84m high, is located close S of Tanjung Warangan. Gunung Tugel, a conical hill 85m high, is located 5.5 miles SE of Gunung Semongkrong.

Gunung Glugu, 5 miles SE of Probolinggo, is 104m high. There are trees on its top darker than the others. The lights of the sugar mills along the coast are visible at night.

Pulau Ketapang (7°41'S., 113°15'E.) is a low sparsely wooded island, 12m high, lying in the N approach to Probolinggo. A flagstaff stands on the E end of the island. Karang Katon, 2 miles SE of Pulau Ketapang, is a small patch of sand, shells, and stones, with a depth of 7.9m.

Karang Nangkok and Karang Munira, with depths of 11.9 and 11m, respectively, lie between Karang Katon and Pulau Ketapang.

3.59 Probolinggo (7°45'S., 113°13'E.) (World Port Index No. 51180) stands at the head of a small basin and is approached through a dredged channel, 610m long and 23m wide. There is quayage for small craft around the inner and outer basins and on both sides of the channel connecting the two basins. Ships are loaded and discharged in Probolinggo Roads, an open lighterage port.

Vessels up to 35,000 dwt, with maximum draft of 7.4m, can be handled at the anchorage.

Probolinggo Light, a white beacon 16m high, is situated NE of the town.

At the entrance to the canal leading to Probolinggo, a framework tower, 14m high, painted green, stands on the head of the W mole. A similar structure, painted red, stands on the head of the E mole.

Anchorage can be taken, in 12m, mud, with the harbor entrance open and the light bearing 180°, 0.5 mile. This anchorage is partly sheltered from NE winds by Pulau Ketapang. Anchorage may also be taken 1 mile NW of the light.

At the N end of Probolinggo is an oblong basin, with wharves for praus and lighters. A channel, with a depth of 3m, leads between the two stone breakwaters. Within the basin is a depth of 2.5m. Close to the head of the W breakwater is a wreck covered by 1.2m.

Pilotage is compulsory. Vessels should send their ETA to their agent 10 days, 3 days, 48 hours, and 24 hours prior to arrival.

Vessels approaching Probolinggo Road from W, steer for Gunung Glugu with the lighthouse bearing 141°, or another hill about 10.5 miles SSE, with the lighthouse bearing 158°. Both of these ranges lead W of Karang Katon.

When approaching from E, vessels may pass on either side of Pulau Ketapang, or between that island and Karang Katon, depending on draft. Gunung Glugu, in range with the hill 5 miles S, bearing 178°, leads E of Pulau Ketapang.

Caution.—A torpedo firing range extends 3 miles S and 2 miles E from the E extremity of Pulau Ketapang. Fishing is prohibited in the area. When practice is taking place, a black cylinder above the national flag will be displayed by the firing and recovery vessels. Similar signals are also displayed at the breakwater lighthouse and flagstaff on the E end of Pulau Ketapang. At night, a red light is shown at the lighthouse.

3.60 Tanjung Gerinting (Grinting) (Bedulan) (7°42'S., 113°29'E.) is a low, sandy, and steep-to point 16 miles E of Probolinggo. The point is hard to identify. The intervening coast is low and covered with paddy fields.

The coast is fronted by a drying sand and mud bank which can be safely approached by sounding, except off Tanjung Gerinting.

At certain times of the year, the lights of the sugar factories, on or near the coast, may be visible from seaward.

Tanjung Kraksaan lies 11 miles E of Probolinggo. The point may be recognized by trees standing in the water at the mouth of the river. Tanjung Kraksaan extends N.

Kraksaan Road affords anchorage, in a depth of 18m, N of Tanjung Kraksaan, bound by the parallel of Tanjung Gerinting and the meridians of 113°23.5'E and 113°26.5'E. Close to the coast forming its S boundary is a large warehouse with a zinc

roof.

From Tanjung Gerinting, the low coast continues for 4.5 miles E where the slope from Gunung Loros reaches the coast. Here, there is only a narrow strip of sandy beach, fronted by a drying reef, which extends for 5.5 miles E to the village of Taman. Gunung Temporah, 99m high, rises close W of the village.

A measured distance marked by three pairs of beacons is established on the coast. The W pair of beacons stand 3.5 miles ESE of Tanjung Gerinting.

An ammunition dumping ground is situated about 4.5 miles NE of Tanjung Gerinting (Grinting).

Karang Kerandji (Pulau Kerandji) (7°42'S., 113°35'E.), a steep-to coral patch with a depth of 2.4m, lies 0.75 mile N of the E pair of the measured distance beacons.

Paiton (7°42'S., 113°35'E.) has a coal-fired power station complex and jetties for discharging coal from barges and bulk carriers. The multipurpose terminal offers seven jetties which accommodate vessels up to 45,000 dwt with no draft restrictions.

3.61 Besuki (7°44'S., 113°41'E.) is the capital of the residency. Vessels calling here must anchor in Besuki Road which fronts the town between Gunung Temporah and Tanjung Ketah, and is bound on the N by the parallel of the latter point, and on the W by the meridian of Gunung Temporah, and the coast.

A light, shown from a metal framework structure, black and white bands, stands on the W bank of the Kali Besuki, N of Besuki.

A reddish banyan tree stands about 0.6 mile SSE of the light, and two warehouses with red roofs stand close S of the tree. A flagstaff stands 0.2 mile S and a sugar factory and chimney are 0.5 mile E, respectively, of the banyan tree.

Anchorage may be obtained, in a depth of 18m, 0.5 mile NW of the light.

Vessels approaching Besuki Road from E should steer on Gunung Temporah, bearing 242°, keeping in depths of 18.3m. Vessels from W, should pass well N of Karang Kerandji by keeping the N point of Gunung Temporah bearing not less than 114°. The reef will be cleared when Gunung Loros bears 180°.

Tanjung Ketah (7°43'S., 113°42'E.), the NE entrance point to Besuki Road, is low, flat, rounded, and marshy. Kali Deluwang flows into the sea here.

Between Tanjung Ketah and Tanjung Pasir Putih, about 6 miles E, the coast is flat and wooded with high coconut palms. The coastal bank extends 0.3 mile off Tanjung Pasir Putih.

The chimney of a sugar mill may be seen behind the palm trees. From Tanjung Pasir Putih to Tanjung Pecaron, 3.3 miles ENE, the coast is formed by the spurs of Gunung Ringgit; a narrow reef fringes this coast.

Tanjung Pecaron (7°41'S., 113°52'E.), the W entrance point of Panarukan Road, is formed by a conical hill 62m high, which appears as an islet when seen from a distance.

A tomb, surrounded by tall trees, stands on its summit.

3.62 Gunung Ringgit (7°43'S., 113°51'E.) is the W summit of a range, which rises 3 miles within the coast, and has several steep peaks. Its highest summit is 1,250m.

Gunung Beser, 1,303m high, rises 5.5 miles SSW of Gunung Ringgit and is one of several prominent peaks that rise E of Gunung Argopuru. Gunung Malang, 250m high, stands 2.3 miles ENE of Gunung Ringgit; Gunung Kukusan, 509m high, with a village on its summit, rises 1 mile S of Gunung Malang.

A prominent peak, 600m high, stands 0.75 mile SSW of Kukusan.

Within the coast SE and ESE of Gunung Ringgit are some mountains identifiable in clear weather.

Gunung Raung (8°07'S., 114°03'E.), 26 miles SSE of Gunung Ringgit, is a volcano 3,332m high, with a large plateau on its summit. Gunung Merapi, at the E end of the range, is 2,800m high and conical. Spurs descend from this mountain range to Selat Bali.

Gunung Ringgih (7°59'S., 114°13'E.), 1,995m, is the highest summit of a mountain range N of Gunung Merapi.

The two mountain ranges, of which Gunung Merapi and Gunung Ringgih are a part, form an almost circular ring of peaks around a table, covering an area of approximately 25 square miles; this is known as Idjen Plateau.

Gunung Baluran (7°50'S., 114°22'E.), 1,247m high, rises near the NE extremity of Jawa. Baluran forms the SW side of a crater that is broken down on its NE side.

Close W of the crater are two peculiar reddish-brown knobs lying close together.

3.63 Panarukan (Pelabuhan Panarukan) (7°42'S., 113°56'E.) (World Port Index No. 51200) is situated on the low coast, 1 mile E of the head of the bight, between the two points that form Panarukan Road.

The port was reconstructed and extended to 597m from the old port. The draft alongside on the extended port is 5m.

The town stands on the banks of Kali Sampean, and may be easily identified from sea by the many zinc-roofed warehouses.

A light, shown from a metal framework tower, 14m high, black and white bands, and a flagstaff E of it are difficult to identify. There is a short pier near the flagstaff and a longer pier 365m SW.

Foul ground lies 1.3 miles N of the light; **Karang Jamungang** (7°41.3'S., 113°55.5'E.), with a depth of 4.6m, lies 0.75 miles NNE of the light.

Two more shoals, with depths of 2.1m and 3.3m, lie about 0.6 mile N of the same light.

The mouth of Kali Sampean lies 0.75 mile NNE of the light,; a drying mud bank extends 0.75 mile N of the river. A beacon, 0.3 mile ENE of Karang Jamungan, marks the W limit of this mud bank.

Panarukan Road is bound by a line joining Tanjung Pecaron and Tanjung Paras on the N and the coast on the S. From April to December, working cargo with lighters at the anchorages can be carried out without difficulty.

During the Northwest Monsoon, especially during January and February, there is a short sea so that lighters cannot be fully loaded, and may have difficulty in berthing alongside.

Pilotage is not compulsory. Vessels should send their ETA 48 hours in advance.

Anchorage for moderate size vessels may be taken, in a depth of 16m, 0.75 mile NW of the flagpole. Deep-draft vessels should anchor farther seaward.

Vessels approaching Panarukan Road from E will clear the reef fringing Tanjung Paras, by keeping the light bearing S of 195°. It should be noted that the depths decrease sharply within

the 20m line.

From Panarukan Road, the coast trends in a NE direction for 8.3 miles to Tanjung Pacenan, then SE about 30 miles to Tanjung Sedano.

Kalbut Situbondo Terminal consists of the storage tanker New Renown, which is 240,830 dwt, 319m long, and anchored about 4.2 miles W of Tanjung Pacenan in approximate position 7°36.8'S, 113°58.2'E. Pilotage is compulsory and berthing is done in daylight only.

3.64 Tanjung Pacenan (7°36'S., 114°02'E.), 8 miles NE of Panarukan, is a rounded steep-to point formed by low, narrow, sandy islets. The islets and fish ponds extend 1 mile S. Tanjung Pacenan Light stands at a height of 43m on the point.

Kalbut Road is about midway between Tanjung Paras and Tanjung Pacenan, and is used by the sugar factories in the vicinity for the shipment of sugar.

From the W, the position of Kalbut can be identified by the numerous praus always lying in the road, and the tall palm trees lining the coast, NE of Tanjung Paras.

From N and NW, a sugar factory, with a chimney, lies about 3 miles SE of Kalbut, and may be seen over the low land.

From Tanjung Pacenan, the low sandy coast extends SE, 13 miles to Tanjung Jangkar, a low point covered with high trees.

The 18.3m line lies up to 1.5 miles offshore along this coast, but is charted only about 0.1 mile off Tanjung Jangkar.

Karang Putih (7°41'S., 114°10'E.), 2 miles offshore, 8.5 miles SE of Tanjung Pacenan, has a depth of 1.5m.

The town of **Jangkarlor** (7°43'S., 114°12'E.) lies at the head of a small bight, about 2 miles SW of Tanjung Jangkar. Sugar is exported from the road off Jangkar. There are two piers at the head of the bight; one is about 91m long.

A prominent warehouse with a zinc roof is situated in the town and a sugar factory with a chimney stands 3 miles S of Tanjung Jangkar.

Anchorage may be obtained, in a depth of 15m, 1.3 miles N of the town. A 4.5m patch lies 1 mile NW of Jangkar; a 1.4m patch lies 1 mile further W.

Tanjung Cotek (Tanjung Tjotek) (7°45'S., 114°19'E.) lies 5 miles SE of Tanjung Jangkar. The coast between the two points is low and sandy, with marshy ground inland.

Tanjung Lumut lies 3.75 miles E of Tanjung Cotek. There is a small group of tall trees on Tanjung Lumut, and Gunung Baluran rises 5.5 miles S of the point.

Between Tanjung Cotek and Tanjung Lumut, a chain of islets lies parallel with the coast about 0.5 mile offshore.

Small local craft can obtain shelter within the narrow channel, which has depths of 7.3 to 12.8m.

3.65 Tanjung Sumbertboto (7°47'S., 114°26'E.) lies 4.75 miles SE of Tanjung Lumut. Close NW of Tanjung Sumberbatok, there are some above-water rocks.

A measured distance of 7,177m is established between Tanjung Lumut and Tanjung Sumberbatok and is marked by two pairs of beacons. The NW pair stand 0.75 mile SE of Tanjung Lumut and the SE pair 1 mile SE of Tanjung Sumberbatok. The running course is 124° and 304°, at a distance of 2.75 miles from the coast.

Tanjung Sedano (7°50'S., 114°28'E.), the NE extremity of Jawa, is located 2.5 miles SE of Tanjung Sumberbatok. It may be identified by three steep-to precipitous rocky cliffs at the extremity of a spur from Gunung Baluran.

Pulau Karangmas (Gosong Karangmas) (7°40'S., 114°26'E.) lies 6 miles offshore, NE of Tanjung Lumut; it is the E of five reefs, partly dries, and has some bushes on it.

Discolored water extends 0.5 mile SW from the E reef, and two reefs with depths of 8.8 to 11m, lie within 1.5 miles SW. Reefs, with depths of 4.5m and 11m, lie 1 mile NW and 0.75 mile N, respectively, of Pulau Karangmas. A light shown from an eight-sided metal tower, 16m high, is situated on Pulau Karangmas.

Anchorage may be obtained in the basin between the reefs, 0.5 mile SW of the light, in a depth of 44m. This anchorage can be reached by steering a course of 072° with the light ahead. With good light, the edge of the reef can be avoided due to its discoloration.

Selat Madura

3.66 Selat Madura is the wide and deep strait between Madura on the N and the NE coast of Jawa on the S. Entry into the strait from the E is through the Bali Sea or from NE, through Selat Sapudi. Light-draft vessels may proceed from the W end of Selat Madura to Tanjungperak, then N through Selat Surabaya.

The N and S coast of Selat Madura have been described beginning in paragraph 3.55; the approach to Selat Surabaya from the W extremity of Selat Madura has been described in paragraph 3.39.

Winds—Weather.—The monsoons in Selat Madura are relatively weak, the Southeast Monsoon being stronger. The high land on both sides of the strait create land and sea breezes which interfere with the steadiness of the monsoonal winds.

The Southeast Monsoon commences in April and blows from an ESE direction until September. It is stronger and steadier at night on the S side of the strait. The sea breeze opposes the Southeast Monsoon during the day to give light variable winds. On the N side of the strait contrary conditions will produce steady winds by day and weak and variable winds at night.

The Northwest Monsoon, from W of WNW, is impeded by the intervening mountains, but is more reliable in January and February. During these months, the wind is more constant near the Jawa coast in daytime and on the Madura side at night.

A cloudless, but very hazy sky, is the prevailing feature of the Southeast Monsoon, when rain seldom falls. The wet season lasts from December to March, though thunder squalls are infrequent.

Tides—Currents.—The horizontal movement of the water in Selat Madura is a mixture of monsoon currents and practically semi-diurnal tidal currents.

In the vicinity of **Zwaantjes Reef** (7°28'S., 113°07'E.), the latter predominates and near **Gosong Karangmas** (7°40'S., 114°26'E.), the monsoon currents predominate.

Between these two positions the conditions are variable.

Vessels approaching the E entrance to Selat Surabaya will find that the monsoon current is no longer perceptible and that the tidal currents have increased considerably. In the vicinity of Zwaances Reef, the average rate of the tidal current is 1 knot, increasing to 1.5 knots at full and new moon and decreasing,

Gayam Wharf and Cupola

toward the quarters, to about 0.5 knot.

The direction is E with the ebb and W with the flood. The current flows twice daily in each direction, at the change of the tide. The tidal currents under the Jawa and Madura shores are not as strong as in the middle of Selat Madura, the maximum rate being about 0.5 knot.

Caution.—Selat Madura is used extensively for naval exercises. For the limits of these areas and for mined areas refer to Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Anchorage is prohibited in an area with a radius of 5 miles, centered about 12 miles E of **Zwaantjes Reef** (7°28'S., 113°07'E.). An explosives dumping area, lies near the center of the prohibited anchorage area.

Unexploded depth charges lie, both within and outside the limits, of the NE quadrant of the prohibited anchorage area. There is also an unexploded depth charge, charted 9.3 miles NW of Tanjung Pacenan. All other known dangers in Selat Madura have been discussed.

Selat Sapudi

3.67 Selat Sapudi is a wide and deep channel that lies between Gili Yang and **Pulau Sapudi** (7°08'S., 114°20'E.), 7.5 miles SE. The strait is used by vessels as passage from Singapore to Australia, as well as those bound for Selat Madura and Selat Bali. The strait is prominent by radar.

Tembaga Reefs (7°07'S., 114°09'E.), a group of three reefs, lie on the W side of Selat Sapudi, 7.5 miles SSW of Gili Yang. The NE reef of the group partially dries and has a stranded wreck on its N side. The S reef, with a depth of 0.6m, lies 0.75 miles SSW and the W reef, which dries, lies 1.3 miles SW of the NE reef.

There is a clear channel, with a depth of 11 to 16.5m, between Tembaga Reefs and Pulau Puteran, 3.75 miles to the W.

Yacoba Elisabett, a coral rock. with a depth of 12m, lies 4.5 miles SSE of Gili Yang; the rock is steep-to. An obstruction was reported to lie 4 miles ENE of this coral rock.

Tides—Currents.—The horizontal movement of water in Selat Sapudi is a mixture of monsoonal current and tidal stream.

There is no regular connection between the changes in the horizontal and vertical movements of the water, but generally, the flood tidal current appears to set S, and the ebb N.

During the Southeast Monsoon, the current sets N and in the Northwest Monsoon, S. When the current and tidal stream coincide and are running together, they attain a rate of 2 knots.

Caution.—Mined areas may exist in Selat Sapudi; for further information see Pub. 120, Sailing Directions (Planning Guide) for Southeast Asia.

Submarines exercise frequently in an area bound by the par-

allels 7°14'S and 7°24'S, and between the meridians 114°20'E and 114°40'E.

An explosives dumping ground, best seen on the chart, is centered 7 miles SW of the SW extremity of Pulau Sapudi and 9 miles SSE of Yacoba Elisabett.

A gas pipeline, oriented 070°-250°, is located about 3 miles S of the explosive dumping ground.

Kepulauan Sapudi

3.68 Kepulauan Sapudi, on the E side of Selat Sapudi, consists of 13 principal islands. The largest of the group is Pulau Sapudi, with the others extending E 30 miles to Pulau Goagoa.

With the exception of Pulau Sapudi and Pulau Raas, 4.5 miles E, all the islands are low and flat. Some of the islands are inhabited and considerable trade is carried out by praus, principally at the beginning and the end of the Southeast Monsoon.

Pulau Sapudi (7°08'S., 114°20'E.) rises to a height of 120m in its SE part. The island lies 11 miles SE of Tanjung Lapa, the E extremity of Madura. There is a stone pier and flagstaff at **Gayam** (7°10'S., 114°20'E.), the principal village on the island.

The pier has a prominent red-roofed cupola on its head, and a light shown from a wooden mast, 12m high, stands nearby.

Tribung Light is shown from a white eight-sided framework tower, 59m high, 5.5 miles NNW of Gayam. The village of Tribung is situated about 1.3 miles SSE of the light. The island of Pulau Sapudi is reef fringed.

Anchorage may be taken in the Northwest Monsoon, in a depth of 35m, mud, 0.4 mile S of the pier at Gayam. During the Southeast Monsoon, the preferred anchorage, in depths of 29 to 33m, lies 0.5 mile W of Tribung Light. These anchorages are unsuitable for a prolonged stay, and when the monsoon current and tidal currents coincide, eddies and whirlpools may cause a foul anchor.

Pulau Payangan (6°58'S., 114°26'E.) is the farthest N of this group. It lies on a steep-to reef, 7 miles NE of Pulau Sapudi. A patch, with a depth of 11m, is located 2.5 miles NNW of Pulau Payangan.

Pulau Bulumanuk lies on a drying reef, 3.5 miles SE of Pulau Payangan. The reef, which is steep-to on its E and S sides, extends up to 1 mile offshore.

3.69 **Pulau Raas** (7°09'S., 114°33'E.) lies 4 miles E of Pulau Sapudi. The island rises to a height of 25m in the W and 49m in the E. The middle part is low and when viewed from a distance, it appears as two islands.

The island is fringed by a steep-to drying reef on its S and W sides. A reef, which dries, extends 4.5 miles N. Pulau Sarok, which is wooded and provides a good landmark, is located 1 mile within the N extremity of the drying reef. A detached reef, with a sand cay, lies 4 miles NE of the W extremity of Pulau Raas.

Koset (7°04'S., 114°29'E.), a reef with a least depth of 3.3m, is located 4.5 miles N of NW extremity of Pulau Raas. The reef is usually marked by discoloration.

Reiger, a reef with a depth of 7m, lies 4 miles ENE of Koset, and is not marked by discoloration.

Selat Raas is a deep and clear channel that lies between Pulau Sapudi and Pulau Raas. The strait is seldom used by large ships as the currents run at a greater rate than at Selat Sapudi.

Pulau Tundu (Tonduk) (7°10'S., 114°40'E.) has a hill, 30m high, with a flat summit. The island lies on a drying reef, which extends 2.75 miles NW from its N extremity.

Three low reef-fringed islands lie between 5 miles N and 3.75 miles NNE of Pulau Tonduk. They are, from N to E, Pulau Telango Air, Pulau Telango Tengah, and Pulau Telango Timur.

Pulau Goagoa (7°08'S., 114°46'E.) lies on the SE extremity of an extensive reef which extends 3 miles NW. Pulau Kamudi, 1 mile NE of Pulau Goagoa, is surrounded by a white sandy beach. A light is situated on the E side of Pulau Kamudi.

The channel that extends NW between the reefs of Pulau Tundu and Pulau Goagoa is deep and clear of dangers, except for a 14m patch, 1.75 miles SW of Pulau Goagoa.

Pulau Bawean and Off-lying Islands

3.70 Pulau Bawean lies 60 miles N of Ujung Pangkah, the W entrance point of Selat Surabaya. The mountainous, wooded island rises to a height of 656m, near its center; it is surrounded by dangerous reefs. Parts of the S and NW coasts of the island are low, but elsewhere the mountain ridges reach the coast.

Gosong Gia lies 45 miles NE of Pulau Bawean. Masalembo-kecil and Masalembo-besar lie about 100 miles ENE of the same island and are described in paragraph 3.73.

Tides—Currents.—In the vicinity of Pulau Bawean, generally, the flood current sets to the E and the ebb current sets to the W. The horizontal movement of the water is almost entirely due to the monsoons. No greatest observed rate has been than 2 knots.

Tanjung Mentigi (5°43'S., 112°41'E.), the N extremity of Pulau Bawean, is 98m high, partly cultivated, and marked by a light. Tanjung Gebang lies 2.8 miles ESE of Tanjung Mentigi.

The coast then trends 5.5 miles in a S direction to Tanjung Klumpang.

Reefs extend 9.5 miles from the E coast of Pulau Bawean, rendering the approach on this side dangerous. A wreck, best seen on the chart, lies 27 miles E of the S tip of Pulau Bawean.

The shoals show little discoloration, and although the water is quite clear, they are first seen only when the ship is right over them. The reefs that uncover do not show much discoloration when submerged.

Karang Gosong (5°46'S., 112°51'E.) lies about 5.5 miles off the E coast of Pulau Bawean. The reef is always covered, but has numerous heads just below the surface.

The remains of a stranded wreck may be visible on the NE side of the reef. A 2.4m sandy patch lies 2 miles N of Karang Gosong, and is the NE danger off the E side of Pulau Bawean.

3.71 **Gili** (5°48'S., 112°46'E.), surrounded by reefs and separated from the E coast of Pulau Bawean by a foul channel 1.75 miles wide, is a thickly-wooded islet that rises to a height of 105m.

Karang Bitian (Bitian) (5°52'S., 112°52'E.), the E of the known dangers off this coast, is a narrow, elongated reef, with a least depth of 5.8m. Karang Bungarang, an above-water rock, lies on an extensive reef, 5.5 miles W of Karang Bitian.

Pulau Noko (5°53'S., 112°42'E.), a low brush-covered islet, lies off the SE coast of Pulau Bawean, 5 miles WSW of Karang Bungarang and is fringed by a reef extending about 0.4 mile offshore. An 11m patch lies 3 miles SSE of Pulau Noko and an 8.5m patch lies 3.8 miles ESE of the same islet.

There are numerous shoals lying off the E coast of Pulau

Bawean, which may best be seen on the chart.

Tanjung Layar (5°52'S., 112°41'E.), 3.8 miles SW of Tanjung Klumpang, is the extremity of a peninsula 183m high, connected to the island by a low isthmus. Tanjung Layar is barren and from a distance appears as an islet.

Tanjung Alangalang (5°52'S., 112°37'E.), 4 miles W of Tanjung Layar, is the extremity of another peninsula, 70m high, which appears as an islet when seen from seaward. There are some large above-water rocks on the coastal reef, which extends 0.3 mile from the point.

3.72 Sangkapura Road (5°52'S., 112°37'E.) (World Port Index No. 51110), is bound by the parallel of Tanjung Alangalang on the S and the coast on the N, and between the meridians of Tanjung Alangalang and Tanjung Layar.

A stone pier, about 0.2 mile long, projects SSW from the head of Sangkapura Road, close SW of the village of Sangkapura. Sangkapura Light (5°43'S., 112°39.2'E.) is shown from a white metal framework tower, which is reported to have a height of 20m. A breakwater, about 0.2 mile long, is built across the reef S of the pier.

Numerous reefs and dangers lie in the road. Timbul Reef, with a least depth of 1.8m, lies on the W side of the entrance range. Other charted dangers lie on both the E and W sides of the range.

Tanjung Alangalang and Tanjung Layar are useful landmarks as is Gunung Maloko, 0.75 mile NNE of the root of the pier.

A range, with lighted beacons in line bearing 000°, leads between the dangers. The front beacon stands on the beach 1 mile WNW of the pier and the rear beacon is on a hill, 1 mile N.

Anchorage may be obtained by large vessels in depths of 22 to 26m, 0.6 mile S of the pier. Small vessels may anchor on the range line 0.75 mile W of the pier head.

Continuous SE and SW winds raise a heavy swell in the roadstead. A swell also sets in with winds between W and NW.

Camar Marine Terminal (6°18'S., 113°00'E.) (World Port Index No. 50972), stands about 33 miles SE of Pulau Bawean in the Camar Oil Field; a restricted area surrounds the field. Two lighted oil production platforms stand in the E edge and NE parts of the restricted area.

Caution.—Best seen on chart, an obstruction lies 1.5 miles S of the E platform. A dangerous unmarked wreck lies 14 miles S of the NE platform.

3.73 Tanjung Gaang (5°51'S., 112°34'E.), the SW extremity of Pulau Bawean, 3.3 miles NW of Tanjung Alangalang, is a low bare rocky tongue of land. Inland of the point the land rises to a hill, 212m high.

Tanjung Gili (5°48'S., 112°34'E.), the W extremity of the island, lies 2.3 miles N of Tanjung Gaang. The densely-wooded point, 47m high, is easy to identify.

Teluk Bangsal is entered between Tanjung Gili and a low point, 1 mile NNE.

Anchorage, by vessels with local knowledge, is available in the bay during the Southeast Monsoon.

Tanjung Cina (Tjina) (5°47'S., 112°35'E.), 2.5 miles N of Tanjung Gili, is a wooded peninsula, 116m high, connected to the main island by a very low, sandy isthmus.

From Tanjung Cina, the coast trends in a NE direction about 7 miles to Tanjung Mentigi, a point previously described in paragraph 3.69. Promahan Bay lies on the W side of Tanjung Mentigi.

Anchorage, with local knowledge, may be obtained in Promahan Bay, in depths of 15 to 20m. Care must be taken to avoid a reef, with a depth of 4.5m, which extends 0.75 mile NE from the W entrance point of the bay.

Caution.—A 4.5m patch lies 4.75 miles WSW of Tanjung Alangalang. This patch is the farthest SW danger charted off the W coast of Pulau Bawean.

A below water rock lies 0.75 mile SW of Tanjung Gili and a 12m patch lies 2 miles farther SW. A reef, with a below-water rock off its outer end, extends 1.3 miles NW from Tanjung Gili.

A below-water rock lies in the middle of the entrance to Teluk Bangsal.

Numerous wrecks lie in the waters between Pulau Bawean and the islands of Jawa and Madura. These wrecks can best be seen on the chart.

An oil rig lies as a dangerous wreck about 31 miles SE of Pulau Bawean. The wreck is marked by lighted buoys.

Another dangerous wreck unmarked, lies 14 miles further S.

3.74 Nusa (Noesa) (5°45'S., 112°32'E.), a high, bare rock, is 2.5 miles WNW of Tanjung Cina. A reef, with a depth of 0.9m, lies 1.3 miles SSW of Nusa. A 4.9m patch lies about 1.75 miles WNW of Nusa, and a below-water rock lies 1 mile N of the same reference point.

The entire area should be avoided, although most of the shoals can be seen in clear weather from a relatively short distance.

Pulau Bila (Bila) (5°45'S., 112°36'E.), a wooded islet, 48m high, lies near the end of a coastal reef in a position 2.3 miles NNE of Tanjung Cina.

Masalembo-Besar (5°33'S., 114°26'E.), about 100 miles ENE of Pulau Bawean, is a small thickly wooded island, 197m high, surrounded by reefs. The reef, when covered, is usually well marked by discoloration. The island was reported to be radar conspicuous at a distance of 29 miles.

There is a small port on the N side of the island with a T-head jetty, 472m long. There is a buoyed approach channel through the reef that leads to the pier.

A light, shown from a metal framework tower with red and white stripes, stands on the summit of the island. A dangerous wreck lies about 6 miles WNW of the light. An ammunition dumping ground exists 10 miles WNW of the light.

Masalembo-kecil (5°26'S., 114°26'E.), 4.3 miles N of Masalembo-Besar, is 79m high and fringed by a drying reef. The reef, when covered, is usually well marked by discoloration. The reef on the NW side of the island does not cover. An unused aluminum light stands on the S extremity of the island.

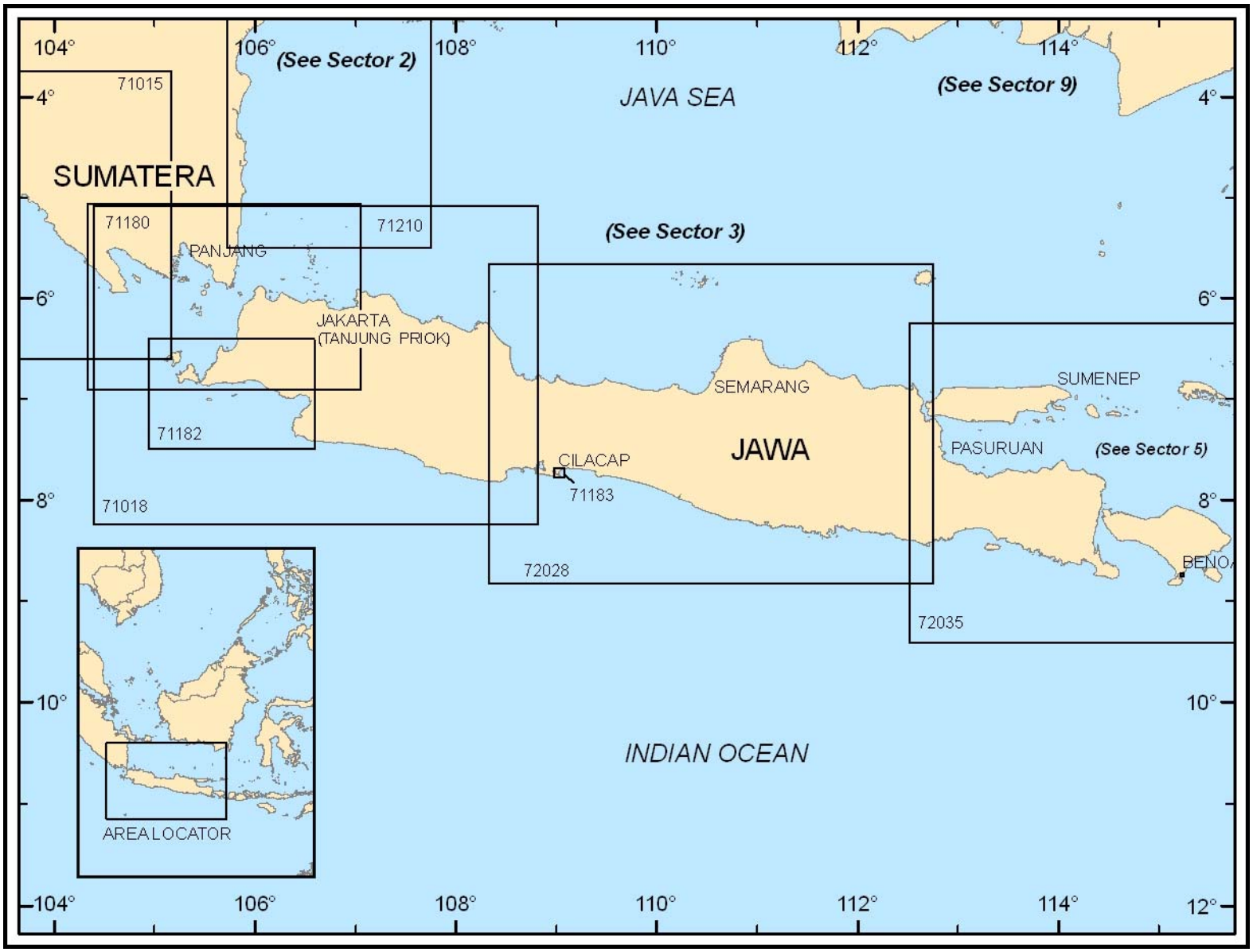
A detached 4.6m patch lies 0.75 mile outside the fringing reef off the SE side of the island, and is not marked by discoloration.

Discolored water was reported, 31 miles W of Masalembo-kecil. Discolored water was reported in 1981, 10 miles WSW of Masalembo-kecil.

Gosong Gia (Annie Florence Reef) (5°12'S., 113°17'E.), 47 miles NE of Pulau Bawean, is small in extent, and dries at low water. When covered, the reef shows little discoloration, but sometimes breaks heavily.

A patch of 14.6m, gravel and sand, lies about 9 miles ENE of

this reef. In clear weather, Pulau Bawean can be seen from the vicinity of the reef. A wreck lies 16.5 miles SE of Gosong Gia.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **4** — CHART INFORMATION

SECTOR 4

JAWA—SOUTH COAST AND SELAT SUNDA

Plan.—This sector describes the S extremity of Sumatera, the Selat Sunda, and the W and S coasts of Jawa, as far E as **Tanjung Bantenan** (8°47'S., 114°32'E.).

The descriptive sequence is N and S from **Tanjung Serdang** (4°27'S., 105°54'E.) to **Cukuh Balimbing** (5°56'S., 104°33'E.), then to the E, describing the S coast of Jawa.

General Remarks

4.1 Winds—Weather.—The SE monsoons which prevail between April and November bring good weather and clear skies. The winds near the coast are NE during the day shifting to SW at night.

December through March brings the NW monsoon with W to NW, generally light winds. Periods of stronger winds are not uncommon with squalls encountered near the coast.

Rain is common between October and April. Much of the heavy weather persists overnight over much of the sea. Visibility is frequently limited in these storms.

Tides—Currents.—The flood current sets NE and the ebb current sets SW; both are weak. In the channel, the flood current sets NE and may attain velocities of 4.8 knots during W winds.

Between Terumbu Kalihat (Stroom Rock) (5°55’S, 105°49’E) and Kepulauan Sumur, tidal currents are very strong, attaining a maximum rate of 6 knots; eddies and rips may occur.

Along the NW and S shores of Pulau Singiang, the combined SW setting tidal and nontidal current is strong; E of Pulau Sangiang, typical tidal currents occur.

Rips and whirlpools occur along the SW shore of Pulau Sangiang.

Rips occur at Terumbu Gosal (Winsor Rock).

Rips occur when tidal current speed exceeds 1 knot.

Between Pulau Merak and the coast of Java, the current speed does not exceed 2 knots.

Near Kepulaun Seribu, the E current is always stronger than the W current; the speed does not exceed 2 knots.

Regulations.—For information regarding designated Archipelagic Sea Lanes, as defined by the United Nations Convention on the Law of the Sea (UNCLOS), passing through the Selat Sunda and the W Java Sea, see the Indonesia section of Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Selat Sunda

4.2 Selat Sunda (Sunda Strait), between the W end of Jawa and the S coast of Sumatera, is the principal channel connecting the Java Sea and the Indian Ocean.

The NE entrance, between **Ujung Kanggalan (Oedjoeng Kanggalan)** (5°48'S., 105°48'E.) and Tanjung Pujut, the NW extremity of Jawa, is nearly 15.5 miles wide.

The SW entrance, between **Cukuh Balimbing** (5°56'S., 104°33'E.) and **Pulau Panaitan** (6°35'S., 105°13'E.), N of the W end of Jawa, is about 52 miles wide. The charted features, at the entrance of the strait, are radar identifiable at a distance of 35 miles. Vessels over 100,000 dwt do not use Selat Sunda.

The S coast of Sumatera, which forms the N side of Selat Sunda, slopes gently down to the sea. It is densely wooded and has several high peaks inland. Several extensive indentations complete the S coast of Sumatera.

The W coast of Jawa is not high, with a low coast over a large portion of its length; it is also densely wooded.

Winds—Weather.—The Southeast Monsoon prevails from April to September, but does not attain any great degree of constancy until August. It is particularly unsteady in the daytime and variable winds are common. In August and September, the monsoon blows strong and steady from SE and SSE, particularly off the Jawa coast at night when the land breeze reinforces the monsoon.

The Northwest Monsoon arrives at the end of November. This results in WSW winds in December, W winds in January, and WNW winds in February.

Clouded skies and SW squalls are frequent, the later occurring during the Northwest Monsoon and accompanied by thunder. The rainfall corresponds with the monsoons, the Northwest Monsoon months being the rainier. December and January have the greatest rainfall, with September the least.

The state of the sea is generally rough. Heavy swells are not uncommon, particularly during the stronger period of the Northwest Monsoon, when the current is running counter to the prevailing wind. As a rule, the sea is calmest in March, July, and November.

Tides—Currents.—During the Northwest Monsoon, current direction varies through Selat Sunda. From April to September, the currents are SW to S at a rate of about 0.75 knots. From October to March, the currents are NE to N at the same rate. When the winds are from the NW through N to NNE, the current sets S to SW at up to 1.3 knots.

The tidal currents in Selat Sunda, when combined with the currents described above, are strong and mainly diurnal. Where the strait broadens out, they decrease in rate rapidly and in the **Great Channel** (6°23'S., 105°18'E.), are hardly appreciable.

When the flow is strong to the SW, sharply defined tide rips are often met in the N entrance to the strait. With such a flow the rates are strong along the NW and S sides of **Pulau Sangian** (5°58'S., 105°51'E.), causing heavy tide rips and a whirlpool in the bay on the SW side of the island. In the open Java Sea near Kepulauan Seribu, there is little horizontal movement of the water except the monsoon current which never exceeds 2 knots. The E current is always stronger than the W current among the Kepulauan Seribu.

The monsoon currents begin earlier here, and attain their greatest strength a month earlier than in adjacent waters. The W current predominates as early as March; it is strongest in April and May. The E current becomes evident in November and is strongest in December; its rate is double that of the W current in April and May.

Regulations.—A traffic separation scheme, consisting of two sets of traffic lanes separated by a precautionary area, exists between the SE part of Sumatera at Tanjung Tua (5°54.5'S., 105°43.0'E.) and Pulau Sangiang. A single inshore traffic zone lies to the W of the traffic lanes. The scheme is IMO-adopted and Rule 10 of *The International Regulations for Preventing Collisions at Sea (1972)* applies.

Vessel Traffic Service.—SUNDAREP is in operation for the control of shipping and is mandatory for all Indonesian vessels and strongly recommended for all foreign vessels. SUNDAREP broadcasts on VHF channels 22 and 68.

Southbound vessel reporting points are as, follows:

1. Crossing latitude 05°45'S for ships from the N part of Jawa Sea.
2. Crossing longitude 105°55'E for ships from the E part of Jawa Sea.

Northbound vessel reporting points are, as follows:

1. Crossing latitude 06°00'S for ships from the S part of Sunda Strait
2. Crossing longitude 105°43'E for ships from Lampung Bay.

Anchorage.—Two emergency anchorages (South Emergency and North Emergency), best seen on the chart, have been established within Selat Sunda.

Directions.—This area contains many exploratory and producing oil fields, which may or may not be marked or charted. Anchorage is prohibited except in designated areas.

A vessel approaching the strait from the N should proceed to the S end of the swept channel in Selat Baur, and follow a track defined by the following points:

a. 5°16'S, 106°47'E (4 miles SE of Beting Raja).
b. 5°42'S, 106°41'E (13.5 miles NE of Pulau Payung).
c. 5°50'S, 106°34'E (1.5 miles SE of Pulau Payung).
d. 5°50'S, 106°17'E (1.5 miles S of Pulau Tunda).
e. 5°50'S, 106°02'E (3 miles N of Tanjung Pujut).
f. 6°02'S, 105°51'E (3 miles NW of Tanjung Cikoneng).
g. From point f, proceed in a SW direction through Selat Sunda.

Vessels approaching the strait from S should follow the directions in a reverse order. Keep a lookout for traffic bound to and from Jakarta, especially in Outer Channel. The least depth shown on the track is reported to be 19.8m.

Caution.—The area between the S coast of Sumatera and the extensive island group **Kepulauan Seribu** (5°29'S., 106°31'E.), which fronts the approach to Selat Sunda from the NE, contains a number of islands, reefs, rocks, and drying banks that must be considered when approaching Selat Sunda.

A dangerous area due to mines, having a 3-mile radius, lies centered 3 miles SW of **Kepulauan Segama** (5°10'S., 106°06'E.), in position 5°12'S, 106°04'E.

Because of volcanic eruptions, the area between **Pulau Rakata** (Pulau Khakatau) (6°09'S., 105°26'E.) and **Pulau Sebesi** (5°58'S., 105°29'E.), should be considered unsafe; only routes that will clear this area should be taken. The sea bottom in the vicinity of the islands is subject to change. See the remarks on volcanic activity.

Submarine gas and oil pipelines connect between various platforms within a number of oil fields, and between the existing oil fields in the N approaches to Selat Sunda.

Vessels that are going to anchor in the area, run the risk of prosecution for any damage which may been caused from anchorage.

Mariners are warned that ferries cross Selat Sunda between Bakauhuni (5°52'S., 105°45'E.) and ports on the N coast of Jawa.

Tanjung Serdang to Tanjung Tua

4.3 The coast trends S from **Tanjung Serdang** (4°27'S., 105°54'E.) to **Tanjung Tua** (5°55'S., 105°43'E.) and except for a few hills in the S part, is low, flat, and swampy. Off-lying islands in the S part of the coast constitute a possible danger for vessels in the area.

A bank of drying soft mud, 0.5 mile wide in places, extends nearly the entire length of this coast, except off the outlets of several rivers and at other places marked by sandy beaches.

Outside this bank, the depths increase gradually seaward and good anchorage can be taken almost everywhere. The bottom is clay with a layer of mud.

Tanjung Serdang (4°27'S., 105°54'E.), the northernmost point of this sector, has a mud bank, which is reported to dry. It stretches 3 miles NNW and extends about 1 mile from the coast.

From Tanjung Serdang to Tanjung Bungin, about 6 miles S, the coast is marked by trees considerably higher than those to the N or S.

Tanjung Kenam (4°40'S., 105°55'E.), 12.5 miles S of Tanjung Serdang, has depths of less than 7.3m, sand and mud, as far as 13 miles offshore. Anchorage can be taken by vessels with local knowledge off the outlet of the **Wai Seputih** (Sungai Seputih) (4°41'S., 105°53'E.).

The recommended position is with Tanjung Keman bearing 331° and the river mouth bearing 304°, in a depth of 6m, soft mud, distance 4 miles. A bar across the outlet restricts entrance to all but small craft.

The coast between Tanjung Kenam and **Tanjung Sekopong** (Pulausekopong) (4°56'S., 105°54'E.) is about 16 miles long and marshy. **Gosong Sekopong** (Clifton Bank) (4°56'S., 106°04'E.), a patch of hard sand with a least depth of 5m, lies nearly 9 miles E of Tanjung Pulausekopong. A buoy is moored off the E side of Clifton Bank. This buoy has been reported missing.

The coast between Tanjung Sekopong and **Tanjung Penet** (5°15'S., 105°52'E.), a distance of about 20 miles, is flat, thickly wooded, and has no distinguishing features.

Tanjung Penet is a rounded point which cannot be identified except when close to the coast. A reef, with a depth less than 1.8m, lies approximately 4 miles S of Tanjung Penet.

Gosong Syahbandar (Sjahbandar Bank) (5°05'S., 106°00'E.) consists of a number of sandy ridges lying within 8 miles of the coast, about midway between Tanjung Sekopong and Tanjung Penet. All lie within the 10m line.

The coast between Tanjung Penet and **Tanjung Sekampung** (5°35'S., 105°49'E.), 20 miles S, is thickly wooded with high trees, sometimes visible from 14 miles. Tanjung Sekampung is difficult to distinguish from other positions, except those close inshore S of it. Sungai Sekampung, one of the largest rivers in this district, flows into the sea on the N side of the point. The least depth that can pass over a bar across the outlet is 0.6m. Inside the bar, the depths increase rapidly to 7m and 9m. Surf

usually marks the bar during the Southeast Monsoon.

Anchorage can be taken by vessels with local knowledge off the outlet of the river. In this position the outlet bears 247°, distant 2 miles, and a conspicuous tree of **Pulau Mundu** (5°41'S., 105°50'E.) bears 188°. The depth is reported to be about 16m, mud. The rate of the tidal current at this anchorage is from about 1.5 to 2 knots.

4.4 **Pulau Mundu** (5°41'S., 105°50'E.), 6 miles S of Tanjung Sekampung, is a coral island, covered with coconut trees and fringed by a reef, with some above-water rocks. The island is marked by a light.

Kepulauan Seram (5°45'S., 105°48'E.) are three islets lying near the coast, 3.75 miles SSW of Pulau Mundu.

Pulau Seram Besar, the N and largest islet, is covered with coconut trees.

The E side is a swamp, with a few bare tree trunks. A coral patch, with a depth of about 10m, lies 1 mile E of this islet. Pulau Seram Besar is the only islet that can be seen from any distance. All these islets lie within the 5m line.

Small craft, with local knowledge, can find shelter between the islets and the coast, in depths of 1 or 2m, sand and mud.

Ujung Kanggalan (Oedjoeng Kanggalan) **(5°48'S., 105°48'E.)** is a low point, 3 miles S of Pulau Seram. The intervening coast is low and weeded. From abreast this point, the mountain **Gunung Rajabasa** (Radjabasa) (5°47'S., 105°38'E.) is prominent. This point is marked by a light close E.

Pulau Kupiah (5°47'S., 105°48'E.), high and covered with vegetation, is located 0.5 mile N of Ujung Kanggalan and 0.5 mile offshore.

Ujung Curam (Tanjung Sumur Batu) (5°50'S., 105°47'E.), 3 miles SW of Ujung Kanggalan, is low-lying, but prominent point due to a dense growth of trees formed by a spur running E from the saddle-shaped hill, **Gunung Panjang** (Pantjong) (5°50'S., 105°46'E.), which is 222m high. From NE, a separate summit appears just within the point and is visible 2 miles E of Pulau Mundu, an island 1.5 miles offshore and 10 miles NNE of Ujung Curam (Tanjung Sumur Batu).

In addition to Gunung Panjang (Gunung Pantjong), Sepan, a conical hill, 207m high, 0.5 mile W of Gunung Panjang, and Chikur, 250m high with a round grass covered summit, 2 miles WSW of Gunung Panjang, are noticeable.

Pulau-Pulau Sumur (Kepulauan Sumur) is a group of four islands and a number of islets lying within 2.5 miles of the Sumatera coast between Ujung Curam (Tanjung Sumur Batu) and **Tanjung Tua** (5°55'S., 105°43'E.), about 5.75 miles SSW.

Most of the islands are high and densely wooded. The depths between the islands and reefs are variable; the bottom is rocky and covered with sand.

Tides—Currents.—During the Northwest Monsoon, the NE current may attain a rate of 4.75 knots between the islands. It is advisable to give the islands a berth of 1.5 miles.

Pulau Kandangbalak (5°53'S., 105°46'E.), the SW island, has two separate hills, the SW being higher; elsewhere the island is flat.

Pulau Panjurit (5°53'S., 105°47'E.), 0.75 mile ESE of the N end of Pulau Kandangbalak, has a ridge of hills 90m high along its S side. A light is shown from the NE point of the island; a racon is situated at the light.

Pulau Rimaubalak (5°52'S., 105°47'E.), the largest and highest of Kepulauan Sumur, lies 1 mile NNE of Pulau Kandangbalak. It has three summits; the SW summit has an elevation of 211m and is very noticeable.

Tanjung Tua (5°55'S., 105°43'E.) is located about 2 miles WSW of the S extremity of Pulau Kandangbalak. It is a high, rocky, and wooded point, joined to higher land behind, by a low bare ridge. Close off the point are depths of 73m.

A light is shown on Tanjung Tua from a white metal framework tower, 15m high.

Caution.—It is not advisable to proceed through the channel between Kepulauan Sumur and the coast of Sumatera. Tidal currents of up to 3 knots cause strong eddies off the reefs.

Islands and Dangers in the North Approach to Selat Sunda

4.5 The main group of the Kepulauan Seribu islands extend in a N and S direction between the meridians of 106°30'E and 106°37'E. Vessels should not pass among them.

NW of the main group, near the usual route taken by vessels toward Selat Sunda from the N, is a smaller group consisting of four islands and a number of reefs. This smaller group is separated from the main group by a channel with depths of 21.9 to 27.4m.

The usual route taken by vessels bound for Selat Sunda from the N, lies between **Gosong Serdang** (Brouwers Reefs) (Brouwer Banken) (5°05'S., 106°16'E.) and **Pulau Jagautara** (Jaga Utara) (5°12'S., 106°28'E.).

Pulau Jagautara (Jaga Utara) (Pulau Tuguan) lies about 36 miles off the coast of Sumatera, and about 50 miles N of the N coast of Jawa. It is entirely covered with brushwood and high trees, and can be seen at distances up to 14 miles. The island is surrounded by a reef which partly dries. A light is shown from the island. Pulau Jagautara is reported to give a good radar return up to 20 miles.

Anchorage has been prohibited in the area E of Pulau Jagautara. The N extremity of an oil field lies 28 miles NW of Pulau Jagautara.

Numerous dangerous wrecks and obstructions are charted up to 20 miles N to NE of Pulau Jagautara.

Gosong Serdang (Brouwers Reefs) (Brouwer Banken), lying 13 miles NW of Pulau Jagautara and marked by a light, are two coral patches, 0.2 mile apart in a N and S direction. At high water, only a few rocks are visible and there is a small patch of coral sand on the N patch. They are visible from a distance of 2 miles.

A dangerous wreck lies about 19 miles NNE of Brouwers Reef.

4.6 **Kepulauan Segama** (Gebroeders) (Pulau Segamat) (5°10'S., 106°06'E.), two reef-fringed islets, lie about 15 miles off the coast of Sumatera, and about 21 miles W of Pulau Jagautara (Jaga Utara). The islets are small and covered densely with high trees.

A coral reef, which dries, fringes the islets. A coral patch, with a depth of 0.6m, lies 0.3 mile S of the S islet. In the Northwest Monsoon, Kepulauan Segama can be seen from a distance of 20 miles. In the Southeast Monsoon, they are not visible until much closer.

Two wrecks, one with masts showing lie, respectively, 3.5

miles NW and 3.75 miles NNW of the N extremity of Kepulauan Segama.

Karang Basa (Lynn Reef) (Lynn Bank) (5°12'S., 106°12'E.), 6.3 miles ESE of Kepulauan Segama, is a coral reef with a least depth of 0.6m. The reef, barely marked with ripples and discoloration, can only be detected close in; it sometimes breaks with a heavy E swell.

A depth of 12.8m was reported about 5.5 miles E of Karang Basa.

Layang-Layang (**Swallow Bank)** (5°18'S., 106°04'E.), with a depth of 7.9m and steep-to, is a coral patch lying 13 miles E of **Tanjung Penet** (5°15'S., 105°52'E.).

Batu Karang Pematan (5°24'S., 106°16'E.), a dangerous coral patch, lies in the fairway in a position about 16.5 miles SW of Pulau Jagautara. The least depth is 3.7m. Only under favorable conditions is there discoloration in the immediate vicinity, and occasionally there are tide rips. Obstructions exist 6.5 miles and 7.5 miles WNW of Batu Karang Pematan.

A National Park is established among **Pulau-pulau Seribu** (5°30'S., 106°30'E.).

Oil fields in the N approaches to Selat Sunda are numerous. Each contains production platforms, pipelines, and mooring buoys. Most platforms and structures are lit. Mariners should navigate with caution in these areas, as some structures are unlit, unmarked, or uncharted; submerged obstructions also exist.

4.7 **Cinta Oil Terminal** (5°27'S., 106°16'E.) (World Port Index No. 50350) consists of numerous oil production platforms, pipelines, and mooring buoys. The area extends NNE and S of Batu Karang Pematan. Pipelines are laid from various production platforms to a central gathering platform situated 3 miles SSW of Batu Karang Pematan.

Off-lying platforms are situated 17 miles NNE, 9 miles NE, 5 miles SE, and 9.5 miles SW of the central gathering platform; they are connected to it by pipeline.

The oil platforms in the area are well lighted at night. The SBMs are designed to handle vessels in the 55,000 dwt class.

There is a radio station at the terminal. Initial ETA should be sent not less than 72 hours prior to arrival. Further ETA information should be sent 48 hours, 24 hours, 12 hours, and 4 hours if change of original ETA varies more than 1 hour.

When the vessel is 4 hours from the terminal, communications on VHF channel 16 should be established.

There are four lighted SBMs, in depths of about 21m.

No. 1 Storage SBM is situated in position 5°25'40"S, 106°14'42"E. The storage barge Cinta Natomas, 143,000 dwt and 183m in length, is permanently moored to it and contains the Terminal Administrative Offices.

No. 2 Storage SBM is moored in position 5°26'23"S, 106°13'45"E, 1.5 miles NW of the central platform.

No. 1 Export SBM is situated in position 5°25'25"S, 106°14'09"E. Tankers load to a displacement between 20,000 and 175,000 dwt, with a length between 160m and 325m.

No. 2 Export SBM is moored 1 mile SW of No. 2 Storage SBM, in position 5°27'30”S, 106°12'55”E.

Pilotage.—Pilotage is compulsory within the terminal limits. The Mooring Master boards vessels in the anchorage area, and will advise on all operational matters within the terminal area. Weather permitting, the terminal operates 24 hours. Vessels can berth in daylight only, but can unberth at any time.

Regulations.—Indonesian government regulations are strictly enforced. The Indonesian flag should be flown by day, throughout the vessel’s stay at the terminal. Port facilities are not available, however, emergency medical services can be arranged.

Anchorage.—Anchorage can be taken within a 1 mile radius of position 5°26'50”S, 106°11'09”E, in a depth of 36m.

4.8 **Karang Kabung** (Hajiwal), with a depth of 2.4m, lies about 3 miles E of Terumbu Urai (Arminia). Neither patch is marked by discoloration. The NW corner of the Sea Conservation Area is marked by a lighted buoy moored 0.2 miles E of Karang Hajiwal.

Kepulauan Dua (Doea Eilanden) (Pulau Dua) (5°25'S., 106°28'E.), two islets, lie 12 miles E of Batu Karang Pematan. They are thickly wooded with high trees and separated by a clear deep channel about 1 mile wide. Beronang, a patch with a depth of 2.4m, lies about 2.3 miles SW of the W Kepulauan Dua (Doea Eilanden). It is not marked at high water.

Gosong Rangat (5°28'S., 106°26'E.), an islet conspicuous by its high trees, lies about 1.75 miles S of Beronang. Karang Rangat, with a depth of 0.9m, lies about 1 mile SE of Gosong Rangat. It is marked by surf and discoloration, and breaks with any sea.

Two small steep-to stone banks lying midway between Kepulauan Dua and Gosong Rangat, with depths of 2.5 and 7.3m, respectively, are marked by ripples in a strong current. A dangerous rock was reported 1.75 miles ESE of the two small stone banks.

Pulau Pebelokan (West Eiland) (5°29'S., 106°24'E.), 3 miles WSW of Gosong Rangat, is a self-supporting offshore base. There are numerous buildings and installations on the island.

A wharf, with a large storage area on the S side of the island, can accommodate coasters up to a 6m draft and 36m in length. The islet is visible from distances up to 13 miles.

Coventry Reef, 1 mile SSW of Pulau Pabelokan, dries in patches at its N end. It is marked by discoloration and breaks with the least swell or sea.

Pulau Jagung (Djagoeng) (5°29'S., 106°31'E.), 5 miles E of Gosong Rangat, is thickly covered by high trees. It is the easternmost island of Kepulauan Seribu covered by this sector.

Tanjung Pontang to Tanjung Pujut

4.9 This portion of the N coast of Jawa is generally low, marshy, and thickly wooded, except for the mountains S of **Tanjung Pujut** (5°52'S., 106°02'E.). Pinang, a hill, 259m high, 11.5 miles SSE of Tanjung Pujut, and the islands off **Teluk Banten** (5°58'S., 106°11'E.) are the few prominent landmarks along this stretch of coast.

Tanjung Pontang (5°56'S., 106°16'E.), about 7.5 miles S of Pulau Tunda, was previously described in paragraph 3.2.

Caution.—Nearly all the rivers flow into the sea with a considerable amount of debris, therefore, vessels should keep in depths over 11m when rounding these points.

Teluk Banten, entered between Tanjung Pontang and **Tanjung Kapo** (5°56'S., 106°07'E.), 8.75 miles W, is of no importance for general shipping. The hilly land on the W side of the bay terminates in Gunung Santri, a prominent hill, 95m high,

with an isolated tree on its summit, 3 miles SSW of Tanjung Kapo.

Tanjung Kapo is high and prominent; the remaining shores of the bay are low, marshy, and fringed by a wide shallow mud bank. Several islands lie in Teluk Banten, the largest being **Pulau Pinjang** (5°56'S., 106°09'E.). The roadstead off the river at the head of the bay is only suitable for small craft, due to continuous shoaling.

Bojonegara (5°59'S., 106°7'S.) is situated on the W side of Banten Bay, approximately 65 miles NW of Jakarta. Originally devised to become a deep-water container and coal terminal port, Bojonegara is in the final phase of its expected 12-year completion plan (2014-2025). During this final phase, the container and general cargo terminals will be expanded and special wharfs will be constructed. When complete, the port will consist of five terminals and is expected to accommodate vessels of up to 50,000 dwt, 270m in length, and with a draft of 12.7m. Berth information is given in the table titled **Bojonegara—Berth Information**.

4.10 Guna Nusa (5°56'S., 106°06'E.) is close NW of Tanjung Kapo. There is an offshore fabrication yard with a wharf, 60m long, parallel to the coast. Tugs and barges with a draft up to 4.8m can berth alongside. Anchorage for small vessels, in depths of 12.8m, lies off the coast between Pulau-pulau Kali.

Directions.—No attempt should be made to berth alongside the wharf at night, since there are numerous fish traps off the mainland and Panjung coasts.

By day, a vessel should steer S from the anchorage, keeping close to the fish traps off the coast of Panjang, and turn gradually to bring Tanjung Kapo ahead. On this heading, when 0.25 mile off the point, steer NW to close the wharf, but keeping clear of the a small black buoy that marks a sunken reef lying between 0.2 and 0.3 mile off the wharf.

From Tanjung Kapo, the coast trends about 4 miles NW to **Tanjung Piatu** (5°53'S., 106°04'E.), a low point with a few trees. Two low, wooded islands, about 0.2 mile offshore, lie about 1.5 miles SE of Tanjung Piatu.

Merak Oil Terminal, situated at Tanjung Piatu, consists of a dolphin berth connected to the shore by a narrow bridge. The largest vessel to berth was 32,000 tons.

Anchorage, in depths of 30 to 40m, lies 1 mile N to NE of the terminal.

Berthing and unberthing is conducted at slack water due to strong tidal currents. Mooring boats are available.

An obstruction, with a depth of 14.9m, lies 3.5 miles ENE of Tanjung Piatu.

Tanjung Pujut (5°52'S., 106°02'E.), the NW extremity of Jawa, is located about 2 miles W of Tanjung Piatu. It is a narrow tongue of land, 13m high.

Gunung Gede, 594m high, is a flat-topped summit, 3.3 miles SSE of Tanjung Pujut. Gunung Batur, 553m high, is nearly 2.5 miles WSW of Gunung Gede. **Gunung Pinang** (6°04'S., 106°06'E.), a hill 259m, 11.5 miles SSE of Tanjung Pujut, is also a prominent landmark on this stretch of coast.

Bojonegara—Berth Information

Berth	Length	Depth	Remarks
PT. Samudra Marine Indonesia			
No. 4	300m	—	Unloading steel plates. Bunkering available.
No. 5	500m	—	
No. 6	300m	—	
No. 7	500m	—	
PT. Farika Steel			
Steel Berth	55m	—	Steel products.
Apexindo			
Offshore Rig Berth	90m	—	Mooring offshore rig “Raissa.”
PT. Cilegon Fabricators			
Jetty No. 1	120m	7.0m	Servicing fabrication yard and ro-ro.
PT. Gunanusa Utama Fabricators			
Jetty No. 1	136m	7.5m	Servicing fabrication yard and general cargo.
Jetty No. 2	80m	7.0m	
PT. Dok Pulo Ampel			
No. 1	106m	—	General cargo and dry bulk cargo.
No. 2	106m	—	
PT Gandasari Perkasa Mandiri			
No. 1	102m	—	Bauxite and coal.

Bojonegara—Berth Information			
Berth	Length	Depth	Remarks
PT. Pacific Lubritama Indonesia			
No. 1	50m	—	Lube oils.
No. 2	50m	—	
No. 3	50m	—	

South Side of Selat Sunda

4.11 The coast between Tanjung Pujut and Tanjung Sekong is high and broken by steep points. Gosong Jawa (Java Rif), a small coral patch with a depth of 8.8m, lies about 0.6 mile offshore, W of Tanjung Sekong. Ripples appear when the current is running at a rate of 1 to 2 knots; at times it is marked by discoloration.

Suralaya (5°53'S., 106°02'E.) is situated along the coast N of Merak. Suralaya Power Station is a sub-port of Merak. Land reclamation is in progress SW of Suralaya. New jetties have been established close SE of the port. Mariners are advised to navigate with caution in the area and contact the local authorities for the latest information.

Merak Petroleum Base (5°55'S., 106°00'E.) is situated on Tanjung Sekong. The terminal is used for the import of bulk ores. Equipment for offshore oil installations are fabricated here. In addition, small tankers and LPG carriers also use the base.

Vessels up to 2,000 dwt, 91.4m in length, and 4.5m draft, can berth alongside two small jetties. The jetties have a depth of 5.5m alongside. Two mooring buoys, which can handle vessels up to 20,00 dwt, are located in the bay S of Merak.

Pilotage is available from Merak.

Anchorage off the jetty, sheltered from NE to SSW, but otherwise exposed, can be obtained 0.4 mile NW of the jetty, in a depth of 36m, with good holding ground. Tidal currents in the anchorage run NE and SW up to 2 knots.

Caution.—A small coral patch, best seen on the chart, has a least charted depth of 8.9m and lies 0.7 mile W of the Merak Petroleum Base.

Merak Mas Terminal (5°55.4'S., 105°59.6'E.) is a multipurpose terminal located 0.5 mile N of Merak. Merak Mas Terminal is U-shaped and has three berths, with a charted depth of 11m in the basin.

Pilotage is available 24 hours. The pilot boards approximately 1 mile W of Tamposo Island.

Anchorage, protected from NE through SSW winds, can be taken about 0.75 mile NW of the Tamposo Island, in a depth of 35m, mud and sand. Good holding characteristics are reported here.

Pulau Merak (Merak Besar) (5°56'S., 105°59'E.), a wooded island, 66m high, lying a little less than 1.3 miles SSW of Tanjung Sekong, is fringed by a narrow coral reef which is steep-to on its NW side.

Pulau Merak Kecil (5°56'S., 106°00'E.), 0.45 mile SE of Pulau Merak and 0.15 mile offshore, is a low islet.

4.12 **Tarembu** (5°56.2'S., 105°59.5'E.), a rock with a depth of 1.1m, lies in the middle of the W side of the extensive reef, with depths of less than 10m, lying between Pulau Merak and Pulau Merak Kecil. A 4.9m patch lies on this reef 0.1 mile NNE of Tarembu. A shoal, with a depth of 5.5m, sand and stones, lies close NE of Tarembu.

A dangerous wreck lies 0.15 mile NE of Tarembu.

Vessels may enter the roadstead from the S passing W of Pulau Merak Kecil and then to either side of Tarembu; the E channel has a depth of 10.6m while the W channel has a depth of 10.8m.

Merak—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Merak Bakauheni Ferry Terminal						
No. 01	210m	—	—	—	—	Ro-ro passengers/vehicles/rail.
No. 02	98m	—	—	—	—	Ro-ro passengers/vehicles/rail. Berth length includes dolphins.
No. 03	160m	—	—	—	—	—
No. 04	102m	—	—	—	—	Ro-ro passengers/vehicles/rail. Berth length includes dolphins.
No. 05	140m	—	—	—	—	Ro-ro passengers/vehicles/rail. Berth length includes dolphins.
Merak Mas Multipurpose Terminal						
Container Quay	300m	—	—	—	—	Containers and breakbulk.

Merak—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Inner Berth	175m	—	—	—	—	Coal.
North Pier Berth	335m	—	—	—	—	
South Pier Berth	351m	—	—	—	—	
PLTU Terminal						
L Berth	305m	—	—	—	—	Coal.
PT. Merak Energi Terminal						
Dry Cargo Berth	74m	—	—	—	—	Coal. Berthing length of 125m (including dolphins).
PT. Semen Indonesia Divisi Merak Terminal						
Inner Berth	228m	—	—	—	—	Cement.
Outer Berth	255m	—	—	—	—	
Sulfindo Multipurpose Terminal						
Sulfindo Jetty	140m	15.0m	200m	14.0m	35,000 dwt	Chemical gases, chemicals, and LPG. Berthing length of 282m (including dolphins).
Suralaya Power Station						
Barge Berth	180m	—	—	—	10,000 dwt	Coal. Berthing length of 230m (including dolphins).
Panamax Coal Berth North	250m	—	—	—	—	Continuous berthing length of 600m.
Panamax Coal Berth South	350m	—	—	—	80,000 dwt	
Suralaya Pltu Oil Jetty	200m	10.5-12.8m	—	—	—	Clean products (CPP).
Arbee Tanker Terminal						
Jetty Arbee	11m	6.6m	100m	5.6m	5,000 dwt	Chemical gases and chemicals. Berthing length of (including dolphins).
BASF Latexindo						
Jetty Latexindo	15m	12.0m	160m	11.0m	10,000 dwt	Chemical gases. Berthing length of 180m (including dolphins).
Bumi Merak Terminal						
Jetty BMT	14m	8.5m	180m	7.5m	15,000 dwt	Chemicals and dirty products (DPP). Berthing length of 212m (including dolphins).
Dover Terminal						
Jetty Dover	10m	8.0m	180m	7.0m	35,000 dwt	Chemicals and bunkers. Berthing length of 180m (including dolphins).
Merak Oil Terminal						
Jetty No 1	25m	20.0m	270m	17.0m	110,000 dwt	Aviation fuel, clean products (CPP), crude, and vegetable oils. Berthing length of 295m (including dolphins). Maximum beam of 43m. Maximum displacement of 132,000t.

Merak—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Jetty No 2	25m	19.0m	144m	16.0m	15,000 dwt	Aviation fuel, clean products (CPP), crude, and vegetable oils. Berthing length of 174m (including dolphins). Maximum displacement of 19,000t.
Mitsubishi Chemical Indonesia Terminal						
Jetty MCCI	24m	11.5m	170m	10.0m	20,000 dwt	Chemical gases, chemicals, crude products. Berthing length of 215m (including dolphins).
Pertamina Gas & LPG Tanjung Sekong Terminal						
LPG Berth	30m	—	—	—	—	LPG. Berthing length of 191m (including dolphins).
Pertamina Persero UPPDN III						
Jetty No 1	15m	13.0m	105m	12.0m	6,500 dwt	Clean products (CPP), dirty products (DPP), and bunkers. Berth length of 290m (including dolphins).
Jetty No 2	15m	13.0m	120m	12.0m	36,000 dwt	Clean products (CPP), dirty products (DPP), and bunkers. Berthing length of 220m (including dolphins).
Jetty No 3	17m	8.0m	80m	—	1,000 dwt	Clean products (CPP), bunkers. Berthing length of 57m (including dolphins). For domestic use only.
Polychem Indonesia						
Jetty Polychem	22m	12.0m	160m	11.0m	12,000 dwt	Chemical gases, chemicals, and LPG. Berthing length of 182m (including dolphins).
Polychem Lindo						
PT. Polychem Lindo	10m	12.0m	174m	11.0m	20,000 dwt	Chemicals, bunkers. Berthing length of 190m (including dolphins).
PT Vopak Terminal Merak						
Jetty No. 1 Prointal	22m	10.7m	180m	9.0m	30,000 dwt	Chemical gases, chemicals, clean products (CPP), LPG, and bunkers. Berthing length of 230m (including dolphins). Maximum displacement of 40,000t.
Jetty No. 2 Prointal	10m	9.5m	120m	7.0m	6,500 dwt	Chemicals and LPG. Berthing length of 188m (including dolphins). Maximum displacement of 21,000t.
PT. Baria Bulk Terminal						
Tanker Berth	15m	—-	—	—	—	Clean products and dirty products, Berthing length of 208m (including dolphins).
Redeco Petrolin Utama, Merak Terminal						
Jetty Redeco I	15m	14.0m	—	13.0m	35,000 dwt	Chemical gases, chemicals, clean products, LNG, and bunkers. Berthing length of 200m (including dolphins).

Merak—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Jetty Redeco II	15m	14.0m	—	13.0m	35,000 dwt	Chemical gases, chemicals, clean products, and LNG. Berthing length of 200m (including dolphins).
Titan						
Titan Berth (ex Peni Jetty)	26m	9.5m	150m	8.0m	12,000 dwt	Chemical gases and LPG. Berthing length of 200m (including dolphins).
Tomindomas Bulk Tank						
Jetty TBT	25m	13.0m	150m	12.0m	15,000 dwt	Chemical gases and chemicals.
UIC Terminal						
North Pier	95m	—	—	—	40,000 dwt	Chemicals. Berthing length of 217m (including dolphins). Under construction.
South Pier	87m	—	—	—	40,000 dwt	Chemicals. Berthing length of 215m (including dolphins).
UIC Berth	10m	9.5m	170m	8.5m	20,000 dwt	Chemical gases, chemicals, and clean products. Berthing length of 183m (including dolphins). Maximum beam of 22m.

The E channel is marked by lighted buoys and a beacon; these buoys are reported unreliable.

The W channel is marked by a lighted beacon. The current in the strait is usually S, at a maximum rate of 2 knots

The entrance to the roadstead, N of Pulau Merak, is narrowed by a bank which extends 137m from that island; there is a 7.9m patch mid-channel.

The roadstead, in addition to offering shelter because of Pulau Merak and the breakwater-like reefs adjacent to Tarembu, affords the only sheltered anchorage on the W coast of Jawa. It is comparatively free of swells, and the maximum rate of tidal currents is about 2 knots.

4.13 Merak (Tanjung Sekong) (5°56'S., 106°00'E.) (World Port Index No. 50935) is a village with a small harbor located E of Pulau Merak. A Pertamina terminal is located here in addition to a ferry terminal. There is a coastal radio station situated at the village.

Depths—Limitations.—The Merak area has a large number of small ports and private berths for ferries and general cargo. Approximately 40 terminals line the area for the steel, petroleum, gas, and chemical industries. Berthing information is shown in the table titled **Merak—Berthing Information.**

Pilotage.—Both good weather and bad weather boarding areas have been designated for vessels mooring at the Pertamina terminal in Merak. During good weather, the pilot boards 1.5 miles NNE of Pulau Ular in position 5°59.5'S, 105°55.5'E. During bad weather, the pilot boards inshore of Brouwers Sand in position 5°58.5'S, 105°58.5'E.

Caution.—Gosong Serdang (Brouwers Sand) is a formation of hard sand extending about 3 miles in a SW direction, parallel to the coast from a position about 0.5 mile SW of the S extremity of Pulau Merak. The least depth over this shoal, 4.8m, is near the NE extremity.

Jetty works are underway along the coast 2.5 miles S of Merak.

Pulau Ular (6°00'S., 105°56'E.) is a steep-to rock lying about 5.75 miles SW of the S extremity of Pulau Merak. A shoal patch of 10.1m, lies 0.75 mile NE of Pulau Ular. A light is shown from the island.

Krakatau Steel Works (5°59.5'S., 105°58.7'E.) is the site of a jetty extending 300m with a charted depth of 9m at its terminus.

Cigading—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Cigading Terminal 1						
No. 1-1	175m	—	229m	15.0m	60,000 dwt	Coal, grain, iron ore, scrap metal, sugar, steel products, and general/bulk cargo.
No. 1-2	175m	—	200m	15.0m	60,000 dwt	

Cigading—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
No. 1-3	270m	18.0m	275m	17.0m	60,000 dwt	Coal, fertilizer, grain, gypsum, iron ore, salt, sugar, and general/bulk cargo.
No. 1-4	240m	—	250m	20.0m	150,000 dwt	Coal, fertilizer, grain, gypsum, iron ore, salt, sugar, and general/bulk cargo. Berthing length of 285m (including dolphins).
Note.—Berths No. 1-1, 1-2, 1-3, and 1-4 have a continuous berthing length of 905m.						
No. 1-5	122m	—	229m	14.0m	25,000 dwt	Coal, fertilizer, grain, gypsum, salt, sugar, and general/bulk cargo. Continuous berthing length of 543m.
No. 1-6	121m	—	200m	14.0m	25,000 dwt	
No. 1-7	150m	—	200m	12.0m	40,000 dwt	
No. 1-8	150m	—	133m	10.0m	20,000 dwt	
No. 2	240m	—	235m	15.0m	70,000 dwt	General/bulk cargo.
No. 3	170m	—	101m	12.0m	30,000 dwt	General/bulk cargo.
No. 4-1	95m	—	—	6.0m	10,000 dwt	General/bulk cargo. Barge berth.
No. 4-2	96m	—	—	6.0m	10,000 dwt	
Semen Indonesia Cigading Terminal						
No. 7	562m	—	229m	12.0m	40,000 dwt	Cement and bunkers. Berthing length of 592m (including dolphins).
Cigading Terminal II						
No. 5	240m	9.0m	100m	8.0m	12,000 dwt	Clean products, breakbulk, and bunkers.
No. 6	325m	—	300m	21.0m	200,000 dwt	Coal, iron ore, breakbulk, and bunkers. Berthing length of 425m (including dolphins).

4.14 Cigading (6°01'S., 105°57'E.) (World Port Index No. 50925) is a port for the import of bulk iron ore, situated on the W coast of Jawa, 1.75 miles E of Pulau Ular.

Cigading Port Authority
http://www.cigadingport.com

Depths—Limitations.—A T-headed concrete jetty projects 300m from the shore, with the T-head orientated NE-SW. It is equipped with a conveyor for bulk handling of ore. The main berthing face on the seaward side of the T-head is 860m long, with a depth alongside of 18m. Three shore cranes are available. Vessels can use their own equipment for loading and unloading. Berthing information is shown in the table titled **Cigading—Berth Information.**

Vessels up to 150,000 dwt, with a maximum length of 250m and a maximum draft of 20m, can be accommodated.

Pilotage.—Assistance in berthing may be requested from the harbormaster at Merak, 5 miles NNE. Berthing is only possible by day, but unberthing is by day or night. At the tanker berth, berthing and unberthing is arranged during daylight only. The ETA of a vessel, its draft, and any special requirements for discharging cargo should be communicated 48 hours in advance. Pilots board 1 mile E of Pulau Ular; for Capesize vessels, pilots board at 6°01.5'S., 105°55.0'E.

Ciwandan—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
PT Pelindo 2 Terminal						
Berth 001	122m	9.0m	98m	—	35,000 dwt	Chemicals, dirty products, cement, project.heavy, steel products, breakbulk, bunkers, general cargo, pipe, and food. Berthing length of 182m (including dolphins).

Ciwandan—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Berth 002	38m	6.0m	80m	—	—	Coal, ro/pax, project/heavy, steel products, break-bulk, bunkers, and general cargo. Berth length of 86m (including dolphins).
Berth 003	38m	7.0m	180m	—	—	Cement, coal, project.heavy, steel products, bun-kers, and general cargo. Continuous berthing length of 72m.
Berth 004 (Jetty CC)	26m	9.0m	130m	8.0m	12,500 dwt	Chemicals, dirty products, and bunkers. Berthing length of 182m (including dolphins)..
Berth 005A	402m	15.0m	220m	12.0m	70,000 dwt	Chemicals, clean products, cement, ro-pax con-tainers, project/heavy, steel products, breakbulk, multipurpose, bunkers, reefer, and general cargo.
Berth 005B	300m	16.0m	230m	—	70,000 dwt	Chemicals, clean products, cement, ro-pax, proj-ect/heavy, steel products, breakbulk, multipurpose, bunkers, and general cargo.
Berth 005C	300m	16.0m	230m	—	—	Chemicals, clean products, cement, ro-pax, proj-ect/heavy, steel products, breakbulk, multipurpose, bunkers, and general cargo.
Berth 006	25m	2.0m	—	—	—	Ro-ro/lo-lo and bunkers.
Berth 007	38m	7.0m	112m	—	—	Cement, coal, breakbulk, bunkers, and general car-go.

Anchorage.—Vessels waiting to berth should anchor about 0.75 mile off the port, in a depth of 20m. The tidal current sets NE to SW at rates between 3 to 4 knots, and a sufficient length of anchor chain should be used.

Directions.—The port should be approached in daylight only, from a position about 0.5 mile S of Pulau Ular.

4.15 Ciwandan (6°01'S., 105°57'E.) is situated on the W coast of Java 0.5 mile SW of Cigading Ore Jetty. Ciwandan, also known as Banten Port, is a deep-water general purpose port, serving as an overflow port for Tanjung Priok, consisting of a general purpose berth, coal berths, a multipurpose berth, and a tanker berth.

Depths—Limitations.—Berthing information is shown in the table titled **Ciwandan—Berth Information.**

Ciwandan can accommodate vessels up to 70,000 dwt, with a maximum loa of 220m and a maximum draft of 12.0m.

4.16 Tanjung Leneng (6°01'S., 105°57'E.) is a point on the coast of Jawa, about 1.3 miles SE of Pulau Ular. Tanjung Leneng is rocky and has a narrow fringe of reef. The coast near Tanjung Leneng is hilly, unlike the level coast above and below it. A reef, with a depth of 4.6m, lies 0.2 mile N of Tanjung Leneng. This reef is not easily recognized.

Anyer Terminal (Asahimas Chemical Jetty) (6°02'S., 105°56'E.), close SW of Tanjung Leneng, is used mainly for the handling of petrochemical products for the chemical plant which together with the storage tanks occupies an area near the root of the jetties. Chemical commodities are also exported. This busy terminal handles considerable tonnage each year and is constantly growing.

Winds—Weather.—Both the berths are exposed to winds from SSW through W to NE, and even in calm weather, there is a continual swell from the NW. During most of the Northwest Monsoon period (November to March), the berths are unusable.

Depths—Limitations.—An L-shape jetty extends 200m from the shore. The jetty head runs SW, with its seaward face forming No.1 Berth, 1,300m long, with depths of 11m alongside. It can accommodate a vessel of 22,000 dwt. A 2m draft clearance should be allowed for the swell conditions. A conveyor belt extends along the length of No. 1 Berth.

Anyer Terminal—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
PT Asahimas Chemical						
Asahimas Bulk Berth	160m	12.0m	200m	10.0m	63,314 dwt	Salt, chemicals, multipurpose, and bun-kers. Berthing length of 290m (including dolphins).

Anyer Terminal—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Jetty No 1	135m	11.0m	160m	10.0m	23,704 dwt	Chemical gases, chemicals, and LPG. Berthing length of 240m (including dolphins).
Jetty No 2	25	—	100m	—	4,771 dwt	Chemicals and LPG. Berthing length of 110m (including dolphins).
Pt. Selago Makmur Plantation Terminal						
Pier 1	30m	—	142m	—	16,298 dwt	Chemicals and vegetable oils. Berthing length of 210m (including dolphins).
Bayer (Arco Chemical)						
Jetty Bayer	13m	—	190m	10.0m	40,000 dwt	Closed. Chemical gases. Berthing length of 212m (including dolphins).
Chandra Asri (Tripolita)						
Jetty A	40m	15.0m	260m	13.0m	119,456 dwt	Chemical gases, chemicals, clean products, crude and LPG. Berthing length of 300m (including dolphins).
Jetty B	—	12.0m	115m	8.0m	8,909 dwt	Clean products, chemical gases, chemicals, and LPG. Berthing length of 210m (including dolphins).
Jetty C	70m	8.3m	130m	7.0m	13,102 dwt	Clean products, chemical gases, and LPG. Berthing length of 200m (including dolphins).

No. 2 Berth is orientated 078° to 258° on the seaward side of the structure and is situated 90m NE of No.1 Berth. No. 2 Berth is 25m long and accommodates vessels of 2,000 dwt.

Petrochemical jetty A is a T-shaped jetty extending SW-NE. This jetty lies 0.5 miles SW of the caustic soda jetty and is 120m long with depths of 13m alongside. Vessels should allow a 2m clearance due to the swell.

Jetty B, close SW of jetty A, is 30m long with a depth of 12m alongside; vessels up to 3,000 dwt can be accommodated.

Lighted berthing dolphins extend beyond these berths.

Jetty C is a single 70m long berth with a depth alongside of 8m; vessels up to 10,000 dwt can be accommodated.

Berthing dolphins stand on either end of the berths and between them, accessible by catwalks. Tidal currents attain rates up to 6 knots and run parallel along No. 1 Berth. Vessels normally dock in daylight hours, but they may undock anytime. Berthing information is shown in the table titled **Anyer Terminal—Berth Information.**

Pilotage.—Pilotage is compulsory. Pilots from Merak are available with 24 hours notice. Vessels should transmit their ETA 24 hours before arrival through Cigading or Jakarta radio. The pilots and the port authority operate on VHF channel 12.

Anchorage.—Anchorage, with good holding ground, lies 0.5 to 1 mile off No. 1 Berth.

Tanjung Cikoneng (Tanjung Tjikoneng) (6°04'S., 105°53'E.), about 5 miles SW of Tanjung Leneng, is low and overgrown with brushwood. A light is shown on the point. A dangerous wreck was reported to lie 0.75 mile NW of Tanjung Cikoneng.

Caution.—An underwater volcano is reported to lie 5.3 miles WNW of Tanjung Cikoneng.

4.17 Anyer-lor (Anjer-lor) (6°03'S., 105°55'E.) (World Port Index No. 50930) is a village 2.5 miles NE of Tanjung Cikoneng, identifiable by a hill, 60m high, near the coast N of it. A prominent white chimney stands near the coast, NE of the hill.

Anchorage off Anyer-lor is not easily found, but it can be approached by bearing of the summit of **Pulau Sangian** (5°58'S., 105°51'E.), which is visible in the haziest weather during the Southeast Monsoon, and off the light on Tanjung Cikoneng (Tanjung Tjikoneng).

A good berth is 0.3 mile from the drying coastal reef, with the light on Tanjung Cikoneng bearing 230° and the summit of Pulau Sangian bearing 320°. Small vessels can anchor, in a depth of 7 to 9m, in an inlet near Anyer-lor during the Southeast Monsoon.

The coast trends about 4.3 miles SSW from Tanjung Cikoneng to **Pasangteneng Road** (6°08'S., 105°52'E.), a cove-like roadstead off the entrance of a river.

Pasangteneng Road has sloping shores of sand, sheltered on the N side by a coral reef, where landing can be easily effected.

Pasang Tenang (Pasangtenang) (Catharina Rosten) (6°08'S., 105°51'E.), two above-water rocks, surrounded by a reef, lie in the entrance of Pasangteneng Road. They are visible from a distance of about 3 miles. Several reefs lie within 0.35 mile N and NE of them. A few miles E of Pasangteneng Road are a number of high peaks.

Tanjong Cikoneng Light

Gunung Gede (6°08'S., 105°56'E.), the highest and southernmost peak, is about 4.5 miles E of the roadstead, and attains a height of 744m.

The W coast of Jawa trends S, about 19 miles, from Tanjung Cikoneng to Labuhan. Labuhan is a settlement, situated near the mouth of a river, which flows out about 1.5 miles NNE of **Pulau Popole** (6°24'S., 105°49'E.).

Small craft can pass in and out of the river at high water; a blue flag is displayed if conditions are unfavorable.

A shoal, with a depth of 3m, lies 1 mile W of the mouth of the river. Karang Kebua, a drying reef marked by breakers, lies 1 mile N of this shoal.

Pulau Popole, a low, sandy islet covered with vegetation, lies 1.5 miles SSW of Labuhan, and is easily recognized. A drying rock lies 2.75 miles SSW of Pulau Popole, with a 0.9m patch 0.25 mile E of it. A shoal, with a depth of 1.5m, is located close SSW of the drying rock.

Teluk Miskam (Teluk Lada) (6°28'S., 105°44'E.) indents the W coast, between the shore abreast Pulau Popole and Tanjung Lesung (6°29'S., 105°39'E.), about 10 miles SW.

Good anchorage can be taken in Teluk Lada during the Southeast Monsoon.

Tanjung Lesung, marked by a light, is a wooded point with a sandy beach. The land in the immediate vicinity of the point is low and flat, and the point is low, except for a hillock, 14m high.

Between Tanjung Lesung and **Tanjung Camara** (Tanjung Tjamara) (6°36'S., 105°37'E.), about 8.3 miles SSW, the coast is rocky. Several hills are located close inland.

The coast trends SSW about 13 miles from Tanjung Lesung to **Tanjung Palagan** (6°40'S., 105°34'E.). This section is generally low and contains numerous coconut plantations and other cultivated lands.

4.18 Taluk Paraja (Salamadatang) (6°41'S., 105°28'E.) is entered between Tanjung Palagan and **Tanjung Alangalang** (6°39'S., 105°22'E.), 12 miles W.

The beach is separated from the S coast of Jawa by a low neck of land, 1 mile wide.

In the fairway entrance to the bay are depths of 42 to 46m, decreasing gradually to 14.6m E of **Pulau-pulau Handeuleum** (6°45'S., 105°26'E.), and to 4m near the land. In the Northwest Monsoon, the W and S shores of the bay, which are visited by fishermen during the Southeast Monsoon, are unpopulated and marshy. The E shore consists largely of sandy beaches.

Teluk Slamadatang has not been completely surveyed.

Panter Reefs (Panter Riffen) lie in the middle of the entrance to Teluk Slamadatang, about 5.75 miles E of Tanjung Alang-alang. They are usually marked by surf, with a least depth of 2.7m.

Anchorage, with good holding ground, may be taken in Teluk Slamadatang. Turbulent seas occur during the Southeast Monsoon and also during the Northwest Monsoon, when the wind is from the N.

Landing can be effected NW of Pulau Handeuleum and on several sandy beaches on the E shore of Teluk Slamadatang, during the Southeast Monsoon.

4.19 Teluk Peucang (Meeuwen Baai) (6°42'S., 105°18'E.) indents the NW side of the peninsula between Tanjung Senini, 3 miles WSW of Tanjung Alangalang, and **Tanjung Layar** (Tanjung Lajar) (6°45'S., 105°13'E.), about 8.5 miles SW.

The shore of Teluk Peucang is low, densely wooded, and fringed by a narrow coral reef.

Pulau Peucang (Meeuwen Eil) (6°44'S., 105°16'E.), in the S part of the bay, has a prominent summit. It is densely wooded, and fringed by a coral reef, with three rocks lying off the islands steep NW point.

There is a narrow passage between Pulau Peucang and the mainland, but a reef lies in the N part. During a SW wind, hard squalls followed by sudden lulls are experienced in this channel. Small vessels, with local knowledge, can obtain good anchorage in this passage.

Pulau Panaitan (6°35'S., 105°13'E.), the largest island in Selat Sunda, lies about 7 miles NW of Tanjung Alangalang. It is hilly and densely wooded, except in its SW part. The coasts are reef-fringed. Gunung Raksa, the highest peak near the E coast, is 320m high and visible from all directions. The W end of Pulau Panaitan is low and hard to distinguish.

The SW shore of Pulau Panaitan ends in a fringing reef, which dries. As far as 1.5 miles offshore the depths are less than 18.3m. A group of surf-marked rocks extends as far as 1 mile S from **Tanjung Kanangjajar** (Karangburung) (6°41'S., 105°11'E.), the S extremity of the island.

The inner part of the extensive indentation in the SW shore

of the island has convenient depths for anchoring, but it is entirely open to the heavy S swell.

The E side of the island, 1.5 miles S of Tanjung Parat, the N extremity of the island, affords good anchorage in a depth of 24m, with Gunung Parat bearing 288°, and Gunung Raksa bearing 205°. This berth is 0.15 mile from the coastal reef.

A conservation area surrounds the island. Entry restrictions are not known. However, vessels that give its headland a distance of about 2 miles wide, pass clear of the area.

Selat Panaitan (Prinsen Strait) (Behouden Passage), between the S extremity of Pulau Panaitan and Tanjung Layar on Jawa, is free of dangers. The Pulau Panaitan shore should not be approached within 1 mile because of rocks off its S extremity. These dangers are marked by surf and vessels should use extreme caution when navigating in this area.

Tanjung Layar (Tanjung Lajar) (6°45'S., 105°13'E.) is 2.5 miles SW of the NW extremity of Pulau Peucang. It is also the S entrance point of the SW end of Selat Panaitan (Behouden Passage) forming a low, rocky point rising gradually.

A light, equipped with a racon, is shown from a 30m high white metal framework tower situated on the point.

Tanjung Guakolak (Tanjung Goeakolak), the SW point of the peninsula of Menanjung Ujung-Kulon, lies about 6 miles SSE of Tanjung Layar. Rocks, above and below-water, extend about 0.5 mile off the coast between the above two points.

Tanjung Cangkuang (6°51'S., 105°16'E.), a little over 1.5 miles SE, is the southernmost point of the peninsula.

Caution.—An explosives dumping ground lies 11 miles W of Tanjung Guakolak.

Islands in the North and Northwest Part of Selat Sunda

4.20 Pulau Sangiang (5°58'S., 105°51'E.) is located in the middle of the narrowest part of Selat Sunda, and is easily identified. Pulau Sangiang is designated a conservation area of flora and fauna. From a distance it appears to consist of several islets. There are some hills along the SW side, the highest having an elevation of 153m; on the N side there is a plain.

The S extremity of the island is marked by a light.

The N and E coasts are fringed by a narrow reef; on the SE side the reef projects 0.3 mile, and is often marked by heavy surf. From the middle of the SW side, a reef extends 0.1 mile, otherwise, this side is clear. A rock lies close off the W extremity of the island, and another off the S extremity. A spoil ground, best seen on the chart, is located 2 miles E. Mariners are advised to navigate with caution in the area.

A bank of sand, with depths of 13 to 36m, extends 7 miles SW from Pulau Sangian, affording good anchorage. An underwater volcano is reported to lie 6.5 miles SSW of the island.

The SW current, which runs with great force along the NW and S sides of the island, causes heavy tide rips. An eddy, which sets strongly inshore, is formed in the bay on the SW side. The depths in the bay are irregular. Pulau Sangiang is a good radar target up to 25 miles.

Trumbu Koliot (Kalihat) (Stroomklip) (5°55'S., 105°49'E.), a rock above water and visible at 3 miles, lies nearly 2 miles NNW of the W extremity of Pulau Sangian. The rock always breaks.

There is deep water on all sides at a distance of about 0.3 mile. South and W currents are strong around Terumbu Koliot and with opposing winds, there are tide rips and patches of discolored water that sometimes create the impression that Terumbu Kalihat and Pulau Sangiang are connected by a ridge under water, which is not the case.

A current with a rate of 6 knots has been observed abreast Terumbu Kalihat. A depth of 14.6m was reported 0.75 mile ESE of the rock.

Pulau Tempurung (Tampurang) (5°54'S., 105°56'E.), a steep rock, 70m high and covered with vegetation, lies nearly 5 miles NE of Pulau Sangiang. The rock can be seen from distances up to 20 miles. The water is deep around the rock. A light from which a racon transmits stands on the highest point of Pulau Tampurang. The rock has been reported to be a good radar target at a distance of 15 miles.

Terumbu Gosal (Winsorklip) (Winsor Rock) (5°53'S., 105°55'E.), about 1.5 miles NW of Pulau Tampurang, is a steep-to rock, with a least depth of 3.8m; it is marked by discoloration and tide rips.

Islands and Dangers on the North Side of Selat Sunda

4.21 Pulau Rakata (Pulau Krakatau) (6°09'S., 105°26'E.), an active volcano, is located in the middle of Selat Sunda, about 25 miles WSW of the S extremity of Pulau Sangiang. The highest part of Pulau Rakata culminates in a peak 813m high, falling steeply away to N to form an arc-shaped cliff which is actually a portion of a huge crater lying between Pulau Rakata and Pulau Sertung, to the NW. Pulau Rakata was reported to be a good radar target at a distance of 20 miles.

Volcanic activity has been observed on Rakata. It was reported that the island had extended 0.5 mile E.

In the event of a threatened eruption on Pulau Rakata, Jakarta radio station will broadcast the necessary warning in Indonesian and English text.

Pulau Rakata (Pulau Krakatau)

Pulau Sertung (6°05'S., 105°23'E.), about 3.5 miles NW of Pulau Rakata (Pulau Krakatau), is also an active volcano. Pulau Rakata-kecil (Lang Eiland), 1.75 miles N of Pulau Rakata, attains a height of 147m. A reef extends about 0.5 mile from the W shore of the island.

Between Pulau Rakata-kecil and Pulau Sebesi to the N, and also as far as 5 miles NE of Pulau Rakata-kecil, there are a number of reefs which are the higher parts of an extensive bank formed during a major eruption of Pulau Rakata. The sea is reported to continually break on these reefs.

Terumbu Mohammed Basir (Zeeklip) (Sea Rock) (5°58'S., 105°23'E.), nearly 5 miles NNW of the N extremity of Pulau Sertung, are two steep-to rocks, close together, which are visible from a considerable distance.

Pulau Sebesi (5°58'S., 105°29'E.) lies about 7 miles NE of Pulau Sertung. Pulau Sebesi appears as a mountain with two peaks, the SW, 843m high, is the highest.

Pulau Sebuku (5°54'S., 105°30'E.) is separated from Pulau Sebesi to the SSW by a clear, deep channel about 1 mile wide. Pulau Sebuku is reef-fringed. A heavy surf often marks this reef and there are a number of above-water rocks. A light is shown from the N extremity of the island.

Caution.—Because of volcanic activity, the area between Pulau Rakata (Pulau Krakatau) and Pulau Sebesi, 10 miles N, must be considered as unsafe and routes outside these islands should be taken by vessels.

A stranded wreck, in approximate position 6°12’S., 105°17’E., lies 7 miles WSW of Pulau Rakata. All vessels should navigate with caution in this area.

Northern Side of Selat Sunda

4.22 **Tanjung Tua** (5°55'S., 105°43'E.), the southeasternmost point of Sumatera, has been previously described in paragraph 4.4.

A light is shown from Tanjung Tua. From the W, the SW end of **Pulau Kandangbalak** (5°53'S., 105°46'E.) appears to be behind Tanjung Tua, when the latter bears less than 077°.

When Tanjung Tua bears 071°, the S end of **Pulau Panjurit (Hout Island)** (5°53'S., 105°47'E.) comes into view. As both these island extremities bear some resemblance to Tanjung Tua, it is possible to mistake one of them for the point when approaching from W. From E, Tanjung Tua is easily identified.

Terumbu Serdang (Batumandi) (5°53'S., 105°42'E.), 1.5 miles NW of Tanjung Tua, is a small islet, 2m high, which can be seen from a distance of about 3 miles. There are depths of 30 to 50m close around it.

The steep coast trends about 8.5 miles W and NW from Tanjung Tua to **Tanjung Kelapa** (5°50'S., 105°36'E.).

Teluk Lampung

4.23 Teluk Lampung is the extensive indentation between the middle and eastern peninsulas of this portion of the coast of Sumatera. Its entrance, between Tanjung Kelapa to the E and **Tanjung Tikus** (5°48'S., 105°13'E.) to the W, is about 23 miles wide.

Teluk Lampung is available to deep-draft vessels. It is generally steep-to on the E shore. Conspicuous mountains lie on the W shore of Teluk Lampung. Spurs from these mountains descend to the coast forming a number of bays, with many good anchorages, on the W shore, although there are numerous dangers.

This shore is marshy in places and there are some large villages, though seldom visible from seaward. During the Northwest Monsoon, safe anchorage can be taken in a number of places off the W shore.

Fishtraps may be encountered off the coasts of both sides of Teluk Lampung.

It was reported that many fish traps and huts also extend to the center of Taluk Lampung. Crossing the bay would require keeping as far S as the latitude of Medusa Reef.

A naval exercise area occupies much of the SW part of the bay; the limits can be best seen on the chart.

4.24 Kepulauan Legundi, on the W side of the entrance to Teluk Lampung, consist of six islands. **Pulau Legundi** (Pulau Legoendi) (5°50'S., 105°14'E.), 343m high, is the largest of the group. These islands are all densely wooded, hilly, and mostly fringed by narrow reefs which are steep-to on the S sides. The passages between the various islands are not recommended for large vessels.

Anchorage may be taken by vessels, with local knowledge, in either of two bays indenting the NW shore of Pulau Legundi. Shelter is provided from the prevailing W and SE winds.

Selat Legundi (Straat Legoendi) (5°50'S., 105°12'E.) is the channel trending NE between the coast of Sumatera and Pulau Legundi into Teluk Lampung. This clear deep waterway is used by vessels from the W proceeding to the head of Teluk Lampung.

Medusa (5°46'S., 105°16'E.), a coral reef, with a least depth of 4.9m, lies off the NE entrance to Selat Legundi and 2 miles NE of Pulau Seserot. It is sometimes marked by discoloration and ripples. It never breaks and is dangerous to navigation.

Pulau Serdang (5°49'S., 105°23'E.), a high, steep, and brush-covered island, lies about 5 miles E of the E extremity of Pulau Legundi.

The intervening channel to the W is clear and deep. A light is shown from Pulau Serdang.

It was reported that a tall tower with a red top, similar to a radio tower, and several white buildings were seen on the island.

Kepulauan Tiga (Pulau Tiga) (5°49'S., 105°33'E.), on the E side of the entrance of Teluk Lampung, about 4.3 miles WNW of Tanjung Kelapa, is a group of rocky islets.

The NW islet is the largest and from its NW side a reef, usually marked by breakers, extends 0.25 mile offshore. A light is shown from the SE island of the group.

Although vessels can pass on either side of Kepulauan Tiga, there is a strong current in the vicinity.

The coast from **Tanjung Kelapa** (5°50'S., 105°36'E.), NW and N to Kaliandak Road, a section 5.5 miles long, rises steadily to a conspicuous twin-peaked summit, **Gunung Rajabasa** (Radjabasa) (5°47'S., 105°38'E.).

Anchorage can be taken off the village **Canti** (Tijanti) (5°48'S., 105°35'E.), about 3.5 miles S of Kaliandak Road, in a depth of 14.9m, mud, with the S islet of Kepulauan Tiga (Pulau Tiga) bearing 236°.

4.25 Kaliandak Road is the roadstead off the village **Kaliandak** (5°45'S., 105°36'E.) (World Port Index No. 50370). It

Taharan Coal Terminal

affords anchorage, in a depth of 11.8m, mud, with the flagstaff at the root of the pier in line with the head of the pier, bearing 112°.

The coast between Kaliandak and **Teluk Belantung** (Loeboek Anchorage) (5°42'S., 105°33'E.), 3.5 miles NW, is low and fringed by a reef. Teluk Belantung is free of dangers but affords no sheltered anchorage.

Between Teluk Belantung and Panjung (Pandjang), nearly 19 miles NW, the coast is high and fringed by a steep-to coastal reef on which the sea breaks heavily in W winds.

Taharan Coal Terminal (5°31'S., 105°20'E.) is situated 3 miles SSE of Panjang. The berth is 170m long, depth of 12m, and lies between dolphins, 240m apart.

The largest vessel to use the berth was 40,000 dwt, with a length of 160m, a beam of 27m, and a draft of 8m.

4.26 Panjang (5°28'S., 105°19'E.) (World Port Index No. 50380) lies inshore of a natural breakwater of sand and coral, formed by an extension of the coastal reef on the NE side of the head of Teluk Lampung. Panjang is the largest seaport on the S end of Sumatera. It has a coastal radio station.

Depths—Limitations.—The depths are 12.2 to 15.8m in the entrance of Panjang, and from 9 to 13m in the harbor. Berthing details are shown in the table titled **Panjang—Berth Information.**

Panjang—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Panjang Port Terminal						
A	182m	8.0m	160m	—	15,000 dwt	Breakbulk.
B	210m	8.4m	110m	—	6,500 dwt	Ro-pax and breakbulk.
C1	140m	9.0m	75m	—	2,500 dwt	Chemicals, dirty products, breakbulk, and multipurpose.
C2	200m	9.0m	—	—	—	Chemicals, dirty products, ro-pax, breakbulk, and multipurpose.
D	86m	9.0m	—	—	—	Chemicals, dirty products, ro-ro/passengers, breakbulk, and multipurpose. Continuous berthing length of 486m.
D1	200m	9.0m	200m	—	28,000 dwt	
D2	200m	13.0m	200m	12.5m	28,000 dwt	
Dolphin Quay G	—	—	—	—	—	Clean products, ro-pax, breakbulk, and multipurpose. Berthing length of 125m (including dolphins).
E	400m	13.0m	—	—	—	Containers.
G	150m	7.0m	—	—	—	Breakbulk.
Tarahan Coal Terminal						
Jetty 01	175m	16.0m	270m	15.0m	80,000 dwt	Coal. Waterline to hatch coaming height (HW) of 15m. Berthing length of 300m (including dolphins).
Jetty 02	290m	16.0m	433m	—	210,000 dwt	Coal. Berthing length of 433m (including dolphins).
Coal Barge Berth	130m	—	—	—	10,000 dwt	Coal and transhipment by barge.
Tarahan Forest Product Terminal						
PT Tel Berth	150m	—	—	14.0m	52,000 dwt	Breakbulk. Berthing length of 276m (including dolphins).

Panjang—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Sebalang Thermal Power Station						
Coal Berth	150m	—	—	—	—	Coal.
Semen Padang Terminal						
Cement Berth	50m	—	—	—	—	Cement. Berthing length of 162m (including dolphins).
ISAB Terminal						
ISAB Berth	303m	15.0m	—	14.5m	—	Vegetable oils, breakbulk, and multipurpose.
Pertamina Terminal						
Chemical Berth	23m	—	—	—	—	Chemicals, clean products, and dirty products. Berthing length of 162m (including dolphins).
Jetty 01	50m	—	105m	8.0m	6,500 dwt	Chemicals, clean products, crude, crude products, and LPG.
Jetty 02	36m	—	160m	9.0m	17,000 dwt	Chemicals, clean products, crude products, and LPG.
SMART Refinery Terminal						
No. 01	182m	—	—	—	—	Vegetable oils. Berthing length of 540m (including dolphins).
No. 02	37m	—	—	—	—	
Indocement Cement Terminal						
Indocement Berth	16m	—	—	—	—	Cement. Berthing length of 132m (including dolphins).
PT Holcim Terminal						
Holcim Berth	20m	—	—	—	—	Cement. Berthing length of 130m (including dolphins).

Ocean-going vessels can be berthed at two mooring buoys; these moorings buoys are situated within the harbor in a depth of 9m.

A sea-island berth, with a depth of 12m alongside, was reported available inside the harbor. Tankers from 2,000 to 18,000 dwt and from 80 to 150m long can be accommodated. Berthing is restricted to daylight hours, but unberthing can be done at any time.

General cargo quays extend along the SE and NE sides of the harbor. Berthing information is given in the table titled **Pamjang—Berthing Information**.

Pilotage.—Pilotage is compulsory. Pilotage service is available 24 hours. Pilots require at least 6 hours notice for docking and 3 hours for undocking and shifting.

Contact Information.—See the table titled **Panjang—Contact Information**.

Panjang—Contact Information	
Port Operations	
Telephone	62-721-31146-49

Panjang—Contact Information	
Facsimile	62-721-31155
E-mail	panjang@indonesiaport.co.id
Web site	http://www.panjangport.co.id
Vessel Traffic Service	
Call sign	VTS Panjang
VHF	VHF channels 16, 20, and 22
MMSI	005250013
Telephone	62-721-31139
E-mail	panjangvts@yahoo.com

Anchorage.—Anchorage can be taken 1.5 miles SW of the harbor entrance.

Directions.—Panjang is entered by way of a channel leading in from NW around the N end of the natural breakwater. The fairway is about 137m wide.

Caution.—Lighted buoys mark the N extremity of the natu-

ral breakwater and the entrance to the harbor. A light is shown from the NE extremity of this breakwater.

Because of the existence of unlighted fishing stakes, dangerous to navigation, Panjang should be approached in daylight.

Depths off the berths may vary from charted values. Contact local sources prior to arrival for the latest information.

4.27 **Telukbetung** (5°27'S., 105°16'E.) is a town on the NE side of the mouth of the Wai Kuripan River at the W side of the head of Teluk Lampung. It is located about 3.3 miles WNW of Panjang.

Although Telukbetung has considerable frontage on Teluk Lampung, the port facilities are suitable only for native craft. Panjang serves as the port for Telukbetung.

Anchorage.—The small coastal vessels sometimes make use of Telukbetung, usually anchoring closely as possible to **Pulau Pasaran** (5°28'S., 105°16'E.). The depths are less than 11m, at distances closer than 0.25 mile to the island.

The W shore of the head of Teluk Lampung between Telukbetung and **Tanjung Tambikil** (5°31'S., 105°16'E.), 4 miles S, is encumbered with islets, reefs, and sand banks. Pulau Tangkil, 56m high, covered with coconut palms, lies 0.5 mile NE of Tanjung Tambikil.

There is a clear passage between the reefs fringing Pulau Tangkil and the coast W.

Pulau Kubur, 25m high, and Pulau Pasaran, a low reef-fringed islet, lie close offshore 1.5 miles and 2.75 miles NNW, respectively, of Pulau Tangkil.

4.28 **Pamunggutan** (5°29'S., 105°16'E.) is a bank of sand, coral, and stones, which dries 1.2m about 0.75 mile NE of Pulau Kubur. A number of reef patches lie within 0.5 mile of Pamunggutan.

A light is shown from a red metal framework structure standing on a reef 0.6 mile ESE of Pulau Pasaran.

Between Tanjung Tambikil and **Pulau Maitem** (5°36'S., 105°15'E.), a coastal section about 4.5 miles long, the W shore is alternately hilly and marshy, and is fringed by coral to a distance, in places, of 0.5 mile.

Pulau Tegal (5°34'S., 105°17'E.) lies about 2 miles NE of Pulau Maitem. It attains a height of 117m and is entirely covered with coconut trees.

A reef, with an above-water sand bank on its W side, lies between Pulau Tegal and the W coast; there is a narrow but deep channel on either side of this reef.

Caution.—A prohibited anchorage area lies N of Pulau Tegal from 5°31’S., 105°15’E. to 5°35’S., 105°17’E.

4.29 Pulau Kelagian, 281m high, lies about 2.3 miles S of Pulau Maitem. **Teluk Ratai** (Ratai Baai) (5°36'S., 105°13'E.), the largest and most important bay on the W side of Teluk Lampung, indents the coast between these points. There is a clear channel on either side of Pulau Kelagian.

The N entrance point of the bay lies 1.75 miles NNE of the N extremity of Pulau Kelagian. Pulau Kelagian lies 0.6 mile NE of the S entrance point of the bay.

In the bay itself there are no dangers, except two drying reefs which lie within 0.5 mile of the NW extremity of Pulau Kelagian and which are always marked by discoloration.

Anchorage may be obtained off **Piabung** (Piapoeng) (5°37'S., 105°10'E.), a village near the head of the bay, in a depth of 13m, 137m offshore. There is a small pier, suitable for lighters, at Piabung.

Pulau Puhawang (Poehawang) (5°41'S., 105°13'E.), the largest island in Teluk Lampung, lies about 1.5 miles S of Pulau Kelagian. The passage N of the island presents no difficulty to vessels with local knowledge. A reef, with a depth of 1.5m, lies in the N entrance to this channel, 0.5 mile NNW of the N extremity of Pulau Puhawang.

Pulau Puhawanglunik is connected to the E side of Pulau Puhawang by a drying reef. A patch, with a depth of 11m, lies 1 mile SSE of Pulau Puhawanglunik.

Teluk Punduh (Poendoeh Baai) is the area about 1 mile wide between Pulau Puhawang and the shore of Teluk Lampung to the W, NW, and SW. The mainland shore is marshy and through its SW part flows the Wai Pundu, a river with a mud bank, which is continually extending off its outlet.

4.30 **Teluk Pedada** (Pedada Baai) (5°45'S., 105°13'E.) is the southernmost of a number of recesses in the W shore of Teluk Lampung. Several islets lie in the entrance to, and within Teluk Pedada. Detached reefs in the bay, most of which lies in the N part, are marked by surf. A reef, with a depth of 2.7m, lies in about the middle of the entrance to Teluk Pedada.

Anchorage is available on the W side of **Ujung Cukucapah** (Pengrangan) (5°46'S., 105°12'E.), the S side of the entrance to Teluk Pedada. Anchorage should be taken only by those possessing local knowledge.

Close SE of the S entrance to Teluk Pedada is **Tanjung Tikus** (5°48'S., 105°13'E.), the W entrance point of Teluk Lampung.

Teluk Peper (Peper Baai) (5°48'S., 105°13'E.), entered between Tanjung Tikus and Tanjung Belantung, 1.5 miles WSW, has a noticeable steep group of rocks in the middle, with some others close off its W shore.

There is nearly always a turbulent sea in the bay, but when there is little swell, landing can be effected in a small cove with a sandy beach N of Tanjung Belantung.

Tanjung Tuntungkalik (5°48'S., 105°05'E.) lies 6.5 miles W of Tanjung Belantung. The intervening coast is steep, inaccessible, and offers no anchorage.

Teluk Semangka

4.31 Teluk Semangka, the W indentation of the S coast of Sumatera, is entered between Tanjung Tuntungkalik and **Tanjung Cina (Ujung Cukuredak)** (5°56'S., 104°44'E.), 23 miles WSW and is entirely open to SE winds. When these winds are blowing, it affords anchorage in the N part. The bay extends nearly 34 miles in a NW direction from Tanjung Tuntungkalik.

The E shore is steep and affords opportunity for anchorage, in depths of 30 to 50m, 2 miles offshore.

The W side is steep-to with depths of 30 to 50m within 0.5 mile. Local knowledge is advisable for vessels visiting any port, village, or anchorage on either side of Teluk Semangka.

The mornings are often misty in the entrance area and it is difficult to take bearings on the NE side of Teluk Semangka. The only prominent marks visible are the steep, rocky islets **Pulau Hiu** (Hioe) (5°45'S., 105°01'E.) and **Pulau Tuntungka-**

lik (5°48'S., 105°05'E.).

Gunung Tanggamus (5°26'S., 104°40'E.), at the head of Teluk Semangka, is 2,101m high with a sharp cone.

Pulau Tabuan (5°51'S., 104°51'E.), an island near the middle of the entrance of Teluk Semangka, is steep-to and densely wooded. It rises in its SE part to a height of 671m and appears sharp from S or N. Except on the NE side, the island is fringed by a steep-to bank. On the SE side of the island this bank extends 4 miles E, with depths of less than 30m. Anchorage can be taken on this bank, and also off a village near the NW extremity of the island.

The Teluk Semangka Oil terminal consists of two permanently-moored storage tankers in depths of 59m. The Energy Renown (VLCC), which stores gas, oil, and kerosene, is moored 4 miles SW of Kotaagung.

Tankers up to 390,000 dwt, with a maximum length of 375m and 25m draft, can berth alongside the storage vessels. Port radio at Kotaagung operates on VHF at all times.

Pilotage is compulsory. Pilots are embarked the same as in Panjang. Anchorage can be obtained in the vicinity of the tankers in depths of 20 to 40m, good holding ground.

A mooring master, compulsory for vessels berthing alongside a storage tanker, boards in the anchorage. Berthing is carried out only in daylight, though vessels are occasionally unberthed at night. Several tugs are available.

4.32 Teluk Kiluan (Kiloean) (5°46'S., 105°06'E.), on the N side of Tanjung Tuntungkalik (5°48'S., 105°05'E.), affords a good anchorage at the E entrance to Teluk Semangka, although there is little room to swing; vessels lie here sheltered from all winds.

Pulau Tuntungkalik, a steep, rocky islet lying 0.25 mile SW of Tanjung Tuntungkalik, the S entrance point, is a good landmark. **Pulau Kiluan** (5°47'S., 105°06'E.) lies in the middle of the entrance.

A coral reef, which dries, extends about 0.1 mile from the N shore of the bay. A small detached reef, which dries at the head of the bay, is usually marked by discoloration.

Directions.—In entering the bay a vessel should pass S of the rocks extending SW from Pulau Kiluan, and then proceed in mid-channel between that islet and the SE shore of the bay, and somewhat closely off a steep point E of Pulau Kiluan.

An anchorage position should be selected by eye, giving the coral reef extending from the N shore of the bay a good berth. Teluk Pegadungan, close N of Teluk Kiluan, is too exposed to afford anchorage.

Pulau Hiu (Hioe) (5°45'S., 105°01'E.) is a rocky steep-sided island about 3.5 miles NW of Teluk Pegadungan. This wooded island is a useful mark, and is visible up to 15 miles.

Teluk Umbar (Teluk Oembar) (5°43'S., 104°58'E.), entered about 7 miles NW of Teluk Pegadungan, affords anchorage for small vessels with local knowledge. The bay is exposed to the S swell.

Two steep rocky islets, covered with vegetation, lie close offshore W of the entrance, and there are some above-water rocks on both sides of the bay. The bay should be entered in mid-channel. The village Umbar stands in the NE corner of the bay.

Labuhan Tengor (Tengor Anchorage) (5°40'S., 104°54'E.), the indentation 5 miles NW of Teluk Umbar, is not desirable as an anchorage. Some drying rocks lie on the W side of the entrance.

The coast, 19 miles NW of Labuhan Tengor, may be approached closely except for off **Tanjung Badak** (5°37'S., 104°49'E.), 5.5 miles NW of Labuhan Tengor. A dangerous patch of coral, with a depth of 3.6m, not marked by discoloration, lies 1.5 miles SW of Tanjung Badak.

The village **Kotaagung** (5°30'S., 104°37'E.) is situated on the beach at the head of Teluk Semangka, 14 miles NW of Tanjung Badak. There is a pier at Kotaagung. A T-shaped oil jetty is close W of the original pier.

Anchorage may be obtained, in a depth of 9m, mud and sand, 0.5 mile offshore SSW of the pier. Rocky patches lie in positions relative to the pier, as follows:

a. 0.3m—1 mile WSW.
b. 8.8m—slightly less than 1 mile SW.
c. 15m—1.5 miles SE.

A flagstaff behind the village is a useful mark.

At the head of Teluk Semangka, between Kotaagung and **Tanjung Betung** (Betoeng) (5°34'S., 104°33'E.), 5.5 miles SW, the land is low and marshy, but wooded with high trees. Through the valley, formed between them by mountain ranges, flow several rivers.

4.33 Betung (5°33'S., 104°33'E.), one of the largest villages on the W shore of the bay, is situated on the N side of Tanjung Betung. There is anchorage, in a depth of 31m, 0.15 mile offshore, with the village bearing 240°. Above-water rocks and discolored water extend 0.1 mile offshore.

Wainipah is a village about 2.75 miles SSE of Betung. Coral reefs extend 0.5 mile offshore between the two villages.

Anchorage can be taken off Wainipah, in 20m. The anchorage should be approached by sounding and having the low point immediately N of the village bearing 316°.

A light is shown 0.75 miles N of the village.

Tanjung Gunungdalam (5°44'S., 104°39'E.) is a high point 10 miles SE of Wainipah. There is anchorage off Karangberak, a village on the S side of the point, in a depth of 33m, 0.3 mile offshore. A light is shown from this point.

Tanjung Batoeloenik (5°51'S., 104°43'E.) is a less than 7.5 miles SSE of Teluk Gunungdalam.

Teluk Tampang (Tampang Baai) (5°52'S., 104°43'E.), entered between Tanjung Batoeloenik and Ujung Cukuredak (Tanjung Cina) (5°56'S., 104°44'E.), 6 miles S, is entirely open to SE winds but affords good anchorage in a depth of 25m, sand, NE of Tampang, a village situated near the head of the bay. Teluk Cina, the W entrance to Teluk Semangka, is a low point which is well outlined when seen from seaward.

The coast between Teluk Cina and **Cukuh Balimbing** (5°56'S., 104°33'E.), 10.5 miles W, is reef-fringed. A light, equipped with a racon, is shown from Cukuh Balimbing. Approaching this coast in thick weather, when the land can not be seen, the soundings are a good guide but it is advisable to keep in a depth of not less than 40m.

A reef, with a depth of 1.5m and marked by breakers, lies 1 mile offshore and 2.75 miles ESE of **Tanjung Rata** (5°57'S., 104°35'E.), the southernmost point of Sumatera, located 2 miles SE of Cukuh Balimbing. There is a patch, with a depth of 8.8m, 0.5 mile SSW of Tanjung Rata. A patch, with a depth of 11m, lies 3 miles S of the same point, with depths of from 12.8 to 14.6m between it and the shore.

Jawa—South Coast

4.34 The S coast of Jawa is high and consists of steep rocks and rugged points. This desolate barren coast has great depths inshore. There are some bays and harbors which afford shelter in both monsoons.

Jawa is relatively narrow; the prominent mountains on the island serve as good landmarks for its S and N coasts. Some of the mountains can be identified up to 75 miles during the Northwest Monsoon.

During the Southeast Monsoon these mountains are usually concealed by the hazy atmosphere, except occasionally in the early morning.

Heavy swells break unceasingly on all exposed points and roll into the bays and some harbors. There are a few harbors which afford shelter during either monsoon. Cilacap (Tjilatjap) is the most important port on the S coast of Jawa.

Winds—Weather.—Southerly winds prevail along the S coast of Jawa during all months except January. The Southeast Monsoon commences in April and lasts until September; the wind occasionally blows from the SSW or SW at this time.

In October the mean direction of the wind is S, in November and December SSW, and in January WNW or NW.

A retrograde motion begins in February, and in March winds from the SW occur. These winds sometimes shift to NW or SE. This unsettled condition lasts until the latter half of April.

Tides—Currents.—Currents run usually to the SE, being strongest during the Northwest Monsoon and weak at other times. The vertical tide movement is mixed with a predominantly semi-diurnal character.

In general, the tidal currents set W on the rising tide and E on the falling tide.

Aspect.—Among the mountains in the W part of the S coast of Jawa are **Gunung Salak** (6°43'S., 106°44'E.) 2,211m high, with Gunung Halimun, 1,744m high, and Gunung Sanggabuwana, 1,919m high, 13 miles SW and 17.5 miles W, respectively.

Gunung Pangrango, 3,019m high and shaped like a truncated cone, rises 14 miles ESE of Gunung Salak, with Gunung Gede, 2,958m high, close SE. A white column of smoke is often seen rising from the crater on the NW peak of Gunung Gede.

Caution.—The S coast of Jawa, between **Tanjung Guhakolak** (6°50'S., 105°15'E.) and Tanjung Sodong (6°52'S., 105°32'E.), is similar in appearance, during hazy weather, to the coast NW, including **Pulau Panaitan** (6°35'S., 105°13'E.).

The long narrow isthmus connecting Menanjung Ujung-kulon with the Jawa mainland has been mistaken at a distance for the entrance of Selat Panaitan (Prinsen Straat) (Behouden Passage).

4.35 **Tanjung Cangkuang** (Tanjung Tjankoeang) (6°51'S., 105°16'E.) is the southernmost point of Menanjung Ujung-kulon isthmus. A 388m peak rises just N of the point. This area should not be approached within 2 miles.

The coast between Tanjung Cangkuang and **Ujung Sinini** (7°00'S., 106°21'E.), about 68 miles E, is fronted by a sandy beach upon which the sea breaks at all times. There are a few scattered villages along the coast, and dune formations which are subject to continuous change.

Tanjung Tereleng (6°51'S., 105°25'E.), 9 miles E of Tanjung Cangkuang, is a 49m high reef fringed cape extending almost 1 mile from the coast. A prominent tree is located in the middle of Tanjung Terelung.

Tanjung Sodong (6°52'S., 105°32'E.), located about 7 miles E of Tanjung Tereleng, is a sandy point backed by hills.

Tanjung Panto (6°51'S., 105°54'E.) is the E end of a promontory, 1.5 miles long, and is fronted by a drying reef which extends 0.25 mile offshore.

Anchorage may be obtained during the Northwest Monsoon in the bay N of Tanjung Panto, in depths of 11 to 15m. The holding ground is good, but a considerable swell frequently sets in round the point.

Off-lying Islands

4.36 **Pulau Deli** (Klapper Eil) (7°01'S., 105°32'E.), an uninhabited island, 48m high at its NW end, lies 7 miles S of Tanjung Sodongrand and is thickly wooded. A light surmounting a 40m high white tower, is exhibited from the SW extremity of the island.

Pulau Tinjil (Pulau Tindjil) (Trouwers Eil), about 12 miles E of Pulau Deli, is similar in appearance to Pulau Deli. Between these islands and the coast of Jawa, there is a bank with depths of 22 to 55m, coarse sand and mud bottom.

From Tanjung Panto, the coast continues low and sandy and in its W part it is backed by sand dunes for 9 miles E, where a narrow drying reef extends 1 mile S from the coast. It then turns SE for 14 miles to **Ujung Karangtaraje** (Karangtaradje) (6°57'S., 106°14'E.), and is mostly fringed by a drying reef. Anchorage may be obtained by those with local knowledge in the bay close W of Ujung Karangtaraje, in depths of 11 to 16m, sand.

Teluk Pelabuhan Ratu (Wijnkoops Baai), entered between **Ujung Sinini** (7°00'S., 106°21'E.), 7.5 miles ESE of Ujung Karangtaraje, and Ujung Karangterang, a point 10 miles SE, is backed by steep wooded mountains.

In Teluk Pelabuhan Ratu, rugged points project in places from the shore with a few rocks close inshore. A stream flows into the sea at the head of the roadstead with the village of **Pelabuhanratu** (Cidadap) (6°59'S., 106°32'E.) at its entrance, where there is a small T-head pier. Coastal vessels call during both monsoons.

Teluk Ciletuh (Teluk Tjiasem) (Zand Baai) (7°11'S., 106°26'E.), just S of the larger bay, is small in extent and relatively shallow. It provides good shelter during the Southeast Monsoon for vessels with local knowledge.

Castorklip (Karang Castor) is a small rock awash lying in the middle of the bay, 1.5 miles SSW of Ujung Karangragok, the N entrance point of Teluk Ciletuh. It can only be identified when there is a swell.

Between Teluk Ciletuh and Ujung Genteng, there are several bights with white sandy beaches, separated by prominent points formed by spurs from the hilly land behind. Vessels should give this part of the coast a berth of at least 1 mile, as above and below-water rocks lie up to 0.75 mile offshore.

4.37 **Ujung Genteng** (7°23'S., 106°24'E.), 12 miles S of Teluk Ciletuh, is a low peninsula with tall trees; it is very conspicuous from the W. A sand bank, with numerous rocks, fringes the point and extends 0.4 mile S.

The S part of this sand bank is prolonged in a SSE direction for about 0.75 mile by a rocky ridge, with a depth of 6.9m at its

outer part. During the Southeast Monsoon there is heavy surf on the outer end of the spit, but during the Northwest Monsoon there is hardly a ripple during calm weather. Ujung Genteng should not be rounded from the E in depths of less than 37m.

A 27m depth lies 8.3 miles WNW of Ujung Genteng.

An inlet indents the coastal reef on the W side of the peninsula. The inlet is narrow and has a fairway width of less than 91m at the entrance. A pier extends 125m in a S direction to the edge of the sand bank on the W side of the inlet. There is a depth of 6.2m alongside. Two mooring buoys are moored E of the pier.

Tides—Currents.—A strong tidal current may be encountered off the inlet, but the rate has not been determined. The maximum rate of the S current occurs at the time of semi-diurnal high water, and that of the N current at low water.

A beacon stands on the neck of the peninsula at its head near a prominent shed with a zinc roof. The W side of the inlet is marked by a beacon and two piles, and the E side by a beacon.

Anchorage may be taken, during the Southeast Monsoon, off the entrance to the inlet, in a depth of 20m, 0.45 mile W of Ujung Genteng. It may also be taken farther seaward, in depths of 26 to 29m, but a heavy swell exists here.

Directions.—Approaching from the W, steer for Ujung Genteng, bearing more than 090° and when the beacon at the head of the inlet bears 029°, steer for it and pass between the beacons on either side, which leads to the pier.

The coast between Ujung Genteng and **Teluk Cilauteureun** (Tjilauteureun) (7°40'S., 107°41'E.) is low, straight, and backed by sand dunes up to 84m high in the W and central parts.

Between Teluk Cilauteureun and **Ujung Madasari** (7°47'S., 108°30'E.), the coast is low, wooded, cultivated, and backed by low hills covered with rubber plantations. There appears to be no off-lying dangers off the previously-mentioned stretch of coast, though reefs, on which the sea breaks with violence, extend up to about 0.5 mile from the prominent points. In every bay heavy surf rolls up to the white sandy beaches.

Teluk Penanjung

4.38 Tanjung Cimanggu (Tanjung Tjimanggu) (7°44'S., 108°40'E.) is the S extremity of a small peninsula which separates Teluk Parigi from Teluk Citanduy (Teluk Maurits). These bays collectively form Teluk Penanjung.

Teluk Parigi offers good shelter during the Northwest Monsoon. Vessels can anchor, in 18m, with Ujung Citanduy bearing 199° and Tanjung Cimangu bearing 091°. During the Southeast Monsoon, vessels can anchor in the E part of the bay, off the small peninsula.

Teluk Citanduy (Teluk Maurits) offers good shelter during the Northwest Monsoon. Vessels can anchor, in 14 or 18m, with the SE side of the small peninsula bearing 186° and **Tanjung Besek** (7°44'S., 108°47'E.) bearing 105°. The latter point is the SW extremity of Nusa Kambangan, a long and narrow island.

Nusa Kambangan (7°44'S., 108°55'E.) is separated from the S coast of Jawa by very narrow channels. The W, S, and E sides of the island are steep and rocky. The channel N of the W end of the island expands into a large lagoon, with general depths of 0.9m and numerous drying patches. A light is shown from a 32m white stone tower and a racon transmits from **Gunung Cimiring** (Tjimiring) (7°47'S., 109°02'E.), the SE end of Nusa Kambangan.

An offshore tanker terminal, consisting of an SBM and marked by lighted buoys, is situated 4 miles SE of the light. A submarine pipeline, marked by lighted buoys, connects the terminal to the shore.

Teluk Penyu and Cilacap Inlet

4.39 Teluk Penyu (7°45'S., 109°04'E.) is an open bight between Nusa Kambangan and Tanjung Karangbata (Tanjung Karangboto) (7°46'S., 109°24'E.).

Gunung Slamet

Approaching Teluk Penyu from S, **Gunung Slamet** (7°14'S., 109°13'E.), 3,420m high, is an excellent landmark in clear weather. It should be steered for bearing less than 011°, which leads E of the 8.5m depths reported to lie 3.5 miles E and SW, respectively, of Cimiring Light. A dangerous wreck was reported (2005) to lie on the NE edge of this area.

Care should be taken that the isolated group of mountains N of Tanjung Karangbata, the E entrance point to Teluk Penyu which has the appearance of an island from a distance, should not be mistaken for Nusa Kambangan.

The largest port on the S coast of Jawa, Cilacap is now known as Tanjung Intan. Cilacap, entered between the E end of Nusa Kambangan and the S coast of Jawa, is the most important harbor on this coast. It affords the best anchorage of this stretch of coast and vessels can lie here in safety during both monsoons.

Cilacap Inlet (7°45'S., 109°03'E.), the narrow channel to Cilacap, leads along the NE side of Nusa Kambangan.

The town of Cilacap is situated on the N and E banks of **Kali Donan** (7°44'S., 109°00'E.), close within the entrance to the inlet.

A dangerous wreck lies in position 7°47'S, 109°10'E.

Tanjung Intan (Cilacap) (7°44'S., 109°00'E.)

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4.40 Tanjung Intan is a port of call for coastal and foreign shipping. There is a radio station at Cilacap. Extensive wharfage, with rail facilities, front the S, SW and W sides of the town. Mobile cranes are available for working cargo. The channel to Cilacap has been dredged and widened. Aids to navigation have been adjusted to reflect the channel limits.

Winds—Weather.—A gentle land breeze from the W or NW blows in during the morning hours. From the middle of July until the beginning of October there are continuous E winds which raise a high swell.

In August and September, these winds are accompanied by heavy rains and frequent storms, with no W or land breeze at all.

The climate cannot be considered healthful during the Northwest Monsoon. During the Southeast Monsoon, there are fresh breezes. The heaviest rainfall occurs from October to January, at which time it rains during 20 days of each month. The driest months are August and September, when rain falls about 11 days in each month. Heavy squalls, during the intermediate period between monsoons, sometimes impedes the working of cargo.

Tides—Currents.—In Cilacap Inlet, the tide is mostly semi-diurnal. Off the entrance to the inlet, there is an almost constant N stream. Along the axis of the channel, the current follows the line of the channel, but on both sides it passes over the shoals.

The flood current sets SW over the hard sand bank and then WSW. Because of the influence of the river Kali Donan, especially during the rainy season, the duration of the ebb is usually longer than that of the flood.

During neap tides, the current is usually 0.5 to 1 knot. At spring tides, this rate may increase to 2 to 4 knots and during the rainy season, the current has been known to attain a rate of 5 knots.

Depths—Limitations.—The channel is reported to have a minimum width of 200m from a position about 0.7 mile ENE of Tanjung Karangbolong to the W end of Pertamina Wharf; this portion of the channel has dredged depths of 14.5 to 12.1m.

Between Pertamina Wharf and the General Cargo Wharves the channel narrows to a width of 80m with a depth of 8m, after which the depth reduces to 4.5m in the reach to Donan Wharf.

The Crude Island Berth lies on the S side of the channel, about 1 mile W of Tanjung Karangbolong. It consists of two berths which can accommodate vessels up to 250m in length, 100,000 dwt, with a maximum draft of 13m.

Cilacap Range Light

There is a turning basin close N of Crude Island Berths and S of Lighted Buoy No.13.

Pasir Besi Iron Ore Wharf lies on the N side of the channel, about 1.5 miles WNW of Tanjung Karangbolang. The T-shaped wharf, with a 50m long concrete head, has a dolphin on each side. Vessels up to 186m long with a draft of 10.4m can berth there. The Fort Jetty lies close NW.

Pertamina Pier (Area 70) lies on the N shore of the channel, about 0.25 mile WNW of the Iron Ore Wharf. It consists of a triple-headed three-berth wharf, with a total length of 860m. The wharf can accommodate tankers up to 35,000 dwt, with a maximum loa of 200m and a maximum draft of 10.5m.

An inter-island piers lies halfway between the Pertamina Pier and the junction of the Sapuregal and Donan rivers

Tanjung Intan—Berth Information							
Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
BUNTON Power Plant							
Coal Jetty	215m	—	189.8m	—	32.2m	50,249 dwt	Coal.

Tanjung Intan—Berth Information							
Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
Holcim Terminal							
Nusakambangan Jetty	15m	4.0m	—	—	—	—	Limestone by barge. Berthing length of 140m (including dolphins).
Pangan Mas Inti Persada Terminal							
Pangan Mas Dock	120m	10.0m	—	—	—	—	Grain. Berthing length of 190m (including dolphins).
PLTU Karangkandri Power Plant							
East Jetty	150m	—	—	—	—	—	Coal.
North Quay	183m	—	106m	—	25.0m	10,500 dwt	Coal. Berthing length of 235m (including dolphins).
South Jetty	—	—	—	—	—	—	Under construction.
Pupuk Sriwidjaja (PUSRI) Terminal							
Pupuk Swiwijaya Jetty	40m	11.5m	—	—	—	—	Fertilizer. Berthing length of 150m (including dolphins).
Tanjung Intan Port Terminal							
Berth I	157m	11.0m	—	—	—	—	Wood chips, project/heavy, breakbulk, and livestock.
Berth II	134m	11.0m	—	—	—	—	Breakbulk and livestock.
Berth III	50m	11.0m	—	—	—	—	Coal, wood chips, and breakbulk.
Berth IV	72m	10.0m	—	—	—	—	Breakbulk.
Berth VI	120m	11.0m	—	—	—	—	Coal, breakbulk, and livestock.
Coal Berth	70m	7.5m	—	—	—	—	Coal and breakbulk.
Wijayapura Berth	70m	7.0m	—	—	—	—	Coal and breakbulk by barge. Berthing length of102m (including dolphins).
Area 70 Terminal							
CIB 01	26m	17.0m	250m	12.5m	39.9m	135,000 dwt	Crude, dirty products, and bunkers. Berthing length of 380m (including dolphins).
CIB 02	23m	17.0m					
Iron Ore Jetty	10m	11.0m	—	10.4m	—	—	Iron ore. Berthing length of 360m (including dolphins).
Jetty No.1	—	10.5m	200m	10.5m	—	35,000 dwt	Clean products, crude, dirty products, and bunkers. Berthing length of 203m (including dolphins).
Jetty No. 2	—	10.5m	200m	10.5m	—	35,000 dwt	Clean products, dirty products, and bunkers. Berthing length of 290m (including dolphins).
Jetty No. 3	—	12.0m	200m	10.5m	—	35,000 dwt	Chemicals, clean products, dirty products, and bunkers. Berth length of 150m (including dolphins).

Tanjung Intan—Berth Information							
Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
SBM	—	30.0m	334m	24.0m	—	300,000 dwt	Crude and bunkers.
Area 60 Terminal							
Jetty No.1	184m	7.0m	85m	5.8m	—	3,000 dwt	Aviation fuel, clean products, dirty products, and bunkers.
Jetty No. 2	—	3.5m	—	—	—	—	Dirty products, and bunkers. Berthing length of 122m (including dolphins).
Jetty No. 3	25m	7.0m	105m	5.8m	—	8,000 dwt	Aviation fuel, chemicals, clean products, dirty products, LPG, and bunkers. Berthing length of 178m (including dolphins).
Jetty No. 4	34m	7.0m	105m	5.8m	—	3,000 dwt	Aviation fuel, chemicals, clean products, dirty products, LPG, and bunkers. Berthing length of 168m (including dolphins).
BBM Cilacap Terminal							
Oil Jetty	15m	—	—	—	—	—	Clean products, dirty products, LPG, and bunkers. Berthing length of 40m (including dolphins).

There are four berths situated on the E side of Kali Donan at the General Cargo Wharves, which can accommodate vessels up to 10,000 dwt, with a maximum length of 114m and a maximum draft of 7m

Pertamina Wharves (Area 60) lie in the upper reaches of the Donan river and consists of three T-head berths that can accommodate vessels 105m in length, 8,000 dwt, with depths from 5 to 7m alongside.

Vessels dock port side-to, except at the Crude Island Berths, where vessels are berthed bow upriver. Berthing information is shown in the table titled **Tanjung Intan—Berthing Information.**

Aspect.—A white metal framework light, 15m high, stands 1 mile N of the iron ore piers. A prominent monument lies on the W side of Kali Jasa, 0.75 mile NW of the iron ore piers. A flagstaff and a monument lie close W of **Tanjung Sodong** (7°44.5'S., 108°59.5'E.).

Pilotage.—Pilotage is compulsory for all vessels. Pilots are available 24 hours for vessels up to 150m loa. Vessels over 150m in length are restricted to movements in daylight hours only. Request for pilot should be made 6 hours in advance and 3 hours before departure.

A vessel arriving at night should not make the signal for a pilot until daybreak. The pilot usually meets vessels about 0.75 mile ENE of Tanjung Karangbolong. Ships can communicate with the pilots on VHF.

Regulations.—There is a time limit of 48 hours for reporting the arrival of foreign vessels and crew at PTK Cabang Cilacap (the Government terminal in Cilacap).

The Appointment Letter or Notice of Vessel/Crew arrival should be provided to the agent at least two days (48 hours) in advance of arrival. Failure to comply will result in a heavy fine.

Signals.—Pilot signals are acknowledged by **Cimiring Light** (7°47'S., 109°02'E.); the information is then telephoned to the pilot station at Cilacap.

Cilacap—Pilot Answering Signals	
Signal	Meaning
Indonesian flag is hoisted at the signal yard.	The pilot is proceeding to board the vessel.
A ball, with two cones, points up, vertically disposed below.	Vessel wait outside until further notice.
Two cones, vertically disposed, bases together.	Vessel may enter without a pilot.
A ball, with a cone, point up, below it.	Pilot will not board vessel outside; proceed into Cilacap Inlet without a pilot until one is met.
A black ball between two cones, points up, vertically disposed.	Vessel cannot enter that day.

The pilot answering signals made by the light are given in the accompanying table. It has been reported recently that the signals from the lighthouse were difficult to see.

Contact Information.—See the table titled **Cilacap—Con-**

tact Information.

Cilacap—Contact Information	
Port Authority	
Telephone	62-282-534651
	62-282-534652
Facsimile	62-282-534653
E-mail	tgintan@pp3.co.id
Agents (Pertamina)	
VHF	VHF channel 19
Pilots	
VHF	VHF channels 12, 14, 16, and 20

Anchorage.—The outer anchorage, contained within a 1 square mile area, is centered 1.5 miles SE of Tanjung Karangbolong, in depths of 16 to 20m. Vessels also anchor between the anchorage area and the point, away from the wreck lying 0.2 mile ESE of the point.

Caution.—Rivers discharge into the bay carrying out trees and debris which cause discoloration of the water and dangers to navigation. Anchoring and trawling is prohibited in the vicinity of the submarine pipeline, laid across the harbor near the Iron Ore Wharf.

The 10m curve is located about 2 miles E of the E side of Cilacap. At this position the insular shelf is hard sand and shoals gradually to the shore. Two drying patches are located WNW of Ujung Karangbolong.

The entrance channel leads S of these patches and N of a narrow steep-to reef fringing the NE shore of Nusa Kambangan. Numerous wrecks lie in the inlet and harbor.

The dredged channel entered between Lighted Buoy No. 1 and Lighted Buoy No. 2 is moored less than a mile ENE of Tanjung Karangbolong. A pilot embarks in this vicinity. The channel is marked by lighted buoys (IALA Maritime Buoyage System Region A) and three sets of lighted range beacons.

4.41 Tanjung Krangboto (Karangbata) (7°46'S., 109°24'E.), the E entrance point to Teluk Penyu, is the S extremity of a steep and high promontory. The low land on either side renders it prominent. Heavy surf makes it impracticable to land on the promontory and, as uncharted rocks may exist close inshore, it should be given a wide berth.

Kali Lukul enters the sea 14 miles E of Tanjung Karangbata. Cilicap Radiobeacon transmits from a structure on the E side of the river.

Tanjung Karangboto to Tanjung Bantenan

4.42 The entire coast between Tanjung Karangboto and **Teluk Pacitan** (8°15'S., 111°05'E.), about 105 miles ESE, is inaccessible because of heavy surf. The W part between Tanjung Karangboto and the entrance of **Kali Opak** (8°01'S., 110°17'E.), 54 miles ESE, consists of a low plain fronted by sand dunes 9 to 16m high, behind which are numerous villages and paddy fields.

The E part of this stretch of coast is more mountainous, and the coast is steep and desolate. Dangers, other than those charted, may exist along this coast.

The only part of this coast which has been surveyed is E of position 7°53'S, 110°01'E, to the entrance of **Kali Opak** (8°01'S., 110°17'E.), 16.5 miles ESE. Soundings off this stretch of coast show that the 200m curve lies approximately 7 miles offshore, the bottom being very regular within this depth, but rising abruptly near the coast.

Off the entrance to Kali Opak, the 20m line lies approximately 1.5 miles offshore on either side of the entrance. The average depth 3 miles offshore is 49m, but owing to the heavy swell it is inadvisable to approach the coast within 2 miles.

Teluk Pacitan (Patjitan) (8°15'S., 111°05'E.) is open to S winds and sea. It is entered between Tanjung Karangsemanda and **Tanjung Ngamber** (8°15'S., 111°06'E.), 1 mile E, and is difficult to identify from a distance. **Gunung Lawu** (7°37'S., 111°12'E.) 3,265m, and Gunung Tulah 1,134m high lie; respectively, 38 miles NNE and 15 miles N of Tanjung Ngamber.

Another mountain, 729m high with a jagged summit which is easily identified, rises 7 miles ENE of Tanjung Ngamber.

Under favorable conditions, a beacon standing on the summit of a hill 0.3 mile NE of Tanjung Ngamber, and another similar beacon about 0.6 mile N of Tanjung Karangsemanda, can both be seen from a considerable distance.

A village, fronted by a small jetty suitable for boats, is situated about 1.3 miles N of Tanjung Karangsemanda.

The N shore of the bay is formed by a sandy beach with low ground behind, but because of the heavy surf, it is impracticable to land.

Anchorage may be obtained, in a depth of about 13m, sand and clay, about 0.2 mile SE of this jetty at the village.

Between Teluk Pacitan and **Teluk Panggul** (8°17'S., 111°26'E.), 20 miles E, the coast is high, rocky, and unsurveyed and should be given a wide berth.

Teluk Panggul, open to the S and SW, is a port of call for coastal vessels and only affords safe anchorage during the Southeast Monsoon.

Pacitan Power Station (8°16'S., 111°22'E), reported to be the largest coal-fired power station in Indonesia, has a 197m long bulk berth used for transferring coal. Vessels up to174m loa, with a maximum draft (HW) of 9.8m and a maximum beam of 27.5m, can be accommodated.

Anchorage may be taken off the entrance to the river **Kali Konang** (8°17'S., 111°27'E.), in depths of 13 to 15m, but it is exposed to the heavy swell and landing is difficult.

It is preferable to anchor in **Teluk Panggul** (Djaketra Baai) (8°17'S., 111°27'E.), 23 miles farther E, in depths of 9 to 13m, sand and clay. The bottom here rises gradually to a sandy beach where there are some warehouses.

4.43 Pulau Konyelan (Konjelan) (8°17'S., 111°27'E.) is an islet 42m high off the S entrance point to Teluk Panggul. Pulau Karangmalang lies 0.3 mile further S. Both islets are fringed with reefs, and vessels are cautioned not to pass between them and the coast E. A group of islets and rocks lie 0.35 mile S of the E entrance point to Teluk Panggul.

The coast between the E entrance point to Teluk Panggul and the W entrance point to **Teluk Sumbreng** (8°20'S., 111°33'E.),

4.5 miles E, is indented, steep, wooded, and unsurveyed.

Pulau Prendjono (8°22'S., 111°29'E.), with Pulau Panehan 1.5 miles ESE, are two prominent rocky islets about 2.5 miles off the S cost of Jawa. Because of the lack of soundings in the vicinity of the islets, caution should be exercised.

Teluk Sumbreng is entered between two rocky, wooded points and the bay is free from dangers except for some rocks and islets, which extend 0.75 mile SW from the E entrance point.

Anchorage.—During the Southeast Monsoon, anchorage can be taken, in 11 to 18.3m, off a small bight, located about 0.5 mile N of the E entrance point. This anchorage, although somewhat sheltered from the prevailing monsoon, is exposed to heavy S swells.

Between the E entrance point of Teluk Sumbreng and **Ujung Siklopo** (Siklapa) (8°22'S., 111°44'E.), the SW entrance point to Teluk Prigi, the coast is rocky and indented by several bays, which are steep, wooded, and afford no suitable anchorage. This stretch of coast has not been surveyed and should be given a wide berth.

A light is situated on the SW entrance point of **Teluk Segoro Wedi (Teluk Prigi)** (8°21'S., 111°44'E.).

Pulau Sarah (8°23'S., 111°40'E.), a rocky islet with an above-water rock between it and the coast, lies about 1 mile offshore. A breaking rock lies 1 mile SSE of the islet. A breaking reef lies 2 miles SE of the islet.

Off-lying Islets

4.44 Several islets, which serve as good landmarks, front Teluk Segoro Wedi. They lie within 2.5 miles of the salient points. **Pulau Bababan** (Pulau Sebabahan) (8°24'S., 111°42'E.) consists of two high, needle rocks standing on a narrow reef which is usually covered by high breakers. Pulau Sekel, 0.4 mile S of Pulau Bababan, is an above-water rock and is usually marked by heavy breakers. A below-water rock lies 0.6 mile W of Pulau Babadan.

Pulau Batang (8°25'S., 111°45'E.), 2.5 miles ENE of Pulau Bababan, is similar to Pulau Sekel.

Pulau Solimo is the largest of a group of five rocky, wooded islets lying on foul ground, 0.6 mile E of Pulau Batang.

Pulau Tamengan (8°22'S., 111°47'E.) is the largest of three rocky, wooded islets lying close together on an area of foul ground.

Pulau Sosari, 1 mile ENE of Pulau Tamengan, is the easternmost danger in the approach to Teluk Prigi.

Teluk Segoro Wedi (8°21'S., 111°44'E.), with high mountains W and E, is the clearest and safest bay on the S coast of Jawa. Within the entrance to Teluk Segoro Wedi, the depths decrease regularly to 7.3m near its head, where there is good holding ground of mud, clay, and sand.

The bay is divided into a W and N arm. **Labuan Damas** (8°20'S., 111°42'E.) indents the W arm and **Labuan Gangsa** (8°19'S., 111°44'E.) the E side of the N arm. Several villages stand along the shore of the latter bight.

Anchorage.—There is sheltered anchorage in Labuan Gangsa, in a depth of 26m, mud and clay, off the village of Pager Gunung, 1 mile NE of **Pulau Ngrembeng** (8°19'S., 111°44'E.), a conical islet lying off the middle of the E side of the bay. Some above-water rocks extend 0.2 mile SW from a village close NW of Pager Gunung. Anchorage is also available in the E part of the head of Teluk Segoro Wedi, in depths of 5 to 11m.

Here, vessels should berth as close inshore as possible off the pier off the village at the head of Teluk Segoro Wedi. This anchorage is sheltered from S and E winds, and landing can be easily effected. Anchorage in Labuan Damas and elsewhere off the W coast of Teluk Prigi is not safe.

Directions.—The recommended approach is SE, passing between Pulau Solimo and Pulau Tamengan. Soundings give no warning of the approach to the dangers.

4.45 Teluk Gemek (Teluk Popoh) (8°17'S., 111°47'E.) is entered NE of Teluk Segoro Wedi. The shores of the bay are rocky and very steep. The village of Popoh stands near the NE shore of the bay.

The entrance to Teluk Gemak is deep, and the depths decrease gradually to 37m, 3 miles NE of the W entrance point. The E entrance point is a narrow steep-to rocky promontory. The depths decrease to 13m near its head. The bay contains no known dangers other than a reef which extends 0.3 mile E from W entrance point.

Anchorage may be obtained by vessels with local knowledge off Popoh, in a depth of 11m; the depths decrease gradually.

For those without local knowledge, anchorage is taken in a depth of 20m. There are some shoals which have been reported to be difficult to detect because of their lack of discoloration.

The N and W sides of Teluk Gemak are unsafe during the Southeast Monsoon, and even the anchorages given above are precarious in that monsoon.

4.46 Teluk Semrawang (Bumbun Bay) (8°17'S., 111°51'E.), on the E side of Teluk Gemak is only calm when there are light or E winds. The entrance is deep and shoals gradually to 5.5m at its head.

Between the above bay and **Pulau Sempu** (8°27'S., 112°42'E.), 47 miles E, the area off the coast is unsurveyed. The coast is generally high, wooded, and for a distance W of Pulau Sempu is fringed by a coral reef. Inland of the above stretch of coast there are many villages and rubber plantations.

Pulau Sempu is a high, rocky, and desolate island. It is separated from the mainland by a narrow channel about 0.1 mile wide. There is a least depth of 10.1m in the E entrance of the channel. The S side of Pulau Sempu is inaccessible.

Anchorage.—Vessels with local knowledge may obtain safe anchorage on the NW side of Pulau Sempu by proceeding through the channel from E. There is a pier on the NW side of the island, with depths of 4.9 to 7m alongside. Within 12 miles E of Pulau Sempu, the coast is indented by three small open bays, but little is known of them.

Between the easternmost bay and **Tanjung Pelindu** (8°24'S., 113°24'E.), about 28 miles E, the coast forms a bight, the W part of which is rocky. Dangerous reefs are reported to extend off this part of the bight. The E part of this bight has a sandy beach, blocked by sand hills.

Teluk Dampar (8°17'S., 113°05'E.), at the head of the bight, has not been surveyed. Gunung Semeru rises 15 miles NW of Teluk Dampar.

4.47 Nusa Barung (8°29'S., 113°20'E.), a large rocky wooded island, lies with its E extremity 4 miles SSE of **Tan-**

Gunung Semeru

jung Pelindu (8°24'S., 113°24'E.). The island rises to 326m near its center. The channel between the island and the coast is deep in the fairway, but without local knowledge it is inadvisable to approach within 1 mile of Nusa Barung, as unknown dangers may exist.

Anchorage.—The N side of Nusa Barung is less steep than the other sides, and is indented near its center by a small bay. A vessel with local knowledge may take sheltered anchorage here, in a depth of 49m.

Between Tanjung Pelindu and a steep, wooded, rocky point 5.5 miles E, there is a bay with a sandy beach in its W and N parts, backed by low marshy ground. A village stands on the NE side of the entrance to a small river, 1.75 miles ENE of Tanjung Pelindu. Anchorage may be obtained in the bay when conditions permit.

From the E entrance point of the bay described above, and a point 38 miles ESE, the coast is uninhabited except in its W part. This part is rocky, high, covered with forest, and indented with several bays which have not been surveyed.

Apart from the islets off the coast, all of which lie within 2 miles, there are no known dangers. Prominent mountains back the coast.

From position 8°37'S, 114°05'E, the coast is formed by low, wooded ground in its E part and then to **Tanjung Capil** (8°38'S., 114°13'E.), where it is high, wooded, and rocky. In the middle of the above sandy beach, the river **Kali Baru** (8°37'S., 114°07'E.) enters the sea.

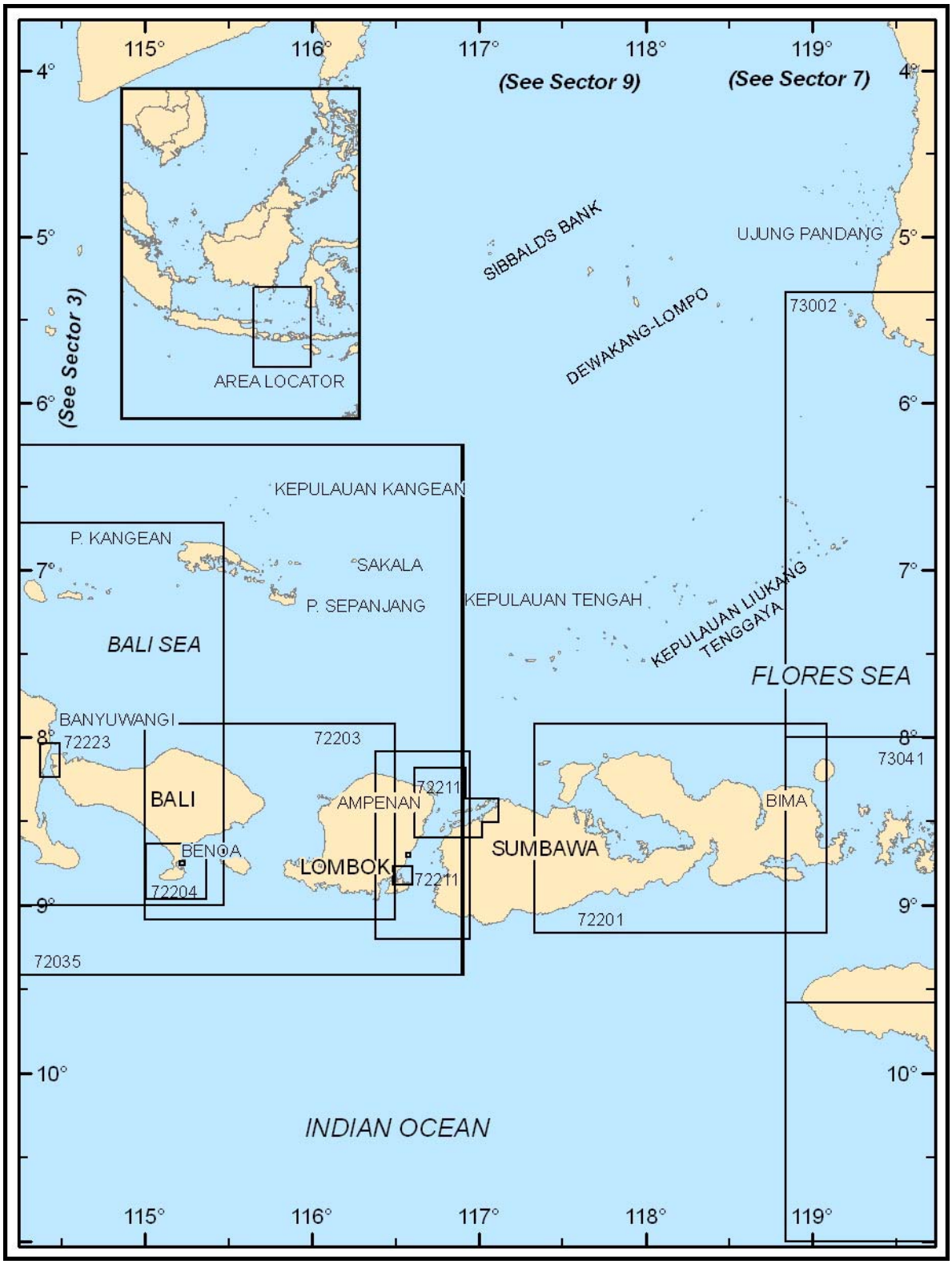
4.48 Teluk Grajagan (8°40'S., 114°15'E.) is entered between Tanjung Capil and **Tanjung Purwo** (8°44'S., 114°20'E.), a low point 9m high, 9 miles SE. The former point rises abruptly to a mountain 384m high.

The village of Grajagan stands at the NW corner of the bay, at the mouth of the **Segara Anak** (8°36'S., 114°13'E.), but its entrance is blocked by a drying sand bank.

Anchorage may be obtained in Teluk Grajagan, during the SE monsoon, in depths of 15 to 26m.

The Blambangan Peninsula, a broad peninsula forming the SE extremity of Jawa, extends 15 miles E from Tanjung Purwo, and rises to 360m, 10 miles ENE of the point. The peninsula is covered with forest and has no noticeable features.

4.49 Tanjung Bantenan (8°47'S., 114°32'E.) is the S projection of Semanjung Blambangan, which is covered with a dense monotonous forest. The S and E sides of the peninsula are fringed by a drying reef up to 1 mile offshore. The sea breaks heavily on this reef.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **5** — CHART INFORMATION

SECTOR 5

BALI, LOMBOK, SUMBAWA, AND ADJACENT STRAITS

Plan.—This sector describes the islands of Bali, Lombok, and Sumbawa with the straits adjoining them, and the off-lying islands to the N. The arrangement is N through Selat Bali, then E covering the three islands, related straits, and off-lying islands to the N.

General Remarks

5.1 Selat Bali (8°15'S., 114°26'E.), separating the E side of Jawa from Bali, is deep and is used mainly by coastal and inter-island vessels. **Banyuwangi** (8°13'S., 114°23'E.), an important shipping place, is situated on the W side of the strait, S of the narrows. During the Southeast Monsoon, the weather is hazy and the high mountains of Jawa and Bali can rarely be seen.

Bali, the start of Nusa Tenggara, previously known as the Lesser Sunda Islands, is mountainous through the main ridge running from W to E in apparent continuation of the volcanic ridge through Jawa. Most of the spurs of the ridge approach the N and NE coasts very closely and only occasionally does a narrow stretch of lowland remain. Southward of the ridge, the land is low or slightly hilly with the exception of Bukit Badung and the hills around **Labuhan Amu** (Labuan Amuk) (8°31'S., 115°32'E.).

The coasts of Bali generally rise steeply from the sea, with great depths close to, so that there is anchorage inshore only. Because the coast is entirely open, the only safe anchorage is off the E coast in the Northwest Monsoon and off the W coast in the Southeast Monsoon.

Winds—Weather.—During the Southeast Monsoon, the wind is mostly from SSW to SE with a W current. From July to September, the wind can be very strong. In the Northwest Monsoon, a vessel may be set strongly E, both by wind and current.

Tides—Currents.—The character of the tidal current in Selat Bali is semidiurnal. The direction is affected by the monsoon, with the Southeast Monsoon causing a constant S current, and the Northwest Monsoon causing a constant N current. The resultant current, due to the combined working of the tides and the monsoons, is, as follows:

1. In the narrows of the N entrance, during the Southeast Monsoon, the current flows nearly in a constant S direction. It is strongest about 5 hours after the moon's upper and lower transit, with a maximum rate of 6 to 7 knots. From about 3 hours before until the moon's transit, a weaker current sets N with a maximum rate of 3.5 knots, although this may be replaced by an inconsistent current or even by a weak S current with a maximum rate of 2 knots.
2. In the narrows, during the Northwest Monsoon, the N current is the stronger and flows for about 8 hours from about 6 hours before to 2 hours after the moon's upper and lower transit. The maximum rate, from 6 to 7 knots, occurs about 3 hours before the moon's upper and lower transit. During other periods there is a S current.
3. In the narrows, during the transition months between the monsoons, the rate of either the N or S current does not exceed 5.5 knots. The N current runs from about 4 hours 30 minutes before to 2 hours 30 minutes after the moon's upper and lower transit, and the S current runs during the remainder of the period.

As a general rule, the strongest currents can be expected in the first week after full or new moon. During neap tides (first week after the quarters) the rate never exceeds 3 knots.

Near **Tanjung Sembulungan** (8°27'S., 114°23'E.), the tidal currents start about 2 to 2 hours 30 minutes earlier than in the narrows; near **Banyuwangi** (8°13'S., 114°23'E.) from 1 hour to 1 hour 30 minutes earlier; and near **Pulau Tabuan** (8°03'S., 114°28'E.) from 1 to 2 hours later. In the wider part of the strait the tidal currents usually occur later than close to the coast.

The maximum rate of the current increases regularly as the narrows are approached. Under the N coast of Bali, E of **Tanjung Pasir** (8°06'S., 114°26'E.), the NW extremity of the island, where the N current is setting through the strait, there is usually an eddy or the current is inappreciable.

The N current decreases in strength to the S of the narrows; off Banyuwangi, the rate is about half that off Tanjung Pasir. In the S part of the strait, during the Northwest Monsoon, the current sets strongly to the E, toward **Bukit Badung** (8°48'S., 115°10'E.), a peninsula forming the S extremity of Bali.

The currents near the shore are not as strong as those in the middle of the strait. They sometimes run in a contrary direction.

Depths—Limitations.—Depths in Selat Bali range from 18 to 188m with the majority of transiting depths between 25 and 75m. Depths are best seen on the chart and mariners are advised to seek the most up-to-date depth information.

Gosong Ratu (8°35'S., 114°39'E.), near the middle of the S entrance of Selat Bali, has a least depth of 9.1m. This shoal bank is about 1 mile in diameter and is not marked by discoloration.

Bukit Badung (8°48'S., 115°10'E.), the peninsula forming the S extremity of Bali, bears some resemblance to that of **Semanjung Blambangan** (Blambangan Peninsula) (8°45'S., 114°25'E.), the SE extremity of Jawa, when seen from S. During the Southeast Monsoon, care must be taken not to mistake **Selat Badung** (8°40'S., 115°22'E.) for Semanjung Blambangan.

Selat Bali—West Side

5.2 Tanjung Bantenan (8°47'S., 114°32'E.), the S projection of Semanjung Blambangan, has been previously described in paragraph 4.48

The W side of the S part of Selat Bali, between **Tanjung Slokah** (8°43'S., 114°36'E.) and **Tanjung Sembulungan** (8°27'S., 114°23'E.), is formed by Semanjung Blambangan. The coast is steep-to, with considerable depths close offshore.

Tanjung Kutjur (Tanjung Kucur), a wooded point 34m high,

lies 4 miles NNW of Tanjung Slokah, and then WNW for 6 miles to Tanjung Keben, another wooded point 56m high, the E entrance point to Teluk Banyubiru, the coast is high and wooded.

Anchorage may be taken in Teluk Banyubiru, in a depth of 37m, 0.5 mile off the head of the bay. Between the W entrance point to Teluk Banyubiru and **Tanjung Sembulugan** (8°27'S., 114°23'E.), the coast is wooded. Tanjung Sembulungan is the N extremity of a high peninsula and forms the E side of Teluk Pangpang, which indents the coast. The E shore of the bay is fringed by a steep-to reef and fronted by a sandy beach. The head of the bay and the W shore are fronted by a partly drying mudflat which occupies the greater part of the bay.

Sheltered anchorage may be taken in Teluk Pangpang at all times. Depths decrease gradually from 18m in the fairway of the entrance, to 5.5m about 3 miles within. Between Teluk Pangpang and **Tanjung Pakem** (8°14'S., 114°23'E.), the coast is thickly wooded with a few openings for some scattered settlements. A submarine power cable lies 3 miles N of Teluk Panpang and runs NE across Selat Bali to the coast 2 miles N of Tanjung Pabawahan.

Bromo Rock (8°16'S., 114°25'E.), with a least depth of 11m, and Parkem Reef, with a least depth of 4.6m lie; respectively, 2.25 and 1.25 miles SSE of Tanjung Pakem.

Parkem Reef is marked by a beacon on its E side. From Tanjung Pakem to the town of Banyuwangi, 1.75 miles NNW, the coast is similar to that S of the point.

5.3 Banyuwangi (8°13'S., 114°23'E.) (World Port Index No. 51210), a lighterage port of some importance, consists of an Outer Road, Inner Road, and an Inner Harbor. The latter consists of a shallow rectangular basin with sloping walls and lighter jetties. The basin is connected to the town by rail and road bridges.

Winds—Weather.—The climate is hot and sultry due to Banyuwangi enclosed by lofty mountains to the W. During the Southeast Monsoon the temperatures are lower and the nights are somewhat cooler.

Tides—Currents.—Semidiurnal tides predominate.

The direction of the tidal currents, near the Jawa coast, often changes considerably earlier than farther out. The tidal currents in the Inner Road often run more strongly and in a contrary direction to those in the Outer Road, and may attain a rate of 2.5 knots.

Depths of 18 to 20m are found in the Outer Road, and depths of between 7m and 13m are found in the Inner Road.

New Bank, with a least depth of 6.7m, and marked on its N side by a lighted buoy, lies 0.25 mile E of the port office.

Aspect.—Prominent objects in the approach to Banyuwangi are a radio mast showing an obstruction light 0.5 mile WSW, and a factory and chimney 0.75 mile N of the port office at Banyuwangi.

Pilotage.—Pilotage is compulsory for vessels over 150 gt. Pilots must be ordered by the agent 48 hours in advance.

Anchorage.—The Outer Road between Ommen Shoal and New Bank affords good anchorage for moderate-sized vessels, in depths of 18 to 20m, but the bottom is uneven.

Vessels making for the inner anchorage are advised to moor as there is limited space. During the Northwest Monsoon, there is seldom any sea and communications with the shore can always be maintained.

Directions.—Banyuwangi is difficult to identify in the afternoon, when the sun is behind it, but mountains on Bali, 6 miles E, provide a good mark. Vessels approaching the Outer Road from S should avoid Bromo Rock and Parkem Reef, and pass mid-channel between Ommen Shoal and DeGroots Rock. Vessels approaching from N should pass E of Ommen Shoal in depths of not less than 27.4m. Due to the narrowness of the inner anchorage, vessels entering or leaving this channel should take care to proceed against the current.

Caution.—Due to changing conditions, vessels not having the latest local knowledge are advised to seek the assistance of the harbormaster. DeGroots Rock, with a least depth of 3.6m, lies about 0.75 miles SE of the port office. Ommen Shoal, a small coral patch with a depth of 4.8m, lies about 0.8 mile ENE of DeGroots Rock.

Ketapang (8°09'S., 114°24'E.) lies 4 miles N of Banyuwangi, with a low coast between. A ferry pier with service to Bali is located at Ketapang. An area in which anchoring is prohibited due to the presence of submarine cables is situated between Ketapang and the NW side of Bali. A dangerous wreck lies 0.5 mile SE of Ketapang.

5.4 Tanjung Wangi (Meneng) (8°07'S., 114°24'E.), located 5.5 miles N of Banyuwangi, has largely superseded Banyuwangi as the main port for foreign vessels in the area. A light is shown from the port.

Port of Tanjung Wangi
http://www.maritimindo.com/PelabuhanIII/PelabuhanTanjungWangi.html

Depths—Limitations.—The port can accommodate vessels up to 20,000 dwt, with a maximum draft of 12m and a maximum loa of 190m. Berthing information is provided in the table titled **Tanjung Wangi—Berthing Information.**

The DMK jetty is 40m in length and can accommodate vessels with a maximum draft of 6m. The jetty is used for the transfer of liquid asphalt.

Tanjung Wangi—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
BSW Cement Terminal						
BSW Cement Jetty	45m	—	—	—	—	Cement. Berth length 270m (including dolphins).

Tanjung Wangi—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Semen Indonesian Terminal						
Cement Berth	35m	20.0m	—	—	—	Cement, ro-ro passengers/vehicles/rail, project/heavy, ready mix, and general cargo. Berthing length of 182m (including dolphins).
PUSRI Terminal						
Pusri Berth	72m	7.3m	—	—	—	Chemicals, clean products, fertilizer, and urea. Berth length 194m (including dolphins).
Tanjung Wangi General Port Terminal						
Berth 1	108m	12.0m	—	—	—	Chemicals, clean products, cement, fertilizer, ro-ro/passengers, bunkers, general cargo, crude products, aggregates, breakbulk, and reefer. Continuous berthing length of 543m. Increased loa is permitted if smaller/no vessel on adjacent berth.
Berth 2	108m	12.0m	—	—	—	
Berth 3	108m	12.0m	—	—	—	
Berth 4	108m	12.0m	—	—	—	
Berth 5	108m	12.0m	—	—	—	
BBM Pertamina Tanjung Wangi Terminal						
BBM Tanjung Wangi Berth	25m	12.0m	190m	—	18,000 dwt	—
LPG Bosowa Banyuwangi Terminal						
LPG Jetty	12m	—	—	—	6,500 dwt	LPG. Berthing length of 200m (including dolphins).
Summitama Asphalt Plant						
Sumitama Asphalt Jetty	40m	8.5m	—	6.0m	—	Clean products. Berthing length of 179m (including dolphins).

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Ketapang

Pilotage.—Pilotage is compulsory for vessels over 150gt and should be ordered at least 6 hours prior to arrival. Berthing and unberthing are carried out during daylight only. Meneng Radio may also be contacted on VHF channels 8,12, 14 and 16. The agent should coordinate with the pilot 48 hours in advance.

Anchorage.—Anchorage may be taken in Teluk Mana, located 1.5 miles N of Ketapang, in depths of 17 to 31m.

This anchorage is free of strong tidal currents, but eddies exist.

5.5 Tanjung Bansering (8°04'S., 114°26'E.) lies 5 miles N of Ketapang and is low and covered with coconut palms. Tanjung Bansering Range Lights, in line bearing 005°, led through the narrows at the N end of Selat Bali. The rear light is a 20m high, white metal framework tower, situated 0.3 mile WNW of Tanjung Bansering. The front light is shown from a 13m high white metal framework tower, lying 0.3 mile S of the rear light. Between Tanjung Bansering and **Tanjung Candiban** (Jandiban) (Tjandiban) (7°53'S., 114°28'E.), 10.5 miles N, the E coast of Jawa is fringed by reefs. The portion of the coast abreast **Pulau Tabuan** (8°03'S., 114°28'E.), 3 miles N of the narrows, is fronted by a broad coastal reef. Several drying patches, covered with vegetation and resembling islands, are found on this reef. Many above and below-water detached reefs lie off this coast.

Krokodil (7°57'S., 114°27'E.) is located about 3.5 miles S of

Tanjung Candiban. It is a steep-to rock marked by discoloration, with a depth of 3m. Between Tanjung Candiban and **Tanjung Sedano** (7°50'S., 114°28'E.), 4.5 miles N, the coast is fringed by a narrow coral reef with several openings.

Gunung Baluran (7°51'S., 114°22'E.), located near the NE extremity of Jawa, forms a mountainous background about 5 miles W of Tanjung Sedano and was previously described in paragraph 3.61.

Selat Bali—East Side

5.6 **Bukit Badung** (8°48'S., 115°10'E.), a peninsula forming the S extremity of Bali, is joined to that island by a low sandy isthmus and forms the E entrance point to Selat Bali at its S end.

Gunung Putung (8°49'S., 115°09'E.), 202m high near its center, with another hill 213m high, 0.75 mile SSW of it, appears lower than it actually is when compared to the high mountains in the N part of Bali.

The S coast of the peninsula is steep and wooded in places. There are sandy beaches at the foot of the cliffs. The coastal reef which dries, extends up to 0.4 mile offshore, and except for some rocks close inshore, there are no known dangers. There is a heavy surf here.

Tanjung Mebulu (8°50'S., 115°05'E.), the W extremity of Bukit Badung, has a white temple standing at an elevation of 78m.

Between Tanjung Mebulu and **Tanjung Tanjungan** (8°38'S., 115°06'E.), 11 miles N, the coast recedes to form a bight, and this bay is named Pantai Barat.

Pantai Barat is divided into two parts by a drying reef, which extends up to 0.75 mile offshore from the low isthmus connecting Bukit Badung with Bali. The village of **Jimbaran** (Djimbaran) (8°46'S., 115°11'E.) has two remarkable round-topped trees.

5.7 **Labuan Jimbaran** (Djimbaran) (8°46'S., 115°09'E.), is located in the S part of the bight. Anchorage may be taken at Labuan Jimbaran, in a depth of 9m, hard sand, 1.5 miles W of the two remarkable round-topped trees in Jimbaran. It is not advisable to proceed closer in due to heavy rollers.

Seasonal swells from 1 to 2m can be experienced at anchor and caution is urged when taking barges alongside and with accommodation ladders.

Up to 2 knots of current have been observed in the approaches to Labuan Jimbaran. The current was negligible inside the bay.

When approaching Pantai Barat from the SW, there is a natural range by which to verify gyro error. The range is 083°T between Tanjung Mebula Light and Bukit Badung Light. The westernmost of three charted airport control towers also makes for an excellent navigation aid.

Pilotage is not required for vessels going to anchor in Pantai Barat.

Launches utilize the Fleet Landing Pier located 2 miles E of the anchorage. The 120m pier is made of wood and is 2.5m wide.

Caution.—Vessels should anchor S of 8°45.7'S to stay clear of the approach to the airport.

5.8 From Tanjung Tanjungan to **Tanjung Pengambengan** (8°24'S., 114°35'E.), about 34 miles WNW, the coast is flat with a low plain extending to the foot of the mountains. In some areas, spurs from the mountain ridges run down close to the sea. All dangers are contained within the 20m line which lies up to 1.5 miles offshore. A light is shown from a 33m high white framework tower situated on Tanjung Pengambengan.

At **Tanjung Pabuwahan** (8°20'S., 114°31'E.), 5 miles NW, the coast is fronted by shoals to a distance over 1 mile. Tanjung Pabuwahan is the S extremity of a long, low, narrow peninsula.

Tjandikesuma (Candikesuma) (8°19'S., 114°31'E.) is a small village situated just N of the narrow peninsula. A white stone pyramid stands on a small hill near the village. The village is surrounded by an extensive coconut plantation, which can be seen from a distance of 4 to 6 miles. Anchorage can be taken, in 9m to 11m, sand, with the white stone pyramid bearing 034°. A prohibited anchorage area, shown on the chart, is situated NW of the white pyramid.

Teluk Gilimanuk (8°09'S., 114°26'E.), located about 10.5 miles NNE of Tjandikesuma, is suitable only for small craft with local knowledge and is a narrow reef-fringed inlet. A wreck, in position 8°09'12"S, 114°25'58"E, lies off the islet and is dangerous to navigation.

Tanjung Pasir (8°06'S., 114°26'E.), the NW point of Bali, located 3.5 miles N of Teluk Gilimanuk, is fronted by a narrow reef. A light is shown from the point.

Bali—North Coast

5.9 The N coast of Bali between Tanjung Pasir and **Tanjung Bungkulan** (8°03'S., 115°11'E.), about 45 miles E, affords few suitable or safe anchorages.

The W part of this coast is high, and affords good landmarks for approaching the island from the N. Between Tanjung Pasir and **Tanjung Bedak** (8°06'S., 114°29'E.), about 3.25 miles E, the coast is steep-to and rises to the forest covered **Gunung Prapatagung** (8°08'S., 114°29'E.), 310m high. Pulau Menjangan, 70m high and wooded, lies 0.75 mile E of Tanjung Bedak. Anchorages may be taken, with local knowledge, in the channel between Pulau Menjangan and Bali. The reefs on both sides show discoloration.

The main mountain ridge traversing the N side of the island may be divided into two parts. **Gunung Sangiang** (8°13'S., 114°36'E.), at the W end of the W part of the ridge, rises to 1,004m, with its highest summit Gunung Patas, 1,414m high, 13 miles E. **Gunung Merbuk** (8°14'S., 114°39'E.), 1,346m high, lies between.

Bukit Batukau (8°20'S., 115°06'E.), 2,276m high, is located about 16.5 miles ESE of Gunung Patas. Bukit Batukau separates the W part of the mountain ridge from the E part. Bukit Pohen, 2,069m high, about 3.75 miles NNE of Bukit Batukau, stands at the W end of the E part of the ridge.

Gunung Batur (8°14'S., 115°23'E.), 1,717m high, is located about 18 miles NE of Bukit Batukau, with its upper slopes covered with volcanic ash.

Gunung Agung (8°20'S., 115°30'E.) is a prominent volcanic cone, with a crater summit 3,105m high, and is the island's highest peak. The uppermost slopes on the N and S sides of the mountain are covered by lava, but there are many buildings on the SW slopes.

Gunung Abang (8°17'S., 115°26'E.) 2,153m high, rises midway between Gunung Batur and Gunung Agung.

Gunung Seraya (Seraja Mountains) (8°23'S., 115°40'E.), 1,186m high, rises at the E end of the ridge traversing the island, and is conical-shaped when seen from the E. On the N side of Bali, spurs run down close to the N and NE coasts leaving only an occasional narrow strip of flat land. The range slopes down to the S and SW coasts.

Bukit Badung (8°48'S., 115°10'E.), and a group of volcanic mountains lie WNW of **Labuan Amuk** (8°31'S., 115°32'E.) on the SE coast. The lower slopes of the mountains SW and S of Bukit Batukau, and S of Gunung Abang are densely covered with villages standing amongst paddy fields. The numerous small rivers of the island frequently dry in the Southeast Monsoon.

5.10 Teluk Trima (8°08'S., 114°32'E.) is entered between Tanjung Bedak and **Tanjung Pulaki** (8°07'S., 114°35'E.), and its head is filled with reefs and foul ground. Both sides of the head of the bay are steep and wooded. Anchorage may be taken, in about 40m, E of the N end of the drying reef in the center of the bay. Such anchorage is not advised in July or August with a strong SSW wind, because movement between the reefs then becomes very difficult.

Teluk Pegametan (8°07'S., 114°36'E.) is entered between Tanjung Pulaki and a mangrove-covered reef, 2 miles E. Reefs extend up to 1.5 miles W from the E side of the bay, and the head of the bay is foul. Anchorage may be taken in the N part of Teluk Pegametan, in depths of 18 to 29m, good holding ground. It is advisable to keep outside the charted 200m line off this stretch of coast.

Tanjung Sendang (8°08'S., 114°39'E.) is a low point 3 miles ESE of Tanjung Pulaki. A prominent hill, 132m high, lies close S of Tanjung Sendang. **Tanjung Gondol** (8°09'S., 114°43'E.), a steep point 52m high, lies 4.5 miles ESE of Tanjung Sendang.

From Tanjung Gondol, the low coast to **Pulau Celukanbawang** (Pulau Tjelukandawang) (Celukan Bawang) (8°11'S., 114°50'E.), 7.5 miles ESE, is covered with coconut palms. The island itself lies near the N edge of a drying reef which extends about 0.3 mile SW to the W entrance point of the inlet SE. Another low island, on which there is a pillar, lies midway between Pulau Celukanbawang and the point. A shelving reef, the W edge of which is marked by a lighted beacon, extends from position 8°11'S, 114°49'E, and is marked by discoloration. A concrete wharf, 73m long, lies in the inlet. The wharf can accommodate vessels up to 6,706 dwt, withy a maximum loa of 113m and a maximum beam of 16.0m.

In the fairway of the entrance to the inlet, there are depths of 17 to 30m. The shores are low and reef fringed. A detached reef, with a depth of 2.7m, lies in the middle of the inlet and is marked by a beacon.

At the head of the inlet there is a village with a remarkable round-topped tree, 0.25 mile SW of its mosque. Range lights lead E of the detached reef.

A jetty, situated on the W shore of the bay, has 160m of berthing space with an alongside depth of 9.1m. Vessels up to 9,099 dwt, with a maximum length of 210m and a maximum beam of 27.99m, can be accommodated. A T-head pier, with a berthing length of 58m and an alongside depth of 14m, lies close SW of the jetty.

Celukanbawang

Anchorage.—The inlet is sheltered from the Northwest Monsoon by the reef on which Pulau Celukanbawang lies. Anchorage should be taken in the entrance, in depths of 49 to 60m.

Temukus Road, 9.5 miles E of Celukanbawang, is the best roadstead on the N coast of Bali.

5.11 Pulau Temukus (Pulau Kramat) (8°10'S., 114°59'E.), a steep-to reef-fringed island, lies about 0.2 mile N of **Temukus** (8°11'S., 114°59'E.). Temukus is one of the principal trading places in Bali.

Anchorage.—The roadstead affords good anchorage in the Southeast Monsoon, and good shelter in the Northwest Monsoon under the lee of Pulau Temukus, but there is barely sufficient space for two vessels. There is also anchorage, in a depth of 26m, in a narrow passage between Pulau Temukus and Temukus. In order to swing clear of the shoals on both sides, vessels should moor WSW and ENE.

Directions.—When approaching from W, care should be taken to avoid the shoals lying within 0.75 mile of the coast between **Pengastulan** (8°11'S., 114°56'E.) and Temukus. When approaching from E, care must be taken to keep in a depth of more than 18.3m, as the reef off **Tanjung Sangeang** (8°10'S., 115°00'E.), 1.25 miles NE of Temukus, is extending.

Buleleng Road (8°06'S., 115°06'E.), 7 miles NE of Temukus Road, affords very bad anchorage, probably the poorest on the N coast of Bali. The bottom rises steeply in the roadstead from the charted 200m line, approximately 0.5 mile offshore. A reef lies in the NE part of the roadstead, about 0.9 mile WSW of **Tanjung Panurukan** (8°05'S., 115°07'E.), a low palm-covered point, and has a least depth of 1m. A beacon stands on the NW side of the reef.

5.12 Buleleng (8°06'S., 115°06'E.), the suburb of Singaraja, 1 mile S, is connected by road with most parts of the island. A light is shown from Buleleng, about 1.5 miles SW of Tanjung Panurukan. The port was closed to commercial traffic. All traffic is now handled at Celukanbawang.

Anchorage.—The least unfavorable anchorage in the vicinity of Buleleng is a depth of 35m, 0.2 mile WNW of Buleleng

Light. Care must be taken to avoid the foul patches in the vicinity of this anchorage. Submarine cables exist 0.5 mile NE of Buleleng Light.

Directions.—The NE anchorage should be approached, steering 211° for Buleleng Light, which leads 183m E of a 3.4m patch, 0.2 mile NE of the previously-mentioned reef. It should be remembered that the beacon stands on the NW side of the reef.

5.13 Tanjung Bungkunlan (8°03'S., 115°11'E.), a low stony point located about 6 miles NE of Buleleng, is the northernmost point of Bali. The NE coast of Bali is less populated than that W of Tanjung Bungkulan. Southeast of **Tanjung Tekurenan** (8°11'S., 115°29'E.), midway along this stretch of coast, it is only sparsely populated.

Numerous spurs from the mountains run down to the coast with sandy beaches between. The charted 18.3m line lies very close to the coast, and there are no known dangers outside it, except for an 11m patch, 1.5 miles E of Tanjung Bungkulan. Because of the steepness of the bottom, there are few anchorages and practically no shelter in the Southeast Monsoon.

Tides—Currents.—The N tidal currents from Selat Bali and Selat Lombok (Straat Lombok) meet near **Tanjung Gulah** (8°06'S., 115°20'E.), 10 miles ESE of Tanjung Bungkulan. When a S current is setting through these two straits, there is a W current abreast Tanjung Bungkulan, and E off **Tanjung Ngis** (8°10'S., 115°27'E.), 8 miles ESE of Tanjung Gulah.

Bali—East Coast

5.14 From **Tanjung Bungkulan** (8°03'S., 115°11'E.) to **Tanjung Ibus** (Tanjung Iboes) (8°22'S., 115°42'E.), 36 miles SE, many mountain spurs descend to the sea. **Tanjung Batu** (8°05'S., 115°16'E.), a low rocky point, lies 5 miles SE of Tanjung Bungkulan; between is an open road 0.3 mile offshore with depths of 20.1m, soft mud and sand.

To the W of **Tanjung Saneh** (8°05'S., 115°16'E.), a point about 1 mile W of Tanjung Batu, is a sand beach and low terrain; eastward there are mountain spurs descending to the sea. A conspicuous house, with a zinc roof, stands in the village of **Julah** (Djoelah) (8°06'S., 115°19'E.), 2.5 miles ESE of Tanjung Batu. Between Tanjung Batu and Tanjung Ngis, 11 miles ESE, the coast is backed by coconut plantations.

Tianjar Road (8°12'S., 115°30'E.), over 15 miles ESE of Tanjung Batu, is identified by its village, Tianjar, which lies at the foot of **Gunung Abang** (8°17'S., 115°26'E.). Noticeable objects when approaching the roadstead are, a small temple at the NW end of the village, a large round-typed tree between **Tanjung Tekurenan** (8°11'S., 115°29'E.), 2 miles SE of Tanjung Ngis, and a similar tree and a large house with a red roof SE of the village. Two dark lava streams, devoid of vegetation, lie 0.5 mile SE of the village.

Eddies are known to exist in Tianjar Road. Anchorage may be taken, in a depth of 36.6m, off Tainjar, W of a line drawn N from the bare hill, 231m high, 2 miles S of the village. From Tianjar Road to Labuhan Ambat, 12 miles SE, the coast is flat but the slopes of Gunung Agung rise sharply behind it.

Labuhan Ambat is formed by a slight bend in the coast between **Tanjung Truna** (Tanjung Troena) (8°20'S., 115°38'E.) and **Tanjung Jambelo** (Tanjung Djambelo) (8°20'S., 115°40'E.), 2.25 miles SE. Small craft anchor off the village, in 36.6 to 54.9m, but are unsheltered in both monsoons. The sea breeze quickly raises a heavy surf. Sudden violent squalls can be experienced night or day. Eddies are known to exist in Labuan Ambat.

The coast from Tanjung Jambelo to **Tanjung Ibus** (8°22'S., 115°42'E.), 2.25 miles SE, is steep and unapproachable. Gili Selang, close off the E extremity of Bali is a rock, 11m high, covered with vegetation and lies 2.25 miles SSE of Tanjung Ibus. A light, from which a racon transmits, is shown from Gili Selang.

Between Gili Selang, the E extremity of Bali, and **Tanjung Lokan** (8°27'S., 115°39'E.), 5 miles SW, the coast continues to be fringed by a narrow steep-to reef which dries. There are large rocks, especially off the high points.

The village of **Ujung** (8°28'S., 115°38'E.), 6 miles SW of Gili Selang, is located on the bight between Tanjung Lokan and **Tanjung Data** (8°28'S., 115°38'E.). The village is the port for **Karangasem** (8°26'S., 115°37'E.), the chief town of the area. Vessels anchor, in 29 to 45.7m, sand. The roadstead should not be approached within a depth of 29m, as the bottom rises steeply.

Tanjung Biasputih (8°30'S., 115°37'E.), 8.75 miles SW of Gili Selang, is steep-to, with a depth of 16.5m against the shore. Biasputih village is situated in the 0.5 mile bight N of Tanjung Biasputih, and may be recognized by warehouses with zinc and red roofs.

Anchorage, in 20.1m, sand and rocks, is afforded in the middle of the bight.

5.15 Gili Biaha (8°30'S., 115°37'E.) is an islet about 0.25 mile offshore from Tanjung Biasputih. The channel in between is deep and clear, but tidal currents run strongly through it. Near the top of Gili Biaha is an opening connected by tunnel to the sea. The surf beating against the islet causes a fine mist through this opening, giving the appearance of a column of smoke rising from a crater.

Labuan Amuk Terminal—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Pertamina TBBM Manggis Bali Terminal						
Jetty 01	20m	14.5m	180m	9.0m	35,000 dwt	Chemicals, clean products, and crude products. Berth ing length of 280m (including dolphins)

Labuan Amuk Terminal—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Jetty 02	42m	14.5m	—	9.0m	7,000 dwt	Chemicals, clean products, and LPG. Berthing length of 216m (including dolphins).
Jetty 03	16m	—	—	—	—	Chemicals, clean products, and LPG. Berthing length of 116m (including dolphins).
Jetty TT BBM Manggis	—	35.0m	325m	10.0m	23,500 dwt	Clean products.

Tanjung Bugbug (8°31'S., 115°35'E.), a low steep point, lies 2 miles WSW of Tanjung Biasputih. **Bugbug** (8°30'S., 115°36'E.), an isolated coastal hill, rises to 298m 0.75 mile NE of the point. A reef, which dries with some above-water rocks, lies 0.5 mile SSW of Tanjung Bugbug.

Gili Tepekong (8°32'S., 115°35'E.) rises steeply from the sea 1 mile S of Tanjung Bugbug, and is covered with tall grass. Two large above-water rocks lie close off the N end of the islet. The passages between the reef and Gili Tepekong, and between the reef and Tanjung Bugbug are clear of dangers, but should only be attempted at slack water.

Labuhan Amuk (8°31'S., 115°32'E.) is entered between Tanjung Bugbug and **Tanjung Sari** (8°32'S., 115°31'E.), 4.25 miles WSW. A light is shown from Tanjung Sari. Partially-protected anchorage is taken, in 42 to 49m, soft bottom, about 0.5 to 0.75 mile NNE of the short spit, 0.25 mile N of Tanjung Sari. At springs the tidal current attains a rate of 4 knots.

Labuan Amuk Terminal (8°31'S., 115°32'E.) consists of a moored storage tanker and an anchorage area, which is about 1.2 miles E of the storage tanker. Berthing is undertaken during daylight hours only; unberthing may be done at any time. The depth alongside the tanker is 35m.Berthing information is shown in the table titled **Labuan Amuk Terminal—Berthing Information.**

Teluk Padang (8°32'S., 115°31'E.) is a small bay on the SW of Tanjung Sari. The bay is nearly filled with a drying reef, leaving only a narrow channel used by small craft. Range lights, in line bearing 288°, lead into the bay. The village of Padang is situated at the head of the bay. There is a wooden jetty, with flagstaff on its head, for small craft to berth alongside. There is a stone mole about 200m long used for ferry service to Lombok. The Ferry Port Authority Terminal is comprised of Dermaga 01 and Dermaga 02. These two berths are 16m long, can accommodate vessels with a maximum draft of 5.0m, and support ro-ro/passenger operations.

Anchorage may be taken close off Teluk Padang, about 0.2 mile SW of Tanjung Sari, in a depth of 49m, about 0.1 mile from the 5.5m line. An obstruction consisting of an anchor and cable lies close to the above anchorage

Caution.—An incident of piracy occurred at this anchorage in 2003. Vessels are urged to take precautions when passing the above-mentioned area.

5.16 Tanjung Setra (8°34'S. 115°27'E.), about 4.5 miles SW of Tanjung Sari, is a low sandspit marked by two tall trees and an above-water, darker colored rock. The village of Kusamba is situated close N of Tanjung Setra and is distinguished by sheds and a long row of salt pans. The low coast continues as a dark gray sandy beach, backed by villages standing amongst paddy fields to Tanjung Geling, 10 miles WSW of Tanjung Setra. The village of Ketewal, 0.5 mile NW of Tanjung Geling, can be identified by three warehouses with zinc roofs and three high round-topped trees with white trunks. A river enters the sea near the village and has scoured an opening in the coastal reef, which provides a good landing place.

Sanur Road (8°40'S., 115°16'E.), about 3.5 miles SSW of Tanjung Geling, lies in a bight off the coast between **Tanjung Geling** (8°23'S., 115°16'E.) and **Tanjung Serangan** (8°43'S., 115°16'E.), a low wooded point with a white sand beach. Between Tanjung Serangan and the large village **Sanur** (8°40'S., 115°15'E.), 2 miles N, are several buildings and coconut plantations.

Pabeansanur (Pabean Sanur) (8°40'S., 115°16'E.) is situated on the beach at the head of the bight; close inland is Sanur. The coastal reef fronting the shore, between Tanjung Serangan and Sanur, gradually decreases in width and is backed by a white sandy beach. At Sanur, there is a channel running S which is navigable by boats at high water between the reef and the shore. In the N part of the bight the coastal reef is narrow and backed by a dark, gray, sandy beach. The depths in the bight decrease gradually towards the head, but they are irregular within depths of 12.8m and there are some reefs.

Anchorage should not be taken in depths of less than 12.8m, nor with Tanjung Serangan bearing less than 187°.

During the Northwest Monsoon, there is little tidal current in the roadstead but in the Southeast Monsoon, the S current from **Selat Badung** (Straat Badoeng) (8°40'S., 115°22'E.) curves around the coast at a rate of up to 5 knots.

5.17 **Pantai Timur** (8°45'S., 115°12'E.) is a bay with swampy shores lying between Tanjung Serangan and **Tanjung Benoa** (8°45'S., 115°13'E.), 3.75 miles SW. Tanjung Benoa is the N extremity of a peninsula jutting 2 miles N into Panti Timur; on the point is the village of Benoa. A drying coastal reef, steep-to, fringes Tanjung Serangan to 0.75 miles and except for two channels, extends solidly SW across the entrance to Pantai Timur. A lighted buoy is moored 0.5 mile E of Tanjung Benoa.

Pulau Serangan (8°44'S., 115°14'E.) lies across the entrance to Pantai Timur and is 1m high at its N end, where there is a village. The red roof of a temple on the W side of the island and another temple on its SW side, are visible from seaward.

5.18 Benoa-Ujung (Ujung) (Benoa) (8°45'S., 115°13'E.) (World Port Index No. 51260), 0.75 mile W of Pulau Serangan on the N side of Benoa Channel, is the chief port of Bali. It is formed by an artificial islet on the seaward side of a causeway, on which there is a road extending across a drying reef to **Denpasar** (8°40'S., 115°13'E.).

Port of Benoa
http://benoa.pp3.co.id

Depths—Limitations.—Berthing information is shown in the table titled **Benoa—Berth Information.**

Benoa Channel (Alur Pelayaran Benua) penetrates a considerable distance through the drying reef in Panti Timur and forms a natural harbor. The channel is reported to have been dredged to a depth of 10m.

There is good radar presentation of the coastline approaching Benoa Channel.

Tides—Currents.—Strong tidal currents, which are reported to attain a rate of 5 knots at springs, set in and out of Benoa Channel, and the channel N of Pulau Serangan. Strong tide rips and eddies occur in Benoa Channel. During the period of maximum declination (0° to 6°), the tide appears to be semi-diurnal, turning about 30 minutes after the times of semi-diurnal high and low water.

Pilotage.—No pilot is required for the outer anchorage, but pilotage is compulsory for Benoa Channel. The pilot boards off the entrance to the channel 2.5 miles E of Benoa. All movement in the channel is prohibited at night after 1700 without special permission.

Vessel Traffic Service.— Participation in the Lombok Strait Reporting System (LOMBOKREP) is mandatory for all Indonesian vessels and strongly recommended for all foreign vessels. Reporting points have been established in the following table titled **LOMBOKREP Reporting Points.** All required vessels should report via VHF channels 16 and 68 when passing the reporting points below. The VTS contact details are shown in the table titled **Benoa—Contact Information.**

Anchorage.—Anchorage may be taken outside the charted 20m line in the open bight between Tanjung Serangan and **Nusa Dua** (8°48'S., 115°14'E.), about 5.5 miles S. There is often a heavy swell over the banks 1.75 miles NNE and 2 miles NE of Nusa Dua, when it is advisable to anchor between the banks and the coast.

LOMBOKREP Reporting Points.
Northbound Vessels TSS Lombok Strait
8°54.65'S, 115°43.48'E
8°19.42'S, 115°53.96'E
Southbound Vessels TSS Lombok Strait
8°18.29'S, 115°51.18'E
8°53.36'S, 115°39.02'E
Northern Precautionary Area
8°26.53'S, 115°56.15'E (westbound)
8°24.94'S, 115°44.35'E (eastbound)
Southern Precautionary Area
8°38.58'S, 115°51.82E (westbound)
8°37.40'S, 115°40.02'E (eastbound)

Benoa—Contact Information	
Port	
Telephone	62-361-720560
	62-361-723352
	62-361-723351
E-mail	benoa@pp3.co.id
VTS	
Call sign	VTS Benoa
VHF	VHF channels 16, 67, and 68
Telephone	62-361-720292
MMSI	005250014
E-mail	benoavts@gmail.com

Benoa—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Benoa Terminal						
Kade Timur	338m	9.0m	268m	—	8,530 dwt	Aggregates, others, cruise, ro-ro/lo-lo, container, breakbulk, bunkers, and reefer.
Terminal BBM Sanggaran						
Asphalt Jetty	20m	—	95.6m	—	4,226 dwt	Dirty products.
Pertamina Oil Terminal						
Benoa	20m	4.6m	109m	—	7,271 dwt	Chemicals, clean products, crude products, dirty products, and bunkers. Berthing length of 45m (including dolphins).

Benoa—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Benoa LGN Terminals						
FRU 'Karunia Dewata'	144m	—	151m	—	12,493 dwt	Floating regasification unit used for the STS transfer of LNG

During the Northwest Monsoon, a high swell almost breaking, sets over the banks and it is advisable to anchor in **Sanur Road** (8°40'S., 115°16'E.).

Anchorage may also be taken off the entrance to the channel N of Pulau Serangan, in a depth of 18m, 1.5 miles S of Tanjung Serangan.

Caution.—A 9.9m shoal patch, best seen on the chart, lies close WNW of the Benoa Channel entrance.

5.19 Tanjung Benoa (8°45'S., 115°13'E.) lies at the NE extremity of Bukit Badung, forming the southernmost part of Bali.

Tanjung Gagar (8°50'S., 115°13'E.), about 5 miles S of Tanjung Benoa, is relatively low with a drying reef fringing the coast. Although the peninsula rises to **Gunung Ingas** (8°49'S., 115°09'E.), 201m high near its center, it appears lower than it actually is in comparison with the high mountains in the N part of Bali.

Bukit Badung Light is shown from the W summit of the peninsula, about 3.75 miles E of its W extremity. Masts with red obstruction lights are situated 1.75 miles and 2.5 miles farther E. A radiobeacon is situated 3.5 miles SE of Bukit Badung Light.

Selat Lombok

5.20 Selat Lombok (Straat Lombok) (8°35'S., 115°45'E.), between Bali and Lombok, is the most important strait for vessels proceeding from Australia to Singapore, China, and Japan, and vice versa, owing to its width and ease of navigation. Supertankers from the Persian Gulf, unable to pass through the Straits of Malacca, use Selat Lombok.

The S entrance to the strait is divided into two parts by **Nasu Penida** (Noesa Besar) (8°44'S., 115°32'E.) and adjacent islands, which lie W on a detached plateau of less than 183m. The portion of the strait W of these islands is known as **Selat Badung** (Straat Badoeng) (8°40'S., 115°22'E.). Selat Badung, 5.75 miles wide between Bali and Nusa Penida and its adjacent islands, is much traversed by local traffic. Selat Badung is deep and clear of dangers.

Winds—Weather.—In Selat Lombok, during the Southeast Monsoon, calm wind is frequent from sunrise to noon. At noon a fresh S wind arises, turning to SE on the Bali side and to SSW on the Lombok side, blowing strong during the night. In the Northwest Monsoon, the winds are generally from the NW. In the N approach to the strait, these winds are sometimes accompanied by violent squalls and a high sea.

Tides—Currents.—The tidal currents in Selat Lombok have a semidiurnal character, but are influenced by the currents N of the strait and in the Flores Sea. They are produced by the monsoons; therefore, in the Southeast Monsoon, a predominating S current may be expected and in the Northwest Monsoon, a predominating N current may be expected. There is insufficient information available to give full particulars of the rate and direction of the tidal currents. In the narrows of Selat Lombok, between Nusa Penida and Lombok, there are more powerful currents (up to 6 knots) than in the broader N part, where currents up to 3.5 knots can arise. Their direction is more clearly N or S than elsewhere. Counter currents may be felt in places along both shores. Strong overfalls and eddies may be encountered in both the S and N entrances to Selat Lombok at any time.

There is often a turbulent sea S of the narrows, and the tidal currents are felt far outside. Considerable variations in the directions of the tidal currents may be expected NE of Selat Badung, off Labuan Amuk and there are often eddies in **Ampenan Road** (8°35'S., 116°03'E.). The tidal currents in Selat Badung are semi-diurnal, but to the fact that its direction runs obliquely to the general S to N direction of Selat Lombok, and the curved shape of the channel, the character of the current is very complicated.

The tidal currents are also influenced by the monsoons in the same manner as in Selat Lombok. The strongest current, with a maximum rate of 8 knots, occurs in the Southeast Monsoon, with the direction being between SW and S. The strongest current in the opposite direction occurs in the Northwest Monsoon, the maximum rate being between 4 to 5 knots.

About the time of the moon's transit, the tidal current sets between N and NE (up to 4 knots) over a strip about 2.5 miles wide along the Bali shore from Tanjung Serangan to near Labuhan Amuk. In the remainder of the strait, the predominate current sets between S and SW, with strong whirling eddies between the two apposing currents.

About 2 hours after the moon's transit, the strip setting N to NE narrows between Tanjung Serangan and **Tanjung Sari** (8°32'S., 115°31'E.), but E of the meridian of Tanjung Sari it diverges to such an extent that between **Tanjung Bugbug** (8°31'S., 115°35'E.) and **Tanjung Krambitan** (8°40'S., 115°34'E.) the current sets NE toward Selat Lombok almost throughout. At the same time there is a wide strip off **Nusa Lembongan** (8°40'S., 115°28'E.) with a N to NE current. Toward the middle of Selat Badung the S current (0.5 to 3 knots) causes strong, whirling eddies. About 4 hours after the moon's transit the current sets SW to S up to 4.5 knots. Eastward of **Tanjung Setra** (8°34'S., 115°27'E.) there is a rather broad countercurrent setting NE. Six hours after the moon's transit the SW to S current weakens to 2 knots, and the above mentioned countercurrent is observed to start farther S in the strait, at **Tanjung Peranu** (8°37'S., 115°19'E.).

About 8 hours after the moon's transit the SW to S current practically disappears and from the outer roadstead of Tanjung Benoa to near Labuan Amuk, there is a N to NE current with a

rate of 1 to 2 knots over a strip 4 miles wide along the Bali shore. Approximately 10 hours after the moon's transit the current over the whole strait sets N to NE. Within 3 miles of the Bali shore there are eddies and patches of much weaker current, and even S currents are observed.

About the time of the moon's transit, the tidal current sets between N and NE over a strip about 3 miles wide along the Bali shore from Tanjung Petanu to Tanjung Bugbug. In the remainder of the strait there is a SW to S current (up to 5.5 knots) with whirling eddies between the two opposing currents. About 2 hours after the moon's transit the N to NE current practically disappears.

Throughout the strait there is a SW to S current averaging 3.5 knots, but reaching 8 knots for a short period.

Approximately 3 to 4 hours after the moon's transit there is still a SW to S current which reaches an average of 4.5 knots. A maximum rate of 8 knots has also been observed during this period, while sometimes an eddy runs under Nusa Lembongan shore, with eddies where the main stream and eddy meet.

The SW to S current is always weaker under the Bali shore. About 8 hours after the moon's transit, the SW current decreases to about 2 knots. In the bight between Tanjung Setra and Tanjung Serangan, slack water may be expected, while the current may set NE across the entrance of Labuan Amuk. Approximately 10 hours after the moon's transit, the N to NE current (averaging 1.5 knots and reaching 3 knots) commences along the Bali shore as far S as Tanjung Petanu.

On the opposite side of the strait along Nusa Lembongan, there is a SW to S current. In the remainder of the strait the current is more confused but the inclination towards a SW or S current, which occurs in this area at the time of the moon's transit, becomes more noticeable. In the neck of Selat Lombok, there is a S current (6 knots maximum) in the Southeast Monsoon season, and a N current in the Northwest Monsoon season. Consideration should be given to these facts when transiting these waters.

Local currents exist within Selat Lombok, as follows:

1. Strong tidal currents have been observed in the deep passage between Nusa Ceningan and Nusa Penida.
2. Strong and irregular tidal currents occur in the vicinity of Batu Abah, a rock near the E extremity of Nusa Penida.
3. In the anchorage off a cove, 0.5 mile NE of the SW end of Nusa Lambongan, the tidal currents are strong and irregular even during slack water within the cove.
4. In a position NE of Selat Badung, tidal currents change direction frequently and many rips and eddies occur.
5. Eddies often occur in Ampenan Road.
6. In Benoa Channel, the reversing tidal currents are strong. East of the wharf at Benoa, the tidal currents are also strong with the flood setting S and the ebb, N.
7. In the roadstead off Sanur, tidal currents are weak during the Northwest Monsoon. During the Southeast Monsoon, there is a strong set out of Selat Badung which turns into the roadstead.
8. Heavy rips occur frequently in the S entrance to Selat Lombok and at times they resemble surf breaking over a reef extending across the entrance. Speeds up to 6 knots have been observed in the narrow part of the strait between Nusa Penida and Lombok. In the wider N part of the strait, the maximum speed is reported to be about 3.5 knots, and rips are observed at times. Rips usually occur in the strait when tidal currents reverse direction.

In Selat Badung, the pattern of tidal currents is very complex. The stronger current (as much as 8 knots) sets SW and S with the ebb when E winds predominate; with prevailing W winds, the current sets N and NE with the flood and attains speeds of 4 to 6 knots. Frequently, a current about 2.5 mile wide sets NE along the Bali coast at the same time that a current flows SW through the remainder of the strait; rips and eddies occur along the boundary between these two opposing currents.

Regulations.—A traffic separation scheme established in Selat Lombok consists of two precautionary areas joined by traffic lanes and a single inshore traffic zone to the E. The TSS is IMO-adopted, and Rule 10 of *The International Regulations for Preventing Collisions at Sea (1972)* applies. Vessels should be aware of crossing traffic in the vicinity of the precautionary areas.

Vessel Traffic Service.— LOMBOKREP is in operation for the control of shipping and is mandatory for all Indonesian vessels and strongly recommended for all foreign vessels.

Caution.—Small fishing boats operate without lights at night; when a major vessel approaches, they display weak lights. These vessels sometimes fail to show up on the radar screen. A depth of 95m exists on the E side of the S entrance in position 8°52'S, 115°46'E. The currents in Selat Lombok are noticeable far beyond the S end of the strait.

Nusa Penida

5.21 Nusa Penida (Noesa Besar) (8°44'S., 115°32'E.), the island between Selat Badung and Selat Lombok, has hills sloping steeply to all coasts but the N. **Mundi** (8°44'S., 115°31'E.), the summit of the island, 528m high with a round summit and a tree, rises near the center of the island.

Batu Abah (Batu Aba) (8°47'S., 115°38'E.), a rock covered with vegetation, lies off the E extremity of Nusa Penida. It was reported that Batu Abah is a good radar target at 5 miles.

Tanung Bakung (Tanjung Sedihang) (8°49'S., 115°35'E.), the S extremity of Nusa Penida, forms a cove on its N side. The cove, which is the only landing place in the S part of the island, has a narrow sand beach on which stands a temple. The cove is too encumbered with rocks for anchoring, and there are great depths outside them. A light is shown from a gray metal framework tower on Tanjung Bakung.

Nusa Lembongan (8°40'S., 115°28'E.), lying close NW of Nusa Penida and almost completely under coconut cultivation, is hilly in the SW and low in the NE. A light is shown from a white metal framework tower on **Tanjung Taal** (8°40'S., 115°27'E.), the N extremity of the island. Vessels anchor, in 11 to 12.8m, coral and stone, off a foul cove 0.5 mile NE of Tanjung Sangiang, the SW extremity of Nusa Lembongan. The cove is identified by a sand beach on which stands a temple and a broad crowned tree. Vessels must be careful not to be carried too fast toward the cove by the current.

Nusa Ceningan (Nusa Tjeningan) (8°42'S., 115°27'E.), joined to the SE side of Nusa.

Lembongan by a drying reef, is hilly except for its NW corner. The passage between Nusa Ceningan and Nusa Penida is 0.5 mile wide and very deep, with steep shores on either side.

Because of strong tidal currents, navigation is difficult.

Lombok—West Coast

5.22 The SW extremity of Lombok lies over 36 miles E of the S extremity of Bali. The 3,765m peak of **Gunung Rinjani** (8°25'S., 116°27'E.) is one of the highest and largest volcanoes in the archipelago. It has four peaks in a circle and a fifth peak in the middle, from which smoke always rises. It is reported that the peak can be seen for 80 miles in clear weather. S of Gunung Rinjani, the mountainous land descends regularly to a hilly, fertile country which again rises to a desolate range.

Tanjung Batugendang (Tanjung Batoe Gendang) is a range of mountains running along the S coast of the island. The highest elevation along this range is **Gunung Mareje** (8°46'S., 116°08'E.), 740m high, about 48 miles SSW of **Gunung Rinjani** (8°25'S., 116°27'E.), the SW extremity of Lombok, is high and steep, and has a prominent bare, perpendicular rock, shaped like a finger, 107m high. When seen from SW, this rock cannot be distinguished from the land behind.

The S part of the coast between Tanjung Batugendang and **Tanjung Pandanan** (8°43'S., 115°51'E.), 6.5 miles N, is steep and desolate. Midway between the points, the shore rises sheer from the sea in a white cliff, 444m high.

The coast N of the white cliff is mainly flat with a sandy beach, except for a steep part at the foot of a hill, 175m, with a fairly prominent conical summit, 2 miles SW of Tanjung Pandanan.

Between Tanjung Pandanan and **Tanjung Bebera** (8°43'S., 115°52'E.), a low point with a sandy beach on its W side, and then to **Tanjung Gresak** (8°43'S., 116°02'E.), 9.75 miles E, the coast is indented, reef-fringed, backed by low ground, and encumbered with islets.

Tanjung Gresak, W of the entrance to **Labuhan Tereng Bay** (Teluk Labuhantereng) (8°43'S., 116°03'E.), may be identified by an isolated hill 196m high, 0.6 mile S of the point.

5.23 Labuhan Tereng Bay (Teluk Labuhantereng) is entered on the E side of **Tanjung Bunutan** (8°44'S., 116°02'E.), a bluff which is easily identified. The E side of the entrance is low and sandy, and the remainder of the shore is alternatively high and low, and fringed with mud banks with mangroves in places.

A light is shown on Tanjung Bunutan; another stands about 0.75 miles W of Lembar.

The inner bay on the E side of the entrance is entered between **Tanjung Cemara** (Tanjung Tjemara) (8°44'S., 116°03'E.) and Tanjung Kubur, 0.5 mile SE, between the bank extending from them.

The channel is marked by buoys and beacons. Shoal water with a depth of 4.5m extends W from Tanjung Kubur. The buoys may not be in their charted positions. There is always calm water within the inner bay.

Tides—Currents.—The tides are mixed but predominantly semidiurnal. The average range of diurnal spring tides is 1.2m and of semi-diurnal spring tides is 0.9m.

5.24 **Lembar** (8°44'S., 116°04'E.) is situated at the head of an inlet leading from the E side of Labuhan Tereng Bay. Lembar has superseded Ampenan, which lies 10 miles N, as the main port for the area. The port also has a ferry terminal linking the island with Bali.

Depths—Limitations.—The NE arm of the bay has a least depth of 4.5m in the entrance, and 5.1m to 6.9m inside. The outer part of Labuhan Tereng Bay is clear with depths from 22.8m in the entrance, to 13.7m 0.5 mile from the head.

Berthing information is shown in the table titled **Lembar—Berth Information**.

Pilotage.—Pilotage is available.

Lembar—Berth Information

Berth	Length	Depth	Maximum Vessel		Remarks
			LOA	Size	
East Landing Terminal					
Barge Berth	100m	6.0m	—	—	Coal by barge.
Dermaga Lokai	150m	4.0m	—	—	Breakbulk.
Dermaga Nusantara I	162m	7.0m	—	—	Containers and breakbulk.
Dermaga Pelra	40m	4.0m	—	—	Ro-pax and breakbulk.
Gili Mas Cruise Terminal					
Cruise Berth	438m	—	—	—	Cruise vessels. Berth length 510m with dolphins.
Lembar Cruise Terminal					
Center Berth	—	—	61m	—	Cruise vessels and ro-pax. Berthing length of 92m (including dolphins).
East Berth	—	—	61m	—	Cruise vessels and ro-pax. Berthing length of 86m (including dolphins).
West Berth	—	—	61m	—	Cruise vessels and ro-pax.

Lembar—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			LOA	Size	
PT Indocement Terminal					
Cement Berth 01	—	—	—	—	Cement.
Cement Berth 02	—	—	—	—	Cement.
PLTD Ampenan Terminal					
CBM PLTD	—	10.0m	140m	14,000 dwt	Clean products.

Regulations.—Berthing and unberthing are carried out during daylight hours only.

Anchorage.—Anchorage may be taken at all times in Labuhan Tereng Bay, particularly during the Southeast Monsoon. During N winds, it is advisable to anchor in the inner bay E of Tanjung Cemara. Local knowledge is required.

Between the entrance of Labuhan Tereng Bay and the town of Ampenan, 9.5 miles N, the coast is low and cultivated except for **Gunung Kawang** (8°40'S., 116°05'E.) and the hills just N of it.

5.25 **Medusa Reef** (8°35'S., 116°03'E.), with a least depth of 3.9m, lies 1 mile WSW of Ampenan. A ridge, having several 5.5m patches, extends about 5 miles S of Medusa Reef and then turns seaward.

Wilhelmina Reef (8°33'S., 116°04'E.), with a least depth of 1.2m, lies about 1.25 miles NNW of Ampenan. **Santigi Reef** (8°32'S., 116°02'E.), with a least depth of 1.5m, sand and coral, lies about 3.25 miles NNW of Ampenan.

Ampenan Road (8°35'S., 116°03'E.) is bounded by the meridian of Medusa Reef, the parallel of the S entrance to **Kokok Jangkok** (Kokok Djangkok) (8°35'S., 116°04'E.), and the roadstead boundary mark, 1 mile N of the river entrance.

5.26 **Ampenan** (8°34'S., 116°04'E.) (World Port Index No. 51280) was previously the principal trading center of Lombok and is situated close N of the mouth of Kokok Jangkok. Because the river mouth is never dry, there is an especially active small craft traffic during the Southeast Monsoon.

Two red mooring buoys, used by tankers, lie about 0.25 mile NW of the pier at Ampenan. A submarine pipeline extends from shore to a position midway between the buoys. The end of the flexible hose connected to the pipeline is marked by a gray drum buoy. Anchorage is prohibited within a radius of 0.15 mile of the head of the pipeline. Currents in the roadstead are limited and irregular.

Mataram (8°35'S., 116°06'E.), the chief town of Lombok, is 2 miles inland from Ampenan. A light is shown from Ampenan, 0.3 mile N of the river mouth.

Anchorage.—Ampenan Road affords safe anchorage during the Southeast Monsoon and transition periods inside the line of shoals extending S from Medusa Reef. During the Northwest Monsoon, when a blue flag is displayed from the flagstaff, communication with the shore is suspended.

Small craft then proceed to Labuhan Tereng to discharge cargo. Deep draft vessels usually anchor 0.5 mile offshore, in depths of 16 to 18m.

Directions.—When approaching Ampenan from the SW, pass outside the shoals fronting the coast S of the town, and approach the lighthouse bearing not less than 090°, which leads 0.25 mile N of Medusa Reef; then anchor as convenient, or proceed to the oil berth.

When approaching from the N, steer on the leading beacons in line, bearing 118° to the oil berth.

5.27 The coast NW of Ampenan continues low for a distance of 3.25 miles and is covered with paddy fields. Then for 1.25 miles NW to **Tanjung Santigi** (8°30'S., 116°02'E.), there is a narrow strip of low land at the foot of the steep, wooded mountains.

Between Tanjung Santigi and **Tanjung Kecinan** (Tanjung Ketjinan) (8°34'S., 116°03'E.), 6 miles N, the coast is very steep, mountainous, and wooded with spurs extending to the coast. Teluk Kombal, entered between Tanjung Kecinan and **Tanjung Sirah** (Tanjung Sirrah) (8°22'S., 116°06'E.), is open to the Northwest Monsoon and has been reported to not always afford the most suitable anchorage.

Anchorage.—Although Teluk Kombal is not always a suitable anchorage in the Northwest Monsoon, sometimes during a stiff NW wind in Selat Lombok, a light wind exists from NNE and NE in the bay. When this occurs, there is a good anchorage off the village of **Baru** (Baroe) (8°24'S., 116°06'E.), in 18m, at the head of the bay, 2 miles S of Tanjung Sirah.

Directions.—Due to the existence of a reef lying 1 mile N of Baru, with a depth of 3.7m, it is advisable to approach the anchorage of Baru from SW along the S shore of the bay.

Off-lying Islands

5.28 **Pulau Terawangan** (Pulau Terewangan) (8°21'S., 116°02'E.) is the highest and westernmost of a chain of three islands, extending 4.5 miles W from **Tanjung Sirah** (8°22'S., 116°06'E.). Gili Meno and Gili Ayer (Gili Aer), the two other islets between Pulau Terawangan and the point, are flat. All three islets are covered with palm trees. The peak of Pulau Terawangan is considered to be a good radar target. A light is reported to be shown from Terawangan Island.

A reef, with a depth of 7m, lies 1 mile NE of Gili Meno. From there, a succession of detached reefs, with deep water between, extends E to the coast. A patch, with a depth of 0.5m, lies 2.25 miles NNE of Tanjung Sirah, and is plainly marked by discoloration, although the other dangers are not visible. Another group of detached reefs extend for 1.25 miles ESE from the 0.5m patch. Vessels without local knowledge should give

the islets and previously-mentioned dangers a wide berth.

Sorong Roadstead, of some importance as a shipping place for local products, lies midway between Tanjung Sirah and **Tanjung Papak** (8°19'S., 116°11'E.). The road is an indentation in the above and below-water reefs extending seaward from the villages of **Paloh** (8°22'S., 116°08'E.) and **Sorong Jukung** (8°21'S., 116°09'E.). The reefs serve as breakwaters and provide a quiet anchorage.

A beacon stands on the NE edge of a reef on the W side of the roadstead, 0.75 mile W of **Tembobor** (8°22'S., 116°07'E.). A beacon marks the W edge of the drying reef which extends from the same village.

Directions.—Sorong Road is easily entered by vessels with local knowledge, aided by the beacons and a reef which dries, located near the outer end of the spit extending N from Tembobor. A vessel can pass close E of the beacon, as it stands on the edge of the reef. Vessels approaching from S, with local knowledge, can pass E or W of Gili Ayer or between Gili Meno and Pulau Terawangan.

The passage between Gili Ayer and Gili Meno is normally used, steering 022° with **Tanjung Mipah** (8°26'S., 116°02'E.) astern. Having passed through the passage, alter course E with the N extremity of Pulau Terawangan astern bearing 252°, which leads N of all dangers. A vessel, with local knowledge, after passing between Gili Ayer and Gili Meno, can then round the former at a distance of 0.5 mile, and steer E, passing S of the outer dangers.

From Tanjung Sirah to **Tanjung Papak** (8°19'S., 116°11'E.), 6.5 miles ENE, the NW coast of Lombok is low with a rising hinterland. The village of **Ketapang** (8°20'S., 116°01'E.) stands 1.5 miles S of Tanjung Papak.

Anchorage may be taken, by vessels with local knowledge, in a depth of 18m, close offshore from Ketapang. The best approach is with the village bearing 150°.

Lombok—North Coast

5.29 The N coast between Tanjung Papak and **Tanjung Sentigi** (8°22'S., 116°43'E.), about 37 miles, is low in some places and in others, steep and rocky. Behind the coast there is a relatively narrow strip of undulating land gradually increasing to high summits. Because of great depths close to the coast, there are few anchorages and the few villages on this coast are seldom visited.

Tanjung Agar Agar (8°13'S., 116°20'E.), low and inconspicuous, lies 10 miles NE of Tanjung Papak. Tidal currents from Selat Lombok are felt as far E as Tanjung Agar Agar. **Tanjung Beri** (8°14'S., 116°28'E.), a precipitous point, lies 7.5 miles E of Tanjung Agar Agar.

The NE end of Lombok is fronted by **Gili Lawang** (8°18'S., 116°42'E.) and Gili Sulat, two low brush covered islets. The W end of Gili Lawang lies 14 miles E of Tanjung Beri. Together, the islets are 5 miles in length and are separated from each other by a narrow, but deep channel.

Selat Sungian (Sungian Strait) (8°19'S., 116°42'E.) separates Gili Lawang and Gili Sulat from the NE side of Lombok. Selat Sungian is safe and has a depth of 15.8m in the fairway, through which a mid-channel course may be steered. **Tanjung Bonde** (8°21'S., 116°43'E.) is the NE extremity of Lombok.

Lombok—East Coast

5.30 The E coast of Lombok, from Tanjung Bonde to **Tanjung Gali** (8°34'S., 116°40'E.), 13 miles S, is generally low. The coast is backed by gently undulating hills which soon merge inland with the **Gunung Rinjani** (8°25'S., 116°27'E.) mountain complex. From Tanjung Bonde to Tanjung Gali, the coast is fronted by islands and dangers.

Gili Petagan (8°25'S., 116°45'E.), covered with scrub and fringed by an above and below-water reef, lies 4.5 miles SSE of Tanjung Bonde. A light is situated on the SE edge of the reef fringing the island. Anchorage may be taken, with local knowledge, 0.25 mile S of the light, in a depth of 31m, sheltered from sea and swell.

The **Rotsige Islands** (Karang Berbatu) (8°27'S., 116°44'E.), lying within 1.5 miles SSW of Gili Petagan, consists of four islets barely above water. Above and below-water reefs fringe the islands.

Tanjung Prepe (8°27'S., 116°43'E.), 5.75 miles S of Tanjung Bonde, lies W of the Rotsige Islands. Vessels using the channel W of the Rotsige Islands and Gili Petangan should pass E of the 4m and 7.3m shoals which lie S and SW, respectively, of Tanjung Prepe, and then in mid-channel, which is clear of dangers.

Teluk Lombok (8°30'S., 116°40'E.), 3.5 miles SW of Tanjung Prepe, is of no importance to navigation as the entrance channel has a depth of 0.6m. The islet of **Gili Lebur** (8°29'S., 116°41'E.), a bare sandy islet on the N side of a drying reef, lies nearly 1 mile E of Tanjung Bonae, the S entrance point of Teluk Lombok. Anchorage, in 20.1m, is afforded WNW of Gili Lebur, off the entrance of Teluk Lombok. A light is shown from Gile Lebur and Tanjung Bonae.

Tanjung Kajangan (8°30'S., 116°41'E.), 1.25 miles SE of Tanjung Bonae, is high and steep and has a conspicuous small knob. The 230m high peak, 2.75 miles W, is an isolated hill with a prominent knob on it.

Between Tanjung Gali and Labuhanhaji (Labuhanhadji), 10 miles SSE, the coast is low with steep sides in places. Inland, the ground rises gradually to a low hilly plain. An isolated depth of 19.2m lies about 3 miles S of Tanjung Gali.

5.31 **Labuhanhaji** (8°42'S., 116°34'E.) (World Port Index No. 51290) can be readily identified from seaward by the chimney of a rice mill. In the drying coastal reef off Labuhanhaji there is an opening to a basin marked by a beacon on the NE side, and two beacons on the SW side. There are depths of 0.3 to 1.5m in the basin, which affords shelter to small craft.

Labuhanhaji Road, bounded by the arc of a circle, with a radius of 1 mile, centered on the flagstaff does not afford safe anchorage during the Southeast Monsoon. A strong S wind blows from about 0900 until late in the afternoon. A 5.4m patch lies 1.25 miles NE of Labuhanhaji. Large vessels can take anchorage E of Labuhanhaji, in a depth of 14.6m.

The shoal fringed coast from Labuhanhaji extends about 4.75 miles SSW to **Batu Belajar** (8°46'S., 116°32'E.). The bight between Batu Belajar and Tanjung Ringgit, about 6.5 miles SE, is encumbered by several reefs and shoals which dry within the 20m curve. Ships without local knowledge should not enter the area. The peninsula extending S from the isthmus is a 67m high plateau with steep sides; it forms the SE end of

Lombok.

The S coast of this peninsula is a whitish color. Tanjung Ringgit Light is shown from 0.5 mile WSW of the point.

From **Tanjung Ringgit** (8°52'S., 116°36'E.) to **Tanjung Sangula** (8°55'S., 116°26'E.), 10.5 miles WSW, the coast comprises the S shore of the large peninsula forming the SE of Lombok. An unexamined inlet lies 4 miles E of Tanjung Sangula.

Gili Batu (8°57'S., 116°30'E.), a low, dark rock, lies 4 miles ESE of Tanjung Sangula, 1.5 miles offshore. Close SW of Gili Batu is a breaking rock, dry only at low water stand. A 14.6m ridge extends 0.3 mile SW from the breaking rock.

Gili Melayu (Melaju) (8°56'S., 116°30'E.), a rocky islet with a level top, lies almost 0.75 mile NNE of Gili Batu, 0.25 mile off the drying reef at the entrance of the unexamined bay.

Lombok—South Coast

5.32 The S coast of Lombok is rocky and steep-to. It is inaccessible except in a few places, because of the surf caused by the heavy ocean swell. Though the hinterland is desolate and lacking in landmarks, the coast is varied. It has many high, dark points between which are short sections of sand beach. Occasionally there are conspicuous hilltops near the coast.

Teluk Awang (Ekas Bay) (8°57'S., 116°26'E.) is entered between Tanjung Sangula, steep and high, and **Tanjung Bungkulan** (8°58'S., 116°23'E.), about 3.25 miles SW. Tanjung Bungkulan is the SE end of a peninsula, which on its S side, rises vertically from the sea. The greater part of the W shore of the bay, between Tanjung Bungkulan and Tanjung Bariendi, 3.25 miles N, is steep. The S part of the E shore NNE of Tanjung Sangula is similar to the W shore, and is of a whitish color. The inner part of Teluk Awang is encumbered with reefs and should be considered dangerous. Anchorage may be taken in the outer part of Teluk Awang, in a depth of 34.7m, mud, and free from the ocean swell.

From Tanjung Bungkulan to **Tanjung Tampa** (8°55'S., 116°12'E.), 12 miles W, the coastline is steep and indented by several bays having sandy beaches. Teluk Gumbang, a bay on the W side of Tanjung Bungkulan peninsula, is reported inaccessible to ships. From Tanjung Tampa to **Tanjung Sara** (8°54'S., 116°04'E.), 7.25 miles W, the coast is indented by Teluk Silungbelanak (Silung Belanak) and Teluk Pengantap. These bays are separated from each other by **Tanjung Kaju Bele** (8°53'S., 116°06'E.), 2.5 miles NE of Tanjung Sara. A small reef, with a depth of 3.3m, marked by ripples in a calm sea, lies 0.5 mile offshore, 1.75 mile W of Tanjung Tampa.

Tanjung Mareseh (8°52'S., 116°09'E.), a steep point on the E side of Teluk Silungbelanak, lies 2.75 miles E of Tanjung Kaju Bele. An above-water rock lies just off the drying reef which fringes the point.

Gili Nusa (8°53'S., 116°09'E.), a wooded islet, lies about 0.75 mile WSW of Tanjung Mareseh. Vessels should not pass S or E of Gili Nusa. An islet lies in the SW part of Teluk Pengantap, 0.5 mile NE of Tanjung Sara. A flat above-water rock lies about 1 mile NE of the islet.

Anchorage.—Except in the change of monsoons, neither bay affords good anchorage. Small craft are fairly protected in the NE part of Teluk Silungbelanak, in a depth of 12.8m, sand.

5.33 **Teluk Blongas** (8°53'S., 116°02'E.), which affords good anchorage, is entered between Tanjung Sara and a rugged tongue of land 3 miles W of Tanjung Sara. The bay narrows to a width of 1.75 miles and terminates in a E and W arm.

Tanjung Pangga (8°55'S., 116°00'E.) lies 5 miles W of Tanjung Sara. Three above-water rocks lie close E of this point. Sophia Louisa Rock, 1 mile S of Tanjung Pangga, is 3m high and steep-to. The channel between the islet and the point is clear of dangers in the fairway. Gili Sara, a rocky islet 76m high, lies in the middle of the entrance to Teluk Blongas, 1.75 miles W of Tanjung Sara.

Teluk Sepi (8°52'S., 116°03'E.), the E arm of Teluk Blongas, shoals gradually from 16.5 to 5.5m, 0.5 mile from its head, which is fronted by a mud bank. On the S side of the entrance to Teluk Sepi is Gili Lowang, a small islet about 24m high, fringed by a reef. **Teluk Sawar** (8°5'S., 116°01'E.), the W arm of Teluk Blongas, is bordered by drying reefs and is suitable only for small craft. A conspicuous green, pointed hill rises to 263m, 0.5 mile N of Teluk Sawar. A 3.3m shoal lies in Teluk Sawar, 1.25 miles W of Gili Lawang. Anchorage may be taken, in a depth of 29m, in Teluk Blongas, or lesser depths in Teluk Sepi.

Directions.—Pass either N or S of **Sophia Louisa Rock** (8°56'S., 116°00'E.). When S of the narrow tongue E of Tanjung Pangga, keep the white beach of Teluk Sara behind Gili Sara in order to clear the rock awash E of the tongue. The 263m hill on the N side of Teluk Sawar, in range 329° with Tanjung Pengampus, leads to the entrance of Teluk Blongas. From Tanjung Pangga to **Tanjung Batu Gendang** (Tanjung Batoe Gendang) (8°50'S., 115°50'E.), the coast trends about 10.5 miles WNW. Midway on this stretch of coast is a small bay which affords anchorage.

Selat Atlas

5.34 Selat Alas (Alas Strait), about 35 miles long, is entered between Tanjung Ringgit, the SE extremity of Lombok, and **Tanjung Mangkun** (9°01'S., 116°44'E.), the SW extremity of Sumbawa. It separates Lombok from Sumbawa, and is frequently used instead of Selat Lombok. It is preferable to all passages between Nusa Tenggara (Lower Sunda Islands), as there are no dangers in it. The islands can be approached closely, and anchorage may be obtained under the coasts of Lombok and Sumbawa. Numerous prominent points and islands make it easy to fix a vessel's position.

Winds—Weather.—In the Southeast Monsoon, the S wind blows strong in Selat Alas for the greater part of the day, but subsides toward evening when the land breeze from Lombok begins. In the Northwest Monsoon, variable and baffling S winds are often experienced in Selat Alas.

Tides—Currents.—The tidal currents in Selat Alas are semidiurnal, with the flood setting N and the ebb S similarly to Selat Bali and Selat Lombok. The currents are influenced by the monsoons in the area N of Bali and Lombok, and in the Flores Sea. It is the strength of the Southeast Monsoon, a predominant S current may be expected in the Northwest Monsoon, a predominant N current may be expected.

With weak tides, the current may run continuously in one direction (as determined above), the tidal influence being noticeable only by periodic slackening of the rate. With strong tides,

the tidal current and the monsoon current may balance each other, or may augment each other. The rate of the strong currents is usually 4 knots, but with maximum lunar effect, can reach 5.5 knots.

The strongest S current of the day can be expected 6 hours after the moon's upper and lower transits. At the time of transit (depending on the relative strengths of tidal and monsoon influences), either a weak N current or slack water is experienced; when the monsoon current predominates, a weak S current predominates.

Along the Lombok E shore there is a countercurrent between **Tanjung Gali** (8°34'S., 116°40'E.), and **Tanjung Kuangwahe** (8°45'S., 116°32'E.), 14 miles SSW.

In **Labuhanhaji Road** (8°42'S., 116°34'E.) it was observed that the N countercurrent runs from 6 hours before, to 1 hour before the moon's transit, and the S countercurrent from 1 hour before, to 6 hours after the moon's transits. Along the Sumbawa shore, the currents are very weak and the direction is the same as the main current.

The monsoon influence appears only in the N part of Selat Alas; the differences between currents in this part and the S part are, as follows:

1. North of Tanjung Gali, in the deep channel E of **Tanjung Petagan** (8°25'S., 116°45'E.), the strongest N currents of the day can be expected at the moon's upper and lower transits. About 6 hours after these transits (depending on the relative strengths of the tidal and monsoon influence) there is either a weak S current or slack water; if the monsoon's influence predominates, a weak N current occurs.
2. West of the deep channel in the N part of the strait, between **Tanjung Kayangan (Tanjung Kajangan)** (8°30'S., 116°41'E.) and Tanjung Gali, the currents run with some strength 1 to 2 hours earlier, thus often causing an indraft toward the Lombok shore.
3. East of the deep channel, close along the W side of **Pulau Belang** (8°33'S., 116°47'E.), and also S of that island, there is little or no current and sometimes a countercurrent.
4. South of Tanjung Gali, the N current runs from 4 hours before, to the times of the moon's upper and lower transits. The S current then runs until 8 hours after the moon's upper and lower transits. The maximum rate observed was 3 knots for both N and S currents. The rate of the S current increases to 4.5 knots only with maximum lunar effect. The maximum rate of 5.5 knots, previously mentioned, never occurs in the Northwest Monsoon in the S part of the strait.

In the Northwest Monsoon, there is no countercurrent along the Lombok shore, but the current there is weaker and changes 2 hours earlier than the main current.

Directions.—Approaching from S, Selat Alas may be identified by the high plateau forming the SE part of Lombok and the high, rugged land of the SW part of Sumbawa. From N, **Gunung Rinjani** (8°25'S., 116°27'E.) and the high NW part of Sumbawa are visible.

Sumbawa

5.35 Sumbawa is chiefly composed of volcanic, irregularly formed, and moderately wooded mountains having a parched appearance during the Southeast Monsoon. Because of the similarity of the peaks, the island offers few landmarks for offshore navigation.

The W half of Sumbawa is mostly a 600 to 1,000m high plateau, on which there are higher ridges and peaks cut by deep depressions. The E half of the island, including the peninsula at **Teluk Saleh** (8°34'S., 117°54'E.) on the N coast, has more isolated mountains and mountain groups which are largely composed of extinct volcanoes.

Gunung Tambora (8°14'S., 117°58'E.), a volcanic mountain about 2,754m high, rises in the middle of the peninsula on the NE side of Teluk Saleh, and is the highest mountain of Sumbawa. This large crater on the SE side is 1.25 miles wide. Last erupting in 1895, Gunung Tambora is believed to be the only active volcano on the island. Its chief advantage as a landmark is its comparative isolation.

Tides—Currents.—There is no information in respect to the inshore currents along the S and N coasts of Sumbawa. It may be significant that strong currents have not been reported. At either end of the W and E coasts, the influence of the tidal currents in Selat Alas and **Selat Sape** (8°39'S., 119°18'E.) should be considered. These currents are sometimes felt for great distances, especially S of the entrances.

On the S coast of Sumbawa, rotary currents and countercurrents have been observed near Selat Alas, near **Teluk Talonan** (9°07'S., 117°02'E.), **Tano Gerantah** (9°05'S., 117°09'E.), near the entrance points of **Teluk Cempi** (8°46'S., 118°21'E.), and the S point of Teluk Waworada (8°44'S., 118°51'E.).

On the N coast, a powerful current can arise in and out of the entrances of **Teluk Saleh** (8°34'S., 117°54'E.).

Sumbawa—West Coast

5.36 **Tanjung Mangkun** (9°01'S., 116°44'E.), bold and steep-to, is the SW extremity of Sumbawa. The point is conspicuous for the 276m table mountain close N. This mountain, with lower hills NE, merges with the Sumbawa range. Three small peaks are located on the S slope of the table mountain. There is a light shown from the point.

The coast between Tanjung Mangkun and **Tanjung Benete** (8°53'S., 116°44'E.), about 8.25 miles N, has the same character throughout, lofty and broken, furrowed by dark ravines with crags and steep sides, and sandy beaches in the bay.

Tanjung Amat (8°58'S., 116°43'E.), 2.5 miles NW of Tanjung Mangkun, can be identified by the light yellow rocks on its W side and by Olet Gekli, the 352m peak on its NE side.

Tanjung Maloh (Tanjung Maluk) (8°55'S., 116°44'E.), about 3.5 miles further N, may be seen from S to N and is easily identified by the peculiar shape of a hill, 285m high. When seen from W, this hill is not particularly prominent. The bay SE of Tanjung Maloh affords anchorage, in a depth of 12m.

Between Tanjung Maloh and Tanjung Benete lies the port of **Benete** (8°53'S., 116°44'E.). The port lies on the S shore of the inlet. Depths decrease regularly from 33m in the entrance, to 20m close off its head. A buoyed channel and range lights mark the entrance. The port services a large copper mine located inland.

Three berths make up the Benete Port Terminal, as follows:

1. The Concentrate Berth—220m long including dolphins. The berth handles copper concentrate and breakbulk. Vessels up to 100,000 dwt, with a maximum loa of 200m and

Benete Port

a maximum draft (HW) of 14.0m, can be accommodated.

2. General Cargo Berth—160m long including dolphins with a depth alongside of 12.0m. The berth handles chemicals, LPG, ro-ro/lo-lo, containers, breakbulk, and multipurpose cargo.

3. Jamuna Berth—78m long, with a depth alongside of 9m. The berth can accommodate a vessel with a maximum loa of 79.8m. The berth handles coal.

A pilot is available and boards vessels approximately 2 miles SW of Tanjung Benete.

From Tanjung Benete to **Tanjung Djelengnja** (Tanjung Jelengnya) (8°51'S., 116°46'E.), 2.5 miles NE, there is a low, wooded strip of coast fronted by a drying reef, which extends up to 0.5 mile offshore. Then to **Tanjung Beru** (8°49'S., 116°47'E.), a steep-to point, 2 miles NE, the coast is bold and steep.

5.37 Teluk Taliwang (8°48'S., 116°47'E.) is entered between Tanjung Beru and Tanjung Balat, 2.5 miles N. Pulau Ponjung (Pulau Ponyung), in the S part of the bay, lies 1 mile ENE of Tanjung Beru. Tanjung Putuh Batu, a steep-to point 1.5 miles ENE of Tanjung Beru, at the foot of the steeply rising Gunung Pulu Batu, 481m high, divides the bay into two parts. There is a low valley with paddy fields at the head of the S part of the bay, into which a river flows. The entrance to the river is filled with small, low islets and off it is an islet joined to the shore by a drying reef.

Several villages stand on the banks of the river, 2.75 miles and 3.5 miles SE of Tanjung Beru.

Labuan Balat, at the head of the N part of the bay, is fronted by a beach backed by a broad valley covered with coconut palms.

Tanjung Balat is a prominent wooded point from which a reef, with a depth of 7.6m, extends 0.3 mile S.

Vessels anchor in the N part of Teluk Taliwang, off the village of Labuan Balat. Although this anchorage is open to S winds, it has been observed that the swell is less troublesome here than S of Pulau Ponjung. A landing pier at the village extends over the coastal reef.

Teluk Kertasari (Kerta Sari Bay) (8°45'S., 116°46'E.) is entered between **Tanjung Biri** (8°46'S., 116°46'E.) and a point 1.5 miles NNW. On the N entrance point to Teluk Kertasari, is a most striking sugarloaf-shaped hill, 166m high. There is seldom any significant current within the entrance points of the bay.

Anchorage may be taken, in depths of 11 to 18m, sand and mud, in Teluk Kertasari, but S and SW winds quickly raise a heavy swell.

Pulau Sasasait (8°45'S., 116°43'E.), 44m high, covered with vegetation and steep-to, lies 2.75 miles W of the N entrance

point to Teluk Kertasari.

Midway between the N entrance point to Teluk Kertasari and **Tanjung Belusun** (8°40'S., 116°45'E.), the high, wooded, and reef-fringed coast is broken by a low valley covered with palms. Pulau Sarong, 125m high, lies on the outer end of a drying reef which extends 1 mile W from the entrance to the valley.

Pulau Dua (8°43'S., 116°44'E.), two small rock islets covered with vegetation, lies about 1.75 miles SW of Tanjung Belusun. From Tanjung Belusun, the high, wooded, and reef-fringed coast extends 5.5 miles NNE to the S entrance point of a wide bay. This bay is entered between its S entrance point and **Tanjung Labu Beru** (Tanjung Tano) (8°31'S., 116°49'E.), 4 miles NNE. The reef-fringed shore of the bay has a narrow strip of low land behind it. Tanjung Labu Beru is a steep-to point which forms the NW extremity of a wooded hilly promontory, rising to 133m high at its extremity. A light is shown from the point.

5.38 **Pulau Belang** (8°33'S., 116°47'E.) lies at the SW end of a chain of uninhabited islands and reefs, extending ENE parallel to the coast of Sumbawa for 20 miles to **Pulau Kromo** (8°23'S., 117°05'E.). Eight islands are disposed around Tanjung Labu Beru.

Pulau Paseran (8°31'S., 116°47'E.), 1.5 miles W of Tanjung Labu Beru, is flat and heavily vegetated as is Pulau Belang, close SSW. Both islands lie on a shoal of less than 18.3m. Depths of less than 9.1m extend 1.75 miles SW from Pulau Belang.

Closely joined by a drying reef to the NE end of Pulau Belang is Pulau Songi, 70m high. This islet is rocky and is a good landmark.

Within 3.25 miles ENE of the peninsula are **Pulau Kalong** (8°30'S., 116°52'E.) and Pulau Namo, both hilly. Pulau Kenawa, 46m high, lies about 1 mile N of the Tanjung Labu Beru peninsula and is the highest island of the three.

Pulau Genang and Pulau Ular lie within 1.75 miles NNW of the peninsula. Both are small rocky islets, the former bare and the latter vegetated.

All the above islands form the SW group off the NW coast of Sumbawa. Pulau Pandjang (Pulau Panjang), 3 miles N of Pulau Kalong, is fringed by a drying reef and covered with mangroves. It lies with its N side close within the 200m curve.

Pulau Saringi (8°26'S., 116°59'E.), 1 mile ENE of Pulau Pandjang, is separated from it by a narrow channel. There is a 5.9m patch in the middle of the channel; depths are considerably less than charted.

Pulau Saringi with Pulau Bungin Kelat, Pulau Airtawar (Pulau Ayertawar), Pulau Demudang, and Pulau Kromo ENE of it, form the NE groups of islands, and lie on an extensive drying reef close within the 200m curve. With the exception of Pulau Saringi, all the islands are covered with mangroves. A drying boulder was reported to stand midway along the drying reef extending E from Pulau Kromo and affords a useful mark.

A prominent sandy islet, **Pulau Bedil** (8°24'S., 117°04'E.), stands near the middle of a drying reef, about 1 mile S of Pulau Kromo.

Caution.—Caution must be exercised as it was reported that the currents set obliquely across the channel towards the reef on which Pulau Bedil stands and the 4.9m patch, 0.6 mile W of it.

Tanjung Labu Beru to Tanjung Perappat

5.39 For a distance of 6 miles ESE of Tanjung Labu Beru, the coast is wooded and rises inland to two mountains, 5 miles SE and 6.75 miles ESE of the point. Then to the W entrance point of Teluk Bungin, 5 miles ENE, it is low and covered with woods, marshy land, and paddy fields.

The entire stretch of coast is clear of dangers outside the 5.5m curve, which lies fairly close, except in the vicinity of Teluk Bungin where local knowledge and caution is advised.

Teluk Labu Beru (8°32'S., 116°51'E.), a bight on the E side of Tanjung Labu Beru peninsula, is sheltered from N by Pulau Kenawa, Pulau Namo, and Pulau Kalong. It affords good anchorage in depths of 11 to 22m. A village stands 7 miles E of Tanjung Labu Beru, where there are two small jetties.

Teluk Bungin (Bungin Bay) (8°29'S., 117°00'E.) is entered between its W entrance point, a low wooded point and Pulau Kaun, on which there are several round-topped trees lying on the coastal reef, close off the E entrance point to the bay, 1.5 miles NE.

Teluk Bungin is so encumbered with drying reefs as to be practically useless, except for small vessels with local knowledge.

The coast between **Pulau Burung** (8°27'S., 117°02'E.) and **Teluk Bajo** (Teluk Badjo) (8°25'S., 117°05'E.) is low and covered with marshy ground and paddy fields interspersed with coconut palms.

Teluk Bajo affords anchorage for small vessels, in depths of 6.7 to 11.8m, but its shores are reef-fringed.

Between Teluk Bajo and Tanjung Perappat, 2.5 miles NE, the low coast is mostly covered with paddy fields and coconut palms.

Tanjung Perappat (8°22'S., 117°06'E.) is a low marshy point with paddy fields inland. The coastal reef extends 0.5 mile WSW from the point.

Channels Off the Northwest Side of Sumbawa

5.40 **Directions.—**Between the islands off the NW side of Sumbawa and Sumbawa itself, there is a good channel, with anchorage almost everywhere. The channel may be entered by passing between Pulau Paseran and Pulau Ular, and then between Pulau Kenawa and Pulau Namo, passing close N of the latter island and Pulau Kalong. Pass S of Pulau Belang, taking care to avoid the spit extending SW from the island, and then midway between Pulau Belang and Tanjung Labu Beru.

From abreast the N side of Pulau Kalong, steer ENE for a position in mid-channel S of the E end of Pulau Pandjang. Here a vessel may alter course N and pass between Pulau Pandjang and Pulau Saring, taking care to avoid the 5.9m patch in mid-channel.

Vessels continuing ENE through the channel should be careful of the reefs extending from Sumbawa shore, between Teluk Bungin and Tanjung Perappat. Here a course nearer the off-lying islands should be held. The passage N of the islet in mid-channel S of Pulau Kromo is recommended. It is clear of dangers except for the 4.9m shoal in mid-channel between the islet and Pulau Kromo.

The low islets of **Pulau Kaun** (8°28'S., 117°00'E.) and **Pulau Burung** (8°27'S., 117°02'E.) are useful marks when navi-

gating the ENE part of this channel. After passing the previously-mentioned sandy islet and Pulau Bedil in mid-channel, pass midway between the E end of Pulau Kromo and Tanjung Perappat to sea.

Sumbawa—North Coast

5.41 Vessels navigating off the N coast of Sumbawa usually steer along the parallel of 8°00'S. At this distance there are few remarkable landmarks.

Teluk Dalum (8°22'S., 117°08'E.) lies between Tanjung Perappat and **Tanjung Sarokaja** (8°22'S., 117°10'E.), the NE entrance point to Selat Alas, 3 miles E. The coast is low and fronted by coconut palms.

Anchorage may be taken, with local knowledge, 0.25 mile offshore in Teluk Dalum, in 37m, but it is open to swells. Tanjung Sarokaja is steep-to with the charted 200m curve less than 0.5 mile offshore. The point is wooded and rises to a flat hill about 100m high.

Anchorage.—A small inlet, the entrance to which lies 1.5 miles SE of Tanjung Sarokaja, affords good anchorage for small vessels, in 7.8 to 11m, free from swells. The inlet is enclosed by low, wooded hills, and has an entrance 45m wide. It is not discernible from seaward except from N. Vessels are advised to keep close to the NW shore when entering.

5.42 **Teluk Sumbawa** (8°27'S., 117°23'E.) is entered off **Tanjung Batu Kuping** (Tanjung Batoe Koeping) (8°28'S., 117°23'E.), 15 miles ESE of Tanjung Sarokaja.

Aspect.—Approaching from N, good visual bearings can be taken on Tanjung Batu Kuping and on the mouth of the Brang Sumbawa (Sungai Soembawa), in the SE part of the bay. At or near low water, the mouth is seen as a sharp gully. It is prominent on radar.

Anchorage, with good holding ground, is afforded, in 54.9m with Tanjung Batu Kuping bearing 240°, 0.8 mile distant. Since Teluk Sumbawa is open, a vessel cannot be considered safe during the Northwest Monsoon.

5.43 **Badas** (8°28'S., 117°23'E.), the port for the town of **Sumbawa Besar** (Soembawa) (8°30'S., 117°26'E.), situated 3 miles SE of Tanjung Batu Kuping, lies in a narrow inlet 0.5 mile WNW of the point. A light is shown from the W entrance point of the inlet. The entrance has a depth of 26m in the fairway and is marked on either side by a buoy which are lighted when a vessel is expected.

Depths—Limitations.—Berthing information is shown in the table titled **Badas—Berthing Information.**

Within the entrance to the inlet which is sheltered from the Southeast Monsoon, there are depths decreasing from 20.1 to 5.5m. Because of a limited turning room, only vessels of less than 99m should enter the port.

Vessels should enter the inlet for Badas in daytime only. Approach the entrance from well offshore, steering 211° for two range beacons, reported to stand at the head of the inlet, and then pass between the buoys at the entrance.

From **Tanjung Limong** (8°27'S., 117°24'E.), on the E side of Teluk Sumbawa, the low, forest covered coast extends 3.75 miles NNE to **Tanjung Menangis** (8°24'S., 117°26'E.), a low, wooded steep-to point.

Teluk Saleh

5.44 **Teluk Saleh** (Saleh Baai) (8°28'S., 117°48'E.) extends 45 miles ESE, penetrating to within 6 miles of the S coast of Sumbawa. The bay is seldom visited as there are no trading centers of any importance. The NE side of the bay is steep-to with depths ranging from over 183m in the outer part, to 5.4m at the head. The SW side of the bay is fronted by islets and shoals. The islets, which can generally be approached closely, are chiefly rocks covered with vegetation rising perpendicularly from deep water. Numerous villages are situated on the SW side of the bay and at the head.

Badas—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Badas Port Terminal						
APBN Berth	5m	—	—	—	—	Ro-pax and breakbulk.
North Berth	96m	—	—	8.2m	10,040 dwt	Dirty products, ro-pax, breakbulk, multipurpose, and general cargo. Continuous berthing length of 192m.
South Berth	96m	—	—	8.2m	10,040 dwt	
Nusantara East Berth	50m	—	—	—	—	Dirty products, ro-pax, breakbulk, and multipurpose.
Nusantara West Berth	104m	—	—	—	—	
Pelra Berth	10m	—	—	—	—	Breakbulk.
Badas BBM Terminal						
Pertamina Jetty	48m	10.0m	120m	—	6,000 dwt	Clean products, dirty products, and bunkers. Continuous berthing length of 192m.

Gunung Tambora (8°14'S., 117°58'E.), a volcanic mountain rising in the middle of the peninsula, has been previously described in paragraph 5.34.

Islands at the Entrance to Teluk Saleh

5.45 Pulau Moyo (Pulau Mojo) (8°15'S., 117°33'E.), a large island, lies across the entrance to Teluk Saleh. Selat Saleh (Straat Saleh), at the S end of Pulau Moyo and Selat Batahai (Straat Batahai), at the N end, are the deep and clear entrances into Teluk Saleh.

Pulau Moyo is declared a Wildlife Reserve and the waters S of Moyo are to be a National Sea Park.

Pulau Medang (8°08'S., 117°24'E.), 4.75 miles NW of Pulau Moyo, is the outer island in the approach to Teluk Saleh. It is separated from Pulau Moyo by a deep and clear channel in which no strong currents have been reported.

Tanjung Utara (Tanjung Oetara), the W end of the island, has shoal patches as far as 1.25 miles SW.

Several detached reefs, with depths of 4.5 to 7m, lie within 1 mile of the N coast, and a small islet on a drying reef lies 0.4 mile N of Tanjung Timor, the E extremity of the island. Vessels passing N of Pulau Medang should keep outside the 200m curve. A light is shown from the N central part of Pulau Medang. It was reported that Pulau Medang was a good radar target at 18 miles.

Anchorage may be taken, by vessels with local knowledge, off the N coast of Pulau Medang where the depths decrease gradually within the 40m curve.

Pulau Satonda (8°06'S., 117°45'E.), 4.5 miles NE of Pulau Moyo, lies 1.25 miles off the Sumbawa coast at the NE end of Selat Batahai. The island is saddle-shaped, 312m high, and densely overgrown.

5.46 Selat Saleh (Straat Saleh), a clear channel between the S end of Pulau Moyo and the Sumbawa coast, has a least width of 1.25 miles. A 2 knot current in either direction may be found in the strait. The strait has steep shores on either side, except for part of the S shore 3 miles ESE of **Tanjung Menangis** (8°24'S., 117°26'E.), where three rivers enter the strait through a mangrove swamp. Here, the 20m curve lies 0.5 mile offshore. When passing through the strait it is preferable to favor the shore of Pulau Moyo, which is steep-to.

Anchorage may be taken, by vessels with local knowledge, 0.5 mile W of the entrance to the three rivers on the S shore. Care should be taking to avoid a 5.9m patch which lies just within the 20m curve.

Selat Batahai (Straat Batahai) forms the N entrance to Teluk Saleh and is entered between **Tanjung Panda** (8°09'S., 117°40'E.) and **Tanjung Brenti** (8°09'S., 117°44'E.) on Sumbawa. A 10.1m patch lies 0.5 mile SW of Tanjung Brenti, but elsewhere the strait is deep and clear of dangers. Tidal currents in Selat Batahai attain a rate of 2 knots.

Teluk Praya (8°25'S., 117°35'E.), close within Selat Saleh, has a least width of 0.5 mile between the fringing reefs and extends 4.75 miles S to its head. The S part of the bay broadens to about 1 mile and affords good anchorage. Depths shoal regularly from about 50m in the entrance, to 12.8m at the head. Care must be taken to avoid two shoals, with depths of 0.3m and 0.9m, just outside the 10m curve on the E side of the head of the bay.

Teluk Tarata (Tarata Baai) (8°28'S., 117°42'E.), 7 miles SE of Teluk Praya, is entered between **Pulau Dangar besar** (8°26'S., 117°40'E.) and **Pulau Liang** (Pulau Liang Maja) (8°32'S., 117°41'E.) on the W, and **Pulau Ngali** (8°29'S., 117°43'E.) on the E. Pulau Dangar-besar is conspicuous for the 123m hillock on its N end. Teluk Tarata extends S between the above mentioned islands, and has its head S of Pulau Liang.

Anchorage, in 13.7 to 15m, mud, is taken off the wide mouth of a river at the head of Teluk Tarata.

Directions.—Vessels having local knowledge can pass E of the drying reef off the SE side of Pulau Liang, and W of **Kabo** (8°32'S., 117°42'E.), a high sharp-pointed islet in mid-channel off the SE end of Pulau Liang. A 5.5m patch between the islet and the point may be passed on either side. The S extremity of Pulau Liang should be passed fairly closely, and then course may be altered for the anchorage by steering for the river entrance at the head of the bay. Take care to avoid the shoals, with depths of 1.2m and 3m, which lie 0.6 mile SW of and the same distance SSW of the S extremity of Pulau Liang.

The portion of Teluk Tarata lying SE and S of the SE end of Pulau Liang is foul. Between Pulau Ngali and **Pulau Raki** (Pulau Rakiet) (8°37'S., 117°58'E.), 11.25 miles ESE, the SW shore of Teluk Saleh forms a broad bight studded with islets and shoals, and bordered by numerous villages. The shores of the bight are indented by small bays.

5.47 Karang Raba (Aart van Nes) (8°32'S., 117°53'E.), which dries and lies close to the charted 200m curve, is 6.5 miles ENE of the SE extremity of Pulau Ngali. When covered, it is plainly marked by discoloration. A shoal, with a depth of 0.3m not marked by discoloration, lies 2.25 miles E of Karang Raba. A steep-to reef, which dries, lies 1.75 miles farther E.

Extending for 7 miles SE from Pulau Ngali are the islands Pulau Tengar, Pulau Kelapang (Pulau Katapang), Pulau Dompo, and Pulau Taikebo (Pulau Taikabo). These islands are hilly and high, except for Pulau Kelapang.

Pulau Tengar is joined to Pulau Ngali by a drying reef. The channel between Pulau Tengar and Pulau Kelapang is deep and clear. Pulau Dompo, the highest island, is conspicuous for a saddle ridge, 253m high. The channel between Pulau Dompo and Pulau Kelapang is narrowed by a drying reef projecting from Pulau Kelapang. A fragmented drying reef named **Ganteng** (8°36'S., 117°50'E.) extends 1 mile SSE from Pulau Dompo.

Pulau Taikebo, 2 miles ESE of Pulau Dompo, has a 2.7m shoal 0.75 mile S. The channel between Pulau Taikebo and Pulau Dompo is deep and clear, except for Ganteng reef on the W side. A wide, clear passage separates Pulau Taikebo and Pulau Raki, about 4.75 miles E. The coast of Teluk Saleh, W of Pulau Dompo, extending S for about 7.5 miles, then 12 miles E, is encumbered with numerous dangers. Local knowledge is required when entering any of the various bights and bays indenting this coast.

Pulau Raki (Pulau Rakiet) (8°37'S., 117°58'E.), deeply indented by small bays, lies a little over 1 mile off the S shore of Teluk Saleh. A small, detached, drying reef, usually marked by discoloration when covered, lies 2 miles N of Pulau Raki. Scattered above and below-water dangers extend 7 miles ENE from the island.

Pulau Bakau (8°42'S., 118°01'E.), a flat bush-covered islet, lies in mid-channel between Pulau Raki and the S shore of Teluk Saleh. Other dangers lie in this narrow channel.

5.48 **Teluk Bangko Lua** (8°40'S., 118°12'E.), entered 11 miles E of Pulau Raki, is on the E side of the head of Teluk Saleh. The islets of Pulau Besar and Pulau Wakakos, plus smaller islets, comprise the N and E sides of the bay. Vessels must pass close to **Tanjung Pekat** (8°40'S., 118°11'E.), the W entrance point of the bay, to avoid a 0.9m shoal, 1 mile N of the point.

Gunung Rumah (8°35'S., 118°16'E.), a hill 256m high, is located on the N side of the head of Teluk Saleh.

The hill is the S end of a ridge which, because of its even crest, resembles the roof of a house.

Teluk Kempang (8°34'S., 118°14'E.) is entered between the point on which Gunung Rumah is located and **Tanjung Kessi** (8°34'S., 118°12'E.), 3 miles WNW.

An islet lies close off a small projection at the head of the bay. A dangerous sunken rock lies close SE of the islet. A 5.9m patch lies 0.5 mile SE of the same islet.

Sapudu (8°36'S., 118°12'E.), a brush covered rock on a detached drying reef, lies 1.5 miles S of Tanjung Kessi.

Anchorage may be taken in Teluk Kempang, in a depth of 8m, 0.5 mile S of the head of the bay.

Tanjung Paranggawu (8°30'S., 118°07'E.) lies about 7.75 miles NW of Tanjung Kessi; 4 miles SSW of the point is a detached drying reef. The E shore of Teluk Saleh, from Tanjung Paranggawu to the SE entrance point of Selat Batahai, 30 miles NW, is steep-to and affords no anchorage. The only danger off this shore is a 1.8m shoal head lying 9.5 miles WNW of Tanjung Paranggawu, 0.5 mile offshore.

5.49 The coast from **Tanjung Brenti** (8°09'S., 117°44'E.) to **Tanjung Katupa** (Tanjung Katoepa) (8°08'S., 118°09'E.) trends 25 miles E. The volcano Gunung Tambora dominates this coast. A local magnetic anomaly has been reported off the N coast of Pulau Sumbawa in the vicinity of Gunung Tambora. Caution should be exercised when navigating along this coast.

From Tanjung Katupa to **Tanjung Juli** (Tanjung Djoeli) (8°15'S., 118°28'E.), 20 miles ESE, the coast indents in a wide bight. **Teluk Motitoi** (Moti Toi) (8°19'S., 118°16'E.) is located close W of **Tanjung Piun** (Tanjung Pioen) (8°20'S., 118°16'E.), a high rocky point, 14 miles SE of Tanjung Katupa. A shoal ridge extending more than 1 mile NW to SE fronts the bay, but a deep clear channel exists at either end of the ridge.

Anchorage is taken inside the ridge, in 25.6 to 29m, sand and mud.

Teluk Sanggar (Dompo Bay) (8°19'S., 118°19'E.) is entered between Tanjung Piun (Pieon) and **Tanjung Propa** (8°18'S., 118°23'E.), 6.75 miles ENE.

Tanjung Matompo (8°22'S., 118°19'E.) lies 3.25 miles SE of Tanjung Piun. The best anchorage in Teluk Sanggar, in 29m, mud, lies in the bight close SW of Tanjung Matompo, off the mouth of the **Sungai Kambu** (8°23'S., 118°19'E.).

From Tanjung Juli to **Tanjung Paropa** (8°18'S., 118°39'E.), 11.5 miles E, the ridge of several mountain peaks extends to the coast.

Tanjung Wonto (8°20'S., 118°41'E.), 3 miles SE of Tanjung Paropa, is the W entrance point of Teluk Bima.

Teluk Bima, entered between Tanjung Wonto and **Tanjung Batuputih** (Tanjung Batoe Poetih) (8°21'S., 118°44'E.), 3 miles ESE, extends 13 miles S. The bay lies between high, hilly land and affords secure anchorage.

About 4 miles S of Tanjung Wonto, the bay narrows to a least width of 0.3 mile, and the channel becomes somewhat winding for 1.5 miles.

The bay then widens again and remains so almost to it head. The port of Bima is situated on the E side of Teluk Bima, 2.5 miles S of the narrows.

5.50 **Bima** (8°27'S., 118°43'E.) is the principal port serving eastern Sumbawa. The town is actually a collection of villages built on a plain through which the **Sungai Romo** (8°27'S., 118°43'E.) flows.

A causeway extending over the tide flat at Bima has a T-head about 68m long. Small craft and lighters up to 50m in length can berth alongside, in a depth of 3m. Ocean-going vessels anchor off the pier where coastal vessels and lighters are worked alongside.

Winds—Weather.—During the Southeast Monsoon, very strong S winds accompanied by heavy squalls sometimes blow continuously for many days. The land and sea breezes are usually regular in both monsoons; the Southeast Monsoon blows directly out through the entrance, and the Northwest Monsoon blows directly in.

Tides—Currents.—No significant currents have been noted in Teluk Bima.

Depths—Limitations.—Depths in Teluk Bima, from its entrance to the S end of the narrows, are 45m or more. Fairway depths shoal regularly from 45 to 11m at the head. Berthing information is shown in the table titled **Bima—Berthing Information.**

Anchorage.—Anchorage may be taken almost anywhere in the inner part of Teluk Bima, in depths of 12 to 33m. The bottom is sand and mud. Off Bima, vessels usually anchor between **Pulau Kambing** (8°27'S., 118°42'E.) and the entrance to the Sungai Romo, in depths of 16 to 18m.

Caution.—Anchoring within the bay between parallels of 8°25'00"S and 8°26'30"S is dangerous because of possible mines.

Bima—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
KSOP Bima Terminal						
KSOP East Berth	50m	—	—	—	—	Ro/pax and breakbulk.

Bima—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
KSOP West Berth	50m	—	—	—	—	Ro/pax and breakbulk.
PT Pelindo III Terminal						
Nusantara Berth	192m	6.0m	89m	—	6,500 dwt	Ro/paxand breakbulk Berthing length of 62m (including dolphins).
Pertamina Terminal						
MBM Pertamina	—	10.0m	80m	6.5m	3,500 dwt	Dirty products.

5.51 From Tanjung Batuputih to **Tanjung Naru** (Tanjung Naroe) (8°19'S., 119°00'E.), the NE extremity of Sumbawa, the coast is low, flat, and edged by tall trees. Tanjung Naru Light stands at a height of 44m on the point.

Doro Maria (8°29'S., 118°56'E.) about 1,479m high, 11.5 miles SSW of Tanjung Naru, but it is obscured from N by a high spur extending from it. The only village on this stretch of coast lies at the head of **Teluk Wera** (8°18'S., 118°56'E.), 4.75 miles W of Tanjung Naru, in the entrance to a grassy valley between two high ridges extending from Doro Maria.

The village is not visible from seaward, but a row of palm trees stands behind it and indicate its position. Two above-water rocks lie on the coastal reef extending from the W entrance point to Teluk Wera. The W and larger is 9m high. The E entrance point is rocky, but there is a sandy beach between the points.

Anchorage may be taken, by a vessel with local knowledge, E or W of the entrance to a small river which flows into the head of the bay, in a depth of 18m. The W entrance is preferable, as the 9.1m and 20m curves are farther apart.

Pulau Sangeang (8°10'S., 119°05'E.), an active volcanic island whose slopes descend to the sea, lies 4 miles NNE of Tanjung Naru. The intervening channel is deep and clear. A light is shown from the N side of the island.

Sumbawa—East Coast

5.52 From Tanjung Naru to **Tanjung Wamba** (8°31'S., 119°03'E.), the coast trends SSE 12 miles. The mountainous land lies a few miles back of this coastal stretch. The only recognizable peak is the blunt mountain Doro Maria, 8 miles W of Tanjung Wamba. This is the highest elevation in the vicinity.

Between Tanjung Wamba and **Tano Mabala** (Toro Mabalang) (8°33'S., 119°10'E.), 7.25 miles ESE, the coast forms a bight which extends 7.75 miles SSW. The W side of the bight is mostly low and flat.

Toro Naga Nuri (8°33'S., 119°02'E.), 3 miles SW of Tanjung Wamba, is the E termination of a ridge running through the flat land. A light is shown from the point. Nisa Sani, about 1 mile ESE of Toro Naga Nuri, is a 143m high island, steep-to on its E side. The island is easily seen against the Sumbawa coast.

5.53 **Teluk Sape** (8°33'S., 119°02'E.) is entered between Toro Naga Nuri and the N end of Nisa Sanai. The S entrance of the bay is obstructed by islets and drying shoals, extending from the SW side of Nisa Sanai to the Sumbawa coast.

This small fishing village is routinely visited by inter-island trading vessels and also has an established ferry service to Flores, Sumba, and Timor. Sape was once an entry point for Komodo, but this is no longer the case.

Nisa Tosso (8°34'S., 119°02'E.), the northernmost of these dangers, is steep-to on its N side. A 4.6m patch lies about 0.3 mile E of this islet. A stone causeway, about 0.3 mile long, is situated at the head of a river, 1.5 miles SSW of Toro Naga Nuri. Toro Naga Nuri Light is shown from the point.

Courtesy of http://www.agrisoft-systems.de/kawasaki

The ferry to Flores berthed at the port of Sape, Sumbawa

Anchorage may be obtained in Teluk Sape, N of Nisa Tosso. Small vessels can anchor SW of this islet off the head of the causeway.

Between **Pulau Radeh** (8°36'S., 119°03'E.) and **Toro Gadu** (Tano Gadu) (8°36'S., 119°07'E.), 4.5 miles E, there is a large bay fronted by a wide sandy beach, except on its W side where it is mud. The W part of the bay is backed by a wooded ridge which extends N from the hill in the SW part of the bay. Loh Latoh, an inlet, lies 2.5 miles SSE of Tano Gadu, but it is too encumbered with reefs to be recommended as an anchorage. A drying sand bank, marked by surf and discoloration when covered, lies 1.5 miles SW of Taro Gadu.

Anchorage may be taken between the 20m and 40m curves in

the bay W of the reefs and banks off Loh Latoh. Between Taro Gadu and Tano Mabala (Toro Mabalang), 4 miles NE, the coast is indented by several inlets which are mostly encumbered by drying banks. Tano Mabala is the N extremity of a peninsula forming the E side of the bight between it and Tanjung Wamba.

Off-lying Islands

5.54 Pulau Sentodo (Sentodo) (8°33'S., 119°11'E.), 0.75 mile NE of Tano Mabala, is 60m high and separated from the coast by a deep clear channel. Close W of Pulau Sentodo is an islet equally steep, but much worn by the sea. Two rocks, 6m high, lie about 0.3 mile E of Pulau Sentodo. At times, there are heavy tide rips in the channel between Pulau Sentodo and the mainland, extending far into Selat Sape.

Pulau Matagateh (Mata Gateh) (8°34'S., 119°12'E.), 75m high, lies across the entrance to Labuan Jati (Labuan Djati), about 1.25 miles SE of Tano Mabala. The island rises steeply from the sea, is covered with grass, and reef-fringed with some sandy beaches in the bays on the E and W sides.

Anchorage, free from tide rips, is situated in the S part of Labuan Jati, in depths of 18 to 37m. If entering by the S entrance between **Tano Wadudali** (Toro Wadoe Dali) (8°35'S., 119°11'E.) and Pulau Matagateh, 0.4 mile NE, it is preferable to pass W of a 2.7m shoal lying 0.5 mile S of the island.

Pulau Kelapa (8°40'S., 119°14'E.), rises to about 429m high in its center. The coast on all sides is indented with bays, and a drying reef extends 0.75 mile from its E side. Two lights, in line bearing 172°, are shown from Pulau Kelapa, marking the main channel of Selat Sape. It passes between Palau Matagateh and **Pulau Barsu Panda** (Barsoe Panda) (8°32'S., 119°14'E.), about 3 miles NE of the N extremity of Pulau Matagateh. Pulau Ilus (Iloes), a rocky islet 39m high, lies 1 mile SW of Pulau Kelapa. A steep-to ridge, with a least depth of 10.1m, lies between Pulau Ilus and Pulau Kelapa. Because there are heavy rollers and tide rips over this ridge, vessels using the channel between Pulau Kelapa and Sumbawa should pass W of Pulau Ilus.

5.55 Labuan Botu (Laboean Botoe) (8°38'S., 119°11'E.) is entered 3.25 miles S of Pulau Matagateh, between **Tano Botu** (Tanjung Botoe) (8°39'S., 119°11'E.) and a narrow, wooded point, 1 mile NE. A low, rocky islet lies 0.3 mile SE of the N entrance point of the bay.

A similar islet lies 0.6 mile NNE of the same point. A reef, with depths of less than 8.5m, extends 1 mile ENE from Tano Botu. This danger is often marked by breakers.

From Tano Botu to **Tanjung Rata** (8°42'S., 119°11'E.), about 3 miles S, the coast continues high, wooded, and reef-fringed. Small vessels obtain good anchorage in the cove on the N side of an unnamed rocky islet about 0.5 mile N of Tanjung Rata.

A rocky islet, with an above-water rock off its E side, lies 1.25 miles ESE of Tanjung Rata. Between Tanjung Rata and Tanjung Rano (Toro Rano), 1.5 miles S, there is a small reef-fringed bay. Tanjung Rano may be identified by a conical hill, 233m high, inside the point. An arched rock, 8m high, with two above-water rocks close to it, lies close E of the point. Two rocks, which dry and usually marked by surf, lie close SE of the arched rock. Between Tanjung Rano and **Toro Rata** (8°45'S., 119°09'E.), 2.75 miles WSW, the coast is steep-to and wooded.

Selat Sape

5.56 Selat Sape (Straat Sape) (8°39'S., 119°18'E.), between Sumbawa and Pulau Komodo, 11.5 miles E, is the usual route taken when proceeding from Selat Sumba (Straat Soemba) to the Flores Sea, and vice versa. The N part of Selat Sape is divided into two branches by **Pulau Banta (Gila Banta)** (8°26'S., 119°18'E.). The main route lies E of **Pulau Kelapa** (8°40'S., 119°14'E.), then between **Pulau Sentodo** (8°33'S., 119°11'E.) and Pulau Barsu Panda (Barsoe Panda), 3 miles E, and then W or E of Pulau Sangeang.

The passage E of Pulau Banta and Pulau Komodo is seldom used. The depths are great, the tidal currents strong, and there is less opportunity for anchoring off the W side of Pulau Komodo than off Sumbawa, especially in the Northwest Monsoon.

Winds—Weather.—The Southeast Monsoon lasts from April to October and is strongest in July and August. During these months, S to SE winds blow continuously causing a high S swell and turbulent sea, especially when wind and current oppose each other. In November and December, the two transition months, the sea is comparatively calm. In the Northwest Monsoon there is also a S sea swell. The change from this monsoon to the Southeast Monsoon is not particularly notable.

Tides—Currents.—The tidal currents in Selat Sape are semidiurnal and are only slightly affected by the monsoon drift in the Flores Sea. The tidal currents are weakest about 5 days after the quarter moons, the maximum N and S currents averaging 3 knots. Very strong tidal currents with a maximum rate of 4 to 6 knots occur from 2 to 5 days after the full and new moon.

When the moon's greatest declination occurs during this period, a rate of 8 to 10 knots may be expected; although, during the Northwest Monsoon this only applies to the N current, and during the Southeast Monsoon only to the S current.

Near **Pulau Sentodo** (8°33'S., 119°11'E.), there are frequently strong tide rips and whirlpools which seriously affect vessel steerage.

In the large bight between Pulau Langkoi and Toro Letuhoh, 6.25 miles N, there is frequently an eddy under the shore of Pulau Komodo. During the Northwest Monsoon, from about 4 hours before, to 1 hour after the moon's upper and lower meridian transits, there is a N current which was reported to attain a rate of 2 knots with strong tide rips and eddies. For the remainder of the time the current is S. Under the coast of Sumbawa, in the N part of the strait, the current turns about 1 hour later.

During the Southeast Monsoon, from about 3.5 hours before, to 1.5 hours after the moon's upper and lower meridian transits, the current is N. For the remainder of the time the current is S.

Islands and Dangers in Selat Sape

5.57 Pulau Sapekah (Sapekah) (8°33'S., 119°16'E.), 76m high, is the most useful landmark in the middle of the main route through Selat Sape. The island has the appearance of a wedge with the low end lying N, the flat upper side overgrown with reeds, and the bare S side rising steeply from the sea. A large rock, 6m high, stands on the drying reef close to its NW side. There are great depths around Pulau Sapekah.

Tukoh Mapinka (8°33'S., 119°15'E.), 15.2m high, 1.5 miles W of Pulau Sapekah, are two rocks separated by a narrow, shoal channel. These rocks are flat on top, covered with reeds,

Courtesy of Earth Sciences and Image

Selat Sape as viewed from the Space Shuttle

steep-to, and may be passed close, allowing for the strong tidal currents. A 12.8m patch, the position of which is approximate, lies 1.5 miles W of Tukoh Mapinka. There are heavy tide rips over this patch.

Pulau Barsu Panda (Barsoe Panda) (8°32'S., 119°14'E.) is a bare gray rock, 11m high on its S and N sides, lying 1 mile NW of Pulau Mapinka. A shoal ridge, with a least depth of 4.9m at its outer end, extends nearly 0.3 mile N from Pulau Barsu Panda, and the depths around it are irregular.

Barsu Menyerih (Barsoe Menjerih) (8°31'S., 119°15'E.), 1.75 miles NE of Pulau Barsu Panda, is a small rock awash. Because this rock is never marked by breakers, and there are only tide rips during the strength of the tidal currents, it constitutes a serious danger.

Barsu Basso (Barsoe Basso) (8°29'S., 119°15'E.), 1.5 miles N of Barsu Menyerih, consists of a mass of rocks a few meters

above water on which the sea breaks heavily. Shoal water surrounding the rocks has a diameter of about 0.25 mile.

Pulau Banta (Gila Banta) (8°26'S., 119°18'E.) is mountainous, uninhabited, and mostly covered with reeds. The highest part of the island, 1.5 miles SSW of Tano Oiungke (Toro Oi Uengke), the NE extremity, is 369m high. Three hills on the NW peninsula of Pulau Banta are easy to identify from W. The large bay on the N side of the island is too deep for anchorage.

Lubuan Gili Banta (8°27'S., 119°19'E.), the largest bay on the S side of Pulau Banta, is clear of dangers, but narrows to a width of about 0.4 mile at its head. Depths in the bay decrease from 53m at the entrance, to 7m at its head.

Anchorage may be taken, by vessels with local knowledge, on the W side of Labuan Gili Banta, NE of the W entrance point.

Caution.—A large reef, with a least depth of 4m, lies about 1 mile NNE of the NE extremity of Pulau Banta. The reef is normally marked by strong tidal eddies, except at slack water.

Pulau Komodo

5.58 The E side of Selat Sape is formed by the W coast of **Pulau Komodo** (8°35'S., 119°27'E.), a mountainous island almost entirely covered with forest. A ridge of mountains traverses Pulau Komodo from N to S, but there are no distinctive peaks anywhere that can be used by vessels as a landmark.

Toro Beru (Batu Montjo) (8°26'S., 119°26'E.), the NW extremity of Pulau Komodo, is a steep wooded point. Two bare rocks lie on the coastal reef close W of this point. Relatively strong currents may be encountered off this point.

Lehok Boko (8°29'S., 119°26'E.), entered between a point about 1.75 miles S of Toro Beru, and Toro Lehok Boi, 2 miles farther SW, has limited anchorage area. The head of Lehok Boko is constricted by a broad drying reef which fringes the N shore.

Vessels can anchor, in depths of 18 to 26m, close W of a point on the S side of Lehok Boko, 1.75 miles ENE of Toro Lehok Boi. Toro Lehok Boi is the extremity of a high tongue of land separating Lehok Boko from **Lehok Boi** (8°31'S., 119°26'E.), the next bay S.

Tukoh Lehok Boi, two islets covered with vegetation and some rocks above-water, lie on a drying reef in the middle of the entrance to Lehok Boi, 1 mile S of Toro Lehok Boi.

Anchorage may be taken off the head of Lehok Boi, S of a projecting point which divides the head into two parts outside the 20m curve.

Off-lying Islets

5.59 Several offshore dangers lie W of Toro Lehok Boi, the outermost being Tukoh Gili Banta, 4 miles W. This sharp, bare rock, which rises steeply from the sea has three peaks 60m high. Seen from SW, the peaks are exactly in line. A little over 1 mile NNW of Tukoh Gili Banta is a small dangerous rock usually visible. The surf on this rock cannot be distinguished from the usual tide rips in Selat Sape.

Luluh Tare (8°31'S., 119°22'E.), 1.5 miles SE of the S extremity of Tukoh Gili Banta, is a 21m high pinnacle fringed by a narrow steep-to reef.

Tukoh Lehok Gebah (8°34'S., 119°23'E.), 3 miles WSW of Toro Lehok Boi, consists of two islets on a drying reef. A bank, with a depth of 37m, lies near the 200m curve, 1 mile W of Tukoh Lehok Gebah.

Overfalls marking this bank gives it the appearance of a serious danger. Tukoh Seri Kaja, 1 mile NE of Tukoh Lehok Gebah, is a steep-to islet covered with reeds and 41m high. Tukoh Seri Kaja resembles Tukoh Lehok Gebah, but is larger and higher.

Tanjung Saloka (8°35'S., 119°22'E.), midway on the W coast of Pulau Komodo, is a high, steep point. A steep-to rock, awash but seldom breaking, lies 1 mile NNE of Tanjung Saloka.

Toro Letuhoh (8°37'S., 119°23'E.), 2.75 miles S of Tanjung Saloka, is high and from N or S appears as a sugarloaf.

Nisa Leme (8°37'S., 119°21'E.), 2 miles WNW of Toro Letuhoh, is a rugged rock, 40m high, and can be passed close-to. Labuan Letuhoh lies E of Toro Letuhoh and is the only anchorage S of Tanjung Saloka.

A steep rocky islet, covered with vegetation, lies on the wide bank extending 0.4 mile N from the E entrance point of the bay. At the head of the bay is a sandy beach. Ships seldom lie quietly in Labuan Letuhoh.

Between Toro Letuhoh and the SW extremity of Pulau Komodo, 6 miles S, the coast is high and steep. The S end of the range traversing the island, 519m high, rises 3 miles NE of the SW extremity of Pulau Komodo.

Pulau Langkoi (Langkoi) (8°44'S., 119°23'E.), close off the SW extremity of Pulau Komodo, to which it is joined by a reef, is a steep bare islet rising to a narrow prominent ridge. The islet is a good landmark for vessels approaching Selat Sape from S. Above-water rocks, extend 0.2 mile S from Pulau Langkoi.

Sumbawa—South Coast

5.60 From **Toro Rata** (8°45'S., 119°09'E.) to **Tporo Jampang** (Tano Jampa) (8°45'S., 118°59'E.), 9.5 miles W, the coast is mainly steep and rocky with an occasional sand beach.

A light is shown from Toro Jampang. Tano Baku (Toro Bakoe), 2.5 miles E of Tano Jampa, is marked by a 359m high hill close NE. Seen from ESE, the hill is conical, but from S it is tabular with the SE edge higher.

Teluk Waworada (Waworada Baai) (8°46'S., 118°58'E.) is entered between Tano Jampa (Toro Djampang) and **Tano Sido** (Toro Sido) (8°47'S., 118°58'E.), about 2.75 miles SSW. The bay extends 16 miles W from its entrance and affords anchorage throughout. The bay is backed by mountains with flat land generally at the foot of the slopes.

Tides—Currents.—No currents of any significance are reported in Teluk Waworada. The possibility of a crosscurrent in front of the entrance must be allowed for.

Depths—Limitations.—Teluk Waworada has general depths from 36.6 to 54.9m within 5 miles of the head. The 20m curve lies about 1.25 miles from the head and less than 1 mile from the other shore. Close within the curve are numerous dangers. The S and N coasts are indented by bights forming several bays encumbered by drying shoals. Offshore islands, shoals, and various other dangers lie within Teluk Waworada. Nisa Bea and Nisa Dorah islands lie; respectively, 8.75 mile and 11 miles W of Tano Jampa.

Directions.—For standing into the bay, the S end of Nisa Bea in range, bearing 279°, with the N end of Nisa Dorah is a good mark. In clear weather, **Doro Simposai** (8°43'S., 118°42'E.), 416m high, will be seen on this bearing and when

passing, **Toro Pangkajarat** (8°46'S., 118°55'E.) should not be opened S of Nisa Dorah. Nisa Bea can be passed on either side, but if proceeding N of the island, care must be taken to avoid the 3.7m reef near mid-channel.

5.61 **Tanjung Langundu** (Toro Langoedoe) (8°49'S., 118°59'E.), 1.75 miles SSE of Tano Sido, is conspicuous for three sharp peaks, each higher than the previous when progressing inland. From Tanjung Langundu to **Tanjung Doro** (Toro Doro) (8°53'S., 118°29'E.), a steep and rocky point located 29 miles W of Tanjung Langundu, the coast indents 3.5 miles N in the form of a long bight.

Doro Rasa (8°48'S., 118°43'E.), 15 miles W of Tanjung Langundu, is a prominent bare mountain, 431m high. From E, it is conical-shaped with a dome-shaped summit of a ridge, and from W appears as an isolated half-sphere.

Teluk Cempi (Tjempi Baai) (8°46'S., 118°21'E.), entered between Tanjung Doro and Tanjung Baru (Tanjung Baroe), 19.5 miles W, extends 17 miles NE and is backed on either side by high land, except at its head. The E shore of Teluk Cempi, between Tanjung Doro and **Toro Huu (8°47'S., 118°24'E.)**, 8 miles NW, is steep, wooded, and fringed by a drying reef. Toro Huu is the SW extremity of a low sandy point covered with paddy fields. Batu Kurung Buha (Batoe Koeroeng Boeha), a reef with depths of less than 5.5m, extends 2.25 miles WNW from Toro Huu, and forms a breakwater across the entrance to the bay.

There are some rocks awash near the outer edges of the reef, and depths are very irregular up to the 20m curve.

Though surf usually marks the reefs, it does not indicate the edge.

Good anchorage is afforded along the W side of Teluk Cempi. Good anchorage, sheltered from the swell, may be taken N of Batu Kurung Buha.

Caution.—Because of the muddy state of the water, caused by numerous small rivers flowing into the bay, the reef is seldom marked by discoloration. Tidal currents in and out of the bay are fairly strong, but precise information is lacking.

5.62 Between **Tanjung Baru** (8°53'S., 118°10'E.) and Tanjung Mata, 15 miles WSW, is **Teluk Tiro** (Telok Baroe) (8°52'S., 118°04'E.). The head of the bay and the E side are formed by sandy beaches backed by palm trees. The E entrance point of the bay is Tanjung Baru, with the bay extending 8.75 miles W.

Anchorage may be obtained in the NE part of Teluk Tiro during the Southeast Monsoon, and in the change of monsoons, in a depth of 37m.

The coast between Tanjung Mata and **Tanjung Sebu** (Seboe) (9°03'S., 117°20'E.), a steep point about 35 miles WSW, is identified by several bays with sandy beaches and many rivers fronted by drying reefs.

Unter Satong (Satong) (8°52'S., 117°46'E.), about 430m high, lies about 9.5 miles WNW of Tanjung Mata.

When seen from S, it shows a number of peaks. A hill, 346m high, prominent for its conical shape when viewed from S or E, is located about 9 miles, bearing 238° from Unter Satong.

From Tanjung Sebu to Tano Garantah, the coast trends 11.5 miles W forming the broad bight **Teluk Lampui** (Lamar) (9°03'S., 117°13'E.). At the head of this bay are several streams. The shore of Teluk Lampui consists of an uninterrupted sand beach, fronted by a drying reef, lying at the foot of mountains covered with low vegetation.

Anchorage may be taken, by vessels with local knowledge, off the common entrance to the rivers. A rock, visible 5 miles from the W, lies close off Tano Garantah.

Between Tano Garantah and **Tanjung Mangkun** (9°01'S., 116°44'E.), the coast trends 26 miles W.

Tanjung Moneh (Talonan) (9°06'S., 117°02'E.), a low point where a tongue of land projects across a small bay, lies about 7.5 miles W of Tano Garantah. The coast between Tanjung Talonan and Tanjung Mangkun, 18.5 miles WNW, is comprised of a sandy beach fringed by a drying reef and backed by a narrow strip of palms.

Off-lying Dangers to the North

5.63 The sea area N of Bali, Lomok, and Sumbawa, as far as the parallel 5°S, consists of several island atolls along with islets, shoals, reefs, and accompanying dangers. There are several extensive detached shoal banks, notably **Kepulauan Tengah** (7°30'S., 117°29'E.) and **Kepulauan Liukang Tenggaya** (6°33'S., 118°48'E.) and the unnamed bank on which stands **Pulau Kalukalukuang** (5°12'S., 117°40'E.), together with several smaller banks in the area embraced by these three. All these banks appear to lie on a shelf with depths of less than 550m. In addition to these banks, there are some isolated small shoals and islets rising abruptly from deep water.

Kepulauan Kangean (7°03'S., 115°00'E.) consists of one large island and several smaller ones, with numerous islets surrounding and between them. These islands are only important to navigation as landmarks. The sea area N of the larger islands of the groups, as far as the parallel 6°20'S, is studded with reefs and dangers. Navigation in this area is inadvisable.

Karang Takat (7°03'S., 115°00'E.), a large steep-to reef marked on its W edge by a light, lies 12 miles WSW of the W extremity of **Pulau Kangean** (6°55'S., 115°20'E.). The tidal currents are irregular and set strongly along the W and E points of the reef. The reef is plainly marked by discoloration, when covered.

The passage between the W extremity of Karang Takat and the shoal ground about 11 miles SW, is deep and clear, except for a shoal with a 5.5m depth, about 1 mile W of Karang Takat. Pulau Kangean, the largest island of the group, is densely wooded and consists of coral lime heaved up by volcanic action. The greater part of the N coast is mountainous.

Tanjung Tinggi (6°50'S., 115°13'E.), the NW extremity of the island, is high, wooded, and visible for 24 to 28 miles. Teluk Ketapang, which indents the coast just S of this point, is the only anchorage of importance. It is entered between **Pulau Mamburit** (6°51'S., 115°13'E.), where a light is located, and Tanjung Batu Teteh, 2.75 miles SSW. The N side of the bay is formed by a hilly promontory terminating in Tanjung Batu Guluk.

Anchorage may be obtained, in depths of 13 to 15m, hard clay, about 0.2 mile ESE of Tanjung Batu Guluk.

Takat Patokanan (6°51'S., 115°14'E.) consists of three drying reefs. Takat Luar and Takat Takat, two other drying reefs, separated by a narrow foul channel, lie 0.4 mile E and 0.7 mile SE, respectively, of Takat Patokanan.

This channel, which has a depth of 0.9m, leads to **Kalisangka** (6°51'S., 115°15'E.) pier, 1.5 miles SE of Tanjung Batu Guluk. A light is shown from the head of the pier.

Anchorage may be obtained, in depths of 5.7 to 7m, soft clay, 0.2 mile W of the W end of Takat Takat. The S coast of Pulau Kangean is low and indented with many bays and inlets, all encumbered with islets and reefs. Teluk Hekla and Teluk Gedeh, with its entrance 5 miles SE, are of no importance.

5.64 Pulau Saubi (7°00'S., 115°26'E.) and Pulau Sabunting, both of which are low, lie 6.5 and 11 miles E of the entrance to Teluk Gedeh. Anchorage may be taken, with local knowledge, N of Pulau Saubi, in depths of 20 to 33m, mud.

Pulau Paliat (6°58'S., 115°36'E.) is separated from Pulau Kangean by a narrow channel. A ridge of hills extends the length of the island, rising to its highest summit of 143m near its NW end.

Pulau Sapankur (7°00'S., 115°31'E.) and Pulau Saur lie 2 miles off the S side of Pulau Paliat, and are high in the middle and cultivated. Pulau Saebus, 1 mile E of Pulau Saur, is covered with coconut palms, inhabited, and cultivated.

Pulau Sapeken (7°00'S., 115°42'E.), next in importance to Pulau Kangean, lies 1 mile E of Pulau Paliat with some zinc-roofed houses near its S end. Pulau Parappo lies in the channel. The latter is covered with mangroves and apparently uninhabited.

Pulau Bangkan (7°01'S., 115°41'E.), 0.5 mile S of Pulau Paroppo, is reef fringed and mangrove covered. Anchorage may be taken off the SE side of Pulau Sapeken, in a depth of 11m. Caution is necessary in order to avoid the numerous shoals and mud flats. The area has not been completely surveyed.

Pulau Silarangan (6°56'S., 115°38'E.), 2 miles N of Pulau Paliat, with some scattered trees, lies on the W end of an extensive reef.

Pulau Satabo (6°58'S., 115°42'E.), 4.5 miles ESE of Pulau Silarangan, is wooded and lies on the W end of an extensive reef, on the E end is Pulau Sidulang-kecil (Pulau Sedulang-ketjil). The latter has a small high point with clumps of mangroves on the reefs. Pulau Sidulang-besar (Pulau Sedulang-besar), lies about 1.25 miles NE of Pulau Sidulang-kecil.

Pulau Saular (6°56'S., 115°44'E.), about 2.5 miles W of Pulau Sidulang-besar, lies on the SE end of a reef. A hospital with a red roof is situated on Pulau Saular.

Pulau Pagerungan-kecil (6°57'S., 115°52'E.), located about 4.25 miles E of Pulau Sidulang-besar, is densely covered with coconut palms. Pulau Pagerungan-besar, 1 mile E, is cultivated in the W part and wooded on its E.

Caution.—A gas field, which consists of an offshore platform, lies 2 miles E of Pulau Pagerungan-besar. Pagerungan Marine Terminal consists of an SBM lying 2 miles S of the platform and an anchorage area for waiting ships lying 2 miles S of the SBM.

Tankers up to 125,000 dwt can be handled. A depth of 7m was reported to lie 3 miles E of the SBM.

5.65 Pulau Sepanjang (Pulau Sapanjang) (7°10'S., 115°50'E.), the SE and second largest island of Kepulauan Kangean, is low and wooded. A fishing village stands on the NE extremity of the island. It has been reported that the S coastal reef extends about 0.3 mile farther S than charted.

Pulau Saseel (7°05'S., 115°45'E.), near the NW end of the reef fringing Pulau Sapanjang, has a village on its E side and some scattered trees. Pulau Seridi-kecil and Pulau Seridi-besar, 2.5 miles and 4 miles NE of Pulau Saseel, are wooded and uninhabited.

Pulau Sakala (6°57'S., 116°15'E.), 12 miles ENE of the NE point of Pulau Sepanjang, is the E of Kepulauan Kangean, and although low, it has some tall trees which are visible from about 17 miles. The island is fringed by a steep-to reef, the NE edge of which is covered with vegetation, giving it the appearance of a detached island when seen from W.

A light is shown from a white metal framework tower on the E side of Pulau Sakala.

Caution.—The sea area N of the larger islands of Kepulauan Kangean, as far as the parallel 6°20'S, is studded with reefs and dangers.

There is deep water between these dangers, but few marks are available for avoiding them and navigating in this area is inadvisable.

A rock, with a depth of less than 2m, has been reported to lie about 25 miles S of the light on Pulau Sakala.

5.66 Pulau Araan (6°29'S., 115°45'E.), the largest of the many islets, has high trees. All the islets in the area are uninhabited, but are temporarily occupied by fishermen at times.

Pulau Aluan, 9 miles S of Pulau Araan, has three round-topped trees.

Pulau Igangan (Pulau Patjar) (6°40'S., 115°38'E.), 5 miles SW, has two tall trees, and Pulau Segentoh, 1.75 miles SE of the same islet, has a slender row of casuarenas. All the above islets, which lie on drying reefs, are visible in clear weather from 13 miles.

Pulau Miongan (6°43'S., 115°39'E.), lying 6 miles SSW of Pulau Aluan, has a remarkable tree, and Pulau Timunan, which lies 10.5 miles WNW of Pulau Aluan, is covered with low vegetation. Both islets are reef-fringed, and visible from between 7 miles and 8 miles.

5.67 Pulau Bunginnjampur (6°36'S., 115°30'E.), 3 miles SSW of Pulau Timunan, is a reef fringed, sand cay covered with vegetation, visible at 6 miles.

Gosong Balam (6°25'S., 115°13'E.), with a depth of 2.1m, lies about 31 miles W of Pulau Araan. An 11m patch lies 6 miles WNW, an 11.9m patch lies 10.5 miles SW, and a drying rock lies 10 miles SE; respectively, of Gosong Balam. These are the known NW dangers in the area. In the NE part of the area is **Kwong Eng Reef** (6°32'S., 116°07'E.), with a least depth of 1.2m. Breakers were reported to lie 17 miles NNW of Kwong Eng Reef and a 6.9m patch lies 9 miles to the ENE.

Sibbalds Bank (5°45'S., 117°05'E.), lying about 73 miles NE of Kwong Eng Reef, has a least depth of 7.6m. It lies at the SW end of an extensive coral bank.

Tide rips have also been observed from 6 miles SW, to 6 miles SE of the bank. A light is shown from a black metal framework tower on the NE side of the bank.

The SW end of a large bank, with charted depths of less than 183m, lies 10 miles ESE of Sibbalds Bank, and extends about 63 miles NE. There are several islands and dangers in the E and NW part of this bank. A bank of coral, with depths of 11m, lies 15 miles SE of Sibbalds Bank.

5.68 Pulau Kalukalukuang (5°12'S., 117°40'E.), 59m

high and covered with coconut palms, stands on the NW side of the bank about 48 miles NE of Sibbalds Banks. It was reported to be radar conspicuous at 24 miles, and is visible at least 12 miles in clear weather. A coral reef fringes the island. A light is shown from the N extremity of Pulau Kalukalukuang, and a racon transmits from the light. A shoal, with a depth of 12.2m, was reported to lie 9 miles S of the S extremity of Palau Kalukalukung.

Pulau Butongbutongan, the N and smaller island, lies 16 miles NE of Pulau Kalukalukuang on an extensive drying reef. It is covered with banana trees and uninhabited.

Pulau Doangdoangan-kecil (5°15'S., 117°53'E.), about 33m high and covered with coconut palms, lies 13 miles ESE of Pulau Kalukalukuang and is fringed by a drying reef. Pulau Doangdoangan-besar, visible 12 miles in clear weather, lies about 5 miles SSE of Pulau Doangdoangan-kecil. It is fringed by a drying reef. The island has been reported to lie 2 miles NW of its charted position.

Doangdoangan Besar Light (5°24.8'S., 117°56.8'E.) is shown at a height of 41m.

Pulau Marasende (5°07'S., 118°09'E.), about 29m high, 15 miles ESE of Pulau Butongbutongan, may be identified by a group of high casuarinas on its N end, visible 16 miles in clear weather. Elsewhere, the island is covered with coconut palms and a village stands on its W side. Karang Marasende, about 6 miles SSW of Pulau Marasende, is a steep-to drying coral reef of small extent.

Laars Bank, consisting of three isolated coral reefs covered with fine white sand, rises steeply from great depths. The N end of the N reef lies 23 miles SE of Pulau Marasende.

Pulau Dewakang-lompo (5°24'S., 118°26'E.) and **Pulau Dewakang-cadi** (5°30'S., 118°28'E.), both about 29m high and covered with coconut trees, lie on the N reef. Pulau Dewakang-lompo is visible in clear weather for 13 to 14 miles and Pulau Dewakang-cadi for 12 to 13 miles. The reef on which Pulau Dewakang-lompo lies forms a funnel-shaped opening on the S side, where small vessels with local knowledge can obtain good anchorage.

The channel leading into the S side of the island is encumbered with many shoals and drying rocks. A light is shown on a 30m high white metal framework tower from the N end of the island; a radiobeacon transmits from it.

Bone Laisi (5°55'S., 118°12'E.), the S reef, has a least depth of 10.5m on a ridge along the NW part of the reef.

Pisani Bank (6°07'S., 118°17'E.), with a least depth of 20m, lies near the S end of Bone Laisi, 43 miles SSW of Pulau Dewakang-lompo. A detached shoal, with a depth of 13.1m, was found close E of the S end of Pisani Bank.

Bone Pute (5°43'S., 118°18'E.), the middle reef, is separated from Bone Laisi by a deep channel, 2 miles wide. There is a least depth of 5.8m over the N end of Bone Pute. In the channel between Bone Laisi and Bone Pute, a 5m patch lies 2 miles NE of the N end of Bone Pute; although, it has been reported that less water exists in this area. A strong current causes rips and overfalls.

5.69 Pulau Banka Oeluang (5°30'S., 118°38'E.), 10.5 miles E of Pulau Dewakang-cadi, is partly covered with coconut palms. It was reported as a good radar target at 13 miles.

Karang Bankauluang (5°50'S., 118°28'E.), with a least depth of 9.6m, lies 19 miles S of Pulau Dewakang-cadi and is steep-to.

De Greve Shoal (5°58'S., 118°26'E.), slightly discolored and with a least depth of 11m, sand and stones, lies about 6 miles SW of the S extremity of Karang Bankauluang.

Taka Rewataya (6°05'S., 118°54'E.), 19 miles W of De-Greve Shoal, is an atoll-shaped coral reef, the edge of which dries except in one part of the SW side, where there is a channel with depths of 2 to 4m giving access to a deep basin. A light is shown from a 23m white, eight-sided metal tower with red stripes on the SW edge of the bank. Kepulauan Liukang Tenggaya (Kepulauan Tenggaya) (Pulau Pulau Sabalana) and Kepulauan Tengah, two island groups between the parallels 7°50'S and 6°30'S, extend about 130 miles NE. Both main groups are divided into two lesser groups lying on separate atolls NE and SW of each other. At the SW end of Kepulauan Tengah are Sekunci (Sakuntji) and Pulau Sadapur, both of which lie on the same atoll. Separating the four main atolls, on which these islands and reefs lie, are wide channels with depths of over 183m that may be safely navigated by day. The islands are seldom visited, except for small craft collecting copra or during the fishing season.

The large islands of the groups have a peculiar formation in that the seaward side consists of a ridge of reefs, 45 to 91m wide, thickly covered with vegetation.

The main island lies behind this ridge of reef, and the intervening reef either dries or is below-water. In some islands the formation is very pronounced and in others, the growth of the coral reef is in its early stages.

Tides—Currents.—Over the atolls on which Kepulauan Liukang Tenggaya and Kepulauan Tengah lie, and the channels between them, the tidal currents only appear appreciable in that they strengthen the monsoon current, when both are running in the same direction, and weaken it when in opposition. A rate of 1 to 2 knots over the atolls is not exceptional. The combined current is usually strongest along the E and SE edges of the atolls, in some places attaining a rate of 2 to 3 knots for about 1 hour, with whirlpools and heavy tide rips. Although the same peculiarity is sometimes observed along the W and NW edges of the atolls, it does not occur in so marked a degree. It is always advisable for passing vessels to give the edges of the atolls a wide berth.

5.70 Pulau Jailamu (Djailamu) (6°33'S., 118°48'E.), at the NE end of the atoll, lies about 29 miles SSW of **Taku Rewataya** (6°05'S., 118°54'E.). The majority of the islands of this atoll lie on its NE and SE edges. About 5 miles off the W edge are two detached islets and two detached reefs. Between Pulau Jailamu and **Pulau Lilikang** (6°48'S., 119°11'E.), about 27 miles SE, the atoll is formed by a chain of islets.

There is a village standing among palm trees in the middle of **Pulau Sabaru** (6°35'S., 118°50'E.), located 3 miles SE of Pulau Jailamu. Another village on the SW side of Pulau Balobaloang-besar lies 1.5 miles farther SE.

Dog Reefs (6°44'S., 118°50'E.), with a least depth of 6.4m, SW end lies 9 miles SSW of Pulau Balobaloang-besar. Numerous patches, with a least depth of 7.6m, and a below-water rock at their SW end, extend 14 miles SW from Dog Reefs.

Pulau Banawaya (6°50'S., 119°12'E.), marked by a light, lies on the E extremity of the atoll with Pulau Lilikang, 2 miles N, on the E end of a drying reef.

Pulau Sabalana (6°51'S., 119°07'E.), the largest island on the atoll, lies near the middle of the large drying reef, 4 miles WSW of Pulau Banawaya, and is covered with mangroves on its SE side. Pulau Santigiang lies 2.75 miles SW of Pulau Sabalana on the SW end of a large reef.

5.71 **Pulau Sanana-besar** (6°50'S., 119°02'E.) lies 5 miles WNW of Pulau Sabalana, while **Pulau Soroabu** (6°55'S., 119°02'E.) lies 5 miles SW of the same island.

Pulau Meong (6°51'S., 119°00'E.), a small sand cay, lies 6 miles W of Pulau Sabalana with **Pulau Matalang** (6°52'S., 118°58'E.), 1.25 miles WSW. Between Pulau Matalang and **Pulau Sarege** (7°04'S., 118°39'E.), the southernmost islands of the group, are **Pulau Balaohong** (6°53'S., 118°55'E.), **Pulau Manukang** (6°56'S., 118°52'E.), and **Pulau Sadulang** (6°58'S., 118°49'E.), with apparently clear channels between.

Anchorage may be taken in an emergency in a basin, with depths of 7.3 to 16.4m, sand, enclosed by shoal water extending between **Pulau Sanana-kecil** (6°49'S., 119°01'E.), Pulau Sanana-besar, Pulau Santigiang, and Pulau Soroabu (Pulau Suruabu), SE of Pulau Meong. This anchorage affords shelter to vessels with local knowledge.

Directions.—The basin is entered from W, passing either N or S of Pulau Meong's fringing, drying reef. During the Northwest Monsoon, it is advisable to take the passage between Pulau Matalang and Pulau Meong, thus passing S of Pulau Meong and over a 7.3m stony ridge. In the Southeast Monsoon, vessels can pass N of Pulau Meong, where a least depth over the ridge is 5.9m.

5.72 **Pulau Pelokang** (7°11'S., 118°25'E.), comprised of three islets, lies at the E end of the atoll. There is a light on the islet.

Pulau Sapuka-besar (7°04'S., 118°11'E.), the largest island of the group, lies about 15 miles WNW of Pulau Pelokang with a chain of reefs between. It lies near the SE end of an extensive reef in the middle of the N side of the atoll. Pulau Sambardjaga and Pulau Sambargigitang lie; respectively, on this chain of reefs about 3 miles ESE of and 7 miles SE of Pulau Sapuka-besar.

Pulau Sapuka-kecil (7°07'S., 118°10'E.), close S of Pulau Sapuka-besar, lies on the NE part of a 5 mile long drying reef. Numerous reefs extend W from this drying reef. Anchorage may be taken S of the edge of the reef fringing Pulau Sapuka-besar, in depths of 37 to 55m.

Directions.—Pass S of Pulau Sambardjaga, steering for Pulau Sapuka-kecil, bearing 258°. When the W extremity of Pulau Sapuka-besar bears 305°, steer for it and the anchorage.

The passage between the reefs, on which Pulau Sapuka-besar and Pulau Sapuka-kecil stand, may be used by vessels with local knowledge.

5.73 **Pulau Kambanglamari** (7°04'S., 118°00'E.) lies near the NW end of the atoll with Pulau Tinggalungang 3 miles NE. The W side of the atoll, between Pulau Kambanglamari and **Pulau Tokohbatu** (7°13'S., 118°01'E.), 9 miles S, is free of dangers except for a 4.6m patch, located 2.5 miles SSW of Pulau Kambanflamari. A ridge, with a least depth of 5.4m, extends 5 miles S from Pulau Tokohbatu.

Pulau Lamuruang (7°18'S., 118°06'E.), the southernmost island of the atoll, lies about 7.5 miles SE of Pulau Tokohbatu. There is a noticeable tree on Pulau Lamuruang.

An extensive steep-to bank, with a least depth of 10.1m on its W edge, lies 23 miles SSE of Pulau Lamuruang.

The bank is marked by heavy rips and the bottom, sand and coral, is visible in many places.

5.74 Kepulauan Tengah stands on an atoll which rises very steeply from the sea on all sides. The E extremity lies about 15 miles SSW of Pulau Lamuruang. The charted 200m curve around the atoll is clearly defined.

Except at the E end where there are numerous reefs, the atoll can be easily navigated. The passages between the islets are mostly deep and clear of dangers, and the reefs are clearly marked by discoloration; patches, with depths of 12.8 to 16.5m, are so plain that they give the impression of much less water. The islets on this atoll are about 29m high, sandy, and covered with coconut palms except where otherwise stated. All of them stand on drying reefs.

Karang Satunggul (7°32'S., 118°00'E.), the E extremity of the atoll, is formed by three sand cays on the NE side of the reef, with sand cays on its SE and SW edges. Several reefs lie between Karang Satunggul and Pulau Sapinggang, 8 miles WNW. Foul ground extends from Karang Satunggul almost to **Pulau Satunggul** (7°32'S., 117°53'E.), 6 miles W, and a reef extends for 7 miles WNW.

Pulau Aloang (7°23'S., 117°48'E.) lies in the middle of the NE side of the atoll, 4.5 miles WNW of Pulau Sapinggang. Pulau Tampaang, a sand cay, lies about 3.5 miles WNW of Pulau Aloang.

Between Pulau Tampaang and **Pulau Sadujung** (Pulau Saujung) (7°21'S., 117°32'E.), 12.5 miles W, there is a large drying reef from which foul ground extends nearly 3 miles S.

Pulau Sadujung lies in the middle of the N side of the atoll. Sand cays lie 4 miles SE and 7.75 miles SSE, respectively, of Pulau Sadujung.

Pulau Marabatuang (7°29'S., 117°29'E.), 9 miles SSW of Pulau Sadujung, is a low sandy islet covered with palm trees and mangroves on its E side. This islet is exceptional in its formation as the outlying ridge lies on its E side of the islet, instead of the seaward side.

5.75 **Pulau Sailus-besar** (7°28'S., 117°26'E.) lies 2.25 miles SW of Pulau Marabatuang and is 59m high.

Villages stand on the E and W sides of the island, where fresh water wells exist. Anchorage may be obtained by vessels with local knowledge either E or SW of Pulau Sailus-besar, outside the 20m curve.

Directions.—From N, pass between Pulau Sailus-besar and **Pulau Satengar** (7°32'S., 117°20'E.), 5.5 miles W, if proceeding to the SW anchorage.

If proceeding to the E anchorage, pass between Pulau Sailus-besar and Pulau Marabatuang. From S, steer for the W extremity of Pulau Sailus-besar, bearing between 005° and 015°. This approach leads in a least depth of 16.5m over a sandy ridge between **Pulau Sailus-kecil** (7°35'S., 117°27'E.), close SW of Pulau Sailus-besar, and the drying reef 5 miles W. From E, steer 270° for the S extremity of Pulau Sailus-besar, which leads to the E anchorage.

Pulau Satengar (7°32'S., 117°20'E.), the W islet of the main atoll, lies about 5.5 miles W of Pulau Sailus-besar, with a village on its E end.

Pulau Kapoposangbali (7°30'S., 117°11'E.), 5.5 miles

WNW of Pulau Satengar, is the W island of the group and lies on the SE end of a detached atoll. A tall tree stands in the middle of the island and is prominent, except from N. A light is shown from the NW side of the island.

The passage between this atoll and the main atoll is very deep and clear of dangers. It cannot be recommended because it is comparatively narrow and the tidal currents are strong.

5.76 Karang Kapoposangbali (7°36'S., 117°12'E.), 5.5 miles S of Pulau Kapoposangbali, is a sand cay. Another sand cay and a large drying reef lie about 3.25 miles and 8 miles E of Karang Kapoposangbali. The N side of a reef, an enclosed atoll, very steep-to on its outer side, lies about 9 miles S of Karang Kapoposangbali.

On the N edge of the atoll are drying reefs. A sandy islet, about 29m high and covered with vegetation, lies on the E end of the W reef. A disused lighthouse stands on the W end of the W reef. The central reef dries. On the E reef, there are three low sandy islets covered with vegetation. From the E islet, **Pulau Sadapur** (7°46'S., 117°13'E.), a ridge of below-water coral extends along the E side of the atoll.

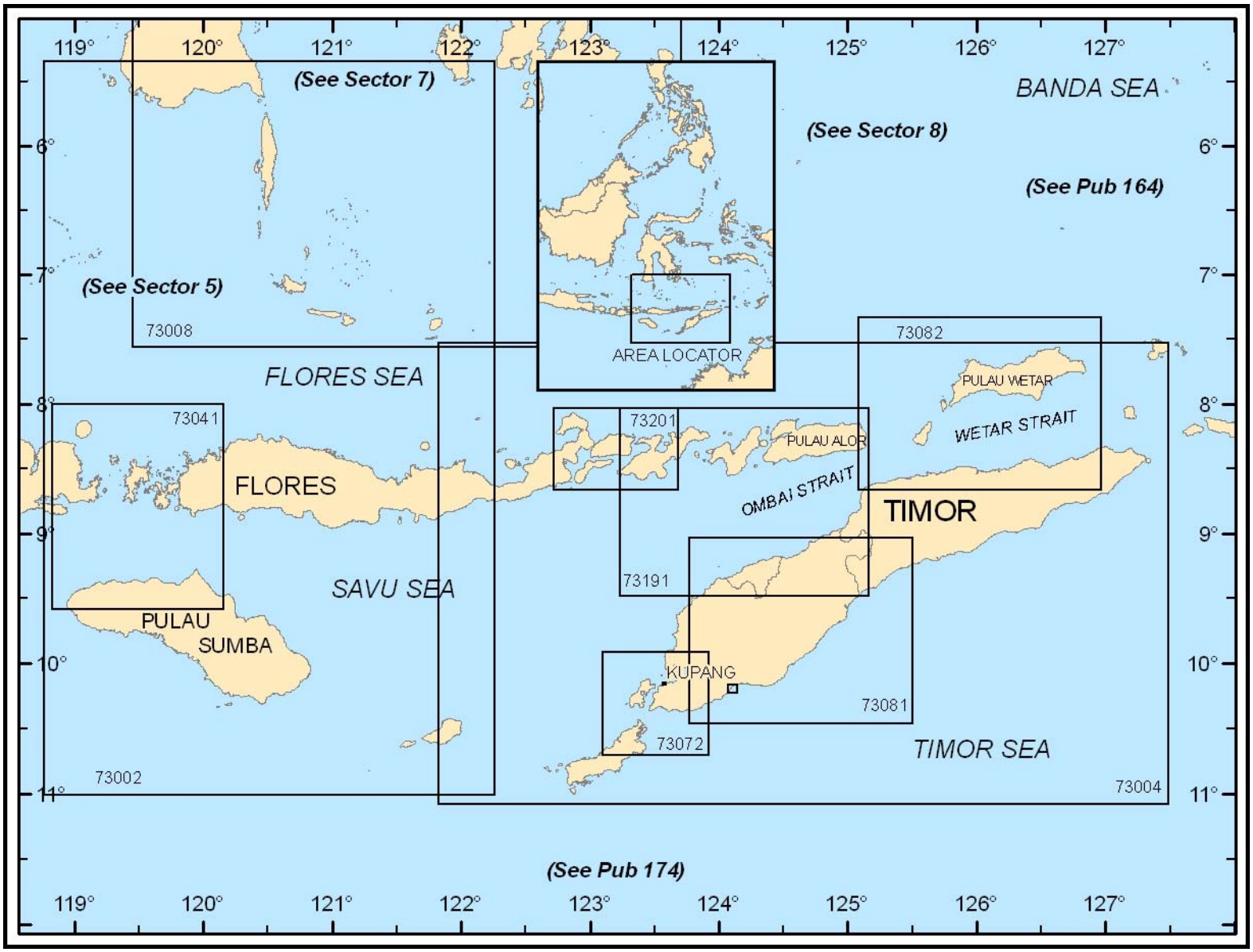
5.77 Sekunci (Sekuntji) (7°51'S., 117°12'E.), a reef, lies on the S side of the atoll and consists of a steep-to reef and coral sand, the latter always above-water. A lighthouse situated on the E part of Sekunci Reef was reported to be a radar target at 6 miles.

Anchorage.—The W side of Sekunci may be approached cautiously, and anchorage may be obtained, in depths of 29 to 55m, sand and coral.

Directions.—Having passed through Selat Bali, Selat Lombok, or Selat Alas, a vessel may proceed through several channels heading N. Passing between Kepulauan Kangean and Kepulauan Tengah, keep W of Sibbalds Banks and **Pulau Kalukalukuang** (5°12'S., 117°40'E.), then NE about 110 miles and N into the E side of Makassar Strait.

The channel between the bank on which Pulau Kalukalukuang and adjacent islands lie and Laars Banks, 18 miles ESE, is used by vessels proceeding N along the E side of Makassar Strait.

The channel between Laars Banks and **Taka Rewataya** (6°05'S., 118°54'E.), 38 miles E of their S end, is frequently used by vessels proceeding between **Surabaya** (7°12'S., 112°44'E.) and **Ujung Pandang** (5°08'S., 119°24'E.).



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **6** — CHART INFORMATION

SECTOR 6

NUSA TENGGARA (LESSER SUNDA ISLANDS)

Plan.—This sector describes Pulau Sumba, Flores, Pulau Lomblen, Kepulauan Alor, Timor, and Pulau Wetar together with the adjacent islands and straits. The descriptive sequence is from W to E. Pulau Tana Jampea, Kepulauan Macan, and adjacent islands which lie N of the central and E parts of Flores are described in an E to W direction.

General Remarks

6.1 Nusa Tenggara, previously known as the Lesser Sunda Islands, extend about 750 miles E from Jawa to Timor. The principal islands of the chain described in this sector consist of Flores, Pulau Solor, Pulau Lomblen, Pulau Pantar, and Pulau Alor plus their dependent islets. The islands of Pulau Sumba, Pulau Sawu, Pulau Roti, and Timor lie S of the chain but are an integral part of the Lesser Sunda Group.

The primary physical feature of the principal chain of islands is a line of volcanic ridges running from end to end. The W end of the chain has the highest elevations with lesser elevations along the E end of the chain. Pulau Sumba, Pulau Sawu, and Pulau Roti are off the main volcanic line. The island of Timor, differing considerably in physical aspect from the rest of the group, is traversed by a series of mountains seldom rising higher than 1,829 to 2,134m.

Selat Linta, between Pulau Komodo and Pulau Rintja, is seldom used. Selat Molo, between the latter island and Flores, is navigable only by small craft because of the currents in its narrowest part. Selat Flores, at the E end of Flores, is deep and clear.

The islands which lie between Flores and the S end of Sulawesi to the N, and which are described in this sector have no ports of importance and are usually only frequented by small inter-island coasters. Exposed anchorage is provided in the vicinity of some of these islands.

Winds—Weather.—The general characteristics of the weather, which prevails in the area covered by this sector, have been previously described in paragraph 5.1. The climate of Pulau Sumba is pleasant with temperatures averaging between 26°C and 32°C. Flores has a dry climate.

Tides—Currents.—In the Flores Sea the currents set W during the Southeast Monsoon and E during the Northwest Monsoon. Both of currents are, on the average, stronger than those in the Java Sea, with the E current somewhat stronger than the W current. Maximum rates of 2.5 knots or more have been recorded.

The tidal currents in the straits will be discussed along with a general description of the straits.

Regulations.—For information regarding designated Archipelagic Sea Lanes, as defined by the United Nations Convention on the Law of the Sea (UNCLOS), passing through the Savu Sea, see the Indonesia section of Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

6.2 **Pulau Sumba** (9°40'S., 120°00'E.) lies 35 miles SE of Pulau Sumbawa. Except for its S side, the island is generally low along the coast and mountainous farther inland. In the N central part the island rises to a height of almost 914m; in the SE part the elevation is a little over 1,219m. Volcanic activity has never been observed.

The central and E parts of Pulau Sumba are almost all bare tableland, cut by rocky ravines. The W part of the island is hillier and has more vegetation.

The numerous rivers consist of shallow streams of no navigational importance. In the river valleys of central Pulau Sumba, there are a few small villages situated at great distances from each other.

The only useful landmark on the N shore is the 445m high projection of high land that terminates in Tanjung Sasar.

Visible landmarks along the S shore are the mountains just N of the S extremity of the island, especially the highest point, located 18 miles NW of the southernmost point.

The mountains have been reported to be identifiable by radar at 12 miles.

Winds—Weather.—The climate of Pulau Sumba is very healthful and there is little sickness reported among the inhabitants.

The average daytime temperature is in the 26° to 32°C range. November is the hottest month, with the temperature frequently reaching 35°C. From mid-June to August, the nights are cool and the temperature seldom exceeds 15°C.

The average rainfall is 800mm. The wettest months are January and February, with a total of 240mm. During the Northwest Monsoon, in February, the rivers become swollen.

From June to October, it seldom rains near **Waingapu** (9°38'S., 120°16'E.), on the N coast, and the land in this district becomes dry and withered.

Tides—Currents.—The direction of the current depends on the monsoons. From April to October, the current is W and from December to March, it is E. In November the currents are generally SE or SW.

Depths—Limitations.—The 200m curve lies about 3.5 miles off the N coast of Pulau Sumba, broadening to 6.5 miles off the E end, and 9 miles off the S part (but only 1.5 miles off the outlying islands along this part). From there to Tanjung Karosso, the curve lies about 4.5 miles from the shore. All dangers are contained within the 200m curve. Selat Sumba is deep and clear.

Caution.—This area is subject to intense volcanic activity, and the possibility of underwater eruptions leading to great depth changes cannot be excluded.

Pulau Sumba—North Coast

6.3 **Tanjung Karosso** (9°33'S., 118°56'E.), the W extremity of Pulau Sumba, is low, sandy, and fringed by a narrow drying reef. The coast extends 65 miles ENE to Tanjung Sasar. Between Tanjung Karosso and Teluk Waikalo, about 21 miles NE, the hinterland appears as a horizontal ridge sloping to the W. The

only landmark along this section of coast is the dark forest located E of Tanjung Karosso on a higher ridge. Sandy beaches are found in places along this section of coast.

A village and a noticeable sandy beach are located about 4 miles NNE of Tanjung Karosso.

Tanjung Suma (9°26'S., 119°02'E.), 10 miles NE of Tanjung Karosso, barely projects from the coast, but may be recognized by two houses rising over a ridge just behind the beach.

Anchorage may be taken, with local knowledge, in a depth of 27m, sand and coral, with the E house in range 156° and a coconut palm on the beach N of Tanjung Suma.

A current up to 1.5 knots has been observed off the village.

Teluk Waikelo (9°22'S., 119°14'E.), a small bay, is located 12 miles ENE of Tanjung Suma. A mountain, 5.75 miles S of the bay head, is easily recognized by its saddle shape. A shed with an iron roof stands on the offshore side of the light in Teluk Waikelo, and a mosque stands about 0.25 mile E of the light structure. The light is shown only when a vessel is expected.

Anchorage, reported to be safe during the Southeast Monsoon, can be taken in Teluk Waikelo, in a depth of 52m, with the light bearing 161° and the points on the E side of the bay in range, bearing 066°. A moderate current may be found off the bay, but none inside.

Tanjung Nanga Amba (9°21'S., 119°18'E.), low and wooded, lies 5 miles E of Teluk Waikelo. The coast between Tanjung Nanga Amba and Tanjung Karendi, a low sandy point 7 miles E, is fronted by mangroves and sandy beaches.

Tanjung Batoembaba, a low rocky point 4 miles E of **Tanjung Karendi** (9°22'S., 119°25'E.), and the low sandy Tanjung Laramampa, 5.5 miles farther E, are the E and W entrance points of a bight with the village of Memboro at its head. A conspicuous white sandy beach lies along the E side of the bight.

6.4 Tanjung Wanda (Tanjung Terapa) (9°21'S., 119°38'E.), about 4 miles ENE of Tanjung Laramampa, is rocky and covered with vegetation, but is not high. The point is hollowed out below the high water line. A sandy beach lies between this point and Tanjung Palmedo, about 8 miles ESE. This latter point is the rocky spur of a plateau, bordering the valley of a stream with the village of Palmedo on its E bank.

Lena (Palindi Mutu), a wooded peak 396m high, stands 4 miles S of Palmedo. It can be seen from offshore when off the coast between Tanjung Terapa and Tanjung Sasar, about 12 miles NE. A 622m peak, about 5.5 miles WSW of Lena, can also be seen along this section of coast. The peak is the W end of a ridge which slopes to a plateau farther W.

Anchorage can be taken off the village of Palmedo, in a depth of 29m, sand and stone. The village should be in range, bearing 165°, with the first steep part of the coast W of the mouth of the river. A 2.5 knot current is sometimes felt at this anchorage.

Tanjung Wainde (Tanjung Ratuwolu) (9°21'S., 119°51'E.), 5 miles ENE of Tanjung Palmedo, is composed of steep, but not high, white colored rocks. A conspicuous broad-topped tree stands on the coastal reef at the point.

Tanjung Sasar (9°17'S., 119°56'E.), the N point of Pulau Sumba, is a spur of the mountain plateau to the south. Tanjung Sasar Light stands at a height of 85m on the point. Slides on the W side of the point have produced vertical walls 30 to 39m high. The current around the point is strong at times.

Pulau Sumba—Northeast Coast

6.5 The NE Coast of Pulau Sumba has no marks for offshore navigation, except for the projecting **Tanjung Ngaroe Roehoe** (Tanjung Laundi) (9°28'S., 120°12'E.) and **Tanjung Batuatu** (9°37'S., 120°29'E.). With the exception of a few rocky parts, the coast is predominantly sandy beach fronting a plain with high trees. Behind the wooded section are terraced hills with grassy plains.

From Tanjung Sasar, the coast extends 18.5 miles SE to Tanjung Ngaroe Roehoe. Midway along this section of coast lies the mouth of the Sungai Kadessa. About 2.5 miles upstream, the river flows through a cleft in the rocks which is visible from seaward.

The shore of this coastal stretch is fringed by a narrow, drying reef broken only at the mouths of two existing rivers, 7 miles apart, by drying sand flats. Depths within the 200m curve are very irregular and anchoring is not recommended.

Tanjung Ngaroe Roehoe, lying 18.5 miles SE of Tanjung Sasar, is a low point backed close inland by a hill, 130m high. This hill is the N end of a steep, crumbling limestone wall forming the edge of a plateau. A very strong current, sometimes causing eddies, sets around this point.

Teluk Nangamesi (Nangamesi Bay) (9°37'S., 120°20'E.) is entered between Tanjung Ngaroe Roehoe and Tanjung Batuata, a sandy point covered with vegetation, 19 miles SE. A small projection divides the head of the bay into two parts, with **Waingapu Road** (9°38.0'S., 120°15.5'E.) lying to the W and Teluk Kambaniru to the E. Kali Kambera, the largest of several streams, flows into the head of Teluk Kambaniru. Waingapu Road is the principal shipping place on Pulau Sumba.

The 200m curve lies up to 1.25 miles off the W side of Teluk Nangamesi and up to 3.25 miles off the S side. Depths throughout the entire area are irregular. A steep-to drying reef fringes the S side of the bay up to 0.5 mile offshore and extends up to the same distance off the head of the bay in Waingapu Road. The fringing reef on the W side of the bay is narrow. The only dangers in Teluk Nangamesi exist in Waingapu Road. Strong currents exist off the approaches to the bay but are barely perceptible within its limits.

Between Tanjung Laundi and Tanjung Mandulung, about 4.5 miles SSE, the shore on the W side of the bay is rocky and bordered by sandy beaches. Between Tanjung Mandulung and the village of **Utaleumbu** (9°35'S., 120°14'E.), the sandy shore is bordered by mangroves.

The sudden change from mangroves to sandy beach at the otherwise inconspicuous Utaleumbu provides a good landmark. Anchorage can be taken off the sandy beach S of the village, in depths of 35 to 46m, sand and coral. A prominent white patch is visible on the face of the outer end of the tableland behind Utaleumba.

Between Tanjung Batuata and Tanjung Djumbu, about 4.5 miles WSW, the low sandy shore is backed by trees. Between this latter point and Waingapu Road the muddy shore is marked by mangroves.

Waingapu Road, at the head of Teluk Nangamesi, is the general area between **Tanjung Tai Manuk** (9°37'S., 120°15'E.), 2.5 miles S of the village of Utaleumbu, and **Tanjung Atu** (9°38'S.,

120°16'E.), about 1.3 miles farther SSE.

6.6 **Waingapu** (9°38'S., 120°16'E.) (World Port Index No. 51350) is the only town on Pulau Sumba and is the administrative center for the island. A stone pier fronting the village has a depth of 2.1m alongside. A flagstaff stands at the inner end of this pier. A light is shown from a white framework tower at Waingapu. There are lighted beacons and leading marks.

Tides—Currents.—The tides at Waingapu are mixed, but predominantly semidiurnal. Spring tides rise 2.5m and neaps rise 0.8m.

Depths—Limitations.—Berthing information is shown in the table titled **Waingapu—Berth Information.**

A 274m wide swept channel leads into the inner road between the drying reefs. Depths range from 11 to 32m. Both arms, which make up the inner road, have depths of 12m or more.

A 2.7m reef, marked by a beacon, lies 0.3 mile E of Tanjung Tai Manuk. A detached, 1.8m, sunken rock lies 0.15 mile NNW of the beacon and a 9m coral head, unmarked by discoloration, lies 0.2 mile E of the beacon.

A drying reef extends 0.32 mile N from Tanjung Atu; a detached 0.9m patch lies close N of its N end. A drying reef, which forms the W side of the inner road, extends 0.25 mile from the shore S of Tanjung Tai Manuk.

Aspect.—Two white stone beacons, in range bearing 188°, lead down the centerline of the swept channel and into the inner road.

Anchorage.—The best anchorage lies just within the entrance of the inner road, in a depth of 28m, mud and sand, 0.3 mile WNW of Tanjung Atu. Small vessels can anchor closer in at the entrance of either arm of the inner road in a depth of 22m. The W arm has more room but the bottom is hard, whereas, the bottom in the E arm is stiff mud. Several lighters are available for working cargo at the anchorages. An embedded anchor on the N end of the reef, between the two arms, can be used as a bollard.

6.7 Teluk Kambaniru is entered between **Tanjung Pasia Manuk** (9°39'S., 120°19'E.) and Tanjung Sudu, 3 miles to the E. Kali Kambera, the principal river of Pulau Sumba, enters the head of this bay but its mouth is fouled by drying sand bars. Depths in Teluk Kambaniru are irregular, but anchorage can be taken off the river mouth, in a depth of about 45.7m.

The coast between **Tanjung Batuata** (9°37'S., 120°29'E.), 6.5 miles ENE of Tanjung Sudu, and Melolo Village, about 20 miles SE, consists of an unbroken sandy beach backed by high land a short distance inland. Anchorage can be taken anywhere along this coast between Tanjung Batuata and Melolo Village.

Tanjung Tuak (9°43'S., 120°36'E.), 10.5 miles SE of Tanjung Batuata, is a flat point covered with grass and has two groups of coconut palms.

Tanjung Petawang (9°48'S., 120°38'E.), 4.25 miles farther SSE, is wooded and fairly prominent. The village of Petawang stands in the trees, 0.5 mile SSW of the point.

Melolo Road (9°53'S., 120°40'E.), with Melolo Village along the shore, lies 6 miles SSE of Tanjung Petawang. A mosque and a long house, with a zinc roof, in the village are visible from the roadstead.

Anchorage.—Anchorage can be taken, in a depth of 33m, mud and sand, NE of the mosque. It is not advisable to anchor close in because the bottom rises very steeply near the coastal reef which extends up to 0.25 mile offshore.

The coast between Melolo Village and Tanjung Undu, about 17.5 miles SE, continues sandy as far as Tanjung Rendi, about 2 miles SE of Melolo Village, and then changes to a muddy coast bordered by mangroves.

There are reports of no suitable anchorage being provided along this section of coast because of the steep bottom.

Caution.—It has been reported (1994) that the village, mosque, and long house are not visible.

6.8 **Tanjung Wara Djangga** (9°55'S., 120°45'E.), about 5.75 miles SE of Melolo Village, is wooded and inconspicuous. There are occasional fishing huts along the coast, with small craft lying off the coast in a small bight midway along this stretch. Tanjung Tapi (Tanjung Tapil), 2.5 miles SE of Tanjung Wara Djangga, is a rocky, wooded point with rocks on the coastal reef fronting it.

A village, about 4 miles SE of Tanjung Tapi, is inhabited by fishermen; the high roofs of some houses can be sighted.

Tanjung Undu (Tanjung Oendoe) (10°05'S., 120°51'E.), which lies 9 miles SSE of Tanjung Tapi, is the E extremity of Pulau Sumba. This low sandy point has the mouth of a river on its N side which is entered by small craft at high water. Tanjung Undu Light stands at a height of 42m on the point.

Waingapu—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Waingapu Dry Cargo Terminal						
Old PELRA Wharf	93m	5.0-7.0m	—	6.0m	—	Small foreign and inter-island vessels and ro-ro,
Nusantara Wharf	150m	11.0m	—	10.0m	6,000 dwt	Inter island/passenger service vessels.
New PELRA Wharf	70m	—	—	—	—	Small foreign and inter-island vessels
PELNI Ro-Ro Wharf	9m	—	—	—	—	Passenger ferries.
Waingapu Oil Terminal						
No. 3	180m	9.1m	120m	7.3m	6,000 dwt	Oil products.

Waingapu

A coral ridge runs parallel with the coast, 2.75 miles E of Tanjung Undu, for a distance of 5 miles. With the exception of a 6m patch, 3.5 miles NE of the point, which is only slightly marked by discoloration, there are depths of 10.3 to 11.9m over this ridge.

Anchorage may be taken in both monsoons from between the ridge and the coastal reef, in depths of 20 to 29m.

Caution.—Wrecks lie 5 miles N and 3.5 miles NNE of the light; an underwater rock lies 5.5 miles NNE of the Tanjung Undu Light.

Pulau Sumba—Southeast Coast

6.9 The coast between Tanjung Undu and Tanjung Ngunju (Tanjung Ngoendjoe), about 28 miles WSW, consists of a coastal reef extending up to nearly 0.75 mile offshore, broken in a few places by sandy beaches.

Extensive grass-covered, sparsely wooded, plains lie behind the beaches. The terraced interior is fronted along its seaward side by high cliffs. With the exception of the land in the vicinity of Tanjung Ngunju, there are no distinctive features along this section of coast.

There are no completely sheltered anchorages along this coast, but some protection from the sea may be obtained in the bights E of Tanjung Warumanggit and E of Tanjung Watuparonu. There is, however, no shelter from the Southeast Monsoon, which may blow in with considerable force, especially in May and June. During these months the local coastal trade, which is fairly considerable, is suspended.

Shelter may be obtained during the Northwest Monsoon, but a SW swell can be occasionally troublesome. Shelter is provided SW of **Tanjung Watuparonu** (10°15'S., 120°31'E.), and to a lesser degree, off the entrance of the Luku Waikoka, 1.5 miles NE and E of **Tanjung Warumanggit** (10°15'S., 120°37'E.).

Tanjung Waradjangga (Tanjung Nangu Wara) (10°14'S., 120°41'E.) is low, flat, bare, and rocky. A coral reef lies about 1 mile S of the point and extends about 1.25 miles to the NE and parallel to the coast. The reef has general depths of 6.7m or more and a least depth of 2.1m near its center. At times the reef is plainly marked by discoloration but at other times the whole area is discolored by river water. With a heavy swell, the sea

often breaks over the shoal part of the reef. A shorter coral reef, with a least depth of 7.9m, lies about 1 mile W.

Tanjung Warumanggit (Tanjung Ngaru Mangeh) (10°15'S., 120°37'E.), which lies 4 miles WSW of Tanjung Waradjangga, provides partially protected anchorage during the Northwest Monsoon in the 3 mile wide bight on its E side. A landing place is located at an indentation lying at the W end of a drying coastal reef projecting 0.75 mile from the shore in the vicinity of Tanjung Warumanggit. Heavy SW swells break on both sides of this indentation.

6.10 Tanjung Watuparonu (Tanjung Watu Perono) (10°15'S., 120°31'E.) is a small projection at the head of the wide bight between Tanjung Warumanggit and Tanjung Ngunju. Tanjung Watuparonu is conspicuous for its white cliffs and its low, fairly level hills marked by tall reeds and a few groves. These hills are joined to the higher land to the NW by a somewhat lower ridge. These cliffs, which are first seen at Tanjung Watuparonu, extend an additional 2 miles to the W.

Vessels anchor, with some protection, in the bights on either side of Tanjung Watuparonu according to the wind. The E bight is clear and slopes evenly but the W bight is fouled by coral reefs which break at LW. Two reefs, with depths of 3m and 4.9m, lie 2 miles S of Tanjung Watuparonu just within the 20m curve. An 8.5m patch lies 1 mile SE of the same point.

Tanjung Ngunju (Tanjung Ngoendjoe) (10°19'S., 120°27'E.), the S extremity of Pulau Sumba, consists of a mountain spur ending in a prominent steep cape with a 46m high hill on its outer end. A group of high white rocks stand close E of the neck of the cape, which partly covers at HW. The mountain spur rises 1.25 miles N of the cape to an elevation of 473m.

The currents must be taken into account when rounding Tanjung Ngunju, eddies and rotary currents have been observed close S of the point.

Pulau Sumba—Southwest Coast

6.11 For passing vessels, the rather conspicuous hilltop and the off-lying islands of the coastal area SE of **Tanjung Malanggu** (10°07'S., 120°01'E.) provide good landmarks. The coastal hills to the NW of this point present no prominent features as far W as the W end of Pulau Sumba. The land in the interior, although rising to heights of almost 914m, remains fairly regular with no prominent outstanding ridges or peaks.

Although the depths provide anchorage almost anywhere along the coast to vessels with local knowledge, they are not completely protected from the continual heavy swell.

The current generally sets parallel with the coast with the prevailing monsoon at a maximum rate of 1.5 knots.

Pulau Halura, Pulau Kotak, and Pulau Mangkudu are a group of three islands which lie from 3 to 6.5 miles offshore midway between Tanjung Ngunju and Tanjung Malanggu, about 29 miles WNW. The first two islands mentioned are joined by a drying reef. All of the islands are uninhabited.

Pulau Halura (Lahalura) (10°19'S., 120°12'E.), the easternmost and largest of the off-lying islands, lies about 14.5 miles W of Tanjung Ngunju. This rocky island is covered with reeds and palm trees and rises to a height of 318m near its E end.

A reef extends 0.5 mile from the S and W shores of the island, with a prominent pillar rock 0.2 mile S of its W extremity. The reef breaks heavily.

Pulau Kotak (10°19'S., 120°10'E.), which stands on the W edge of Pulau Halura's drying reef, is a 66m high dome with sunken rocks close off its NW side.

Pulau Mangkudu (Pulau Mangoedoe) (10°20'S., 120°07'E.), 2.75 miles W of Pulau Halura, is fairly low and has a sandy beach on all sides. A drying reef, which breaks heavily, fringes the S and W sides of Pulau Mangkudu. A light is shown from the SSW end of the island.

Eddies and weak rotary currents have been observed around these islands. A strong current frequently runs between Pulau Mangkudu and the W end of Pulau Halura's fringing reef.

6.12 From Tanjung Ngunju, the coast extends about 29 miles NW to Tanjung Malanggu. Tanjung Karera (Tanjung Woenoe), 10 miles WNW of Tanjung Ngunju, is rocky and steep and fronted by two high rocks which stand close offshore.

Tanjung Lawitu (Tanjung Lewitu) (10°10'S., 120°05'E.), which consists of red rock and is sparsely wooded. Two adjacent hills, 72m and 192m high, rise close behind the point.

The coast between Tanjung Lawitu and Tanjung Melangu is mostly bare and rises gradually from the shore where a continuous surf breaks.

Tanjung Melangu (Tanjung Malanggu) (10°07'S., 120°01'E.), with a ridge behind it, is one of the best landmarks for navigation along this coast. The point consists of rock connected by a narrow crest to the dark rocky land behind it, which rises steeply to an elevation of almost 488m.

Between Tanjung Melangu and Tanjung Laikameni, about 30.5 miles WNW, the mountains provide no landmarks except for an occasional coastal hill. The 335m hill, 6.25 miles N of Tanjung Malanggu, has an almost bare top.

Tanjung Laparoeno (Tanjung Watuparunu) (10°00'S., 119°57'E.) is fronted by three sharp pillar rocks close offshore. The needle-shaped rock of the group is conspicuous.

Teluk Malikaba (9°58'S., 119°57'E.) and Teluk Mambang (Lamombang Bay), two bays entered about 1 and 4 miles NW of Tanjung Laparoeno, provide the best anchorage on the SW coast of Pulau Sumba. In the Southeast Monsoon, protected anchorage can be taken on the SE sides of both bays which are sheltered by the fringing reefs. In the Northwest Monsoon, calm anchorage can sometimes be taken in Teluk Malikaba.

The coast between the above bays consists of steep moderately-high limestone hills fronted in places by sandy beaches and an occasional white cliff.

Depths—Limitations.—Depths within both bays are about 10m or more. The 10m curve lies close off the head of Teluk Malikaba, but lies 0.3 mile off the head of Teluk Mambang. A depth of 4.9m lies a little more than 0.5 mile W of the E entrance point of Teluk Mambang. Depths of less than 10m extend 0.3 mile NW from this patch.

Directions.—To enter Teluk Malikaba, steer 038° for the 506m hill, 4 miles NE of the bay. A conspicuous tree stands on this round hill. To enter Teluk Mambang, favor the W side of the bay to avoid the 4.9m shoal off the E entrance point.

6.13 Teluk Kakadu (9°56'S., 119°57'E.), an open bay with moderate depths, lies 1.5 miles NW of Teluk Mambang. The S

entrance point consists of bare rock with a flat rock close W of it. Anchorage is not advisable within the bay because of the poor protection.

Tanjung Nonguwawi (Tanjung Ngungu Wawi) (9°55'S., 119°47'E.) is 204m high and has a T-shaped peninsula extending a short distance S. A bight, partially protected from the W by a series of islets and rocks extending seaward, lies on the W side of the point. In favorable weather, vessels can anchor on either side of the outer rock, in a depth of 27.4m.

Watu Sipu (9°51'S., 119°42'E.), a wooded islet, 90m high, lies 7 miles NW of Tanjung Nonguwawi and is joined to the mainland by a drying reef. Tanjung Lamarongi (Tanjung Marongi), 2 miles farther NW, is a fairly steep, rocky point covered with tall grass.

Teluk Lasipu (Sipu Bay) (9°48'S., 119°40'E.) is entered between Tanjung Lamarongi and the low, sandy Tanjung (Lahikememe) Laikameni, 3.75 miles NW. The bay has moderate depths, especially in its N part, and is clear of dangers except close off its shores. Some protection is provided in the Northwest Monsoon. A black, almost perpendicular cliff, which stands along the middle part of the E shore is conspicuous.

6.14 Teluk Sendikari (9°47'S., 119°37'E.) is entered between Tanjung Laikameni and **Tanjung Ta Atu** (9°47'S., 119°36'E.), 2 miles NW. The higher outer end of the latter point is flat and bare except for a few trees.

Depths within the bay decrease gradually toward the shore, but above and below-water rocks extend up to 0.25 mile off both sides. A detached 6.7m patch lies about 0.75 mile SE of Tanjung Ta Atu.

The holding ground in Teluk Sendikari is good, but no protection is provided from the SW swell.

Between Tanjung Ta Atu and **Tanjung Mambang** (9°45'S., 119°11'E.), about 24.5 miles W, the coast is free from dangers about 1 mile offshore and may be approached closely. The swell breaks continuously on the coastal reef and the line of breakers is visible at night.

The coast between Tanjung Ta Atu and Tanjung Meloku, about 3.75 miles W, is indented by two small coves. A high islet with a conspicuous cone of rocks stands on the E side of the E cove, but is not visible from all directions. A dark rock with a flat top lies at the W entrance of the W cove and is conspicuous from the W. Another small cove lies 2 miles W of Tanjung Meloku.

6.15 Tanjung Rua (9°48'S., 119°28'E.), which lies 7.5 miles WSW of Tanjung Meloku, is the S end of a short blunt peninsula. Fair anchorage is provided in the bight between the points because of the moderate swell.

Vessels anchor, in a depth of 18m, off a small stream flowing into the head of the bay. A few pointed roofs projected above the tree tops are the only parts of the houses of the villages which stand on the hills behind the peninsula, which can be seen from seaward.

Tanjung Watubolo (Tanjung Watoembolo) (9°46'S., 119°20'E.), the S end of a fairly low, broad spur of the hills behind it, lies 5 miles WNW of Tanjung Rua.

Tanjung Mamba (Tanjung Mambang) (9°45'S., 119°11'E.), 8 miles W of Tanjung Watubolo, is the steep S side of a conspicuous short peninsula, almost bare of vegetation, which slopes gradually to the sea.

Some large rocks are reported to lie on the coastal reef close off the point.

Tanjung Waibuku (9°40'S., 119°02'E.), lying 11.5 miles NW of Tanjung Mamba, is a prominent point rising steeply from the sea to a bare flat summit. The sandy coast between this latter point and **Tanjung Waiselai** (9°37'S., 119°00'E.), 3 miles to the NW, is densely wooded.

Several small villages stand among the trees between Tanjung Waiselai and **Tanjung Karosso** (9°34'S., 118°55'E.), about 5 miles to the NW.

When approaching Tanjung Karosso from the W, the summit of a mountain 735m high, about 24 miles E will be seen as a half-sphere rising above the long uniform ridge which descends gradually towards the sea. On closer approach, the low sandy wooded point of Tanjung Karosso can be identified together with the dark wood on a ridge of hills 2.5 miles E.

Anchorage.—Anchorage can be taken, by vessels with local knowledge, in depths of 20 to 27m, sand, with the S extremity of the rocky N entrance point of the stream in range, bearing 065° with the N house in the village close N of Tanjung Waiselai. On this bearing, the S extremity of the entrance of the stream appears as a detached rock. It is not advisable to anchor closer in because of the S swell.

The tidal current in the road sets parallel with the coast at a rate of 0.75 knot.

Islands and Straits between Pulau Komodo and Flores

6.16 Pulau Rinca, between Pulau Komodo and Flores, is similar in appearance to Pulau Komodo and is also uninhabited, except for a village on the NE extremity. The island is mountainous and densely wooded over most of its area. Doro Radja, in the island's NE part, is 351m high and prominent when viewed from the N or South. A conservation area has been established (2003) in the waters between Pulau Komodo and Flores and can best be viewed on the chart. Certain restrictions may apply. For further information, contact the Indonesian Department of Forestry.

Tides—Currents.—Selat Lintah, between Pulau Komodo and Pulau Rinca, is little or never used because of strong, little known currents. Three main channels lead among the islands N of Pulau Rinca into the S and wider part of the strait.

Selat Molo, between Pulau Rinca and Flores, is navigable only by small craft because of the strong currents in its narrowest part.

The tidal currents in the N approach to Selat Lintah divide into two parts, one part setting W along the N coast of Pulau Komodo and the other E along the N coast of Flores. The numerous islets lying in the N part of the strait affect the general direction of the currents causing whirlpools, eddies, and tide rips N of Pulau Rinca.

The tidal currents are semidiurnal and although very strong at the narrows in the N end of the strait, they are much weaker immediately N of the narrows and in the S and wider part of the strait.

The maximum rate of current in Selat Molo is unknown, but a current of more than 5 knots was observed during a period of neap tides. The maximum rate at springs is not known. It is advisable to wait for the short periods of slack water before attempting to pass through the narrows.

Depths—Limitations.—The three channels leading among

the islands N of Pulau Rinca, then to the S and into Selat Lintah, have depths of more than 36.6m, but numerous dangers lie on either side of the recommended tracks. The S part of the strait is deep and mostly clear.

Along the E coast of Pulau Komodo, a maximum velocity of 6 knots was observed during both the N and S currents. A velocity of 9 knots was observed S of the narrows between Pulau Padar and Pulau Rinca.

Little information can be given about the changes in tidal currents. In the narrows between Pulau Padar and Pulau Rinca, a S current with a velocity of 4 knots was observed to change to a 4 knot N current within a time period of 30 minutes. It was also observed that when the S current was running strongly W of Pulau Padar, there was a strong eddy N through **Loho Karbau** (Lehok Karbau) (8°40'S., 119°38'E.).

Anchorage.—Anchorages are available on both sides of Selat Lintah and in the S part of Selat Molo.

Pulau Komodo—North Coast

6.17 This coast is mountainous and except for the NW side of the NW peninsula, the coast and its points offer no landmarks. The islets off the NE end of Pulau Komodo are conspicuous.

Toro Beru (8°26'S., 119°26'E.) is the NW extremity of Pulau Komodo and is a steep grassy point. Two bare rocks stand on a drying reef close off this point. Fairly strong currents may be encountered off Toro Beru. Teluk Beru (Loho Batumontjong) is entered about 1 mile E of Toro Beru. Teluk Beru provides anchorage, in 54.9m, sand. Though the bottom rises evenly, the 40m curve lies from 0.1 to 0.3 mile offshore.

Teluk Gili Lawa (8°28'S., 119°31'E.) is separated from Teluk Beru by a high peninsula which rises from 237m, near its N end, to 423m 2 miles farther N. The E side of the bay is formed by the islands of Gili Lawalaut and Gili Lawadarat. Teluk Gili Lawa has three bights at its head.

Loho Tala (8°29'S., 119°31'E.), the middle bight, can be recognized by its E entrance point which resembles the back of an elephant. The bight has a white sand beach and provides good anchorage, in 40 to 45.7m, sand, with the S point of Gili Lawadarat in range, bearing 080° with the E entrance point of the bight.

6.18 **Gili Lawadarat** (8°28'S., 119°33'E.), the S island on the E side of Teluk Gili Lawa, is separated from Pulau Komodo by a narrow 11m passage and from Gili Lawalaut by a narrower 9m passage. Gili Lawadarat rises to a plateau with lower land and several peaks to the N.

Gili Lawalaut (8°27'S., 119°35'E.), the N island, is divided into two parts by a low isthmus. The E part has two peaks of almost equal heights. The W part consists of lower hills with several pointed peaks.

Pulau Toko Toko (8°25'S., 119°34'E.), about 2 miles N of Gili Lawalaut, is a small islet of raised coral. It has three summits, with the middle rising to a height of 26m.

A coral shoal, with a depth of 3m, lies 1.25 miles S of Pulau Toko Toko. Midway between this shoal and Gili Lawalaut is a rock awash.

The E coast of Pulau Komodo is described in paragraph 6.21.

The S coast of Pulau Komodo is steep and subject to a heavy sea, particularly during the Southeast Monsoon. This coast consists mostly of a large open bight with the island of Pulau Tala in its E part.

Caution.—A dangerous pinnacle rock, which covers and uncovers between the swells, lies about 1.5 miles S of the SW extremity of Pulau Komodo. Depths of more than 100m lie all around this pinnacle rock.

6.19 **Pulau Langkoi** (8°44'S., 119°23'E.), close off the S extremity of Pulau Komodo, has been previously described in paragraph 5.58.

Pulau Tala (8°45'S., 119°26'E.) lies 0.3 mile off Pulau Komodo. This partially brush-covered island has four summits, the highest rising to an elevation of 299m. All sides of the island are steep with the exception of its N side which has a gentle slope. A cone with a white sand beach lies on the S side. An above-water rock lies off the W entrance point of the cove.

Anchorage can be taken in a basin formed between Pulau Tala, the Pulau Komodo shore, and four rocks about 0.75 mile NW of Pulau Tala. Vessels lie sheltered here, in a depth of 44m, black sand and coral.

The peninsula forming the SE extremity of Pulau Komodo is narrow, high, and steep, with a 251m high hill shaped like a box near its E end. A high rock, fringed by a drying reef, lies about 0.75 mile E of the E end of the peninsula, but the intervening channel is clear. A drying reef extends a short distance off the middle part of the S side of the peninsula.

Selat Lintah

6.20 **Selat Lintah** (8°37'S., 119°35'E.), connecting Selat Sumba and the Flores Sea, passes along the E side of Pulau Komodo. The S entrance of the strait is wide and clear in the fairway, but the N entrance is fouled in places by rocks, shoals, and islands which cause irregular currents. For this reason the strait is rarely used.

The shores bordering Selat Lintah will be described in the following order:

1. The E coast of Pulau Komodo.
2. Pulau Padar.
3. Pulau Rinca.
4. The islets N of Pulau Rinca.
5. The NW coast of Flores.

Palau Komodo—East Coast

6.21 From the unnamed NE point of Pulau Komodo to Toro Kuning, 6.5 miles to the S, the coast is fairly steep. The two Pulau Bugies (Bugies Islands) off the NE point are separated from each other and from Pulau Komodo by clear channels marked by strong currents. These islands have high, sharp summits covered with reeds.

West of Pulau Bugies the coast of Pulau Komodo is marked by occasional sandy beaches, but farther S it is overgrown with mangroves. South of these two islands numerous reefs front the coast of Pulau Komodo up to 2 miles offshore.

A rock, 6.1m high and surrounded by a drying reef for a short distance, lies 1.3 miles E of the N end of **Tambunan Singkala** (8°33'S., 119°36'E.).

Toro Kuning (8°36'S., 119°35'E.), which is the outer end of

a gradually sloping mountain spur, rises inland to a prominent hill, 314m high, whose summit consists of several sharp crests.

Three above-water rocks lie on a small drying reef about 0.5 mile SSE of the point. The intervening passage is clear.

From Toro Kuning to the SE end of Pulau Komodo, the coast and its off-lying islands are generally steep and rocky. Pulau Punya lies close off Toro Liang, the NE entrance point of Teluk Slawi which is a fairly large bay to the W. A 2.4m patch lies in the intervening channel.

Pulau Lawang (8°37'S., 119°32'E.), a smaller islet, lies almost 0.5 mile S of Pulau Punya; the intervening channel is clear. A small islet lies close off the S side of Pulau Punya, and two rocks awash lie within 0.3 mile E of the E side of the same island.

6.22 Teluk Slawi (8°36'S., 119°31'E.), entered between Toro Liang and Toro Lawi, about 1.5 miles WSW, is divided into two deep bays, one to the NE and the other to the SW. There are no currents within Teluk Slawi, but the cross currents at the entrance must be allowed for when entering or departing.

Soro Lia (8°35'S., 119°31'E.), which indents the NE side of Teluk Slawi, is deep and clear except for a 0.9m patch on its E side, 0.75 mile N of Toro Liang.

Soro Go (Soro Masangga) (8°36'S., 119°28'E.), which indents the SW side of Teluk Slawi, is bordered by mangroves along its shores and, with the exception of two islets in its central part. It is deep and clear seaward of the shore reef. The peninsula forming the E side of the bay terminates in Toro Lawi, the rocky SW entrance point of Teluk Slawi.

Between Toro Lawi and the SE extremity of Pulau Komodo, about 7.5 miles SSW, the coast is high and steep, indented by several small bays and fronted by a very narrow coastal reef. Teluk Logo, an open bay entered 3 miles SSW of Toro Lawi, provides anchorage as does Loho Sera, the bight near the S end of this coast.

Pulau Ndihang (8°39'S., 119°30'E.), a steep-to 96m high islet molded in the shape of a sugarloaf, stands 2 miles S of Toro Lawi. Pulau Logo, 105m high, stands 2.5 miles SW of this islet and has a conspicuous clear white stone wall on its NE side.

Pulau Padar

6.23 Pulau Padar (8°39'S., 119°35'E.), a reed-covered island, divides Selat Lintah into a main W channel and a narrow E channel. A 269m pyramidal hill in the NE part of the island is the most conspicuous summit of three hills which stand on the island.

Several islets lie close off the SW end of Pulau Padar. Pulau Padar-ketjil, 129m high, somewhat conical and sparsely vegetated, is the largest of these islets.

Pulau Sarang, a rock 0.75 mile SW of Pulau Padar-ketjil, is 29m high. Other dangers lie within 0.5 mile of the NW and SW coasts of Pulau Padar.

Pulau Payung (8°40'S., 119°37'E.) lies in mid-channel between Pulau Padar and Pulau Rinca, about 1.5 miles SE of the pyramidal hill on Pulau Padar.

Pulau Rinca

6.24 Pulau Rinca (Pulau Rintja) (8°43'S., 119°41'E.), between Selat Lintah on the W and Selat Molo (described later in paragraph 6.31) on the E, is a mountainous island and densely wooded in its S part. The N coast is divided into two parts by Lehok Kima.

Toro Nggikok (8°36'S., 119°37'E.), the NW extremity of Pulau Rinca, is steep and rises to a grass-covered hill, 249m high, about 1.5 miles SE.

Loho Karbau (8°40'S., 119°38'E.), a large bight, is entered between Sarai, a bright red island 1.5 miles S of Toro Nggikok and Toro Gongge, 2.75 miles S of Sarai.

The hilly coast behind the bight descends in a whitish-yellow slope to a narrow sandy beach.

Lehok Ginggo (Loho Ginggo) (8°41'S., 119°39'E.), entered between Toro Gongge and Toro Mbarata, 1.75 miles SSW, provides the best anchorage on the W coast of Pulau Rinca. No current is found in this bay. The shores of Lehok Ginggo are irregular and some islets lie in its N part. A drying rock, sometimes breaking but showing no discoloration, lies 0.5 mile W of Toro Mbarata. Sunken and awash rocks, not marked by discoloration but breaking at times, lie up to 0.25 mile off Toro Propa, a light green rocky point 1.75 miles SSW of Toro Mbarata.

6.25 Toro Taa (8°48'S., 119°37'E.), the SW extremity of Pulau Rinca, has two above-water rocks plus several rocks awash lying up to 0.2 mile offshore.

The S coast of Pulau Rinca is vegetated and marked by vertical cliffs separated by narrow sandy beaches.

Loho Uadadasami (8°47'S., 119°39'E.), the large bay indenting the S coast of Pulau Rinca, is obstructed in its central part by Nusa Kode, an irregular-shaped island.

A rock, awash, not marked by discoloration, lies about 0.3 mile W of the drying reef which lies off the N point of the island.

The best anchorage can be found at the head of the E arm of the two bights at the head of Loho Uadadasami, S of a white sandy beach. Because the rock awash mentioned above is invisible at high water, it is advisable to approach this anchorage through the E arm.

From **Toro Nta Ulah** (8°48'S., 119°41'E.), the SE extremity of Pulau Rinca, the coast extends 5 mile NNE to Toro Walu and is indented by a number of small bays.

Toro Sie, about 1 mile S of Toro Walu, is conspicuous for its reddish-brown color and for a cave which pierces the point in a SW to NE direction. A rock awash close E of the point is not always marked by breakers or discoloration.

Toro Amarau (8°46'S., 119°44'E.), 0.5 mile NNE of Toro Sie, is conspicuous for a natural bridge of rock standing on the extension of the point. Loho Baru, entered between Toro Tongkir and Toro Tanturi, 3 miles NNE, provides anchorage for large vessels free of the current.

6.26 Pulau Muang (8°42'S., 119°46'E.), a small narrow island, lies with its N end 1.25 miles E of Toro Tanturi. A steep-to shoal extends more than 0.5 mile E from the middle of the E side of the island.

Salah Karontong (8°40'S., 119°46'E.), a bight between Toro Tanturi and Toro Waitimbang, 4 miles NE, is marked by a white sandy beach. The island Nusa Rohbong (Nuha Rohbang), which stands near the N end of the bight, lies 0.5

mile offshore. Nusa Kampas lies close off the N shore of Salah Karontong, almost 0.5 mile NE of Nusa Rohbong. This islet is low, has rocky shores, and is covered with vegetation.

Toro Waitimbang (8°39'S., 119°48'E.) is the SW entrance point and Toro Salah Molo, NNW of Toro Waitimbang, is the NW entrance point of the narrows leading through Selat Molo.

The coast between Toro Selah Melo and Toro Gindang, 4.5 miles W, is high, wooded, and fringed by a reef.

Loho Binga (8°38'S., 119°43'E.) is a reef encumbered bay lying 2.75 miles W of Toro Selah Molo. Pulau Gindang, a high steep-to island, lies 0.5 mile N of Toro Gindang.

Loho Buaja, a small bay encumbered by reefs and islets, is entered between Toro Gindang and Toro Pondo, 2 miles SW.

Loho Kima (8°39'S., 119°41'E.), a deep bay entered between Toro Pondo and Toro Kaloh, about 2 miles NW, extends about 4 miles S to its head. Three small detached heads lie off the W side of the bay. The southernmost and outermost of these dangers, which has a least depth of 0.9m, lies about 0.75 mile offshore.

Anchorage can be taken in Loho Kima over a muddy bottom out of the influence of the current.

The coast between Toro Kaloh and Toro Nggikok, 3 miles W, is fronted near its E end by steep-to above and below-water rocks which extend up to 1.25 miles N from the shore.

Islets North of Pulau Rinca

6.27 The numerous islets which lie N of Pulau Rinca are mostly reed-covered with occasional trees and bushes. Because of the very strong and irregular currents which set through the passages between these islets, they are rarely used by general shipping. The strong set, to and from the narrows of Selat Lintah and Selat Molo, is felt S and SW of **Pulau Pungu-besar** (8°31'S., 119°48'E.).

Pulau Siaba-besar (8°32'S., 119°39'E.), 3.5 miles NE of the NW extremity of Pulau Rinca, consists of coral with a N-S ridge rising to a height of 137m. The island coastal reef is narrow, except on the N side, where it extends about 0.5 mile offshore. Pulau Siaba-kecil, reef-covered, lies close W of the larger islet and is separated from it by a 7.3m channel.

Pulau Tatawa (8°31'S., 119°39'E.), a reed-covered island about 1 mile NNW of Pulau Siaba-besar, rises to a height of 93m and is steep on its N and W sides. A drying reef extends 0.3 mile from its S side. A 27m high sugarloaf shaped rock lies 0.75 mile SW of Pulau Tatawa.

Pulau Mauan (8°33'S., 119°38'E.), a scrub-covered island, lies 1 mile W of the SW point of Pulau Siaba-besar and is topped by three peaks. The tallest peak rises to a height of 38m. A bank, with depths of less than 20m, extends 0.5 mile S and SE.

6.28 **Pulau Sabayur-besar** (8°30'S., 119°44'E.), a partially reed-covered island about 3.25 miles NE of Pulau Siaba-besar, lies with several smaller islets on a submarine plateau over which the general depths are about 36.6m or less. Deep gullies separate many of the islets.

Pulau Sabayur-kecil (8°31'S., 119°42'E.), 60m high, lies close off the SW side of the larger island and is separated from it by a narrow deep channel.

Pulau Mengjatan (Pulau Mangiatan) (8°33'S., 119°41'E.), 2.25 miles SW of Pulau Sabayur-besar, rises to a height of 120m. A reef, the inner half drying and the outer half having depths ranging from 1.8 to 4.7m, extends almost 1.25 miles NE from the island.

Pulau Kanawa (8°30'S., 119°46'E.) has a plateau covered with reeds and is 91m high on its N part. The N coast is rocky, but the S half of the island consists of low bush-covered land fringed by a sandy beach.

Pulau Misa (8°32'S., 119°45'E.), a low inhabited islet, lies 1 miles SSW of Pulau Kanawa. Numerous islets and reefs lie between this islet and Pulau Sabayur besar to the NW. Drying reefs lie within 1 mile E and SW of Pulau Misa.

6.29 **Pulau Pungu-besar** (8°31'S., 119°48'E.) and Pulau Pungu-kecil, its adjacent smaller islet to the N, lie on a drying reef which terminates 0.25 mile NE of the smaller islet. The NW coast of the larger islet is steep, broken, and has a whitish-yellow cast. A series of shoals, with depths of less than 11m, extends 1.5 miles N from a position about 1 mile N of the smaller islet. A steep-to, 2.7m coral patch lies 3.5 miles N of the same islet.

Pulau Bangkau (8°33'S., 119°47'E.) and Pulau Kukusan lie on the same drying reef, about 1 mile S of Pulau Pungu-besar. Patches of drying reef lie S of the two islets and still farther S, are the islets lying in the N entrance of Selat Molo.

Pulau Papagaran-besar (8°34'S., 119°48'E.) and the smaller Pulau Papagaran-kecil, 1 mile to the E, lie on drying reefs and form the S side of the channel which passes S of Pulau Sabayur-besar and its adjacent islets.

Pulau Panikia (8°35'S., 119°45'E.), 0.75 mile SE of Pulau Papagaran-kecil, lies on the NE edge of an extensive drying reef. A 4.9m coral patch lies in mid-channel between the drying reef and the coastal reef off the N coast of Pulau Rinca. Nusa Pimpe and Nusa Kaaba lie within 1 mile SE of Pulau Panikia. The latter islet is mangrove-covered and stands on the N end of a drying reef. An above-water rock lies 0.25 mile NE of Nusa Pimpe.

Pulau Tengah-besar and the smaller Pulau Tengah-kecil lie on the same drying reef about 0.5 mile W of Pulau Papagaran-besar. The conical summit on the larger islet rises to a height of 140m. An above-water rock lies about 0.25 mile off the W side of the larger islet. A trio of islets lie within 1 mile SE of Pulau Papagaran-kecil and a submerged rock, with a depth of 0.5m, lies 0.25 mile S of the southernmost of these three.

Selat Lintah

6.30 Three main channels lead through the islands N of Pulau Rinca into the S and wider part of Selat Lintah. In following these directions ample allowance should be made for the effects of the currents on steering.

The first channel passes W of Pulau Tatawa and Pulau Mauan. Approaching from the N, the three peaks on Pulau Padar will be visible and the most conspicuous of these, the pyramidal peak in the E part, should be steered for on a course of 194°. This course leads E of the 6.1m high rock in mid-channel, and E of the 2.1m coral patch farther to the S. Both these dangers will be safely passed when the S point of Pulau Siaba-besar is in range with **Mandjaga Peak** (8°34'S., 119°50'E.) on the NW coast of Flores.

The second main channel leads from the N between Pulau Siaba-besar and Pulau Mangiatan. There are no dangers on this route except for the rocks off the N coast of Pulau Rinca, W of the entrance of Loho Kima. These rocks are cleared to the N by steering 250° with the SE point of Pulau Pungu-besar in range, bearing 070° astern, with the saddle of Flores to the ENE. This range is the lower end of the third main channel.

The third main channel leads from the N, passing E of Pulau Kanawa. Steer 145° with the saddle on Pulau Pungu-kecil in range with the previously-mentioned Mandjaga Peak. When the SW peak of **Gili Lawalaut** (8°27'S., 119°35'E.) is in range, bearing 285°, with the S point of Pulau Kanawa, alter course to 195°. Avoid the 11m patch in mid-channel W of Pulau Pungu-besar, and the 4.9m projection off the SW point of the same island. When the SW point of Pulau Pungu-besar is in range, bearing 070° astern with the saddle on Flores, steer 250°on that range to the entrance of the broader, S part of Selat Lintah.

The channel between Pulau Padar and Pulau Rinca is not recommended.

Selat Molo

6.31 **Selat Molo** (8°37'S., 119°49'E.), connecting Selat Sumba with the Flores Sea, passes along the E coast of Pulau Rinca and along the SW coast of Flores. As previously stated, the strait can only be used by small well-powered craft because of the strong currents in its narrowest part.

Gilimota (8°48'S., 119°48'E.), an island in the S entrance of the strait, is the major landfall for Selat Molo from the S. This island has three peaks, the highest attaining an elevation of 449m, and is easily sighted because of its sharp outline. A conservation area has been established (2003) in the waters surrounding Gilimota and can best be viewed on the chart. Certain restrictions may apply. For further information contact the Indonesian Department of Forestry.

Both shores of the broad S part of Selat Molo are marked by a succession of sharp, high points generally covered with tall reeds. Muddy mangrove-covered bights lie in between. A prominent exception is the bight at Salah Karontong on Pulau Rinca at the entrance of the narrows leading through Selat Molo. This bight has a white sandy beach visible for a great distance. In general, the bays on either shore can provide anchorage according to their size.

A dangerous drying rock lies in mid-channel between Toro Kembang, the NE extremity of Gili Mota, and the coast of Flores to the NE. This rock seldom breaks and never shows any discoloration.

Selat Molo Narrows are entered between Toro Waitimbang and the Flores coast close N of Linteh village. The shores are uninhabited and alternately rocky and muddy. Pulau Muleng, about 0.5 mile N of Toro Waitimbang, consists of two large mid-channel growth-covered rocks lying close together in a N-S direction. A 0.9m shoal extends 160m S from the S rock.

Tukoh Selat Molo, an island about 1.25 miles N of Pulau Muleng, consists of a single clump of vegetated rocks. The narrowest part of the passage is found close S of Tukoh Selat Molo.

Directions.—When approaching from the S, Gili Mota, the landfall island, is readily identified. The channel which passes W of this island, being wide and danger free, is preferred. If proceeding E of Gili Mota, the dangerous drying rock lying midway between the NE point of Gili Mota and the Flores shore must be avoided.

In order to clear this rock, bring Doro Tumbuh, the 187.5m peak on Pulau Rinca, in range bearing 331° with the opening between Nusa Baleh and the saddle-shaped islet close W, which leads 0.32 mile W of the rock.

Having cleared this rock, course should then be altered to the NW passing N of Gili Mota.

The narrows of Selat Molo may be navigated by eye but only at slack water. Pulau Muleng and Tukoh Selat Molo may be passed on the E side, as there is more room E of the latter rocks. From the N end of the narrows, steer NW and when the W sides of Pulau Pungu-besar and Pulau Bangkau are in range bearing 002°, steer for them passing W of Pulau Nisa Purung and Pulau Gadoh.

Flores

6.32 A mountain chain, attaining a height in excess of 2,377m in the W part, traverses the middle of Flores from W to E. From both sides of the chain, ridges run N and S forming steep promontories. The W part of the island has no volcanoes, but the E part, especially near the E and S coasts, has numerous volcanoes, some still active. Many rivers discharge along the N and S coasts but none are of any use to commercial shipping. Only a few are navigable near their entrance by small craft at high water. During the rainy season, they are not navigable higher up because of the strong currents, and in the dry season they are too shallow or dry completely.

Toro Waturamba (8°26'S., 119°52'E.) is the steep rounded NW extremity of a hilly grass-covered peninsula showing two summits from a W and E direction; the S summit rises to a height of 216m.

A bare dark rock, 24m high, resembling a lion lying down with its head W, lies 1 mile SW of Toro Waturamba. A lighted bouy lies 3.5 miles WSW of Toro Waturamba.

Pulau Seraya-besar (8°23'S., 119°52'E.) lies 1.75 miles N of Toro Waturamba, and has three summits. The W and highest summit rises to a height of 187m. The coast of the island is steep and rocky with occasional sandy beaches. The coastal reef is steep-to and shoals lie within 1 mile of the NE extremity of the island.

Pulau Seraya-kecil (8°24'S., 119°52'E.), between the above island and the coast of Flores, is low, wooded, and fringed by a steep-to drying reef.

There is a large area SW of Pulau Seraya-besar and W of Pulau Seraya-kecil, with depths of 35 to 55m, mud and sand, which provides good anchorage that is sheltered from the Southeast Monsoon.

Pulau Sabolan-besar (8°23'S., 119°49'E.) and Pulau Sabolan-kecil lie W of Pulau Seraya-besar, and are separated from it by a deep clear passage, 1.5 miles wide.

All of the coasts of the larger island are rocky, except its SE extremity which has a sandy beach. Both islands are fringed by a narrow steep-to reef.

Pulau Sabolan-kecil is marked by a light.

The coast between Toro Waturamba and **Pulau Boasala** (8°36'S., 119°47'E.), about 10.75 miles SSW, is indented by a large bight in its N part. Pulau Boasala is the NE entrance point

to the narrows of Selat Molo.

Pulau Tobolon (Pulau Tebolon) (8°29'S., 119°50'E.), Pulau Situri, Pulau Tenga, and Pulau Bajo, with the exception of Pulau Tobolon, are connected by the same drying reef and extend from W to E in that order. Pulau Tobolon, the westernmost island, is reed-covered and has a coconut plantation on its S side. Two small islets lie in the passage which separate Pulau Tobolon from Pulau Situri to the SE. This passage is not recommended because of the strong currents which set through it.

Pulau Situri (Pulau Kokotoan) (8°29'S., 119°51'E.), which rises to a height of 90m, has a dangerous drying rock close off its SW end.

6.33 Pulau Tenga (8°29'S., 119°51'E.) is topped by three summits, the N and E, 122m high, have conspicuous yellow stripes.

Pulau Bajo (Pulau Badjo) (8°29'S., 119°52'E.), 97m high on its N side, has a village on its NE extremity.

Labuhanbajo is the S part of the channel between Pulau Bajo and the coast of Flores to the E. The roadstead is free from danger but there are shoals in the approaches. In the S approach, a sunken coral rock which is seldom marked by discoloration, lies 0.75 mile S of the low, sandy point at the NW end of the village of Labuhanbajo. A sunken rock lies close off the stone pier fronting the village. In the N approaches, a 4m patch lies in mid-channel, 0.25 mile N of the same low sandy point reducing the navigable channel to a width of barely 91m.

Confined anchorage can be taken, in depths of 16 to 18m, mud, 0.25 mile SSW of the above low, sandy point.

The currents never exceed a rate of 0.5 knot in the roadstead.

Labuhanbajo (Labuhan Bajo) (8°29'S., 119°53'E.) is a large village of some importance as a place of export. A 39.5m long pier extends from the shore abreast of the village, but is available only to launches. A flagstaff stands on the beach, but it is difficult to identify unless a flag is displayed from it. A conspicuous white tomb stands N of the village. The port is now the starting point for trips to Pulau Komodo and Pulau Rinca.

The coast between Labuhanbajo and Pade Village, about 1 mile to the S, is steep-to about 0.25 mile offshore. Between this village and Toro Batuputih, about 3.5 miles SW, the coast is bordered by coconut trees and houses.

Toro Batuputih (8°32'S., 119°51'E.), a steep protruding white point, 75m high, has a white sand beach on either side and is conspicuous.

Pulau Mandjaga, which appears as a high cape from the W and NW, is joined by a drying reef to a point about 1 mile WSW of Toro Batuputih.

The coast between Pulau Mandjaga and the narrows of Selat Molo is mostly marshy with occasional rocky areas.

Pulau Kelor (8°33'S., 119°49'E.), lightly vegetated and conspicuous for its 60m hill, lies 1 mile WSW of Pulau Mandjaga.

6.34 Pulau Gadoh (8°35'S., 119°48'E.) lies close offshore on the coastal reef, 2 miles SSW of Pulau Kelor. Pulau Gadoh is hilly with a marshy coast, except on its rocky W extremity and on which there are some above-water rocks on the fringing drying reef.

A steep-to, partially drying reef, which is not always marked by discoloration, lies about 0.75 mile NNE of the 4.9m patch, about 0.25 mile NW of the W end of Pulau Gadoh.

Courtesy of http://www.agrisoft-systems.de/kawasaki

Entering the harbor of Lahuhanbajo by boat.

Pulau Boasala (8°36'S., 119°47'E.), covered by vegetation, rises to two round peaks each about 156m high; together these peaks form a flat-topped plateau. A conspicuous, bare reddish patch is located on the SW side of the islet. The islet is also the NW entrance point to the narrows of Selat Molo.

Anchorage.—Anchorage can be taken almost anywhere off this part of the coast of Flores. The best position lies in the bight formed by Pulau Boasala, Pulau Gadoh, and the coast of Flores. Good anchorage can also be taken in the bight at the NE end of Pulau Rinca, which has Rinca Village at its head. In the more open area W and N of Pulau Boasala, the current is never too strong for a vessel to anchor while awaiting for slack water in Selat Molo.

Selat Molo and the narrows of Selat Molo have been previously described in paragraph 6.31 as part of Pulau Rinca.

6.35 Toro Wairii (8°40'S., 119°48'E.), lying 9 miles S of Pulau Boasala, is the SE entrance point to the narrows of Selat Molo. A shoal of sand and stone, marked by discoloration at low tide, with a depth of 5.5m, lies 0.35 mile N of Toro Wairii.

A 7.6m shoal, not marked by discoloration, lies 0.25 mile further N.

Anchorage.—Anchorage can be obtained NE of the point, in depths of 10 to 12m. Toro Ladjar, a bare rocky point 18m high, lies 1.25 miles SSW of Toro Wairii.

From any distance to the S, the point looks like an islet.

Ini Tengah (8°42'S., 119°48'E.), a rock on the extremity of a drying reef, lies 1 mile S of Toro Ladjar.

This rock is 18m high and stands out prominently against the beach behind it.

Loho Kenupur (8°45'S., 119°48'E.) is a small bay lying 2.75 miles S of Ini Tengah. A conspicuous rectangular rock, 18m high, is the outer rock fringing the S entrance point of the bay. The N point of the bay drops sheer to the sea. Loho Rase is entered about 1 mile N of Loho Kenupur.

Numerous islands, rocks, and shoals lie in the channel between Gili Mota and the coast of Flores.

Toro Keritaku is a small, bare, cliffy, promontory lying 2 miles E of Gili Mota. The point rises to a 549m high mountain

2.25 miles NNE.

Tanjung Keritamese, lying 4.75 miles SE of Toro Keritaku, is the SW end of Flores.

Flores—South Coast

6.36 Tanjung Keritamese (Toro Kerita) (8°52'S., 119°55'E.) is the broad end of a peninsula having several small projections. A hill on the peninsula rises to a height of 408m and from any distance to the E or W appears as an island. The sides of the point are rough, bare and steep, and in places precipitous.

The W part of the S coast of Flores from some distance offshore appears as desolate irregularly-shaped mountain terrain with only an occasional area of coastal lowland. Large parts of the island are covered with reeds and sparsely covered with trees.

This part of the coast is partially protected by the high island of Pulau Sumba, but even a slight sea raises a surf along the coast.

Pulau Mules (8°54'S., 120°18'E.) is a prominent landmark along this part of the S coast. This island is hilly, mostly barren, and is conspicuous for the columnar peak in its SW part.

The volcanic cone of Gunung Inerie, about 40 miles E of Pulau Mules, is another good landmark.

The S coast of Flores, E of Gunung Inerie as viewed from the Savu Sea, is a rugged high mountainous area. The only low section of coast found along this stretch can be found in the area NE of Teluk Paga, about 73 miles E of Ineri, where Flores is only 6 to 7 miles wide.

The 200m curve never extends more than 2.5 miles off the S coast of Flores. Beyond 200m, the coast is entirely clear of dangers.

Tides—Currents.—The tidal currents along the S coast of Flores are semidiurnal and weak, and approximately parallel the shore. From November to March, the W current was observed to be stronger than the E current but never stronger than 1.5 knots. A current of 2 to 3 knots may be encountered in the channel between Pulau Mules and the shore. Currents greater than 1.5 knots are also found at the S entrance of Selat Flores at the E end of the island.

Toward the middle of Selat Sumba and the Savu Sea, the monsoonal current is the predominate set. As far as is known, the W set is stronger than the E. It is probable that there is a regular and constant W ocean current in these open areas.

From Tanjung Keritamese on Toro Lomo, 25 miles to the E, the coast gradually changes from a steep, rugged, wooded area to regular flat ridges covered with reeds. These ridges slope seaward, usually terminating in 20m high bluffs which are often carved into grottoes and odd projections by the sea.

6.37 Teluk Nangalili (Nangaele Bay) (8°48'S., 120°09'E.) is the wide bight between Tanjung Keritamese and Toro Repi. Nangalili, a small village, stands 0.5 mile within the mouth of a small river which flows into the head of the bay. A drying bank obstructs the mouth of the river.

Tangi, a village built on the seaward side of a high, steep ridge, is situated about 3 miles inland of Nangalili.

Anchorage can be taken, in a depth of 43m, off the drying bank fronting the river. During the Northwest Monsoon, vessels can anchor, in a depth of 45.7m, in the middle of a small bay that indents the E side of the peninsula forming Tanjung Keritamese.

Toro Lomo (8°50'S., 120°19'E.), low and tree-covered, is fronted by sandy beach. Pegunungan Todo (Munti Mountains), a high lofty chain, lie to the N of Toro Lomo.

Pulau Mules, which has been previously described in paragraph 6.36, is almost completely surrounded by a sandy beach, and in a few places fringed by a narrow reef. The channel between this island and the mainland coast is deep and clear, but strong currents run through it.

Anchorage can be taken, in depths of 40 to 55m, off the NW side of the island; however, tidal currents in this anchorage sometimes attain a speed of 3 knots.

Between Toro Lomo and **Toro Watu Ipu** (8°50'S., 120°37'E.), about 18 miles to the E, the coast is slightly indented by a wide bight whose shores are flat, tree-covered, and backed by rising ground. Two small villages are situated at the NW and NE corners of the bight. The coast, in the vicinity of the former, appears as a high wall fronted by a sandy beach.

Teluk Aimere (8°52'S., 120°50'E.), entered between **Toro Atuoto** (Tanjung Saukemeh) (8°53'S., 120°47'E.) and Toro Wai Waru, a low point about 6 miles to the E, is deep throughout. The former point is steep, broken, and strikingly white. The W side of the bay is steep and rocky, whereas the N side rises gradually inland. A long chain of mountains backs the E shore of the bay.

Gunung Inerie (8°53'S., 120°59'E.) is a remarkably symmetrical volcanic cone standing isolated by valleys and clefts from the peaks to the N. This cone is visible for a great distance seaward and is a valuable aid to navigators.

There is little or no current in the middle of Teluk Aimere, but strong currents are sometimes found along the shores.

Anchorage can be taken off the mouth of a river, at the head of the bay, in a depth of 49m, off the village of Aimere, SW of the zinc-roofed customs shed.

From Toro Wai Waru, the coast is boarded by the base of Gunung Inerie as far as **Ngaru Bere** (8°57'S., 121°00'E.), the S point of Flores, about 8.5 miles SE. Between the latter point and Ngalu Tangi (Ngaru Dai), about 19 miles ENE, the coast is indented by a large bight backed by steep mountains with cultivated slopes.

6.38 Teluk Ende (8°50'S., 121°31'E.), entered between Ngaru Dai on the W and Tanjung Ija on the E, is surrounded by hilly land with higher mountains lying farther inland. The peninsula separating this bay from Teluk Ipi to the E, has an active volcano in its S part. This volcano rises to a height of 669m and is covered with sulfur and ashes from frequent eruptions. It has an active crater on its S side.

The massive Keli Kotto (Ngakroe Tangi) has steep spurs and forms the W side of the larger bay. The spurs rise steeply from the sea to a height of 1,407m. A prominent mass of grass-covered rocks stands near the coast, SE of Keli Kotto.

The N shore of Teluk Ende consists of a limestone formation with some prominent white and gray patches. Ende, a village of some importance, stands in the NE corner of the bay.

Pulau Ende (Pulau Nosea) (8°52'S., 121°32'E.), which lies near the center of Teluk Ende and 2.5 miles offshore, consists of two mountains joined by a fairly low, narrow ridge. The S and higher mountain of the two is 472m high and prominent.

Several villages are situated on the island.

6.39 Ende (Endeh) (8°50'S., 121°39'E.) (World Port Index No. 51340), a small village standing in the NE corner of the bay, is the seat of a government official. The village can be recognized by a white building with a dark roof, and by a building with a red roof, both near the shore W of the pier. A light, 43m high, stands in position 8°50.7'S, 121°38.6'E.

The Ende Terminal Pier, which extends from the shore abreast the village, is 180m long with a depth of 5m alongside.

The Port of IPPI has two berths. No. 1 is 75m long, with an depths alongside depth of 7m, and accommodates fast ferries and ro-ro/lo-lo vessels. No. 2 is 140m long and accommodates ro-ro passengers/vehicles/rail, containers, and breakbulk.

Pertamina Oil Berth, consisting of an island with two mooring buoys, has a depth of 7.2m and may accept vessels up to 6,000 dwt, with a length of 120m.

The 40m curve lies about 0.15 mile offshore off Ende. Pilots are available but not compulsory. Anchorage can be taken, in depths of 55 to 66m, 0.25 mile NW of the pier. During the Southeast Monsoon, a moderate swell sets into the bay especially in the afternoon.

Teluk Ipi (8°52'S., 121°41'E.), entered close E of Tanjung Ija, is marked by a light at its head. During the Northwest Monsoon, it is better to anchor in Teluk Ipi, about 0.25 mile of **Ipi Village** (8°51'S., 121°40'E.), in a depth of about 54.9m. Care must be taken not to anchor too close to the coastal reef to the N. Ipi Ende Light is shown from a a white lighthouse, 20m high, lying close NW of the T-jetty.

The coast E of Teluk Ipi is high and steep and is formed by the spurs of the sharp mountain ridges.

Courtesy of http://www.stefan.wg-kunterbunt.de/gallery/ende_boat
Ende from pier head facing town

Teluk Mbuli (8°50'S., 121°53'E.), an open bight backed by a broad well-cultivated strip of land fronting the coastal mountains, is very deep. A reddish-colored dome-shaped hill, 704m high, forms the E point of the bay. Some dangers lie up to 0.75 mile offshore E of this point. The bay does not afford safe anchorage during either monsoon.

Courtesy of http://www.stefan.wg-kunterbunt.de/gallery/ende_boat
Port of Ende

Courtesy of http://www.stefan.wg-kunterbunt.de/gallery/ende_boat
Ende—Pertamina Oil Berth

Ngalu Ljukate (Ngaru Itju Kate) (8°48'S., 122°00'E.), a cliffy perforated point, lies about 6 miles ENE of Teluk Mbuli. A village stands on the banks of a river which discharges close W of the point. A rocky islet stands in a small bight close E of the point. A prominent light green hill, 308m high, stands close to the coast at the head of this bight.

6.40 Teluk Paga (8°45'S., 122°07'E.), a deep open bay, lies centered about 8 miles NE of Ngalu Ljukate. A conspicuous peak with a flat summit, 1,446m high, rises about 6.5 miles N of the head of the bay. Two large villages, fronted by reefs which extend about 0.5 mile offshore, stand near the shore on the W side of the bay. A village, consisting of a few houses and a mission, stands in the NE part of the bay.

Anchorage can be taken off this village, in a depth of 58m. Fair shelter is provided during the Southeast Monsoon.

Sika Besar (8°45'S., 122°12'E.) and Tanjung Wokar, a point about 1.25 miles to the E, form a long, flat plain backed by steep mountains. A church stands in a village on this plain. The spire and zinc roof of the church are visible from the offing. A number of sheds stand near the shore and a reef extends about 0.25 mile offshore.

Ngaru Baluk, a steep, rocky point about 80m high, lies about 4.25 miles E of Tanjung Wokar.

Ngaru Kelahi (8°42'S., 122°32'E.), about 16 miles E, is the extremity of a steep mountain ridge and can be recognized from the offing by two vertical patches of white rocks, one above the other. The bight between this point and Ngaru Kuar, about 6 miles to the NE, is bordered by a sandy beach.

Tanjung Tuak (8°38'S., 122°43'E.), about 12 miles ENE of Nagaru Kelahi, has a prominent, bare hill, 138m high. An oblong reef, with a least depth of 1.5m, lies centered about 2 miles W of this point and 1 mile offshore.

The coast to the E of Tanjung Tuak is surmounted by **Ili Lewotobi-perempuan** (8°33'S., 122°47'E.), consisting of two active volcanoes. The highest volcano is 1,704m.

Tanjung Lirang (Tanjung Lerang) (8°37'S., 122°47'E.), the E of two rocky points, lies about 3.5 miles NE of Tanjung Tuak. Tanjung Lirang is reported to be prominent. The coast between the points is indented by two bays separated by a mountainous promontory.

6.41 Larantuka (8°21'S., 122°59'E.) (World Port Index No. 51330) is situated about 17 miles NE of Tanjung Lerang. It is the district capital of East Flores and the site of an original 17th century Portuguese mission.

A pier, 46m long, which can be used as a landing place but not for vessels to berth alongside, fronts the village. The custom house is situated on the pier with a flagstaff at its root.

The Ferry Berth, 206m in length, accommodates fast ferries. The General Cargo Berth, 122m in length, accommodates break-bulk vessels with a maximum draft of 5.8m. The Larantuka Oil Terminal Berth No. 1 is 15m long with a depth of8.6m alongside and can accommodate vessels up to 1,500 dwt with a maximum l loa of 65m.

A long barrack stands about 1.5 miles W of **Laurantuka Light** (8°20'S., 122°59'E.), 0.2 mile NE of the church.

Small ferries run between Larantuka, Pualu Solor, and Pulau Andonara.

Anchorage may be taken, in a depth 29m, 0.2 mile off the pier or for a distance of 0.6 mile, NE of this berth.

Larantuka Terminal (8°20'S., 122°55'E.) is situated on the W side of Teluk Oka, approximately 0.5 miles S of the village of Oka. The facility is owned and operated by Pertamina and handles petroleum products. Vessels with lengths up to 65m and 1,500 dwt have been accommodated. A depth of 6m alongside has been reported.

Between Larantuka and **Tanjung Matangdu** (8°17'S., 123°01'E.), about 4.5 miles NNE, the coast slopes gradually upward and is mostly wooded with palms. Sandy beaches front the coast.

From Tanjung Matangdu to **Tanjung Karangwutun** (8°08'S., 122°58'E.), about 9.25 miles NNW, the coast is mountainous and fringed by a narrow reef.

Nusa Berlang (Pulau Serbete) (8°09'S., 123°01'E.), an islet 29m high with a sandy beach on its S side, lies 7.5 mile N of Tanjung Matandu. The N side of the islet is rocky. The island lies on the W end of a reef which extends 1.75 miles E. The reef dries entirely at LW in April and November. Sand cays lie off the W side of the islet, midway along the N side and on the E end of the reef.

The S side of the reef is almost steep-to, but irregular depths extend 1.5 miles NW of the N side of the reef. The channel between Pulau Serbete and the E coast of Flores is deep and clear of dangers. Tanjung Serbete Light is shown from a beacon near the point.

Between Kari-Wutun and **Tanjung Kopondei** (8°04'S., 122°52'E.), about 7.5 miles NW, the coast is rocky and steep with all dangers lying within 0.5 mile offshore.

Flores—North Coast

6.42 Toro Waturamba (8°26'S., 119°52'E.), the NW extremity of Flores, has been previously described in paragraph 6.32.

The N coast of Flores, E of Toro Waturamba, is very irregular with numerous projecting points and inlets. The coast rises steeply to the high mountains in the interior. The central mountains of Flores can be seen far inland.

Many of the bays provide good anchorage during the monsoons, with some providing shelter from both monsoons.

Detached dangers lie up to 6 miles off the projecting points along the N coast. All of these dangers lie within the 200m curve, except **Gosong Boni** (8°22'S., 122°14'E.) and Pasir Layaran (Angelica Bank), both described later in paragraph 6.52 and paragraph 6.49, respectively.

The currents off the N coast of Flores usually follow the direction of the prevailing monsoon, at a rate of 1 knot.

Teluk Rangko (8°27'S., 119°55'E.), whose E boundary is Toro Waturamba and Teluk Boleh, lying just to the E of Teluk Rangko, are separated from each other by Toro Boleng, a steep point 186m high. These bays are of little navigational importance because of the dangers in their approaches.

Teluk Terang (8°24'S., 120°07'E.), with an entrance 0.3 mile wide, is deep and clear in its outer part. The entrance lies between the reefs extending N from **Toro Tjarmi** (8°21'S., 120°07'E.) on the E side, and those extending N from Toro Lehok Tjamba. The latter point stands 3.3 miles E of **Toro Pontianah** (8°23'S., 120°02'E.).

Three inlets, of little importance to shipping, indent the W side of the bay.

Anchorage can be taken in the outer part of the bay, in convenient depths over a bottom of mud.

Nusa Longgo (Nusa Longos) (8°21'S., 120°08'E.) is a low, stony, wooded island with a marshy coast lying close N of Toro Tengkel (Toro Tjarmi).

A chain of reefs, separated from the reefs fringing Nusa Longos by the deep channel leading to Teluk Terang, extends 3 miles NE from Toro Lehok Tjambi, and then 8 miles W, just within the 200m curve.

Teluk Levilia (8°22'S., 120°10'E.) lies between Nusa Longos and the coast to the S and SE. The entrance is 0.4 mile wide between the reef fronting the NE side of Nusa Longos, and the reef extending from the coast to the E.

Anchorage.—Vessels can anchor in Teluk Levilia. Good anchorage can be taken, in a depth of 40m, mud, S of the E point

of Nusa Longos.

Between **Tanjung Peta Bari** (8°18'S., 120°12'E.) and Tanjung Besi, about 14.5 miles ENE, the coast is fringed by a narrow reef and backed by high mountains.

The former point, which is low and sandy, has a white sandy patch, always above-water, on the reef to the W of it.

6.43 Tanjung Besi (8°14'S., 120°25'E.), marked by a light, is the extremity of a very prominent plateau rising to a height of 392m.

Between this point and Tanjung Kurungbaja, about 10 miles to the E, the coast is indented by two rather small bays.

Teluk Reo (8°16'S., 120°30'E.) is entered between the E side of the promontory terminating in Tanjung Besi and a low point about 4.75 miles to the SE.

Reo Light (8°17'S., 120°27'E.) stands on the E side of Tanjung Besi. The W shore of the bay as far as Toro Kedindi, a low rocky point 2.5 miles SSE of Tanjung Besi, rises steeply to the plateau on the promontory and is bordered by a sandy beach. Saddle Mountain (Zadelberg), a prominent 1239m high mountain, lies 11 miles S of the head of Teluk Reo.

Kedindi Village (8°17'S., 120°27'E.) lies at the head of Teluk Kedindi and is fronted by a pier in ruins which extends across the coastal reef. Several rocks and a stranded wreck lie off the pier.

Anchorage can be taken, in a depth of 22m, mud, off the pier at Kedindi and in a depth of 45.7m, SE of Kedindi.

Teluk Linggeh (8°16'S., 120°34'E.) is entered between Toro Lubu (8°16'S., 120°32'E.) and Tanjung Kurungbaja, 4 miles to the ENE, and provides the best anchorage for large vessels along this part of the coast. The head of the bay is low, marshy, and intersected by several small rivers. Vessels can anchor, in depths of 43.8 to 54.9m, mud, in the SE part of the bay.

Tanjung Kurungbaja (8°15'S., 120°36'E.), a steep, rocky point with a 205m round-topped hill, 0.5 mile S, is the termination of a ridge descending from the mountain range inland. Between this point and Toro Barat, 8.5 miles SE, the coast is steep and wooded with occasional sand beaches and marshy strips.

Labuhan Pota (8°20'S., 120°45'E.), a small open bay fringed by a drying reef, is entered between Toro Barat and Toro Lari, about 2.75 miles ESE. A sandy beach, intersected by several streams, forms the shores of the bay.

Toro Roto (8°20'S., 120°48'E.), which stands about 3 miles E of Toro Lari, consists of a broad mountain spur with a light brown color. Olifantsberg (Golo Watupuh), 1,145m high, bare, and resembling an elephant, rises 8 miles S of the same point.

Toro Padang (8°20'S., 120°59'E.), about 13 miles E of Toro Roto, is the NE extremity of a partly wooded peninsula forming the W side of Teluk Damu, and which is connected to the mainland by a low narrow isthmus about 0.5 mile wide. The peninsula rises to a height of 209m about 0.75 mile WSW of Toro Pedang.

6.44 Teluk Damu (8°22'S., 120°59'E.) is deep, clear of dangers, and provides sheltered anchorage, but in considerable depths. The E side of the inlet is fouled by reefs which extend 1.25 miles from the N side of Pulau Untelue (8°23'S., 121°01'E.), leaving an entrance 0.2 mile wide between them and the reefs extending from the E side of Toro Padang. Unnamed islets lie on the drying reefs extending from the N side of Pulau Untelue.

Teluk Riung (Rioeng Bay) (8°23'S., 121°02'E.) is a large, reef-strewn bay lying between Pulau Untelue on the W side and Pulau Ruton and Pulau Tangril, both lying on a drying reef, on the W side.

Batu Kolong lies on the reef extending 0.5 mile from the E side of Pulau Untelue.

Between Batu Kolong and a point 4.75 miles ESE, the coast is fronted by bare and rocky islets and reefs, the latter extending up to 0.75 mile offshore. Some of these islets off Teluk Riung are good landmarks.

Riung Village (8°26'S., 121°01'E.) stands on the crest of a hill, 564m high, about 2.25 miles inland.

Anchorage.—Anchorage can be taken in Teluk Riung in the outer roadstead, in a depth of 51m, about 0.75 mile ESE of Batu Kolong. Small vessels can anchor in the inner roadstead, in a depth of 27m, mud, about 1.5 miles S of Batu Kolong, but the space is confined. Good shelter is provided in both roadsteads during the monsoons.

Directions.—Vessels approaching from the W should steer 146° for Pulau Ruton. When Pulau Pata bears 201°and is open E of Riung Village, steer for it on that bearing to the outer anchorage. If anchoring in the inner roadstead, continue on this course until **Pulau Babajie** (8°24'S., 121°01'E.) bears 230°, then steer by eye between the drying reefs, which are marked by discoloration extending from Pulau Pata, and Pulau Lainjawa, almost 0.5 mile NNW.

When approaching from the E, Pulau Dua should not bear more than 270°, and when Pulau Pata bears 201°, proceed as previously directed.

6.45 Tanjung Torieng (8°25'S., 121°09'E.), which lies 7 miles E of Teluk Riung, is the relatively low, rocky end of a narrow hillcrest sloping from SE to the NW.

Between Tanjung Torieng and **Tanjung Nbai** (8°30'S., 121°18'E.), about 10 miles ESE, the tree-covered coast is low for the most part. Spurs descend to the coast from Gunung Wangka, about 6 miles SSW of Tanjung Torieng.

This prominent mountain rises to a height of 1,126m and is the summit of a high ridge extending to the NW. A prominent rocky rugged hill, 256m high, stands near the coast about 4.5 miles W of Tanjung Nbai. A light is shown from the coast 2.25 miles SSE of Tanjung Nbai.

The 200m curve parallels the coast about 3 miles offshore. A long ridge of reefs, which continue to the E as far as a peninsula about 19 miles E of Tanjung Nbai, lies close within this curve. The best passage through the outer reefs lies W of **Pasir Rita** (8°26'S., 121°18'E.) with the 256m hill, about 4.5 miles W of Tanjung Nbai, bearing 231°. Pasir Rita consists of a large sand bank with some low trees, which is surrounded by a drying reef.

Between Tanjung Nbai and **Tanjung Lambo** (8°26'S., 121°22'E.), about 6 miles SE, the coast is low and marshy. An extensive plain lies inland along this stretch of coast. Marapokot (8°31'S., 121°20'E) is a small port 3 miles NW of Tanjung Lambo. The Main Jetty, 157m in length, handles dirty products (DPP), cement, breakbulk, and bulk cargo.

Several deep bays, separated by prominent points, indent the coast between Tanjung Lambo and Ngalu Pola Boko (Tanjung Karterbileh), about 16.25 miles ENE. The 200m curve fronts the projecting points up to 2.5 miles offshore. Just within this curve

lies the chain of reefs previously mentioned. Other dangers lie in the immediate approaches to and within these bays.

6.46 Teluk Todo (8°34'S., 121°26'E.), a small exposed bight, is entered between a conspicuous white limestone point, located 1.5 miles ESE of Tanjung Lambo, and Tanjung Todo, a steep, rocky, and grass-covered point lying 3.5 miles to the E. A mountain with a broad summit, 416m high, stands about 1 mile S of this latter point. A sharp peak, 569m high, stands 2.25 miles SSE of the same point.

The head of the bay consists of a marshy lagoon, with a steep rocky islet lying in the entrance. Two large rocks lie on the drying reef fringing the W entrance point of the bay.

Teluk Todo provides fair anchorage, especially during the Northwest Monsoon, because it is somewhat protected from the sea by numerous reefs. The anchorage is difficult to reach and should only be attempted by small vessels with local knowledge, and then only under the most favorable conditions.

Teluk Sindeh (Tjiendeh Bay) (8°34'S., 121°31'E.), entered E of Tanjung Sindeh and located 2.5 miles ESE of Tanjung Todo, provides anchorage during both monsoons. Pulau Sindeh (Tjiendeh), a rocky islet 89m high, is separated from Tanjung Sindeh by a narrow passage. A reef, with a depth of 1.8m, lies in the middle of the entrance to the bay. Other reefs and dangers lie within 1.5 miles NNW of Tanjung Kaburia, which lies about 2 miles E of Tanjung Sindeh.

Anchorage.—Teluk Sindeh is more spacious than Teluk Todo, and although more open to N winds, affords safe anchorage to vessels with local knowledge.

Directions.—Steer for the limestone point 0.5 mile S of Tanjung Kaburia, bearing 174°, which leads 0.7 mile E of a drying sand bank, 2.75 miles N of Pulau Sindeh.

Continue on this course until the N side of the islet is in range, bearing 276°, with Tanjung Todo. Then proceed into the bay passing W of the reefs lying off the E entrance.

6.47 Ngalu Pola Boko (Tanjung Karterbileh) (8°28'S., 121°37'E.), 9 miles NE of Teluk Sindeh and marked by a light shown at an elevation of 127m, and Tanjung Lolakota, 1.75 miles further E, are the N and NE points of a rugged peninsula. Between the latter point and Tanjung Batuboga, about 19 miles to the E, the coast is indented by some wide, open bays. In several places the mountains recede inland, leaving fairly broad plains fronted by sandy beaches.

The 200m curve lies up to 1.5 miles off the salient points. A chain of reefs extends along the 200m curve, except to the N of Teluk Nangarujeng. These reefs increase in number as Tanjung Batuboga is approached.

Pulau Palu (8°20'S., 121°43'E.) lies 8.5 miles NNE of Ngalu Pola Boko and is 889m high. The 200m curve is never more than 0.3 mile offshore. A steep mountain ridge exists on the NW part of the island.

Labuan Bokko, a small open bight, indents the NW coast close S of this ridge. Small vessels, with local knowledge, can anchor off the N coast about 0.15 mile NW of Mage and 0.1 mile off the coastal reef, in depths of 54.8 to 73.2m.

Caution.—Caution is advised because the bottom is steep. It is advisable to run a hawser to the shore.

Teluk Nangarujeng (Nanga Roedjong Bay) (8°30'S., 121°41'E.), 3 mile SE of Tanjung Lolakota, is entered between an unnamed point and a reef-fringed point, about 3 miles to the E. It is deep and clear, but exposed to both monsoons. Fair weather anchorage can be taken, in depths of 27 to 45m, mud, about 0.5 mile offshore.

Teluk Mausambi (8°29'S., 121°48'E.) is entered between Tanjung Mausambi and **Ngalu Bu** (8°29'S., 121°50'E.), about 3.5 miles ENE. It provides some shelter from both monsoons. A ridge of reefs, just within the 200m curve, fronts the entering points. A small reef, with a depth of 4.9m, lies 0.6 mile E of Tanjung Mausambi.

Another reef, with a depth of 0.9m, is 0.4 mile farther E. When the reefs are plainly marked by discoloration, vessels with local knowledge can pass between a reef with a depth of 5.5m, 1.25 miles NNE of Tanjung Mausambi, and a shallower and larger reef farther E.

Anchorage.—Anchorage may be obtained by vessels with local knowledge, in a depth of 37m, mud, 0.3 mile SE of Tanjung Mausambi.

6.48 Teluk Dondo (Dondo Bay) (8°29'S., 121°53'E.) is the wide and open bight which lies between Ngalu Bu and Tanjung Batuboga. The former point must not be approached closer than 1 mile due to the reef in its vicinity, Dondo village lies 5 miles E of Ngalu Bu.

Vessels can anchor, in a depth of 46m, mud, to the W of the village about 0.3 mile offshore.

Tanjung Batuboga (8°26'S., 121°57'E.) is the rugged N extremity of a grass-covered rocky peninsula. The largest of two small islets which stand off the point has a few trees on its summit. The coastal reef extends 0.25 mile off these islets and has some prominent above-water rocks at its seaward end.

Anchorage.—Anchorage can be taken, in a depth of 73m, with local knowledge, in a small inlet 0.5 mile S of Tanjung Batuboga.

6.49 Tanjung Batumanuk (8°26'S., 122°02'E.) is the outer end of a bold, high, and grass-covered promontory. A reef, with a depth of 6.7m, lies 0.25 mile WNW from the point.

A foul bay lies between this point and Tanjung Nanga Delan, about 7 miles SE.

Ili Kimang (Kimangboleng) (8°37'S., 122°07'E.), a prominent flat summit 1,446m high, stands at the E end of a high range of mountains which back this coast.

Pulau Sukur (8°07'S., 122°08'E.), lying 20 miles NNE of Tanjung Batumanuk, has a conspicuous summit 264m high on its NE side. In the SW part of the island there is a hill, 86m high, and N of this hill Pulau Sukur is low and flat. A rock, with a lone tree, stands close off the E shore of the island.

A narrow ridge, with depths of 26 to 47m, extends about 0.75 mile N from the W part of the island. Here vessels with local knowledge may take anchorage 0.75 mile N of the 86m high hill.

Pasir Layaran (Angelica Bank) (7°46'S., 122°18'E.), an atoll plainly marked by discoloration lying 22 mile NE of Pulau Sukur, is divided into two basins.

The reef dividing the lagoon into two parts, runs in a WNW and opposite direction and has some very conspicuous, large, drying brown rocks in the middle. Some drying patches lie on the outer edge of the outside reef.

Anchorage.—Anchorage can be taken by small vessels with local knowledge, in depths of 44 to 60m, by passing over the

reefs close NE of the sand cay on the W extremity of the atoll in the W basin. A radar conspicuous wreck was reported on the NW corner of the reef.

Teluk Maumere

6.50 Teluk Maumere (8°35'S., 122°18'E.), entered between **Tanjung Titir** (8°36'S., 122°13'E.) and **Tanjung Pogong** (8°37'S., 122°20'E.), 7.25 miles to the E, is exposed to NW winds. The shores of the bay are mostly low and sandy, and backed by a broad plain extending some distance inland. The coastal reef is narrow, but in places detached reefs lie 0.5 mile offshore.

Caution.—During the months of June, July, and August strong winds lasting many days sweep down from between the mountains that back Teluk Maumere.

All of the known dangers are contained within the 200m curve, which lies up to 0.75 mile offshore. The approaches to Maumere Road are clear, but a number of reefs lie on either side of the approach to Geliting Road close E. There is a break in the coastal reef off Maumere, but the bottom rises very steeply.

6.51 Maumere (8°37'S., 122°13'E.) (World Port Index No. 51320), the seat of a government official, is a small agriculture export center and is frequented by small inter-island vessels.

Depths—Limitations.—The port consists of three berths, as follows:

1. Berth No. 1, 60m long, can accommodate vessels up to 3,500 dwt, with a maximum length of 45m and a maximum draft of 8m.
2. Berth No. 2, 60m long, can accommodate vessels with a maximum length of 60m and a maximum draft of 9m.
3. Berth No. 3, 60m long, can accommodate vessels with a maximum draft of 9m.

The BBM Maumere Terminal Pertamina Oil Berth, with a berthing length of 162m including dolphins, can accommodate vessels up to 6,500 dwt with a maximum length of 130m. A stranded wreck lies close off the head of the pier.

Anchorage.—Anchorage may be obtained, in a depth of 30m, mud and sand, 91m off Maumere where the bottom rising steeply. Several small lighters are available to handle cargo at the anchorage. Geliting, 5 miles E, has no facilities for handling vessels.

Between **Tanjung Pogong** (8°37'S., 122°20'E.), 3 miles NE of Geliting, and **Tanjung Darat** (8°30'S., 122°29'E.), about 11.5 miles NE, the low coast is mostly tree-covered. The latter point is low, but close inland the terrain rises to four hills, the N hill being covered with reeds and a few trees. Small inlets with villages at their heads, indent the SE and E parts of this section of coast.

6.52 Pulau Besar (8°28'S., 122°22'E.), Pulau Damhilah, and Pangah Batang lie close together on a shoal plateau, which is separated from the rounded peninsula forming Tanjung Darat, by Selat Pangabatang, a deep, clear strait. Pulau Besar is high, steep, and wooded with some villages on its slopes. Two small islets lie close off the SE end of the island.

Detached reefs are reported to lie up to 2 miles E of this end of the island.

Pulau Dambilah (8°28'S., 122°26'E.) is irregular, hilly, and 219m high. Pulau Parmahan with a settlement on it, lies close N of this island.

Pangah Batang (8°29'S., 122°28'E.), a small islet with a settlement on it, lies SE of Pulau Dambilah at the SE end of the shoal plateau.

Pulau Babi (8°26'S., 122°30'E.), lying in the NE approach to Selat Pangabatang, is 351m high, wooded, steep, and reef-fringed.

Pulau Pamana-besar (8°22'S., 122°18'E.) and Pulau Pamana-kecil stand close together on the same reef, 4.75 miles NW of Pulau Besar. The 200m curve lies close to the edge of the reef surrounding the islands.

Gosong Boni (8°22'S., 122°14'E.), 2.25 miles SW of Pulau Pamana-besar, is an atoll which dries in places with depths of 37 to 84m, white clay, inside the lagoon. An opening 0.15 mile wide on the E side of the atoll leads into the lagoon. The S side of the atoll is marked by a light.

The coast between Tanjung Darat and Tanjung Bela, about 17 miles ENE, is irregular and for the most part steep-to. The Nanga Gite, the principal river in the NE part of Flores discharges through a broad valley about 4.5 miles NE of Tanjung Darat.

Anchorage can be taken W of the river mouth, about 0.2 mile offshore, in depths of 37 to 55m, mud and sand.

Tanjung Watu Wulan (8°24'S., 122°36'E.), 9 miles NE of Tanjung Darat, and Tanjung Bokan, about 1.75 miles further NE, are both high and rocky points and should not be approached within 0.75 mile to avoid the coastal reef.

6.53 Teluk Waiprung (8°21'S., 122°46'E.), a small bay, provides anchorage, in depths of 37 to 73m, in its central part about 0.35 mile offshore. The bottom is steep and irregular.

The coast between Tanjung Bela and Tanjung Batoe Pajoeng, about 8.25 miles N, is indented by Teluk Hading, a deep and spacious bay. The S shore is bordered by high, steep, mountain land. Gunung Kumarodo, with two high rounded summits of almost equal height, stands near the head of Teluk Hading.

Gunung Nubi (8°07'S., 122°51'E.), on the N side of the bay, has two summits separated by a shallow saddle. The N and highest peak rises to a height of 747m.

The bay is very deep and clear except for some small detached reefs lying close offshore. The 200m curve follows the trend of the coast about 0.5 mile offshore in places.

Small vessels can anchor NW of a reef-fringed inlet in the NE corner of the bay, in a depth of 46m, 0.15 mile off the coastal reef.

Tanjung Batoe Pajoeng (Tanjung Watupayung) (8°14'S., 122°44'E.) is low and tree-covered. The coast between this point and Tanjung Kopondie, about 13 miles NE, is well cultivated and has a few scattered villages.

Small vessels with local knowledge can anchor very close to shore on either side of Tanjung Gedong, a high, rocky, small peninsula, about 1.5 miles WSW of Tanjung Kopondei. There are depths of 46 to 55m, but swinging room is limited.

Tanjung Kopondei (Flores Head) (8°04'S., 122°52'E.) is a high, steep promontory with its E side bordered by a bare, rocky wall, dropping almost perpendicularly into the sea. A prominent flat rock lies close off the point. Magnetic disturbances have been reported off the point.

Straits and Islands between Flores and Pulau Lomblen

6.54 Kepulauan Solor (8°29'S., 123°21'E.), consisting of Pulau Adunara, Pulau Solor, and Pulau Lomblen belongs to the residency of Timor and are well populated. Agriculture is the principal industry of the islands because of the very fertile soil. Numerous coconut plantations are scattered throughout the islands.

The W side of Pulau Adunara and Pulau Solor are separated from the E side of Flores by Selat Flores, which is variable in width and clear of dangers.

Selat Larantuka (Larantuka Narrows), the N entrance of Selat Flores, lies between the E end of Flores and the SW side of Pulau Adunara, and has a minimum width of 0.2 mile between the 20m curves.

Selat Lewotobi, the S entrance of Selat Flores, separates the SW side of Pulau Solor from the SE end of Flores. This entrance has a width of 1.75 miles and is deep and clear.

Selat Boleng separates the NE end of Pulau Adunara from the NW end of Pulau Lomblen. Selat Lamakera separates the E end of Pulau Solor from the SW side of Pulau Lomblen. These straits are deep and clear, but exposed to seas and swells. Anchorage is impracticable in Selat Boleng.

Pulau Komba (7°48'S., 123°35'E.), 26 miles N of the N coast of Pulau Lomblen, is about 2 miles in diameter with an active volcano, 748m high, in its S part. The island serves as an excellent landmark for vessels approaching Selat Flores or Selat Boleng from the N. It was reported to be a good radar target at 40 miles.

6.55 Nusa Belang (Pulau Serbete) (8°09'S., 123°01'E.), a small oblong-shaped islet 8.5 miles NW of Pulau Adunara, is surrounded by a reef which extends 1.75 miles ESE and 1 mile NW. It partly dries at low water during April and November. A light is shown near the W end of the reef. Two sand banks lie on this reef. The E bank, near the edge of the reef, is reported no longer visible above water.

Tides—Currents.—The tides in all the main straits in this area are mixed, but are predominately of a semidiurnal nature. The lowest level is reached in April and November.

The horizontal tidal movement in Selat Flores is of a semidiurnal nature with the current turning somewhere about the time of the moon's transit, and from 6 to 8 hours later.

From 2 to 6 hours after the moon's transit, the S current is very strong with the maximum velocity occurring during the 5th or 6th hour. The N current is strongest from 4 hours before the moon's transit to about the time of transit.

The greatest velocity occurs about 3 to 4 days after full and changes. The S current may then attain a rate of 8 to 11 knots, and the N current a rate of 6 knots. The least velocity occurs about 3 to 4 days after the moon's quarter phases, when both N and S currents attain a maximum rate of 3.5 knots. Only very weak tidal currents are found in the wide part of the strait.

The current in Selat Larantuka sets N about 1 hour after the rising and setting of the moon, the S current 6 hours later. Slack water, especially during springs, is of short duration.

Strong currents run through Selat Larantuka and low-powered vessels are advised not to navigate this strait. Other vessels must use great caution.

The N current in Selat Lewotobi begins 1 hour after the rising and setting of the new moon. The maximum rate is 5 knots and is strongest between **Nuha Lobetobi** (8°36'S., 122°51'E.) and the coast of Flores.

In Selat Solor the tidal currents set E on the rising tide and W on the falling tide, at a rate of 1 to 1.5 knots. The direction and strength of this current is greatly affected by the currents in Selat Flores, Selat Boleng, and Selat Lamakera at that time.

In Selat Boleng and Selat Lamakera the horizontal tidal movement is of a semidiurnal nature and can be very strong. Limited observations indicate that the NE current in Selat Boleng can be expected to occur from 2 to 3 hours before to 2 to 3 hours after the moon's passage, and usually earlier in Selat Lamakera.

The SW current commences from 3 to 4 hours after the moon's transit to 9 to 10 hours after transit. The tidal currents are strongest at the narrow N entrance and near the S entrance. During springs, the current could possibly attain a rate of 7 knots. A rate of 5.5 knots has been observed 2 days after springs.

In Selat Lamakera the tidal currents are very strong. A maximum rate of 7 knots has been reported. Limited observations indicate that the NE current occurs from 2 to 3 hours before to 2 to 3 hours after the transit of the moon.

The SW current occurs from 3 to 4 hours after to 9 to 10 hours after transit.

Directions.—Vessels approaching Selat Larantuka (Larantuka Narrows) from the N should bring **Tanjung Serbete** (8°19'S., 123°01'E.) in range with **Tanjung Udang** (8°20'S., 123°01'E.), bearing 204°. When the church at **Wureh** (Wuri) (8°18'S., 123°02'E.) bears 114°, the course should be altered more to the S and a mid-channel course steered through the narrows into the wide part of Selat Flores. Approaching from the S, vessels should have little difficulty as many good landmarks exist.

6.56 Pulau Adunara (Adonara) (8°09'S., 123°12'E.), a large and mountainous island, forms the E side of Selat Larantuka.

Between **Tanjung Sanganyiwutun** (8°14'S., 123°09'E.), the NW projection of the island, and Tanjung Horongwutun, 3 miles to the E, the coast forms an open, reef-fringed, and foul bight. The former point consists of a low ridge extending some distance offshore and rises almost perpendicularly from the sea.

Teluk Sagu, a small reef-fringed bay, is entered between **Tanjung Saguwutun** (8°14'S., 123°13'E.) and Tanjung Koli Kedehwutun, about 1.3 miles E. The bay provides good shelter to small vessels. Sagu, a village, stands along the SW shore and can be identified by a stone building with a zinc roof. A flagstaff stands in front of the building and a conspicuous shed stands to the E. A white stone pyramid stands at the head of the bay. A rounded hill rises SW of the pyramid.

Several detached shoal patches with depths of 5.5 to 9m lie between 0.75 mile E and 1.75 miles ENE of Tanjung Saguwutun. Several other shoal patches, with depths of 3.5m and less, lie in the S half of the bay.

Small vessels with local knowledge can enter the bay by steering 176° for the white pyramid, and anchor when Tanjung Koli Kedehwutun bears 062°. This position has a depth of

43.9m, sand, and lies about 0.15 mile off the reefs on either side. Smaller craft can anchor farther in, according to draft.

Caution.—It was reported (1996) that the flagstaff was damaged and difficult to see and that the stone pyramid no longer existed.

6.57 Between Tanjung Koli Kedehwutun and **Tanjung Wurgobin** (8°16'S., 123°20'E.), about 6.5 miles ESE, the coast is fronted by reefs and dangers to a distance of 2 miles offshore. Mokko, a village built on piles over the water, stands about 1 mile W of Tanjung Wurgobin.

Pulau Watupeni (Watu Peni) (8°14'S., 123°19'E.) and Pulau Kroko lie about 2 miles N of Tanjung Wurgobin on an extensive reef which partly dries. On the S side of the reef there is a conspicuous drying patch of white sand.

Tanjung Wurgobin, the NE extremity of Pulau Adunara, is a low, thickly wooded point fringed with mangroves.

Ili Boleng (Boling) (8°21'S., 123°15'E.), an active volcano about 1,689m high with a large crater opening on its NW side, occupies the entire SE part of Pulau Adunara. It is prominent from all directions.

Selat Boleng and Selat Lamakera

6.58 Selat Boleng and Selat Lamakera provide a spacious, deep, and almost clear passage from Flores Sea to the Savu Sea (Sawu Sea), Pulau Adunara, and Pulau Solar on the W side, with Pulau Lomblen to the E. The straits are somewhat exposed to seas and swells during the latter part of October, and the months of November and December. Strong tidal currents prevail. For these reasons, Selat Flores is preferable, although Selat Larantuka, owing to its less width and stronger tidal currents, is more difficult to navigate than Selat Boleng.

Stiff SW winds prevail in Selat Boleng and Selat Lamakera, from the latter half of October through the months of November and December.

Selat Boleng (8°17'S., 123°21'E.) is the W side of the strait is formed by the E coast of Pulau Adunara, between **Tanjung Wurgobin** (8°16'S., 123°20'E.) and **Tanjung Watuwoko** (8°23'S., 123°17'E.), 8 miles SSW. A village, Pasar Waiwuri, stands 2.5 miles SW of Tanjung Wurgobin, and between them the coast is reef-fringed and wooded. A sandy beach is found between Pasar Waiwuri and Tanjung Deriwutun, a little over 3 miles S.

From Tanjung Deriwutun, the coast to Tanjung Watuwoko about 2.5 miles S, consists of rocky points with off-lying rocks and small islets with sandy beaches between them.

The low, narrow peninsula that forms the E side of the entrance of Selat Boleng is fringed by a drying reef on its channel side. **Tanjung Wajau** (8°15'S., 123°25'E.), the NE entrance point to Selat Boleng, 5 miles NE of **Tanjung Tuwak** (Tanjung Tuak) (8°18'S., 123°21'E.), is formed by a spur from an isolated hill 150m high, 1 mile S of the point. A light is situated on the point.

The coast between Tanjung Waiau and Tanjung Tuwak is low and covered with mangroves, with irregular sandy beaches. A reef which almost dries, extends up to 0.6 mile from this stretch of coast.

Teluk Lebaleba (Lewoleba One) (8°20'S., 123°25'E.), entered between Tanjung Tuwak and **Tanjung Waiwewang** (Tanjung Waiwowang) (8°22'S., 123°23'E.), has moderate depths and is largely clear of dangers.

Lewoleba (8°22'S., 123° 24'E) is a small port which can accommodate vessels with a maximum draft of 5.8m. The port handles breakbulk, containers, dry bulk, passengers, and liquid cargo. Three berths include a dry cargo berth, 170m long, a passenger berth, 60m long, and the PT Karimsa Persada Energy Berth, 27m long.

Between **Tanjung Geleko** (8°21'S., 123°27'E.), which can be identified by the high trees, and Tanjung Waiwewang, 3 miles WSW, the coast is low and wooded.

Most of the dangers lie within the 20m curve which fronts the shores of the bay to a distance of 1 mile.

6.59 **Awalolong Reef** (8°22'S., 123°25'E.), consisting of coral sand, part of which dries at half tide, lies within the a 20m curve in the S part of the bay.

Anchorage may be obtained midway between Awalolong Reef and the reef extending from Tanjung Geleko, in a depth of 15m, sand and coral.

The NW side of **Selat Lamakera** (8°28'S., 123°12'E.) is formed by the S coast of Pulau Adunara between Tanjung Watuwoka, the SE extremity of the island, and **Tanjung Anaburakawutun** (8°24'S., 123°14'E.), 4 miles W, thence to the SE coast of Pulau Solor.

The W side of Selat Lamakera, the SE coast of Pulau Solor, between **Tanjung Mottong** (Tanjung Motong) (8°26'S., 123°10'E.) and Tanjung Kelette (Tanjung Kelete), about 2 miles SSW, is very steep and rocky. Between Tanjung Kelette and **Tanjung Tobi** (8°30'S., 123°04'E.), 5 miles SW, the coast is steep and rocky and indented by a wide bight.

The SE side of Selat Lamakera, from **Tanjung Waiwewang** (8°22'S., 123°23'E.) to Tanjung Lowukuma, about 4 miles SW, the coast is formed by some rocky points with low, wooded hills inland.

A mountain, about 357m high, rises 1.5 miles S of Tanjung Lowukuma which from W, appears as a wide ridge with two clumps of trees, and from N as a sharp peak.

6.60 **Tanjung Mitawutun** (8°26'S., 123°19'E.), a rocky point formed by a steep ridge covered with reeds, lies about 2.75 miles SW of Tanjung Lowukuma. Between Tanjung Mitanwutun and **Tanjung Waikrong** (8°28'S., 123°17'E.), 2.5 miles SW, the coastal reef, part of which dries, extends up to 0.5 mile offshore. This stretch of coast is wooded and rises gradually inland to a wooded mountain, about 819m high, 4.75 miles SE of Tanjung Mitanwutun.

Ili Mingar (8°31'S., 123°17'E.), about 1,020m high, rises 2.75 miles S of Tanjung Waikrong. Between it and the 589m high summit on the SW extremity of Pulau Lomblen, is a low plain.

Between Tanjung Waikrong and **Tanjung Liangmah** (Tanjung Liangmeah) (8°31'S., 123°13'E.), a rocky point about 5 miles to the SW, the coast is sparsely wooded and fronted by a drying reef.

Tanjung Suba (8°33'S., 123°13'E.), the SW extremity of Pulau Lomblen and the SE entrance point of Selat Lamakera, is a steep-to point which rises to a wooded hill, 241m, 0.5 mile N of the point.

The hill is the S extremity of a ridge which rises to a steep, rocky mounting (Lama Imu), about 585m high, with two peaks 1.5 miles NNW.

Pulau Suangi (Soangi) (8°34'S., 123°14'E.), a little over

0.75 mile S of Tanjung Suba, is about 55m high, rocky and almost bare. There is a clear passage between Pulau Suangi and the coast of Pulau Lomblen, but the tidal currents are strong during spring tides.

Pulau Adunara—South Coast

6.61 Between **Tanjung Wotang** (8°25'S., 123°00'E.) and Tanjung Werang (Tanjung Werawutun), a low, prominent, wooded point 3.5 miles E, the coast is indented with small bays. In Teluk Bani Ona, the E bay, there are warm springs on the drying reef, and when covered, steam can be seen rising from them.

From Tanjung Werang (Werawutun) to 4.25 miles ENE, the coast is low and wooded, the land behind rising to the main ridge in the island which extends ENE from Tanjung Wotang. The summits of this range cannot be seen from this coast. There are occasional sandy beaches varied by rocks and trees growing down to the water's edge.

Anchorage may be obtained almost anywhere along the S coast of Pulau Adunara, in depths of 27 to 55m at a convenient distance offshore.

Between **Tanjung Warangwutun** (8°24'S., 123°10'E.) and **Tanjung Ana-burakawutun** (8°24'S., 123°14'E.), 3.5 miles E, a bight is formed in the coast which is fringed by a sandy beach. Tanjung Ana-burakawutun can be identified from W or E by a ridge of black rocks extending from it, and should be given a berth of at least 0.2 mile.

From Tanjung Ana-burakawutun to **Tanjung Watuwoka** (8°23'S., 123°17'E.), the SE extremity of Pulau Adunara, about 3.5 miles E, the coast is backed by the wooded slopes of Ili Boleng.

Pulau Solor—North Coast

6.62 The entire N coast of Pulau Solor is sandy, stony, and interspersed with trees. Behind the coast is **Ili Watuom** (Keriwatu) (8°28'S., 122°59'E.), 890m high, and the range extending ENE from Ili Lewuung (Lewuung), 882m high, to Tanjung Motang (Mottong), the NE extremity of the island.

Anchorage may be obtained almost everywhere off the N coast of Pulau Solor, in reported depths of 37 to 64m.

Pamakayu (Pamakaju), a village at the head of a small bay, lies about 1 mile E of **Tanjung Kalikawutun** (8°26'S., 122°59'E.), the NW extremity of Pulau Solor.

Lewahajong (Lawayong) (8°26'S., 123°04'E.), a village lying about 1.75 miles E of Tanjung Lewokahawutun, contains the ruins of an old fort. Menanga (Mananga) village lies 1 mile farther E. This village stands on a plateau descending steeply on the E side to a narrow inlet at the head of which there is a small river which enters the sea through a cleft. The coast E of the inlet is mostly covered with reeds and rises inland to the mountain ridges.

Pelabuhan Lamakera (8°27'S., 123°10'E.) is situated close W of Tanjung Mottong, the NW point of Pulau Solor, Lamakera, a village, stands on a wide sandy beach W of the point. The red roof of a mosque, a flagstaff, the road leading from the beach and some graves on the point NW of the village are readily identified.

Anchorage.—Anchorage may be obtained in Pelabuhan Lamakera, out of the strength of the tidal currents, in depths of 20 to 22m, 0.2 mile offshore, N of Tanjung Motang. The 5.5m curve lies 0.1 mile off the village of Lamakera with foul ground between.

Pulau Solor—South and East Coasts

6.63 Between **Matang Wutun** (Tanjung Lawawolo) (8°37'S., 122°53'E.), the SW extremity of Pulau Solor and Wutun Tauk (Tanjung Tauk), 1.25 miles E, there is a sandy beach. Then to **Tanjung Samatanyi** (Samatanyiwutun) (8°34'S., 122°57'E.), a low, bare, rocky point with some rocks off it, 4 miles NE, the coast is steep and rocky, rising inland steeply to **Ili Berapun** (Berapun) (8°35'S., 122°55'E.).

From Tanjung Samatanyi to **Tanjung Lamanuk** (8°30'S., 123°00'E.), 5.25 miles NE, the coast is fronted by a drying reef with a sandy beach behind it.

Anchorage may be taken between Tanjung Samatanyi and **Tanjung Lianwutun** (8°32'S., 122°58'E.), 2.25 miles NNE, bearing in mind that the coastal reef extends some distance offshore.

Between Tanjung Lamanuk and **Tanjung Tobi** (8°30'S., 123°04'E.), 3.75 miles E, the coast recedes to form a bight with a long, sandy beach at its head.

Pulau Lomblen—Southeast Coast

6.64 **Atu One** (Telok Atu) (8°33'S., 123°15'E.) is entered close E of Tanjung Suba. There is a sandy beach along the greater part of the bay; a prominent group of black rocks lie close off the E side.

Anchorage, with shelter from the Northwest Monsoon, may be taken, in depths of 11 to 16m, in Atu One.

Tanjung Konga (Tanjung Nubi) (8°33'S., 123°18'E.) lies 4.5 miles E of Tanjung Suba and rises steeply to 91m high. Atawai One (Telok Atawai) is entered between Tanjung Konga and **Tanjung Beloppo** (8°34'S., 123°21'E.), 3.5 miles ESE. The W shore, which has a sandy beach fronted by a narrow reef, rises to Ili Mingar (Mingar). At the head of the bay there is a sandy beach with several villages nearby.

Ili Labalekang (Lamararap) (8°33'S., 123°23'E.), about 1,644m high, rises 2 miles NE of Tanjung Beloppo. This mountain, which is prominent when seen from NW or SE, shows a sharp summit.

6.65 **Tanjung Wolo Wutun** (8°35'S., 123°24'E.), the S extremity of Pulau Lomblen, is formed by the long ridge from Ili Labale-kang which ends in a narrow plateau rising sharply out of the sea to 37m high.

Labala One (Labala Bay) (8°33'S., 123°29'E.) is entered between Tanjung Lolowutun, about 2 miles ENE of Tanjung Wolo Wutun, and Tanjung Atande (Tanjung Atadei), 7 miles E. A light beacon, 30m in height, has been established (2003) on Tanjung Atadei. The bay is entirely surrounded by high mountains which descend fairly steeply to the shores of the bay.

Anchorage.—Because of the great depths, anchorage can be taken in the two inlets on either side of **Tanjung Lewowutun** (8°32'S., 123°28'E.) near the W end of the head of the bay. Anchorage may be taken in the W inlet, in a depth of 46m, coarse sand and stones, 0.75 mile WSW of Tanjung Lewowutun.

During November and December, with the prevailing SW winds, this is the best anchorage and landing is easier. Also, anchorage may be taken off the sandy beach E of **Labala** (8°31'S., 123°29'E.) in a depth of 44m, mud and sand, 0.4 mile SE of the flagstaff at Labala, 0.15 mile offshore.

6.66 Between Tanjung Atande and Tanjung Penutun, formed by a rocky spur from the mountains inland, 2 miles NE, there is a sandy beach fronting the central part of this stretch of coast.

Three volcanic islets have been reported within a radius of 3 miles from Tanjung Penutun. In 1974 and 1993, volcanic activity was experienced. Mariners should give this area a wide berth.

From Tanjung Penutun to **Tanjung Paugora** (Tanjung Pan Gorawutun) (8°30'S., 123°35'E.), 2.75 miles N, the coast is fronted by groups of above-water rocks lying close offshore.

A prominent mountain, about 1,063m high, stands 1.5 miles SW of Tanjung Paugora.

The E side of the mountain is almost vertical, and when seen from NE shows four sharp peaks. Volcanic activity was reported on the E side of the mountain.

6.67 **Waiteba One** (8°37'S., 123°38'E.) is entered between Tanjung Paugora and Batularang Wutun (Tanjung Belu Galeh), a steep, wooded point formed by a spur from the mountains inland, 7 miles NE. The bay is backed by steep mountains, but there are no prominent summits. The depths in Waiteba One are considerable, and the bottom slopes steeply near the shore.

Anchorage may be taken by vessels with local knowledge in the N part of the bay S of Tanjung Tepiwutun, in about 51m, sand, about 0.2 mile offshore.

Gelugala Wutun (Tanjung Komiwutun) (8°26'S., 123°41'E.), a prominent steep wooded point formed by a spur from the mountains inland, lies 1.5 miles E of Batularang Wutun. There is a prominent tree on Gelugala Wutun. Foul ground, on which there are some groups of above-water rocks, extends 0.3 mile offshore in places between these points.

From Gelugala Wutun to **Tanjung Nanga Lebang** (8°24'S., 123°42'E.), 2.5 miles NE, the coast is rocky. A mountain, 587m high, rises 1.75 miles NW of Tanjung Nanga Lebang.

Atanila (Ata Nila) (8°19'S., 123°45'E.), the only large village on the coast of Pulau Lomblen between Gelugala Wutun and the NE extremity of the island, stands about 6 miles NNE of Tanjung Nanga Lebang.

Anchorage may be taken by vessels with local knowledge off Atanila.

6.68 **Melang Wutun** (Tanjung Belkodi) (8°17'S., 123°47'E.) lies about 2.75 miles NE of Atanila. The coast between is low, wooded and fringed by a narrow reef. Between Melang Wutun and **Tanjung Wapue** (Tanjung Batu Merah) (8°17'S., 123°50'E.), 3 miles E, there is a bay with a sandy beach fringed by a reef; inland there are low, wooded hills.

Tides—Currents.—The bottom in the bay between Melang Wutun and Tanjung Wapue is not steep and vessels lie out of the strong tidal currents setting along this coast. The maximum rate observed at the anchorage was 2 knots, generally setting in a NE direction as there is usually an eddy here when there is a S current in the adjacent strait.

Anchorage.—Anchorage may be taken by vessels with local knowledge, in a depth of 64m, sand, in the bay between Melang Wutun and Tanjung Wapue.

Tanjung Bao Belewang (8°17'S., 123°52'E.) is a low, wooded point 1.75 miles ENE of Tanjung Wapue. A rock, covered with vegetation, lies close off Tanjung Bao Belewang.

From Tanjung Bao Belewang to **Tanjung Leur** (8°15'S., 123°55'E.), the NE extremity of Pulau Lomblen, the coast is low with a few wooded hills lying some distance inland.

Pulau Lomblen—North Coast

6.69 Between **Tanjung Wai Au** (8°15'S., 123°25'E.), the NW extremity of Pulau Lomblen, and Tanjung Munuwutun, 1.75 miles SE, the coast forms a bay entirely obstructed by reefs. The shore is fronted by mangroves.

Tanjung Munuwutun (Tanjung Munu) (8°16'S., 123°26'E.) is a prominent rocky point with white, vertical cliffs, and is the extremity of a hilly, wooded ridge. Between Tanjung Munuwutun and Lewobela, 2 miles E, the mangroves cease and the coast is formed by a sandy beach.

Anchorage.—Anchorage may be taken 0.2 mile offshore of Lewobela, with Tanjung Wai Au in line with the S end of **Pulau Watupeni** (8°14'S., 123°19'E.), bearing 282° astern, in depths of 42 to 55m, coral. It is essential that vessels anchor exactly on this alignment, as a small ridge with moderate depths extends from a rocky point immediately N of the village. The bottom is fairly steep and the ridge is narrow.

Ili Lewotolo (Lewotolo) (8°16'S., 123°30'E.), about 1,450m high, 2 miles E of Lewobela, is an active volcano with smoke and sulphur continually rising from it. The mountain has a broad summit, the highest part being on the SE side, which is covered with ashes and shows some yellowish-green strips.

Between Lewobela and **Tanjung Watumanuk** (8°14'S., 123°31'E.), 3.5 miles NE, the coast is steep and rocky, and then to **Tanjung Horegala** (Tanjung Horegalawutun) (8°15'S., 123°34'E.), 2.5 miles E, there is a low flat strip of land fronted by a broad sandy beach.

The bay between Tanjung Horegala and **Bajak Wutun** (Tanjung Bachatanwutun) (8°13'S., 123°36'E.), a low, flat, rocky point with few trees 3 miles NE, is divided into two parts by the Niera Peninsula on its E side. Lewolein (Lewaling), a village, stands 4.5 miles SSE of Bajak Wutun.

Lewolein Laleng, on the E side of the outer part of the bay, is entered between Bajak Wutun (Tanjung Bachatanwutun) and Tanjung Nuhanera (Tanjung Pukawutun), the NW extremity of the Neira Peninsula, 4.5 miles SSW.

Anchorage.—Anchorage may be taken during the Southeast Monsoon off Lewolein, in a depth of 37m, 0.2 mile W of the village.

6.70 Waienga One, entered between **Tanjung Bogowutun** (8°17'S., 123°33'E.) and Tanjung Nuhanera, a little over 1.75 miles E, is clear of dangers except in the SW part where the coastal reef is more pronounced and there are some detached dangers close to the shore. Waienga One affords good shelter in both monsoons.

From abreast the village, 3 miles SSW of Tanjung Bogowutun, a drying tongue extends in a S direction and is extended farther S by a small reef. There is a good but confined anchor-

age W of the drying tongue. On the S shore of the bay anchorage may be obtained off **Hadakewa** (Pasar Hadakewa) (8°22'S., 123°33'E.), in depths of 37 to 46m, 0.4 mile offshore.

The coast of the hilly peninsula E of Lewolein Laleng is readily distinguished from both W or E.

The peninsula, covered with reeds and occasional small groups of trees, is a prominent part of this coast. Tanjung Menapawutun, the NE extremity of the peninsula and the W entrance point to Balaurin Laleng (Telok Balurin), is a steep point lying 3.25 miles E of Bajak Wutun (Tanjung Bachatanwutun).

Balaurin Laleng is of little importance as the depths in the greater part of the bay are too deep for anchorage. The only anchorage is in the SW part of the bay.

Anchorage.—Small vessels may anchor 0.2 mile ENE of **Tanjung Parakawutun** (8°15'S., 123°39'E.), 1.25 miles S of Tanjung Menapawutun, in a depth of 27m, mud. An above-water sand cay lies on the S end of a drying reef, 1.5 miles ESE of Tanjung Parakawutun. Vessels approaching this anchorage between the reefs should navigate by eye and soundings.

The coast between **Tanjung Uho** (8°13'S., 123°42'E.), which is marked by a light, and Tanjung Pau, 5 miles NE, is mostly formed by ridges descending from the mountains S.

Moderately strong tidal currents set around Tanjung Pau, but elsewhere along the N coast of Pulau Lomblen the tidal currents are weak.

Between **Tanjung Pau** (8°11'S., 123°46'E.) and Tanjung Leur (Tanjung Leoer), a little over 10 miles SE, occasional rocky spurs descend to the sea with the last 2.5 miles stretch, an uninterrupted sandy beach backed by trees with low hills inland.

Selat Alor

6.71 Selat Alor (Straat Alor) (8°20'S., 123°50'E.), between the N part of Pulau Lomblen on the NW side and Pulau Pantar (Pantar) on the SE side, is sometimes used by vessels during passage between Australia and Japan.

Selat Alor has not been surveyed outside the coastal 200m curve. In recent years, deep draft ore carriers passing between Australia and Japan have used this strait, and the least depth reported was 150m located in the main fairway, 2.5 miles W of **Tanjung Kibingi** (8°23'S., 123°48'E.) on the W coast of **Pulau Rusa** (Roesa) (8°23'S., 123°49'E.).

Caution.—This area is subject to intense volcanic activity, and the possibility of underwater eruptions leading to great depth changes cannot be excluded. The least known depth in the SE approach is an 8m patch midway between Pulau Rusa and Pulau Kambing (Kambing), 2.5 miles ESE.

6.72 On the NW side of Selat Alor, **Ili Ujolewung** (Kedang) (8°13'S., 123°47'E.) 1,553m high, forms an excellent landmark.

On the SE side of Selat Alor, a 444m high plateau on the SW extremity of Pulau Pantar is prominent from S or N, and when seen from the Savu Sea appears as an island.

Tides—Currents.—In Selat Alor, the tidal currents can sometimes be very powerful and are of a semidiurnal nature; they follow the direction of the strait. During the Southeast Monsoon, the SW current is stronger and remains longer than the NE currents. It was recorded that the SW current prevailed from 2 to 9 hours after the moon's transit, and the NE current for the remainder. During the Northwest Monsoon, the NE current is probably stronger and remains longer than the SW current.

Spring tide appears to fall 2 to 3 days after the full moon and new moon, and neaps 2 to 3 days after the quarters. Currents during spring tides may average 5 to 6 knots.

In the N part of the strait the strength of the current is considerably less than in the S part, except close off Tanjung Leur, where a current of 5 knots was observed. In the narrows between Pulau Pantar and Pulau Marisa, a current of 8 knots was recorded.

Tidal rips and eddies have been reported midway between Pulau Rusa and Pulau Lomblen, and between **Pulau Lapan** (8°14'S., 124°02'E.) and Tanjung Leur.

6.73 Pulau Lapang (Lapan) (8°14'S., 124°02'E.) and Pulau Batang (Batang), 1.75 miles apart, lie in the middle of the N approach to Selat Alor. Pulau Lapang, marked by a light on its NW extremity, is a low island with a prominent tree on its W side. A drying reef, with an above water sand cay on its NW extremity, extends 2.5 miles NNE from the N extremity of Pulau Lapang. Eastward, Pulau Batang is about 258m high, light green in color, and easily identified. Its W and E extremities are low and from a distance the island appears like a needle.

Pulau Rusa, in the middle of the SW entrance to Selat Alor, can be easily identified from the S and lies 8.5 miles ENE of **Gelugala Wutun** (Tanjung Komiwutun) (8°26'S., 123°41'E.). Watu Balu, a prominent rocky islet, 27m high and covered with vegetation, lies 0.5 mile off the W coast of Pulau Rusa.

Pulau Marisa, lying 4 miles E of the NE side of Pulau Rusa, rises to a flat summit, 193m high. Pulau Marisa fronts the coast of Pulau Pantar, separated by a narrow channel suitable only for small craft.

Pulau Kambing, about 98m high on its NE part, lies 2.5 miles SE of Pulau Rusa. The island is fairly low with a rocky coast, occasionally interrupted by sandy beaches.

Selat Ambeang, which lies between Pulau Kambing and **Tanjung Soyang** (Tanjung Sojang) (8°27'S., 123°55'E.), the SW extremity of Pulau Pantar (Pantar), 1.5 miles ESE, can be used by vessels approaching Selat Alor from the SE.

Tidal currents in Selat Ambeang are strong and irregular.

The SE side of Selat Alor between Tanjung Soyang, a high rocky point, and Tanjung Oleh Matang, a rocky point, 3 miles NNE, the coast is low and covered with mangroves rising inland to the mountain, Wili.

Anchorage may be taken by vessels with local knowledge, in a depth of 20m, with just sufficient room to swing, in Teluk Wolu (Teluk Woloe), an inlet in the coastal reef about 1.75 miles S of Tanjung Oleh Matang.

Directions.—Entering Teluk Wolu at low water presents no difficulty, as the coastal reef is then dry. At high water, steer for the entrance to a river at the head of the inlet where there is a small prominent patch of trees, bearing 080°.

Between Tanjung Oleh Matang and Kayian (Kajian), a village 1.5 miles NNE, the coast is similar to that S of Tanjung Oleh Matang. From Kayian to Nuha Wutun (Noeha Wutun), 6.5 miles NE, the coast is low and covered with mangroves. Several villages lie between the two points. Inland, the land rises to a 936m high mountain, 3.5 miles S of Nuha Wutun.

Pulau Pantar—North Part of Northwest Coast

6.74 **Teluk Blang Merang** (8°20'S., 124°07'E.) is entered between Tanjung Nuha and **Tanjung Moang** (8°18'S., 124°10'E.), a rocky point 6.5 miles E. It indents the coast for 5 miles and terminates in an inner bay, which may be entered through a 0.15 mile wide opening between the coral reefs.

The village of Blangmerang (Blang Merang), where the chief administrator of the S part of the island resides, stands on the W side of the bay, 4 miles SSE of Nuha Wutun. From Baranusa, the main town and seaport for W Pantar, located just in front of tiny Kura Island, daily ferry connects with Kalabahi.

Anchorage.—Anchorage may be taken by vessels with local knowledge, in a depth of 39m, mud and sand, in the inner bay.

Directions.—When the reefs are visible, there is no difficulty entering the inner bay. The E side of Pulau Kura (Koera), an island in the inner bay S of Blangmerang, in range with the summit of Gunung Topaki (Dlaki Dlama), at the S extremity of the island when not hidden by clouds, bearing 178°, leads between the reefs on either side of the entrance to the inner bay, then to the anchorage. Sometimes the edges of the coastal reefs are marked by beacons placed by the local inhabitants.

6.75 **Kabir** (8°15'S., 124°13'E.), the most important village in Pulau Pantar, lies on a narrow plain 3.5 miles NE of Tanjung Moang. The village is easily identified from seaward by some houses on the beach.

The coastal reef extends 0.2 mile offshore S and N of Kabir, but off the village the reef is very narrow. A below-water reef extends 0.8 mile N from a position 0.8 mile SW of Kabir. The basin off the village is entered from N through a passage 0.2 mile wide between the N end of the below-water reef and the coastal reef E. The only danger in the basin is a 4.9m patch lying 0.3 mile W of the village. There is a also a deep passage 0.1 mile from its N end.

Anchorage.—Anchorage may be taken by vessels with local knowledge, in a depth of 46m, in the basin of Kabir.

Directions.—Steer 158° for a buoy which marks the outer end of the coastal reef on the E side of the entrance to the basin off Kabir. Then pass W of the buoy and steer 180° for the anchorage.

From Kabir to **Tanjung Dola** (8°12'S., 124°15'E.), 4.5 miles NNE, and then 1.5 miles farther NNE, the coast is almost entirely covered with mangroves occasionally interrupted by a sandy beach, and fringed by a steep-to drying reef. **Tanjung Muna** (8°11'S., 124°19'E.), a low point, stands about 4.25 miles ENE of Tanjung Dola, and is the NE extremity of the island.

Pulau Pantar—South Coast

6.76 Between **Tanjung Soyang** (8°27'S., 123°55'E.) and a prominent point 78m high, 1.75 miles SE, the coast is rock-fringed, and rises inland to the mountain Wili.

Watu Ile, a rocky islet, lies close off the prominent point. **Tanjung Ikangkutong** (8°27'S., 123°57'E.), 0.5 mile ENE of Watu Ile, forms the NW entrance point to a large bay. This bay has great depths except on the E side where two banks extend from it. Another bay lies between **Tanjung Delaki** (Tanjung Boda) (8°33'S., 124°04'E.), the S extremity of the island, and **Tanjung Debi** (8°27'S., 124°02'E.), about 5.75 miles N.

A prominent double peak, about 938m high, rises 1.25 miles NE of Tanjung Delaki. Gunung Topaki (Dlaki Dlama), an active volcano, about 1,365m high, the highest summit in Pulau Pantar, rises 2 miles farther NE.

Gunung Topak, is steep on its SW side, but on its NE side a thickly wooded ridge extends 2.5 miles NE terminating in a mountain about 810m high. Between Tanjung Delaki and **Tanjung Botaamin** (Tanjung Bota Amin) (8°33'S., 124°07'E.), a prominent rocky point, 3.5 miles E, the coast is steep and rocky.

Selat Pantar

6.77 Selat Pantar (Straat Pantar) (8°20'S., 124°20'E.), lying between Pulau Pantar and Pulau Alor, about 5 miles E, is little used by international traffic.

It is clear, as the islands within the strait rise steeply out of the water. The strait is easily recognized from the N by the high islands of Pulau Pura (Poera) and Pulau Reta, and from the S by Pulau Treweg (Treweg).

The best channel appears to be between the islands in the N part of the strait and the coast of Pulau Alor, and on either side of Pulau Treweg.

Anchorage off the E coast of Pulau Pantar is not recommended; **Teluk Kalabahi** (Kebola Baai) (8°15'S., 124°29'E.) affords the only anchorage.

In the 1990's, a laden bulk carrier of 41,556 gt, with a length of 179m and a draft of 13m, steamed through Selat Pantar from N to S, passing W of Pulau Ternate and Pulau Reta, and E of Pulau Pura. During this passage, no strong tidal currents were encountered in the strait.

Tides—Currents.—The tidal currents through Selat Pantar sometimes display sharp irregularities, stronger than those in the W straits. The tidal currents are of a semidiurnal character.

During the Southeast Monsoon, the S current predominates more in strength than in duration. Sometimes during the period that the N current should be running, especially from about 2 to 3 days after the quarters, a phenomenon known as "Ajar Gundah" (uncertain water) occurs, owing to the N current being unable to overcome the Southeast Monsoon current.

During the Northwest Monsoon, which appears to have little influence on the currents, the rate of the current was observed not to exceed 4 knots in either direction.

Heavy tide rips, especially with a strong tidal current, are found between **Pulau Pura** (8°18'S., 124°21'E.) and the entrance to Teluk Kalabahi on the W coast of Pulau Alor.

6.78 **Pulau Ternate** (Ternate) (8°11'S., 124°22'E.), in the N entrance of the strait, is small, low and uninhabited.

Pulau Reta (Reta) (8°13'S., 124°22'E.) lies in the middle of the N end of Selat Pantar. Pulau Pura (Pura), with a high double peak, lies about 3 miles SSW of Pulau Reta.

Pulau Treweg (Treweg) (8°29'S., 124°17'E.), in the S entrance of the strait, is 398m high. There is a sandy beach with large detached rocks on the S side of the island.

There is a mosque with a prominent dome on the N side of Pulau Treweg.

The W side of Selat Pantar is formed by the E coast of Pulau Pantar. The steep and wooded coast, extending from **Tanjung Bota Amin** (8°33'S., 124°07'E.), a prominent rocky point, to

Tanjung Muna (8°11'S., 124°19'E.), 25 miles NE, is occasionally broken by a rocky point. A single beach is on the SE side of Tanjung Muna.

The E side of Selat Pantar is formed by the W coast of Pulau Alor between **Tanjung Artwoli** (Tanjung Matari) (8°08'S., 124°29'E.), the NE entrance point of the strait, and the high coast 2 miles SW. From Tanjung Artwoli to Tanjung Kumba (Tanjung Koemba), about 10 miles SSW, the coast is low and covered with mangroves.

Pulau Kumba (Koemba) (8°16'S., 124°24'E.), 70m high, lies close W of Tanjung Kumba. The narrow channel between Pulau Kumba and Tanjung Kumba is unsafe because of drying rocks and strong tidal currents.

Teluk Kebola (8°15'S., 124°28'E.), entered between Tanjung Kumba and **Tanjung Tobikumong** (Tanjung Jalono) (8°18'S., 124°24'E.), 1 mile S, is deep and clear of dangers.

The shores of the outer part of the bay are steep, but at the head, the land descends to the low plain connecting the peninsula forming the NW part of Pulau Alor to the main part of the island.

A prominent mountain, 612m high, stands about 4.5 miles E of Tanjung Kumba, on the S side of the bay.

Alor Kechil, a village, stands 0.5 mile N of Tanjung Kumba and may be identified by its mosque. Between Alor Kechil and Dulolong (Doelolong), another village about 2.5 miles NE, there are three other villages.

Anchorage may be taken, in a depth of 33m, 0.1 mile offshore S of Dulolong.

6.79 **Kalabahi** (8°12'S., 124°31'E.) (World Port Index No. 51370), 4.5 miles ENE of Dulolong, has a landing pier for boats during midday hours. The town serves as the capital of Alor. The ferry terminal has two berths. The general cargo terminal has one 40m-long berth. Anchorage may be taken by vessels with local knowledge off Kalabahi, in a depth of 20m, sand, 0.2 mile offshore.

From **Tanjung Jalono** (8°18'S., 124°24'E.) to **Tanjung Karatkuip** (Tanjung Karat Koeip) (8°25'S., 124°20'E.), the SW extremity of Pulau Alor, 8.5 miles SW, the coast is steep and affords no anchorage.

Tanjung Margeta (Tanjung Marget) (8°28'S., 124°25'E.), the S extremity of the island, lies about 5.25 miles ESE of Tanjung Karatkuip. A prominent mountain rises about 992m high, 4.25 miles N of Tanjung Margeta.

Tapal, another prominent mountain 1,036m high, stands on a ridge 8 miles NNE of Tanjung Margeta. Anchorage may be taken in a bay on the W side of Tanjung Margeta.

Pulau Alor—South Coast

6.80 Between Tanjung Margeta and **Tanjung Lisomu** (Tanjung Laisoemboe) (8°19'S., 125°08'E.), the SE extremity of Pulau Alor, 44 miles ENE, there are no off-lying dangers and the coast can be closely approached.

A light is shown from Tanjung Lisome, at a height of 60m.

Anchorage.—Although the bottom is steep, anchorage may be taken off most villages, by vessels with local knowledge, depths of 40 to 51m, 0.2 to 0.3 mile offshore.

Caution.—Volcanic activity has been reported (1993) in position 8°32'S, 123°35'E, about 10.5 miles ESE of Tanjung Margeta.

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Pulau Alor—East Coast

6.81 From Tanjung Lisomu (Laisoemboe) to **Tanjung Manamoni** (8°09'S., 125°06'E.), 10.5 miles N, the coast is clear of dangers and can be approached fairly closely, but the tidal currents are strong and irregular. A lighted beacon, 30m in height, has been established (2003) at Tanjung Manamoni.

The mouth of a river, about 1.5 miles N of Tanjung Lisomu, can be recognized by a small group of trees.

Anchorage may be taken by vessels with local knowledge, 0.15 mile off the mouth of this river, in 49m, sand, with the small group of trees, bearing 270°. This is the only anchorage off the E coast of the island.

Pulau Alor—North Coast

6.82 The mountains within the N coast of Pulau Alor are rocky and high with few noticeable summits.

The peninsula forming the NW part of the island appears separated when seen from seaward.

The coast between **Tanjung Artwoli** (8°08'S., 124°29'E.) until near Tanjung Sika, 7 miles E, is high and rocky.

A point about 1 mile E of Tanjung Artwoli is conspicuous because of its white color. A group of trees stand on the coastal reef, 2 miles W of Tanjung Sika.

Pulau Nuhabeng (Sika) (8°07'S., 124°37'E.), a low islet covered with shrubs, lies on the coastal reef which extends 1 mile NE from **Tanjung Sika** (8°08'S., 124°36'E.). **Teluk Benlelang** (8°10'S., 124°38'E.), entered between Tanjung Sika and **Tanjung Likuwatang** (Likiewatang) (8°10'S., 124°40'E.), 4 miles SE, is foul on its W side.

Elsewhere, the depths are too great for anchorage. The N coast of Pulau Alor, E of Tanjung Likuwatang, is high and steep over its greater part.

Ombai Strait

6.83 **Ombai Strait** (8°40'S., 124°40'E.), a wide deep passage, lies between Pulau Alor and the NW coast of Timor.

Tides—Currents.—During the Southeast Monsoon, there is generally a current setting in a W to SW direction, and in the Northwest Monsoon, in an E to NE direction. The maximum rate of the current in the strait was 3 knots and occurred in June with a SW current. Strong tide rips have been reported up to 15 miles NE of the NE point of Pulau Alor.

Kambing (Pulau Atauro) (8°15'S., 125°34'E.), lying about 22 miles E of Pulau Alor with its steep coasts, can be approached very closely. The coasts are barren and have a rugged appearance. In general, the coast is exceedingly steep-to all around, with the exception of the E coast consisting alternatively of sandy beaches and rocky points.

Anchorage may be taken by vessels with local knowledge off **Mau Meta** (8°16'S., 125°36'E.), in a depth of 37m, sand and

stones, 0.5 mile ESE of the government official's house at Mau Meta.

Pulau Liran (8°00'S., 125°45'E.) lies 7 miles NE of Kambing and is a wooded mountainous island rising to 430m in its central part. A light marking the S extremity of the island, shown at an elevation of 82m.

It was reported that the coastal reef extending S from the island had shoaled considerably, and that it consisted of a steep-to bank of sand and coral, 0.5 mile wide, with rocks over which the sea breaks at LW. The bank extends 2.5 miles S of Pulau Liran, and a least depth of 3.7m with below-water rocks, was found on the bank.

Strong tide rips frequently occur on the S end of the bank.

Karang Nautilis (7°56'S., 125°44'E.) lies 1.25 miles N of Pulau Liran and nearly dries. There is a clear passage between Karang Nautilis and Pulau Liran, but the N extremity of the island should be given a berth of at least 0.5 mile.

In the Southeast Monsoon, vessels with local knowledge may anchorage, in a depth of 60m, sand, W of the light, 0.2 mile off the coastal reef.

Selat Liran, 1.5 miles wide, between Pulau Liran and the SW extremity of Pulau Wetar, is clear of dangers, but should not be attempted because of the strong currents. A current of 3 knots was observed.

6.84 **Pulau Wetar** (7°49'S., 126°14'E.) is a rugged mountainous island which rises in its W part to a summit 1,355m high, 15 miles NE of **Pibia Tutun** (8°01'S., 125°48'E.), the SW extremity. All coasts of Pulau Wetar are high, steep, and inhospitable; there are practically no anchorages.

The W coast of Pulau Wetar is alternately steep and sloping, becoming steeper to the N. Pulau Reong (Reong), off the NW extremity of the island, is a good landmark, and is separated from Pulau Wetar by a deep and clear channel. Strong currents are encountered at times.

The N coast of Pulau Wetar is steep and rocky almost throughout. There are numerous small bays, but few of them afford anchorage.

Nila Tutun (Nila Toetoen) (7°33'S., 126°37'E.), the N extremity of the island, is an extremity of a bold headland which can be identified from E or W.

The E coast of Pulau Wetar, between **Tujau Tutun** (7°32'S., 126°38'E.) and Hatuloi Tutun, about 12 miles ESE, has heavy swells and breakers during both monsoons. Between Hatuloi Tutun and **Iskanawatu Tutun** (7°45'S., 126°50'E.), the SE extremity of the island, 6 miles S, the coast is steep-to with several villages. There are strong tidal currents, eddies, and whirlpools off the coast between Hatuloi Tutun and Iskanawatu Tutun.

Between Iskanawatu Tutun and **Eden Tutun** (7°58'S., 126°28'E.), 25 miles SW, the coast forms a wide bight and is steep-to. There are tide rips and eddies along this part of the coast.

The S coast of Pulau Wetar can be approached closely, bearing in mind the tide rips off the SE and SW points of Pulau Wetar.

Teluk Sau (Saoe Bay) lies about 3.75 miles NW of Eden Tutun. **Ilwaki** (7°56'S., 126°26'E.), the principal village of Pulau Wetar, stands a short distance inland. A shed and several houses stand on the shingle beach fronting Ilwaki.

There is a sheltered anchorage in the Northwest Monsoon, and also with SE winds, in a depth of 55m, 0.2 mile S of Ilwaki. This anchorage is the only good anchorage off Pulau Wetar.

The remainder of the coast, about 37 miles W to Pibia Tutun, is composed of sand and shingle beaches, alternated by rocky points, backed by mountains.

Pulau Kisar (Kisar) (8°01'S., 127°12'E.) lies a little over 25 miles SE of the E extremity of Pulau Wetar. The coasts, which rise steeply from the sea, consists of bare coral lime broken in places where small streams empty into the sea.

Anchorage.—Anchorage is available off the SW side of the island in an open roadstead off **Pantai Wonreli** (8°05'S., 127°08'E.). It may be taken in Pantai Wonreli roads, in depths of 29 to 40m, coral and stones, about 137m NW of a white pyramid on the S shore of the bight. Further offshore, the bottom is so steep that there would be danger of dragging the anchor.

Sudden squalls make this anchorage dangerous and during the Northwest Monsoon, the anchorage is unsafe and communication with the shore is broken. Tidal currents in the anchorage set NNE and SSW. During the Northwest Monsoon, landings are made at **Jawallan** (Djawallan) (8°05'S., 127°13'E.) on the E side of the island.

Wetar Strait

6.85 **Wetar Strait** (8°14'S., 126°16'E.), the wide passage between the S coast of Pulau Wetar and the N coast of Timor is used regularly by local shipping and also by vessels proceeding between Jawa and Australia, and between Singapore and Australia. Vessels on the latter two routes pass N of Pulau Adunara, Pulau Lomblen, Pulau Pantar, and Pulau Alor by following the parallel of 8°S. Vessels on these two routes usually enter the strait from the NW by passing between Pulau Atauro (Kambing) and Pulau Liran (Liran), 7 miles NE, and depart E between Pulau Kisar and the E extremity of Timor, about 14 miles S.

There are no known dangers in Wetar Strait outside the charted 200m curve surrounding the adjacent islands.

Caution is required because of **Sumatra Shoal** (8°07'S., 125°57'E.), charted 13.25 miles ESE of Pulau Liran Light. The position of the shoal and the depth are doubtful, but strong discoloration and a sounding of 25m was obtained.

Currents in Wetar Strait are not well known and are probably similar to those in Ombai Strait, seldom exceeding 0.5 knot.

Timor

6.86 Timor is a large mountainous island with ranges seldom rising higher than 1,829 to 2,134m. A range of mountains lying near the middle of the island are the highest.

Fatamailau (8°55'S., 125°29'E.) rises to 2,920m high. These high peaks in the middle of the island are often covered with clouds. The N coast of Timor has numerous peaks which provide landmarks, but they are generally only useful during the Southeast Monsoon.

Waters along the SE coast of Timor, between the mouth of **Mota Masin** (9°28'S., 125°05'E.) and **Pulau Jaco** (8°26'S., 127°20'E.), and the adjacent sea area out to 12 miles offshore, are prohibited to all non-Indonesian vessels.

The N coast of Timor is mountainous, especially the W part between **Tanjung Parimbala** (8°39'S., 125°07'E.) and **Tan-**

jung Suba (Tanjung Soebang), 52 miles E. Here the mountains rise steeply from the sea, except for a low plain midway between these two points at Dili (Dilly), the most important place on this coast. The NE end of Timor is occupied by a fairly high, flat ridge of mountains, terminating in an almost perpendicular cliff 1 mile within **Tanjung Sevivara** (8°23'S., 127°18'E.), the NE extremity of Timor.

There are numerous villages along this coast, many of which contain large mission houses and churches. Some of the houses are built to resemble forts and give a picturesque appearance as well as affording good landmarks when navigating within a few miles of the coast.

Maubara (8°37'S., 125°12'E.), a village about 5 miles ENE of Tanjung Parimbala, can be readily distinguished from seaward by a small church and a house with high walls, standing close to the sea. The residence of the military commandant, situated on the summit of a hill, is prominent.

Tides—Currents.—Tidal currents off Maubara cause strong eddies and may cause a vessel to swing and foul its anchors.

Anchorage.—Vessels, with local knowledge, can anchor temporarily, in 49m, with a point about 1.5 miles WSW of the village in line with a rock close W of Maubara.

Tanjung Palila (Tanjung Sia Ria), 10.5 miles E of Maubara, is a high, rocky spur formed from the mountain behind it. A coastal reef, extending up to 0.5 mile offshore, begins at a point 3.5 miles E of Tanjung Palila and continues unbroken for 3.5 miles in an E direction until Tanjung Mau Duki.

Tanjung Mau Duki (8°32'S., 125°32'E.), a low muddy point, contains the mouth of a small river. For a distance 1 mile E of the river there is a white, sandy beach which is free of reefs.

6.87 Dili (Dilly) (8°32'S., 125°35'E.) on the N coast of East Timor is situated on a low plain at the head of a bay between Tanjung Mau Duki and Tanjung Fatu Cama (Tanjung Fatoe Kama), a salient point 1.75 miles SE. The inner roadstead is sheltered by reefs, which dry, extending from the shore at each end of the town and a large detached reef between them.

Dili—Main Cargo Wharf

Between January and April heavy rains may occur limiting visibility. During the Northwest Monsoon, which occurs between December and March, strong winds may be encountered sometimes reaching gale force.

The mean maximum range of tide for Dili is 1.6m.

Two channels pass through the reef to give access to the harbor. The W channel, with a least depth of 14.5m, is marked by range lights and leads into the harbor.

The main cargo wharf, of concrete construction, is 285m in length, with a depth of 7.0m alongside. A vessel of 140m in length with a draft of 7.2m has berthed alongside. A ferry terminal lies at the head of harbor, with depths alongside ranging from 2 to 7m.

The Dili Oil Depot lies 1.5 miles W of town. A stone causeway 300m in length extends to a T-headed berth, with a charted depth of 13m alongside. A wreck was reported (2003) to lie 170m due E of the pier head.

Contact Information.—See the table titled **Dili—Contact Information**.

Dili—Contact Information	
Harbormaster	
VHF	VHF channels 16 and 68
Telephone	670-7730-5998
	670-7731-3761
	670-7732-2411

6.88 Tanjung Laquebada (8°32'S., 125°34'E.) is the NW entrance point to Dili. A conspicuous light, which sits on a 17m high metal framework tower with a white stone base and blue bands, stands on the point. A large religious statue is visible during daylight hours to the E of Mount Fatocoma. A large warehouse on the wharf, 0.4 mile SE of Tanjung Laquebada, was reported to be conspicuous from seaward. The former Governor's palace stands close SE of the wharf. A conspicuous customs house stands 0.3 mile E of the former Governor's palace; midway between them is a stone jetty.

A compulsory pilot is available at Dili.

The outer anchorage for general cargo vessels lies N and NW of Tanjung Laquebada. Caution is necessary as foul ground lies in the E section of the anchorage and dangerous wrecks lie 0.7 mile WNW and 1.1 miles NE of Tanjung Laquebada. Anchorage may also be obtained in the inner road, clear of the reefs, in a depth of 20m. Vessels can anchor as convenient or proceed alongside the wharf however the best time to anchor is in daylight at low tide when coral heads are visible.

6.89 From **Tanjung Fatu Cama** (8°32'S., 125°36'E.) to **Tanjung Fatu Lana** (8°29'S., 125°51'E.), 15 miles E, the coast is fringed by an irregular reef. An above-water rock lies close to the coast, 0.5 mile W of Tanjung Fatu Lana.

Between Tanjung Fatu Lana and **Tanjung Subang** (Tanjung Subao) (8°29'S., 125°59'E.), 7.75 miles E, the coast rises steeply.

Manatutu (Manatoetoe) (8°31'S., 126°01'E.), about 3.5 miles SE of Tanjung Subang, is a fairly important place. It can easily be identified by a white church with two towers and some houses on a hill. Range lights are occasionally shown at Manatutu.

Anchorage.—Anchorage may be taken by vessels with local knowledge, in 55m, but the bottom is soft mud and the holding ground is not good.

6.90 The coast between Manatutu and **Tanjung Bigono** (8°26'S., 126°22'E.), 21 miles ENE, is hilly. Tanjung Bandura, about 3 miles E of Tanjung Bigono, is high and steep as is the coast between these two points, and it is a good landmark from E or W.

Baucau (Vila Salazar) (8°27'S., 126°30'E.), the largest town on this stretch of coast, stands 3.5 miles SSE of Tanjung Bandura, at an elevation of 319m.

Anchorage.—Anchorage may be taken by vessels with local knowledge off the roadstead leading to the town, in a depth of 40m, coral, where vessels will swing clear of the narrow coastal reef and lie well in both monsoons. A noticeable group of rocks lies close offshore, 1.75 miles W of the anchorage.

6.91 Between Baucau and **Tanjung Chater** (Ponta Chater) (8°20'S., 127°00'E.), about 32 miles E, the coast is fairly low, rising gradually to the mountains inland.

Anchorage can be taken off **Nova Zazara** (Koen) (8°22'S., 127°04'E.), a little over 4 miles SE of Tanjung Chater, by vessels with local knowledge, in a depth of 46m, stony bottom. The anchorage itself is a small natural harbor formed by an opening in the coastal reef. It is available to vessels up to 2,000 gt and offers protection during the Northwest Monsoon. The entrance is about 0.1 mile wide and is easy to approach.

From Nova Zazara, the coast extends 7 miles E to **Tanjung Hero** (Punta Hero) (8°20'S., 127°11'E.). The coast between Tanjung Hero and Tanjung Sevivara (Punta Sevivara), 7.5 miles SE, is fronted by steep-to cliffs.

Timor—Southeast Coast

6.92 Caution.—Non-Indonesian vessels are prohibited from entering waters within 12 miles of the SE coast of Timor between the meridians of 125°05'E and 127°21'E.

The SE coast may be approached fairly closely throughout, as there are no off-lying dangers other than **Beatrice Reefs** (10°31'S., 123°36'E.) in Selat Roti (Roti Strait). There are no bays or harbors which afford shelter in the Southeast Monsoon. Nearly all the rivers are inaccessible in the dry season, and even in the Northwest Monsoon there is frequently a heavy surf so that landing is difficult.

The action of the surf on the soft white rocks near the coast causes a white discoloration of the sea. Patches of this discoloration are carried by the current for miles seaward.

6.93 Pulau Jaco (Yaco) (8°26'S., 127°20'E.), a flat wooded island marked by a light, lies close off Tanjung Sevivara, the E extremity of Timor.

It was reported that Pulau Jaco is a good radar target at 9 miles. Light-colored smooth water, breaking at the outer edges, was reported to extend 2.5 miles S and E from Pulau Jaco. A depth of 14.3m was reported (1997) to lie about 11 miles NE of Pulau Jaco.

Selat Jaco is a 0.3 mile-wide clear channel between the NE extremity of Timor and Pulau Jaco, which may be safely navigated by steering a mid-channel course. Tidal currents may attain 4 knots. There are whirlpools at both entrances to the strait.

The coast from Tanjung Sevivara to **Tanjung Lore** (Tanjung Soeloro) (8°41'S., 127°01'E.), 24 miles SW, is rocky with the last few miles fringed by a sandy beach.

Lore (Suloro) (8°39'S., 127°01'E.), the center of the timber trade, stands 2.25 miles N of Tanjung Lore. The landing place for the center is at a village 1.5 miles W of the point. The conspicuous house of the manager of the sawmills, elevation 12m, is situated NW of Tanjung Lore.

A channel, 0.5 mile wide, leads through the wide coastal reef to the landing place, which is sheltered in both monsoons. Two pillars near the beach, in range 350°, lead through the middle of the channel.

Anchorage may be taken, in 18m, SSE of the pillars in range.

6.94 The coast between Tanjung Lore and **Tanjung Beaco** (Tanjung Beaso) (8°57'S., 126°28'E.) is hilly with high mountains inland.

Elomar (8°45'S., 126°46'E.), a village, stands on the shore of a small bay about 15 miles WSW of Tanjung Lore. A reef which dries, extends from the E shore but off the village there is a broad, sandy beach where good landing can be affected. Two pillars in range, bearing 026°, lead to the anchorage, in 7m.

Tanjung Roro Ai (8°48'S., 126°37'E.) is a high, rocky point formed by a spur from the mountain N, located 10 miles WSW of Elomar.

Aliambata (8°47'S., 126°36'E.), close W of Tanjung Roro Ai, can be identified by a large pyramid.

Anchorage.—Anchorage may be taken in a depth of 18m, SE of the pyramid. The depth is reported to be 37m, 0.75 mile offshore, and 16m, 0.45 mile offshore.

6.95 Tanjung Beaco, 11 miles SSW of Aliambata, is a low point. Beaco, a village, stands 1.5 miles W of Tanjung Beaco, and may be identified by the custom house and a white pillar.

Anchorage may be taken, by vessels with local knowledge, in a convenient depth off Beaco, SSW of the white pillar. In the Southeast Monsoon, there is a heavy swell.

Tanjung Luca (Tanjung Loeka), a low, marshy, and reef-fringed point, lies about 10.5 miles W of Tanjung Beaco.

Two large rivers enter the sea through deltas of mangroves, 14 and 23.5 miles WSW of Tanjung Luca, the coast between being a low plain.

Tanjung Metibot (Tanjung Meti Boot) (9°09'S., 125°49'E.) is located 30.5 miles WSW of Tanjung Luca.

The coast between Tanjung Metibot and **Tanjung Manemara** (Tanjung Lalete) (9°12'S., 125°42'E.), about 7.5 miles WSW, is reef-fringed in places.

Tanjung Suai (9°21'S., 125°16'E.) is reef-fringed, lies about 27 miles WSW of Tanjung Manemara, and has a village on its point.

Tanjung Tafara (9°25'S., 125°12'E.), 5.5 miles SW of Tanjung Suai, is a low point which can be identified by some casuarino trees, and terminates in a bank of shingle.

From Tanjung Tafara to **Tanjung Wetoh** (Tanjung We Toh) (9°38'S., 124°53'E.), 19 miles SW, there is a slight indentation in the coast.

6.96 Tanjung Batu Merah (Tanjung Menu) (9°52'S., 124°45'E.) is a steep, rocky point, formed by a spur from the mountains, 19.5 miles SW of Tanjung Wetoh. A wide, low plain extends between the two. Tanjung Noiloetuke, the NE entrance point to Teluk Kalbano, lies 13 miles SW of Tanjung Batu Merah. The intervening coast consists of high cliffs on which there are remarkable red and white patches.

Teluk Kalbano (10°02'S., 124°33'E.) is backed by high mountains. It has a shore consisting of a steep, inclining beach of stones except in the S part, where there is a narrow coastal reef, which dries.

Kalbano (10°02'S., 124°32'E.), a village, stands 0.35 mile inland behind groves of palm trees on the W shore of the bay. There is a noticeable mass of rock on the beach at the N end of the palm trees.

Anchorage.—Anchorage may be taken by vessels with local knowledge, 0.3 mile E of the N end of a drying reef, in depths of 20 to 60m. There is a good landing place immediately N of the coastal reef.

6.97 The coast between Teluk Kalbano and **Tanjung Batuputih** (Tanjung Batoe Poetih) (10°13'S., 124°05'E.) trends 30 miles WSW. Tanjung Batuputih is a prominent, steep, white rocky cliff, 50m high and easy to identify from E. Immediately NE of Tanjung Batuputih is Teluk Noilmina (Noilmina Bay) which has a wide sandy shore over the greater part of its head.

Anchorage may be taken in the Northwest Monsoon, by vessels with local knowledge, in the W part of the bight, in depths of 5 to 9m. In the Southeast Monsoon, the shore should not be approached closely.

From Tanjung Batuputih to **Tanjung Oisina** (10°21'S., 123°27'E.), the SW extremity of Timor, the coast trends about 38 miles WSW. Tanjung Oisina should be given a wide berth as the sea and tide rips make steering difficult. The point is marked by a light.

Tanjung Mali (10°22'S., 123°36'E.), a narrow rocky point about 9.25 miles E of Tanjung Oisina, should be given a berth of 1 mile because of a shoal spit extending from it.

Timor—West Coast

6.98 Pulau Semau (10°14'S., 123°23'E.), a large hilly island with **Tanjung Uloimi** (10°20'S., 123°24'E.), its steep SE extremity, lies 3.25 miles WNW of Tanjung Oisina. The island, reef-fringed, has no remarkable summits but rises to about 189m in its N part. A light is shown 1 mile SW of Tanjung Kurong, the N extremity of the island.

6.99 Hansisi (10°11'S., 123°30'E.)**,** close W of Tanjung Hansisi, the NE extremity of Pulau Semau, is a coaling station for Government vessels only. Landing can be affected at all times at the steps of a stone pier fronting the village. There was a depth of 2.1m at the steps and 3.4m alongside the pierhead.

Tides—Currents.—Tidal currents and very strong tide rips, especially off **Tanjung Upeoh** (10°14'S., 123°19'E.), make traffic inadvisable along the W coast of Pulau Semau.

Anchorage.—A small vessel can anchor in Hansisi Road, in a depth of 7m, S of a water tank seen between two coaling sheds.

Large vessels should not anchor in a depth of less than 33m, as the depths decrease rapidly towards the shore.

6.100 Selat Semau (10°16'S., 123°27'E.) lies between Pulau Semau and the SW part of the W coast of Timor, and is deep and free from dangers in the fairway. The safest course through the strait is mid-channel. Depths in the vicinity of Selat Semau has been reported to be less than charted.

Tides—Currents.—Strong currents run through the strait, but the S current does not continue as long as the N. The current is seldom stronger than 3 knots.

The W coast of Timor lies between Tanjung Oisina, the SW extremity, and **Tanjung Gumuk** (Goemoek) (9°30'S., 123°48'E.), the W extremity of Timor, 55 miles NNE. A light house, 40m in height, has been established (2003) at Tanjung Gumuk. Irregular tidal currents and tide rips are found off nearly all the salient points, which should be given a wide berth.

Between Tanjung Oisina and **Tanjung Lelendo** (Tanjung Lelindo) (10°14'S., 123°29'E.), 8 miles N, the W coast should be given a wide berth as the depths outside the coastal reef are irregular, and a turbulent sea and tide rips make steering difficult.

6.101 Tenau (10°12'S., 123°32'E.) is situated in the NE part of a bight, lying between Tanjung Lelendo and **Tanjung Fanot** (Tanjung Tenau) (10°11'S., 123°32'E.), 3.25 miles NE. Tenau has superseded Kupang as the major loading port for the area. Kupang, located about 3.75 miles NE, is less favorable during the Northwest Monsoon. A light is shown at the root of the pier at Tenau.

Tenau harbor comprises a rectangular basin with wharfs extending from the sides. Berthing information is found in the table titled **Tenau—Berth Information.**

Tenau—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Bolok Power Plant Terminal						
Bolok Berth	90m	—	—	—	—	Coal by barge. Berthing length of 162m (including dolphins).
PT ASPD Kupang Terminal						
Passenger Berth East	8m	—	—	—	—	Fast ferries. Berthing length of 40m (including dolphins).
Passenger Berth North	5m	—	—	—	—	Fast ferries.

Tenau—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Passenger Berth West	8m	—	—	—	—	Fast ferries. Berthing length of 40m (including dolphins).
Tenau Kupang Container Terminal						
A-Multiguna Berth	237m	14.0m	—	—	—	Containers and reefer.
Tenau Kupang Port Terminal						
B-Nusantara Berth	136m	12.0m	—	—	—	Ro/pax and breakbulk.
C-Lokal Berth	212m	10.0m	—	—	—	Breakbulk.
Cargo Dock	110m	—	—	—	—	Breakbulk.
D-Multipurpose Berth	100m	15.0m	—	—	—	Fast ferries and breakbulk
Pertamina TBBM Tenau Kupang Terminal						
Oil Jetty	15m	10.0m	242m	9.6m	17,500 dwt	Chemicals, clean products, and bunkers. Berthing length of 242m (including dolphins).

Pilotage.—Pilotage is compulsory.

Regulations.—Vessels should send their ETA 3 hours prior to arrival.

Contact Information.—See the table titled **Tenau—Contact Information**.

Tenau—Contact Information	
Port Authority	
Telephone	62-380-890030
	62-380-890022
Facsimile	62-380-890072
E-mail	kupang@pp3.co.id
Web site	http://www.pp3.co.id
Harbor Master	
Telephone	62-380-21289
Pilot	
Call sign	Kupang Radio (PKK)
VHF	VHF channels 12, 14, and16

Anchorage.—The recommended anchorage is 0.2 mile NW of the head of the pier.

Teluk Kupang (10°06'S., 123°40'E.) is entered between Tanjung Tenau and **Tanjung Pakular** (Tanjung Pakoelak) (10°02'S., 123°35'E.), a sandy wooded point 9 miles NNE. Depths in the vicinity of Teluk Kupang are reported less than charted.

6.102 Kupang (10°10'S., 123°35'E.) lies on the S side of Teluk Kupang and within the entrance of the Sungai Kupang. A concrete pier, 55m long, is part of the seawall which extends NNW from the harbor entrance.

A light is shown from a 13m, white metal framework tower on the W entrance point of the river at Kupang. Another light is occasionally shown on the head of a pier extending from the E entrance of the river.

Anchorage.—Anchorage is available during the Southeast Monsoon, in a depth of 18m, 0.25 mile NW of the light on the W entrance of the river.

An area of foul ground lies close E of this anchorage. In the Northwest Monsoon, it is better to anchor farther out, in a depth of 33m.

Between Tanjung Pakulak and **Tanjung Gumuk** (9°30'S., 123°48'E.), the NW extremity of Timor about 35 miles NNE, the coast is steep and rocky with an occasional sandy beach.

Because of irregular currents and tide rips off this section of coast, vessels should not approach Tanjung Gumuk within 1 mile. An explosives dumping ground lies about 21 miles NW of Tanjung Pakulak.

The NW coast of Timor, between Tanjung Gumuk and Tanjung Parimbala, 95 miles NE, is mountainous over its greater part, but occasionally broken by lower, hilly land.

6.103 Atapupu (Atapoepoe) (9°00'S., 124°52'E.) (World Port Index No. 51400), about 70 miles NE of Tanjung Gumuk, lies at the head of a narrow inlet in the coastal reef which projects about 0.5 mile from the shore.

The port is situated on the E side of the mouth of a river and is marked by a light. There is a narrow 137m wide but deep passage through the reef, widening out to a basin about 0.3m wide with depths of 5.8 to 14.6m forming the inner roadstead. A cargo quay, 102m long, handles containers, fishing vessels, and breakbulk cargo. The Cargo Jetty, 70m long, handles ro/ro passengers and breakbulk. The Fuel Jetty, with a berthing length of 33m long including dolphins, handles clean products.

Anchorage.—Vessels can anchor in the inner roadstead W of the range line, in 7 to 13m. Because of the restricted space, it is advisable to moor.

During the Southeast Monsoon, anchorage may be obtained outside the coastal reef on the range line, in depths of 55 to

73m.

Directions.—Steer 164° with the white monument in range with the highest point of the E side of a prominent mountain cliff, located less than 2 miles SSE of Atapupu.

6.104 The coast between Atapupu and **Batu Gadeh** (8°57'S., 124°58'E.), 7.5 miles ENE, is formed by a wooded plain, fronted by mangroves, with an occasional sandy beach.

Tanjung Fatu Sue (Tanjung Fatoe Soe) (8°52'S., 125°00'E.) lies about 5.5 miles NNE of Batu Gadeh.

Tanjung Fatu Bero (8°41'S., 125°06'E.), is a rocky point 12 miles NNE. Here, the coast recedes to form a bight. It was reported that the coastal reef, for a distance of 3 miles S of Tanjung Fatu Bero, had extended about 2 miles to the W.

Tanjung Parimbala (8°39'S., 125°07'E.), 3.5 miles N of Tanjung Fatu Bero, is one of several rocky points of a high rounded part of the coast.

Selat Roti

6.105 This strait, lying between the S extremity of Timor and Pulau Roti, about 6.5 miles SW, is deep and clear except for a narrow coral bank 2.25 mile miles SSW of Tanjung Oisina, the SW extremity of Timor. The coral bank has a least depth of 16.5m, and it is advisable to give it a berth of 3 miles, for it has been reported that depths are less than charted.

Beatrice Reefs (10°31'S., 123°36'E.), about 12.5 miles SE of Tanjung Oisina, consists of two coral reefs, 2.25 miles apart, with deep water between. The E reef has a least depth of 5.5m and the W has 7.3m. They are usually recognized by their discoloration, surf, and tide rips. The S sides of the reefs are steep-to.

Tides—Currents.—The tidal currents in the strait may run with some strength, and there is frequently a turbulent sea in the E part.

Anchorage, if necessary, can be taken off the N side of either reef, in 20m.

A rock with less than 1.8m depth lies about 2.5 miles N of the E reef.

Pulau Roti

6.106 **Pulau Roti** (10°45'S., 123°09'E.), whose NE extremity lies 6.5 miles SW of Timor across Selat Roti, is a hilly island rising near the middle of the S side of the island to a height of 429m. The island is also surrounded by a coastal reef which is fairly broad in places. Outside this reef the depths generally increase rapidly, and in some places off the S coast the 200m curve is only 0.5 mile offshore.

The E coast, between **Tanjung Pukuatu** (Tanjung Poekoeatoe) (10°26'S., 123°22'E.), low and sandy, and **Tanjung Piakokoli** (Tanjung Mepe) (10°39'S., 123°25'E.), about 14 miles S, has few landmarks.

Pulau Usu (Usu) (10°30'S., 123°25'E.), a hilly island, about 5.5 miles SE of Tanjung Pukuatu, is difficult to identify from the main island and is separated from it by a narrow strait.

Teluk Pepela (10°35'S., 123°25'E.) is entered between Tanjung Liudese, the S extremity of Pulau Usu, and **Tanjung Liakokoli** (Tanjung Batuisi) (10°37'S., 123°25'E.), a little over 3 miles SSE. The bay is encumbered by dangerous shoal patches and the depths are very irregular. Exercise caution when entering the bay.

Anchorage.—Anchorage may be taken in an inlet in the coastal reef on the S side of the entrance to Teluk Pepela, in 24m, sheltered from W winds.

Directions.—For the approach to Teluk Pepela, steer 221° for **Lakimola** (10°40'S., 123°21'E.), 273m high, and anchor when Batu Luak, a large rock on the drying coastal reef, 1.5 miles WNW of Tanjung Liakokoli (Tanjung Batuisi) is in range with a flat hill at the head of the bay, bearing 274°.

6.107 The coast trends 2.75 miles S from Tanjung Liakokoli to Tanjung Piakokoli, the E extremity of Pulau Roti. Then to **Tanjung Poeleh** (10°50'S., 123°13'E.), a low rocky point about 16 miles SW, the coast is low and rocky in places with the land rising steeply inland.

From Tanjung Pondalaun to Pulau Lai, about 10 miles WSW, the coast is high and steep with the depths too great for anchoring.

Teluk Buka (Boeka Bay), indenting the coast between **Tanjung Manulaluk** (10°52'S., 123°01'E.), a steep point and **Tanjung Makar** (10°55'S., 122°58'E.), 3.75 miles SW, is fringed on its N and W sides by a broad bank of sand and coral.

Pulau Tua (10°53'S., 123°03'E.), a small islet with a white stone pyramid, lies about 1.5 miles W of Tanjung Manulaluk.

Pulau Lai (10°52'S., 123°04'E.), an islet off the N entrance of Teluk Buka, is fringed by a drying reef. A few rocks on the S side of a large reef lie about 1 mile SW of Pulau Lai. Pulau Landu (Landoe) at its W end lies close off the S entrance of Teluk Buka.

Nusa Manuk (Manoek) (10°55'S., 123°00'E.) lies on a drying reef connected to Tanjung Makar. Several conspicuous low and bare islets and rocks lie on a reef extending E from Nusa Manuk. The outermost rock, about 2 miles E of the SE extremity of Nusa Manuk, is especially conspicuous.

It was reported that Nusa Manuk is a good radar target at 21 miles.

In the middle of Teluk Buka are two large drying reefs. North of these reefs is an extensive basin with anchorage, in 20m, mud and sand. The entrance of this basin is about 0.3 mile wide between the N side of the E drying reef and the edge of the drying shore bank. Local knowledge is necessary.

In approaching the anchorage, proceed between the reefs extending from Nusa Manuk and the rocks on the S side of a large reef, 2 miles SE of Tanjung Manulaluk. Steer course 312° on the white stone pyramid standing on Pulau Tua. Change course sharply to N when the S side of the large reef SW of Pulau Lai is in range with the S point of Pulau Lai. When the S point of Pulau Lai bears 090° alter course quickly to 270°, and anchor, in 20m, when the white stone pyramid bears 337°.

Islands and Dangers off the West Coast

6.108 **Pulau Dana** (11°00'S., 122°53'E.), close S of Tanjung Bua (Tanjung Boa), is a rocky, uninhabited island. A light beacon, 30m in height, has been established (2003) on the island. Pulau Helihana (Haliana), 1 mile NE of Pulau Dana, is a steep, rocky islet. South of Pulau Dana there is a heavy swell and a turbulent sea at all times.

Pulau Ndao (Ndao) (10°49'S., 122°40'E.), Pulau Nuse (No-

ese), and Doo all lie inside the 200m curve off the W coast of Pulau Roti. If passing between these islands from the S, it is advisable to pass E of Doo and then between Pulau Ndao and Pulau Nuse. A light, 40m in height, stands on **Dao Besar Island** (Ndao) (10°48.47'S., 122°49.35'E.).

There is usually heavy surf on the coastal reef fringing these islands and tidal currents among these islands can reach speeds of up to 3 knots.

On the NW coast from **Tanjung Tongga** (Tanjung Tonga) (10°47'S., 122°49'E.) to **Baa** (10°44'S., 123°03'E.), a village 14.5 miles ENE, the coast is fringed by a reef which extends 1 mile offshore in places. The coast is low and covered with mangroves.

Baa Road (10°43'S., 123°03'E.) fronts Baa, the principal village on Pulau Roti. The roadstead is entirely open to W and NW winds. A light is shown from a white metal framework tower on the beach. Another light is occasionally shown from the head of a pier, 0.1 mile further E.

Anchorage.—Anchorage may be taken during the Southeast Monsoon, in 20 to 26m, mud and sand, with the light structure bearing 147°, distant about 0.45 mile.

6.109 Tanjung Unggae (Tanjung Oenggae) (10°36'S., 123°12'E.), 12 miles NE of Baa, is the S entrance for Teluk Korobafo (Korobafo Bay). The N entrance is 0.8 mile farther NE, with both entrance points reef-fringed and mangrove-covered, making Teluk Korobafo difficult to identify. The current in the entrance to the bay can be very strong during high tides. Because of the current in the entrance to Teluk Korobafo, it is only navigable by small vessels. Over a small part of W end of Teluk Korobafo there are depths of over 9.1m, but elsewhere it is shoal.

The coast between Teluk Korobafo and Tanjung Pukuatu, the NE extremity of Pulau Roti, is low and wooded with occasional rocky cliffs, the entire coast being fronted by a drying reef.

Pulau Sawu (Sawu) (10°31'S., 121°55'E.) lies 51 miles WNW of Pulau Roti and is a hilly island. The highest peak on the island, **Raipiga** (Rai Piga) (10°34'S., 121°48'E.), 342m high, lies about 8 miles E of **Tanjung Mesera** (Tanjung Mesara) (10°34'S., 121°41'E.), the W extremity of the island. Lights are often seen along the coasts of the island; these lights are torches used by the inhabitants of the island engaged in fishing.

The NW coast of Pulau Sawu, from Tanjung Mesera to Seba, about 10.5 miles NE, is mostly sandy with a few rocky parts.

6.110 Seba (10°29'S., 121°51'E.) is a village not easily recognized from the sea. A light is shown from Seba.

When approaching Seba during the day, a 9m high white stone pyramid standing close SW of the light structure will be sighted. The pyramid is difficult to recognize because of a white building behind it.

Anchorage.—Anchorage may be taken during the Southeast Monsoon, in a depth of 12m, mud and sand, 0.4 mile NW of the light structure. A patch which dries, lies 0.15 mile SE of this position and when approaching the anchorage the bottom rises very steeply. In the Northwest Monsoon, it is better to anchor farther out, in a depth of 35m, at least 0.75 mile offshore.

6.111 North of Seba, the empties into the sea about 2.75 miles WSW of Kali Menia (Kali Mehia) **Tanjung Aimau** (10°26'S., 121°52'E.), the N point of the island. A sandy beach at the river mouth affords a good landing place. A light is shown close E of the mouth of Kali Menia.

There is a remarkable cliff formed of grayish-green masses of rock 1 mile W of **Tanjung Niuwudu** (Tanjung Nioewoedoe) (10°27'S., 122°00'E.).

Anchorage may be obtained during the Northwest Monsoon between **Tanjung Bali** (10°28'S., 122°00'E.) and **Tanjung Lie Geta** (10°33'S., 121°59'E.), but the coastal reef extends as much as 0.8 mile offshore near Tanjung Bali. A light, 40m in height, stands on Tanjung Lie Geta. During the Northwest Monsoon, anchorage may be taken by vessels with local knowledge, in a depth of 33m, SW of Tanjung Lie Geta.

The coastal reef, S of Tanjung Lie Geta, is interspersed with rock and sandy beaches with occasional rocks on the coastal reef itself.

Selat Raijua (Rai Djoea Strait) lies between Pulau Sawu and Pulau Raijua, 3.5 miles WSW, and is deep and clear of danger in the fairway.

6.112 Pulau Raijua (10°36'S., 121°39'E.), separated from Pulau Sawu by Selat Raijua, is inhabited and cultivated. There are no good anchorages off the S coast of Pulau Raijua. Anchorage may be taken during the Southeast Monsoon by vessels with local knowledge 0.5 mile N of **Tanjung Wuimahi** (10°38'S., 121°31'E.), the W extremity of Pulau Raijua, in a depth of 35m, sand and coral. This anchorage is sheltered from E winds.

A prominent sugarloaf-shaped hill, 60m high, rises 0.5 mile SW of **Tanjung Meranga** (10°36'S., 121°33'E.), the NW extremity of the island. The highest hill, lies near the middle of the island and is 165m high.

Pulau Dana (Dana) (10°50'S., 121°17'E.), 18 miles SW of Pulau Raijua, is a small island partly covered with low timber and uninhabited. The W and highest part of the island rises to a rocky plateau, 36m high. A prominent rock, 34m high, lies on the N side of the island.

Anchorage may be taken by vessels with local knowledge, in a depth of 29m, N of the prominent high rock.

Islands Lying North of the East and Central Parts of Flores

6.113 Pulau Kauna (Kaoena) (7°26'S., 122°05'E.), over 22 miles NW of Pasir Layaran, is a wooded coral islet and uninhabited. A small sandflat lies on the drying SE edge of the fringing coastal reef.

Pulau Kakabia (Kakabia) (6°54'S., 122°13'E.), 32 miles NNE of Pulau Kauna, is high, rocky, wooded, and uninhabited. Numerous seabirds and rats live on the island, and some of the trees and rocks are white with guano. The island is fringed by a drying coral reef which extends 1.25 miles ESE, and contains a deep inaccessible basin. A detached reef which dries lies off the NE side of the reef, and is separated it by a narrow, deep channel.

Pulau Madu (Madoe) (7°30'S., 121°46'E.), 17 miles WSW of Pulau Kauna, has several detached reefs lying near the coastal reef inside the 200m curve.

Pulau Kalaotoa (Kalao Toa) (7°23'S., 121°48'E.), 3 miles N

of Pulau Madu, are separated by a deep passage. Pulau Kalaotoa is the most important and densely populated island of this group. The village **Gorau Upa** (7°25'S., 121°45'E.) is situated on the SW side.

Anchorage.—Anchorage may be taken by vessels with local knowledge off Gorau Upa, close N of a 6.7m patch SW of the village. Anchorage may also be taken close to the coastal reef extending from the SE, E, and N sides of Pulau Kalaotoa.

Taka Lambaena (7°16'S., 121°40'E.), an extensive steep-to reef, lies 3.5 miles NW of Pulau Kalaotoa from which it is separated by a deep channel.

Pulau Karompa Lompo (Karompa Lompo) (7°17'S., 121°46'E.) and Pulau Karompa Cadi (Karompa Tjadi) lie on the SE and NE end of Taka Lambaena.

Taka Lambaena extends 16 miles WNW from Pulau Karompa Lompo, and close within its extremity is a prominent above-water rock. A steep-to reef and a small coral islet lie, 1 and 2.5 miles NW; respectively, of the W extremity of Tara Lambaena.

6.114 Kaju Pangang (7°28'S., 121°25'E.), 18.5 miles W of Pulau Mudu, consists of two small rocky islets covered with vegetation, and visible 10 miles in clear weather lying on the S side of a reef.

Taka Bassi (Marianne Reef) (7°31'S., 121°13'E.), a drying reef, lies 11.5 miles WSW of Kaju Pangang. Some detached dangers, which are scarcely visible by discoloration, lie within the 200m curve S and SE of Taka Bassi.

Kepulauan Bone Rate, a large group of coral islands under formation, occupy a large area between the N extremity of the reef Taka Lambaena, and **Ujung Apatana** (Tanjung Apatana) (6°30'S., 120°29'E.), the S extremity of Pulau Salayar (Pulau Selayar). These islands are mostly uninhabited and are only visited regularly by local trading vessels. The ordinary navigation routes lie far outside the archipelago.

The passages across and along the barrier reef inside the 200m curve can be navigated by sight. The large reefs are nearly always marked by discoloration when covered, but such is not the case with the smaller reefs. The difference in appearance at HW, when all the reefs are practically covered, and at LW when the reefs are dry, is very conspicuous.

In the channels between these islands the tidal current runs N with the rising tide and S with the falling tide.

6.115 Pulau Bone Rate (Bone Rate) (7°21'S., 121°07'E.), 9 miles NW of Taka Bassi (Marianne Reef), is wooded with coconut palms to the S and has the highest of three flat hills near the N end of the island. Bone Rate Light is shown from the SW side of the island.

Pulau Kalao (7°18'S., 120°56'E.) lies W of Pulau Bone Rate and separated by a deep channel 1.75 miles wide.

The elevation of the island is higher at its E and W extremities than in the middle.

Anchorage may be taken off Beru, a village on the E side of the island, in a depth of 69m. In the Northwest Monsoon, vessels lie here safer than off Pulau Bone Rate.

Pulau Tanajampea (Tana Djampea) (7°08'S., 120°46'E.), lies about 8.75 miles N of the W extremity of Pulau Kalao. The island is high, rugged, and broken on the W side, off which lie many smaller islands.

On the bank which extends 12 miles W from the W coast of Pulau Tanajampea, there are a number of small heads of coral. They are usually marked by discoloration, although the water is so clear that the bottom can plainly be seen at a depth of 9.1m. Vessels passing the bank should keep outside the 200m curve.

Tides—Currents.—During the Southeast Monsoon, when passing W of this bank, a W current attaining a rate of 2.25 knots has been observed.

Taka Kapalle (7°07'S., 120°25'E.) are extensive reefs, which show discoloration, at the SW corner of the bank. The least depth on this reef is 3.7m.

6.116 Karangsane (Sane Sane Reef) (6°58'S., 120°27'E.), NW of the bank and outside the 200m curve, is a reef of sand, coral, and stones which partly dries, and has two above-water sand cays on its NE side.

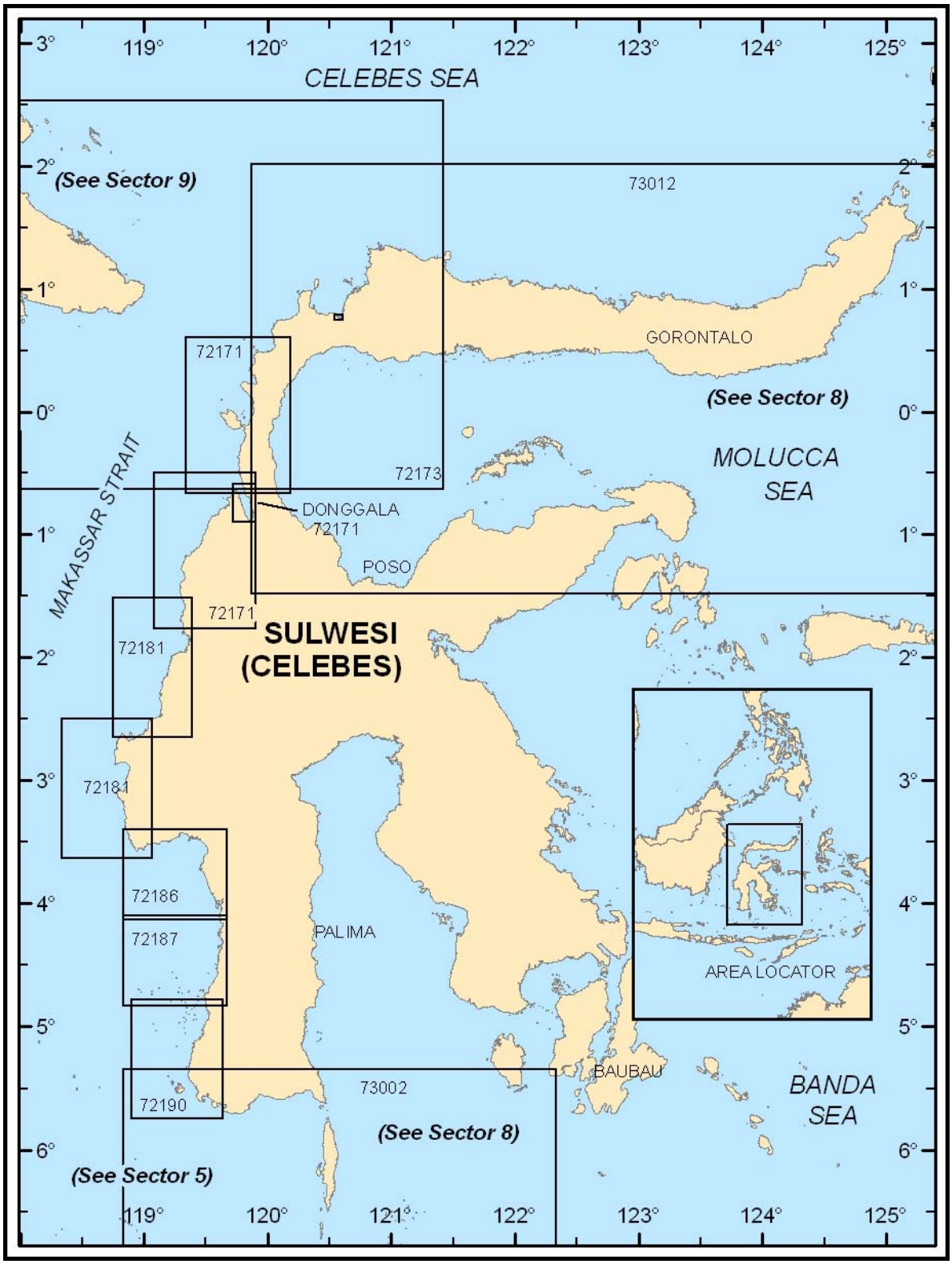
Three islets lie on the bank between **Pulau Kayuadi** (Kajoe Adi) (6°48'S., 120°48'E.) and the N coast of Pulau Tanajampea.

Pulau Kauna (Taoena) (6°53'S., 120°47'E.) lies on the E side of a reef, 1 mile S of Pulau Kayuadi, and is a small wooded island.

Pulau Panjang (Pandjang) (6°58'S., 120°47'E.), 4.5 miles S of Pulau Kayuadi, is a small sand island covered with coconut palms lying on the SE end of a drying reef. There are strong eddies 2 miles NNE of the island.

6.117 Pulau Batu (Batoe) (7°02'S., 120°45'E.), with a rock close S of it, lies 4 miles SSW of Pulau Panjang.

Pulau Pulasi (Poelasi) (6°41'S., 120°26'E.), about 20 miles NNW of Pulau Tanajampea, and Pulau Tambolongang (Tambulongang), 1.5 miles N of Pulau Pulasi, lie on the E side of an extensive bank, steep-to near the 200m curve, consisting of sand, coral, and rocks. Shoal patches on this bank can easily be seen as the water is so clear that the bottom can easily be seen at a depth of 20m. The water over the N part of the bank is reported to be discolored.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **7** — CHART INFORMATION

SECTOR 7

SULAWESI—WEST AND NORTH COASTS

Plan.—This sector describes the W coast of Sulawesi from Tanjung Lassa W about 60 miles to Tanjung Pepe, then N about 430 miles to Ujung Malangka. From Ujung Malangka, the coast trends in a general E direction about 255 miles to Tanjung Utara, the N extremity of Sulawesi.

The coastal description is from E to W along the SW peninsula then N along the W coast, then from W to E along the N peninsula of the island. Then off-lying islands and dangers are described with their respective coastal areas.

General Remarks

7.1 The best known and most important of the Sulawesi peninsulas is the SW, which has Makassar Strait to the W and Teluk Bone to the E. A chain of mountains runs through the peninsula and rises to a height of about 2,896m in the S and about 3,440m in the N.

The N peninsula is about 260 miles in length and never exceeds 60 miles in breadth. A range of mountains run through it, the general height being about 610m, while some peaks rise to over 1,829m. The entire peninsula is rugged and mountainous. The NE extremity is a highly cultivated and fertile district. A large part of this district is a plateau from 762 to 914m.

The only port of importance along these coasts is Ujungpandang (formerly known as Makassar), near the SW extremity of the SW peninsula. It is the chief shipping point for Sulawesi.

Winds—Weather.—The monsoons in Makassar Strait are not as marked and are weaker than those in the Java Sea. Near the shores of Sulawesi, the land and sea breezes blow throughout the whole year.

The local topographical features and direction of the coast may greatly influence the force and direction of the wind then blowing in the strait. Land breezes can be expected between about 1900 and 0700 and sea breezes from 1000 to 1700. Where the monsoon is strong on a lee shore, the land breeze may not occur.

Along the W coast of Sulawesi, the Southeast Monsoon sets in over the S part in April blowing from NE to SE. Calms and NW winds are sometimes felt. This unsettled weather lasts until June, when the wind begins to blow with some regularity from SE, occasionally shifting to the SW. These winds will bring in a swell and blowing in opposition to the prevailing S currents, produce a short and troubled sea.

In September and October there is a decrease in wind and sea and changing through S and W. Winds blow from W in November, and in December from SW to NW. These winds cannot be relied upon.

Squalls and thunderstorms occur in December. The Northwest Monsoon is at its height in January and blows from the NW. The heavy squalls, with much rain and heavy seas, begin to abate in February. Light breezes from NW to NE and E occur in March.

December to March are considered the rainy months, but there are showers at all other times. July to August can be termed the dry season.

In the N part of the W peninsula, the force of the wind is still less. The monsoons from N and SSW are variable and depend to a great extent on the strength of the wind circulation in the Celebes Sea and the Java Sea. The seasons are not well defined and much rain occurs.

In May, the SSW winds commence. These veer occasionally to W and NW, and are more or less variable and unsteady. The monsoon is at its height from June to September, and SW winds prevail both day and night.

In October, the monsoon decreases in force and is lowest in November, the wind sometimes veering to the N and NE. In December the general direction is NW, in January N, and in February NNE winds blow with some steadiness, decreasing in April when calms and variable breezes can be expected.

There is less cloudiness in the N than in the S part of the peninsula, but rain is heavier and more continuous. The rainy season is from November to March, and the dry season from July to September. Squalls and thunderstorms are rare, but mist occurs.

In the Celebes Sea, along the N coast of the W peninsula, the Southeast Monsoon prevails from the second half of May to October, and a Northnortheast Monsoon from December to April, but neither have great constancy or great force.

Near the Sulawesi coast, the land and sea breezes have an influence on the monsoons so that the Southeast Monsoon is more constant and stronger by night, while the Northnortheast Monsoon is stronger by day. April and October are the months of the monsoon change. In general, the monsoons have a more characteristic course toward the E.

Rain falls all year around, though not in great quantities. The most rain falls in January, the least in September. Further E, the contrast between seasons is greater. Hard squalls are relatively rare, but they reach the N coast of Sulawesi particularly when the Southeast Monsoon is at its strongest, and the land breeze is paired with hard squalls and thunderstorms.

November and December are the months in which a hard wind (Barat) is most common. This wind, during the North Monsoon, rises to about 30 knots and because of the accompanying state of the sea surf makes communication with the shore and open roadsteads of N Sulawesi temporarily impossible.

Tides—Currents.—A S or SW current occurs within the open part of Makassar Strait throughout the year. It is sometimes stronger along the Sulawesi coast. The average rate is about 0.75 knot, varying somewhat in different months. A maximum rate of 3 knots during the Southeast Monsoon has been recorded.

In the S part of Makassar Strait, the direction of the S current is influenced by the prevailing monsoon. From June to September, the current is SW and passes into the W current of the Java Sea. From November to March, the current is SE and passes into the E current of the Java and Flores Seas. April and May are months of transition and the current along the Sulawesi coast turns SE. During the transition month of October, the current

turns SW and W.

Little is known of the currents along the N coast of Sulawesi as no systematic observations have been made.

From numerous previous reports, the currents along this coast appear to be irregular and fairly strong. In the month of June, during the first quarter of the moon, a current with a rate of 2.25 to 3 knots was observed setting onto the coast in an ESE direction. The current probably sets E along the N coast throughout the year. Its mean rate is probably less than 1 knot, except during the Northwest Monsoon, when it may exceed 3 knot on rare occasions.

Regulations.—For information regarding designated Archipelagic Sea Lanes, as defined by the United Nations Convention on the Law of the Sea (UNCLOS), passing through the Makassar Strait, see the Indonesia section of Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Caution.—The possibility of mines exist in the area described in this sector.

West Peninsula—Off-lying Islands and Dangers

7.2 Selat Salayar is about 9 miles wide between Tanjung Lassa and Pulau Salayar. The most used part of the strait is 3 miles wide with depths of 366 to 732m, which quickly deepens E to 2,196m.

Pulau Liukanglu (North Island) (5°39'S., 120°26'E.), 2 miles SW of Tanjung Lassa, is wooded on the N and E coast. Anchorage may be obtained off the SW coast, in depths of 15 to 26m, sand. Vessels can also anchor off the W side of the island, in 20m, with some shelter from wind and sea.

Currents in the W anchorage sets WNW and attain a rate of 2 to 3 knots.

Pulau Sarontang, 42m high and nearly in the middle of the strait, is rocky and slightly wooded. There is a surrounding reef, and on the S side the 10m curve is 0.3 mile from shore. Pulau Pasitanete (South Island) is 59m high, and except on the N side which can be closely approached, is fringed by a reef.

A light shown from a white iron framework tower, 20m high, stands on the N side of the island.

The channel between Pulau Pasitanete and Pulau Salayar is 1 mile wide, but is reduced by reefs from both sides to less than 0.25 mile in width. Tidal currents in the passage are violent and irregular and render it unfit for any but small vessels.

Taka Boloh (Mansfield Shoal) (5°48'S., 120°13'E.), about 15 miles SW of Pulau Liukanglu, is of coral and sand and has a least depth of 6.7m.

Quirk Reef is located about 5.25 miles WNW of Taka Boloh. When seen, it is marked by brown discolored water, with waves breaking and tide rips around it.

Taka Rangkap, 9 miles W of Pulau Liukanglu, is formed of coral, sand, and stone. The least depth over the reef is 4.5m, with 18.3 to 37m around it.

Tides—Currents.—Through all the passages in Selat Salayar, strong currents causing whirlpools are frequently experienced, and when wind and current are opposed to each other, overfalls resembling surf are raised. There is often a strong eddy under the coast of Sulawesi.

From May to September, at the height of the Southeast Monsoon, there is a constant SW stream with a rate of 1 knot. At the decline of this monsoon, it takes an E direction which persists till March or April, and the rate decreases to 0.25 knot.

Weather conditions on either side of Selat Salayar often show striking contrasts. During the Northwest Monsoon, rain may occur on the W side of the strait while on the E side, it is fine.

In May, June, and July rainy weather and a high sea on the E side will suddenly change over to calm weather on the W side.

Pulau Salayar—West Coast

7.3 **Pulau Salayar** (6°08'S., 120°30'E.), separated from Tanjung Lassa by Selat Salayar, is about 44 miles long N and S, and is traversed throughout by a mountain chain that runs along the E coast and slopes gradually to the flat stretch of coast on the W side.

Tanjung Sangkulungan (Tanjung Matainyi), the N extremity of Pulau Salayar, rises to a plateau 117m high and is separated from the higher land S by a deep saddle, which when seen from a distance E or W, has the appearance of an island and it is sometimes mistaken for Pulau Pasitanete.

About 6 miles S of Tanjung Sangkulungan, a plateau rises steeply to a height of 341m and has a square wood on its N edge.

The coast between Tanjung Sangkulungan and **Balangnipa** (Batangmata) (5°56'S., 120°27'E.), 10 miles S, is bordered by a drying reef that extends about 0.25 mile offshore.

From Balangnipa to Barugeja, a village 6 miles S, then to Benteng 5.25 miles farther S, the coast is high but there are no conspicuous summits. There is a prominent cleft in the hilly land 1 mile N of Barugeja, and 1 mile NE of the cleft there is a conspicuous tree charted.

During the Southeast Monsoon, numerous praus are usually seen lying near the coastal reef off Balangnipa, and there is considerable local traffic between the village and Sulawesi and also to points S.

7.4 **Benteng** (6°07'S., 120°28'E.),a large village and the headquarters of a government official, stands 2 miles SE of Tanjung Baruya, the N extremity of Pulau Pasi. There is a flagstaff at the N end of the village and a boat pier which can only be reached at high water.

A mosque stands 0.3 mile E of the pier and a warehouse with a zinc roof stands 0.3 mile S of the pier, both are excellent landmarks.

Benteng Road is bound by a line drawn from Tanjung Baraya (Tanjung Baroeja) to the flagstaff at Benteng, then in a 259° direction to Pulau Pasi.

Anchorage may be taken 0.25 mile W of Benteng, in depths of 12 to 15m. Strong W winds quickly raise a sea, and communication with the shore is difficult.

Directions.—When bound for Benting from the N, steer 139° for an isolated zinc shed 0.4 mile S of the flagstaff at Bening, which leads between a 4.2m patch 0.3 mile NE and a 4.9m patch 1.25 miles N of **Tanjung Baruya** (6°06'S., 120°26'E.).

When Tanjung Baruya bears 250°, change course to 180° which leads midway between Tanjung Baruya and a below-water reef with a depth of 1.5m, 0.7 mile E of Tanjung Baruya.

When the flagstaff at Benteng bears 109°, change course and steer for the middle of Benteng which leads between a 1.0m

patch 1 mile SE of Tanjung Baruya, and a 2.7m patch 0.6 mile further N.

7.5 Pulau Pasi (Varkens) (6°09'S., 120°25'E.) lies parallel to the W coast of Pulau Salayar, and is about 6 miles long. It is about 2 miles wide at the S end where it rises in a line of hills to a height of 96m. The N end of the island is low and covered with coconut trees. A hilly ridge rises to 57m, 1.25 miles to the S.

The coastal reef around Pulau Pasi extends up to 0.6 mile on the S and W sides, but extends 1.25 miles NW from Tanjung Baruya.

There is a channel between Pulau Pasi and Pulau Salayar that is about 1.25 miles in width at the N end, and is contracted to a width of 183m at the S end which is known as Padang Narrows.

The S entrance is also obstructed by fishing stakes. Only small light-draft vessels should attempt to pass through the narrows.

A 4.9m coral patch lies in the N entrance, about 1.25 miles N of Tanjung Baruya.

A 4.2m coral patch and a 1.5m coral patch lie 0.3 mile NE and 0.5 mile E, respectively, of Tanjung Baruya. A coral patch with a least depth of 2.7m lies close S of the 1.5m patch described above. All of these patches are surrounded by deep water.

Tidal currents in the channel between Pulau Pasi and Pulau Salayar are weak.

Whale Reef (Welvisch) (6°05'S., 120°20'E.) consists of three detached groups of shoals 3 to 7.6m deep. The 7.6m shoal lies 7.75 miles WNW of Tanjung Baruya near the 200m curve, and is steep-to on the W side. The reefs are steep and reported visible at about 2 to 2.25 miles.

From Whale Reef, the charted 200m curve extends S 16 miles, then turns NE toward the coast to a position about 2.25 miles offshore near Layolo Bay.

Padang (6°11'S., 120°26'E.) is located 4.25 miles SSW of Benting and is situated on the E side of the passage described above.

The coast between Padang and Ujung Apatana, 20 miles farther S, is high as far as Layolo Bay, then it gradually descends to Ujung Apatana, a low spit running far out to sea and ending in a sand bank. The sand bank is fringed by a reef which extends 0.75 mile offshore and is steep-to.

Ujung Dodaija (Tanjung Batu Kallong) (6°16'S., 120°27'E.), located 5.25 miles S of Padang, is the N entrance point of Layolo Bay. Tanjung Batu Putih, 2.75 miles SE of Ujung Dodaija, is the S entrance point of Layolo Bay.

Tanjung Batu Putih is a high, white sandstone point which is conspicuous with the sun shining on it. A reef extends 2 miles W from the point.

Ujung Batukurapu (Tanjung Batoe Kerapo), 5 miles SSW of Tanjung Batu Putih, is a steep and rocky point.

Ujung Apatana (Tanjung Apatana) is located 7 miles SSE of Ujung Batukurapu.

Bylandt Reef (6°18'S., 120°24'E.), with a least depth of 1.2m, lies 3.75 miles WSW of Ujung Dodaija. A 4.8m patch, lying 1.25 miles WNW of this reef, is only slightly marked by discoloration.

Pulau Guang (Goeang), 57m high, and Pulau Malimbu, 66m high, lie 2 and 3.25 miles, respectively, N of Ujung Batukurapu.

Anchorage may be obtained by vessels with local knowledge, about 0.3 mile W of Pulau Guang, in 27 to 37m, sand.

The channel within Pulau Guang and Pulau Malimbu is only suitable for praus.

The islands S of Pulau Salayar lie on a large steep-to bank near the 200m curve, and consist of sand, coral, and stones. The water is very clear; the bottom can be easily seen in 20m.

Pulau Bahuluang (Bahoeloeang) (6°29'S., 120°26'E.), the farthest N of this group of islands, is located 3.75 miles NW of Ujung Apatana. The island rises to a height of 72m, and is conspicuous. A reef which dries, extends 1.25 miles N from the island.

The passage between Pulau Bahuluang and the S extremity of Pulau Salayar, 2.75 miles E, is deep and safe.

Badjan Lamberreh (Bajan Lamberreh) is a narrow ridge with a least depth of 3.3m, which extends S from Pulau Bahuluang to Pulau Tambolongang.

With careful sounding, little sea, and a clear sight of the reefs, small vessels may pass over this ridge, taking care to avoid the central part.

Tides—Currents.—Currents with a rate of 2 knots have been observed over Badjan Lamberreh.

Tidal currents between Pulau Bahuluang and the S extremity of Pulau Salayar, a NW stream, sometimes attain a rate of 3 knots. During May, June, and July, the SE current is not strong.

Pulau Tambolongang, with a 221m hill in the N part, is a good landmark from all directions. The administrative headquarters are in the village of Taloh, on the E coast.

Pulau Pulasi (Poelasi) has a conspicuous steep hill, 227m high on the N side, tailing off to the S with a series of pointed hills gradually decreasing in height. Pulau Pulasi, the farthest S of this group of islands, lies 10 miles SSW of Ujang Apatana.

Nambolaki (6°42'S., 120°17'E.), a small wooded islet lying on the SW point of the bank, is located 9 miles W of Pulau Pulasi; the islet is marked by a light. There are several shoal patches on the bank which may best be seen on the chart. There is a 1.2m patch, close within the 200m line, located 7 miles N of Nambolaki.

Sulawesi—West Coast

7.6 Tanjung Lassa (Tanjung Laso) (5°37'S., 120°29'E.), is the SE extremity of the W peninsula of Sulawesi. From Tanjung Lassa to Tanjung Pepe, about 60 miles W, the coast forms a few bays and is backed by some conspicuous mountains.

In the E part, one of the most conspicuous mountains is **Slangenberg** (5°29'S., 120°10'E.), 423m high, located about 20 miles WNW of Tanjung Lassa.

The highest and most conspicuous of these mountains is Gunung Lompobatang (Lompo Batang), 2,900m high, located 11 miles inland, 16 miles NW of Slangenberg. Vessels approaching the SW coast of Sulawesi under favorable conditions will sight Gunung Lomobatang long before the off-lying islands and low wooded coast are visible.

The mountains SW of Gunung Lompobatang are of little use for navigation at any distance, because the various peaks are not easily identified.

The coast from Tanjung Lassa to **Bulukumba** (5°34'S., 120°11'E.), about 17 miles W, is generally low and the depths

off it are irregular. The coast between these two positions recedes and forms Teluk Birangkeke. There is good anchorage in Teluk Birangkeke, in 26m, with shelter in both monsoons.

Bulukumba, a large village at the mouth of Sungai Teko, is easily recognized by the light shown from a white metal framework tower, 24m high 0.3 mile SW of the river entrance. Anchorage may be taken E of the light; however, vessels do not lie well here as a heavy surf quickly rises off the entrance. A better anchorage is situated about 1 mile SW of the lighthouse where communication with the shore is easier and there is no trouble with breakers.

Bonthain, 15 miles W of Bulukumba, extends for a considerable distance along the coast at the foot of the mountains and is an administrative headquarters. There is a waterfall, 79m high, in the vicinity of the village, and a conspicuous bare hill stands 1.25 miles WNW of Bonthain. A flagstaff is situated on the principal building in the village. A small landing pier is situated near the flagstaff. Bonthain Road is bound within the limit of a circle with a 1 mile radius, measured from the flagstaff. Anchorage may be taken in the road, in depths of 7 to 9m, good holding ground, 0.8 mile SW of the flagstaff. The anchorage is safe in the Northwest Monsoon, but the swell is felt until close inshore. In the Southeast Monsoon, there is often a heavy swell and with S winds boats have considerable difficulty proceeding alongside the boat pier.

Between Bonthain and Jeneponto (Djeneponto), 17 miles SW, the coast is covered with paddy fields and coconut palms. Tanjung Petang, 9 miles SW of Bonthain, is low and Tanjung Bulu Bulu, 5 miles farther SW, is an inconspicuous rounded point. Between Bonthain and Tanjung Petang there are several shoal patches with irregular depths, within 2.25 miles of the shore.

7.7 Jeneponto (5°42'S., 119°43'E.), the seat of a government official, lies at the entrance of a river of the same name. Jeneponto is not easy to identify from seaward, but in clear weather steer for the high mountain Maya (Maja), located 15 miles WSW of Gunung Lompobatang, on course 356°.

Temporary anchorage may be obtained, depending on the weather, outside the 5.5m line off Jeneponto.

A danger area exists S of Jeneponto. Its limits may be seen on the chart.

From Jeneponto, the coast trends in a WNW direction about 5 miles to Tanjung Kayuleleng (Tanjung Kajoeleleng), a low, shrub covered point. It is advisable not to approach the coast at this point within 1.25 miles, as the depth S and W of it are irregular.

Teluk Malasoro is entered between Ujung Kayuleleng and Ujung Mangasa, 4.25 miles WNW. The bay is 2.25 miles wide and offers secure anchorage in both monsoons.

Pulau Libukang, off the W side of the entrance, is reef fringed. On the NE shore of the bay, Cinnong (Tjinnong), a hill 115m high with two white patches at the base, is conspicuous. Bulu Pinka, 615m high, is located 6.25 miles N of Cinnong. Bulu Pinka has steep slopes and a rugged outline. When viewed from the S or SE, it shows two vertical clefts in the summit. Sibukang is a 204m rounded hill, thickly wooded with dark trees, lying 5 miles SSW of Bulu Pinka.

The bay may be approached with Bulu Pinka and Sibukang in line, bearing 021°, and entered with Cinnong, bearing 048°.

Teluk Laikang is 4 miles wide between Ujung Kasimatimpowa (Udjung Kasi Matimpowa), its SE entrance point 6 miles WNW of Ujung Kayuleleng, and Ujung Pepe, the NW entrance point. Both entrance points are low, sandy, and fringed by a drying reef. A dangerous wreck, with a least depth of 4m, lies about 2 miles SW of Ujung Pepe.

7.8 Karampuang (5°35'S., 119°33'E.), a hill 114m high, is located close inland on the NE shore of the bay.

Tanjung Puntondo is low and thickly covered with dark trees. It lies within the W entrance of Teluk Laikang, 1 mile N of Ujung Pepe.

To enter Teluk Laikang, steer on Karampuang, bearing 038°. This leads clear of the entrance reefs. Anchorage may be taken either SE or NE of Tanjung Puntondo.

Ujung Pepe (5°37'S., 119°28'E.) is low and not conspicuous, but a point 2.25 miles NW may be identified by two dark rocks which show well against the sandy shore.

The coast between Ujung Pepe and Ujungpandang, 30 miles N, is low with few noticeable landmarks.

From Ujung Pepe to Ujung Salisingang (Udjung Djambatang I Meong), 4.25 miles NNW, the coast is covered with tall trees that grow close to the water. The ridge inland is not wooded.

Ujung Parapa (5°25'S., 119°22'E.) is located 8.25 miles NNW of Ujung Salisingang. The low coast between the two points is reported to be mostly fronted by fish ponds.

Takalar, a large village, is situated about 1 mile inland, 5 miles N of Ujung Salisingang.

From Ujung Pepe to Ujung Parapa, the 11m curve lies from 1 to 2.25 miles offshore.

Taka Luwara (Taka Loewara) (5°37'S., 119°23'E.), a small sand and coral patch with a depth of 6.7m, lies 5.25 miles W of Ujung Pepe. Manrantusang, a shoal area with a least depth of 6.7m, lies 3.25 miles N of Taka Luwara. This shoal, which is not marked by discoloration, may be passed on either side, but a dangerous wreck lies 1.25 miles E of the shoal.

Malambeang, with a least depth of 2.1m, lies 2 miles S of Ujung Parapa. There are several shoals around it.

7.9 Selat Tanakeke (5°30'S., 119°21'E.) is bound on the E by the coast of Sulawesi between Ujung Salisingang and Ujung Parapa, and on the W by Pulau Tanakeke. The strait is about 1.25 miles wide at the N end between the shoals in the vicinity of Malambeang and Pulau Tanakeke, and is about 5 miles wide at the S entrance, although it is partly blocked there by Manrantusang. The depths in the strait vary from 10.4 to 25m. Tidal currents set in the general direction of the fairway and are sometimes very strong.

Caution.—A dangerous wreck, best seen on the chart, lies 1.8 miles NE of Tanakeke Light.

7.10 Pulau Tanakeke (5°30'S., 119°17'E.) is a low thickly-overgrown island covered in parts with high trees. There is an extensive growth of scrub on the coastal reef which dries. When covered, the reef is marked by discoloration. A light is shown from the S coast of the island.

Owing to this growth, the points of the island should not be used for bearings. The island can usually be seen from a distance of 10 miles. A dangerous wreck lies approximately 6.75

miles S of the island.

The village of Kalukan on the SW side, and Tompotana on the E side are hidden by coconut palms. Tanakeke Light is shown from a white beacon standing on a reef close NE of Tompotana.

Pulau Bauluwang (Pulau Baoeloeang) is separated from the NW side of Pulau Tanakeke by a channel about 1 mile wide. This channel should not be used. Pulau Satanga, which has some high coconut palms, lies NW of Pulau Bauluwang. It is separated from Palau Bauluwang by a narrow shoal channel.

Pulau Dayangdayangan (Dajangdajangan) (5°24'S., 119°11'E.) lies 2.75 miles NW of Pulau Satanga. The island is nearly surrounded by a drying reef, except on its NE side. A channel with a depth of 21.6m lies between the two islands. It is frequently used by vessels approaching Ujungpandang (Makassar) from SW.

A light, shown from a white metal framework tower, 30m high, stands on the SE side of the island.

A shallow area, with a least depth of 17.2m, lies 4 miles ENE of Pulau Dayangdayangan.

Taka Gosseya (5°23'S., 118°59'E.) covers a large area and has a least depth of 4.5m. It lies 12 miles W of Pulau Dayangdayangan and is generally marked by discoloration.

Ponto Pontopontowang, a small shoal with a depth of 5.8m, lies 4.75 miles SE of Taka Gosseya and is not marked by discoloration. A light stands on the E side of this shoal.

Taka Patapa (5°29'S., 119°06'E.), with a least depth of 9.5m, lies 10 mile SE of Taka Gosseya on the S end of a bank with a least depth of 18.3m.

Taka Dange, with a least depth of 10.3m, lies 5.25 miles ESE of Taka Patapa.

Between Ujung Parapa and the delta of Jene Berang (Djene Berang), about 16 miles N, there are few landmarks. Pulau Sangrobengi, a small island lying on the coastal reef 6 miles N of Ujung Parapa, is a good landmark from N or S, but from the W it is difficult to distinguish.

7.11 **Taka Bubuyang** (Boeboejang) (5°11'S., 119°22'E.) is a stony patch with a least depth of 5.7m located 1.25 miles W of the delta of Jene Berang. Taka Pinjing (Taka Pindjing), a below-water rock, lies 0.25 mile NW of Jene Berang.

Pulau Laelae Besar (Pulau Laelae) (5°08'S., 119°23'E.) is an artificial island lying on a reef which partly dries. A breakwater, about 0.3 mile in length, extends NNW from the island. This island, which is located 3.25 miles NNE of Taka Bubuyang, lies within the harbor limits of Ujungpandang.

Pulau Laelae Kecil (Pulau Laelae Tjadi) (Pulau Laelae Cadi) is a bare sand flat, surrounded by a reef which only dries near its E end at the lowest tides. This reef, which lies close NNE of Pulau Laelae Besar, has a breakwater which is about 0.6 mile in length and lies in a NNE to SSW direction.

Gosong Boni is separated from the breakwater on Pulau Laelae Kecil by a channel, 183m wide, with depths of 12.8 to 16.5m. This is the main entrance channel to Ujungpandang. A small islet located on the E side of the reef is marked by the buildings of the quarantine station.

Karang Utama, with a least depth of 3.4m, lies 0.25 mile S of Pulau Laelae Kecil; a spoil ground lies 0.15 mile farther SW.

Taka Baku (Bakoe) (5°08'S., 119°21'E.), 2 miles WNW of Pulau Laelae Besar, is a small reef with a depth of 0.9m. The reef is seldom marked by discoloration.

Ujungpandang (Makassar) (5°08'S., 119°24'E.)

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7.12 Ujungpandang is an open roadstead and the most important port on the W coast of Sulawesi. It consists of a city, a basin for small vessels, and berthing facilities for large ships. An outer anchorage for large vessels lies W of the breakwaters.

Indonesia Port Corporation IV
http://www.portina4.go.id/mksr.htm

Winds—Weather.—In the approach to Ujungpandang during the Southeast Monsoon, the sea breeze sets in at about 1000 and often blows with considerable strength from the SSW to SW.

The land wind is less and sets in between 1800 and 1900 from SSE to E; it is often strongest about sunrise. Ujungpandang is approximately at the boundary of the dry E winds known as Brubu, which at times blow down from the mountains.

They may dominate the sea breeze and extend 4 or 5 miles offshore, setting in unexpectedly and with gusts accompanied by hazy weather.

In the Northwest Monsoon, which sets in about December with squalls and much rain, the wind is from W to NNW. The land breeze is seldom felt and only in a direction S of E.

Tides—Currents.—Tidal currents in Pelabuhan Ujungpandang have only a slight influence on the monsoon current. It was found from a 4-day observation towards the end of March, during the Northwest Monsoon, that the duration of the N current against the S current was just over half of that of the S current at this period of the year.

The rate of the S current was 1 to 1.25 knots, while that of the N current was very weak.

In Pelabuhan Ujungpandang the current generally runs S in the strength of the Northwest Monsoon and N in the Southeast Monsoon. When Jene Berang is in flood there is a N current in the roadstead, while outside the reefs the current is setting S. The average tidal range is 0.3 to 1m.

Depths—Limitations.—Depths less than charted exist within the approaches to and in the port of Ujungpandang.

Berth information is shown in the table titled **Ujungpandang—Berth Information**.

The S entrance to the harbor lies between Ujungpandang Light and a reef 0.6 mile NW.

Aspect.—A white grain silo, 54m high, stands near the grain wharf and the radio towers, 1.75 miles SSE of Tanjung Pandan, provide a conspicuous landmark.

Pilotage.—Pilotage is compulsory except for exempted vessels. Pilots embark at the E end of the swept channel, close N of the N breakwater.

A vessel should send her ETA to Ujungpandang Radio station, 36 hours to 48 hours beforehand. The pilot station can also be contacted by radio. Normal pilot hours are 0600 to 1800, but in exceptional circumstances a vessel may leave as late as 2400.

Signals.—The following signals must be shown until the pilot is on board or until an answering signal has been made. Vessels arriving at night, but not wishing to enter, shall show the pilot signal at daybreak.

During the day, the following signals are applicable:

1. The national flag, surrounded by a white border, displayed at the foremast head.
2. The pilot signal UC of the International Code of signals.
3. Flag G of the International Code of Signals.
4. The distant signal, consisting of a cone point up, with two balls above.

Ujungpandang—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			LOA	Draft	
Makassar Container Terminal					
No. 1	175m	9.0-12.0m (MLWS)	—	10.0m	Grain, ro-ro passengers/vehicles/ rail, and breakbulk.
No. 2	—	9.0-12.0m (MLWS)	—	10.0m	Ro-ro passengers/vehicles/rail, containers, breakbulk, and reefer.
No. 3			—	10.0m	
No. 4	—	9.0-12.0m (MLWS)	—	10.0m	Ro-ro/lo-lo, containers, breakbulk, and reefer.
No. 5	—	9.0-12.0m (MLWS)	—	10.0m	Ro-ro passengers/vehicles/rail, containers, breakbulk, andreefer.
No. 6	—		—	10.0m	
No. 7	160m		—	10.0m	
Note.—Berths No. 1-7 have a continuous berth length 850m.					
Makassar New Port					
North Berth	—	—	—	—	Containers. Continuous berthing length of 362m.
South Berth	—	—	—	—	
Soekarno Terminal					
Dermaga 100	145m	12.0m	—	9.0m	Grain, breakbulk, and bunkers.
Dermaga 101	315m	12.0m	—	—	Clean products, breakbulk, and bunkers.
Dermaga 102	245m	12.0m	—	—	Cement, breakbulk, and bunkers.
Dermaga 103	—	12.0m	—	—	Ro/pax, ro-ro/lo-lo, containers, breakbulk, and bunkers. Continuous berthing length of 650m.
Dermaga 104	—	12.0m	—	—	
Dermaga 105	—	12.0m	—	—	
Makassar (UJU)-Petamina oil W					
Oil Jetty No. 1	30m	9.0m	160m	—	Aviation fuel, clean products, LPG, and bunkers. Berthing length of 70m (including dolphins).
Oil Jetty No. 2	15m	8.0m	160m	—	Clean products, dirty products, LPG, and bunkers. Berthing length of 32m (including dolphins).
Note.—Vessels up to 18,000 dwt can be accommodated when using the total brthing length of Oil Jetty No. 1 and Oil Jetty No. 2. Vessels up to 3,500 dwt, with a maximum loa of 90m can be accommodated when using a single jetty.					

Ujungpandang—Lookout Station Answering Signals		
Day signal	Night signal	Meaning
A black cylinder	A rocket	The vessel has been observed.

Ujungpandang—Lookout Station Answering Signals		
Day signal	**Night signal**	**Meaning**
The company or the national flag, or the vessel's name signal	A red light	The pilot is proceeding to the vessel.
A ball, with two cones, points up, vertically disposed below it	Three lights, vertically disposed, with the upper one red and the other two white	The pilot is proceeding to the vessel.
Two cones vertically disposed, bases together	A white light above a green light	Pilot not available; vessel may enter without a pilot.
A ball with a cone below it, point up	A red light above a white light	Pilot not available; vessel may enter without a pilot.

During the night, the following signals are applicable:

1. A blue light every 15 minutes.
2. A bright white light flashed or shown just above the bulwarks at frequent intervals for 1 minute.
3. The signal by G lamp.

The answering signals made by the lookout station at Ujungpandang are given in the accompanying table.

Anchorage.—Anchorage may be taken in the outer anchorage, 0.25 mile W of the breakwaters, in depths of 17.4 to 23m. The embarking/disembarking of passengers or loading/unloading cargo is prohibited in this anchorage.

The anchorage between the town and the line of coral reefs W is protected and the holding ground is good, in depths of 12.8 to 18.3m. After the request is approved by the local authority, vessels may anchor within the breakwater in depths of 16m or less.

Directions.—Description of the approach channels to Ujungpandang are given in subsequent paragraphs.

Caution.—A detached shoal, with depths of 2.7 to 3.6m, lies 0.25 mile SSE of the sand flat on Pulau Laelae Kecil. A patch of coral exists in an area about 1 mile N of the Oil Wharf Naval Depot. A dangerous wreck lies close W of Pulau Laelae Besar breakwater. A dangerous historic wreck, best seen on the chart, lies 0.5 mile SSE of Taka Bako. A submarine gas pipeline lies close N of Ujung Kasirukang and extends W over 2 miles offshore.

It was reported that the channel S of the breakwater has not been dredged for many years and is blocked by fishing stakes.

Extensive port developments have taken place within Ujungpandang. Changes to coastline, new piers, and land reclamation have taken place within the area close S of Hatta Container Terminal. A container terminal has been constructed extending 1 mile off the shore oriented to the NW has been constructed about 2 miles N of the port. A works in progress (2020) area has been established, to the S of the New Container Terminal centered on position 5°05'58.2"S, 119°24'59.4"E.

Pulau-pulau Sangkarang (Pulau-pulau Pabbiring) (Spermonde Archipelago)

7.13 The banks, rocks, and islands that comprise Pulau-pulau Sangkarang are described in a S to N direction. Only those dangers that lie near a recommended channel will be discussed, the other many dangers may best be seen on the chart. The channels which provide access to Ujungpandang are described in the following order:

1. South Channel.
2. Swept Channel.
3. West Channel.
4. Hoven Channel.
5. North Channel.

Pulau-pulau Sangkarang is an extensive area encumbered with coral islands, rocks, and banks which stand on a flat off the SW coast of Sulawesi. The banks and dangers extend about 82 miles in a N to S direction, and at their widest part, are 35 miles offshore. A great part of the outer edge is formed by a raised ridge of coral, which slopes abruptly into charted depths of over 200m.Under favorable conditions it is plainly marked by discoloration.

The formation of the numerous islets and reefs in Pulau-pulau Sangkarang is not constant, reefs grow into islets and islets disappear.

Shoals that were of no danger to shipping during the survey may have since reformed. Without local knowledge vessels should adhere strictly to the swept channel through the archipelago.

The only known danger outside the 200m curve in this part is **Taka Bakang** (4°58'S., 118°32'E.). This reef dries and can be seen at a distance of 5 miles at low water; it is marked by a light.

Winds—Weather.—In Pulau-pulau Sangkarang, a Southeast Monsoon and a Northwest Monsoon prevails. In July, August, and September, the "Brubu" or mountain wind is met. The approach of these squalls, which usually come in the forenoon, is generally marked by a heavy sky and the land becomes very indistinct. Frequently this wind sets in unexpectedly, the only sign of its arrival being a rippling of the water.

In the S part of the archipelago, the hazy SE wind is called "Tongora."

In October, the wind varies from SW to SE in the daytime and at night from SE to E. In November, it is very changeable, coming from all points. In December, January, February, and March, the Northwest Monsoon prevails, but blows with less force than the Southeast Monsoon, especially at night when opposed to land breezes.

Tides—Currents.—Within Pulau-pulau Sangkarang, there is no tidal current. Depending on the state of weather, a current toward the N or S may be expected.

Current along the outer edge of the bank sometimes causes heavy ripples, often having the appearance of breakers.

7.14 South Channel to Ujungpandang.—South Channel comprises the wide channel which is clear of dangers, and leads N of Pulau Dayangdayangan and Selat Tanakeke.

This channel can be entered from the S through Selat Tanakeke, from the SW by passing between Pulau Dayangdayangan and Pulau Satanga, and from the W by passing N of Taka Gosseya and Pulau Dayangdayangan.

The passage N of Taka Gosseya and Pulau Dayangdayangan is generally used both day and night by large vessels proceeding to and from Ujungpandang.

Between **Pulau Dewakang-lompo** (5°24'S., 118°26'E.) and Pulau Dayangdayangan, a S current with a rate of 2 knots is sometimes experienced, even during the strength of the Southeast Monsoon. A vessel approaching from W should obtain a bearing on Pulau Dayangdayangan, which is usually visible from 10 miles.

Bone Pinjing (5°19'S., 119°13'E.), with a least charted depth of 5.8m, lies on the W side of the S approach channel, 5 miles NNE of Pulau Dayangdayangan. Bone Lure (Loere) with a least depth of 10m, Bone Kaluku (Kaloekoe) with a least depth of 8.2m, and Bone Pamalompo with a least depth of 8.2m lie 2 miles NW, 4 and 6.75 miles N, respectively, of Bone Pinjing.

The channel which leads to Unjung Pandang is entered between Bone Malonjo and Taka Sandkarang.

Bone Malonjo (5°14'S., 119°06'E.), lying 8.25 miles NW of Bone Pinjing, is a shoal with a least depth of 7.6m, and is 0.3 miles NW of Taka Sangkarang. Taka Sangkarang is a chain of reefs extending 20 miles NNW from its S end.

Pulau Langkai (5°02'S., 119°05'E.) lies on a drying reef midway along this chain of reefs, and is reported to be a good radar target when approaching from the W.

The buoyed channel is entered about 3.25 miles WNW of Bone Malonjo. The 1 mile wide channel leads ENE and passes N of Bone Pamalompo and Bone Pamakeke.

The channel narrows to a width of 0.25 mile and turns NE, passing E of Bone Pute (Bone Poete), and W of Pulau Kudingarenglompo (Koedingareng Lompo).

Keeping well clear of the reef, which is reported to be extending S, steer E passing S of Pulau Kudingarengkeke, then to Ujungpandang.

Another section of swept channel leads ENE, also passing N of Bone Palalompo and Bone Pamakeke and S of Pulau Kudingarenglompo, turning NE to pass between Pulau Kudingarenglompo and Pulau Samalona, then turning E to pass N of Pulau Samalona, then to Ujungpandang.

Bone Pamakeke (5°12'S., 119°13'E.), with a least depth of 8.2m, lies 1.25 miles NE of Bone Pamalompo.

Bone Pute, with a least charted depth of 3.5m, lies 1.25 miles NNW of Bone Pamakeke.

Pulau Kudingarenglompo, a low heavily wooded island, lies 4 miles NE of Bone Pamakeke. The island is visible 14 miles in clear weather. A fringing reef extends 0.25 mile from its N and W sides, and 0.75 mile from its S side.

A light is shown from a 17m high framework tower on the W side of the island. A dangerous wreck lies 3 miles N of the light.

Pulau Kudingarengkeke (5°06'S., 119°17'E.) lies on the NE side of a drying reef, 2.75 miles NNE of Pulau Kudingarenglompo.

Caution.—The buoys in this approach to Ujungpandang are reported to be unreliable. A dangerous wreck lies near the entrance to the swept channel.

7.15 West Channel to Ujungpandang.—Pulau Lanyukang (4°59'S., 119°04'E.) lies 3.25 miles NNW of Pulau Langkai. The island, which is covered with palms, is visible 11 miles in clear weather and is marked by a light. It lies close within the charted 200m curve. On the edge of the bank the bottom may be seen in 20m, and a W current will cause heavy rips having the appearance of breakers.

In approaching the W passage from N or NW, the high trees on Pulau Langkai must not bear more than 137° until ready to turn E into the recommended tracks.

The navigation of the W channel, once inside the entrance, is not difficult as the islets on either side form fairly good landmarks and careful sounding gives warning of the approach to some of the dangers in the W part of this route.

The channel N of Pulau Lanyukang has the greater depth, but vessels must be guided through it by eye.

Pulau Sarappo (4°53'S., 119°16'E.), which has a noticeable tree in the middle, lies 12.75 miles ENE of Pulau Lanyukang. When the islet is seen and kept on a bearing of 070°, it leads through the greatest depth. When the W extremity of Pulau Lanyukang bears 180°, course may be gradually altered S to pass 1.25 miles E of this island. As soon as Pulau Kudingarenglompo bears 131°, steer for it. This leads to a position 0.3 mile N of **Batunai Balo** (5°04'S., 119°10'E.), a shoal patch with a least depth of 9m, located 5 miles SE of Pulau Langkai. Then follow the directions stated below for vessels entering S of Pulau Lanjukang.

Pulau Lumulumu (4°59'S., 119°13'E.) and Pulau Badi, 4.25 miles farther E, form a range bearing 084° which may be steered to enter the channel S of Pulau Lanjukang.

When the W extremity of Pulau Langkai bears 180°, steer for Pulau Kudingarenglompo bearing 131°, as previously directed.

When the E side of Pulau Lumulumu is in line with the high tree on Pulau Sarappo, bearing 028°, steer for Pulau Kudingarengkeke on course 110°. This leads between Batunai Balo and Siborong, a shoal patch with a least depth of 8m, that lies 1 mile NE.

When Pulau Kudingarenglompo bears 142°, steer 124° until the NW side of Pulau Kudingarengkeke is in line with the SE side of Pulau Barangkeke, a high wooded islet lying 2.25 miles NE, and the E side of Pulau Kudingarenglompo bears 189°. Then steer 104° to pass S of Pulau Laelae Besar or steer 090° to pass N of Pulau Laelae Kecil to Ujungpandang.

Caution.—Vessels with drafts in excess of 4.9m are advised to avoid using the West Channel.

7.16 Hoven Channel to Ujungpandang.—Between the N end of Taka Sangkarang and **Pulau Kapoposang** (4°42'S., 118°57'E.), about 10 miles NNW, a chain of reefs are reported to lie close inside the charted 200m curve.

Pulau Kapoposang, a long narrow island planted with coconut trees, is located on an extensive drying reef. A light is shown from a 33m high framework tower; a racon also transmits from there, on the W extremity of the island. This island is important to vessels proceeding through the E side of Makassar Strait, outside of the archipelago.

Papandangang, 1.25 miles SE of Pulau Kapoposang, is low but owing to the high trees on it, is visible 10 miles in clear weather. Pulau Kondongbali, 4.75 miles E of Papandangang, is located on a drying reef. A long ridge, which dries in places, lies between these two islets.

Pulau Tambakulu (4°44'S., 119°03'E.), 1 mile S of Pulau Kondongbali, is covered with low scrub. Taka Luwar, a drying reef with a small sand cay, lies 3.25 miles SW of Pulau Tambakulu.

The navigation of Hoven Channel presents no difficulties as the channel has a least depth of 20m, wide, and has good marks for fixing the position of a vessel.

The usual entrance channel for deep draft vessels lies SW of Pulau Kapoposang. Small vessels may also enter E of Papandangang.

To enter the channel SW of Pulau Kapoposang, steer for the N extremity of Pulau Papandangang in line with the S extremity of Pulau Kondongbali, bearing 089°.

When the W extremity of Pulau Kapoposang bears 000°, alter course to 112°, passing S of Papandangang.

A vessel with local knowledge entering the channel E of Papandangang, passes about 0.35 mile E of that islet on a course of 180°, which leads over a shoal patch with a least charted depth of 8.2m. When the W point of Pulau Kapoposang comes in range with the NE point of Papandangang, bearing 306° astern, keep this alignment until the drying sand flat on the reef extending NW from Pulau Tambakulu is in line, bearing 056° with Pulau Pamangangang, 4.75 miles NE. Then course is altered to 112° and meets the track recommended to pass SW of Pulau Kapoposang.

When the W extremities of Pulau Kondongbali and Pulau Tambakulu are in line, bearing 000°, alter course to 118° for Pulau Sarappo. This course leads to the narrowest part of the passage, between **Taka Tengah Tengah** (4°50'S., 119°08'E.), a shoal patch reportedly extending N with a least depth of 3.1m, and a shoal with a least depth of 4.7m, located about 0.75 mile NNE. In this area attention should be paid to the current which may be setting across the track. When the opening between Pulau Kondongbali and Pulau Tambakulu bears 319°, make good course 139° until Pulau Sarappo bears 090°, course is then altered to 146°; Pulau Kondongbali and Pulau Tambakulu disappear from sight here.

7.17 Kassi (4°54'S., 119°10'E.) is located on the W side of the track and a 9m patch lies on the E side of the track.

When Pulau Lumulumu and Pulau Lanjukang form a range, bearing 268°, steer for the SW side of Pulau Barangkeke, 8.75 miles SSE, bearing 150°. When the S extremity of **Pulau Baranglompo** (5°03'S., 119°20'E.) bears 090°, alter course to 126°, steering between Pulau Baranglompo and Pulau Barangkeke. This course will lead to the channel N of Pulau Laelae Kecil.

Karangan (4°26'S., 119°12'E.), the NW island of the archipelago, is little more than a sand cay.

Pankamandra (4°17'S., 119°17'E.), a shoal patch 11 miles NNE of Karangan, is the N extremity of the known reef. Pankamandra Light is shown from a 15m high beacon, situated 7 miles NE of **Taka Bulango** (4°22'S., 119°12'E.), which is the NW extremity of the known reef.

A rock, whose charted position is approximate, lies outside the 200m curve, 8.25 miles N of Karangan. There is another rock that lies about 8 miles N of Karangan.

7.18 North Channel to Ujungpandang.—North Channel to Ujungpandang leads in a generally S direction, no more than 2.25 miles offshore. The channel, which is marked by beacons, has a least depth of 5.5m, but the depths in the channel vary between 7.6m and 18.3m.

The NW portion of Kepulauan Pabbiring has not been fully examined. It is suggested that vessels making for this passage from NW must not approach the entrance unless a reliable position has been obtained well outside the 200m curve. Vessels should possess local knowledge and have the sun in a position favorable for seeing discoloration before attempting to navigate North Channel.

Pulau Panikiang (4°21'S., 119°36'E.) is a low, wooded island lying 1 mile W of the Sulawesi coast. The N entrance to the channel lies between a number of reefs extending 1.25 miles W from this island and Tomisa, a reef with a depth of 3.7m, 3 miles W. This reef is marked by a beacon.

In approaching North Channel, steer 179° for a position about 0.75 mile E of the beacon on Tomisa. Then make good course 197° for 8 miles to a position 0.6 mile E of Labutung (Laboetoeng), a reef which mostly dries. A stranded wreck is situated on the N side of the reef. Angin Bau Laut (Angin Baoe Laoet), below-water, lies 4.25 miles S of Tomisa and is the nearest reef to the track on the E side.

When abreast **Labutung** (Laboetoeng) (4°29'S., 119°30'E.), and with the thickly-wooded Pulau Puteanging (Pulau Poeteanging) close under the Sulawesi coast, bearing 104°, steer 212°.

With **Batu Pankaya** (Batu Pankaja) (4°36'S., 119°24'E.), a 1.2m shoal patch bearing 284°, 2 miles, the charted channel divides. The E channel of these two is described here.

From a position ESE of Batu Pankaya with **Pulau Sakoala** (4°40'S., 119°30'E.), a palm covered islet 5 miles, bearing 130° or Bulu Tanette, bearing 088°, make good course 185°.

Pulau Sabutan (Sabutang) (4°45'S., 119°26'E.) lies on the W side of the above track. The beacon about 2.25 miles N of Pulau Sabutan, in line with the W side of Laya (Laja), a wooded islet about 4 miles S of Pulau Sabutan, forms a good range for the 185° leg described above.

As soon as Pulau Salemo, 4 miles NNE of Pulau Sabutan, bears 107°, a beacon on a reef 1.25 miles SSE of Pulau Sabutan, and a beacon situated 3.75 miles farther S, should be brought into line, bearing 174°. When abreast the S extremity of Pulau Sabutan, course is changed to 180°. This course leads through a channel 0.2 mile wide between steep-to reefs.

When through this narrow channel and the NE extremity of **Pulau Bankobankoang** (4°47'S., 119°26'E.), is in line with the W extremity of Pulau Sabutan, bearing 341°; steer 161°, keeping the 341° range astern.

When the beacon on the W reef of Taka Tallu, 4 miles SSE of Pulau Bankobankoang, bears 181°, steer for it.

The beacon on Taka Tallu stands about 35m inside the W reef and should be left 0.2 mile to the E. Then bring it astern, bearing 001°, and steer 181° until the beacon on **Batu Lua** (4°59'S., 119°27'E.), 9 miles S of Taka Tallu is sighted. When about 0.2 mile N of the beacon on Batu Lua, alter course to pass NW of it on a SW course. It will often be more convenient

to pass S of Batu Lua, especially with good visibility and a S current.

After passing the beacon on Batu Lau, bring it astern bearing 032°, and keep the beacon on this bearing until the stone beacon on Gosong Barimbaringang, 4.25 miles SSW of Batu Lua, bears 182°, then course should be altered to 173°.

Garongkong (4°22'S., 119°37'E.), a port situated on the W coast of Sulawesi on the Makassar Strait, lies 1.5 miles SE of Panikiang and 21 miles S of Parepare. The port mainly handles fuel oil, dry cargo, breakbulk, and passengers and can accommodate a maximum draft of 13.0m. The Bosowa Cement Terminal consists of five piers ranging from 18m to 146m in length including dolphins and handles cement and clinker. A Ferry Terminal has a 135m long quay for ro-ro/passengers. The Garongkong Sea Port's inner berth is 210m long and handles coal and breakbulk; the outer berth is 250m long and handles cement and breakbulk. The oil jetty at PT Multi Trading Pratama is 256m long including dolphins, handles clean products (CPP), and can accommodate a maximum draft (HW) of 11.6m.

7.19 Pulau Balang-cadi (Pulau Balang-tjadi) (4°57'S., 119°25'E.), a wooded island located 3 miles NW of Batu Lua, should be kept well open W of Mauang, a small islet 1 mile SSE of Pulau Balang-cadi, while on the 173° track.

The beacon on Gosong Barimbaringang may be passed at a distance of 0.3 mile, and when bearing about 270°, alter course to 210°. Past Gosong Barimbaringang, the depths gradually decrease to 6.4m over a ridge of mud and sand extending from the Sulawesi coast.

When **Bone Malalaya** (Bone Malalaja) (5°05'S., 119°24'E.), 1.75 miles SSW of Gosong Barimbaringang, is abeam, alter course to 202°, passing E of Gosong Trabanusu and Gosong Panyoa (Gosong Panjoa) in depths of 11 to 20.1m, then steer for the roadstead. Gosong Trabanusu lies 1 mile and Gosong Panyoa lies 1.75 miles SSW; respectively, of Bone Malalaya.

An alternative route to Ujungpandang from the vicinity of Taka Tallu, following deeper water than the previously described route, was surveyed many years ago. From a position 0.6 mile N of the beacon on Taka Tallu, steer 225° for 3.75 miles to a position 1 mile SE of the S point of **Pulau Karanrang** (4°52'S., 119°23'E.). A 5.9m patch lies 0.6 mile W of this position. Then steer course 208° for 5.75 miles, passing about 1.25 mile SE of the lighted beacon (port hand) shown from a mast 15m high on the N side of Batu Bajangang, about 1 mile ESE of Gosong Podang Keke. A drying reef lies 3.25 miles SSE of Pulau Karanrang and 0.6 mile WNW of Batu Posienja, a drying reef. When 0.25 mile NW of the lighted beacon marking Bone Penambungang, a small 4.9m patch, alter course to 186° for 5.75 miles, passing about 0.4 mile E of Padjenekang Keke, a patch of drying reef. When midway between **Pulau Baranglompo** (5°03'S., 119°20'E.) and Bone Lola, a patch of drying reef 1.25 miles E, steer SSE for Ujungpandang.

A 15.9m patch lies 2.25 miles S of Bone Lola in the center of the mine-swept channel.

Between Ujungpandang and **Ujung Panreng** (4°21'S., 119°37'E.) about 49 miles N, there is a densely-populated, cultivated, and wooded strip of land backing the coast, 10 miles wide at the S end and decreasing to 1 mile wide at the N end. Behind this coastal strip there is a range of high mountains.

The whole stretch of coast is fronted by a bank of varying width, which is wider in the S part. Several reefs, sand banks, and islets lie on or near this coast. Some of the reefs and islets have previously been discussed with the channels through the archipelago. This stretch of coast is of no importance to general shipping and is not described in detail.

Between Ujungpandang and Pulau Kuricaddi, 6.25 miles NNE, the coast is low and swampy except at the N entrance point of Jene Tello (Djene Tello), 3 miles ENE of Ujungpandang.

7.20 Pulau Kuricaddi (5°02'S., 119°28'E.), a rocky islet separated from the coast by a creek, has a conspicuous tree located on its W coast. Pateene (Boeloe Karampoeang), a sharp conical peak 2.25 miles SSE of Pulau Kuricaddi, also has a conspicuous tree.

Tanjung Kasi, 4 miles NNE of Pulau Kuricaddi, is the N entrance of a small, shallow river. The point is marked by a coconut grove.

Sungai Binangasangkarang, the deepest river along this coast, is entered 4.25 miles N of Tanjung Kasi. Its entrance is fronted by a sand bar, through which there is a channel with a depth of 1.4m.

Between Tanjung Kasi and Tanjung Tua, 12 miles N, in addition to Sungai Binangasangkarang, there are several other rivers that empty into the sea. Bulu Bulu, a wooded hill with high trees visible 12 miles, is located on the coast 8 miles N of Tanjung Kasi. The hill appears as an island when seen from offshore.

Bungoro Peak is located 2 miles NE of Bulu Bulu. It is in the W part of a mountain range that extends toward the E.

Biringkasi (4°49'S., 119°29'E.), 3 miles S of Tanjung Tua, is a special harbor for loading Tonasa cement and coal. The port can accommodate vessels up to 15,000 dwt with a maximum draft of 12.4m. The PLTU Semen Tonasa Terminal consists of four berths, as follows:

1. East Berth, 570m long, handles cement and breakbulk.
2. East Loading Berth, 120m long, handles coal by barge.
3. West Berth, 570m long, handles cement and breakbulk.
4. West Loading Berth, 120m long, handles coal by barge.

A pilot is available.

Tanjung Kasikebo (Tanjung Kassikkebok) (4°42'S., 119°31'E.), 4 miles NNE of Tanjung Tua, is rocky. Bulu Tanette, 510m high with a sharp summit, rises 10 miles NE of Tanjung Kasikebo. Tanjung Lajari (Tanjung Ladjar) is located 17.25 miles N of Tanjung Kasikebo. Sumpangbinangae is a town standing at the mouth of a river, 1 mile NE of Tanjung Lajari.

Ujung Panreng, located 5.25 miles NNE of Tanjung Lajari, is fronted by Pulau Panikiang, an island previously discussed in paragraph 7.18.

7.21 Between Ujung Panreng and Tanjung Bulo the coast trends in a generally N direction for about 50 miles, then in a W direction for 30 miles to Tanjung Rangasa. There are some isolated peaks of importance which will be described. The

200m curve lies from 0.25 mile to 5 miles offshore along this coast.

Between Ujung Panreng and Tanjung Pakangsiponge, 7 miles NNW, the coast is hilly and indented by numerous small bays.

From **Tanjung Pakangsiponge** (4°14'S., 119°36'E.) to Tanjung Tonrangang, 11 miles N, the coast is hilly and indented by small bays, with no dangers charted outside the 200m curve.

Bulu Kerikeri, a conspicuous peak 769m high, rises 6 miles E of Tanjung Pakangsiponge. Batu Tolong (Keghoek), 285m high, rises 1.75 miles SSE of Tanjung Tonrangang. It is steep on its E and SE side, but slopes gradually on its NW side. Batu Kiki (Batoe Kiki), 1.25 miles E of Tanjung Tonrangang, is fairly conspicuous and can be recognized by the small crown-topped trees on its summit.

7.22 Tanjung Tonrangang (4°03'S., 119°37'E.), the E entrance of Teluk Parepare (Parepare Baai), is low with shoal water extending about 0.4 mile offshore. A shoal patch with a depth of 15.8m, lies 0.6 mile WSW of Tanjung Tonrangang.

Tanjung Lero, the W entrance point to Teluk Parepare, lying 1.25 miles WNW of Tanjung Tonrangang, is a low reef-fringed point covered mostly with trees, forming the S end of a peninsula. A light is shown from an 8m white metal tower painted with red and white bands situated on the S edge off the reef, about 0.3 mile S of Tanjung Lero.

Teluk Parepare is divided into two parts by a narrow passage. The inner bay is known as Teluk Supa (Soepa Baai). Depths in the outer part of the bay vary from 16 to 54m. Depths in the E part of the inner bay vary between 5.7 and 12.5m. The W part in the inner bay is shallow and encumbered with islets. Tidal currents may attain 2 knots in the narrow passage between the inner and outer bays.

The bay is used as a port-of-call for cruise liners and for export of livestock. A terminal is planned for construction.

7.23 Parepare (4°01'S., 119°37'E.) (World Port Index No. 52297) is a port of call situated within the entrance of Teluk Parepare. The village, situated on the E side of the narrows, is an administrative center. Parepare is used as a port of call for cruise liners and for the export of livestock.

An agreement was reached in December 2004 to build an oil refinery and terminal at Parepare. Construction is expected to begin in 2005.

Port of Parepare
http://www.portina4.go.id/pare2.htm

Depths—Limitations.—The Parepare Dry Terminal consists of four berths, as follows:

1. The Nusantara Berth is 280m long with a depth alongside of 12.0m. It handles general cargo, ferries, ro-ro, bulk, and container cargo.
2. The Cappa Ujang Berth is 134m long with a depth alongside of 6.0m. It handles general cargo.
3. The Longtagne Berth is 35m long with a depth alongside of 5.0m.
4. The Suppa Berth is 30m long with a depth alongside of 8.0m.

The Parpare Oil Terminal Pertamina Berth is 55m long with a depth alongside of 8.1m and can accommodate vessels up to 6,000 dwt with a maximum loa of 120m.

Pilotage.—Pilotage is compulsory for vessels over 150 gt and should be requested via the Harbor Master. Pilots board at Batu Laubang Lighted Buoy. A port radio station exists at Parepare.

Aspect.—A light is shown from shore about 0.25 mile S of Parepare.

Anchorage.—A good sheltered anchorage exists about 0.75 mile SW of Parepare, in a depth of 20m.

Directions.—From the S, steer for Tanjung Lero in line with the hill on the W side of the narrows, bearing 019°. Then pass 0.3 mile E of the light, S of the cape. The reef is marked by discoloration. Steer 015° until the E entrance point, Teluk Supa, bears 029°, then steer for it. This is the safe course to the anchorage.

From the N, a vessel will remain in deep water by keeping **Pulau Baki** (4°09'S., 119°36'E.) in line with Bulu Alipang (Boeloe Alipang), bearing 160°. The W side of the coastal reef extending from Tanjung Lero is not marked by discoloration. When Batu Kiki bears 090°, steer for it until Tanjung Lero is in line 019° with the hill on the W side of the narrows, then steer NNE to pass not less than 0.3 mile E of Tanjung Lero.

7.24 The coast N of Tanjung Lero is low and covered with vegetation. Batu Manarang, 133m high, is a conical hill that lies 11 miles NNE of Tanjung Lero.

Tanjung Salipolo (3°43'S., 119°26'E.), the S entrance point of the delta of Sungai Sadang, lies 21 miles NNW of Tanjung Lero and is covered with tall trees. Batu Paletiang, a conical hill 156m high, rises 12 miles ESE of Tanjung Salipolo.

Tanjung Babana, 2 miles N of Tanjung Salipolo, is the N entrance point to the delta of Sungai Sadang. The delta of this large river is covered with trees and swamp land. Its main entrance, which is obstructed by a low island, lies close to Tanjung Salipolo.

Anchorage may be obtained, by vessels with local knowledge, off the N and S entrance of Sungai Sadang.

7.25 Teluk Mandar (Golf Van Mandar) (3°37'S., 119°16'E.) is entered between Tanjung Paria and Tanjung Rangasa (Cape Mandar), 31 miles WNW. Teluk Mandar is backed by several conspicuous mountains. Bulu Tirasa, 960m high, rises 11.25 miles ENE of Tanjung Paria. It is sometimes visible 24 miles and the higher mountain land begins to approach the coast from this peak.

Tanjung Kajoeangin (Tanjung Kajuangingge) (3°36'S., 119°29'E.), 5 miles N of Tanjung Paria, may be identified by a group of high trees and a single outstanding tree.

Pajalele (Padjalele), a large village, stands on the coast 6 miles N of Tanjung Kajoeangin. Bulu Letta (Boentoe Letta), 1,600m high, rises 7 miles ENE of Pajalele. Bulu Puang (Boentoe Poeang), 1,091m high and Bulu Pusu (Boentoe Poesoe), 1,230m high, lie 3.25 and 6 miles NNW, respectively, of Pajalele. Bulu Pusu is saddle shaped and is more prominent from S than W; its NW peak is highest.

Pasi Tangan (3°37'S., 119°26'E.), with a depth of 0.3m, lies 2.75 miles W of Tanjung Kajoeangin and is seldom marked by discoloration. A 0.9m patch lies 1.25 miles SSW of Pasi Tan-

gan, and a drying patch lies 1 mile further to the SW.

Several reefs, including Mencerai (Mentjerai) with a depth of 2.1m, 3 miles SW of Pajalele, lie within a line joining Tanjung Kajuangin and Pulau Batuwae (Pulau Batoae), 10 miles NNW. Unless thoroughly familiar, this part of the bay should be avoided.

7.26 Polewali Road (3°28'S., 119°20'E.) is entered between Pulau Batuwae and Tanjung Lakolako, 5 miles WNW. Polewali Light stands at a height of 14m in position 3°26.4'S, 119°20.4'E. Pulau Battowae, a prominent wooded island 96m high, lies close offshore 7 miles WNW of Pajalele. Pulau Battowae has a drying reef which extends 0.75 mile from its S side and 2.25 miles from the W side. A beacon stands on the W end of this reef, and another beacon stands on the E end of a detached, extensive drying reef 0.75 mile W. Other detached reefs, which may be seen on the chart, lie within this line of reefs.

Polewali Road is bounded by the arc of a circle, with a radius of 1.1 mile from the flagstaff at Polewali, a village 2.25 miles NNW of Pulau Batuwae.

To enter the passage that leads to Polewali Road, steer for Pulau Batuwae in line with Bulu Puang, bearing 073°, until Bulu Saluwatan (Bulu Saloewatan), 7 miles N of Pulau Batuwae, bears 021°; the latter bearing leads between the reefs at the entrance to the bay. Inside the bay, course may be set as prudent, for the anchorage off the village of Polewali or for anchorage in the W part of the bay, in about 18.3m of water, mud, and sand.

Tanjung Buku (Tanjung Boekoe) (3°30'S., 119°12'E.), 9.25 miles W of Pulau Batuwae, is one of the three points which are conspicuous and lie between Pulau Batuwae and Tanjung Rangasa. Buku (Boekoe), a village, stands 0.25 mile NE of Tanjung Buku. Bulu Tenggelang, a summit 660m high, rises 13 miles N of Tanjung Buku.

Tanjung Labuang (Tanjung Laboehan) is a steep, rocky point 5.25 miles WSW of Tanjung Baku. Lapu (Lapoe) stands on the W side of the entrance to a river, about 1.75 miles NE of Tanjung Labuang.

Temporary anchorage may be taken in a small bay E of the river's mouth, or about 0.3 mile offshore in a depth of 16m, SE of Lapu.

Tanjung Karama lies 4.25 miles W of Tanjung Labuang and Tanjung Bauru (Tanjung Baoeroeng), a low point covered with high trees, lies 4 miles SW of Tanjung Karama.

Sungai Mandar enters the sea 1 mile W of Tanjung Karama. The town of Para stands on the W side of the entrance to Sungai Mandar. A bank extends 1 mile S from the shore on the E side of the river entrance. Close S of the bank is a below-water coral pinnacle and a drying rock. Small vessels anchor, in a depth of 7m, mud and sand, close S of the pinnacle rock, 1.1 miles SSE of the entrance to Sungai Mandar. The holding ground is bad and in a Southeast Monsoon, the anchorage is often untenable.

Majene Road (Madjene Road) is entered between Tanjung Bauru and Tanjung Rangasa, 3.75 miles W. The roadstead lies at the head of the bay.

The village of Majene (Madjene) is situated at the head of the bay, on the E bank of a river which enters the sea here. A light is shown from a 6m high white metal tower on the pier head at Majene.

The roadstead is sheltered from W winds and there is anchorage, in 27 to 31m, sand, in a break off the village; however, there is only room for one small vessel. Ships may anchor SE of this position, on the edge of the reef, in depths of over 37m. A reef extends about 0.35 mile offshore from a point on the W side of the river.

7.27 Tanjung Rangasa (Cape Mandar) (3°35'S., 118°56'E.), low and covered with coconut palms, rises gradually to a mountain range which can be seen for a considerable distance. Rangas is a small village situated on the SW side of the point. Taka Sitodong extends 0.35 mile S of this point. A light is shown from a 21m white metal framework tower; a racon and radiobeacon transmit from the light, which is situated on the W side of the point. The 200m curve lies 0.6 mile offshore.

The coast between Tanjung Rangasa and Tanjung Lereh, 95 miles N, has high land approaching it fairly closely, but the points are low. There are few prominent features among the mountainous hinterland along this stretch of coast. The charted 200m curve lies close to this coast with no dangers outside it.

Pambauang Road (Pambaoeang Road) lies in a small bay 5 miles N of Tanjung Rangasa. It affords sheltered anchorage within the high rocky points in the Southeast Monsoon. The best anchorage is in the S part of the bay, in depths of 21 to 31m, soft mud. A conspicuous house is situated N of the village.

Anchorage is available off the villages of Binanga and Cinrana (Tjenrana), situated in bights about 9 and 11 miles, respectively, N of Pambauang Road. The anchorage off Binanga is in about 37m. The reef N of this bight dries out about 0.3 mile, and coming from N, the anchorage must not be steered for until Binanga bears 090°. The anchorage off Cinrana, in 29 to 33m, mud, is in the S part of the bay E of Pulau Taimanu (Pulau Taimanoek), and affords some protection in the Northwest Monsoon.

Pulau Taimanu (3°19'S., 118°51'E.), about 30m high and wooded, is conspicuous. The N part of the island should not bear more than 272° from the anchorage. In the center of the bay, N of the island, are two reefs with a least depth of 9m.

7.28 Tanjung Ongkona (3°05'S., 118°47'E.), 15 miles NNW of Cinrana, is the low extremity of a high and well defined peninsula covered with trees which stand in the water at high tide. In the small bay E of Tanjung Ongkona there is anchorage, in 29 to 35m, sand, about 0.2 mile offshore.

Teluk Lebani is entered between Tanjung Ongkona and Tanjung Kai (Tanjung Dongkait), 13 miles N. In this bay the 200m curve runs close to the shore and affords little opportunity for anchoring.

Tanjung Kai is low and covered with mangroves. A reef, which dries, extends approximately 1.25 miles SSW of the point and is usually marked by discoloration. This reef was reported earlier to be extending.

The coast from Tanjung Kai to Tanjung Rangas (Kaap William), 15 miles NNE, is high, steep, and fronted by a narrow reef. Tanjung Rangas is low, but rises to high land within.

A light is shown from a white metal framework tower, 21m high, which stands 0.9 mile SW of the point.

Teluk Mamuju (2°36'S., 118°54'E.) is entered immediately E

of Tanjung Rangas and is divided into two parts by Pulau Mamuju (Mamoedjoe), a high and thickly wooded island not easily seen from N or NW. The passage between the S extremity of Pulau Mamuju and the shore is not recommended for large vessels. A large drying reef, with a small tree 0.2 mile from its S end, lies between Pulau Mamuju and the shore to the S. Several villages line the S shore of the bay. Mamuju, the seat of the administrative authority, is the largest village.

Anchorage may be taken NW of Mamuju.

Teluk Mamuju was reported to be closed to foreign shipping.

7.29 Tanjung Mamuan (Tanjung Mamoean) (2°35'S., 119°00'E.), a reef-fringed point, lies 11.25 miles ENE of Tanjung Rangas. A detached reef, which dries, lies 1.25 miles NW of Tanjung Mamuan.

Tanjung Kaluku (Tanjung Kaloekoe) lies 5 miles NNE of Tanjung Mamuan, and Pulau Bekangkeng (Topisee) (Liutang) lies 5.25 miles ENE of Tanjung Kaluku. Pulau Bekangkeng, 75m high, is a thickly-wooded prominent island.

Sampaga (2°18'S., 119°08'E.), a village with a prominent mosque, stands 10 miles N of Pulau Bekangkeng. Sungai Karama enters the sea close N of the village. Anchorage may be taken, by vessels with local knowledge, off the entrance to Sungai Karama.

The village of Buding Buding (Boeding Boeding) is situated on a river of the same name, 14 miles N of Sungai Karama. Anchorage may be temporarily taken, by vessels with local knowledge, off a projecting part of the coastal reef, 0.25 mile off the entrance to the river, in a depth of 26m. The depths off the entrance are too deep for anchoring.

Tanjung Lereh (Tanjung Lalereh) (2°00'S., 119°12'E.), 4.75 miles N of Buding Buding, is low and covered with trees standing in water.

Between Tanjung Lereh and Tanjung Pasangkayu, 50 miles N, the appearance of the coast is similar to that S, but there are more prominent summits near the coast and some of the points are more noticeable.

From Tanjung Pasangkayu to Tanjung Karang, 40 miles farther NE, the high land approaches close to the coast, but the points are low with trees standing in the water. A strip of hilly land, which gradually becomes more narrow toward its N end, lies between the high mountains and the coast. There are only a few villages between Tanjung Pasangkayu and Tanjung Karang.

7.30 Pulau Tobintah (1°56'S., 119°20'E.), a conspicuous island 148m high and thickly wooded, is located close offshore 7.25 miles ENE of Tanjung Lereh. There is anchorage for vessels with local knowledge, in 26m, mud, 0.35 mile W of Pulau Tobintah. There are numerous detached coral reefs, all steep-to and seldom marked by discoloration, lying within the charted 200m curve between Pulau Tobintah and Tanjung Cinoka, 15 miles N.

Tanjung Cinoka (Tanjung Tjenoki) (1°41'S., 119°17'E.) rises steeply to a round hill covered with trees.

The coastal reef extends 1 mile W from the point.

7.31 Tanjung Memanjing (Tanjung Memandjing) (1°39'S., 119°17'E.) lies 2 miles N of Tanjung Cinoka. The coastal reef extends 1.25 miles N from Tanjung Memanjing. A similar reef extends 0.25 mile N from a point 0.75 mile NE of Tanjung Memanjing. Anchorage, protected by the above reefs, is available off the village of Doda, situated 1.25 miles NE of Tanjung Memanjing.

Sungai Lariang enters the sea about 14 miles N of Tanjung Memanjing and can be identified by the conspicuous hill, 6.25 miles NE of its mouth. The coast is low, sandy, and wooded in this vicinity. The coastal bank, S of the river entrance, is steep-to and vessels should keep outside the charted 20m curve. A reef, which nearly dries, lies on this bank 2 miles SW of the entrance to the river.

Anchorage may be taken, by vessels with local knowledge, 0.6 mile W of the river's entrance.

Tanjung Pasangkayu (Tanjung Passangkajoe) (1°10'S., 119°20'E.), marked by a light, is a low point located 15 miles N of Sungai Lariang. The coastal reef dries for a distance of 0.4 mile NW of the point.

Teluk Pasangkayu (Pasangkajoe Baai) is entered between Tanjung Pasangkayu and Tanjung Baku (Tanjung Bakoe), 3.25 miles NE. The reef-filled bay provides anchorage, protected from E winds, close off its S shore, in 18m.

Tanjung Baku (Tanjung Bakau) (1°8'S., 119°23'E.) consists of a passenger terminal and a palm oil terminal. The passenger terminal has a berth 80m long. PT Tanjung Sarana Lestari, the palm oil terminal, has three berths for handling palm oil. as follows:

1. Berth 1 is 99m long and can accommodate vessels up to 19,950 dwt/13,222 gt, with a maximum loa of 160.5m and a maximum beam of 23.0m.
2. Berth 2 is 90m long.
3. Berth 3 is 60m long.

7.32 Tanjung Karang (0°38'S., 119°44'E.) is a high rectangular, broad spit of land located 36 miles NE of Tanjung Baku. A 103m hill is located at the NW extremity of this spit of land and is easily recognized from sea.

A light is shown from a 21m high white metal framework tower standing on the slopes of the hill, 0.25 mile W of the point.

The only landmarks on this stretch of coast are Loli, 2,046m high, and a 1,089m peak, located 15 miles SSE and 7 miles SSW; respectively, from Tanjung Karang.

Tanjung Balesa (Tanjung Towali), located 6 miles SW of Tanjung Karang, can only be identified when close to the coast. There is a noticeable tower on the seaward side of the point.

Towali lies 1.25 miles NW of Tanjung Balesa and consists of two sand cays, barely marked by discoloration when covered.

There are several charted shoal patches between Towali and Tanjung Karang, 6.25 miles NE. Vessels should not pass between these dangers and the coast.

Teluk Palu (Paloe Baii) (0°45'S., 119°49'E.) is entered between Tanjung Karang and Tanjung Towayo (Towajo), 4 miles NE. The depths in the bay are great and there is anchorage only in the slightly indented bays on either side, and off the village of Palu, situated at the head of the bay, 16 miles SSE of Tanjung Karang. The W side of the bay runs steeply up from the sea. The hills, which are near the coast, increase in height from the summit on Tanjung Karang to Loli. On the E side there is a hilly belt of land about 3 miles wide, which merges into the mountain ranges beyond that rise to a height of 1,829 to

2,134m. At the head of the bay, rice fields on a plain that rises slowly, stretch far into the interior.

7.33 Donggala (0°40'S., 119°45'E.) **(World Port Index No.** 52350**)** stands on the W bank of Teluk Palu, 1.25 miles SSE of Tanjung Karang. The village is the site of an administrative headquarters. The customs house is the largest building in the village. A large warehouse stands 0.15 mile SE of a wharf that is about 20m long.

Donggala

Depths—Limitations.—Vessels up to 2,500 dwt, with a maximum draft of 6.0m, can be accommodated. The Port of Donggala has two berths. Berth 01 is 50m long and handles cement and breakbulk. Berth 02 is 38m long and handles breakbulk.

Pilotage.—Pilotage is not compulsory. Vessels should send their ETA to their agent 10 days, 3 days, 48 hours, and 24 hours prior to arrival.

Anchorage.—Anchorage is available, in 32m, about 0.2 mile offshore, with a hill SW of the village bearing about 240°. A less desirable anchorage is in 44m, with the center of the village bearing between 204° and 261°, the bank here is quite steep. Small craft can anchor in 20m off the middle of the river. It should be noted there is foul ground charted near the anchorages.

7.34 Teluk Kabungakodi is a reef-filled basin that lies 2 miles S of Donggala. There are two deep basins which are accessible to small vessels with local knowledge.

Palu (Paloe) is a large village on the W bank of a river at the head of Teluk Palu. Shoal water extends about 0.7 mile offshore W of the village. The usual anchorage is in the E side of the bight near the landing stage situated on the coast, about 1 mile NE of Palu.

Loliogeh (0°48'S., 119°49'E.), 5 miles N of Palu, is a tanker terminal. It contains a 50m long wharf which has depths of 7 to 8m alongside. Vessels up to 10,000 dwt can be accommodated.

Loliodi Oil Terminal (0°47'S., 119°48'E.), a small tanker terminal, capable of accommodating vessels up to 6,000 dwt with a maximum loa of 120m and a maximum draft of 6.5m,lies 1.5 miles N of Loliogeh. The Loliodi Berth 54m long including dolphins, has a depth alongside of 7.4m and handles clean products.

Between Palu and the village of Wani, on the E side of the bay, 11.25 miles N, there are two anchorages for small vessels. One anchorage is off the village of Mamboro, 5.25 miles N of Palu, in a depth of 27m, mud and sand, and the other is off Panteluan, about 5.25 miles N of Mamboro. The anchorage here is in 35m, sand and stones.

At **Wani** (0°41'S., 119°50'E.), there is anchorage, in 49m, sand, coral, and stones, with the beacon situated SE of the village bearing 085° and a beacon W of the village bearing 334°.

7.35 Pantoloan (0°42'S., 119°51'E.) (World Port Index No. 52330) lies at the head of a small bay on the E shore of Teluk Palu. The port consists of a roadstead anchorage with cargo being loaded and discharged alongside using lighters or barges. The Pantoloan Container Terminal and Pelindo IV Terminal share a continuous berthing length of 438m. Pier 1, 250m long with a depth alongside of 8.4m, is used for fast ferries, ro-ro passengers/vehicles, rail, containers, project/heavy cargo, steel products, and breakbulk. Pier 2, 188m long with a depth alongside of 8.6m. Pier 2 handles clean products (CPP), ro-ro/passengers, containers, breakbulk, and bunkers.

The maximum draft allowed in the port is 9.5m. essels up to 20,000 dwt, with a maximum length of 160m and a maximum draft of 10m, can be accommodated at the anchorage.

Pilotage is available.

Port of Pantoloan
http://www.portina4.go.id/pantol.htm

Pantoloan

Between Tanjung Towajo and Tanjung Manimbaya, 38 miles NNE, the coast is steep and sparsely wooded. The high mountains in the interior are visible from a great distance in clear weather, but have no prominent summits.

Tanjung Labea (0°09'S., 119°48'E.), 27 miles N of Tanjung Towaja, is a prominent point that rises to a height of 351m a

short distance inland.

Labuhan Labea (Labea Anchorage), entered NW of Tanjung Labea, affords good anchorage, in 55 to 73m, sand.

Batu Mekaja (Mekadja), a coral reef which dries and is usually marked by discoloration, lies about 0.25 mile offshore, 3 miles W of Tanjung Labea. A 10.5m patch lies outside the 200m curve, 3.25 miles SW of Tanjung Labea.

7.36 Tanjung Manimbaya (Tandjoeng Manimbaja) (0°00'N., 119°36'E.), 15 miles NW of Tanjung Labea, is the NW extremity of a high rocky peninsula. A light is shown from a height of 50m, close E of the point.

The SW coast of the peninsula terminating in Tanjung Manimbaya should not be approached nearer than 1 mile.

Teluk Beleisang (Balesang Baii) is entered between Tanjung Manimbaya and Tanjung Bau (Tanjung Baoe), 3.75 miles ENE. Anchorage, in a depth of 49 to 55m, sand, may be taken off the village of Popodi that lies at the head of the bay.

Pasie Perombian, 2.75 miles WNW of Tanjung Manimbaya, is a steep-to coral reef which dries. When covered it is usually marked by discoloration.

7.37 Pulau Pasoso (Zuidwachter) (0°06'N., 119°37'E.), 5.25 miles N of Tanjung Manimbaya, is a densely-wooded island, 108m high, visible about 24 miles.

The fringing reef extends 0.75 mile from the S side of the island. Anchorage may be taken with local knowledge in a basin on the S side of the island, in depths of 46 to 55m.

Teluk Tambu (Bocht Van Tamboe), a deep bay encumbered by eight small islets, is entered between Tanjung Bau and Tanjung Dampelas, a low sandy point, 13 miles NNE. Bukit Balesang, 675m high, and Bukit Pomalulu (Pomaloeloe) 558m high, 4 miles and 8.75 miles, respectively, SE of Tanjung Bau.

Pulau Laut (Pulau Laoet), 89m high, the N islet of the group located in Teluk Tambu, lies 7.25 miles SE of Tanjung Bau. The islet lies on a detached reef which mostly dries. The other islets of the group are separated from Pulau Laut by a channel 0.25 mile wide and are on a steep-to drying reef.

Anchorage.—Anchorage may be taken, in a depth of 55m, off the village of Pomalulu (Pomaloeloe), 4 miles SW of Pulau Laut, and, in a depth of 35 to 46m, in a small bay off the village of Sibayu (Sibajoe), 8.25 miles NE of the same islet.

Caution.—Several isolated coral reefs are charted along the E shore of the bay, from the village of Seweili to Sibayu, 6.75 miles NNW.

7.38 Tanjung Dampelas (0°13'N., 119°46'E.), 8.25 miles NW of Sibayu, rises from its sandy shores to a hill 1.25 miles E.

The coast from Tanjung Dampelas trends in a general NNE direction for 56 miles to Tanjung Dondo, then NE 37 miles to Ujung Malangka, the NW extremity of Sulawesi. The coast is mountainous with dense vegetation. There are many islets and drying reefs in the deep inlets. There are numerous conspicuous mountain peaks along this stretch of coast, and N of latitude 0°25'N are some of the highest peaks in Sulawesi.

From Tanjung Dampelas to Tanjung Bagimpuang, 8.25 miles NE, the coast recedes 6 miles E and forms a deep bay. The village of Sirua (Siroea) is situated on the S shore of the bay, 6 miles E of Tanjung Dampelas.

Anchorage may be taken, by vessels with local knowledge, in depths of 29 to 46m, 0.2 mile, N of Sirua.

Tanjung Bagimpuang (Tanjung Bagimpoeang) (0°20'N., 119°51'E.) is formed by coral rocks, 61m high.

Tanjung Siraru (Tanjung Siraroe) lies 6 miles N of Tanjung Bagimpuang, and close N of this point, a ridge of dead coral runs parallel with the coast forming a natural breakwater. A large part of the land behind covers at high water. Tanjung Sosopan lies 3 miles N of Tanjung Siraru.

Pulau Pangalasian lies close off Tanjung Sosopan, and although it is 162m high and wooded, it is difficult to distinguish from the mainland. Pulau Maputi, 171m high, lies 2 miles NW of Pulau Pangalasian, and like that island, it is steep-to and covered with tall trees. Pulau Maputi may be seen at a distance of 25 miles.

7.39 Pulau Tuguan (Nordwachter) (0°35'N., 119°48'E.), an islet 111m high, lies 4.25 miles NW of Pulau Maputi. A light, from which a racon transmits, shown from a white metal framework tower, 30m high, is located on the summit of the islet. Anchorage may be obtained, by vessels with local knowledge, on a ridge with depths of 14 to 18m which extends 1 mile S from the islet.

Between Tanjung Sosopan and Tanjung Bou, 13 miles NE, the coast forms a bight that is low, swampy, and covered with mangroves along the S shore, while the E shore has a sandy beach. Tanjung Bou is low with some brushwood. The high mountains E and SE of Tanjung Bou have been described.

Pasie Bangilongan is a drying coral reef that lies 4 miles NNE of Tanjung Sosopan. The reef does not show discoloration when submerged. Several reefs which dry lie in the bight, 2 to 3 miles ENE of Tanjung Sosopan.

Tanjung Bogoang (0°43'N., 120°03'E.), 3.25 miles NNE of Tanjung Bou, is a steep, rocky point which can be seen from the vicinity of Pulau Maputi.

Pasie Bau, 1 mile NW of Tanjung Bou, dries and is marked by discoloration when covered.

Pulau Taring is a steep, wooded islet lying close offshore, 1.75 miles NE of Tanjung Bogoang. The islet can be passed safely at a distance of 0.25 mile on its W side, but the passage on the E side, through which a strong current sets, has a depth of 4.9m.

Teluk Dampal is a large bight that lies between Pulau Taring and Pulau Lingayang (Pulau Lingajang), 18 miles NE. The bight is full of dangerous reefs, and vessels should not pass E of the curve joining these two islets.

The outer reefs along the 200m curve in Teluk Dampal are Pasie Dongalan, a reef of white sand always above water, Pasie Seranga, a 1.5m patch and, Pasie Siokan, awash at LW, which lie 6.25, 10.25, and 13 miles NE, respectively, from Pulau Taring.

Pulau Lingayang is a low coral island lying on a broad drying reef which shows discoloration. The island is visible 14 miles, but should not be approached nearer than 3 miles because of a strong current that frequently runs past it.

7.40 Tanjung Dondo (1°00'N., 120°17'E.) is 18m high and from the E, appears as a low sandy point with hills rising a short distance within. A prominent peak, 465m high, rises 3.25 miles S of Tanjung Dondo. Tanjung Bobanci (Tanjung Boban-

tiji), 4.25 miles E of Tanjung Dondo, is marked by a noticeable hillock. A small reef, with a depth of 3.9m, lies 1 mile W of Tanjung Bobanci and is usually marked by tide rips. A 1.2m patch lies 2.25 miles NW of Tanjung Bobanci.

Pulau Simatang, 2 miles NE of Tanjung Bobanci, is a large thickly wooded and hilly island that rises to a height of 303m in its S part.

The island can be seen from a considerable distance and affords a good landmark. The drying reef that fringes the island is steep-to. On its W side are four detached reefs. Pulau Tampalekang, 0.35 mile S of Pulau Simatang, is a low island lying close within the E edge of a drying reef which extends SW and W for about 0.6 mile.

Pulau Taidun, 0.4 mile ESE of Tanjung Bobanci, is covered with vegetation and lies on the SE part of a drying reef.

Directions.—There is a clear channel both N and S of Pulau Tampalekang.

From W, when making for the channel N of Pulau Tampalekang, after passing N of the reef with a depth of 1.2m, lying 2.25 miles NE of Tanjung Dondo which is marked by discoloration, steer for the S extremity of Pulau Simatang, bearing 089°. When the SE extremity of Pulau Tampalekang bears 180°, a slightly more S course may be steered through the channel.

From W, when making for the channel S of Pulau Tampalekang, it is advisable to pass well N of the 1.2m reef, described above. Then steer a more S course for Tanjung Bobanci, with Pulau Taidun well open NE. A mid-channel course should then be steered between the point and Pulau Tampalekang.

Tide rips, up to a distance of 0.3 mile NE of Tanjung Bobanci, often give the impression that the coastal reef extends farther than is actually the case.

7.41 Teluk Dondo (0°54'N., 120°30'E.) is entered between Tanjung Bobanci and Tanjung Pangaluang, 17.25 miles ESE. The 200m line lies close off the W coast, but from the S and E coasts, the line extends offshore from 1 to 5 miles.

Teluk Santigi, immediately S of Tanjung Bobanci, affords anchorage in all conditions, in depths of 29 to 37m, 0.25 mile off the head of the bay. The approach lies S of Pulau Taidun, but the bay should only be entered at LW when the coastal reef is plainly visible.

Batu Banga, about 4 miles S of Tanjung Bobanci, is conspicuous from the N.

Teluk Bananga lies in the SW corner of Teluk Dondo, and is bound on the E by a hilly tongue of land terminating in Tanjung Senyangang (Tanjung Senjangang).

The W and S shores of this bay are low and sandy, and the E shore is rocky. Anchorage can be taken about 0.25 mile off the W shore of the bay, in 69m, with a point S of Batu Banga bearing 012° and Tanjung Senyangang bearing 080°.

Tanjung Ogogili (0°48'N., 120°30'E.), on the S shore of the Teluk Dondo, lies 9 miles SE of Tanjung Senyangang. Pasie Beluwah, which dries and is marked by discoloration when covered, lies 2 miles N of Tanjung Ogogili.

Teluk Pagalungian, in the SE corner of Teluk Dondo, is entered 4.25 miles ESE of Tanjung Ogogili.

The W entrance point can be passed close-to, but the coastal reef that surrounds the entire bay extends from the E entrance point to within 0.2 mile of the W entrance. There are depths of 20m in this entrance. By steering near the W entrance point on a SW course, there is anchorage in a basin about 0.25 mile in diameter, in 33 to 51m, mud.

The E coast of Teluk Dondo, from Teluk Pagalungian N to Tanjung Pangaluang, 11 miles NNE, provides no suitable anchorages.

7.42 Tanjung Pangaluang (0°57'N., 120°39'E.), 11 miles N of Teluk Pagalungian, is a steep spur of a mountain ridge. The high mountains NE of the point are often obscured by clouds, but the sharp conical cone 891m high, 19 miles ENE, is sometimes visible from a great distance. Batu Dako, 2,304m high, the highest peak, rises 4 miles NNW of the 891m cone, and N of Dako the range decreases in height. The coast has deep inlets enclosed by partly drying coastal reefs. The coastal reef extends up to 1 mile offshore along this coast.

Pulau Tingi Langa (Pulau Tengelanga) (1°01'N., 120°44'E.), is a thickly-wooded island with a conspicuous 216m high peak in its NE part. It is located on the coastal reef 6 miles NE of Tanjung Pangaluang.

Teluk Pulias is formed between the S and SE coasts of Pulau Tinga Linga and the coast of Sulawesi. The bay is entered between the coastal reef off the E end of the island and the coastal reef off the mainland, about 0.2 mile farther E. A coral patch which uncovers, lies in mid-channel 0.5 mile NNE of the E extremity of the island. Other dangers are charted from NNW to NE from Pulau Tingi Langa.

A mid-channel course in a SSW direction will lead to an anchorage, with a depth of 33m, mud, 0.6 mile within the entrance.

Pulau Kabetan, a wooded island, lies 2 miles NW of Pulau Tengelanga, and is separated from it by a deep channel clear of dangers. The island rises to a height of 174m in the S part, but a flat part near the middle gives it an appearance of two islands when seen from the channel S of Pulau Simatang. There are islets and shoal water that extends 4 miles NE from Pulau Kabetan. The passage among these dangers is unsafe.

The coast between Teluk Pulias and Tanjung Tolitoli, a low point covered with mangroves, 3.75 miles NE, is fringed by a wide reef with some detached reefs outside it.

7.43 Teluk Tolitoli (Bali Van Toli Toli) (1°03'N., 120°48'E.) is entered between Tanjung Tolitoli and Tanjung Labuan Dedeh, a steep rocky point 1.25 miles NE. Labuan Dedeh Light is shown from the point. The bay is free of dangers but the depths decrease rapidly within the charted 20m curve. The shore is mostly fronted by a sandy beach which dries up to 0.2 mile offshore. Nalu (Naloe), the administrative headquarters, is situated on the S shore and Baru (Tolitoli), is situated on the E shore where a pier suitable for light craft.

A light is shown and a racon transmits from the pier head at the N end of the bay. The wooden pier is 38m long, with a depth of 5.5m alongside. The Ferry Terminal is 60m long handles passenger/fast ferries and ro-ro.

Anchorage may be taken, in 30 to 32m, mud, good holding ground, W of Baru.

Pulau Latungan, 159m high and marked by a light, lies in the entrance to Teluk Tolitoli. The passages both N and S of Pulau Latungan are safe for entering the bay, but when visibility is

Courtesy of http://www.infokom-sulteng.go.id
A mosque at Tolitoli

poor, the N passage should be used. A 7.6m patch lies 0.4 mile SE of Pulau Latungan.

From Tanjung Labuan Dedeh, the coast 16 miles N to Ujung Malangka is high with rocky points and shallow bays between with sandy beaches. Pulau Tende, joined to the mainland by a partly drying reef, lies 7 miles N of Tanjung Labuan Dedeh. The islet is 53m high and shows well against its dark background.

There are no dangers inshore along this stretch of coast, but a ridge of reefs, most of which dry, runs offshore at about 5 miles distance with depths of 25 to 92m between them and the shore.

Tanjung Kekoh (1°07'N., 120°47'E.), 3.5 miles N of Tanjung Labuan Dedeh, is a rocky point rising to a hill 171m high. A light is shown from a fuel depot situated 1 mile NNE of Tanjung Kekoh.

7.44 **Pasie Bulu Mata** (1°09'N., 120°37'E.), 4.25 miles N of the N extremity of Pulau Kabetan, is a drying reef on which there is a rock awash. This reef is the SW danger in the line of reefs discussed above. They run in a NE direction terminating in Kepulauan Silando on the N extremity of Pasie Silando. A light is shown and a racon transmits from a white metal framework tower, 25m high, situated on an islet at the NE extremity of Pasie Silando.

Reference to the chart will show the location of the dangers in this area.

Selat Kapas (1°19'N., 120°48'E.), lying between Pasie Silando and the coast, is safe and navigable with a least width of 0.25 mile. There is a shoal patch, with a least depth of 5m, charted 2 miles S of the light.

Vessels entering the strait from the S, steer course 006° and pass W of Pulau Kapas, which lies 1 mile E of the S extremity of Pasie Silando keeping on the reef side. The two islets of Kepulauan Silando must be in line before rounding Ujung Malangka (Tanjung Arus). A current of 1 to 2 knots sometimes runs through the strait, and frequently there is a short turbulent sea outside the N entrance. Anchorage, in 27 to 31m, sand, can be taken in the bight NE of the reef-fringed Pulau Kapas.

Sulawesi—North Coast

7.45 This part of the sector describes the N coast of the island from W to E. The bays, islands, and dangers are described within the text in the appropriate section of the coast.

The N coast of Sulawesi, between Tanjung Malangka (Tanjung Arus) and Tanjung Utara, about 255 miles E, is generally high and most of the capes are formed by the spurs from high mountains which rise a short distance inland along the hilly coast. There is often narrow and bright sand beaches between the dark points of land. The coast is steep-to and can be approached closely, although numerous reefs lie within the 200m curve off the central part of this coast. These reefs are nearly always marked by discoloration and there are sufficient prominent points for fixing a vessel's position.

Tanjung Arus (1°20'N., 120°49'E.) is a prominent, rocky bluff bordered by a coral ledge about 0.2 mile wide.

Close S of the point the land rises to Batu Sikala, 570m high.

From Tanjung Malangka the coast trends in a general E direction 40 miles to Tanjung Kandi. There are several bays formed in this sector. The coast is high, with many conspicuous summits rising a short distance inland, that afford good bearing points.

Lingadang, a large village, stands on the S side of a basin in the coastal reef. It is entered by a narrow passage, 3.25 miles E of the point.

Anchorage with shelter may be obtained at all times, in depths of 7 to 15m, inside the basin. Vessels can safely enter when the reefs are clearly visible.

7.46 Pulau Dolangan, 5 miles ENE of Tanjung Arus, is a flat, thickly wooded island 45m high, lying on a broad steep-to coastal reef that extends 1 mile from the coast. The island is visible about 16 miles and is conspicuous from E and W.

Teluk Belonligun (Baai Van Belonligoen) is entered between the N end of the peninsula extending NE from Lingadang and Tanjung Bonto, a low point 2.25 miles E.

On the W side of the entrance there is a prominent hill with a summit. The E side of the bay is low and covered with mangroves. The S shore of the bay is hilly and densely wooded. The village of Belonligun (Belonlioh) (Loalalang) is situated on a point on the E shore, 1.75 miles SW of Tanjung Bonto.

The entrance to the bay, between the drying reefs projecting from each shore, is about 0.35 mile wide. A 9m patch lies in the middle of the entrance channel. A 3.5m patch lies 0.25 miles to the N.

There is good anchorage, in 38 to 46m, sand, about 0.35 mile WNW of Belonligun. Small vessels may anchor, in 20m, mud, S of the village.

The coast between Tanjung Bonto and **Tanjung Mantok** (1°19'N., 121°05'E.), a cape rising steeply out of the sea 8.25 miles E, is high, rocky, and may be identified by yellow patches among the trees covering it.

Pulau Diuleh, 4.25 miles E of Tanjung Bonto, is a flat rock surrounded by a coral reef that nearly covers at high water. Between the islet and the coast there is a clear passage 0.25 mile wide with a depth of 26m.

Pulau Pinjan (Pulau Pindjan), a group of rocky islets, lies in the mouth of Teluk Pinjan (Pindjan), 1 mile W of Tanjung Mantok.

Anchorage may be taken in Teluk Pinjan, S of the islets near the village of Pinjan or close E of the islets, depending on the wind.

The coast between Tanjung Mantok and Tanjung Dutuno, 16 miles ESE, is generally low and flat in the W part, then 4.25 miles WSW of Tanjung Dutuno, it starts rising to that cliffy point.

Teluk Busak is entered between Tanjung Dutono and **Tanjung Kano** (1°16'N., 121°22'E.).

Pulau Busak, a rocky islet, 75m high, is steep-to. The islet, located 1.25 miles ENE of Tanjung Dutuno, is difficult to identify against the dark background.

Anchorage may be taken, by vessels with local knowledge, in depths of 23 to 27m, 0.9 mile SW of Pulau Busak. Vessels should always approach the anchorage by passing W of Pulau Busak.

Tanjung Kramat, 5.25 miles NE of Tanjung Kano, is the W extremity of a high peninsula, and **Tanjung Kandi** (1°19'N., 121°28'E.), 2 miles E of Tanjung Kramat, is the NE extremity of the same peninsula. Tanjung Kandi Light is shown from a height of 120m.

The peninsula appears as an island when seen from a distance W and the 471m summit is easily seen from the E.

The coast between Tanjung Kano and Tanjung Kramat is steep-to. A reef, with a charted depth of 1.2m, lies close within the 200m curve. Its W extremity lies 0.75 mile NE from Pulau Busak.

7.47 From Tanjung Kandi the coast extends in an ESE direction 62 miles to Tanjung Sumalata, a point that rises to a hill 306m high, and is fringed by a steep-to reef. The coast is backed by the Paleleh Mountains which parallel the shore and rise to a height of 2,300m, 30 miles SE of Tanjung Kandi.

The 200m curve lies as close as 0.75 mile offshore along this coast and as much as 5 miles in other places. There are several charted islets and reefs within the 200m curve, and there are two reefs charted outside of this line.

Teluk Bilang, a bay lying 4.75 miles S of Tanjung Kandi, is almost entirely filled by a bank which dries.

Leok, a village and an administrative headquarters, stands 7.25 miles S of Tanjung Kandi. Buol, 2 miles S of Leok, is also an administrative headquarters.

Anchorage may be taken, in 56m, 0.25 mile offshore of these villages. It is not advisable to approach in less than 28m, as the depths decrease rapidly. Both anchorages are unsafe during E winds.

Karang Pantuluta, with a depth of 10m, lies within the 200m curve, 1.25 miles SE of Tanjung Kandi.

The coast between Buol and Tanjung Kanjai (Tanjung Kandjai), 30 miles E, is generally high. Teluk Lokodidi and Teluk Luokodoka are two small inlets that lie about midway between Buol and Tanjung Kanjai. Close to the coast between these two bays there is a wooded hill, 135m high, that affords a good landmark.

There are no off-lying dangers between Buol and Teluk Luokodoka, but several reefs lie within the 200m curve which runs less than 3 miles from the coast at its furthest point.

7.48 **Pulau Bokki** (1°06'N., 121°49'E.) and Pulau Raja (Pulau Radja) are two low islets, covered with vegetation and surrounded by reefs, that lie from 7 to 9 miles ENE, respectively, of Teluk Luokodoka.

The water between Teluk Luokodoka and Pulau Bokki is encumbered with dangers.

Karang Belanda, a drying rock surrounded by a reef, lies 3 miles ESE of Pulau Raja.

From **Tanjung Kanjai** (1°06'N., 121°56'E.) to Tanjung Sumalata, 31 miles ESE, the coast line is indented by many small inlets and bays, separated by high points projecting far into the sea.

The village of Paleleh is situated on the W shore of a bay, 3 miles SSE of Tanjung Kanjai. The E entrance point of the bay, Tanjung Lobu, lies 8 miles ESE of Tanjung Kanjai. A danger area, best seen on the chart, is situated offshore in this area.

Within the 200m curve along this coast, the depths decrease rapidly and the bottom is irregular. The reefs and islets within the 200m curve are best seen on the chart.

7.49 **Karang Bulolio** (1°08'N., 122°22'E.), a steep-to reef of sand and coral which dries, lies outside the 200m curve, 7.75 miles NW of Tanjung Sumalata. Karang Buliogut, a reef similar to Karang Bulolio, is marked by a light, and lies 2 miles E of that reef. These two reefs are the only dangers outside the charted 200m curve N of Sulawesi.

Tanjung Dulang lies 48 miles E of Tanjung Sumalata. The coast is indented and there are numerous off-lying dangers. The 200m curve lies up to 10 miles offshore, but there are patches which dry, close within this line; there are no charted dangers outside this depth.

The village of Sumalata lies 4.25 miles SE of Tanjung Sumalata. Pulau Ulawa, a low islet, lies 1.25 miles N of Sumalata and Pulau Duyonumo (Pulau Dujonumo), a wooded islet, lies 0.75 mile ENE of Sumalata. Pulau Duyonumo and a drying reef close SE of its E extremity protect the road off Sumalata. A shoal patch is charted 1 mile NE of Pulau Duyonumo.

Anchorage may be taken close under the S coast of Pulau Duyonumo, in 31m, with a hawser to the shore. This anchorage provides protection in the Northwest Monsoon.

Teluk Kuandang, lying between Tanjung Dondo, located 7 miles ESE of Sumalata, and Tanjung Besar, a high point 19 miles E of Tanjung Dondo, is full of islets and reefs; the reefs are generally marked by discoloration.

Laimula Reef (1°03'N., 122°40'E.), with a depth of 5.8m, lies close inside the charted 200m curve, 5 miles NNE of Tanjung Dondo.

Pulau Motuo, an island 263m high, lies 3 miles NNE of Tanjung Dondo. Foul ground extends 1 mile from the SW to the NW sides of the island. A reef, with a depth of 4.9m, lies 3.75 miles E of Pulau Motuo and Karang Montrado, with a depth of 5.8m, lies 1.75 miles farther E.

Karang Haarlemnermeer (1°02'N., 122°50'E.), an extensive shoal with a least depth of 2.7m, lies 12 miles ENE of Tanjung Dondo, close within the 200m curve. It is the N danger off Teluk Kuandang.

Pulau Huha, a hilly islet resembling a whale, lies 1.75 miles N of Tanjung Besar. A reef, on which there are some above-water rocks, lies midway between the islet and the point. The islet is a good landmark when approaching Teluk Kuandang.

Pulau Hulawa lies on the SE side of a drying reef, 3 miles W

of Tanjung Besar. A light is displayed from a 25m high white metal framework tower on a white painted rock located on the NE side of the islet.

Pulau Otangala, 7.25 miles SE of Pulau Motuo, is the largest island in Teluk Kuandang. Pulau Payunga (Pulau Pajunga) lies on a drying reef 3.25 miles E of Pulau Otangala. Each of these islands are surrounded by drying reefs with rocks on them. The many reefs and rocks in this bay, not described in detail, may be seen on the chart.

Anggrek (0°52'S., 122°48'E.), a small dry cargo port close S of Pulau Otangala, is located in Ilangate Village. Port Anggrek consists of a North Quay and a South Quay each with a continuous berthing length of 303m and a depth alongside of 9.0m. The port handles coal,containers breakbulk, and bunkers.

7.50 Kuandang (0°51'N., 122°55'E.) is an open roadstead anchorage situated in the SE part of Teluk Kuandang. The village is situated S of the anchorage and cannot be seen from the roadstead.

The usual anchorage is on the E side of Pulau Payunga, in 11 to 22m, mud; it is safe in both monsoons.

Directions.—From W, vessels may pass either N or S of Pulau Motuo and then N of Pulau Otangala and Pulau Payunga, then to the anchorage.

From E, the passage to the anchorage is between Pulau Huha and Pulau Hulawa and then S to the anchorage.

Vessels must bear in mind the many shoals, some with less than 0.6m of water, lie in the bay.

The coast between **Tanjung Besar** (0°58'N., 122°56'E.) and Tanjung Dulang, 18 miles E, is indented; there are numerous off-lying dangers.

Teluk Himana (Teluk Imana), confined by a bank of sand, mud, and stones which partly dries and occupies the whole inner part of the bay, is located 9 miles ESE of Tanjung Besar.

Anchorage may be taken in the bay, in 9 to 13m.

Teluk Buku, about 4 miles E of Teluk Himana, is entirely open to NW winds and is unsafe during the Northwest Monsoon.

Tanjung Belongkoh is the E entrance point to Teluk Buku. Tanjung Dulang lies 5.25 miles E of Tanjung Belongkoh. Two miles SSW of Tanjung Dulang, the land rises to a height of 608m.

The coastal water from Tanjung Besar to Tanjung Dulang is steep-to. The 200m curve lies up to 7.25 miles offshore, and there are many steep-to reefs in this area.

Pulau Bangkil (1°03'N., 123°06'E.), a low, wooded islet with a white sandy beach, lies on the SW end of a drying reef, close inside the 200m curve, 11 miles NE of Tanjung Besar. Karang Longugu, with a depth of 4.9m, lies 3 miles E of Pulau Bangkil.

Karang Java, with a depth of 3m, lies 3 miles NW of Tanjung Belongkoh.

It should be noted by vessel transiting the N coast of Sulawesi that not all shoal areas are described in this sector, and reference to the appropriate chart should be made.

7.51 From Tanjung Dulang, the coast which is backed by some high peaks, extends 28 miles E to Tanjung Batu. The shore is less indented than that close W or toward the E. The 200m curve lies up to 10 miles offshore in places, and there are some shoal patches close within this line. A danger area, which may best be seen on the chart, lies off Tanjung Dulang.

Labuan Broko is a small bay entered about 2 miles SSE of Tanjung Dulang. This bay affords anchorage SSE of the rocky N point of the bay, but is unprotected from E and N winds.

Bolaangitam (0°55'N., 123°19'E.), a village in which there is a flagstaff, stands 3.25 miles E of Labuan Broko.

A mountain peak with a height of 1,921m, rises 12 miles S of Bolaangitam.

A shoal patch, with a depth of 5.8m, lies 2 miles N of Bolaangitam and a patch, with a depth of 1.2m, lies near the 200m curve, 4 miles farther NNE. A 4.5m patch lies 1 mile E of the 1.2m patch.

7.52 Tanjung Bokabak (0°55'N., 123°27'E.), located 8 miles E of Bolaangitam, rises to a height of 294m, 1.25 miles S.

Pulau Alanga, two reefs which dry, lie 2.25 miles N of Tanjung Bokabak. Buntong, with a depth of 3m, lies 2 miles E of Pulau Alanga.

The Sungai Sangkup enters the sea 8 miles E of Tanjung Bokabak.

Tanjung Batu (0°53'N., 123°43'E.) lies 7 miles E of the entrance to Sungai Sangkup. The land rises to a height of 941m, 3.75 miles S of Tanjung Batu. A rock awash lies 0.25 mile NW of Tanjung Batu, and a similar rock lies 0.75 mile ENE of the same point.

Tanjung Lainpangi lies 41 miles ENE of Tanjung Batu. A few bays along this coast that provide an anchorage.

The mountains rise a short distance inland and the 200m curve lies from about 5 miles offshore at Tanjung Batu, and closes to 1 mile off Tanjung Lainpangi.

7.53 Teluk Domisil (0°51'N., 123°45'E.) is entered close SE of Tanjung Batu. The reef-fringed bay is protected on the E by a peninsula that extends 1.25 miles NNW from the shore.

Anchorage, with shelter from all winds but those from NNW to N, may be taken in the inner part of Teluk Domisil.

Care must be taken to avoid the drying reef that lies 0.25 mile S of the NW extremity of the peninsula.

Pulu Tiqa are three wooded islets surrounded by partly drying reefs that lie 1.25 miles offshore, 3 miles ENE of Teluk Domisil. The middle islet, the highest of the group, is 112m high.

Teluk Bolaanguki, about 7 miles E of Pulu Tiga, affords sheltered anchorage under all conditions. The general depths in the bay are 18 to 29m. An islet covered with vegetation lies off the NE entrance to the bay, and a detached drying reef lies about 0.75 mile SSE of the islet. Inside Teluk Bolaanguki lies **Labuan Uki** (0°51'N., 123°56'E.) a small port handling asphalt and dry bulk. The PT Maesa Nugraha berth is 100m in length and handles dirty products (DPP) and bulk cargo.

Pulau Molosso (Molosso) (0°55'N., 123°58'E.) is a hilly islet lying 2 miles offshore, 4 miles NE of Teluk Bolaanguki.

Lombangin, a large village, stands close SE of a point, 7 miles E of Pulau Molosso. Anchorage may be taken offshore from Lombangin, in a depth of 55m, NNE of the flagstaff, in line with a custom shed farther inland. The PT Sulenco Bohusami Cement Terminal, currently under construction, consists of a 395m-long cement jetty that will accommodate vessels up to 30,000 dwt.

Between Pulau Molosso and Tanjung Nonapang, 17 miles NE, there are several conspicuous hills; Ompu, 215m high, 3

miles SSW of Lombangin; Banka, 172m high, close NE of Ompu; and Mariri, 469m high, 6 miles ENE of Lombangin.

Bolaang Mongondou, a village 3.25 miles ENE of Lombangin, has coconut plantations E of it.

Anchorage may be taken off the village, in depths of 29 to 35m, 0.3 mile offshore; with W winds a sea is quickly raised. From a position 1.25 miles N of Bolaang Mongondou, a line of reefs, some of which partly dry, run parallel NE with the coast for 4 miles. Vessels without local knowledge should pass outside the reefs.

The coast between Bolaang Mongondou and Tanjung Lainpangi, 16 miles NE, is hilly except near Tanjung Nonapang where Sungai Poigar flows through a low plain. Anchorage can be taken off the mouth of Sungai Poigar, in 55 to 65m, about 0.2 mile offshore.

7.54 Tanjung Lainpangi (1°10'N., 124°20'E.) is a steep-to point. Between Tanjung Lainpangi and Tanjung Kelapa, 23 miles NE, the coast is indented by Teluk Amurang.

Teluk Amurang is entered between Tanjung Walintau, 5 miles NE of Tanjung Lainpangi, and Pulau Tetapaan, 8 miles farther NE.

Amurang (1°13'N., 124°33'E), a large village, lies on the SE corner of Teluk Amurang, 7.25 miles SSW of Pulau Tetapaan. It is an administrative district. The church gable and spire are prominent objects in the village. The port handles dry cargo, breakbulk, and bulk liquid cargo. The Coal Pier, 83m in length, handles coal and breakbulk. The Oil Berth, 148m in length including dolphins, handles clean products (CPP) and vegetable oils.

The best anchorage, in 69m, sand, lies about 183m from the beach with the flagstaff of an old fort bearing 148°. Pelabuhan Luak, located on the N shore of Teluk Amurang, affords shelter for small vessels during the Northwest Monsoon.

Pulau Tetapaan (1°18'N., 124°30'E.), a low thickly-wooded island, lies on the coastal reef, 1 mile offshore. Close E of the island there is an inlet that affords shelter for small vessels during the Northwest Monsoon.

The coast between Pulau Tetapaan and Tanjung Kelapa, 10 miles NE, is fringed by a broad coastal reef extending nearly 2 miles offshore. This stretch of coast should not be approached within 3 miles.

Teluk Tanahwangko, entered close E of Tanjung Kelapa, has a narrow coastal reef except off the village of Tanahwangko.

Tanjung Kalasei (Tanjung Mandolang) (1°27'N., 124°44'E.) lies 7.75 miles ENE of Tanjung Kelapa. Gunung Lokon, an active volcano with four summits, the S one 1,584m high, rises 5 miles S of Tanjung Kalasei.

Teluk Manado, entered between Tanjung Kalasei and Tanjung Pisok, 8 miles NNE, is fringed by a narrow coastal reef except off Tanjung Pisok, where it projects 0.4 mile W. This part of the reef is steep-to and the greater part of it dries.

Although Teluk Manado is spacious and free from dangers, the road is never calm and during December, January, and February when heavy rain squalls blow from the NW; it is often unsafe. During other months of the year it is squally, particularly in the evenings after the land breeze sets in. September and October are the best months.

Anchorage.—Anchorage may be taken, in 55m, 0.4 mile offshore N of Manado. The area is foul with lost anchors and chains, and it has been reported that most large vessels remain underway due to the numerous patches of foul ground.

With permission of Remko Fortgens

Manado

7.55 Manado (Menado) (1°30'N., 124°50'E.) (World Port Index No. 52040) is situated on the E shore of Teluk Manado and lies on both banks of Salo Manado, which empties into the bay. The town is the administrative headquarters of the district. A mole extends from the N entrance of the river and a short mole projects from the S entrance. Lights are shown from the seaward extremity of each mole. A basin on the S side of the river provides 223m of wharves with alongside depths of 0.5 to 1m. There is also a ferry pier.

Tanjung Tokabene (1°29'N., 124°50'E.) is located 0.75 mile SW of Manado Light, near the entrance to the Manado River. Karang Tokabene, which dries, lies 0.2 mile WNW of the Tanjung Tokabene. There are two mooring buoys for tankers to discharge oil, SSW of Tanjung Tokabene. Pilotage is not compulsory.

The coast between Tanjung Pisok and Tanjung Utara, 15.5 miles NE, is low and covered with mangroves to the water's edge. It is broken by several creeks, and is bordered by a generally narrow reef. The charted 200m curve lies close offshore along this stretch of coast.

Kima, a village, stands at the head of a bay, 4 miles NE of Tanjung Pisok. Landing can be made here when it is impracticable at Manado.

Anchorage.—Anchorage may be taken with shelter from NW winds, by vessels with local knowledge, off Kima, in a depth of 29m, or inside the reefs, in a depth of 42m.

Anchorage may also be taken in Teluk Kora Kora, 10 miles NE of Kima, with good shelter, in a depth of 35m. A reef which dries, extends from both entrance points of Teluk Kora Kora, leaving a passage 91m wide.

Off-lying Islands

7.56 Pulau Nain-besar (1°47'N., 124°47'E.), lying about 11 miles WNW of Tanjung Utara, appears saddle shaped when seen from E or W. The N summit, 192m high, is the highest

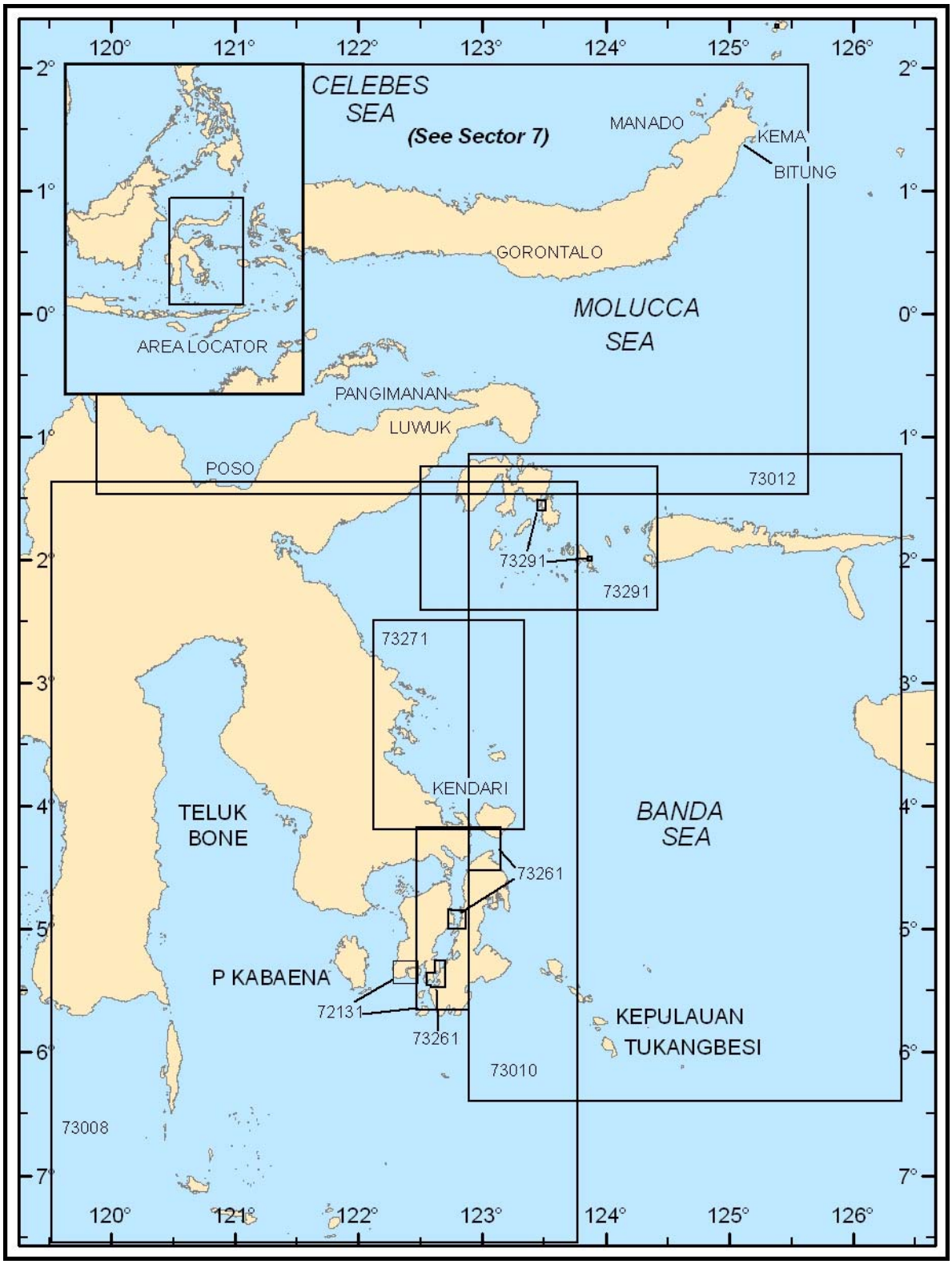
peak. Pulau Nain-kecil, a wooded islet 35m high, lies on the coral reef E of Pulau Nain-besar.

Pulau Mantehage, 2.5 miles SSW of Pulau Nain-besar, is flat and wooded; the fringing reef extends about 1.5 miles.

Pulau Manadotua, a very steep, circular island, rising to a height of 822m in the form of a truncated cone having the appearance of a volcano, is located 4 miles SSW of Pulau Mantehage. An explosives dumping ground lies 6 miles W of Pulau Manadotua. Pulau Buenaken, 1 mile E of Pulau Manadotua, is low but gradually rises to a round-topped hill 110m high in its W part. The S extremity of the island lies 2 miles NW of Tanjung Pisok. Pulau Siladong, 1 mile E of Pulau Buenaken, is low and nearly covered with coconut trees.

All the islands mentioned above are covered by coconut plants and they are reserved for the conservation of flora and fauna.

The channels between these islands are deep and clear.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **8** — CHART INFORMATION

SECTOR 8

SULAWESI—SOUTH AND EAST COASTS

Plan.—This sector describes the E coast of Sulawesi from Tanjung Utara, the N extremity of the island SSW to Tanjung Lassa and includes the W islands of Kepulauan Sula, Kepulauan Tukangbesi, and the E coast of Pulau Selayar.

The general description is from N to S and follows the general coastline in the various bays, of which the most prominent are Teluk Tomini, Teluk Tolo, and Teluk Bone.

General Remarks

8.1 The E peninsula of Sulawesi separating Teluk Tomini and Teluk Tolo is the least known of all the peninsulas of Sulawesi. A chain of islands consisting of Kepulauan Banggi and Kepulauan Sula extends about 200 miles E from the peninsula.

The SE coast of the Sulawesi is formed by the SE peninsula of the island which separates Teluk Tolo from Teluk Bone. At its extremity is Pulau Butung and a group of islands known as Kepulauan Tukangbesi. All of these islands are mountainous and little known.

The SW peninsula, roughly parallel to the SE peninsula, separates Teluk Bone and the Makassar Straits. Several islands lie off the S end of this peninsula.

Mountain ranges run through both the SE and SW peninsula and there are a few conspicuous peaks.

Bitung, the port of most importance, stands at the S end of Selat Lembeh. In the bays and coves of the peninsulas there are some which afford shelter during the monsoons.

Winds—Weather.—In the N entrance of the Molucca Sea the monsoons are powerful and constant. They blow chiefly from the N and S. The Southeast Monsoon prevails from June to November and the Northwest Monsoon blowing from N to NE prevails from December through April. The Southeast Monsoon is somewhat more powerful and regular than the other, but a force of more than 6 has not been reported.

Hard gusts of wind are rare in the S part of this entrance. Rain falls all year round with the greatest in June, July, and January and the least in February, March, September, and October.

On the SE coast of Sulawesi the monsoons are powerful and regular. The Southeast Monsoon prevails from May through October, and the Northwest Monsoon from December through March. The Southeast Monsoon is more constant and powerful than the other, but seldom is a wind force greater than 5, and then during the Northwest Monsoon.

The sky is frequently covered and haze is most common in the latter part of the Southeast Monsoon. Rain squalls occur all year round with hard squalls most frequent in December and January. Thunderstorms occur most often during April and November which are the months of the change of the monsoon.

The monsoons on the S coast of Sulawesi blow with much steadiness, especially the E which begins in the end of April, and blow strongly until October, from ESE by day, and under the influence of the land wind, ENE at night.

The Northwest Monsoon commences in December from WNW and is at its height in January with heavy squalls. In February and March unsteady winds will blow between SW and N. The land wind is seldom felt at this season.

Rain is most abundant in December and January, lessening in February and March. At coast stations the rainy period will last until June.

In the Southeast Monsoon, the sky is hazy, particularly in August and September. During the Northwest Monsoon, it is generally overcast and bright periods only occur toward the end of the W winds.

Tides—Currents.—Currents in the Molucca Sea set in a predominantly NE direction during the year at a rate of 1 knot during the Northwest Monsoon, and about 0.75 knot during the Southeast Monsoon. The currents in Teluk Tomini are thought to be weak.

A high swell can develop with N winds, and during the Southeast Monsoon, especially in July and September, high seas frequently occur.

In the Banda Sea, during the Northwest Monsoon, a strong current runs to the NE while during the Southeast Monsoon, this current runs to the SW. Both flow at an average rate of 1 knot, and at rare intervals may be greater than 3 knots. Tidal currents, near the coast and narrow passages, will run 1 to 2 knots.

Caution.—The aids to navigation from Selat Riau to Pulau Bangka are reported to be unreliable. They may be missing, unlit or out of position.

Tanjung Utara to Tanjung Tombulilatu

8.2 The coast between **Tanjung Utara** (1°45'N., 124°59'E.) and Tanjung Pulisan, 12 miles ESE, forming the S side of Selat Bangka, is low and of little importance to navigation. The islands forming the N side of the strait are hilly and heavily wooded.

The coast between Tanjung Pulisan and Tanjung Flesko, 85 miles SSW, is steep-to with the spurs of high land standing fairly close to the sea, forming conspicuous points along the entire coast. Tanjung Utara, the NE extremity of Sulawesi, is wedge shaped when seen from W or E, and rises gradually to the hilly land within.

Gunung Kalabat (1°27'N., 125°00'E.) is a conspicuous cone standing by itself, rising to a height of 2,022m, 19 miles S of Tanjung Utara. The peak, which rises from a low base, is visible 60 miles in clear weather. Gunung Suasudara, 1,365m high, rises 9 miles ENE of Gunung Kalabat and Gunung Batu Angus, rises to a height of 1,134m, 2 miles N of Gunung Suasudara.

During the Southeast Monsoon, these mountains are generally visible in the early morning, but are frequently hidden by 0800. Gunung Kalabat often remains clear while the mountains E were covered.

From Gunung Kalabat to Gunung Kaweng, a densely-wooded ridge 20 miles SSW, attaining a height of 1,179m, parallels the coast about 5 miles inland.

Numerous spurs approach the coast from this ridge. Southward of the high volcanic group formed by Gunung Sempo, Gunung Soputan, Gunung Kawatak, and Gunung Manimporok, 10 miles WSW of Gunung Kaweng, is a low plain extending to the coast.

From a position 24 miles N of **Tanjung Flesko** (0°28'N., 124°30'E.), the mountains are closer to the coast. Some of the more conspicuous peaks are Pegunungan Mata Mata, 1,195m high, 24 miles NNE of Tanjung Flesko, and Gunung Ambang, 1,823m high, 18 miles SW of Pegunungan Mata Mata.

During the Southeast Monsoon, mountains above 914m are hidden in clouds from about 0800 for the rest of the day.

The 183m curve, from a position close N of Tanjung Utara, encompasses the islands that form the N side of Selat Bangka, then approaches the coast again at Tanjung Pulisan. From Tanjung Pulisan the curve follows the coast and encompasses Pulau Lembeh, and from this island it is from less than 0.5 mile to 5.5 miles offshore with many dangers within the curve. There are no known dangers outside the 183m curve.

8.3 Selat Bangka (1°45'N., 125°05'E.) lies between the NE coast of Sulawesi and a group of islands to the N. The principal islands in this group are Pulau Bangka, Pulau Talisei, and Pulau Gangga.

On the S side of the strait, from Tanjung Utara to Tanjung Pulisan, 12 miles distant, the coast recedes and forms a bay. Pulau Tamperong is a low island lying close offshore in the W part of the bay. Likupang is a small village SE of Pulau Tamperong.

There is anchorage in the road N of Likupang with the point N of Pulau Tamperong, bearing 314°, and the middle of the village, bearing 200°, in depths of 10.9 to 14m. This anchorage affords good shelter during the Southeast Monsoon. Smaller vessels can anchor closer in but care should be taken to remain N of the line of a black pyramidal rock, lying close off the point about 3.5 miles W of Tanjung Pulisan and the first point E of Likupang.

Vessels approaching the roadstead should take care to avoid the charted shoals. Only vessels with local knowledge should approach the road, and only then under the most favorable conditions. The maximum authorized draft for the transit on the recommended Selat Bangka route is 9.0m.

Directions.—From W, Tanjung Utara may be passed at a distance of 0.25 mile, and then a course of 097° is steered, keeping the S end of Pulau Nain-besar just touching Tanjung Utara astern. When the NE extremity of Pulau Talisei and the W extremity of Pulau Bangka are in range, a SE course may then be steered to pass 0.25 mile from Tanjung Pulisan.

From E, pass at least 0.25 mile N of Tanjung Pulisan and steer for the gap between Pulau Gangga and Pulau Tindila until the NE extremity of Pulau Talisei and the W extremity of Pulau Bangka are in range, then steer 277° with the S tangent of Pulau Nain-besar just touching Tanjung Utara. When S of the S extremity of Pulau Gangga, steer to pass 0.25 mile N of Punal Utara.

To pass through the channel between Pulau Bangka and Pulau Kinabohutan, the W extremity of Pulau Bangka should be steered for on course 180°, taking care not to stand into less than 18.3m until the S extremity of Pulau Kinabohutan bears 267°. A course of 219° then leads through the channel in the deepest water. When W of the W extremity of Pulau Bangka, steer as required to the desired destination.

A danger area includes Selat Bangka and the surrounding islands. For further information, see Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

The coast between Tanjung Pulisan and **Tanjung Batuangas** (1°30'N., 125°15'E.), the N entrance of Selat Lembeh, 12 miles SSE, consists of long steep beaches of coarse, black volcanic sand in the N part. In the S part it is low, rocky, and thickly wooded rising continuously to the summit of Gunung Batu Angus. There is heavy surf with a N or NE swell.

Pulau Mogogimbun, 5 miles SSW of Tanjung Pulisan, is a small wooded conical island, 50m high, which lies 1 mile offshore. A reef extends from the N side of the island. There are two rocks on the reef which show at HW. The sea breaks heavily on these rocks with the least sea or swell.

Anchorage, sheltered from S winds, is available in the bay W of Pulau Mogogimbun, in a depth of 25m, with that island bearing 093° and the white topped rock off Tanjung Pulisan, bearing 022°.

8.4 Tanjung Pulisan (1°41'N., 125°10'E.) is a bold point with boulders off it and a narrow fringe of coral. From the cape the land rises abruptly to a high tableland, 277m high, 1 mile long and thickly wooded. It is easily distinguished from all sides by its square, boxlike aspect. A sharp pointed rock, 9.1m high with a white top, lies close off the E side of Tanjung Pulisan.

Pulau Gangga (1°47'N., 125°03'E.), about 101m high, lies in Selat Bangka 4 miles ENE of Tanjung Utara.

Pulau Lehaga lies on a reef close W of the S extremity of Pulau Gangga and Pulau Tindila lies close N of Pulau Gangga. Pulau Talisei, which rises to a height of 359m near its center, is the farthest N of this group of islands.

It is separated from Pulau Tindila by a channel about 0.2 mile wide and with depths of 14.6 to 27m. Tanjung Arus, the N point of the island is a bold steep-to cliff with large broken rocks at its base. A light, from which a radiobeacon and a racon transmit, is shown from a 20m high white framework tower on the point.

The S end of the island is low. Pulau Kinabohutan lies close off the E side of the island, 3 miles NE of its S extremity. Talisei Road lies between the S extremity of Pulau Talisei and Pulau Kinabohutan. There is anchorage available, in 18m, between the head of a mole fronting the village and an 8m patch 0.3 mile SE of the mole. The water SW of Pulau Kinabohutan is foul with shoal patches.

8.5 Pulau Bangka (1°48'N., 125°09'E.) is 353m high and of irregular contours. Batu Kapal, a rock 4.3m high rises 0.2 mile N of the low, mangrove covered N point of the island. Tanjung Batu Gosoh, the E point of the island, is a sharp, conical hill 81m high, joined to the island by a low neck of land. To the NE, the point ends in a succession of sharp needle rocks which are surrounded by water, and are 4.6 to 6.1m high. Off the point 1.5 miles S there are some above-water rocks.

Jiko Sago (Djiko Sago) is a bight on the SE coast of Pulau Bangka where there is anchorage, in 37m, 0.5 mile from shore. The S side of this bight is formed by a narrow tongue of land with an extensive reef projecting to the S, on which there is an

islet and several rocks above water which the sea breaks against.

The S point of Pulau Bangka is a low, cliffy point that rises to a conical hill, 81m high. There are heavy tide rips off the point. The W coast of the island is low and fringed by coral extending about 0.1 mile offshore. The W extremity of the island is a low, dark, red cliff with trees.

8.6 Pulau Lembeh (1°29'N., 125°14'E.) is a densely-wooded island that forms the E side of Selat Lembeh. The island rises to a height of 477m in its SW part. The E coast of the island is cliffy and steep-to, and the N end, with a well-wooded range of hills, is narrow and precipitous on both sides. The N end of the island consists of large masses of vegetation-covered black and red rocks, and the NE point of the island is a wedge shaped cliff about 61m high. White guano-covered rocks extend about 0.4 mile N of the point. The sea always breaks on these rocks.

Pulau Susulina, about 37m high, lies close off the SE point of Pulau Lembeh. Pulau Dua lies about midway along the S coast and has two peaks, the highest one being 94m. This islet is steep-to on all sides except the S which has a shoal that extends almost 0.25 mile off it. An explosives dumping ground lies 12 miles SE of Pulau Susulina.

The S point of Pulau Lembeh is formed by a narrow, hilly tongue of land. The S coast is bordered by an extensive drying reef which extends almost 0.5 mile SW of the S extremity.

Pulau Sandy (1°23'N., 125°10'E.) lies on a reef, 0.7 mile W of the S extremity of Pulau Lembeh. A light shown from a white metal framework tower with red bands stands on the island.

Tanjung Labuan Compenie, 3 miles NE of Pulau Sandy, is the E entrance point of the S end of Selat rocks at its base. A light, from which a radiobeacon and a racon transmit, is shown from a 20m high white framework tower on the stands on the point. The coast of Pulau Lembeh, NE of Tanjung Labuan Compenie, is reef-fringed for a distance of 4 miles, then relatively steep-to, its N extremity.

Selat Lembeh (1°28'N., 125°12'E.) is a narrow, somewhat intricate strait that is bound on the E by Pulau Lembeh and on the W by the mainland. In the middle of the strait there are two islets and an above-water rock encircled by reefs with a channel on either side. The channel W of the islets and rocks is the best because it is straight and the reef shows clear discoloration. The strait has been swept to a controlling depth of 11m; however, a 6.4m patch lies outside the swept channel, 0.5 mile WSW of the S islet in the narrows. The passage through the strait is only recommended for vessels less than 100.5m in length.

Tidal currents in Selat Lembeh are semidiurnal and in the narrowest parts, attain a rate of 3 to 4 knots. The current sets N near the time of HW and S near LW. The current S of the islets, at the entrance to the narrows, is small under Pulau Lembeh and sometimes there is an eddy.

8.7 Bitung (1°26'N., 125°11'E.) (World Port Index No. 52065), a deep-water port, is situated on the Sulawesi coast N of Tanjung Labuan Compenie.

Tides—Currents.—The flood tide sets E and the ebb W, both running parallel to the wharf with a rate of 1 to 2 knots. Ships are always berthed against the current.

Depths—Limitations.—Vessels up to 60,000 dwt, with a maximum loa of 231m and a maximum draft of 12.0m, can be accommodated.

Berth information is shown in the table titled **Bitung—Berth Information**.

Pilotage.—Pilotage is required and may be arranged via Coastal Radio Station Bitung (call sign PKM). A 24-hour ETA is required. Pilots embark about 0.5 mile W of Tanjung Labuan Compenie.

Bitung—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
ASDP Ferry Terminal						
North Jetty	—	—	62m	—	—	Ro/pax. Berthing length of 62m (including dolphins).
South Jetty	—	—	—	—	—	Ro/pax. Berthing length of 62m (including dolphins).
Bitung Container Terminal						
Berth IX	189m	10.0m	231m	—	—	Containers. Continuous berthing length of 378m.
Berth VIII	189m	10.0m	215m	—	—	
Berth X	364m	10.0m	231m	—	—	Containers.
Samudera Bitung Terminal						
No. 01	196m	7.5-9.8m	146m	5.0m	—	Breakbulk.
No. 02	236m	10.2-10.5m	195m	—	—	Breakbulk.
No. 03	170m	8.9-10.1m	183m	—	—	Containers and breakbulk.
No. 04	144m	7.2-7.4m	115m	—	—	Containers and breakbulk.

Bitung—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Tonasa Cement Terminal						
Cement Berth	30m	—	123m	—	—	Cement. Berthing length of 130m (including dolphins).
Bimoli Terminal						
No. 01	13m	—	—	—	—	Vegetable oils, multipurpose, and breakbulk.
No. 02	32m	—	148m	—	—	Chemicals, vegetable oils, multipurpose, and breakbulk.
Bitung Asphalt Terminal						
Cargo Quay	206m	—	—	—	—	Dirty products, asphalt, and fishing vessels.
Madidir Terminal						
East Berth	—	—	—	—	—	Vegetable oils and breakbulk
West Berth	—	—	74m	—	—	Vegetable oils and breakbulk
PT Multi Nabati Sulawesi Terminal						
Anchorage Area	—	—	117m	—	—	Chemicals and vegetable oils.
Multi Nabati Berth	86m	—	195m	—	—	Chemicals, vegetable oils, and breakbulk. Berthing length of 253m (including dolphins).
AKR Bitung Tank Terminal						
AKR Bitung Berth	92m	—	127m	—	—	Berth length 153m (including dolphins).
Gasmindo Utama Terminal						
East Berth	—	—	65m	—	—	LPG.
West Berth	—	—	—	—	—	LPG.
Pertamina Fuel Bitung Terminal						
Jetty 1	15m	10.0m	158m	7.3m	17,000 dwt	Chemicals, clean products, and bunkers. Berthing length of 186m (including dolphins).
Jetty II	—	3.0m	120m	—	1,000 dwt	Clean products, vegetable oils, and bunkers. Berthing of length 130m (including dolphins).

Anchorage.—The recommended anchorage is 1.25 miles WSW of Tanjung Labuan Companie, in a depth of 53m. Ships awaiting berth can also anchor 1 mile ENE of the same point, in a depth of 37m.

Caution.—The water in the vicinity of Bitung is filled with numerous fishing boats with no lights. Approaching or sailing at night should not be attempted.

8.8 Tanjung Merah (1°24'N., 125°07'E.) is located on the Sulawesi coast, 2.75 miles W of Pulau Sandy. This point, which is the S entrance of Selat Lembeh, has shoals with depths of 1.2m that lie nearly 0.5 mile S of it. Vessels should give the point a wide berth. Good anchorage lies close NE of Tanjung Merah, in depths of 56 to 72m.

Kema (1°22'N., 125°05'E.) is a village situated on a plain at the foot of Gunung Kalabat. Numerous palms along the beach indicate the position of Kema, which is not easily seen from seaward. The roadstead off Kema affords good anchorage, in depths of 9 to 20m, throughout the year. At Kema, the S wind of the Southeast Monsoon is said to frequently hinder shipping.

Landing can always be obtained on the S side of the roadstead, even when this is impracticable elsewhere due to a heavy swell. Under favorable conditions the most convenient landing place is at the village.

The coast between Kema and Pulau Bentenan, 25 miles SSW, is low and monotonous, and is fronted by a drying reef

projecting 0.1 to 0.15 mile except immediately S of Kema where it is 0.3 mile broad. The only villages on this part of the coast are Rimbua, 23 miles SSW of Kema, and Bentenan, 2 miles farther SW. There is good anchorage 0.5 mile SE of the village of Bentenan. Lilang Light is shown from a headland about 2.5 miles S of Kema.

Caution.—Submarine cable lies close to Kema extend 6 miles offshore in a ESE direction.

8.9 Pulau Bentenan (0°58'N., 124°54'E.), 135m high and saddle-shaped, lies on a reef extending from the coast 2 miles SSE of Bentenan. Four steep-to rocks lie close off the E side of the island. Pulau Pakolor, 2 miles E of Pulau Bentenan, is 66m high, marked by a light, and sparsely covered with vegetation. A rock with a depth of 0.9m, lies 0.2 mile S of Pulau Pakolor, and in any swell or sea there are heavy rollers over it. In calm weather its position is indicated by rippling. Pulau Punten lies 1.5 miles SW of Pulau Bentenan. Two small islets or rocks lie between these two islands. A 2.1m patch lies close offshore 1.5 miles W of Pulau Punten.

The coast between Pulau Bentenan and Tanjung Flesko, 39 miles SW, is generally low and forested. It is indented by numerous bays and there are several off-lying islands.

Belang Roadstead lies off the village of **Belang** (0°56'N., 124°47'E.), about 7 miles WSW of Pulau Bentenan. The village is large. A few white houses with zinc roofs can be seen at a great distance.

Landing can be effected on the beach fronting the village, or in conditions of swell, 0.25 mile SSW of it. A lighted beacon is shown from Belang.

Anchorage.—Anchorage can be taken from 0.2 to 0.3 mile offshore, in depths of 18 to 37m, SE of Belang, but the holding ground is poor. Numerous fishing nets with floats are often laid in this vicinity.

Tanjung Mangkit (0°55'N., 124°47'E.) is the S entrance point to Belang Roadstead. Pulau Tulang and Pulau Hogow are two rocky islets that lie 2 and 3 miles, respectively, SSW of Tanjung Mangkit.

8.10 Teluk Totok (0°52'N., 124°43'E.) (World Port Index No. 52080), which is fronted by Pulau Tulang and Pulau Hogow, is protected on the S by a tongue of land that extends 2.75 miles NE from the mainland, in a position 4 miles SW of Pulau Hogow. This bay affords spacious and sheltered anchorage in both monsoons. It can be entered by passing either N or S of Pulau Hogow. The passage N of Pulau Hogow should not be attempted without due caution as two banks, the outer with a depth of 11m, extend nearly 0.75 mile SW from Pulau Tulang.

A saddle-shaped islet lies close to the N shore of the bay, 1.5 miles W of Pulau Hogow, with two above-water rocks on a reef close NW of it.

Totok, a village on the W shore of the bay, with Ratotok, another village close NW of it, are of little importance; although, there are several large warehouses and a loading pier about 30.5m long belonging to the mining company.

Anchorage may be taken E of the pier, in depths of 20 to 29m. The water in the anchorage is usually discolored, so that the edge of the coastal reef is not always visible.

Pulau Kumeke (0°48'N., 124°40'E.), a rocky thickly-wooded island, lies 0.25 mile offshore 4 miles SW of Totok. A low rock covered with vegetation lies near the center of an extensive reef with a depth of 4.9m, about 0.8 mile E of Pulau Kumeke. Kotabuna, a large village with a flagstaff, is situated on the coast W of Pulau Kumeke. A small pier projects from the coast near the flagstaff. There is a lighted beacon at Kotabuna. Pulau Bambajanon, 1.5 miles S of Pulau Kumeke, is separated from the coast by a clear channel about 1 mile wide.

In the small bight off the village of Telaga, 3 miles SSE of Pulau Bambajanon, there is anchorage, in 37 to 42m, about 0.25 mile offshore. A rock, awash, lies on the coastal reef off Telaga.

8.11 Tanjung Salimburung (0°43'N., 124°38'E.) is located on the S side of the above bight 0.75 mile from Telaga. Jiko Bulutaya (Djiko Buluntaja), 7 miles SSW of Tanjung Salimburung, affords calm anchorage for vessels with local knowledge in 26m off the village of Molobog.

Kepulauan Laga, two small rock islets, lie close off a point of land 3.5 miles SSE of Jiko Bulutaya. On the W side of the islets there is a bay, which is deep and clear of dangers and which a river enters the sea. Nuangan, a village, stands 1 mile up this river. Vessels with local knowledge may anchor 0.25 mile off the mouth of the river, in a depth of 26m.

Jiko Matabulu (Djiko Matabulu), 4 miles SW of Kepulauan Laga, and Jiko Houjoh (Djiko Houjoh), a short distance farther S, only afford anchorage close offshore for vessels with local knowledge.

8.12 Tanjung Flesko (0°28'N., 124°30'E.) is high, rocky, and there is frequently a strong current and surf near the point. A small, but remarkable peak 633m high, rises 2.5 miles NW of Tanjung Flesko. A drying reef lies 0.45 mile E of the point. A 6.7m patch lies about 2.25 miles SSW of Tanjung Flesko, and a 10.9m patch lies close E of the 6.7m patch.

From Tanjung Flesko the coast trends WSW 14 miles to Tanjung Binarahan. The intervening shore is indented by numerous bays which may provide anchorage.

Pulau Pondang lies 1.25 miles offshore, 3 miles SW of Tanjung Flesko. A reef, with two above-water rocks and a least depth of 3.7m, extends about 0.5 mile SW of the islet. A light, shown from a white metal framework tower 22m high, stands on the SW slope of the islet.

Anchorage.—Anchorage, in 37m, sheltered from all winds, is available in the bight W of Tanjung Flesko. The bight that lies WNW of Pulau Pondang provides sheltered anchorage from all but E winds, 0.45 mile off the head of the bight, in 40m.

8.13 Kepulauan Batutolu are two islets lying 7 miles W of Pulau Pondang. The N is joined to the coast by a drying reef and the S is surrounded by a drying reef. Tobajangan, a village, stands on the NE shore of a bay immediately E of Tanjung Binarahan.

Tanjung Tolu (0°22'N., 124°13'E.), 4 miles W of Tanjung Binarahan, is marked by a round hummock on the end. Tanjung Panango lies 10.5 miles W of Tanjung Tolu. The 200m curve closes to 0.75 mile along this coast and there are several detached reefs, some of them dry, that lie close within this line. Close W of Tanjung Panango are two reefs which dry. A 1.8m patch lies 3 miles W of Tanjung Panango.

Tanjung Salongon, about 5 miles W of Tanjung Panango, is

low but can be recognized from the E by the roof of a large storage shed. A river enters the sea immediately E of the point. Anchorage may be taken, in a depth of 24m inside a 4.6m patch, 0.5 mile E of the mouth of the river, about 0.2 mile offshore.

Tanjung Tombulilatu (0°18'N., 123°20'E.), 39 miles W of Tanjung Salongon, is the N entrance point of Teluk Tomini. It is located at the foot of a mountain range, Pegunungan Sinandaka, and the coast in this vicinity is steep-to with a coastal reef here and there.

Teluk Tomini

8.14 Teluk Tomini lies W of a line joining Tanjung Tombulilatu and Tanjung Pangkalaseang, 60 miles S.

In general, the depths in the gulf are over 1,829m. The gulf is surrounded by high mountain land with low plains in front, except where there is a barrier reef when the mountains generally approach the coast.

On the N shore between Tanjung Tombulilatu and Teluk Limba, 50 miles WNW, the mountains rise abruptly from the sea. The charted 183m curve lies close offshore and there are no dangers outside it. Between a position 5 miles W of Teluk Limba and Tanjung Pelasa, 120 miles W, the charted 183m curve lies farther offshore, and a barrier reef with numerous islets, fronts the shore close within it. Along the W half of this stretch of coast there are several steep-to dangers outside the 183m curve.

The head of Teluk Tomino, between Tanjung Pelasa and Tanjung Sausu, 90 miles S, is fronted by barrier reefs in many places within the 183m curve.

On the S shore, between Tanjung Sausu and Tanjung Batuhitam, 135 miles ENE, the depths are great close along the shore. Generally, the hills within this shore rise steeply from the sea while the interior consists of high land and mountains near the coast. Kepulauan Togian extend NW from Tanjung Batuhitan and cover an extensive area in the S part of the bay.

Winds—Weather.—The monsoons within the bay are weak and variable. The Northwest Monsoon lasts from December to April blowing between NW and N, and the Southeast Monsoon, from May to October blowing from SSE to SSW.

Prolonged strong winds are rare and rain squalls infrequent. Showers occur at any time of the year but there are no regular wet and dry seasons. Land and sea breezes are a regular feature. At times over the N part of Teluk Tomini visibility is reduced by a thick haze.

Tides—Currents.—During the Southeast Monsoon, a current was observed N and NE of Kepulauan Togian, running with some strength in a NE direction along the coast in the vicinity of Tanjung Flesko. At the same time a W current was observed along the N shore of the bay as far W as Teluk Gorontalo. Tidal currents are scarcely noticeable.

Aspect.—There are several conspicuous mountain peaks along this coast but, as with those farther E, during the Southeast Monsoon, the mountains over 914m are obscured by clouds from 0800 for the rest of the day. Even though the mountains are close to the coast, it is not always easy to distinguish the summits. On this coast the points of land are defined and the reefs discolored.

8.15 Between Tanjung Tombulilatu and **Teluk Limba** (0°29'N., 122°31'E.), the mountains rise steeply from the sea with only an occasional coastal reef.

The coast between Teluk Limba and Tanjung Panjung (Tanjung Pandjang), 45 miles W, provides some good landmarks in the mountain peaks. Gunung Tiolo (Tiolo), 17 miles WNW of Teluk Limba, is the highest summit of a long range and has a double peak, 1,015m high. Gunung Dulantangan, 555m, 15 miles WSW of Gunung Tiolo, is the highest summit of a ridge running about 2 miles from the coast.

Gunung Oleonuhe (Olionuhe) (0°35'N., 121°50'E.), 11 miles NNE of Tanjung Panjang, is 701m high. This peak stands by itself and is particularly conspicuous. Further W, between Tanjung Panjang and Tanjung Tolosiadje, about 22 miles, the mountains approach the coast. Gunung Ulota, 14 miles WNW of Gunung Oleonuhe, 884m high, and Gunung Beau, 721m high, 6.5 miles SW of Gunung Ulota, are conspicuous.

North of the bight that lies W of Tanjung Tolosaije, there are three conspicuous peaks: Gunung Dingki 333m high, Gunung Boloo 836m high, and Gunung Salumpengu (Salumpengu) 696m high which rise 4 miles N, 11 miles WNW, and 18 miles WNW, respectively, of Tanjung Tolosiadje.

The mountains from **Tanjung Sempinit** (0°24'N., 121°04'E.), 23 miles W of Tanjung Tolosaidje, to Tanjung Pelasa, 39 miles WNW, form a long arched chain that reaches a height of 2,443m, but has no conspicuous peaks. In this mountain range, Gunung Santigi 306m high, lies near the coast 9 miles W of Tanjung Sempinit and is visible from all directions. Gunung Bosago (Bosago) 1,347m high, rises 19 miles NW of Gunung Santigi and is easily recognized.

Teluk Tomini—North Coast

8.16 **Teluk Gorontalo** (0°30'N., 123°03'E.) lies at the mouth of three rivers, 21 miles NW of Tanjung Tombulilatu. On both sides of the river are steep mountain ridges with a wide plain between them at the junction of the rivers. The mouth of the river is quite deep and about 0.3 mile inside the depths suddenly decrease.

Gorontalo (0°30'N., 123°03'E.) (World Port Index No. 52090), the principal trading place for Teluk Tomini, is situated on the low tongue of land at the junction of Sungai Bolango and Sungai Bone, the principal tributaries of Sungai Gorontalo. Mainly a lighterage port, exporting copra, it is also a ferry port and oil terminal. Gerontalo Light is shown from the E entrance point of the roadstead.

Winds—Weather.—In July and August a strong wind from seaward blows during the day causing a heavy sea. During night, with the land breeze, the sea remains calm. In the Northwest Monsoon, heavy squalls from seaward may occur unexpectedly. Other than the squalls, there is a land breeze which is stronger at night.

Depths—Limitations.—Within the river are two quays able to accommodate vessels up to 5,000 dwt with a maximum draft of 5.0m. One quay is 120m long, with a depth of 10m alongside, and is used for container handling and passengers. The second pier is 59m long, with a depth of 7m alongside and is used for general cargo.

Pertamina Oil Terminal consists of a single, angled, T-head jetty extending 100m SE from the shore with a depth of 8m at the head. It has a berthing length is 60m and can accommodate vessel up to 6,5000 dwt with a maximum draft of 5.0mt. A dolphin lies off the N end of the jetty.

Pilotage.—Pilotage is not required, but pilots are available and board vessels about 0.3 mile SSW of the light.

Anchorage.—Anchorage may be taken outside the bay, in about 80m, mud, about 0.1 mile outside the 10m line with the light structure bearing 040°. An obstruction lies in the middle of the bay about 0.2 mile NW of the light.

8.17 Teluk Pagujaman (0°29'N., 122°40'E.) lies 22 miles W of Gorontalo. It has depths of over 549m in its middle. The village of Bilatu is situated at the head of the bay. Teluk Bobaa, entered 5 miles W of Teluk Pagujaman, has a narrow entrance 0.2 mile wide between the reefs extending from either side, but the reefs are clearly marked by discoloration. The village of Bobaa is situated at the head of the bay.

Anchorage may be taken, by vessels with local knowledge, in a depth of 40m, in Teluk Bobaa.

Teluk Limba, close W of Teluk Bobaa, is divided into two parts by Pulau Limba, a densely-wooded high island. The entrance into the E bay is only 0.2 mile wide between the reefs projecting from the island and from a point of land on the E shore. There is good anchorage in the E bay, in a depth of 40m, but it is not sheltered during the Southeast Monsoon.

Teluk Dulupi is entered between a point 3.5 miles W of Pulau Limba, and Pulau Dulupi, a high island with two hills, 0.6 mile farther W. The bay offers little shelter for large vessels.

The coast between **Tilamuta** (0°30'N., 122°20'E.), 6 miles W of Teluk Dulupi and Tanjung Panjang, about 34 miles farther W, provides good landmarks for vessels navigating outside the barrier reefs.

Along this stretch of coast a barrier of islands and reefs lie just within the 183m curve which is from 1.5 to 5.5 miles offshore. Between this barrier and the islands and reefs under the coast is a broad passage with a few isolated reefs which are easily avoided. The depths in this channel vary from 22 to 55m and occasionally a little more. Anchorage can be found everywhere.

Tilamuta lies on the NW shore of Teluk Tilamuta. A coastal reef extends about 0.7 mile S of the SW entrance point of Teluk Tilamuta. There are two islets on the reef, and the islet 0.21 mile SW of the entrance point serves as a good mark when entering the bay. The largest islet on the coastal reef extending S from the SW entrance point of the bay, lies about 0.5 mile S of that point, and when entering the channel that leads W inside the offlying reef, this islet must be passed on its S side. There is shoal water and reefs off the NE entrance of the bay and a reef extends about 0.7 mile NE from Pulau Mohupombodaa, an island that lies 1.25 miles S of the bay's SW entrance point. The E end of Pulau Mohupombodaa is a conspicuous yellow rocky point.

To enter Teluk Tilamuta, bring the islet close SW of the bay's SW entrance point in line with a peak 6.25 miles W of Tilamuta, bearing 275°. This course will lead between the reef extending NE of Pulau Mohupombodaa, and a 4.8m patch that lies off the NE entrance point of the bay. When the E point of Pulau Mohupombodaa bears 191°, the harbor may be steered for or a course taken SW into the inner passage.

Pilots for Tilamuta can be obtained at Gorontalo.

A light is shown from a beacon at Tilamuta.

Some of the more prominent islets along the barrier reef are **Pulau Mopingulo** (0°27'N., 122°19'E.), Pulau Telefoa, and Pulau Montuli which lie 1.5, 3.25, and 7.5 miles, respectively, WSW of Pulau Mohupombodaa.

Farther W on the barrier reef, Pulau Bitila lies 6.25 miles WSW of Pulau Montuli, and Pulau Lahei lies 10 miles W of Pulau Bitila.

The inner passage between Teluk Tilamuta and Tanjung Bulooliho, about 13 miles W, can be easily navigated. The various reefs within the barrier are all marked by discoloration, and there are numerous landmarks. There are some passages through the barrier reef, through which some villages can be reached directly.

8.18 Batumoito (0°29'N., 122°18'E.), a village, stands at the head of a small bay, 3 miles W of Teluk Tilamuta and N of the passage between Pulau Mopingulo and Pulau Telefoa. There is a reef about 0.7 mile E of Pulau Telefoa with a depth of 4.8m on its W extremity. There are patches of 1 and 1.2m, 1.75 and 2 miles, respectively, NE of Pulau Telefoa.

Tapadaa, a small village 5.5 miles W of Batumoito, can be reached through an entrance in the barrier reef W of Pulau Montuli, on a course of 358°, with a group of casuarina trees W of the village used as an approach mark. This course leads between a 7.9m patch just inside the barrier reef on the E, and a 3.4m patch on the W. Both patches, marked by discoloration, cause heavy tide rips.

Anchorage, in a depth of not less than 27m, can be taken off Tapadaa.

Tanjung Bulooliho (0°28'N., 122°08'E.) is a conspicuous point with a hill, 64m high, about 4 miles WSW of Tapada.

Bumbulan (Pentadoe), a village about 4.5 miles WNW of Tanjung Bulooliho, has a prominent warehouse with a zinc roof, which is visible from well out to sea. The anchorage off the village may be reached by crossing the barrier reef E of Pulau Bitila. Cross the barrier reef with the beacon on the W side of Bumbulan in line with the 555m high peak, 2.25 miles NW, bearing 322°. This course leads E of a beacon marking the reef extending SE from Pulau Bitila.

This reef was reported to extend about 61m SE of the beacon. The reefs on both sides show clearly, and the bottom in the channel can be seen, indicating the continuation of the two reefs.

Continue on course passing close SW of a beacon situated 2.5 miles NNW of Pulau Bitila, which marks a shoal with a depth of 5.8m. Farther inside and directly on this course is a shoal with a depth of 4.3m, marked by a beacon. A reef, with a depth of 0.3m, lies 0.3 mile SE of Bumbulan and is marked by a beacon. There are many other dangers E of the alignment of the beacon and the peak. The reefs are barely marked by discoloration due to the muddy water.

Anchorage may be taken, in a depth of 16m, 0.75 mile SE of the beacon that stands on the W side of Bumbulan.

Pilots are available in the village.

8.19 Tanjung Tamboo (0°27'N., 121°58'E.) is a point located 6 miles WSW of Bumbulan. There are two small islets that lie within 0.5 mile S and SW of Tanjung Tamboo. Marisa,

a village 2.5 miles W of Tanjung Tamboo at the entrance to a river, is prominent.

Anchorage.—Anchorage may be taken S of the entrance to the river, in a depth of 21m, mud, about 0.4 mile offshore with a prominent galvanized metal warehouse bearing 358°. The anchorage may be approached by passing about 1 mile W of Pulau Lanhei on a course of 000° with Marisa ahead. When the two islets off Tanjung Tamboo are in line, course should be altered for the anchorage.

8.20 Tanjung Panjang (0°24'N., 121°48'E.) is low and can be distinguished by a clump of casuarinas. A drying reef, which is always visible, lies 1.5 miles SE of Tanjung Panjang. The coast E of the point is low, marshy, and grown up in mangroves.

Between Tanjung Panjang and **Tanjung Tolosiadje** (Tanjung Tolosiaje) (0°28'N., 121°26'E.), 22 miles W, a bight encumbered with islets and reefs is formed in the N shore of Teluk Tomini. Along the shore of the bight is a narrow, marshy strip of land with mountains rising abruptly behind. Some of the more prominent mountains have been discussed.

Pulau Puntu, 271m high, lying about 7.5 miles NW of Tanjung Panjang, is conspicuous from the E and W. The remaining islets in the bight are low and covered with vegetation. There are no known dangers outside the 183m curve along this coast.

Papajato (Papayato) (0°29'N., 121°28'E.), the most important village on this bight, lies 2 miles ENE of Tanjung Tolosiaje. The roofs of the buildings in the village can be seen from seaward. A pilot can be obtained at Gorontala.

There are two passages through the barrier reef to the anchorage of Papajato. The E passage is close E of a beacon that marks a detached 3m patch, about 0.5 mile NE of **Pulau Sadaa** (Sadaa) (0°26'N., 121°31'E.); steer course 316°. The other passage, with Gunung Dingki bearing 348°, leads through the barrier about 1.25 miles W of Pulau Sadu (Sadu), an islet about 0.75 mile W of Pulau Sadaa. Anchorage can be taken, in a depth of about 22m, sand, S of the village.

8.21 Tanjung Tuladengg (0°25'N., 121°09'E.) is located 18 miles W of Tanjung Tolosiadje. The intervening coast has spurs of the mountains closely approaching the coast as far W as Moutong, about 12 miles W of Tanjung Tolosiaje, then to Tanjung Tuladengg, the coast is low. Tanjung Tuladengg is located at the mouth of a river, and the village of Tuladengg is situated upstream.

Anchorage can be taken, in about 29m, E of the mouth of the river. The approach to the anchorage presents no difficulty as the reefs near the 183m curve show discoloration. The area within the 183m curve is full of islets and reefs; all of them show discoloration. Pulau Ilosangi and Pulau Iloluta (Iloluta) lie on the edge of the barrier reef, 3 miles S and 3.5 miles SSW, respectively, of Tanjung Tolosiaje. Pulau Dulangka lies close within the barrier reef, 6 miles SW of Pulau Iloluta and Pulau Lalaijo (Lalaijo) lies close within the 183m curve, 2 miles SSW of Moutong.

Off-lying Islets and Dangers

8.22 There are several known dangers lying outside the 183m curve. These dangers lie on plateaus and are separated by deep water. **Pulau Panabean** (0°17'N., 121°15'E.), the farthest S of these islets is marked by a light and lies on the NE end of a large reef, 10 miles SSE of Tanjung Tuladengg. The reef extends 2 miles SSW from the islet, then bends W for 4 miles. Some parts of the reef dry, and on the other parts there are depths of less than a meter. Pulau Maluangi, 1.5 miles N of Pulau Panabean, is surrounded by a reef that is steep-to except on the SW side. A large reef extends N from a position 2.5 miles W of Pulau Maluangi.

A high, bare sand flat lies 1 mile SE of Pulau Dulangka.

8.23 Moutong (0°27'N., 121°14'E.) is the only village of importance along this stretch of coast. The village can be recognized by the numerous houses and by a small mosque. A light is shown at the mouth of a small river.

The entrance to the anchorage off Moutong leads E of Pulau Maluangi and W of Pulau Lalaiyo. A reef, with a least depth of 1.2m, lies 0.5 mile N of Pulau Lalaiyo. The reefs to the W show poor discoloration.

Anchorage can be taken, in 20 to 29m, S of Moutong, keeping clear of the numerous reefs.

There is a jetty at Moutong for discharging oil products with a depth alongside of 6.4m. Vessels up to 700 dwt and 60m long can berth. A light is shown near the base of the jetty.

Tanjung Santigi (0°23'N., 120°54'E.) lies about 15 miles W of Tanjung Tuladengg. From Tanjung Tuladengg to Tanjung Sempinit, 5 miles W, the coast is low with sand beaches, then it is grown over with mangroves to Tanjung Santigi.

Mogogondo is a village at the head of a bight, 6 miles WNW of Tanjung Sempinit. A steep rocky hill, 31m high with a rosy color, is located on the coast SW of Mogogondo, and two 131m peaks are located behind Mogogondo. Neither the hill or the two peaks are charted.

Pulau Sama (Sama) is an islet lying on a reef 5 miles SSE of Tanjung Santigi. The approach to the anchorage off Mogogondo through the barrier reef can be made with the rose-colored peak SW of Mogogondo in line with the of the two 131m peaks bearing 039°. This passage is NW of Pulau Sama, leading between two reefs which dry and are plainly marked by discoloration when covered.

Anchorage can be taken, in a depth of 20m, S of Mogogondo.

The inner passage between Tanjung Tuladengg and Mogogondo is not recommended since unknown dangers may exist.

Numerous dangers lie off the coast between Tanjung Santigi and Tanjung Pelasa, 29 miles W. The charted 183m curve does not sharply define the outer limits of the reefs as is generally the case throughout Teluk Tomini.

Vessels without local knowledge are advised to keep outside the charted 183m curve. At night keep S of the parallel 0°10'N.

Coral islets and reefs lie along and inside the edge of the 183m curve and are plainly marked by discoloration.

The islets are all low coral islets with trees and are visible at distances up to 13 miles.

Pulua Olua (0°22'N., 120°49'E.), the largest of these islets, lies about 5.5 miles WSW of Tanjung Santigi.

Pulau Saluton (Saluton) lies 10 miles WSW of Pulau Olua, and Pulau Giombang (Giombang) lies 4.5 miles NNW of Pulau Saluton. These three islets make good landmarks.

Off-lying Dangers

8.24 There are several known dangers outside the 183m curve, and the danger farthest E is a reef which dries, lying about 2.5 miles SSE of Pulau Olua. A small drying reef lies about 5 miles ESE of Pulau Saluton and a 1.8m patch lies 1.75 miles S of this drying reef. Reefs lie about 1.25 miles ESE and 3.5 miles E of Pulau Saluton. A large reef, with several drying patches, lies about 4 miles W of Pulau Giombang, and between this reef and Pulau Saluton there are three other reefs. A 4m patch lies about 0.75 mile SW of Pulau Giombang.

Raaf Reef (Passi Raaf), with a depth of 0.2m, is steep-to and marked by discoloration. It lies 5.5 miles S of Tanjung Pelasa.

Tomini (0°30'N., 120°33'E.) consists of a number of small villages situated on a plain about 4 miles wide. The houses of the village, except for a few near the beach, are obscured by coconut trees. A small landing pier is situated at the village and a conspicuous warehouse is situated about 10.4 mile E. A drying reef, not marked by discoloration, and a 2.4m patch, lie 0.4 mile SE and 0.27 mile S, respectively, of the pier. A lighted beacon stands near the head of the pier. Anchorage can be taken, in 49m, W of the above dangers with the pier bearing NNE.

Teluk Tomini—Head

8.25 From Tanjung Pelasa the coast at the head of the bay trends in a general S direction about 90 miles to **Tanjung Sausu** (0°59'S., 120°30'E.), a low point that is recognizable by the tall trees that stand on it.

Kabu Kabu (Siteo) (0°15'N., 120°11'E.) is a small village situated 19 miles SW of Tanjung Pelasa. There are few conspicuous landmarks along this coast. A dark clump of trees at Tinombo, 9.5 miles SW of Tanjung Pelasa is easily recognized. It appears as an islet when seen at a distance. A dark hill, 54m high, close to the coast, rises from a position 4 miles NNE of Kabu Kabu.

The 183m curve lies 1 mile off the shore at Tinombo, and there are no known dangers outside this line.

There is a pier at the village of Tinombo, an administrative headquarters, and nearby is a conspicuous warehouse. Anchorage may be taken, in a depth of 73m, 0.5 mile S of the pier. The inshore reefs in the vicinity of the anchorage are reported to show well.

The coast between Kabu Kabu and Kasimbar, a village 25 miles SSW, has no prominent landmarks inland. The coast S of Kabu Kabu to Tanjung Lemo, a low flat point 7.5 miles SSW, is generally high. A conspicuous warehouse is situated about 2 miles SW of Tanjung Lemo.

Tanjung Sene (0°02'S., 120°05'E.), 10 miles S of Tanjung Lemo, when seen from N or S, is a prominent point covered with trees of moderate height. A light is shown from Marisa, close S of Kabu Kabu.

A barrier reef lies close inside the 183m curve along this part of the coast, but there are no charted dangers outside.

The charted dangers of the barrier reef may be seen on the chart.

8.26 **Kasimbar** (0°09'S., 120°02'E.) is a small village on the coast 7.5 miles SSW of Tanjung Sene.

Anchorage.—Anchorage may be taken, by vessels with local knowledge, in a depth of 44m, E of the village. A large drying reef lies S of the anchorage, 0.3 mile offshore, and a 3m patch lies 1.5 miles E of the village. The approach to the anchorage should be made from S by steering for the point 2 miles N of Kasimbar, bearing 342°.

The W shore of Teluk Tomini, from Kasimbar to Loji (Lodji), 41 miles SSE, is of little importance and the few anchorages are only visited by small vessels operating in the gulf.

There is no barrier reef along the 183m curve off this stretch of coast, but numerous detached reefs lie within this depth.

Tanjung Turibulu, about 9 miles S of Kasimbar, is sharply defined against the high mountains inland.

Vessels anchor about 0.15 mile from shore, steering for the mouth of a small river, S of the point, on a bearing of 235°. There is better anchorage in the small bight N of the point.

Ampibabo (0°28'S., 120°04'E.), a village about 10 miles S of Tanjung Turibulu, is situated on the S side of a point which has Pulau Dongkala (Dongkala), a wooded islet, lying off it. The islet forms a good mark and are visible from a distance of 10 miles.

Within the 183m curve, which lies 2 miles off, are a number of reefs which dry.

Labua Sore, 12 miles S of Ampibabo, is a basin formed in a coastal reef affording a safe and sheltered anchorage for small vessels. The entrance is about 91m wide, with a depth of 5.5m between the edges of the drying reef and increasing to 18.3m inside.

A conspicuous, bare, yellowish colored hill, 270m high, is located close W of the basin.

8.27 **Pelabuhan Parigi** (Parigi Road) (0°49'S., 120°11'E.) is the roadstead that lies off the village of Loji (Lodji). The ruins of an old fort stand here. Parigi, a small village, stands on the shore 4 miles SW of the light structure, and is visible from seaward.

A T-head pier, with a depth of 1.5m alongside, is situated here and a conspicuous warehouse stands close N of the pier.

There is a jetty for the discharge of oil products with an alongside depth of 7.2m. Vessels up to 700 dwt and 60m long can berth.

The bottom in Pelabuan Parigi is quite steep, leaving little anchoring space in the road. Vessels with little knowledge of the area should approach from outside the 183m curve.

The coast between Loji and Tanjung Sausu, 24 miles SE, provides no landmarks with the exception of Gunung Pondindilisa (Pondindilisa), which rises to a height of 401m, 5 miles W of Tanjung Sausu. This peak is conspicuous from the NW.

Tanjung Makatata and Tanjung Pondindilisa are located 3 miles SSE and 15 miles SE, respectively, of Loji. These two points are low, but they can be recognized by tall trees.

The 183m curve extends from 3 to 5 miles offshore from Tanjung Makatata and Tanjung Pondindilisa. Along and inside this line are reefs and shoals which discolor.

There are few wide openings in the barrier reef.

A small drying reef lies 4.5 miles N of Tanjung Sausu. A 0.5m patch lies 0.5 mile WNW of the drying reef.

Teluk Tomini—South Coast

8.28 The coast between Tanjung Pangkalaseang and **Tan-**

jung Anau (0°34'S., 123°03'E.), a low point 25 miles WNW, is generally high and steep with several isolated mountains inland.

Gunung Tompotiga, a massive mountain plateau, 1,590m high, rises 8 miles SSE of Tanjung Anau.

The 183m curve lies from 1 to 4.5 miles offshore along this stretch of coast. There are no known dangers outside this line.

Tanjung Lonsio (0°39'S., 123°25'E.), 4 miles NNW of Tanjung Pangkalaseang, rises perpendicularly from the sea. A reef lies 1 mile offshore midway between these two points.

Pulau Ampat, a group of four low coral islets, lies near the coast, 3.5 miles NW of Tanjung Lonsio. Three of the islets are covered with vegetation and may be seen from some distance.

Boalemo, a small village, stands on the W side of a bight, 16 miles WNW of Tanjung Lonsio.

Anchorage may be taken off this village, in 16 to 18m, with a prominent hillock about 1 mile S of the head of the bight, bearing 180°.

Pulau Mantawatudaa (0°31'S., 123°06'E.), 4 miles NE of Tanjung Anau, is a low islet covered with vegetation that lies close inside the 183m curve. A smaller islet lies midway between this islet and the mainland.

Pulau Sendiri (0°29'S., 122°56'E.), a vegetation covered islet, lies about 8.75 miles NW of Tanjung Anau.

From Tanjung Anua to Tanjung Batu Hitam (Tanjung Batuhitam), 21 miles WSW, the coast continues high and steep. The E extremity of a small peninsula lies 6.5 miles WSW of Tanjung Anau, and on its NW extremity there is a prominent dark-colored hill, 90m high. A sharp peak, 549m high, rises 4 miles S.

The 183m curve lies 16 miles offshore N of Tanjung Batu Hitam. There are several charted reefs on and within the 183m curve. A 9m shoal lies 1 mile outside this line about 13.5 miles NNE of Tanjung Batu Hitam.

Vessels bound for Teluk Poh from the E may cross the 183m curve about 5.5 miles W of Pulau Sendiri, on a course of 220°, and cross the 183m curve again about 2.5 miles W of Tanjung Batuhitam. Only vessels with local knowledge should attempt this passage.

Kepulauan Togian

8.29 Kepulauan Togian are a group of islands that front the S coast of Teluk Tomini. They lie with their W extremity 67 miles W of Tanjung Batuhitam, extending 43 miles ENE and then SE to Tanjung Batu Hitam.

The principal islands from E to W are Pulau Puah, Pulau Waleabahi, Pulau Waleakodi, Pulau Talatakan, Pulau Togian, Pulau Batudaka, and Pulau Unauna.

Pulau Puah (0°30'S., 122°34'E.) lies 12 miles NNW of Tanjung Batu Hitam. It is a hilly island with the highest part at the SW extremity. The water between Pulau Puah and Tanjung Batu Hitam is encumbered with numerous reefs and small islets.

Anchorage may be taken off the SE coast of Pulau Puah, in a basin in the coastal reef, in a depth of 29m.

Selat Walea (0°25'S., 122°25'E.), a deep strait, is the usual route from Gonontalo, on the N, to the S shore of Teluk Tomini, S of Kepulauan Togian. The strait is about 1.5 miles wide and passes between a 5.8m patch on the N side, and a plateau that extends 7 miles NW from Pulau Puah, on the S side. A light is shown from a black metal beacon standing on a drying reef on the S side of the strait. Tide rips are frequently seen in Selat Walea.

8.30 **Pulau Waleabahi** (0°15'S., 122°18'E.) is a long, hilly island that lies on the N side of the Selat Walea. Its coasts are steep and there are five peaks on the island which are useful for fixing a vessel's position. The highest summit, 448m high, rises 1.75 miles S of Tanjung Komali.

Tanjung Kramat, about 2.75 miles ESE of Tanjung Komali, is a rocky peninsula with two hillocks. A bay that affords anchorage lies on the W side of this peninsula. A ridge, with a depth of 5.8m over the outer end and less water inside, extends 0.5 mile E from the W entrance of this bay, and a rocky islet lies on the ridge 0.2 mile from its outer extremity. A 3.4m patch, marked by discoloration, lies in the entrance of the bay about 0.5 mile NW of Tanjung Kramat.

Anchorage may be taken, by vessels with local knowledge, just within the entrance to the bay, in a depth of 46m, mud and sand.

Pulau Waleakodi (0°15'S., 122°11'E.) lies on the W side of a deep strait that separates it from Pulau Waleabahi. This island, which is hilly, rises to a height of 397m on its SW side.

The strait between Pulau Waleakodi and Pulau Waleabahi is deep throughout and there are many landmarks for fixing a vessel's position. This passage should only be used by vessels with local knowledge.

Pulau Taoleh and Pulau Malingi lie 1.5 and 3 miles W; respectively, of Pulau Waleakodi. A wide coastal reef surrounds the island. The N coast of Pulau Malingi is steep and rocky with some small beaches. Pulau Langkara (Langkara), a hilly island 142m high, lies 0.75 miles SW of Pulau Malingi.

8.31 **Pulau Talatakan** (0°21'S., 122°06'E.) is a hilly island separated from the SE extremity of Pulau Malingi by a channel 0.75 miles wide. The rocky points along the E coast of the island are easily recognized by the islets lying off them. Three islets lie on a drying reef close N of Tanjung Uting, the SE extremity of the island, and another islet which is a useful mark lies 1 mile farther NE. Pulau Towoh, a small islet, lies off E central part of the island.

The passage E of Pulau Talatakan can be used with safety. From S, the 183m curve is crossed through an opening in the barrier reef about 3.5 miles ESE of Tanjung Uting with Pulau Towoh just open SW of the E extremity of Pulau Malingi, bearing 330°. This leads between two drying reefs near the 183m curve. When the NW extremity of the islet 1 mile NNE of Tanjung Uting is in line with the SE extremity of the three islets 0.3 mile NE of Tanjung Uting bearing 209°, steer 000° for 3.25 miles. Pass 0.6 mile W of a small drying reef, lying 3 miles SE of Pulau Towoh and 0.25 mile E of a similar reef lying 2 miles SSE of the same islet. These reefs are usually marked by discoloration. A 4.9m patch lies 1.5 miles E of Pulau Towoh. As soon as the SW extremity of Pulau Taoleh is in line with the NE extremity of Pulau Malingi, bearing 316°, steer this course and then proceed N, passing on either side of Pulau Taoleh.

Pulau Togian (0°23'S., 121°57'E.), the middle of three islands, rises to a height of 542m. The N coast of the island is high, precipitous, and rocky. Numerous islets and dangers lie off the coast. Teluk Kilat (Kilat Bay), in the W part of the N coast, affords spacious anchorage for vessels with local knowledge, in depths of 40 to 49m. Reefs project from each entrance

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Panoramic view of Pagimana

point, reducing the width.

Teluk Togian (Togian Bay), on the S side of Pulau Togian, is a narrow inlet that can be entered by vessels with local knowledge. The drying areas on each side of the channel are marked by discoloration. Anchorage can be taken, in 16m, off the village that lies at the head of the bay.

Pulau Mogo besar (Mogo Besar) lies on a reef extending 1 mile SE of the W entrance to Teluk Togian. A 1.5m patch, barely marked by discoloration, lies about 0.5 mile S of the E extremity of Pulau Mogo besar.

To enter Teluk Togian, steer for the SW extremity of Pulau Mogo besar on the heading of 019°, then round the S side of that islet. Alter course to pass along the NE side of Pulau Mogo besar between the reefs on either side.

When abreast the N point of Pulau Mogo besar, vessels may steer NW on the conspicuous high point on the E side of the bay, then mid-channel to the anchorage.

8.32 Pulau Batudaka (0°30'S., 121°47'E.) lies close W of Pulau Tagian and is separated from that island by a narrow channel. The island is hilly but has no conspicuous landmarks. On the N and W coasts, the barrier reefs run from 1.5 to 3 miles from the coast, with several drying places of sand and coral. The S side of the island rises steeply out of the sea and forms a large bight. The 183m curve runs about 0.5 mile offshore.

Batudaka, a village on the N extremity of the island, is a collecting point for the many coconut plantations on the island.

The passage to the anchorage off Batudaka lies between Pulau Pohon Ndongo (Pohon Ndongo), a hilly island 2 miles WNW of Batudaka and Pulau Kadidi (Kadidi), a steep rocky island close off the NW coast of Pulau Togian. A conspicuous group of rocks is located on the NW side of a drying reef 1.5 miles NW of Pulau Pohon Ndongo. Two hilly islets lie 0.5 mile NW of Palau Kadidi and another islet, conspicuous when seen from the NW, lies about 1.25 miles NE of the two hilly islets. A 1.8m patch lies 2 miles ENE of Pulau Pohon Ndongo. The patch is marked by a beacon, and a beacon marks the N extremity of a reef extending N from Batudaka.

To approach the anchorage off Batudaka, cross the 183m curve 2.5 miles N of Pulau Pohon Ndongo with the N beacon bearing 135°. This course is held until the palms on the SW point of Pulau Kadidi are abeam, then alter course to 123°, passing N of a 7m patch lying about 0.5 mile NW of the N beacon. When the N beacon is in line with the SE side of Pulau Pohon Ndongo, bearing 226°, vessels can then head for the anchorage off the village.

Vessels can anchor, in 20m, when the S beacon is in line with the conspicuous group of rocks NW of Pulau Pohon Ndongo, bearing 287°.

Off-lying Island and Dangers

8.33 Pulau Taupan, 2 miles SW of Pulau Batudaka, is a densely wooded island 83m high, surrounded by a drying coral reef.

The only known dangers lying outside the 183m curve N and W of the main group are two atolls. Pasir Tengah (Karang Tengah), an atoll whose edges dry, lies 4 miles off the NW coast of Pulau Batudaka. An atoll, whose edges also dry, lies 1.5 miles E of Karang Tengah.

Pulau Unauna (0°10'S., 121°38'E.), which lies 17 miles NW of Pulau Togian, is steep-to and covered with vegetation. In July 1983, the volcano on Pulau Unauna erupted.

The charted 183m curve lies close off the island. The only dangers are a reef, with a depth of 2.4m, lying 1 mile SSE of Unauna, a village on the NE coast, and some reefs in the roadstead off the village.

A reef, which dries, extends SE from the N end of Unauna, and two detached reefs, with depths of less than 1m, lie within 0.2 mile of the shore off the S end of the village.

Unauna is the administrative headquarters for the whole of Kepulauan Togian. There is a small pier near the flagstaff at the N end of the village.

An area within 3 miles of the coast surrounding Pulau Unauna has been declared a closed and prohibited area. A light is shown from the NE extremity of the island.

The S coast of Teluk Tomini, W of **Tanjung Batu Hitam,** (0°40'S., 122°43'E.) is a low spur extending from a hill 214m high, standing a short distance within the point.

Teluk Poh, entered S of Tanjung Batu Hitam, is surrounded on all sides by high mountains. The N side of the bay is steep-to, but on the S side the 183m curve lies up to 2 miles offshore. Several reefs, with a least depth of 0.9m, lie on the 183m curve N of the village of Dindinga.

The NW of these reefs is marked by a beacon. This village lies S of Tanjung Batu Hitam.

8.34 Pagimana (0°47'S., 122°39'E.) (World Port Index No. 52180), about 6.5 miles W of Dindinga, is a village on the S side of an inaccessible lagoon. It is an important trading center. A fishing village, built on piles, is situated on the N entrance to

a basin in the coastal reef off the village.

Vessels remaining a short time, anchor within the reefs, in a depth of 46m, or, in a depth of 55m, 0.6 mile NE of the stone pier at Pagimana. Sheltered but confined anchorage may be taken in the basin in the coral reef.

A light is shown near the base of a small pier. A ferry berth, 60m long including dolphins, is used by fast ferries. The Asphalt Terminal has a 130m long berth for dirty products handling.

The coast W of Pagimana to Tanjung Api, about 60 miles distant, is hilly with mountains rising a short distance inland.

Gunung Abasong (0°48'S., 122°25'E.) rises to a height of 780m, 14 miles W of Pagimana. This peak is the only important landmark on this coast.

The only known dangers outside the 183m curve along this part of the coast are **Karang Kabini** (0°48'S., 122°06'E.), a small reef which dries, lying midway between Pagimana and Tanjung Api, and 3.5 miles WNW of Bunta is a village and **Pulau Bukabuka** (0°45'S., 121°45'E.), a heavily-wooded island that rises to a height of 135m, 7 miles NE of Tanjung Api. The island is marked by a light.

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Pagimana Ferry Berth

Bunta (0°50'S., 122°09'E.), an important place for the trading of copra and forest products, is situated on the N side of a small bay, 30 miles W of Pagimana. Pulau Paniki (Paniki), lying on a drying reef, is a good mark in the approach to the anchorage. There is a lighted beacon on the NE side of the bay.

Anchorage may be taken, in a depth of 55m, 0.1 mile off the pier at Bunta.

There are three villages that lie on the shore of the bight between Bunta and Tanjung Api, 30 miles W. Tobelombang, Balingara, and Sabo lie 12 miles SW, 20 miles, and 23 miles WSW; respectively, of Bunta. They are occasionally visited by small vessels, but the anchorages are so near the shore that hawsers to the shore are necessary. There is a small pier at Tobelombang.

8.35 Tanjung Api (0°48'S., 121°39'E.), marked by a light, is the first distinctive feature of land W of Teluk Poh. The land within the point rises to a flat summit 555m high, with a wide low strip of land between the summit and the mountains inland.

Labuan Blanda (0°51'S., 121°34'E.), on the W side of the low land S of Tanjung Api, affords anchorage to vessels with local knowledge close to the shore E of Ampana, a village, in a depth of 55m. There is a lighted beacon at Ampana.

There is an oil jetty at Ampana with a depth alongside of 7m. It can handle vessels up to 1,200 dwt and 70m long.

The S shore of Teluk Tomini between Tanjung Api and Tanjung Sausu, 70 miles W, forms a wide bay generally known as Teluk Poso. The shores of the bay are mostly steep with several prominent summits.

On the E side of the bay a dome shaped hill, 237m high, rises near the village of Bongka, 20 miles SW of Tanjung Api. A prominent mountain, Kandela, is a steep, rocky wall in the mountains immediately behind the narrow strip of land on which the villages stand, about 19 miles SW of Bongka.

Gunung Untu Jowi (1°22'S., 121°11'E.) rises to a sharp peak, 1,002m high, 2.5 miles inland, about 7 miles SW of Kandela. Along the S shore of the bay the high mountains inland appear as a single continuous mountain ridge with a flat upper surface. Gunung Tongku (Tongku), 654m high, 22 miles WSW of Untu Jowi, is the farthest E of three peaks, and Gunung Lebanu (Lebanu), 450m high, 5 miles SW of Gunung Tongku, is in the form of a beehive. These peaks are conspicuous at a distance of 40 miles.

A small isolated reef with a least depth of 0.9m, lies 1 mile offshore about 36 miles SW of Tanjung Api.

Karang Lalanga (1°02'S., 120°41'E.) is a large drying reef, always marked by discoloration, lying 10 miles ESE of Tanjung Sausu. It is steep-to except on its E side where there are three small drying reefs and a 2.4m patch. Another small reef lies 1 mile S of Karang Lalanga.

Haarlemmermeer (Karang Laut) (0°46'S., 120°55'E.), 28 miles NE of Tanjung Sausu, is a coral reef which partly dries, marked by surf and discoloration when covered. A shoal, with a least depth of 4.9m, lies 3 miles NNW of Karang Laut.

8.36 Todjo (Tojo), a village 34 miles SW of Labuan Blanda, lies on the S bank of a river. An administrative building stands in the middle of Todjo, and close to it is a mosque. Anchorage may be taken off the village of Todjo, in a depth of 27m. Kandela is a good landmark in approaching the anchorage.

Banano, a small village, lies at the head of a bight 5 miles SSW of Todjo.

Anchorage may be taken about 0.25 mile NW of the village, in depths of 26 to 31m. A detached reef, which dries, lies about 0.4 mile NNW of Banano.

Tanjung Lemo (1°24'S., 121°02'E.), lying 7.5 miles SW of Banano, is a low point fringed by a reef which extends 0.5 mile N. On the N edge of the reef there is a rock which dries. A reef filled bight lies E of Tanjung Lemo, and a barrier reef fronts the point along the 183m curve.

Tanjung Karawasa, a rocky point, lies 12 miles WNW of Tanjung Lemo and Tanjung Tabawo, 2.75 miles farther W. Tanjung Putia, 2.5 miles SW of Tanjung Tabawo, is the NE entrance point of a small bay where the village of Poso lies. Tanjung Pemandingi, the W entrance point of the bay, lies 1.75 miles SW of Tanjung Putia.

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The Sungai Poso

8.37 **Poso** (1°22'S., 120°45'E.) (World Port Index No. 52140), the seat of a civil administrator, is situated on the E bank of the Sungai Poso. The road off Poso is entirely exposed to N winds.

The oil jetty at Poso has a berthing length of 170m including dolphins, with an alongside depth of 5.6m. It can handle vessels 70 to 130m long and 1,200 to 6,500 dwt. A light is shown near the foot of the jetty.

The Barge Jetty, with a berthing length of 102m long including dolphins, accommodates barges. The General Cargo Quay is 100m long and handles general cargo.

The depths from shore rapidly increase and vessels should anchor, in a depth of 69m, 0.25 mile N of the entrance of the river. Current sometimes sets out strongly from the river.

Mapane, a village about 5 miles SW of Poso, is conspicuous from seaward. The anchorage, in 60m, lies 0.2 mile NE of a prominent tree near the village. The depths decrease rapidly toward shore.

Teluk Tambarana, on the W coast of Teluk Poso, is seldom visited. The bay is fronted by a barrier reef and one of the reefs, lying 2.5 miles SE of **Tanjung Tambarana** (1°11'S., 120°35'E.), with a depth of 0.3m, is marked by a beacon. There is an oil jetty at Poso with an alongside depth of 5.6m. It can handle vessels 70 to 130m long and 1,200 to 6,500 dwt. A light is shown near the foot of the jetty.

The depths from shore rapidly increase and vessels should anchor, in a depth of 69m, 0.25 mile N of the entrance of the river. Current sometimes sets out strongly from the river.

Teluk Tambu, 9 miles NNW of Tanjung Tambarana, is easily recognized by a white sandy beach on its N side.

Anchorage is available, in a depth of 31m, in the entrance of the bay.

Tanjung Sausu lies 3.25 miles NNW of the N entrance point to Teluk Tambu.

Pilotage.—Pilotage is not compulsory, however vessels should send their ETA through Jakarta radio 10 days, 3 days, 48 hours, and 24 hours prior to arrival stating arrival draft and last port of call.

Kepulauan Sula and Kepulauan Banggai

8.38 These island groups lie off the E coast of Sulawesi, S and SE of Tanjung Pangkalaseang. The island groups are described from E to W and from N to S.

The islands are bound on the N by the Molucca Sea and on the S by the Banda Sea. The W islands of Kepulauan Bangaai are separated from Sulawesi by Selat Peleng.

Kepulauan Sula comprises three large islands of Pulau Mangoli (Mangole), Pulau Sanana (Sanana), and Pulau Taliaboe (Taliabu), with a number of smaller islands. These islands are high, bold, fertile, and thickly wooded. The NW extremity of Pulau Taliaboe lies about 70 miles SE of Tanjung Pangkalaseang on Sulawesi.

Pulau Taliaboe and Selat Capalulu are described in this volume. For the islands that lie E of Selat Capalulu, see Pub. 164, Sailing Directions (Enroute) New Guinea.

Kepulauan Banggai (Banggai Archipelago), separated from Kepulauan Sula by Selat Salue Timpaus (Greyhound Strait), includes Pulau Peleng and the island to its SE and S.

Pulau Peleng is separated from Sulawesi on its W and N sides by Selat Peleng. Pulau Peleng is a mountainous and thickly wooded island with an irregular outline forming many bays.

When coming from the N, a conical peak 558m high in the E part of the island, is conspicuous. Pulau Sago (Sago), the southernmost island of the group, is an excellent mark for approaching Kepulauan Banggai from the SW and from the SE, the islands at the S entrance of Selat Salue Timpaus provide more than enough landmarks for the approach.

Pulau Taliaboe (1°50'S., 124°50'E.), is separated from Pulau Mangoli on the E, by Selat Capalulu (Tjapaloeloe Strait).

The N coast of Pulau Taliaboe extends from **Tanjung Fatoekoemboe** (Tanjung Fatukumbu) (1°47'S., 125°19'E.) to Tanjung Marikasoe (Tanjung Marikasu), 56 miles W. This coast has numerous spurs running down to the sea from the mountain and hills making the coast tolerably high.

Except near the E end of the N coast, the 183m curve lies between 4 miles and 7 miles offshore. The depths within this line are irregular, with a number of shoal heads and some islands. Unless necessary, vessels passing this coast should keep outside the 200m curve.

8.39 **Pelabuhan Tubang** (1°45'S., 125°06'E.) provides an anchorage that also serves as the loading berth for small vessels. The bay is entered during daylight hours and local knowledge is essential.

From Tanjung Fatoekoemboe to Tanjung Pohonbatoe (Tanjung Pohonbatu), 13 miles WNW, the coast is indented by three bays where anchorage can be taken in the South Monsoon. The two E bays, 2 miles and 7 miles WNW of Tanjung Fatoekoemboe, provide anchorage in the Northwest Monsoon.

The coast from Tanjung Pohonbatoe to Tanjung Laoe (Tanjung Lau), 15 miles W, is also indented with several bays. At Tanjung Marikasoe, 29 miles farther W, the coast is made up of dunes covered with some vegetation and bordered by a sandy beach. Anchorage can be taken almost anywhere along this part of the coast during the Southeast Monsoon.

The S coast of Pulau Taliaboe extends from **Tanjung Ndoloedeoe** (Tanjung Ndoludeu) (1°54'S., 125°19'E.), the SE extremity of the island, to Tanjung Merah, 56 miles distant, the SW extremity. Tanjung Ndoloedeoe is low and sandy with hills rising close within.

In the bights on either side of Tanjung Kasika, a rocky point 13 miles W of Tanjung Ndoloedeoe, the shores are sandy beaches. A conspicuous hill, 353m high, is located 1 mile N of Tanjung Kasika and a conspicuous hill, 242m high, is located 1 mile inland, 5.5 miles ENE of Tanjung Kasika.

8.40 Tanjung Kona (1°56'S., 125°01'E.), 6 miles SW of Tanjung Kasika, is the W entrance of the bight that lies between the two points. Mantarara, a small village, lies at the head of the bight.

The coast W of Tanjung Kona to Tanjung Pastoeri (Tanjung Pasturi), 7 miles distant, is low and sandy with the hills approaching nearer the coast. A hill, 429m high, rises 1 mile N of Tanjung Pastoeri.

In the bight between Tanjung Pastoeri and Tanjung Wojo, 12 miles WSW, there is a sandy beach interrupted in places by rivulets during the rainy season. Pulau Wojo, a small islet about 20m high, lies close to the coast 1 mile E of Tanjung Wojo. The islet is conspicuous from the E and W. A 4.9m patch and a 4.3m patch lie 0.75 mile ENE and 0.5 mile NE, respectively, of Pulau Wojo.

Anchorage may be taken, by vessels with local knowledge, in a bight immediately NE of Pulau Wojo, in a depth of 29m. Care must be taken to avoid the patches described above.

Kawaloe (Kawalu), a large village 9 miles WSW of Pulau Wojo, is a local administrative headquarters. A hill 1.5 miles W of Kawaloe can be easily recognized as there are some reddish patches of rock.

Tanjung Bo, 4 miles W of Kawalu, is a rocky point of reddish-brown color.

Tanjung Merah, the SW extremity of Pulau Taliaboe, is precipitous and of a brownish color.

The S coast of Pulau Taliaboe has no charted dangers outside the 183m curve which lies from 0.5 mile to 3 miles offshore.

The W coast of Pulau Taliaboe, from **Tanjung Marikasoe** (1°40'S., 124°24'E.) on the N, extends 22 miles S to Tanjung Merah. This coast, when seen from the N or S, appears as a monotonous tableland without any remarkable features. Ridges descend to the coast.

Tides—Currents.—A strong current, often exceeding a rate of 3 knots in the channels between the islands, is experienced off the W coast. This current is caused mostly by those in the Molucca Sea and the Banda Sea. The predominant direction of the current is S.

The 183m curve lies about 25 miles NW of Tanjung Marikasoe and closes to about 3.5 miles off Tanjung Merah. Within this line there are numerous banks, shoals, and islands which may best be seen on the chart.

From Tanjung Marikasoe the coast trends 1.75 miles SSW to Tanjung Keja (Tanjung Keya). This area is low and not easily identified. Pulau Manggoa (Manggoa) lies close offshore 5 miles S of Tanjung Keya, and Pulau Deloema (Deluma) lies 2.5 miles farther S. Pulau Limbo lies 2 miles W of Pulau Mangga. The area enclosing Pulau Deloema, Pulau Limbo, the chain of islands NE, and the bank that extends 4 miles W of Tanjung Marikasoe have not been throughly examined.

Pulau Kramat (1°54'S., 124°20'E.) lies close offshore 4 miles S of Pulau Deloema and is easily recognized. Tanjung Merah lies 8 miles SSE of Pulau Kramat.

Off-lying Islands

8.41 Pulau Masoni (1°45'S., 124°10'E.) is a low island lying 14.5 miles WSW of Tanjung Marikasoe. The passage between this island and Pulau Limbo, 6 miles E, is unsafe due to a reef with a depth of 4.6m, 2.5 miles E of Pulau Masoni, and two 4m patches within 2.5 miles of Pulau Limbo.

Pulau Sekoe (Seku), close NW of Tanjung Merah, 505m high, has a conical shape like a volcano and is prominent. Pulau Kano, lying close SE of Pulau Seku and 0.5 mile SW of Tanjung Merah, is 218m high. The channel between these two islands is only navigable by small vessels with local knowledge.

Selat Boki (Boki Strait), between Tanjung Merah and the two islands close W, is a narrow channel navigable by vessels of moderate size with local knowledge; a strong current sometimes runs through it.

8.42 Selat Capalulu (Tjapaloeloe Strait) (1°50'S., 125°19'E.) is a narrow passage separating Pulau Taliaboe on the W, and Pulau Mangoli. This passage, which runs in a N and S direction, is narrowest at the S entrance. The N entrance of the strait lies between Tanjung Fatoekoemboe and Tanjung Wayteya (Tanjung Wajteja), a rocky point 2.25 miles E. The S entrance lies between Tanjung Ndoloedeoe and Tanjung Sakomata, a low, tree covered point, 2 miles E.

The depths in the strait are generally over 16.5m and it can be navigated by large vessels. A 1.2m patch lies close to the E shore about 3.25 miles within the N entrance. A 2.1m patch lies close off the W shore and a 5.8m patch off the E coast, lie about 1.25 miles WNW and 1.25 miles NW; respectively, of Tanjung Sakomata.

Tides—Currents.—The tidal currents in the strait are of mixed character, but are predominantly semidiurnal. The maximum rate of the S current may reach 6 knots during the semidiurnal spring tides, and when the maximum rate of the N diurnal and semidiurnal tides fall together a rate of 9.5 knots may be expected. These two tides fall together in May and June and in November and December during semidiurnal spring tides. During semidiurnal neap tides, the currents in either direction will not exceed 3 knots.

In the middle and south parts of the strait there are heavy tide rips and eddies when the tidal currents are strong.

Vessels which enter the strait from the N should pass midway in the entrance and proceed southward favoring the E side. When about 3 miles within the entrance, pass 0.14 mile off the W coast, then parallel the W side of the strait, then pass about mid-channel through the S entrance.

From the S vessels should steer for mid-channel and proceed through the strait by reversing the directions given above.

Selat Salue Timpaus

8.43 Selat Salue Timpaus (Greyhound Strait) lies between Kepulauan Sula and Kepulauan Banggai, and is deep and clear

of dangers in the fairway. In the N entrance of the strait it is divided by an extensive steep-to bank, defined by the 183m curve, that is about 3 miles wide and 17 miles long running in a N and S direction. This bank has a least depth of 10.9m.

Tides—Currents.—The drift currents in the Molucca Sea and the Banda Sea indicate that either a N or S current may be expected, but it is impossible to state how far tidal influence reaches here. The current sets NNE through the strait throughout the year. A rate of 2 to 3 knots has been observed.

The E side of Selat Tempaus, **Pulau Tempau** (Pulau Timpaus) (1°51'S., 124°00'E.), 25 miles SW of the NW extremity of Pulau Taliaboe, is a wooded islet rising to a height of 143m near its center. An isolated hill, 88m high, is located in the N part of the island. The S part is lower with a sandy coast.

A ridge, with depths of less than 14.6m and a least depth of 3.9m, extends 10.5 miles SSE of Pulau Tempau.

A 10m patch lies 9.5 miles SSE of Pulau Tempau. Vessels crossing this ridge are cautioned to keep 1.5 miles S of Pulau Tempau where there is a least depth of 14m.

The W coast of Pulau Taliabu, seen from Selat Salue Timpaus, appears as a high tableland without any noticeable features. Pulau Kano and Pulau Seku are useful landmarks when approaching the strait from S.

Kepulauan Banggai

8.44 The islands, dangers, and shoals that comprise Kepulauan Banggai are described in a clockwise manner from the NE extremity of Pulau Peleng. The straits, currents, and suggested approaches are described in the order of occurrence.

Pulau Peleng (1°20'S., 123°10'E.), on the NW side of Kepulauan Banggai, is thickly wooded and mountainous. The island is deeply indented by a bay on its N side and two bays on the S to within a few miles of each other, and nearly divide the island into three parts.

Tanjung Pemali (1°17'S., 123°34'E.), the NE extremity of Pulau Peleng, rises almost vertically from the sea and is easily recognized by a large rock which lies close off it. A light is shown at an elevation of 44m from a tower on the N extremity of Pulau Wowoni.

The E coast of Pulau Peleng is free of dangers except for a rocky islet NE of Sambiut (Sambioet), a village situated on the coast 8 miles S of Tanjung Pemali. Both Sambiut and Kamotokan, a village 3 miles N of Sambiut, are visible from seaward. Anchorage can be taken off Sambiut, in 37m, SSW of the islet.

Selat Kalumbangan (Kaloembangan Strait), a safe passage that separates Pulau Peleng and Pulau Banggai, is the principal route for vessels from the Molucca Sea to the village of Banggai on the W coast of Pulau Banggai. There is a strong current through the strait of 4 to 7 knots running either NE or SW.

Kalumbangan (Kaloembangan), a village on the N side of the strait, 5.5 miles SW of Sambuit, stands on the coastal reef. On the edge of the drying area in front of the village is a sandflat. There is temporary anchorage, in 20m, ESE of this flat.

8.45 **Pulau Banggai** (1°36'S., 123°31'E.) lies 1.75 miles off the SE side of Pulau Peleng. The E coast of the island is high and rocky. Pulau Potil Besar, 133m high, is a conspicuous islet lying close E of the N extremity of Pulau Banggai. The rest of the island is low with a rocky coast.

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Banggai

Teluk Lambako (Lambako Bay) lies on the W side of Tanjung Bandana Olipatan, about 7.5 miles SSE of the N extremity of Pulau Banggai. This bay affords sheltered anchorage during the Southeast Monsoon, in the S part of the bay, in about 40m.

The W coast of Pulau Baggai is low, as are the off-lying islands to the W. To-ulon Besar (To-eolon Besar) and To-ulon Kecil (To-eolon Ketjil) lie close off the NW side of the island, 4.5 miles SSW of its N extremity. Pulau Bakakang (Bakakang Eilanden), two islands lying close together about 0.5 mile SW of To-ulon Kecil, lie at the SE entrance of Selat Kalumbangan.

Banggai (1°32'S., 123°29'E.), the principal village of Kepulaun Banggai, stands at the head of Teluk Banggai, 2.5 miles ESE of Pulau Bakakang. A mosque, with a high roof, is conspicuous from a considerable distance.

Anchorage can be taken, in 12.8m, with a landing pier in line with the mosque, bearing 100°. A 6.7m patch lies about 4.5 miles WSW of Pulau Bakakang.

There is a jetty for the discharge of oil products, with a depth alongside of 6m. Vessels up to 900 dwt and 65m in length may berth.

8.46 **Pulau Bandang** (Bandang Eilanden) (1°41'S., 123°27'E.), two low islands, lie off the SW side of Pulau Banggai, 6 miles SSW of Banggai. Pulau Kenau lies close off the S coast of Pulau Banggai, 5 miles SE of Pulau Bandang.

Besar Salue (Great Saloee) (1°57'S., 123°49'E.) along with Kecil Salue (Little Saloee), close SSE, lie on the W side of Selat Salue Timpaus at the SE end of the plateau on which Kepulauan Banggai lies.

These islands when viewed from the NE, E, and SE appear as a single high ridge with sharp peaks. Besar Salue rises to an elevation of 464m; Kecil Salue rises to an elevation of 311m.

Pulau Belangan (Belangan) rises steeply from the sea to a height of 166m, close W of the N extremity of Besar Salue. Another steep-to, rocky, and wooded islet lies 1.25 miles SE of the same point.

A low wooded islet is located 0.5 mile NE of Kecil Salue, in the E entrance of the passage between Besar-Salue and Kecil Salue. Southeast and S of Kecil Salue there are large drying reefs and low islets.

Between Besar Salue, Kecil Salue, and **Pulau Sago** (Sago) (2°12'S., 123°10'E.), 42 miles WSW, there are numerous islets and reefs. Some of these islets and reefs are separated by narrow channels of 183m. Pulau Sago, about 131m high, lies on a drying reef which shows discoloration. There are some islets on the S part of the reef.

Karang Vesuvius (Vesuvius Reef) (2°06'S., 122°53'E.), the farthest W of three large steep-to drying reefs, lies about 17 miles WNW of Pulau Sago. The other two drying reefs lie 9 miles ENE and 3 miles SE, respectively, of Karang Vesuvius.

A small house, whose charted position is approximate, stands on the latter reef. All of these reefs show discoloration.

Pulau Bangkoeloe (Pulau Bankulu) (1°50'S., 123°06'E.), 14 miles NNE of Karang Vesuvius, rises to a height of 693m near its middle. Pulau Labobo, another wooded island, lies 7 miles E of Pulau Bangkoeloe.

Pulau Bongko (Bongko), a low wooded islet surrounded by a drying reef that discolors, is located 2.25 miles N of Pulau Bangkoeloe.

A bank, with a least depth of 3.7m, extends 3 miles N from Pulau Bongko. A 6.7m patch lies 5.75 miles ESE of Pulau Bongko.

Vessels approaching Banggai from the W should steer to pass about midway between the N extremity of Pulau Bangkulu and Pulau Bongko. When the vessel is directly S of Pulau Bongko, steer for Banggai passing N of Pulau Labobo.

Pulau Peleng—South Coast

8.47 **Tanjung Kembani** (1°36'S., 122°53'E.), the SW extremity of Pulau Peleng, is a low spur rising to the mountains to the N. The point is marked by a light. Several reefs and dangers lie within a radius of 5 miles of Tanjung Kembani.

Teluk Peleng (Peleng Bay), entered between Tanjung Kembani and Tanjung Patipakaman, 13 miles E, is free of dangers except near the coast. Pulau Tetapen, 107m high, is located at the head of the bay and can be seen for a considerable distance as can the villages that are in the N part. Lolantang, on the W shore 13 miles NNE of Tanjung Kembani, is the principal village in the bay.

The large dry areas and danger areas that lie off the entrance of Teluk Peleng show discoloration when submerged.

Teluk Mesamat (Mesamat Bay) (Paisoeloenoe Baai) is entered E of a point that lies 9.5 miles ESE of the E entrance of Teluk Peleng. The two bays are separated by a peninsula that rises to a conspicuous summit 306m high, near its SE extremity.

Teluk Mesamat is obstructed with several shoals in its NE part. The many shoals along the N and W sides show discoloration. Liang, the principal village in the bay, lies in an inlet on the W coast, 5.5 miles within the entrance. Pulau Bobo (Bobo), a conspicuous rocky islet, lies off the S coast about midway of the peninsula separating the two bays.

Pulau Peleng—West Coast

8.48 From Tanjung Kembani, the coast trends NW 9 miles, then 19 miles to Tanjung Batu Putih, the island's NW extremity.

The W coast of Pulau Peleng is mountainous, but the summits are difficult to identify. The 183m curve lies 3.25 miles SW of Tanjung Kembani, but closes to 0.2 mile off the W coast 16 miles farther N. There are several islands and shoal areas within the 183m curve along the SW coast.

Pulau Lesampuang (Lesampoeang) (1°30'S., 122°44'E.) is a conspicuous islet surrounded by a steep, drying coral reef. The islet lies 3 miles offshore, 10.75 miles NW of Tanjung Kembani.

Karang Thames, marked by a light and lying nearly in the middle of Selat Peleng, 6.5 miles SW of Pulau Lesampuang, is an oval-shaped steep-to coral reef which partly dries at low water. When covered, it is marked by surf and a light green coloration.

The reef has two deep basins in its center. Pulau Makailu (Makailu) is an islet, partly wooded with tall trees, and surrounded by a large dry reef. The islet lies 3.5 miles offshore, 9 miles N of Pulau Lesampuang.

Pulau Peleng—North Coast

8.49 **Tanjung Batu Putih** (1°11'S., 122°55'E.) is a steep point with two white rocky patches. The N coast, like the W coast of Pulau Peleng, is mountainous. The coast is steep outside the bays and should not be approached too closely.

Tanjung Bakalinga (1°09'S., 123°12'E.), a low, coconut palm covered point 17 miles E of Tanjung Batu Putih, is the NW entrance point of Teluk Bangkalan.

Teluk Bangkalan is entered between Tanjung Bakalinga and a point 11.5 miles ESE. The bay affords good anchorage throughout.

Pulau Bangkalan Pauno (North Bangkalan) (1°10'S., 123°17'E.), a moderately-high and densely-wooded island, lies in the middle of the entrance of the bay.

Pulau Bangkalan (South Bangkalan), also densely wooded but low and flat, lies S of Pulau Bangkalan Pauno. The two islands are separated by a deep channel free of dangers, but it is not recommended because of strong currents.

The passage either on the E or W side of the above two islands is clear of dangers. A 12m patch in the N part of the E channel is usually marked by discoloration.

A group of islands lie near the SW shore of the bay.

On the E shore of the bay, the villages of Lamobuang and Salakau lie 7 and 8 miles SSW, respectively, of the entrance. A zinc roofed building in Salakau affords a good landmark. The coastal reef in the vicinity of Salakau extends 0.65 mile NW and is steep-to.

A dome-shaped mountain, 456m high, rises at the head of the bay. A prominent peak, 558m high, rises 4 miles ESE of Lamobuang.

Tides—Currents.—The currents in the strait run either N and E or S and W.

The currents to the N and E are more frequent and stronger, sometimes attaining a rate of 2 to 3 knots. In the NE entrance, the tidal currents may attain a rate of 4 knots under the shore of Pulau Peleng.

During the night, the strait is often calm and free of wind.

Anchorage.—Anchorage can be taken about 0.4 mile N of Salakau, in a depth of 33m.

Teluk Lelomping (Lelomping Bay) is entered 1.5 miles E of the E entrance of Teluk Bangkalan.

The E entrance of the bay is a low point covered with coconut palms, 2 miles farther ESE. An island close off the W entrance of the bay is conspicuous.

A bank, with a least depth of 11m, lies 1 mile N of this island. The bank can be distinguished by its light green discoloration and often by tide rips.

Anchorage may be taken in the bay, except during N winds, in depths of 15 to 16m, 0.65 mile ENE of two rocky islets at the head of the bay. The depths decrease rapidly S of this position. The bay may be entered steering for the houses of Luwuksago, a village at the head of the bay.

Tanjung Pemali, rising almost vertically from the sea and readily identifiable by a large above-water rock, is the NE extremity of Pulau Peleng and lies 7.5 miles ESE of the entrance of Teluk Lelomping.

Selat Peleng lies between the N and W coasts of Pulau Peleng on the E, and the coast of Sulawesi between Tanjung Botok and Tanjung Menahakeh, on the N and W sides. The strait is deep and almost free of dangers. The dangers on the E side of the strait have been discussed with the W coast of Pulau Peleng. This channel is the usual route for vessels to and from Teluk Tomini, and the E coast of Sulawesi farther S.

Sulawesi—Tanjung Pangkalaseang to Tanjung Nederburgh

8.50 The coast S of **Tanjung Pangkalaseang** (0°42'S., 123°27'E.) to Tanjung Botok, 21 miles SSE and along the W side of Selat Peleng to Tanjung Maoloh, 44 miles farther WSW, is for the most part high with mountains close inland. The mountains that lie W of Tanjung Pangkalaseang and Tanjung Botok are generally hidden by clouds, but the high steep points along the coast provide useful landmarks.

South of Tanjung Maoloh the coast is low for about 32 miles, then the mountains approach the coast again. A conspicuous summit, 1,698m high, is located 20 miles WNW of Tanjung Menahakeh. A mountain range 25 miles WSW of this conspicuous peak, running in a SSE and NNW direction, is easily recognized. The northern and highest summit attains a height of 2,629m.

The coast S of Teluk Tomori (Tomori Baai) to Tanjung Nederburgh has a few conspicuous peaks that run close along the coast.

The 183m curve runs close to the Sulawesi coast from Tanjung Pangkalaseang to the S part of Selat Peleng, then it gradually extends offshore. Innumerable reefs lie inside this line from 1°33'S to the entrance of Teluk Tomori.

These reefs are generally marked by discoloration and the water is clear, but the utmost caution must be exercised when navigating in this vicinity.

From Teluk Tomori S to Nederburgh, the 183m curve lies from 2 to 6 miles offshore. The reefs inside this line also show good discoloration.

Tanjung Talabu (0°46'S., 123°27'E.), 4 miles S of Tanjung Pangkalaseang, rises perpendicularly from the sea. Karang Tetek (Batu Tetek) are two drying reefs close N of Tanjung Talabu. The heavy breakers over these reefs can be seen from a great distance. Pulau Dua are two islets lying close off the coast, 3 miles S of Tanjung Talabu. The N islet, which is larger, is about 99m high and has a sandy beach on its N side. A partly drying reef lies 0.2 mile N of the sandy beach.

Belantak (0°52'S., 123°24'E.), a large village, lies in a bight 4.5 miles SW of Pulau Dua and close SW of a bluff point fringed by a reef. There are some noticeable white rocks 0.5 mile S of the village. At the N end of the village there are some prominent warehouses and at the S end there is a mosque with a dome.

Anchorage may be taken S of the bluff point, in depths of 20 to 29m, mud and sand. With winds from seaward, there is frequently a long swell rendering landing impracticable.

Tanjung Dongolala is a high, steep point located 5 miles S of Belantak. A 4.9m reef lies inside the 183m curve, 3 miles S of Tanjung Dongolala.

Teluk Tolo (Golf Van Tolo) (2°20'S., 122°30'E.), a body of water that lies SW of Kepulauan Bangai , is bound on the W by the E coast of Sulawesi. The bay is entered from the N through Selat Peleng; the SE entrance is from the Banda Sea. Teluk Tolo is about 63 miles wide between Pulau Sago on the NE and Tanjung Nederburgh to the SW.

8.51 **Tanjung Botok** (1°03'S., 123°20'E.), 7 miles SSW of Tanjung Dongolala and Tanjung Sentigi, 3.5 miles W of Tanjung Botok, mark the NE entrance of Selat Peleng. Teluk Lamala is a large bay whose entrance is located about 13 miles NW of Tanjung Sentigi. There are depths of 20 to 51m in the bay. A shoal with a depth of 1.8m lies in the middle of the entrance. This reef is scarcely marked by discoloration.

Teluk Arjuno (Teluk Ardjuno) is a narrow inlet entered 3 miles W of Teluk Lamala. The entrance is almost closed by a reef with four islets on it, but there is a deep, narrow passage on either side.

Luwuk (0°57'S., 122°48'E.) (World Port Index No. 52220), a village, stands on the shore close N of Tanjung Tumbuk. It is an administrative center and an important collecting place for copra and forest products. The port has scheduled arrivals and departures of intercoastal vessels and periodic visits by foreign vessels.

Ferries running between Makassar and Bitung use the main pier in Luwuk. This 100m pier is T-shaped with a depth of 6m alongside and is located close E of the town.

There is a 30m long concrete wharf used by local fishing boats with a depth of 1.5m alongside.

The Pertamina Oil complex in Luwuk has a jetty, 130m long, with a depth alongside of 6.3m. It can accommodate vessels up to 6,500 dwt and 130m long. Berthing allowed during daylight hours only. **Pertamina Light** (0°56.5'S., 122°48.7'E.) is shown from a height of 10m, 1 mile NE of Tanjung Tumbuk.

Berthing is done during daylight hours.

The open road off Luwuk provides good anchorage about 0.3 mile offshore, in a depth of 45m. The anchorage should be approached with the cleft in the mountains behind the village, bearing 315°.

When a vessel is expected at Luwuk, a light is shown at a height of 15m, from the N end of the village.

Vessels should send their ETA, stating arrival draft, to their agent 10 days, 3 days, 48 hours, and 24 hours prior to arrival.

Pilotage is not available.

8.52 **Mendono** (1°08'S., 122°42'E.), a village 12 miles SSW of Luwuk, stands partly on the coast near a river and part-

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Luwuk range marker

ly on a plateau formed by a ridge from the mountains. This plateau has conspicuous light green patches.

Anchorage may be taken, in a depth of 40m, SW of the village, 0.2 mile offshore.

Luk, a village, lies at the head of a small deep bay immediately NW of Tanjung Batui, 12 miles SSW of Mendono. Anchorage is available in 44m, about 0.15 mile SE of the village.

The coast S of Tanjung Batui is low for a distance of about 35 miles, where the mountains approach the coast again. A barrier reef lies along the 183m curve from a position S of Tanjung Menahakeh, across the entrance of Teluk Tomori, to where it approaches the coast again SE of Teluk Tomori.

Tanjung Menahakeh (1°30'S., 122°23'E.), a low point which is the SW entrance of Selat Peleng, lies 16 miles SW of Tanjung Batui. Tanjung Donggi, also a low point, is located 10 miles SW of Tanjung Menahakeh. The village of Donggi is situated on the bank of a small river that enters the sea, close N of Tanjung Donggi.

Anchorage may be taken, by vessels with local knowledge, in depths of 18 to 22m E of Donggi, 0.5 mile offshore.

The village of Bua Buang (Boea Boeang) is situated in a bight about 14 miles WSW of Tanjung Donggi. A river enters the sea about 1.5 miles SW of Bua Buang.

Tanjung Damari (1°41'S., 121°56'E.) is a high point 8 miles SW of Bua Buang. The coast between these points is high. The reefs in this area may be seen on the chart.

The coast between Tanjung Damari and the village of Tirongan, 8.5 miles SW, is steep, rocky, and forms several bays. A few islets lie on the coastal reef. South of Tirongan to Tanjung Bea, 16 miles distant, the coast is low, swampy, and inaccessible. The principal village along this stretch is Tukala (Toekala), 3.5 miles SSW of Tirongan, which can be recognized by its

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Luwuk—Red and white tower and the Luwuk Mosque

flagstaff.

Tiaka Marine Terminal (1°49'S., 121°59'E.) is an offshore facility for the production, storage and off-loading of crude oil. The terminal consists of the FSO Raisis, berthed at a barge lying alongside a jetty. The jetty is on the N end of a reclaimed atoll, which is 400m in length and 200m wide, linking the flare stack with the FSO jetty. The FSO is oriented 215°-035°.

Depths—Limitations.—The least depth alongside the terminal is 18m. Vessels up to 36,000 dwt, with a maximum loa of 180m and a maximum draft of 12.5m, can be accommodated.

Pilotage.—Pilotage is compulsory. Pilots should be requested at least 2 hours prior to arrival. The pilot will board 2 to 3 miles SE of the terminal, near position 1°51'S, 122°01'E..

Regulations.—Main engines must be maintained ready for immediate departure in the event of an emergency. Disposal of oily waste or refuse overboard is prohibited.

Teluk Tomori

8.53 Teluk Tomori (Tomori Baai) is entered between **Tanjung Bea** (1°58'S., 121°38'E.) and Tanjung Bahuembelu (Tanjung Bahoembeloe), 13.5 miles SSE. There are several dangers in the bay which has general depths of 37 to 62m. Inside the bay are several smaller bays, the principal ones being Teluk Tambayoli (Tambajoli Baai) at the head and Teluk Lambolo (Lambolo Baai) on the SW side. The water in these two bays is exceptionally clear.

The shores of the bay and the islands within the bay are sparsely inhabited. The land on either side of the entrance is low, but elsewhere in the bay it is mountainous except at the head of Teluk Tambayoli.

The largest island in the bay rises to a height of 602m and lies in the entrance of Teluk Tambayoli. Essentially, the several islands in Teluk Tomori may be divided into two main groups. One group in the outer part stretches across the bay in an E and W direction. The other group runs in a N and S direction and divides Teluk Lambolo into two parts.

Tanjung Onematubu (Tanjung Onematoeboe) (1°57'S., 121°33'E.), 3 miles W of Tanjung Bea, is also low. A light is shown from a 16m high black and white banded tower on Tanjung Mposo, 2 miles W of Tanjung Onematubu. Good anchorage is found near the edge of the bank off the mouth of a small river, 5.75 miles NW of Tanjung Onematubu.

In Teluk Tambayoli there is anchorage, in 18.3 to 22m, at a suitable distance from the mouth of the Sungai Bayoli (Sungai Bajoli). This river enters the bay in its N extremity.

Teluk Lambolo is entered between a point 6 miles SSE of **Sungai Bayoli** (1°53'S., 121°21'E.) and a point 2.5 miles further SE.

8.54 Kolonodale (1°59'S., 121°20'E.) (World Port Index No. 52230), a village situated on the W side of Teluk Lambolo, 5 miles within its entrance, is an administrative district.

There is a pier which is suitable for boats at all times. A prominent white customs house stands close N and the village is marked by a light.

The Kolonodale Dry Terminal, a general cargo quay 149m in length with an alongside depth of 4.3m, is used for general cargo and ferries. The Kolonodale Oil Terminal consists of the Pertamina Oil Jetty, 146m long with alongside depths of 6.4 to 7.6m, can accommodate vessels up to 900 dwt, with a maximum loa ofand a maximum draft of 6.5m.

Anchorage.—Anchorage may be taken, by vessels with local knowledge, 0.15 mile E of the pier, in depths of 11 to 13m.

Directions.—To approach Kolonodale from the N, a vessel will cross the 183m curve close N of a beacon standing on the N end of a reef (1°57.6'S., 121°51.8'E.), 14 miles E of Tanjung Bea. Bring this beacon astern, bearing 080°, until an uncharted hill, 180m high, located on the coast 2.5 miles NW of Tanjung Lingkobu is sighted on bearing 260°, which is the course to be steered.

When the summit of an islet 9 miles NW of Tanjung Lingkobu bears 282°, steer that course. When the small islet charted 1.5 miles offshore, 7 miles WNW of Tanjung Bea, is in range with the middle of the large island that fronts Teluk Tambayoli, steer NW on that mark. When near the small islet, the front mark above, pass E and then bring the islet on the coastal reef off the NE point of the large island above, in range with the projecting point about 3.25 miles SE, bearing 312°. Continue on the last mark until the NE point of the large islet in the mouth of Teluk Lambolo bears 265°, then steer for Teluk Lambolo on that mark. Steer for the anchorage off Kolonodale by passing E of the island group that divides Teluk Lambolo.

Vessels that approach the bay from S steer a course parallel to the coast until abeam of Tanjung Dongkala, 12 miles SE of Tanjung Bahumbelu. When Tanjung Bea bears 320°, steer that course taking due note of the reefs until the 282° mark described above comes in range, then proceed as previously described.

The Sungai La, one of the largest rivers in central Sulawesi, discharges into the mouth of Teluk Tomori, 9 miles SE of the E entrance point of Teluk Lambolo. The N arm of the river has depths of 1.5 to 1.8m.

Tanjung Lingkobu (Tanjung Lingkoboe) (2°03'S., 121°32'E.) is located on the S shore of Teluk Tomori, 3 miles SE of the mouth of Sungai La. The bight formed between Tanjung Lingkobu and Tonjung Bahumbelu, 12 miles SE, is free of dangers except for a drying reef, 0.75 mile W of Tanjung Ba-

humbelu.

Tanjung Dongkala (2°18'S., 121°49'E.) lies 11.5 miles SE of Tanjung Bahumbelu. South of the point there are a few conspicuous peaks, and the 183m curve lies close to the coast to Tanjung Losoni, 26 miles SSE. The isolated reefs within the 183m curve show good discoloration.

Vessels can anchor off Wosu (Wosoe), a village about 3.5 miles S of Tanjung Dongkala, in 18 to 22m, with the middle of the village bearing 225°, taking care to avoid four drying reefs and rocks lying 0.4 mile E of the village.

8.55 Bungku (2°33'S., 121°58'E.), a village with considerable trade in forest products and an administrative center, lying 13.5 miles SE of Wosu, may be identified at a great distance by Gunung Kondeh (Kondeh), 576m high, 1.5 miles inland. The village of Bungku is hidden by coconut palms. There is a stone pier extending NE from the shore. There is a break in the barrier reef, about 0.3 mile wide, NE of the pier. The reefs are steep-to and the small detached 2.1m patch on the N side of the reef is not easily seen.

Anchorage, open to E and S winds, is available, in 29 to 44m, NE of the head of the pier.

Losoni, a small village, lies in a small bight about 5.25 miles SSE of Bungku. Only a few houses are visible from seaward. Two large detached reefs, which dry in places, run parallel to the coast NE of Losoni. The reefs, which lie about 1 mile offshore, have a deep passage between them about 0.4 mile wide. There is good anchorage, in 29m as far S as possible in the bight between the reefs and the shore.

8.56 Tanjung Losoni (2°40'S., 122°02'E.), 3.75 miles SSE of Losoni, is steep, rocky, and can be identified by three hills, the highest with an elevation of 214m. A reef, which dries, extends from the coast for 2 miles NW of the point. The point is marked by a light.

In the bight between Tanjung Losoni and Tanjung Laroga, 9.5 miles SSE, there is a strip of land along the coast. The mountains lie a short distance inland. Two large villages lie close SW of Tanjung Losoni near the entrance to a cleft in the mountains.

Anchorage may be taken, by vessels with local knowledge, off these villages, in 50m.

Tanjung Lalompa lies 8.5 miles SE of Tanjung Laroga.

Steep-to reefs lie close within the 183m curve E of Tanjung Laroga. Pulau Alangalang (Alangalang) lies on the coastal reef that extends SE from Tanjung Laroga.

A drying reef lies close inside the charted 183m curve, 2 miles NE of Tanjung Lalompa, and a reef awash lies 1.75 miles ENE of the same point, outside the 183m curve.

Tanjung Nederburgh lies 5 miles SE of Tanjung Lalompa. Reefs with depths of 0.9 to 3m lie off the coast between these two points.

8.57 Bahodopi (2°48'S., 122°09'E.) services the adjacent Morowali Industrial Park. The port exports nickel and steel products while imports consist of mainly coal and various types of ore.

Depths—Limitations.—The IMIP Terminal has a total berthing length of 720m including dolphins; depths alongside are 13 to 20m. A maximum draft of 16m can be accommodated.

Nickle Main Wharf lies close S and has a total length of 160m; depths of about 8.5 to 10m alongside.

Berth 1 lies close SE of Nickle Main Wharf and has a length of 100m with depths of about 5 to 8.5m alongside. It is mainly used by barges.

Three other berths situated S of Berth 1 are suitable for small vessels.

Cargo is also worked at anchorage by barges in an area in the vicinity of 2°47.3'S, 122°09.6'E.

Bahodopi Harbor lies in a small bay SE of Tanjung Laroga. The harbor consists of a T-shaped jetty aligned NNW/SSE extending about 50m from the W shore of the bay. South of the jetty several berths line the W shore and head of the bay. Other berths lie on the E side of the bay. Development reclamation works are in progress (2019) centered on 2°48.7'S, 122°09.6'E.

Pilotage.—Pilotage is available 24 hours. Pilots board in the vicinity of 2°46.29'S., 122°10.5'E.

Caution.— Use caution transiting to the approach as there are a series of shoals E of Tanjung Laroga, with a least depth of 1m, extending NE from the bay, marked by a lighted beacon.

Southeast Coast—Tanjung Nederburgh to Roode Hoek

8.58 Tanjung Nederburgh (2°55'S., 122°19'E.) is a high, steep promontory that forms the NW entrance of Selat Salabangka (Salabangka Strait).

Karang Bantam (Bantam Reef), with a depth of 3.2m, lies about 2.5 miles NNE of Tanjung Nederburgh. A shoal, with a depth of 0.9m, lies about 2.5 miles N of the same cape.

Batu Manu (Batoe Manoe), a rock covered with vegetation, lies close off Tanjung Nederburgh.

Selat Salabangka (Salabangka Strait) (3°04'S., 122°20'E.) is a deep strait lying between Kepulauan Salabangka (Salabangka Islands) and the Sulawesi (Celebes) coast. The N entrance narrows to about 0.4 mile and has strong tidal currents running through it.

The coast of Sulawesi in the vicinity of the strait has no landmarks of importance, except a white patch W of **Tanjung Salabangka** (3°03'S., 122°17'E.). The points along the strait are generally low and marked by tall vegetation.

The barrier reef discolors along the W side of the N entrance to the strait. A drying patch lies on this reef in a position about 3.5 miles SSW of Tanjung Nederburgh.

Kepulauan Salabangka (Salabangka Islands) (Salabangka Eilanden) (3°04'S., 122°28'E.), a chain of islands, extends about 21 miles ESE from a position about 4.5 miles S of Tanjung Nederburgh. These islands are low and covered with shrubs, except for a conspicuous 202m hill on the S side of **Pulau Umbele** (Oembele Island) (3°04'S., 122°30'E.). All the islands are fringed by a drying reef with many detached reefs inside the 183m curve.

There is a deep passage through the middle of the group between Palau Umbele and Pulau Bunginkela (Boenginkela), about 2.25 miles W. Karang Karel (Karel Bank), a reef which dries, lies in the SW entrance to this passage. There are numerous shoal patches in the NE approach. This passage can only be used when the reefs are clearly marked by discoloration and the tidal currents are not strong.

Kepulauan Sinoa (Sainoa Islands), the SE group, consists of

a few low islands and several rocks, some of which are partly covered with vegetation. The whole area shows discoloration, the light green color being visible at a great distance. A conspicuous tree stands on the S part of the island.

8.59 Pulau Togomogolo (Togomogolo) (3°13'S., 122°38'E.), low, well-wooded, and marked by a large tree, lies about 4 miles SE of Kepulauan Salabangka.

A reef projects about 0.3 mile W from **Pulau Papado** (Padabale) (3°01'S., 122°20'E.).

A reef, with a depth of 4m, lies about 5.5 miles WNW of **Tanjung Baja** (Tanjung Baya) (3°08'S., 122°25'E.). A detached reef lies about 1 mile NE of Tanjung Baja.

General Pel Reef, consisting of two rocky heads, with a least depth of 0.9m, lies about 2 miles NE of **Tanjung Tapaulama** (Tanjung Tapoaoeloeno) (3°11'S., 122°29'E.).

Karang Adder (Adder Reef), with a least depth of 4.5m, lies in the S fairway, about 2 miles E of Tanjung Tapaulama. This reef is seldom marked by discoloration.

Directions.—Approaching Selat Salabangka from the N, bring the white patch W of Tanjung Salabangka in line with the beacon W of Pulau Papado, bearing 216.5°. The beacon can be rounded within 100m.

Hold this course until Pulau Hondor, an island lying on a reef about 3 miles SSE of Pulau Papado, bears 107°, then bring Tanjung Baja in line, bearing 120°, with Tanjung Nonna (Tanjung Togotonona).

This course passes S of the buoy marking the 4.1m patch lying in mid-channel and should not be approached within 100m. Alter course E, taking care not to pass within 27m of the beacon off Tanjung Baja.

General Pel Reef is easily passed N on a course of 120° by keeping Pulau Hondor bearing 300° astern.

When the summit of **Pulau De Haan (De Haan)** (3°29'S., 122°29'E.) is in range with the E side of the western Pulau Dua, bearing 188°, course can be shaped more to the S in order to clear Pulau Togomogolo.

Only vessels with local knowledge should attempt the passage W of General Pel Reef and Adder Reef.

8.60 Teluk Tampakura (3°12'S., 122°27'E.), located S of Tanjung Tapaulama, is encumbered with numerous reefs, some of which dry.

The coast S of Teluk Tampakura is broken and forms three bays, Teluk Matarape (Matarape Bay), Teluk Dalam (Telok Dalam), and Teluk Lasolo (Lasolo Bay).

The most conspicuous mountains near the coast are the peaks on Pulau Labengke, Pulau Bahulu (Bahoeloe), and the mountain tops close to the coast S of Teluk Lasolo.

The only river of importance on this part of the coast is the **Sungai Lasolo** (Lasolo River) (3°34'S., 122°14'E.) which discharges with three mouths abreast Pulau Bahulu.

Pulau Labengke (Labengke) (3°27'S., 122°26'E.), 715m high, lies off the high peninsula separating Telok Dalam and Teluk Matarape.

Selat Labengke (Labengke Strait), 1 mile wide, separates the island from the peninsula. The sides of the strait rise steeply from the sea.

Three large and several small islands, with several reefs in the vicinity, lie in Teluk Matarape.

Caution.—A large number of reefs have been reported in the three bays mentioned above.

Off-lying Dangers

8.61 Pulau Dua (Poeloe Doea) (3°16'S., 122°31'E.), two low islets 2 miles apart and covered with trees, lie on detached drying reefs about 5.5 miles SSE of Tanjung Tapaulama.

Karang Hinder Utara (North Hinder) (3°16'S., 122°28'E.), with a least depth of 0.5m, lies about 5 miles SSW of Tanjung Tapaulama.

Karang Hinder Selatan (South Hinder) (3°18'S., 122°30'E.), a small drying reef, lies 2.5 miles E of Pulau Van Leeuwen, a conspicuous island off the NE entrance of Teluk Matarape. The reef is marked by a beacon.

A reef, which dries, and a rock awash lie about 1.25 miles and 1 mile SE, respectively, of Karang Hinder Selatan.

Gosong Utara (North Bank) (3°23'S., 122°30'E.), a small drying reef with stones, lies about 5 miles E of the N extremity of Pulau Labengke. Two reefs awash lie about 1.5 and 4 miles NW, respectively, of Gosong Utara.

A reef, with a depth of 0.9m, lies about 3.5 miles WNW of the same bank.

Gosong Selatan (South Bank) (3°26'S., 122°30'E.), about 5.75 miles ESE of the N extremity of Pulau Labengke, is 1.5 miles long with a small sand shoal near its N end, partly dry at high water.

Karang Serdang (Serdang Reef) (3°24'S., 122°32'E.), with many rocks awash, lies about 2 miles NE of Gosong Selatan.

Pulau De Haan (3°29'S., 122°29'E.), about 144m high and marked by a light, lies about 1 mile E of Pulau Labengke. A detached reef, with a least depth of 0.9m, lies about 1.5 miles E of Pulau De Haan.

North Reef (Noord Rif) (3°32'S., 122°30'E.), with a least depth of 2.7m, lies about 2.5 miles SSE of Pulau De Haan.

Karang Selatan (South Reef) (3°46'S., 122°31'E.), with a least depth of 1.8m, lies about 4.75 miles E of **Tanjung Sawah** (Tanjung Sawa) (3°45'S., 122°27'E.). It is not marked by discoloration. A charted depth of 12.8m, best seen on chart, lies about 3 miles S of Karang Selatan.

Vessels with local knowledge can take anchorage in the bay between Tanjung Sawah and Tanjung Teipa (Tanjung Taipa), about 3.5 miles WNW. Vessels must exercise caution in this area because of the poor visibility of the reefs.

A well protected anchorage, with depths of about 14.6m to 28m, was reported to lie in the N part of Teluk Lasolo (Lasolo Bay), S of the Sungai Lasolo delta.

8.62 Pulau Manui (Pulau Manuei) (3°36'S., 123°08'E.) is the southernmost of a group of islands and reefs extending NW and W to Pulau Dua. It is rocky and steep-to except on its N and NW sides. Ulunambu (Oeloenamboe), situated on the N coast, is the only village on the island. A barrier reef fronts the central part of the N coast with its outer edge about 1 mile offshore. There is an opening 0.2 mile wide in the barrier reef off Ulunambu. A light is shown from the SE extremity of Pulau Manui.

Vessels with local knowledge can take anchorage off the village of Ulunambu close inside the opening in the barrier reef, in depths of 46m to 55m. Vessels must exercise caution to

avoid a reef, with a depth of 4.9m, in the middle of the opening.

Karang Pangadjarang (Karang Pangajarang), a horseshoe-shaped reef, lies about 24 miles WNW of Pulau Manui.

Padea Ketjil (Pulau Padea Kecil) (3°33'S., 123°02'E.) and Padea Besar (Pulau Padea Besar) are low partly-wooded islets lying on reefs about 2.5 miles NW of Pulau Manui.

Pulau Kokoila (Kokoila) (3°29'S., 122°54'E.) is low and covered with shrubs. Pulau Loenasoealoe (Pulau Lunasualu) (Loenas Waloe), located 4.5 miles NE of Pulau Kokoila, is low and thickly timbered. Pulau Samaringa (Samaringa), located about 8 miles NW of Pulau Kokoila, is low, wooded, and stands on the N end of a drying reef.

Pulau Tiga (Poeloe Tiga) (3°23'S., 122°36'E.), a group of three islets, lies on drying reefs about 1 mile apart.

Directions.—Vessels proceeding from a position in the S entrance to Selat Salabangka with the summit of Pulau De Haan in line with the E side of the W Pulau Dua, bearing 188°, should steer a course of between 203° and 210° in order to pass at least 50m W of the beacon marking Karang Hinder Selatan (South Hinder). Then alter course to about 173° to pass at least 100m E of the beacon marking Gosong Utara (North Bank), then alter course to pass at least 77m E of the beacon marking Gosong Selatan (South Bank). When the beacon marking Gosong Selatan is in line astern with the E point of Pulau Van Leeuwen, this bearing is followed until a course can be changed for Tanjung Nipanipa.

Caution.—All the islets in the previously-mentioned chain are low; on many of the drying reefs are sand cays which only cover at HW. During the Southeast Monsoon, there is a heavy surf.

Vessels should avoid the area in which this chain of islets lies due to the numerous dangers and uncertain tidal currents.

8.63 Tanjung Nipanipa (3°54'S., 122°40'E.) is a very conspicuous steep point on the coast of Sulawesi. The coast in the vicinity of the point curves S and W forming a funnel-shaped bay with Pulau Boengkoetoko (Pulau Bungkutoko) lying in the inner part.

Pulau Bakori (Bakori), lying on the NW side of a large detached reef, 2.5 miles S of Tanjung Nipanipa, does not show up plainly against the land.

Pulau Saponda Utara (North Saponda) (3°53'S., 122°49'E.), lying on a detached bank about 9.25 miles E of Tanjung Nipanipa, is low and covered with high trees.

A reef runs about 3 miles W and 1 mile E of the island. A channel, about 3.5 miles wide, lies between this reef and the coastal reef extending from Tanjung Nipanipa. A bank, with a least depth of 4.5m, extends 3.5 miles W of Pulau Soponda Utara.

Sappa Djambi Bank (Sappa Jamba) (3°59'S., 122°41'E.), about 5 miles S of Tanjung Nipanipa, is about 2.5 miles in length, the W part of which dries. A lighted beacon stands on the N edge of the reef.

Middle Saponda (Pulau Middle Saponda) (3°59'S., 122°46'E.) lies near the W end of a large reef extending about 1.5 miles W and 3 miles E of the island. It is low with several large trees. A light marks the island.

Karang Lingoro (Lingoro Reef), with a least depth of 6.9m, lies about 3 miles E of Pulau Middle Saponda.

Pulau Saponda Selatan (South Saponda) (4°02'S., 122°46'E.), located 1 mile N of Tanjung Laonti, is a low islet covered with high trees. A small reef that dries lies 0.2 mile WSW of Pulau Saponda Selatan. The fringing reef extends about 0.2 mile NE and N from the islet.

Karang Puluhari (Poeloehari Banks) (4°01'S., 122°45'E.), 4 miles long E and W and drying in places, lies midway between Pulau Middle Saponda and Pulau Saponda Selatan.

Caution.—Numerous dangers and obstructions have been reported in the channel between Pulau Saponda Selatan and the mainland, and across the channel between Palau Saponda Selatan and Karang Puluhari. They also lie E of the S end of Sappa Djambi Bank.

8.64 Teluk Kendari (Kendari Bay) (3°58'S., 122°35'E.) (World Port Index No. 52240), is a bay where the N passage leading into it, is about 137m wide at its narrowest point. Inside the entrance the bay gradually widens, but a broad mud bank fills the inner part. Tidal currents in the bay and its approaches are strong at times. Teluk Kendari experiences significant rainfall during both monsoon seasons with the wettest month being June. Visibility may be restricted during these heavy rains; mariners should not attempt to enter the narrow channel leading to Teluk Kendari unless the passage is clear. Mariners should seek the guidance of the pilot.

The beacons marking the channel leading into Teluk Kendari may be missing or damaged, and the reefs which they mark have extended. The least depth in the approach channel is 9.0m. A bridge, with a vertical clearance of 19m, spans the channel S of Kendari. The mean maximum tidal range is about 1.4m with a mean minimum range of about 0.8m. Vessels without local knowledge should not attempt to use this channel.

A flagstaff stands on the W side of Pulau Bungkutoko, from which a cone or ball is displayed when a vessel is sighted.

Kendari, a large village and an administrative center, stands on the W side of an inlet in the N shore of the bay near the entrance. The S shore of the bay opposite Kendari should be given a wide berth as reefs extend about 0.2 mile offshore. Nusantara, a 270m long berth with an alongside depth of 9.0m, used for ferries, general cargo, and containers. The Cargo Jetty is 110m long, with an alongside depth of 9.0m, and handles general cargo. The Pertaminal Oil Terminal consists of an Oil Jetty, 170m long, with an alongside depth of 6.9m, and used for handling petroleum products; it can accommodate vessels up to 6,000 dwt with a maximum loa of 120m.

Pilotage.—Pilotage is available but is not compulsory. Vessels should send ETA messages 10 days, 3 days, 48 hours, and 24 hours prior to arrival to the local agent, stating arrival draft and whether a pilot is required. The pilot boards, as follows:

1. In the anchorage S of Tanjung Cabi.
2. East of the entrance passage leading into Teluk Kendari.

Anchorage.—Vessels with local knowledge can take anchorage in the swept area bounded by the meridians of 122°34'20"E, and 122°36'33"E, off Kendari, in depths of 15m to 18m, soft mud.

Anchoring and fishing are prohibited within 0.1 mile of a line indicated by notice boards which mark the landing places of a telephone cable laid across the entrance of the bay, about 0.5 mile W of Pulau Bungkutoko.

8.65 Teluk Wawosungu (Staring Bay) (4°05'S., 122°44'E.) is entered between **Tanjung Wowobatu** (Tanjung Wowobatoe) (4°02'S., 122°40'E.) and Tanjung Laonti, about 6 miles ESE. The bay is of little importance to shipping. It is backed by high, partly inaccessible mountainous land, and except in the SW corner, it is sparsely inhabited. The shores of the bay are fronted by a broad coastal reef and there are several shoals and drying rocks in the bay.

Pulau Wawosungu (Pulau Wawasoengoe), the largest of several islets along the shore of Teluk Wawosungu, lies 4.5 miles SW of Tanjung Laonti and is joined to the coast by a drying reef.

Vessels can take anchorage anywhere in the bay. Good anchorage exists off a small bay S of Pulau Wawosungu.

Moramu Telok (Teluk Moramu) is an inlet which indents the coast about 2 miles in the SW part of Teluk Wawosungu. Depths of 11.5 to 26m are found in the inlet.

Three reefs, one of which dries, lie in mid-channel close inside the entrance.

Directions.—From Selat Wowoni, pass S of South Saponda and the detached reef SW of it. Then the S channel should be entered by the passage between the SW side of Karang Puluhari and the detached reef marked by a beacon SW of it. The hill (Kendari Heuvel), 2.25 miles NW of Tanjung Wowobatu, is a useful mark to steer for until this beacon is sighted.

When within the channel entrance, alter course and pass between the beacons on the NE side of Sappa Djambi Bank and E of the beacon on the detached reef on the opposite side of the channel. The beacon on the detached reef can then be rounded, and course changed for the entrance to Teluk Kendari, when the hill (Kendari Heuvel) comes into line with a mountain, 3 miles SW, bearing 219°.

A swept channel from the E leads to the entrance to Teluk Kendari, the center line of which is joined by the following positions:

a. 3°58'03"S, 122°40'57"E.
b. 3°58'30"S, 122°37'35"E.
c. 3°58'20"S, 122°36'35"E.

The width between point 1 and point 2 is 0.5 mile; the width between point 2 and point 3 is 0.3 mile.

From N, steer for the E side of Middle Saponda in line with the W side of Pulau Saponda Selatan, bearing 169°, which leads 5 miles E of Tanjung Nipanipa, which is steep and prominent. As soon as Pulau Bakori bears 250°, course should be altered for the entrance to the N channel, passing not less than 0.1 mile NW of the beacon marking the N extremity of Sappa Djambi Bank.

In the narrow N passage leading to Teluk Kendari, keep in mid-channel to avoid the coastal reef extending from each side, passing between the beacon and lighted beacon marking each side.

When approaching the sharp bend by the flagstaff on the W side of Pulau Boengkoetoko, a blast on the siren or whistle should be sounded as it is impossible to see if a vessel is approaching from the opposite direction.

8.66 Pulau Wowoni (Wowoni) (4°07'S., 123°06'E.), a wooded island high in its SE part, is separated from the coast of Sulawesi by Selat Wowoni. The SE and W coasts are only sparsely inhabited, but there are several villages along its N coast. The NW coast is lower with a plain running some distance inland.

Tanjung Pamali, the N extremity of the island, is marked by a light. It is partly rocky and terminates in a shoal, with a least depth of 1.8m, extending about 0.5 mile offshore.

Tanjung Dongkalaja (Tanjung Dongkalaya), a low point covered with mangroves, lies 7.75 miles ESE of Tanjung Pamali. A prominent hill, 471m high, stands about 2 miles S of this point.

Vessels can take anchorage in the bight between Tanjung Pamali and Tanjung Dongkalaya.

Tanjung Watutembatu (Tanjung Watoetembatoe), a rocky point located 8.75 miles SE of Tanjung Dongkalaja, forms the E extremity of Pulau Wowoni and is marked by a light.

Vessels can take anchorage during the Northwest Monsoon off Dimba and Ladianta (Ladianti), two villages, situated close together about 3.75 miles NW of Tanjung Watutembatu.

Kiakia (Kekea), a village, is situated at the head of a small bay about 4.75 miles SW of Tanjung Watutembatu. Vessels can take anchorage off Kiakia, protected from the Northwest Monsoon.

Tanjung Wowoni, the S extremity of Pulau Wowoni, lying 12.5 miles SW of Tanjung Watutembatu, is rocky.

Vessels can take anchorage in the bight NE of Tanjung Wowoni.

A shoal, with a depth of 4.9m, lies close offshore from the head of the bight, about 3 miles NE of the point.

Taka Langgara (Taka Langara) (3°59'S., 122°59'E.), an extensive drying reef, lies about 2.5 miles W of Tanjung Pamali.

East Bank (Gosong Timor), located 1.5 miles SW of Taka Langgara, consists of several isolated patches with a least depth of 4m.

Middle Bank (Midden Bank) (Gosong Middle) (4°00'S., 122°54'E.), located about 7 miles W of Tanjung Pamali, is steep-to on all sides with a least reported depth of 4.5m.

West Bank (Gosong Barat) (4°00'S., 122°52'E.), located about 9.5 miles W of Tanjung Pamali, is steep-to with least depth of about 4.5m over its W end.

Selat Wowoni (Wowoni Strait) (4°06'S., 122°54'E.) is located between Pulau Wowoni and the Sulawesi coast. The strait is obstructed by reefs, especially on the E side of the S part which is unsafe for navigation. The reefs show poor discoloration.

Tidal currents have been reported to attain a rate of 3 knots.

Caution.—The beacons marking certain dangers in Selat Wowoni are not being maintained due to the mined area. The strait was reported to be closed to navigation.

A danger area exists in the N entrance of Selat Wowoni.

8.67 North Tjampada (Pulau Campada Utara) and South Tjampada (Pulau Campada Selatan) are two low, wooded islands lying 7 and 9 miles SSE, respectively, of **Tanjung Toro Pemali** (4°03'S., 122°50'E.). North Tjampada consists of two parts lying close together on a drying reef. These islands are surrounded by a very steep reef, narrow on the W sides.

Two Brothers (4°08'S., 122°53'E.) are two rocks, 15m high and covered with vegetation, lying on the coastal reef about 0.6 mile N of Pulau Campada Utara.

North Reef (Karang Utara) (4°05'S., 122°54'E.), a small reef with a least depth of 4.8m, lies in mid-channel of Selat Wowoni, about 3 miles NE of Two Brothers.

Ujung Curam (Tanjung Steile) (4°14'S., 122°55'E.), located on the Sulawesi coast about 2.75 miles S of South Tjampada, can readily be identified from N and S by the two rounded summits standing behind it.

Batu Tinggi (High Rock), lying about 1 mile S of Ujung Curam on the edge of the coastal reef, is a good landmark for navigating the strait.

Barat Tweeling (West Tweeling) (Karang Iris) (4°13'S., 122°55'E.), consisting of two coral heads about 0.1 mile apart with a least depth of 3.4m, lies in the fairway about 1.5 miles NNE of Ujung Curam.

The numerous dangers in the strait E of Barat Tweeling may best be seen on the chart.

Ujung Merah (Roode Hoek) (4°20'S., 122°54'E.), about 5.75 miles S of Ujung Curam, is a steep, bare, rocky cape of reddish color.

Directions.—Vessels proceeding from a position on the inner route should pass W of North Reef and steer SSE until the extremity of Ujung Merah is in range with the W side of Batu Tinggi, bearing 183°. This range will lead close E of the beacon marking the reef SE of South Tjampada and about 0.1 mile W of the beacon marking Barat Tweeling. These reefs are generally discolored.

The passage between the Sulawesi coast, North Tjampada, and South Tjampada is safe and clear of dangers. Vessels should steer a mid-channel course in a least depth of 24m. The narrowest part of the channel at the N entrance is about 302m across. In the Northwest Monsoon, violent squalls sometimes blow suddenly from the mountains of Sulawesi and may completely obscure the land. In such weather this channel is not recommended.

Approaching the S entrance of Selat Wowoni from eastward, Batu Tinggi should be steered for bearing N of 227° until the highest part of North Tjampada bears 339°, then on the leading mark, bearing 183°.

Tidal currents set N and S through Selat Wowoni, and may attain a rate of 3 knots. There is practically no period of slack water except at neap tides, and even then it is only of short duration.

Sulawesi—Southeast Coast—Off-lying Islands

8.68 Kepulauan Tukangbesi (Toekang Besi Islands) (Kepulauan Wakatohi) (5°30'S., 123°40'E.) are the SE group of islands belonging to Sulawesi, and consist of a great number of islands with many groups lying together on the same reef.

The Kepulauan Tukangbesi are surrounded by a steep-to reef, which generally shows good discoloration. Deep water exists between all the islands and atolls which make up the group. Some of the atolls can be seen from a great distance because of the clear, green discoloration marking the reefs.

Pulau Wangiwangi (Pulau Wangi Wangi) (5°18'S., 123°34'E.) is hilly and is fringed by a steep-to drying reef in the NW part of Kepulauan Tukangbesi. The reef is usually marked by discoloration when covered. Several islands lie on this reef, the largest being Pulau Kambode and Pulau Kampenaoene (Pulau Komponaone). Pulau Wangiwangi and Pulau Kambode are inhabited. Pulau Kampenaoene is low and mostly fringed with mangroves.

Pulau Timor and Pulau Soemanga, both mangrove-covered islands, lie on the reef between Pulau Kampenaoene and Pulau Wangiwangi. A drying reef lies 2 miles E of Pulau Timor; 4m and 6.5m patches lie 1 mile NNE of Pulau Timor.

A light, shown from a 21m white metal framework tower, marks the NW extremity of Pulau Wangiwangi.

Vessels with local knowledge can take anchorage in Teluk Wanji (Wandji Bay) (Wantji Baai), a bight formed between Pulau Wangiwangi and Pulau Kambode. Vessels anchor off the long stone pier extending across the coastal reef S of Mendati (Mandati) village, in depths of 46 to 55m, coral. The depths are very irregular.

The tidal currents in Teluk Wanji run in a NW and SE direction. The rate seldom exceeds 0.5 knot. A rate of 2 to 3 knots has been observed at the anchorage when the coastal reef was uncovering, but this only lasted a short time.

Pulau Kaledupa (Pulau Kaledoepa) (Pulau Kaledoapa) (5°32'S., 123°46'E.), the largest and highest of a group of islands, is located about 7 miles SE of Pulau Wangiwangi.

This group consists of the islands of Pulau Kaledupa, mangrove-fringed and the only inhabited island; Pulau North Lintea, low, wooded, and mostly mangrove-fringed, off which there are three other low islets; and Pulau Hoga. All the islands in the group lie on the same reef; the outer edge is steep-to.

Vessels with local knowledge can take anchorage W of an opening in the reef between Pulau Kaledupa and Pulau Hoga. A drying reef lies in the middle of the opening of the reef. The passage lies between the drying reef and the discoloring coastal reef of Pulau Hoga. The least depth in this passage, which narrows to 45m at the E end, is about 6.7m.

Vessels entering this opening in the reef will find good anchorage in a deep basin close inside, in a depth of 26m.

A rock, which dries, lies about 0.45 mile E of the drying reef in the opening. A strong current sets through the opening in the reef.

8.69 Pulau Tomea (5°45'S., 123°56'E.), lying about 9 miles SE of Pulau Kaledupa, is high, wooded, and the fringing reef is steep-to.

Pulau Tolandono, lying on the SW side of the drying coastal reef around Pulau Tomea, is low, with steep sandy coasts, and a sandy beach near the SW extremity.

Pulau South Lintea, S of Pulau Tomea, is high and lies on the NE extremity of a large atoll. Pulau Tokobao, a sand cay covered with vegetation, lies on the NW extremity of the same atoll. There is a deep passage 10.4 mile wide between Pulau South Lintea and Pulau Tomea with a strong current running through it.

Vessels with local knowledge can take anchorage S of Oeskoe (Usku) Village on the S coast of Pulau Tomea, in a depth of 33m. This anchorage lies midway between two shoals, with depths of 12.8m, lying 0.35 mile S of the pier and close to the coastal reef. There are several reefs, with depths of 3 to 4.8m, lying E and W of the 12.8m shoals.

Small vessels can take anchorage in a bight in the coastal reef about 0.5 mile N of Pulau Tolandono. A reef, with a depth of 2.1m and seldom marked by discoloration, lies in the middle of the bight.

Vessels with local knowledge can take anchorage under favorable conditions off the broad coastal reef extending from the NW coast of Pulau Tomea with the N extremity of Pulau

Tomea, bearing 097°, and the W side bearing 172°, in a depth of 51m. Vessels must exercise caution because of the irregular edge of the coastal reef and some detached reefs, with depths of 3m, near it.

Pulau Binongko (5°56'S., 124°00'E.), consisting of raised coral terraces, lies in the SE part of Kepulauan Tukangbesi, 7.5 miles S of the E end of Pulau Tomea. The N part is higher than the S, and there is a depression between the two ends. The interior of the island is wasteland. Popalia, near the middle of the W coast, is the main village.

Vessels with local knowledge can take anchorage inside the barrier reef off the village of Palahidu (Palahidoe) on the N coast of the island. The entrance into the basin is about 91m wide, with a least depth of about 22m. Depths in the basin are about 29 to 37m.

8.70 Pulau Roendoema (Pulau Runduma) (5°21'S., 124°21'E.), the NE island of the Kepulauan Tukangbesi, is 32 miles NE of Pulau Tomea and lies with Pulau Anano on a long, narrow reef extending about 6 miles in a NW and SE direction. Pulau Roendoema is high, wooded, and inhabited.

Karang Roendoema (Karang Runduma) (5°24'S., 124°25'E.), located 4.5 miles SE of Pulau Roendoema, dries and is marked by discoloration when covered.

Karang Kapotta (5°31'S., 123°25'E.), a large atoll, lies about 8.5 miles SW of Pulau Kambode. The anchorage in Karang Kapotta is reached by one of the passages on the NW end of the reef. The northernmost entrance, with a least depth of 6.7m, is recommended.

Karang Kaledoepa (Kaledupa) (5°45'S., 123°41'E.), a large atoll, is located about 16 miles SE of Pulau Kambode. There are two entrances at the SE end with depths of 16m in the fairway.

A deep passage about 2 miles wide lies between Karang Kapotta and Karang Kaledoepa.

Karang Koka (6°04'S., 124°22'E.), an atoll, lies about 15 miles E of Pulau Binongko. It has three entrances, two on its S side and one on its NE side. The NE entrance, which has a least depth of 5.5m in the fairway, is the best, but it should be marked by beacons before entering.

Moro Maho (6°07'S., 124°37'E.), located about 13 miles E of Karang Koka, is a thickly wooded sand bank on a drying reef. It is marked by a light.

Karang Koro Maha (5°45'S., 124°11'E.), an atoll about 9 miles E of Pulau Tomea, has two narrow entrances on the N side which are accessible only by small craft.

Pulau Ndaa (5°39'S., 124°03'E.) lies on the W side of a coral reef which dries, about 6.5 miles NE of Pulau Tomea. The islet is reported to be a radar target at 12 miles.

Pulau Kenti Ole (5°43'S., 124°29'E.), located 29 miles E of Pulau Tomea, is formed of raised coral and is reef-fringed.

Pulau Tjowo Tjowo (5°48"S., 124°20'E.), located about 20 miles E of Pulau Tomea, is similar to Pulau Kenti Ole.

8.71 Pulau Butung (Pulau Boeton) (Pulau Buton) (Pulau Boetoeng) (5°00'S., 122°54'E.), a large island located off the SE coast of Sulawesi, is separated from Kepulauan Tukangbesi by a deep passage.

The mountains of E Pulau Butung are not conspicuous and difficult to distinguish at a distance. On the S coast of the island the middle of three high spits of land is very conspicuous.

Tanjung Butung (Tanjung Buton) (Tanjung Boeton) (Tanjung Boetoeng), the N extremity of the island, lies about 7 miles S of the S extremity of Pulau Wowoni.

Tanjung Lakansai (Tanjung Lakantjai), a rocky point, lies about 8 miles SSE of Tanjung Butung. A conspicuous conical summit, 555m high, lies about 2.5 miles S of Tanjung Lakansai. This peak is very conspicuous from the N and S but loses its sharp character when some distance from the coast.

Teluk Lelamu (Lelamoe Baai) (4°39'S., 123°12'E.), 10 miles SSE of Tanjung Lakansai, is entered either N or S of Pulau Lelamoe (Lelamu), an islet lying across the entrance. This islet is mangrove-covered and fringed by a reef which dries. Teluk Lelamu has not been adequately surveyed.

8.72 Tanjung Goram (4°52'S., 123°12'E.) lies 13.5 miles S of Teluk Lelamu.

Telok Koro (Koro Baai) (4°50'S., 123°09'E.), is entered close W of Tanjung Goram. It can be entered without difficulty as far as the island at the head of the bay. A rock lies on the coastal reef near the SE point of Pulau Pombelaa.

Vessels with local knowledge can take anchorage in the bight W of Pulau Pombelaa. When approaching this anchorage vessels should exercise caution to avoid 2.2m and 5.4m reefs lying about 3 and 2.5 miles, respectively, S of **Latambera** (4°50'S., 123°00'E.). A reef, with a depth of 2.7m, lies about 1 mile S of the W point of Pulau Pombelaa. These reefs are only slightly marked by discoloration.

Laweloa Baai (Telok Kaloekoe) (Teluk Lawelu), 18 miles S of Latambera, is entered between **Tanjung Tomara** (5°08'S., 123°02'E.) and a point about 4 miles W. It is deep and clear of dangers except in the SE part, where the coastal reef extends up to 0.75 mile offshore. The SE side and head of the bay are fronted by mangroves.

Telok Kamaroe (Kamaru Bay) (5°11'S., 123°04'E.) is entered about 3.5 miles SE of Tanjung Tomara. A reef, with a depth of 1.3m, lies 0.13m outside the coastal reef on the W side of the entrance.

Vessels with local knowledge can take anchorage off Kamaroe (Kamaru), a village on the NW side of Telok Kamaroe, in a depth of 55m.

The coastal reef, between Laweloa Baai and Telok Kamaroe, lies up to 2 miles offshore. The coastal reef between Telok Kamaroe and Tanjung Kasolanatombi (Tanjung Kassolana-toembi), 11 miles SE, is difficult to see after heavy rains due to muddy water.

Tanjung Kasolanatombi is marked by a light.

8.73 Pasarwadjo Bay (Wollowa Bay) (Teluk Pasarwadjo) (5°28'S., 122°53'E.) (World Port Index No. 52250), located in the middle of the SE coast of Pulau Butung, 23.5 miles SW of Tanjung Kassolanatoembi, is entered between Tanjung Laranka and Tanjung Kondowa, about 8.25 miles SW. Tanjung Kondawa is marked by a light. It is deep and clear of dangers. A good and sheltered anchorage is found in the SW part of the bay. A T-head pier, with a reported depth of 8.5m alongside, projects S from the shore in this part of the bay.

Vessels can take anchorage in a position ESE of the pier, in a depth of 29m.

Teluk Sampolawa and **Teluk Nalandi** (5°40'S., 122°45'E.)

are two bays formed between the three fairly high tongues of land extending from the S coast of Pulau Butung. A very conspicuous pyramidal hill, about 473m high, stands on the end of the middle tongue of land. The bays have considerable depths and the shores are steep-to.

Vessels with local knowledge can take anchorage in Teluk Sampolawa off the villages on the W shore, in depths of 33 to 49m. A bank of sand and mud, which dries, extends about 0.45 mile from the head of the bay.

Vessels with local knowledge can take anchorage at the head of Teluk Nalandi, close to the coastal reef, in a depth of 55m.

There are strong tidal currents along the S coast of Pulau Butung. Strong eddies are found off the three tongues of land. A circular current runs in the bays.

Pulau Hagedis (Pulau Batoeata) (6°12'S., 122°41'E.), about 30 miles S of Pulau Butung, is 193m high. The W and S sides are steep, the N more sloping, while the E consists of a long sandy point covered with coconut trees.

There are two villages and some scattered houses on the island. Except off the E point, the surrounding coastal reef is narrow and steep-to.

The only anchorage is in a bight on the N side of the island, where a ridge with depths of less than 18.3m, runs about 0.15 mile outside the coastal reef, enclosing a basin with depths of 37 to 44m. During the Northwest Monsoon, small vessels can cross the ridge and anchor in the basin. In the Southeast Monsoon, vessels lie better outside the ridge. The bottom is rocky and uneven. There is always the risk of losing the anchor.

A drying reef lies about 4 miles S of the E end of Pulau Hagedis.

8.74 Selat Butung (Buton Strait) (Boetoeng Strait) (Boeton Strait) (5°00'S., 122°45'E.), lying between the E coast of Pulau Muna and the W coast of Pulau Butung, is the usual coastal route taken by vessels proceeding to and from **Selat Selayar** (Straat Salajar) (5°42'S., 120°30'E.). The land on both sides is high and wooded.

Depths in the strait are very irregular. In North Narrows they vary from 37 to 91m. In the deep basin between North Narrows and South Narrows there are depths of over 366m, and in the S part of the strait, 18.3 to 92m.

Winds—Weather.—In the Southeast Monsoon, from June to September, the winds generally blow from SE with more or less force after 1000 and then become lighter after about 1600. In some parts of the strait, where the land is high on the Pulau Butung side, particularly in South Narrows, violent squalls occur. In June, July, and August storms and rains are sometimes experienced. In these months the air is clearer than usual, but in September the wind falls light with a dense haze over the whole strait. In September and October there is sometimes rain and squally weather over the N part, but fine at the same time in the S, the wind then blowing between NE and SE, occasionally extending to N and S. During the Northwest Monsoon, the winds vary between W and N, but there is little rain.

Tides—Currents.—In both entrances the tidal current sets into the strait during flood and out during ebb. There is practically no period of slack water. Due to the strong tidal currents striking the shores, whirlpools and eddies are found throughout South Narrows, and great care should be taken when passing through the strait. The tidal current sets towards the Pulau Muna shore. The rate of the tidal current in the wider part of the strait is 1 to 3 knots. The maximum rate, 5 knots at springs, occurs in South Narrows.

Selat Butung—North Part

8.75 The N coast of Pulau Butung, between Tanjung Butung and Pulau Labuan Blanda (Laboeang Belanda), 9.25 miles WSW, is very high and steep.

Pulau Labuan Blanda is a high, thickly wooded island. It is fringed by a reef extending about 0.2 mile from the N side of the island. Two above-water rocks lie on this part of the reef.

Vessels can take anchorage about 0.5 mile SW of Pulau Labuan Blanda, in depths of 15 to 18m.

The E shore of the strait, between Pulau Labuan Blanda and **Tanjung Gornea** (4°51'S., 122°50'E.), is low with trees and mangroves growing to the water's edge. A small river discharges off Tanjung Gornea and discolored water extends for a considerable distance into the strait. Low and wooded, this part of the coast of Pulau Muna is fringed by a wide reef, and there are a number of detached reefs lying within 1.5 miles from the shore.

Raha (4°51'S., 122°44'E.) (World Port Index No. 52270), a large village, is an administrative center and shipping place for timber and forest products. The houses of Raha and a large galvanized roof are visible from a considerable distance.

A pier, with a flagstaff near its inner end, extends across the coastal reef from Raha.

A light is shown from a point 0.65 mile E of the pier.

There are several detached reefs in the roadstead. The outer reef, with a depth of 0.9m, lies 0.6 mile ESE of the pier.

Small vessels can take anchorage N of the detached reefs in a depth of 7m.

There is an oil jetty for the discharge of kerosene at Raha, with a depth alongside of 5 to 6m. Vessels up to 1,200 dwt and 70m long can berth.

8.76 North Narrows (4°56'S., 122°48'E.), on the E shore, is high and densely wooded. Pulau Bakealo (Pulau Puning) and Pulau Munante (Lebutan Island), marked by a light on its W side, are low and wooded. Pulau Lebutan is fringed by a reef with a high rock on its NW side. Pulau Kaholipana (Pulau Kaholifana) is covered with tall trees and can be seen at a great distance because of the bare white trunks of dead trees.

The W shore of North Narrows is high and steep.

Anchorage can be taken in Teluk Lohia (Lohia Bay) immediately NW of **Tanjung Haai** (Haai Point) (4°54'S., 122°46'E.). A shoal, with a depth of 5.5m, lies about 0.2 mile NE of Tanjung Haai. Pulau Lima (Lima Islands) consists of six large rocks lying about 1 mile SE of Tanjung Haai. Two of the rocks are covered with vegetation and appear as one islet when seen from the N or S. Pulau Dua (Dua Islands), two islets, lie on a detached reef with a least depth of 0.9m, in a position about 1.5 miles SE of Tanjung Haai. Karang Banka (Banka Reef), with a depth of 4.9m, lies about 2.25 miles SE of Tanjung Haai. Karang Bali (Bali Reef), with a depth of 4.5m, lies about 3 miles SSE of the same point. A reef, with a depth of 10m, lies about 0.5 mile ENE of Karang Bali.

Strait Between North Narrows and South Narrows

8.77 Tanjung Tampunabale (Tanjong Tampenan Bale) (5°03'S., 122°45'E.), the extremity of the low spit of land on the E shore, is fringed by a coastal reef which usually discolors.

Vessels can take anchorage off this cape, in depths of 14.6 to 18m.

Gosong Kulaga, lying about 2.5 miles SSW of Tanjung Tampunabale, consists of several sand bars and rocks which discolor when submerged. Two sand bars, which dry, lie at the S end of this shoal. Due to their color, these sandbars are visible for some distance.

A conspicuous round-topped tree stands on the side of a sloping hill, about 2 miles N of Tanjung Umbulu Suan (Tanjung Kambolosua), and is visible from S. The coast N of Tanjung Kambolosua is high and steep.

Pulau Pendek (Pendek Island) (5°13'S., 122°44'E.) and Pulau Pegate (Pulau Panjang), about 1.75 miles SSW, are both low and wooded islands.

The W shore of the basin between **Tanjung Leibora** (4°59'S., 122°46'E.) and Tanjung Kemba, about 19 miles SSW, is high and steep.

Teluk Kemba (Kemba Bay) (5°15'S., 122°37'E.), entered between Tanjung Mata Ajer (Tanjung Matanuwe) and Tanjung Kemba, about 4 miles S, indents the coast about 3 miles. A conspicuous wooded hill, well defined against the bare background, stands 4.75 miles NNW of Tanjung Mata Ajer, and is plainly visible from N or S.

South Narrows (5°21'S., 122°39'E.), on the E shore between Tanjung Kalankangan and Tanjung Papremkama, about 4.5 miles SSW, is high and steep. Batu Sori, composed of yellow sandstone, lies close S of Tanjung Batu Sori about 0.75 mile S of Tanjung Kalankangan.

Pulau Batu Kapal, abreast of Tanjung Kalankangan, is steep with a flagstaff on it.

Batu Sori Light (5°20.9'S., 122°39.7'E.) is shown from a height of 25m.

The coast between Tanjung Papremkama and Tanjung Kaubula (Tanjung Koubula), about 3.25 miles SSW, forms a large circular bay in which lies Pulau MaKassar (Makasser Island). The island is heavily wooded in the S half.

Tanjung Barutu (5°22'S., 122°38'E.), located on the W side of the narrows, is a low wooded point sharply defined when seen against the opposite shore. The coast N of this point is high and steep. Tanjung Kalandria, about 1.5 miles SW of Tanjung Barutu, is low and wooded. A reef extends about 0.4 mile SW from the point. Vessels can take anchorage off this point, in a depth of 18.3m.

The coast between **Tanjung Baru Baru Koma** (5°25'S., 122°36'E.) and Tanjung Pangela, about 2 miles SSW, is low with a reef extending about 0.5 mile offshore.

8.78 Buton (Baubau) (Boetoeng) (5°28'S., 122°37'E.) (World Port Index No. 52260), the most important town in Selat Butung, is situated about 0.5 mile E of Tanjung Kaubula. A stone breakwater is built over the coastal reef. The Murhum Terminal has a 180m long pier connected to shore by two causeways. A second pier extends 150m from the shore close W.

The BBM Pertamina Baubau Transit Terminal consists of two jetties handling dirty products; as follows:

1. Jetty 01, with a berthing length of 166m including dolphins, can accommodate vessels up to 35,000 dwt, with a maximum draft (HW) of 17.0m and a maximum loa of 200m.
2. Jetty 02, with a berthing length of 234m long including dolphins, can accommodate vessels up to 6,500 dwt, with a maximum draft (HW) of 10.0m and a maximum loa of 120m.

The Pertamina Lama Kota Terminal has an Oil Berth, 46m long with a depth alongside of 6.4m, that handles dirty products and has a maximum loa of 120m and 6,000dwt.

The old palace and prominent white mosque with a flagstaff stand about 1 mile S of Baubau.

The coastal reef fronting Baubau was reported to be extending.

In the outer roadstead the current sets in the direction of the strait. Close inshore there is a countercurrent setting almost parallel to the shore, and between these there is an area of irregular currents.

A swept channel 0.5 mile wide, joined by the following positions, leads from the South Narrows to the S entrance of Selat Butung:

a. 5°26'35"S, 122°36'22"E.
b. 5°23'51"S, 122°37'16"E.
c. 5°21'52"S, 122°38'22"E.

Pilotage.—Pilotage is compulsory. Pilots for the South Channel board in position 5°31'32.4"S, 122°33'12.0"E; pilots for the West Channel board in position 5°27'36.0"S, 122°31'54.0"E.

Anchorage.—Vessels can take anchorage E of the mouth of Kali Baubau, about 0.5 mile E of Tanjung Kaubula, in depths of 12 to 45m. Due to the variable nature of the currents, vessels should moor to avoid collision when swinging at slack water. Designated anchorage details are shown in the table titled **Buton—Anchorages.**

Buton—Anchorages

Anchorage	Position	Depths
General Cargo	5°26'55.2"S, 122°37'51.0"E	31-34m
Passenger Vessels	5°27'03.6"S, 122°37'42.0"E	35-37m
Emergency	5°27'03.6"S, 122°37'58.2"E	33m
Reserve	5°26'55.2"S, 122°38'07.2"E	32m
Small Vessels	5°27'07.2"S, 122°35'52.8"E	6-13m
	5°27'20.4"S, 122°37'18.6"E	6-13m

Directions.—Vessels coming from the N should approach the North Narrows with the E point of Pulau Kaholifana in range with **Mount Lambolo** (5°05'S., 122°48'E.), bearing 178°. This course leads E of **Karang Banka** (4°55'S., 122°47'E.). After passing Karang Banka, alter course to 200° passing midway between Pulau Kaholifana and the Muna coast. When the S side of Pulau Kaholifana bears 090°, change

course to 225° until Tanjung Tampunabale is in range with Lombolo, bearing 100°.

A course of 194°, with the center peak of **Three Hills** (4°57'S., 122°45'E.) bearing 014° astern, will lead through the strait between North and South Narrows.

Vessels transiting the South Narrows from N should run it keeping in mid-channel until the point of land SE of Tanjung Papremkama shows clear of the latter, then alter course to 187° with the mosque and flagstaff S of Baubau on that bearing.

When the middle of Pulau Makassar bears 066°, alter course to 246°.

8.79 Selat Masirir (Massiri Strait) (5°35'S., 122°33'E.) separates Pulau Kadatuang (Pulau Kadatoeang), Pulau Lewutokidi (Lewoeto Kidi), and Pulau Siumpu (Pulau Sioempoe) on the W side from the SW side of Pulau Butung.

The strait is deep and clear of dangers except for a small reef, generally marked by discoloration, with a depth of 0.3m, lying about midway between the NE extremity of Pulau Kadatuang and Pulau Butung.

Pulau Siumpu (Pulau Sioempoe) (5°40'S., 122°30'E.) has a flat summit, 290m high, near its center from which a long spur runs SW, with a hill on the outer end appearing as a separate island from a distance. Batu Popalia, a group of rocks partly above water, lie off Tanjung Massiga which is marked by a light and is the SW extremity of Pulau Siumpu. Passina Tongali, with a depth of 4.5m, lies 1 mile SW of Tanjung Tolando, the NW extremity of Pulau Siumpu, and is not marked by discoloration. Vessels can take anchorage off Tanjung Tolando, in a depth of 44m.

Pulau Lewutokidi (Lewoeto Kidi) (5°36'S., 122°30'E.), located about 1.5 miles N of Pulau Siumpu, has a small hill in the middle of the island. The NE part of the island is low and covered with grass and trees.

Pulau Kadatuang (Pulau Kadatoeang) (5°33'S., 122°30'E.), located about 1.75 miles N of Pulau Lewutokidi, is high and marked on its NE extremity by a light.

Vessels can take anchorage off the W coast of Pulau Kadatuang in a position W of the N of two detached rocks on the coastal reef, in depths of 40 to 46m. This area lies only 0.4 mile from the charted 183m curve.

Vessels can also anchor off the E coast of Pulau Kadatuang about 2 miles S of Banapungi (Banabungi), the NE point of the island, in a depth of 12.8m.

8.80 Pulau Muna (Muna Island) (5°00'S., 122°30'E.), lying W of Pulau Butung and forming the W side of Selat Butung, is generally low except in its SE extremity and is covered with forest. The W and N coasts are generally covered with mangroves. The S part of its W coast and the E coast are inhabited.

The S coast of Pulau Muna is indented by three bays.

Teluk Wambololi (Wambololi Bay) (5°23'S., 122°23'E.), the W of these bays, is shoal and of little use except for small craft.

Vessels with local knowledge can take anchorage in the outer part of Teluk Wambololi, in depths over 37m. The reefs in the inner part of the bay do not show up well because of the reddish-brown color of the water.

Teluk Lasongko (Lasongko Bay) (5°23'S., 122°31'E.), the middle bay, is obstructed by a rocky reef, with depths of 4.6 to 6.7m, lying between the entrance points. Inside the bay there are depths of 18 to 22m in the fairway extending nearly 5 miles towards the head.

Karang Kaunto, rock covered with vegetation, lies on the coastal reef on the W side of the bay, about 4 miles NNE of **Tanjong Inulu** (5°24'S., 122°28'E.). Two smaller rocks lie under 0.45 mile N of Karang Kaunto. The barrier reef can be crossed with the W of these two rocks showing between Karang Kaunto and the W shore of the bay. The greatest depth is found with the E rock in range with the W side of Karang Kaunto, bearing 004°. This range leads very close E of a 4.6m patch on the reef at the entrance.

8.81 Teluk Nambo (Nambo Bay) (5°25'S., 122°34'E.), the E part of the three bays, affords good anchorage.

Selat Tiworo (Tioro Strait) (4°33'S., 122°30'E.) lies between the N coast of Pulau Muna and the coast of Sulawesi. It is an area of countless islands, reefs, and rocks. The reefs and rocks are steep-to and discolored. All the islands are low except Groot Tobea, the largest of Kepulauan Tobea in the E entrance to the strait, and the majority of the islands in the S entrance. Kepulauan Tobea divides the E entrance of Selat Tiworo into two parts, all of which lie on a drying reef.

The N coast of Pulau Muna between **Tanjung Tiworo** (4°45'S., 122°23'E.) and Tanjung Lambiko, the NE extremity of the island, about 22.5 miles ENE, is mangrove-covered and practically uninhabited. Due to the numerous reefs, the coast between Tanjung Tiworo and Tanjung Bakuku (Tanjung Bakoekoe), about 15 miles NE, should not be approached.

8.82 Pulau Tembako (4°54'S., 122°03'E.), located about 0.75 mile E of Tanjung Pandan, is separated from the mainland by a clear channel, with a least depth of 8.5m in the fairway.

Vessels can take anchorage in the channel between Pulau Tembako and the mainland.

There is a village on the W side of the island, and a collecting place for forest products with a small wooden pier on the N point. Laora, a village, lies on the Sulawesi shore N of Pulau Tembako.

Batu Mandi, a rock 5m high, lies about 1 mile SE of Pulau Tembako.

Little is known concerning the currents in Selat Tiworo other than they run either W and S or N and E. In Teluk Lahia (Laea Bay), just within the E entrance and in the passages on either side of Kepulauan Tobea, there is sometimes a tidal current for 24 hours in one direction. The maximum velocity is about 2 knots except possibly in the narrower passages.

The N part of the W coast of Pulau Muna between **Tanjung Nabottiebitte** (5°03'S., 122°23'E.) and Tanjung Mapauti (Tanjung Mapanti), about 16 miles N, is covered with mangroves and uninhabited. Numerous reefs and rocks front this stretch of coast extending up to 16 miles offshore.

The coast between Tanjung Mapauti and Tanjung Tiworo, about 6 miles NE, is low and mangrove-covered. Kepulauan Tiworo, composed of several islands and reefs, extends about 11 miles N from Tanjung Tiworo.

Vessels without local knowledge should not attempt to proceed through Selat Tiworo. Vessels are cautioned that navigational aids in Selat Tiworo may be damaged or missing.

A danger area blocks the entrance of Selat Tiworo in the vicinity of Groot Tobea. Another danger area exists about 25 miles W of Groot Tobea.

8.83 Pulau Kabaena (5°17'S., 121°55'E.) is a steep mountainous island, lying about 13 miles W of Pulau Muna. Gunung Sambapolulu (Sabanpololu), the highest peak, stands in the middle of the island. It appears as a cone from the S, and as a round summit with a cleft from the W. The NW part of the island is low. Gunung Batusangia, 6 miles NW of Guning Sambapolulu, is a very conspicuous mountain with five peaks, but only 2 or 3 are visible.

Tanjung Koku (Tanjung Kokoe) (5°30'S., 121°57'E.), the S extremity of Pulau Kabaena, is a low promontory from which the coastal reef extends 0.6 mile. The S half of the W coast, as far N as **Tanjung Malate** (5°17'S., 121°48'E.), is fronted by a ridge of reefs lying from 1 to 3 miles offshore.

Pulau Sagori (Pulau Sogori), an inhabited island about 4 miles SSW of Tanjung Malate, lies on the N end of a large atoll-shaped reef. A large area of the reef dries. The lagoon can be safely entered through a passage on the E side over a depth of 5.8m. The reef is marked by clear green discoloration when covered.

Pulau Mataha, a low flat island, lies near the S end of the drying reef fronting the N part of the W coast of Pulau Kabaena, and 1 mile W of Tanjung Malate. This reef extends between 0.5 mile and 1.75 miles offshore.

Vessels with local knowledge can take anchorage in **Teluk Pising** (Pising Bay) (5°05'S., 121°56'E.) located on the N coast of Pulau Kabaena. The W side of the bay is foul.

Teluk Lingora (Lingora Bay), located on the NE side of the island, is clear of dangers in the S part outside the 20m curve. The N part of the bay is reported to contain a few reefs.

Passi Pandolangi, a sand bank with drying rocks, lies about 4 miles offshore NE of Teluk Lingora.

Pulau Dahudahu (5°13'S., 122°05'E.), a small islet, is separated from Pulau Kabaena by a deep channel about 0.15 mile wide. On the W side there is a 5.8m patch.

Teluk Tallabassi (5°15'S., 122°04'E.), located close S of Tanjung Tallabassi, a very steep point, has in its S part Pulau Damalawa-Besar, 290m high. A shoal, with a depth of 0.9m, lies about 0.75 mile SSE of Tanjung Tallabassi.

Vessels with local knowledge can take anchorage in Teluk Tallabassi, in a depth of 16.4m.

Pulau Damalawa Besar is separated from Pulau Kabaena by a channel with a depth of 4.6m. Care should be taken to avoid the 2.7m patch lying in the middle of the S entrance.

Pulau Damalawa Ketjil, located about 0.75 mile S of Pulau Damalawa Besar, is separated from the coastal reef extending from Pulau Kabaena by a narrow channel, with depths of 7.6m.

Pulau Telaga Besar and Pulau Telaga Ketjil lie off the S coast of Pulau Kabaena and are separated from it by a clear channel with depths of 10.3 to 21.9m in mid-channel. Pulau Telaga Besar is low on the W side, but rises to a plateau of 148m in the E part. A rock, which dries, lies 0.6 mile W of the extremity of the island. Pulau Telaga Ketjil is 138m high and has a small village on the NW side.

Vessels can take anchorage off the N coast of Pulau Telaga Ketjil, in a depth of 49m.

8.84 Selat Muna (5°15'S., 122°08'E.), the S approach to Selat Tiworo, lies between the E coast of Pulau Kabaena and the S part of the W coast of Pulau Muna.

The E half of the N part of the strait is encumbered with reefs and shoals. Navigation in this area is not advised except with local knowledge. The flood current sets N and the ebb S through the strait, but seldom exceed 2 knots.

Selat Poleang (4°58'S., 121°57'E.), the W approach to Selat Tiworo, is bounded on the S side by the N coast of Pulau Kabaena and on the N side by the Sulawesi coast.

The strait is clear of dangers except for a large reef of sand and stones, with a least depth of 10m, lying in the middle of the strait, about 4 miles N of **Tanjung Magina** (5°04'S., 121°58'E.). The flood current sets E and the ebb W through the strait.

Pulau Pasudu (4°55'S., 121°57'E.), located S of Pelabuhan Lemmu, can be recognized from a great distance by a large tree projecting above the shrubs which cover the islet.

A channel clear of dangers, with a depth of 10.9m, lies between the reef fringing Pulau Pasudu and the reef extending 1.25 miles from the mainland.

8.85 Teluk Bone (Golf Van Bone) (4°00'S., 120°45'E.), separating the two S peninsulas of Sulawesi, is entered between **Tanjung Boengikalo** (4°51'S., 121°41'E.) and Tanjung Lassa, about 87 miles WSW. Numerous reefs lie within the 183m curve off the S part of the W shore.

The E coast of Teluk Bone is sparsely inhabited and backed by wooded mountains. The head of the bay is low and fringed by mangroves. There are several wooded hills standing inland. The area is sparsely populated except at its extreme head. The W coast is densely populated and generally low.

Winds—Weather.—The following particulars of winds and weather were gathered from observation made during the survey of Teluk Bone.

In the S part of the W side, from February to April, rain and showers occurred for 28 out of 78 days observations.

The sky was always cloudy, especially in the daytime. The clouds came up with the sea wind in the forenoon, packed in dark masses against **Gunung Lompobatang** (5°22'S., 119°56'E.), and burst into rain in the afternoon.

Farther N during December and January, the wind was mostly W and NW, quickly raising a troubled sea in the daytime. At the head of Teluk Bone, during July, the wind was weaker and the sea calm.

On the E side of Teluk Bone there appears to be a quite a bit of rain during the Southeast Monsoon. At the end of April and during May, at the entrance to Teluk Bone, the Southeast Monsoon blew freshly, with squalls, much rain, swells, and seas. Farther N the wind was less, but the rain greater. June and July were very unsettled with winds from the SE, but sometimes blowing from W for several days. In August, the rain gradually ceased and the weather became more settled.

Tides—Currents.—Tidal currents in Teluk Bone seem to be very insignificant and weak, except at the mouths of the large rivers. The direction of the current S of Teluk Bone is in accordance with the monsoons, being W from June to October and E from December to May.

All the reefs, which dry, lying near the 183m curve are well marked by discoloration and often break in the Southeast Mon-

soon.

A local magnetic anomaly has been reported off **Teluk Bone** (4°00'S., 120°45'E.), 14 miles W of **Tanjung Lassa** (5°37'S., 120°29'E.).

Caution.—There are a great number of uncharted shoals and reefs in this vicinity and it is advisable to navigate with caution.

8.86 Tanjung Boengikalo (4°51'S., 121°41'E.), the E entrance point of the bay, is low and rounded with some scattered tall trees. A detached drying reef with irregular depths and well marked by discoloration, lies 1.25 miles S of the point. The coastal reef projects 2 miles SW of the point. A small shoal, with a depth 4.1m, lies about 5 miles ESE of Tanjung Boengikalo. The coast forms a wide bight with irregular depths E of the point.

The E coast of Teluk Bone between Tanjung Boengikalo and Tanjung Ponopono, about 16.5 miles NW, is fronted by a wide, drying coastal reef. The reef is discolored for about 5 miles NW of Tanjung Boengikalo.

Karang Sopang (Sopang), a small, dangerous steep-to reef with a depth of 0.9m, lies outside the 183m curve about 9 miles WSW of Tanjung Boengikalo. The reef is marked by discoloration and a heavy surf.

Teluk Paria (4°48'S., 121°38'E.), located about 5 miles NW of Tanjung Boengikalo, is 0.3 mile wide between the coastal reefs on either side of the entrance.

Vessels of moderate size can take anchorage in Teluk Paria, in depths of 14.6 to 29m, sand.

Vessels entering the bay should keep fairly close to the W entrance point, which is covered with mangroves. The coastal reef SW of this point is dangerous and it frequently shows very poor discoloration, as the water is very muddy.

Pulau Basa (4°50'S., 121°30'E.) is a small, low, and thickly-wooded island lying about 10.5 miles W of Tanjung Boengikalo on the N end of a large drying reef. This reef extends about 2 miles SE, 1.5 miles W, and 0.3 mile N.

Karang Boisebola, about 2 miles NW of Pulau Basa, is steep-to and dries in several places.

Karang Lamoeloe (Lamulu), about 1 mile NW of Karang Boisebola, is a very steep reef with a white sand cay in its N part, which dries 1.8m at lowest tide.

The coast between Tanjung Ponopono and Tanjung Pakar, 27 miles N, is hilly and fringed by a reef which dries, extending 0.75 mile offshore in the vicinity of Tanjung Tanggetada, about 6 miles S of Tanjung Pakar.

A number of small reefs, with a depth of 1 to 9m, lie within the 183m curve at distances of 1 to 3 miles offshore. Three drying reefs lie within 2 miles of the coast and 4.5 miles N of Tanjung Towari. To the S of these reefs, a small white sand cay plainly shows at low water.

The mouth of the Kali Oko Oko, which is a landing place for timber, lies about 3 miles N of Tanjung Tangkedata. Depths of less than 1.5m extend 1 mile seaward from the river mouth. Shoals, with depths of 4.1m and 6m lie about 3 miles WNW and NNW, respectively, of the river mouth.

Vessels with local knowledge can take anchorage on the S side of the small bay immediately N of Tanjung Towari, in a depth of 37m, mud. This anchorage is 0.1 mile from the coastal reef with Tanjung Towari, bearing 199°. Vessels with local knowledge can also take anchorage close N of the mouth of the Sungai Towari, located about 1.25 miles N of Tanjung Towari, in a depth of 20m, mud, with Tanjung Towari, bearing 175°.

8.87 Teluk Mekongga (Bingkoka Bay) (4°08'S., 121°30'E.) is entered between Tanjung Pakar and Tanjung Konaweha, about 19 miles NW. The S part of the bay is practically inaccessible because of the numerous reefs and shoals. Several islands lie across the entrance.

An area off Tanjung Pakar was swept to 11.4m. An anchorage lies at the NE end of this area. Reefs, with depths of less than 2m, lie close to all but the SW side of the area; all are marked by beacons.

Pulau Padamarang (4°07'S., 121°25'E.), the largest of the islands in the middle of the entrance to Teluk Mekongga, is rugged and mountainous with numerous small bays. The highest summit, near the center of the island, rises to a height of 702m. The island is generally surrounded by a steep-to reef. The W side is clear except off the points.

Pulau Lima, a small islet about 72m high, lies on the reef which extends 0.5 mile from the SW point. A bare rock lies on the reef projecting from the SE point of the island. Pulau Idju lies close off the N extremity. Pulau Lemo lies 0.35 mile off the E point of Pulau Padamarang, and is fringed by a drying reef. The passage between Pulau Lemo and Pulau Padamarang is deep, narrow, and not recommended because of the strong current. Karang Padamarang, about 1.5 miles NNW of Pulau Idju, is a round coral reef of about 0.2 mile diameter and dry at LW.

8.88 Pulau Lambasina-Besar (4°05'S., 121°21'E.), a high island with two summits forming a saddle, lies about 0.5 mile from the NW extremity of Pulau Padamarang.

The NW peak is 321m high. The island is surrounded by a coastal reef, except on the SW side. The reef projects about 0.7 mile from the N point in a sharp spit, with deep water immediately outside. The passage between this island and Pulau Padamarang is almost closed.

Pulau Lambasina-Ketjil, a low island, lies about 1 mile W of Pulau Lambasina-Besar. A light is shown at a height of 60m from the SW point of the island. The highest summit, 99m high, stands in the SW part of the island. The passage between the Kepulauan Lambasina is about 0.9 mile wide and clear in mid-channel.

Pulau Maniang (4°12'S., 121°29'E.), 222m high, lies 3 miles NW of Tanjung Pakar. Pulau Buija and Pulau Limaei are connected to the N side of Pulau Maniang by a drying reef. Numerous shoals lie between Pulau Maniang and the coast SE.

Pomalaa (4°10'S., 121°36'E.) (World Port Index No. 52295), a large trading village, is situated about 6 miles NE of Tanjung Pakar. Pomalaa is also an anchorage port for the export of nickel ore. Vessels load from barges at the anchorage. There is a pier of concrete construction, providing alongside berths for vessels not more than 135m long, with a draft of 5m at the NE side and 7m at the SW side. A conspicuous chimney, 45m high, stands 1 mile S of Pomalaa.

Pilotage.—Pilotage is not compulsory. However, due to uncleared waters, it is advisable that vessels calling for the first time at Pomalaa use a pilot. A tug meets vessels 1.5m W of Tanjung Pakar where officials board and the tug leads vessels to the anchorage.

Anchorage.—Anchorage may be taken by vessels with local knowledge off Pomalaa.

8.89 **Kolaka** (4°03'S., 121°35'E.), a large village and collecting point for forest products, stands at the head of Teluk Mekongga. A stone pier, about 0.2 mile long, with a depth of 0.9m at its head, is situated off the village.

Kolaka Light (4°03.2'S., 121°36.4'E.) is shown 1 mile E of the village.

http://www.kolaka.go.id

Kolaka

There is a jetty for handling oil products with a depth of 8m. Vessels up to 6,000 dwt and 120m long can berth.

Vessels with local knowledge can take anchorage about 0.5 mile SW of the pier at Kolaka, in a depth of 29m.

Karang Kolaka lies N of the anchorage off Kolaka, about 0.5 mile offshore, and is about 0.3 mile long and 0.1 mile wide, drying in parts.

A dangerous reef lies about midway between Karang Kolaka and the shore E at Kolaka.

Directions.—Vessels approaching Teluk Mekongga from the S should steer 000° for the summit of Pulau Padamarang, passing outside of all dangers. Steer for Palau Lambasina-Besar when sighted, and later the SW summit of Palau Lambasina Ketjil, taking care to keep the latter bearing N of 332°. Then pass in mid-channel between these two islands, making good a course of 034°.

When the N point of Pulau Lambasina Ketjil bears 250°, the beacon on Karang Padamarang may be steered for, leaving it to port, then change course to pass between Karang Mekongga, located about 1.75 miles WSW of Kolaka, and Karang Kolaka. The SE summit of Palau Lambasina-Besar in range, bearing 262°, with the sharp hillock on the NE slope of the NW summit of Pulau Padamarang, leads between these two reefs.

Vessels approaching from W should steer 090° for the summit of Pulau Padamarang to pass well clear of Karang Rosa Marie, located about 10.25 miles W of Pulau Lambasina Ketjil. There is a depth of only a few meters over this reef, which breaks heavily. Karang Tamboli lies about 5 miles NW of Karang Rosa Marie. The reef dries and is plainly visible because of the surf. Shoal water, with a patch that nearly dries, extends about 1 mile to the S.

8.90 **Tanjung Ladongi** (3°55'S., 121°15'E.), located 22 miles NW of Koloka, is steep and conspicuous from the W. Pulau Tjampea lies about 1 mile W of this point.

Teluk Paopao (Paopao Bay), located close SE of Tanjung Ladongi, is open to SW and S seas. A steep coastal reef extends about 0.4 mile from the E shore of the bay. A shoal, with a depth of 0.3m, lies in the NW part of the bay, about 0.4 mile offshore. Vessels with local knowledge can take anchorage on the E side of Teluk Paopao.

Lariko Bay (Teluk Woimenda) (3°51'S., 121°14'E.) is entered between Tanjung Waminda, lying 3.25 miles N of Tanjung Ladongi, and Tanjung Lariko, about 4 miles NW.

Pulau Laburoko (Laboeroko), 122m high, lies about 0.5 mile W of Tanjung Waminda. The shores of the bay are edged by a narrow steep-to reef.

Vessels with local knowledge can take anchorage in the S part of Teluk Waminda, in a depth of 37m.

Karang Dungi (Dungi Reefs) (Doengi Riffen) (3°57'S., 121°06'E.) are two small shoals visible a considerable distance under favorable circumstances.

The reefs lie just within the 183m curve, about 8.5 miles W of Tanjung Ladongi. The NW reef has a depth of 1.5m and the SE, a depth of 0.3m. The ridge between the two reefs has a least depth of 16m.

The westernmost reef lies about 10.5 miles WSW of Tanjung Lariko. The reef is narrow, semicircular with the opening to the E, and partly dries.

The coast between Tanjung Batoe Laki, located about 6.5 miles NW of Tanjung Lariko, and Tanjung Toli Toli, about 18 miles NW, is fringed by a ridge of drying coral reefs extending up to 4 miles offshore.

Teluk Labuandata, a small bay located about 2 miles S of **Tanjung Tabako** (3°25'S., 120°52'E.), provides good anchorage, in a depth of 37m for a single ship.

Teluk Bone—West Coast—Tanjung Lassa to Tanjung Jene

8.91 From **Tanjung Lassa** (5°37'S., 120°29'E.), the SW entrance point of Teluk Bone, the coast trends in a N direction 142 miles to Tanjung Jene. This coast is densely populated, generally low, and in its central part there are large areas of paddy fields.

Tanjung Laboe (Tanjung Labu) (5°22'S., 120°25'E.) is a high point that is prominent due to its white rock formation, located 17.5 miles NNW of Tanjung Lassa.

The coast in this area is high, steep, and can be approached closely, but there is no safe anchorage.

Kadjang (Kajang), an administrative headquarters, is situated in a small bight about 3 miles WNW of Tanjung Laboe.

There is a stone pier on the S side of the bight, but the bottom is too steep for anchoring. The most suitable anchorage is in the NW corner of the bight, in not less than 27m, NNW of the stone pier.

Between Tanjung Laboe and Tanjung Tippoeloewe (Tanjung Tippuluwe), 52 miles N, the charted 183m curve turns 31 miles NE to **Karang Limpogeh** (4°56'S., 120°45'E.), marked by a light, on which there is a sand cay. This reef is noticeable, but the sand cay only shows over a small part at HW. From this reef the charted 183m curve turns NW for a distance of 32.5 miles to a position 4 miles E of Tanjung Tippoeloewe, enclosing some islands and a large foul ground, which is steep-to on its outer edge.

A shoal, with a depth of 6.7m, has been reported to lie about 3.5 miles SE of Karang Limpogeh.

Between Tanjung Laboe and Tanjung Kopang, 10 miles NNW, the coast rises steeply to hills about 122m high, then begins a stretch of low land to Tanjung Ancu (Tanjung Antjoe), about 9 miles farther N.

8.92 Gunung Sinjai (Gunung Sindjai) (5°05'S., 120°12'E.) rises to a height of 263m, 6 miles SW of Tanjung Ancu. This peak is the only good landmark along this part of the coast.

Karang Melambiri (Melambiri) (5°14'S., 120°26'E.), a drying reef that is steep-to on its E side, lies 5.5 miles NNE of Tanjung Laboe. A 7m patch lies close S of Karang Melambiri. Karang Malamala (Malamala), a reef which partly dries, lies 1.75 miles W of Karang Melambiri.

Pulau Bulunrue (Boeloenroee) (5°07'S., 120°24'E.), 7 miles NW of Karang Malamala, is a conspicuous island that rises to a height of 252m. A reef which dries, lies 2 miles S of Pulau Bulunrue and is marked by a beacon.

Another reef, with a depth of 5.5m, lies 3 miles SW of Pulau Bulunrue. An island about 4.5 miles NNE of Pulau Bulunrue appears as a saddle when seen from the N or S.

Caution.—There are a great number of shoals and reefs in this vicinity, and it is advisable to use the greatest care in navigating here.

8.93 Sindjai (Sinjai) (5°08'S., 120°15'E.), an administrative center, is situated on Sungai Sindjai, 2 miles within its entrance, about 6 miles SSW of Tanjung Ancu. There is good anchorage, in a depth of 20.1m, with the mouth of a river, 2.5 miles NE of Sindjai, bearing 292°, at least 1 mile offshore. Anchorage may be taken closer in off the mouth of the river in not less than 9.1m.

The bank off the river mouth is steep-to and deep draft vessels should not approach inside the 20m curve.

To approach the anchorage from the S, vessels when abeam Tanjung Laboe, about 1 mile distant, make good course 354° for Pulau Bulunrue.

When about 3 miles S of Pulau Bulunrue, steer for the anchorage with Gunung Sindjai bearing 297°. Anchor when Pulau Beloppo, 1 mile NE of Tanjung Ancu, bears 006° and the river mouth bears 292°.

Tanjung Salangketo (4°50'S., 120°23'E.) lies 13.5 miles N of Tanjung Ancu, and Tanjung Patiro lies 12 miles farther NNE. Gunung Meru (Meroe) rises to a height of 199m, 2 miles inland, about 7 miles NNW of Tanjung Ancu and Gunung Pacongi (Patjongi) rises to a height of 749m, 8 miles NW of Gunung Meru.

From the mouth of Sungai Sindjai to Tanjung Ancu there is a low strip of marshy land, 1 mile wide along the coast. From Tanjung Ancu to a position on the coast E of Gunung Meru, the coast becomes undulating.

From this point to Tanjung Patiro, there is a wide plain along the coast. The land within rises to spurs from isolated summits. Gunung Cinnung (Tjinnoeng), 256m high with a flat summit, rises 7 miles WSW of Tanjung Patiro and Gunung Damara (Damara), 152m high, conical, covered with tall trees, lies 3.5 miles WNW of Tanjung Patiro.

The coast, between Tanjung Ancu and Tanjung Patiro, is edged by a broad drying reef covered with a layer of mud. A small rocky islet lies on the reef 5.5 miles N of Tanjung Ancu.

Between Tanjung Patiro and Tanjung Tippoeloewe, 11 miles NNW, the coastal appearance changes considerably.

There are large villages with coconut groves interspersed with vast stretches of cultivated land.

8.94 Badioa (Bajowe) (Bajoa) (Bone) (4°33'S., 120°23'E.), a town about 7.5 miles NNW of Tanjung Patiro, has a long pier which dries at low water. The port has daily ferry service. The roadstead within the 10m line, about 3 miles offshore, is thickly studded with coral heads.

Badioa

Badioa

Totopele Light (4°32'S., 120°28'E.) is shown from the reef about 4 miles ENE of the pier.

Reefs, with a least depth of 0.9m, lie about 4.5 miles ESE of the pier head at Badioa. A beacon stands on the N reef. A reef which dries, also marked by a beacon, lies 2.75 miles ESE of the pier head and a 4.5m patch lies 0.5 mile E of this beacon. Karang Torea (Torea), a drying reef, lies 2.5 miles SE of Tanjung Tippoeloewe and another reef which dries, lies about 2 miles farther SE. This latter reef is marked by a lighted beacon.

Directions.—From the anchorage off Sindjai, steer course 029°, rounding a beacon situated on the E side of a reef, 2 miles SSE of Tanjung Ancu. When close E of the beacon, steer

for the islet 5 miles N of Pulau Beloppo until Pulau Beloppo bears 312°. Alter course to the NE to pass W of the beacon on the NW side of Karang Tenghai (Tenghai), a reef lying about 5.5 miles S of Tanjung Salangketo. When Gunung Cinnung bears 316°, the course is 003°.

This course leaves a beacon, 3.5 miles S of Tanjung Patiro, on the port hand and a beacon, 1.5 miles E of Tanjung Patiro, on the starboard hand. From abreast Tanjung Patiro the course is 342°. This course passes over a 7m patch, 2 miles NNE of Tanjung Patiro. When the vessel is about 2 miles S of Karang Torea a W course may be steered for the anchorage off Badioa, passing about 0.75 mile N of the beacon situated 2.75 miles ESE of the pier head.

For vessels continuing N, when about 1.75 miles S of Karang Torea, course may be altered to the NE passing about 0.75 mile N of a drying reef and S of a beacon marking the E extremity of Karang Torea. When clear of the beacon, steer a course as required for desired destination.

Uncharted dangers may exist along this suggested route and local knowledge is essential.

Tanjung Tippoeloewe (Tanjung Tippuluwe) (4°29'S., 120°23'E.) is a high rocky promontory 4.5 miles N of Badioa. It appears as an island from the E and N. The coast, to a point 2.75 miles NW, is high with some tall trees which are particularly noticeable from the N. The coast to a river delta 6 miles farther N is low, mainly fronted by mangroves, and backed by a wooded and paddy field-covered plain.

8.95 Palima (4°20'S., 120°22'E.) (World Port Index No. 52290) is an important trading place situated 2 miles above the river's entrance. There is a customs officer and a port captain in the village.

In the Northwest Monsoon there is good anchorage, in 9 to 11m, off the central mouth of the river delta. The mouths of the river can only be seen when close under the coast, but Gunung Tafelberg (Tafelberg), about 9 miles W, is a useful guide.

In the approach to the anchorage, vessels should pass S of Karang Tobako (Tobako), lying about 3.5 miles ESE of the river delta. The reef is marked by a beacon. The beacon should be passed not less than 0.3 mile distant, taking care to avoid a 5.8m patch lying 1.5 miles SE.

Tanjung Lokoloko (3°44'S., 120°26'E.) lies 36 miles N of Palima. The intervening coast between these two points is a mud bank, occasionally mixed with coral, which dries 1 to 2 miles offshore.

Numerous reefs lie within the charted 183m curve. It is possible more may exist than is shown on the chart. By keeping E of 120°32'E, vessels will pass outside these dangers. Only those lying near the charted 183m curve can be plainly seen. There are frequently areas of false discoloration outside this curve.

8.96 From Palima to Tanjung Lokoloko there are a few villages on the coast, which is low, fronted by mangroves, and backed by a wide plain covered with paddy fields.

There are no distinctive features on or within the coast except a large tree 3.25 miles SSW of Tanjung Lokoloko.

Tanjung Lokoloko and Tanjung Siwa, about 3 miles N, are low and wooded.

Between **Tanjung Siwa** (3°41'S., 120°26'E.) and Tanjung Jene, about 26 miles N, the 183m curve lies close to the shore. From a position about 1 mile E of Tanjung Siwa, the 183m curve gradually edges away to about 5 miles E of Tanjung Jene, then turns NE and E across Teluk Bone.

Pasi Belongka (3°32'S., 120°26'E.) lies near the 183m curve, 9 miles N of Tanjung Siwa. Karang Lamunre (Lamoenre), with a depth of 3.5m, lies 8 miles NNE of Pasi Belongka.

Anchorage.—Anchorage may be taken N of Tanjung Siwa, in a depth of 9.1m. Anchorage may also be taken off Tanjung Polo, 9.5 miles N of Tanjung Siwa, in a depth of 18.3m. The anchorage off Tanjung Polo should be approached N of Pasi Belongka.

The head of Teluk Bone, between Tanjung Jene and Tanjung Tobaku, about 28.5 miles ESE, is encumbered with reefs in its E part, inside the 183m curve. The land is low and flat in the NW part, the mouths of the streams affording the only landmarks. In the N part, ridges from the massive Pegunungan Tambuke approach the coast.

The low plain E has several scattered hills, the most noticeable being Maliowo, with a sharp peak 401m high, and Krambua, 198m high.

8.97 Tanjung Jene (Tanjung Djenemedjai) (3°15'S., 120°25'E.) is a low point of land with a reef that dries extending NE. A light marks the NE extremity of the reef.

The coast between Tanjung Jene and Palopo, a town about 20.5 miles NNW, is low and marshy.

An obstruction lies 2 miles NE of **Tanjung Bua** (Tanjung Boea) (3°03'S., 120°15'E.).

Karang Bali (Bali Riffen) (3°10'S., 120°36'E.), a group of drying reefs, lies near the edge of the 183m curve in a position about 12 miles ENE of Tanjung Jene. Karang Naber (Naber Riffen), a group of drying reefs, is located about 10 miles NNE of Tanjung Jene. Karang Bron (Bron Rif), a drying reef, lies about 9 miles N of Tanjung Jene.

The sea is discolored by the rivers in this area. After heavy rains, thick tree trunks are carried far out to sea.

An 11m patch was reported 4 miles NNE of Tanjung Jene.

Tanjung Jene should be given a wide berth as a constant E current has been reported in the vicinity of Karang Bron.

Teluk Palopo (Palopo Bay) (2°59'S., 120°13'E.), located in the NW corner of the head of Teluk Bone, is surrounded by mountains decreasing in height to the E.

Pulau Libukan, a rocky islet about 62m high, lies on the broad bank extending from the N side of the bay and stands out clearly against the background.

The large town of Palopo, consisting of a collection of villages, is situated on both banks of a river. There is a doctor and a hospital at Palopo.

A stone breakwater, exhibiting a light, extends about 0.9 mile ENE from the shore near the mouth of the river.

There is a tower on the head of the breakwater. A small concrete pier, 57.5m long with a depth of 7m alongside, lies close to the breakwater. The Port of Tanjung Ringgit Palopo Terminal has an inner berth 538m long and an outer berth 208m long, including dolphins; both have a depth alongside of 7.0m and handle cruise cruise vessels and breakbulk. The PT Panca Usaha Terminal has an anchorage area for breakbulk cargo with a maximum vessel draft (HW) of 9.8m and a General Cargo Berth, with a depth of 7.0m, for breakbulk cargo. The PT Pertamina Deport Palopo Terminal Oil Berth is 40m long and handles chemicals and clean products (CPP).

A dangerous wreck, the position of which is approximate, lies about 1 mile E of the head of the breakwater.

There are several reefs in the bay which are not marked by discoloration. Batu Labue, a reef in the S part of the bay, lies about 2.25 miles NNW of Tanjung Bua. A 0.4m patch lies 1.75 miles SSE of Batu Labue.

Vessels can take anchorage about 0.5 mile ENE of the stone breakwater, in a depth of 11m. Smaller vessels can anchor closer inshore, in a depth of 7m. The holding ground is good.

The coast between Teluk Palopo and Teluk Usu, about 50 miles NE, is low with a drying bank of mud and sand. There are occasional coral reefs, extending offshore about 0.75 mile, along the entire coast. The water is murky and muddy from 4 to 5 miles from the coast.

Vessels with local knowledge can take anchorage in a position E of the reefs off the mouth of the **Sungai Wotu** (Sungai Wotoe) (2°38'S., 120°48'E.). It is approached by steering for a conspicuous clump of trees near the mouth, bearing 326°. The channel is marked on either side by beacons. There is a small drying reef S of the channel. The large village of Wotu is situated about 2 miles upriver.

Teluk Usu (Oesoe Baai) (2°40'S., 121°02'E.) lies in the NE corner of Teluk Bone. The E side of the bay is foul. The middle of the bay is free of dangers with depths of 28 to 37m. The Sungai Usu discharges in the N part of the bay.

Pulau Bulubulu lies 0.4 mile W of **Tanjung Bulubulu** (2°48'S., 120°59'E.), the S entrance point of the bay. The channel between the island and the point is about 0.3 mile wide and safe.

Malili, a large and important village, is a collecting place for forest products and the seat of a civil administrator. It lies upriver on the Sungai Malili, about 3 miles above its junction with the Sungai Usu. The Mangkasa Point Terminal consists of two berths, as follows:

1. The Mangkasa Oil Jetty, with a berthing length of 105m including dolphins, has a depth alongside of 6.0m and handles clean products. Vessels up to 16,000 dwt, with a maximum loa of 150m and a maximum beam of 15.5m, can be accommodated150m.
2. The MBM Mangkasa Oil berth handles clean products and dirty products. Vessels up to 20,000 dwt, with a maximum loa of 180m, a maximum drqft (HW) of 9.4m, and a maximum beam of 21m, can be accommodated150m.

8.98 **Mangkasa Oil Terminal** (2°44'S., 121°04'E.) (World Port Index No. 52235) is about 8 miles ENE of Pulau Bulu-bulu. A system of Four Buoy Moorings (FBMS) can accommodate tankers up to 20,000 dwt. Maximum draft is about 9.4m, with an overall length of 183m. Advanced notice of arrival must be given 72 hours prior to arrival and confirmed or amended 48 hours and 24 hours prior to arrival.

A shoal, with a depth of 0.9m, lies S of the entrance to Sungai Usu leaving a channel on either side.

Vessels with local knowledge can take anchorage off the mouth of the Sungai Usu, in a depth of not less than 20m. There is a choppy and difficult sea with the river in flood and the wind from seaward.

The coast between Tanjung Bulupulu and Tanjung Tabako, about 38 miles S, forms numerous small bays of little importance.

Except for the reefs, there is deep water until close inshore.

The coast between Teluk Usu and **Pulau Sapiri** (3°02'S., 121°03'E.) is high with a mountain ridge close to the shore. The coast is sparsely populated and Lelewau (Lelewaoe), situated 13.5 miles SSE of Tanjung Bulubulu, is the only village of any importance.

The coast between Pulau Sapiri and Tanjung Tabako is low and more populated, the high mountains lying some distance inland.

Caution.—A large number of coral reefs, mostly drying and of small circumference, lie close to the 183m curve. Navigation in this part of Teluk Bone should be avoided.

8.99 The E coast of Pulau Selajar lies 9 miles S of Tanjung Lassa, the SW entrance point of Teluk Bone, and is separated from that point by Selat Selajar.

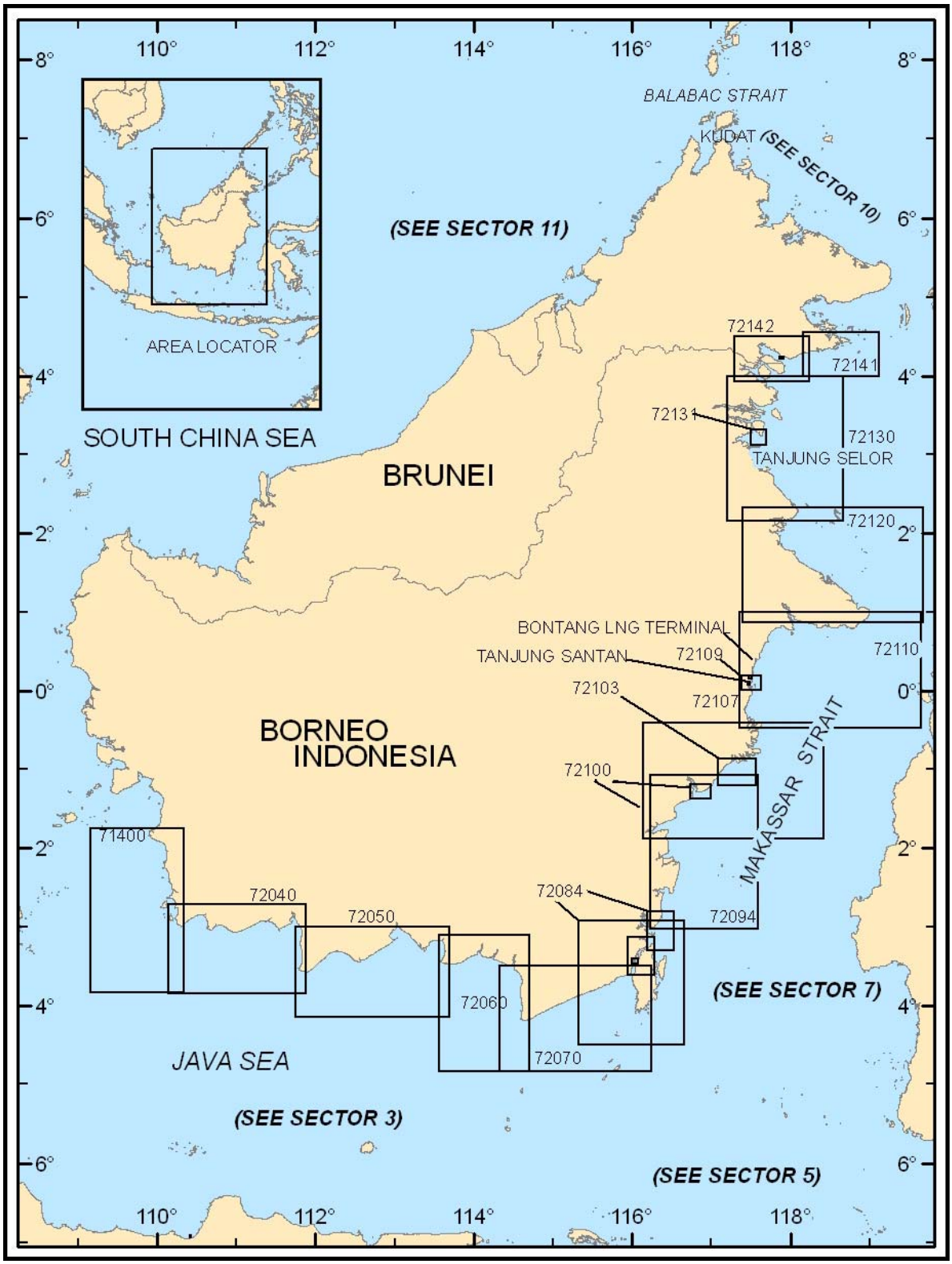
The mountains rise almost vertically from the sea giving the coast a rocky aspect with a few interruptions by sandy beaches.

Gunung Barugaiya (Baroegaija) (6°02'S., 120°33'E.), the highest peak on the island, rises to 696m about 16 miles S of the island's N extremity. There are other charted peaks on the island which may be seen in the offing.

The bottom near the coast is steep except near Ujung Apatana, at the S extremity of the island, where the emerging spots of coral and rocks are reported to be very narrow, and are entirely absent along the middle of the island.

Navigation along the coast is easy but should not be attempted in the Southeast Monsoon.

Anchorage along the coast is not recommended because of the steep bottom and the extreme difficulty of approach.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **9** — CHART INFORMATION

SECTOR 9

BORNEO—SOUTH AND EAST COASTS

Plan.—This sector describes the S coast of Borneo between Tanjung Sambar and the S end of Pulau Laut, about 360 miles to the ESE, and the E coast of Borneo between the S end of Pulau Laut to the mouths of the Sesayap, about 520 miles to the N. The descriptive sequence is ESE and then N.

General Remarks

9.1 The S coast of Borneo, between Tanjung Sambar and Pulau Laut, is densely overgrown with forests of moderate height. There are few distinctive landmarks, but at the river mouths the trees are taller. Banjarmasin is the most important shipping place along this coast.

Pulau Laut, a rather large island separated from the SE coast of Borneo by Selat Laut, is mountainous in its N part and hilly in its S part. The strait is very narrow in parts and should only be used by vessels with local knowledge. Stagen, a lumber port, and Kotabaru, a shipping place of some importance, are situated near the NW end of the island.

The S part of Makassar Strait is partly obstructed by numerous islands and dangers. Borneo Bank projects far into the strait and encloses numerous islands, reefs, and dangers. Between the E edge of the bank and Pulau-pulau Sangkarang (Pulau-pulau Pabbiring) (Spermonde Archipelago), described beginning in paragraph 7.13, are a number of isolated coral banks rising abruptly from great depths, with raised ridges and islands on the N and E edges.

The E coast of Borneo between Pulau Laut and the entrance of the Makassar Strait to the N is low, marshy, and covered with dense vegetation. Numerous rivers, some with large deltas and bays, indent parts of the coast.

There are few landmarks, as the coastal hills usually stand about 6 miles or more inland. Balikpapan and Lingkas are the most important deep-water ports on this coast. Makassar Strait, the main route for shipping, passes between the E coast of Borneo and the W coast of Sulawesi to the E. Between the parallels of 2° and 3° in the S latitude, the strait is separated into two channels by the Little Paternaster Islands. The W channel is 10 miles wide and frequented. There are numerous dangers in this channel and moderate depths are found along the Borneo coast. The E channel, between the 183m curves, has a least width of 22 miles and is extremely deep. This channel is extensively used by all classes of vessels.

Winds—Weather.—In that part of the Java Sea which lies off the S coast of Borneo, the winds will blow for 7 months from April to November, from E in the center of the sea, and ESE to SE over the E portions. The Northwest Monsoon, blowing from WNW to W, is stronger in force than the Southeast Monsoon and lasts from December to March.

Thunderstorms and squalls may be encountered during the change of seasons.

Along the E coast of Borneo in Makassar Strait, the monsoons are markedly weaker than those in the Java Sea off the S coast of Borneo. Near the shores of Borneo and Sulawesi the land and sea breezes blow throughout the whole year. The local topographical features and direction of the coast may greatly influence the force and direction of the wind in the strait.

Land breezes can be expected between about 1900 to 0700; sea breezes occur from 1000 to 1700.

Where the monsoon is strong on a lee shore, the land breeze may not occur.

The Southeast Monsoon sets in over the S part of the strait in April, blowing from the NE to SE. Calms and NW winds are sometimes felt. This unsettled weather lasts until June, when the wind begins to blow with some regularity from SE, occasionally shifting to the SW. At night during June, the wind is mostly E to SE, but it also blows from the S and SW. These winds will bring in a swell and, blowing in opposition to the prevailing S currents, produce a short and troubled sea.

In September and October there is a decrease in wind and sea, and changing to S and W in November, and in December from SW to NW. These winds cannot be relied upon.

The Northwest Monsoon is at its height in January and blows from the NW. Heavy squalls, rain, and heavy seas occur and then begin to abate in February. Light breezes from NW to NE and E occur in March.

December to March are considered the rainy months, but there are showers in all other months. July to September can be termed the dry season. Squalls and thunderstorms occur in December.

In the N part of the strait the force of the wind is less.

The monsoons from N and SSW are variable and depend on the strength of the wind circulation in the Celebes Sea and the Java Sea. The seasons are not well defined and plenty of rain occurs.

The SSW winds commence in May. These veer occasionally to W and NW and are variable and unsteady. The monsoon is at its height from June to September, and SSW winds prevail both day and night.

In October, the monsoon decreases in force and is lowest in November, the wind sometimes veering to the N and NE. In December the general direction is NW, in January N, and in February NNE winds blow, decreasing in April when calms and variable breezes can be expected.

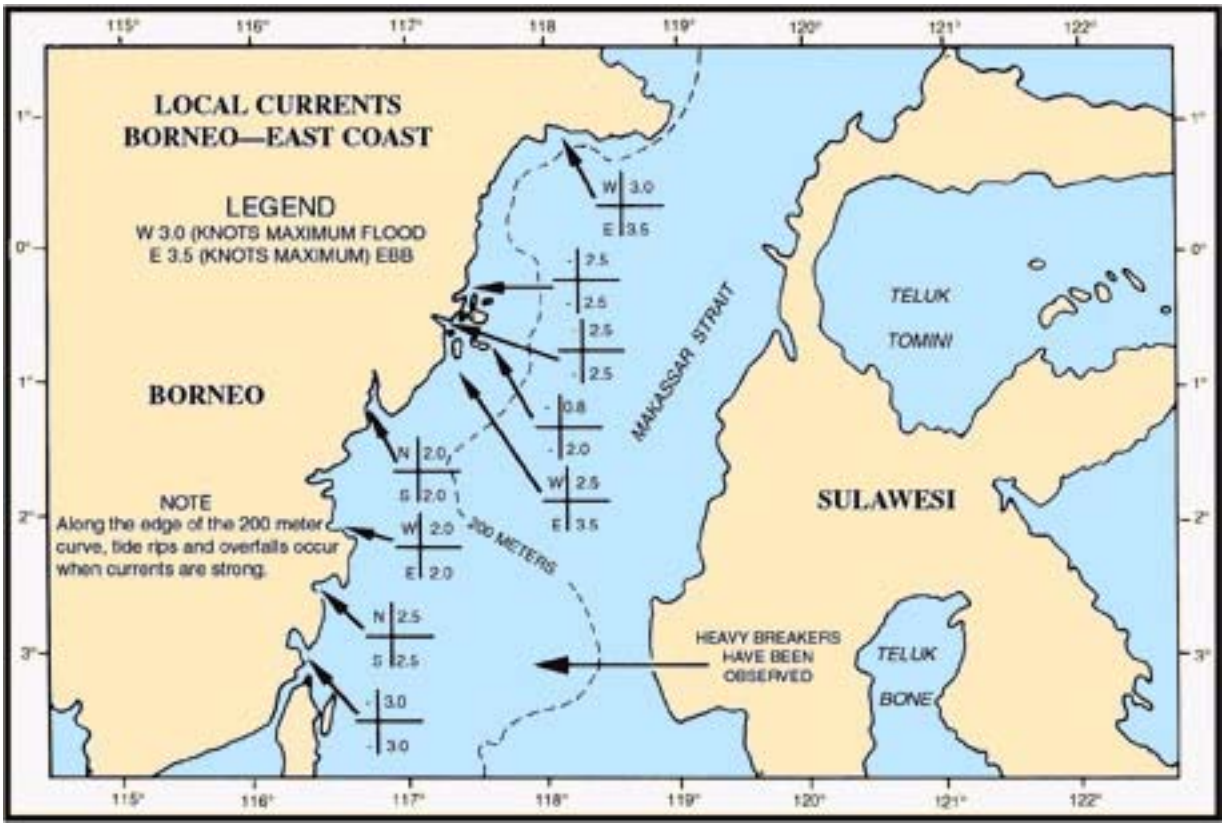
There is less cloudiness in the N than in the S part of the strait, but rain is heavier and more continuous.

Rainfall is greater on the Borneo side than on the Sulawesi side of the strait.

The rainy season is from November to March, and the dry season from July to September. Squalls and thunderstorms are rare, but mist occurs.

Tides—Currents.—The current along the S coast of Borneo is a mixture of tidal and monsoon currents. At HW, the tidal current sets W; near LW it sets E.

During the Northwest Monsoon, a predominating E current can be expected; during the Southeast Monsoon, there is a W current. The monsoon current seldom appears to exceed a rate of 1 knot.



Between the numerous detached sand ridges, extending more than 30 miles S from Tanjung Sambar, the currents sometimes attain rates of 2 to 3 knots with overfalls.

In the various bays into which the large rivers discharge, the usual direction of the currents is naturally altered, and the rate of the current setting in or out averages from 1 to 1.5 knots. In the channels between the banks and close off the points, as well as in the mouths of the rivers, the currents may attain a rate of 3 knots.

The tides on the S coast of Borneo are nearly always diurnal, but a second tide of very small range sometimes occurs. In November, December, and January the highest tides were observed, and the lowest in July and August.

The tides in Makassar Strait are mixed with a predominating semidiurnal character, except in the SE part of the strait where the tides occur at nearly the same time for several days.

Along the Borneo coast this phenomenon is most noticeable in the S part of the strait and on the Sulaweal coast in the N part of the strait.

In the S part of the strait the flood sets N and the ebb to the S. In the area between the 20m curve between Kepulauan Masalina and Little Paternoster Island, the currents are weak and do not greatly affect the usual S current.

The S or SW current is usually met within the open part of Makassar Strait throughout the year. It is sometimes, but not always, stronger on the E side of the strait, toward the Sulawesi coast. The average rate for the whole year is about 0.5 knots, varying somewhat in different months. A maximum rate of 2 knots has been recorded.

A constant N current has been reported in the bight S of Tandjung Mangkalihat along the Borneo coast with a rate of 0.5 knots. Just outside this current the usual S current may by running at a greater rate. The influence of the tidal currents are felt along the Borneo coast.

Experienced pilots state that during the Southeast Monsoon (April to October), the current runs N along the whole of the E coast of Borneo as far as Tandjung Mangkalihat, where it turn SE and S to joins the usual S current.

When the Southeast Monsoon is, or has been strong, the N set off the entrance of Teluk Balikpapan attains a rate of 1.5 to 2 knots, while the S set off Pulau Balahalangan, the outer island of the Little Paternoster Island, has been observed to attain a rate of 2 knots. Vessels crossing the strait from Teluk Balikpapan to the Sulawesi coast during the Southeast Monsoon may experience a N set for a distance of 75 miles from the coast of Borneo, and then a S set for the rest of the passage.

In the S part of the strait the direction of the S current is influenced by the prevailing monsoon. From June to September the current is SW and passes into the W current of the Java Sea. From November to March the current is SE and passes into the E current of the Java Sea and the Flores Sea. April and May are months of transition, with the current in the W part of the strait turning SW as it emerges, while the part towards the Sulawesi shore turns SE.

During the transition month of October, the whole of the emerging current turns SW and W. After a continuous wind, the surface drift is considerable and sometimes appears as a reversal of the prevailing set. As the wind slackens, however, the normal current is resumed with somewhat increased rate, accelerated or retarded by the tidal currents.

In the Celebes Sea during the Southeast Monsoon drift, currents from E will cause a gyrating motion which increases the S set on the W side of the island and gives an E current along the N shore of the Sulaweal.

Regulations.—For information regarding designated Archipelagic Sea Lanes, as defined by the United Nations Convention on the Law of the Sea (UNCLOS), passing through Makassar Strait, see the Indonesia section of Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

Ships are advised to maintain a strict piracy watch and anti-piracy measures and report all attacks and suspicious sightings to the local authorities and the IMB Piracy Reporting Center.

IMB Piracy Reporting Center	
Telephone	603-2031-0014 (Helpline—24 hours)
Facsimile	603-2078-5769 (24 hours)
E-mail	imbk@icc-ccs.org
	piracy@icc-ccs.org

Caution.—Great caution must be exercised in approaching the S coast of Borneo and Makassar Strait, due to the numerous dangers. Vessels should pass well S of the sand ridges which extend more than 42 miles S from Tanjung Sambar.

It has been reported that submarine pipelines lie in the vicinity of (0°58.5'S., 117°09.2'E.).

During the Northwest Monsoon, the discharge from the rivers is great. Discolored water, edged with a streak of foam, is often seen 30 to 40 miles offshore.

Fishermen frequent the waters off the SE coast of Borneo.

Muddy water extends from 8 to 9 miles off the E coast of Borneo so that reefs can seldom be identified by discoloration. During the rainy season this muddy water may extend 12 miles out to sea, and beyond that distance the only dangers readily seen are composed of light-colored coral or when white sand is found among the heads.

Tanjung Sambar to Tanjung Selatan

9.2 Tanjung Sambar (3°00'S., 110°19'E.) is a sharp, rocky tree-covered point. Due W of the S extremity of this point stands a prominent, forked tree which looms above the other trees and is visible about 13 miles. Numerous above-water rocks lie off the point, and three rocks awash lie about 1.25 miles S, with a similar rock about the same distance W. An above-water rock lies about 2.75 miles NE of the same point and 0.6 mile offshore.

For a distance of about 42 miles S of Tanjung Sambar, successive ridges of long narrow sand banks, with deep channels intervening, extend approximately parallel to the coast. Some patches, with depths of 13 to 18.5m, lie between these dangers and 4°00'S. The depths over the shallowest parts of these banks are usually 3.7 to 5.5m.

Due to no safe passages between these banks, vessels are advised to pass well S out of sight of land.

Gosong Aling (Fox Banks) (3°35'S., 110°15'E.), the southernmost of these dangers, are not marked by surf, but there are strong rips and breaking waves with seas of any size.

The shallowest part of Gosong Aling lies in the NW end of the shoal, 32 miles SSW of Tanjung Sambar, and has a least depth of 3m. A light is shown on Gosong Aling.

Caution.—Gosong Aling Light and its associated banks have been reported (1994) to lie 2 miles ENE of charted positions.

9.3 Gosong Djelai (Clemencia Bank) (3°23'S., 110°08'E.), about 25 miles SSW of Tanjung Sambar, has a least depth of 0.3m and almost always breaks.

Aruba Banks (Gosong Aruba) (3°28'S., 110°11'E.), between Gosong Djelai and Gosong Aling, consist of two narrow banks of hard sand with a least depth of 3m. They are almost always marked by tide rips.

A ridge, stretching 13 miles in a NW-SE direction, lies with its center 15 miles WSW of these banks. The depths of 7.8m mark near the center of the ridge, and 16.5m at its extremities. Mariners are advised to give the area a wide berth.

A shoal patch, with a depth of 16.5m, lies 28 miles W of Gosong Aling Light. Another shoal patch, with a depth of 11.5m, was reported to lie 14 miles NNW of the light.

A shoal patch, with a depth of 16.5m, lies 28 miles W of Gosong Aling Light.

An obstruction and shoal, with depths of 14.5m, lie 30 miles SSE from Gosong Aling Light.

Kepulauan Karimunjawa (5°50'S., 110°20'E.) and the dangers to the NE have been previously described in paragraph 3.28. Pulau Bawean has been previously described in paragraph 3.69. Masalembo-Besar, Masalembo-kecil, and Gosong Gia (Annie Florence Reef) have been previously described in paragraph 3.73.

The coast between Tanjung Sambar and Tanjung Puting, 97 miles ESE of Tanjung Sambar, is indented by a number of shoals and unimportant bays. There are no prominent landmarks between the latter point and Tanjung Siamok, 61 miles further E.

Teluk Airhitam (2°55'S., 110°30'E.) is a shallow bay entered between Tanjung Sambar and Tanjung Lumpur, a low muddy point 22 miles E.

There are some trees along the beach and the land behind the beach is marshy and heavily forested. A hill, 62m high with a prominent round-topped tree on its summit, stands at the head of the bay.

9.4 Batu Mogung (2°57'S., 110°29'E.), a coral reef almost submerged at HW, lies near the middle of the bay. Batu Bramil, a rock with a least depth of 0.6m, lies about 1.5 miles SW of this reef.

A current, with a rate of 2 knots or more, is sometimes experienced in the outer part of the bay and around Tanjung Lumpur. This current is mostly affected by the monsoon.

Between Tanjung Lumpur and Tanjung Selaka, 18 miles E, the coast is indented by a shallow bight with sandy beaches and backed by heavy vegetation.

A shallow river, which flows into the NW corner of this

bight, has a trading post on the left bank at the river mouth. Sukamara, about 35 miles upriver, is the seat of a government official. The customs office stands just below the village.

Selaka Bank (3°10'S., 110°54'E.), with depths of 1.2 to 4.6m, coral and sand, with a drying patch, extends 15 miles SSW from a position close W of Tanjung Selaka.

Vessels should not round this bank in depths of less than 18.3m. A patch, with a depth of 6.7m, lies about 2 miles SE of the S end of this bank. Currents may set irregularly across this bank at rates of up to 2 knots.

Between Tanjung Selaka and Tanjung Pengujan, 35.5 miles E, the coast is indented by Teluk Kotawaringin, a shallow bay of no commercial importance. Some tall trees stand on the latter point and close E, the land rises steeply to a 55.5m hill which forms a good landmark.

A light is shown from a red lighted beacon on the W side of the river entrance, 0.5 mile S of **Tanjung Putri** (2°55'S., 111°23'E.).

The Sungai Waringin, a shallow river, flows into the NE part of the bay. A conspicuous grove of trees stands in a small village on the E side of the river entrance.

The coast between Tanjung Selaka and the river mouth consists of sandy beaches alternating with somewhat high areas of white clay steeply sloped toward the sea. Many coconut trees grow along this coast and about 5 miles E of Tanjung Selaka, there is a prominent tree standing on a hill.

The coast between the river mouth and Tanjung Pengujan consists of a strip of bright, white sandy beach with hilly land behind it. This hilly land is visible for about 18 miles.

A shoal flat, defined by the 5.5m curve, extends 9.5 miles S from Tanjung Pengujan. A few 4.6 to 5.5m patches lie W of the outer end of this flat. Berasbasah Banks, consisting of some low, white sand banks which are not readily seen, lie on the N part of this flat. A light stands about 4.5 miles S of Tanjung Pengujan.

A shoal, with a depth of less than 1.8m, coral and stones, lies about 4.75 miles SE of Tanjung Pengujan.

Anchorage can be taken off the mouth of the Sungai Waringin, in depths of 6.4 to 7.3m, mud.

Teluk Kumai

9.5 **Tanjung Puting** (3°31'S., 111°46'E.), the SE entrance point of the bay is low, grass covered and marked by a light. The point can be recognized because its vegetation is of a lighter green color and lower than the high trees to the N and E. A tall group of trees S of Teluk Kramat are conspicuous and appear as an island from the offing. The E shore to the N is mostly mud.

The W shore of the bay, between Tanjung Pengujan and Tanjung Pandan, consists of a narrow sandy beach topped by high trees. A clump of two conspicuous trees stands about 1.5 miles W of Tanjung Pandan. Tanjung Kluang terminates in a long sandy spit almost covered at HW.

Some trees stand at its outer end. The Sungai Kumai, which flows out E of the last-named points, has some commercial importance. A dangerous wreck lies 32 miles SSW of the point.

Tides—Currents.—The tides in Teluk Kumai are mixed but mostly diurnal. The range is 1.1m at springs and 0.15m at neaps. The semidiurnal range is 0.6m at springs and 0.15m at neaps. The tidal currents are mostly semidiurnal at the mouth of the river and change every 6 hours. The duration of the ebb increases as the river is ascended. An ebb current of 3 knots and a flood current of 2 knots has been observed abreast Tanjung Kluang; however, the rates are somewhat less. A current with a rate of more than 2 knots sometimes flows around Tanjung Puting.

Depths—Limitations.—The 5.5m curve lies almost 3 miles S of the rounded point forming Tanjung Puting and about 9.5 miles S of Tanjung Pengujan.

Depths of 5.5 to 9.1m are found in the middle of the outer part of the bay. The least depth over the bar at the entrance to the Sungai Kumai, E of Tanjung Pandan, is 2.1m.

The deepest part of the entrance, which is on the W side near Tanjung Kluang, is obstructed in places by shoals.

Inside the entrance the river deepens and off the village of Kumai, 13 miles above the entrance, there is a depth of 11m. The river is navigable up to 15 miles above Kumai by vessels capable of crossing the bar.

Berasbasah Banks, on the W side of the bay, have been previously described in paragraph 9.4. A reef, about 91m in length and having a least depth of 1.8m, lies about 6.75 miles SE of Tanjung Pengujan and is marked by a beacon.

Sangora Banks (3°14'S., 111°41'E.) and Sapagar Bank are the principal dangers on the E side of the bay. Sangora Banks has three drying patches with bare islets on the N two. These banks change in shape but their position remains constant. A 2.7m rocky shoal, located W of the S part of Sangora Banks, is marked by a lighted beacon.

Sapagar Bank (3°08'S., 111°46'E.) has depths of 0.9 to 1.8m and a drying patch. A circular area, with a least depth of 0.5m, lies NE of Sapagar Bank. Numerous shoal patches, with depths of 0.9 to 4.6m, lie between the two banks. These banks seldom show discoloration.

Two rocks, with depths of less than 1.8m, lie about 2 miles W of the northernmost islet on Sangora Banks.

Less water than charted was reported to exist about 5.5 miles NW of Tanjung Puting. The drying reef fringing Tanjung Pandan has been reported to be extending to the SSE.

A drying bank and a rock, with a depth of less than 1.8m, lies almost in the middle of the river entrance about 1.25 miles NE of Tanjung Kluang.

Anchorage can be taken, in depths of 7.3 to 11m, mud, in the outer part of the bay.

9.6 **Kumai** (2°45'S., 111°43'E.) (World Port Index No. 51920), a small river port, is the seat of a government official. A landing pier at the custom house has a depth of 5.5m alongside. Vessels with local knowledge can anchor abreast of the flagstaff, in a depth of 11m. Here the river is 0.35 mile wide.The maximum draft allowed within the port is 6.0m.

Kumai Port Terminal consists of two berths. The Kumai Berth is 102m long and handles breakbulk cargo. The Panglima Utar Berth, is 154m long and handles ro-ro/passengers and breakbulk cargo.

The Pelindo III Container Terminal has a berthing length of 170m, including dolphins, and handles containers and breakbulk cargo. The Pt Sarana Sampit Mentaya Utama has a berthing length of 105m long, including dolphins, and handles of dirty products.

Tidal signals are displayed at the landing pier. A red flag in-

dicates flood tide; the "P" flag indicates ebb tide.

River scene at Kumai, Kalimantan.

Kumai

Between Tanjung Puting and Tanjung Siamok, about 48 miles ENE, the coast is indented by a shallow bay of no importance. The 10m curve extends about 12 miles offshore and encloses numerous shoals.

The **Sungai Pembuang** (3°26'S., 112°34'E.), marked by high trees on its entrance points, discharges close E of Tanjung Siamok. During the Southeast Monsoon, there is a heavy swell on the bar.

Kumai (Kuala Pembuang), which stands on the W bank, is the principal town. A flagstaff stands close N of the town.

A dangerous wreck lies 24 miles and 30 miles S of Tanjung Siamok.

Between Tanjung Buaja, the E entrance of the Sungai Pembuang and Tanjung Bandaran, about 33.5 miles NE, the coast is fronted by a sandy beach backed by heavy vegetation.

Caution.—The coastal bank in this area, with depths of less than 5.5m and lying as much as 6.5 miles off this stretch of coast, is reported to be extending seaward.

9.7 Tanjung Bandaran (3°08'S., 113°02'E.) is the NE extremity of a narrow tongue of land from which a drying sand bank extends 0.75 mile NE. A narrow spit, with a depth of 0.9m, extends 2.75 mile NE of the sand bank. Tanjung Bandaran Light, shown from a white framework tower, is situated in position 3°10.1'S, 113°00.4'E.

Teluk Sampit (3°13'S., 113°08'E.), a bay encumbered by mud flats, is entered close E of Tanjung Bandaran. Ujungbandaran Light, a white beacon, 40m in height, lies close SW of Tanjung Bandaran. The Sungai Sampit, which discharges into the head of this bay, leads inland to small river ports.

In the channel through the bar off the entrance there is a least depth of 2.1m which increases to a depth of at least 5m within the river. There is a least depth of about 1.5m over the bar, with depths of less than 1m close W of the recommended route; an inner bar, 10 miles upriver, has similar depths. The Sampit approach channel has a reported (2021) least depth of 4.5m.

A depth of 2.4m is found near the inner bar located near the town of Basseri, about 10 miles inland. Elsewhere, a depth of 4.9m can be carried to Sampit, about 35 miles upriver.

The tides at the mouth of the Sungai Sampit are mixed but mostly diurnal. Semidiurnal tides rise 1.2m at springs and 0.7m at neaps. Diurnal tides rise 1.8m at springs and 0.6m at neaps.

Anchorage.—See the table titled **Sampit Anchorages**.

Sampit Anchorages	
Anchorage	**Position**
Teluk Sampit	
Transhipment	3°09'06.0"S, 133°06'03.0"'E
Waiting	3°06'10.8"S, 113°03'31.2'E
Sungai Sampit	
CPO and cargo	2°44'21.0"S, 112°55'09.6"E
Cargo and BBM	2°32'10.2"S, 112°58'06.0"E
Repair	2°31'33.0"S, 112°58'06.0"E
Emergency	2°31'28.2"S, 112°58'11.4"E

Caution.—The approach to the Sungai Sampit is extremely hazardous due to shifting shoals and sand bars as well as sunken vessels. Vessels without local knowledge should not attempt to approach or enter the river without a pilot.

9.8 Sampit (2°31'S., 113°00'E.) (World Port Index No. 51910), the headquarters of a government official, is an important river port. An extensive export trade is carried on and the port is known as the largest timber port in Kalimantan.

Depths—Limitations.—Berthing details are shown in the table titled **Sampit—Berth Information**.

Pilotage.—Pilotage is not compulsory. Vessels should send their ETA to their agent 10 days, 3 days, 48 hours, and 24 hours prior to arrival.

Signals.—Tidal signals are displayed from the jetties at

Sampit.

Sampit—Tidal Signals	
Signal	**Meaning**
Red flag	Flood tide
White flag	Ebb tide
No flag	Slack water

Tanjung Bakai (3°17'S., 113°21'E.), the SE extremity of a low peninsula, lies 21 miles SE of Tanjung Bandaran.

The Sungai Mendawai discharges along the E side of this peninsula.

Pegatan, at the mouth of the Sungai Mendawai, and Mendawai, situated 19 miles upstream, are river ports of some importance.

The tides at the mouth of the river are mixed but mostly diurnal. Semidiurnal tides rise 1m at springs and 0.6m at neaps. Diurnal tides rise 2m at springs and 0.6m at neaps.

Caution.—The approach to the Sungai Mendawai is subject to frequent change. Vessels without local knowledge should not approach or enter the river without the services of a pilot.

A heavy surf is experienced at the mouth of the river during the Southeast Monsoon.

9.9 Teluk Sebangan (3°18'S., 113°30'E.), another shallow bay, is entered close E of Teluk Sampit between Tanjung Bakai and Tanjung Malatayur, about 18 miles SE. Pulau Damar, a small island marked by high trees on its S side, stands close E of the entrance of this river and is a good landmark for vessels approaching both bays.

Shoal ground, parts of which dry, extends 6.5 miles S from Tanjung Bakai. Batu Mandi, the highest of a group of conspicuous yellow-gray, pointed rocks, lies about 6.5 miles SE of the same point. Pulau Buaja, about 1 mile NE of Batu Mandi, consists of a large, bare flat rock. Several rocks awash lie about 2 miles NE of this rock. A rock awash, at LW, lies about 0.5 mile NW of the flat rock.

Anchorage.—The anchorages in the outer parts of the two bays provide good holding ground, but little protection from the Southeast Monsoon. Vessels without local knowledge should not anchor in the inner part of Teluk Sampit.

Vessels should keep in depths of over 9.1m in approaching either bay.

Between Tanjung Malatayur and Tanjung Burung, 56 miles ESE, the coast is low, marshy, and intersected by three rather large rivers. There are no natural landmarks, except near the river mouths, where the trees are higher and closer together. Tanjung Damaran, the E entrance point of the Sungai Kahayan, can be recognized by its high dark trees. Tanjung Tawas and Tanjung Pematang, the W and E entrance points to the Sungai Murung, have higher trees standing on them than those in the surrounding area.

Malatayur Bank (3°48'S., 113°36'E.), with depths of 0.9 to 5.5m, extends about 30 miles S from Tanjung Malatayur. The 10m curve lies about 40 miles S of the point. A wreck is reported in a position about 32.5 miles SW of Tanjung Malatayur.

Between Tanjung Burung and Tanjung Selatan, about 37.5 miles to the S, the coast is overgrown by tall trees and is intersected by a number of small, shallow rivers.

Pulau Datu, rocky and wooded, stands close offshore about 7 miles N of Tanjung Selatan. It is about 30.5m high to the tops of the trees and has a tomb on its summit.

A prominent white house, about 13 miles N of the islet, stands on a steep red-colored bluff.

9.10 Pandan Hill (4°04'S., 114°38'E.), 94.5m high, stands close inland abreast of Pulau Datu. The Bira Mountains, which serve as a good landmark, stand NE of this hill and rise to a 356m high summit. Gunung Tunggah, about 4 miles NE of Tanjung Selatan, is 102m high. Gunung Djadjaran has a flat crest running E and W.

Gunung Karamaian is conical and pointed.

Sampit—Berth Information						
Berth	**Length**	**Depth**	**Maximum Vessel**			**Remarks**
			LOA	**Draft**	**Size**	
Sampit Terminal						
Passenger Wharf	316m	5.0m	—	—	—	Fast ferries, breakbulk, and bulk cargo. The passenger terminal can accommodate 1,000 persons.
Bagendang Terminal						
Dermaga CPO II	141m	6.5m	—	—	—	—
Dermaga CPO I	100m	6.5m	—	—	—	—
Dock Multipurpose I	120m	6.5m	—	—	—	—
Dock Multipurpose II	120m	6.5m	—	5.6m	—	—
Pertamina Terminal						
Dolphin Berth	15m	6.5m	90m	—	35,000 dwt	Clean products. Berthing length of 132m (including dolphins).

Shoal ground, defined by the 5.5m curve, extends from 5.25 to 8 miles off the mouths of the three rivers. The same curve lies up to 3.75 miles off the coast between Tanjung Burung and Tanjung Selatan. Most of the dangers are contained within this curve.

Pinting Belayang, a drying rock, lies close outside this curve, about 13.25 miles N of Tanjung Selatan. A 8.7m patch lies about 7.5 miles NNW of this rock.

The **Sungai Kahayan** (3°30'S., 114°04'E.), entered about 30 miles E of Tanjung Malatayur, is shallow and available only to small vessels with local knowledge. Its mouth cannot readily be seen from seaward because of a river bend just within the entrance, marked by a lighted beacon 5 miles SE of Tanjung Sangaing. Another lighted beacon is situated 5 miles SSE of the same point.

The depth over the bar is 1.8m at LW springs and 3.3m at mean level. These depths increase as the river is ascended. It has been reported that vessels with a draft of 2.7 to 3m can navigate as far as Panhandut, about 80 miles upriver. The outer approach to the river is buoyed.

The tides are mixed, but are mostly diurnal. Diurnal tides rise 2.1m at springs and 0.6m at neaps. Semidiurnal tides rise 1m at springs and 0.7m at neaps. The ebb in the entrance channel can attain a rate of 3.5 knots and the flood a rate of 2 knots.

Pilotage is compulsory for vessels over 500 gt bound for Pulang Pisau; it is not compulsory for vessels bound for Palangkaraya. Pilots are provided from Banjarmasin, where the pilot boards W of the fairway lighted buoy, in the approaches to Sungai Barito in position 3°40.0'S, 114°28.4'E..

A custom house with a flagstaff and a landing pier is situated about 6 miles above the river entrance. Pangkoh Village is situated about 18 miles upriver.

The Sungai Murung, entered about 10 miles E of the Sungai Kahajan, has a very shoal bar and the depths in the entrance are subject to change.

The charted depths cannot always be relied on due to silting. The depth over the bar is 1m at LWS and 2.4m at mean level. The depths increase as the river is ascended. Vessels with a draft of 3.4m can enter the river at HWS.

Kuala Kapuas, 26 miles upriver, is the seat of a government administrator. A flagstaff is situated close S of the town. The Sungai Pulau Petak, a 31-mile long, 0.2-mile wide waterway, connects the Sungai Murung with the Sungai Barito. Vessels up to 49m long, with a draft of 3.6m, can be accommodated.

The **Sungai Barito** (3°32'S., 114°30'E.), about 400 miles long, is the largest and most frequented river on the S coast of Borneo. The Sungai Martapura flows into the E side of the river about 10 miles above the entrance and leads to Banjarmasin.

Caution.—A dangerous wreck is in position (3°35.46'S., 114°29.06'E.).

Banjarmasin (3°20'S., 114°35'E.)

World Port Index No. 51890

9.11 Banjarmasin, which stands on both sides of the Sungai Martapura, is one of the most important trading centers in Borneo. The town and surrounding area is subject to frequent flooding. Banjarmasin is the center of an extensive system of canals and waterways through which a large volume of trade is carried out.

Banjarmasin—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Gresik Portland Cement Terminal						
Cement Berth	—	—	119m	6.3m	5,000 dwt	Cement. Berthing length of 124m (including dolphins).
Trisakti Port Terminal						
Container Dock No. 1	218m	7.0m	134m	6.2m	—	Containers and reefer. Continuous berthing length of 436m.
Container Dock No. 2	240m	7.0m	129m	6.2m	—	Containers and reefer. Continuous berthing length of 601m.
Container Dock No. 3	361m	7.0m	127m	6.3m	—	
General Cargo Dock	218m	7.0m	134m	6.2m	—	Breakbulk. Continuous berthing length of 436m.
Passenger Berth	90m	7.0m	134m	6.3m	—	Fast ferry. Ro-pax.
BBM Banjarmasin Terminal						
Berth I	25m	6.4m	90m	3.8m	3,500 dwt	Chemicals, crude products, and dirty products. Berthing length of 133m (including dolphins).
Berth II (Coastal)	25m	6.1m	109m	4.7m	—	Chemicals, crude products, and dirty products.

Banjarmasin—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Berth III	15m	6.0m	109m	4.8m	—	Chemicals, crude products, and dirty products. Berthing length of 138m (including dolphins).
Asphalt Jetty	12m	—	—	—	—	Dirty products and asphalt. Berthing length of 33m (including dolphins).

The port of Banjarmasin has two harbor areas. Trisakti Wharf, the new port, is situated 12.5 miles upstream from the entrance to the Sungai Barito. The old port area is situated 4 miles upstream from where the Sungai Martupara enters the Sungai Barito.

Modern alongside berthing facilities are provided for all classes of ocean-going vessels capable of crossing the bar.

Port of Banjarmasin

Tides—Currents.—Tides in this area appear to be of a mixed, semi-diurnal, and diurnal nature, although the latter prevails. Springs rise 2.1m and neaps rise 0.6m. In the approach to the river from the E and S, a strong current may flow around Tanjung Selatan. In general, the flood sets in a NNE direction and changes to the ENE with an increase in rate at spring tides. The ebb usually sets in a SSW to W direction with currents being diurnal.

The river current on the bar and at the river mouth changes direction during periods up to 2 hours after HW and LW. At neap tide, about 3 days before the quarter moon, the ebb current flows out for 16 hours continuously and the flood current flows inward for 6 to 8 hours. The rate of the current is 4 knots at the moon's greatest declination. The flood seldom seems to be stronger than 2.5 knots.

The ebb is stronger than the flood but only attains a rate in excess of 2 knots during the rainy season. The times of HW and LW at Banjarmasin occur 2 hours 30 minutes later than on the bar.

Depths—Limitations.—The bar is silting excessively and continuous dredging is necessary to keep the least depth at 4m.

Vessels up to 5,000 dwt, with a maximum length of 200m and a maximum draft of 6m, can be accommodated at the new port complex on the Sungai Barito. Vessels whose draft permits crossing the bar can proceed 150 miles upriver and will have adequate depths for reaching Banjarmasin.

Trisakti Wharf, the new port for Banjarmasin, stands on the E bank of the Sungai Barito, 2.25 miles above the entrance of the Sungai Martapura. The wharf is 320m long and has a least depth of 9m alongside. A T-shaped oil jetty 20m long, with a depth alongside of 9m, stands N of Trisakti wharf.

There are several piers and wharves at Banjarmasin, known as the old port, where coastal vessels load and discharge cargo.

Martapura (Commercial) Wharf No. 1 and No. 2 are situated near the customhouse. Lengths are reported to be 425m and 140m, respectively, with a depth of 5m alongside both.

Aspect.—Between the entrance to the Sungai Barito, to abreast of the entrance to the Sungai Martapura, 10 miles upstream, the W bank of the river is low, wooded, marshy, and sparsely inhabited. The E bank is fronted by coconuts, densely populated, and covered with paddy fields.

Tanjung Pulatan Light, a hut painted with black and white checks, stands on the E bank of the Sungai Barito, 4.5 miles N of Tanjung Burung.

Tanjung Telan Light, a 6.3m high red wooden structure, stands on the W bank of the river, which is about 1.5 miles NNW of Tanjung Pulatan Light.

A prominent customhouse and signal station lie on the S bank of the entrance to Sungal Martapura. Three prominent aluminum-painted oil tanks lie near the oil jetty.

Pilotage.—Pilotage is compulsory. Pilots board in the anchorage area.

Signals.—Tide signals are displayed at the downstream end of the Commercial Wharf, by day, as follows:

Signal	Meaning
A cylinder having a cone, point up, above and a cone, point down, below	Slack water
A cylinder, above which is a cone, point up	Flood current
A cylinder, above which are two cones, points up	Strong flood current
A cylinder, below which is a cone, point down	Ebb current
A cylinder, below which are two cones, points downward	Strong ebb current

The following signals, displayed by a vessel, will be repeat-

Banjarmasin Pilot Station

ed from the flagstaff to the harbor office:

Signal	Meaning
One red light over one white light	I require medical assistance
Three lights, in form of a triangle, with the upper light being white and the lower lights being red	I require police assistance

Signals are displayed from the signal station on the S side of the entrance to the Sungai Martapura for inbound vessels, from the flagstaff on the downstream end of the Commercial Wharf, and from the flagstaff near the harbor office at Banjarmasin for outbound vessels, as follows:

Day signal	Night signal	Meaning
One red ball	One red light	Passage prohibited
One white cone	One white light	Passage permitted
One white triangle over one red ball	One white light over one red light	Ships must wait for above signals
One red ball below one white cone	—	Vessel lying alongside the Commercial Wharf may proceed; passage prohibited for other vessels

In addition, the International Code Flag Signal "IL" meaning "You must remain where you are," may be displayed from the previously-mentioned signal station.

Contact Information.—See the table titled **Banjarmasin—Contact Information**.

Banjarmasin—Contact Information	
Port	
Telephone	62-511-3365866
Facsimile	62-511-3352552
E-mail	tu.banjarmasin@pp3.co.id
Vessel Traffic Service	
Call sign	VTS Banjarmasin
VHF	VHF channels 68 and 83
MMSI	005251520
Telephone	62-511-4368454
Facsimile	62-511-4423328
E-mail	banjarmasinradio@yahoo.co.id

Anchorage.—The area seaward of the outer lighted buoy provides anchorage for vessels awaiting HW. The holding ground is good but this position is exposed to the Northwest Monsoon.

Anchorage is prohibited in the entrance channel of the river. Vessels sometimes anchor in the river off the mouth of the Sungai Martapura to await orders or quarantine inspections.

Directions.—Steer to pass close to the outer lighted buoy, moored 7.5 miles SSW of Tanjung Burung. Cross the bar on

the alignment of the range lights, bearing approximately 028.5°.

When the bar has been crossed, steer for Tanjung Pulatan Light, bearing about 022°, and when Tanjung Pedadatua bears 270°, steer for the W extremity of Pulau Tempurung Besar until Tanjung Pulatan is abeam. Fish stakes mark the E limit of the channel, and then the chart is the best guide.

At night, follow the above directions until NW of the rear leading lighted beacon. When Tanjung Telan Light bears 000°, this light should be kept a little on the port bow. Above Tanjung Telan the channel follows the W bank of the river.

The Sungai Martapura is narrow and winding and is frequented by heavy local traffic. Vessels bound for Banjarmasin should not attempt to navigate with a flood tide.

Vessels wishing to secure alongside the pier at Banjarmasin during the ebb are advised to turn at a distance of 150 to 250m downstream from the pier. These limits are marked by boards on the right bank of the river.

The Sungai Martapura is closed to traffic from 1800 to 0600.

Caution.—Uncharted shoals, with depths of 5.5 to 11m, are reported to lie in the approaches to the Sungai Barito, N of 4°S. The bar and river channels are subject to frequent shifting.

Tree trunks and floating debris come down the river, especially during the rainy season. Vessels rounding Tanjung Selatan often experience a heavy beam sea during the Northwest Monsoon.

Tanjung Selatan to Tanjung Dewa

9.12 Tanjung Selatan (4°10'S., 114°39'E.), low but noticeable from a distance because of the high vegetation, is the southernmost point of Borneo. A light is shown and a radiobeacon transmits from a 30m high white metal framework tower.

Courtesy of Earth Sciences and Image Analysis, NASA

Tanjung Selatan as viewed from the Space Shuttle

The 10m curve to the S lies almost 2 miles from the coast. A strong inshore set has been experienced in the vicinity of Tanjung Selatan and vessels are advised to give it a wide berth.

Mines exist in a charted area extending about 12 miles S from Tanjung Selatan.

Between Tanjung Selatan and Tanjung Petang, about 88 miles NE, the coast is low, flat, marshy, and covered with high trees. Far inland, the Pegunungan Meratus run almost parallel with the coast. During the Southeast Monsoon, this range is visible for a considerable distance but during the Northwest Monsoon, there is much haze. During the change of seasons, the summits show up through the clouds.

A grove of trees near Kampung Salamati, about 4 miles W of Tanjung Petang, is prominent. A small white mosque, which serves as a good landmark under favorable conditions, stands on the W side of Kampung Pedjalan, about 1 mile E of Kampung Pedjalan. There are no ports of importance and vessels should keep in depths of over 14.6m in passing along this coast.

A number of small rivers discharge along this coast. There are few landmarks, but vessels some distance offshore will sight **Kepulaun Marabatua** (Moresses Islands) (4°23'S., 115°48'E.) soon after rounding Tanjung Selatan.

Between Tanjung Petang and Tanjung Dewa, the coast is low, densely wooded, and intersected by a number of small rivers. This coast forms the W side of Selat Laut. Vessels approaching this passage will sight the high peaks of Pulau Laut.

Depths—Limitations.—The 10m curve lies up to 7 miles off this section of coast and about 6 miles off the narrow SW entrance of Selat Laut. Some patches, with depths of 3.7 to 5.5m and some drying rocks and reefs, lie within this curve. Vessels should keep in depths over 14.6m when passing along this coast and avoid an 8.2m patch located about 11.5 miles E of Tanjung Selatan.

Regulations.—Ships are advised to maintain a strict piracy watch and ant-piracy measures and report all attacks and suspicious sightings to the local authorities and the IMB Piracy Reporting Center.

IMB Piracy Reporting Center	
Telephone	603-2031-0014 (Helpline—24 hours)
Facsimile	603-2078-5769 (24 hours)
E-mail	imbk@icc-ccs.org
	piracy@icc-ccs.org

Anchorage.—Designated anchorage areas are best seen on the chart. Piracy incidents have occurred while vessels were at anchorage. Mariners are urged to exercise caution.

Indonesian Marine Police has recommended ships to anchor where they conduct patrol on the vicinity of 4°41.30’S, 114°28'E (Taboneo, 32 miles SSW of Tanjung Selatan).

Caution.—A rectangular-shaped Danger Area, best seen on the chart, extends 5 miles E and W of Tanjung Selatan to a distance of 12 miles off shore. A wreck is reported (2004) to lie 5 miles SE of Tanjung Selatan within the Danger Area. Dangerous wrecks lie 33 miles ENE, 41 miles ENE, and 46 miles E of Tanjung Selatan. All these wrecks lie within 20 miles of the coast.

Off-lying Islands and Dangers

9.13 Arends Eiland (Pulau Keramian) (5°04'S., 114°36'E.), 52 miles S of Tanjung Selatan, is a hilly island with a greatest height of 93m. It has been reported that the high trees on its S end make the island appear as two islands from the offing. A wide reef surrounds the island.

The reef extends 2 miles from the SE side and 1 mile from the NW side of the island, and is usually marked by discoloration when covered. The reef has been reported to be extending to the SE. A small islet lies on the S side of this reef, and several detached reefs lie close off the fringing reef. Discolored water, giving the impression of reefs, may be seen at some distance from the island.

Pulau Keramian Light is shown from the N extremity of the island.

A dangerous wreck lies approximately 12 miles NNE of the N extremity of Pulau Keramian. Another dangerous wreck lies 22 miles SSW of the same position.

The tidal currents in the vicinity of Pulau Keramian attain a rate of 1.5 knots, raising a confused sea near the S end of the island during the Southeast Monsoon. Tide rips also occur off the SE side of the island.

9.14 Karang Selatan (Janssens Reef) (4°36'S., 114°25'E.), small in extent and having a least depth of 3.2m, lies about 30 miles SW of Tanjung Selatan. It is only slightly marked by discoloration.

Duand Shoal, the position of which is doubtful, has a reported depth of 6.9m and is charted in position 4°30'S, 114°49'E, 22 miles SSE of Tanjung Selatan.

Kepulauan Laut Kecil (4°45'S., 115°47'E.) is a group of three islands and some islets lying about 65 miles SSW of Tanjung Petang. All of the islands are high, rocky, and densely wooded.

Pulau Kalamban, the SW island of the group, is 305m high and has some detached rocks off its S end; otherwise, it can be approached closely. The island is uninhabited.

Pulau Matasiri (4°48'S., 115°48'E.), the middle island of the group, is 420m high, and is uninhabited.

Pulau Tjondong is an islet which stands 0.4 mile off the SE side of Pulau Matasiri. An islet lies 0.75 mile N and another islet, 48m high, lies close offshore, 1.25 miles NE of the SW extremity of the island. Telok Sungei, on the NE side of Pulau Matasiri, provides safe anchorage in both monsoons, in depths of 11 to 27m. There is anchorage for small craft inside two detached reefs, with depths of 1.5m, which are not marked by discoloration.

9.15 Pulau Pamalikan (4°45'S., 115°52'E.), with two above-water rocks close S, lies 1.25 miles E of the NE extremity of Pulau Matasiri, and Pulau Kunjit lies 1.75 miles SE of the same point. There is a clear passage between the two islets and Pulau Matasiri. Discolored water was reported to lie 0.5 mile SE of Pulau Pamalikan.

Pulau Kadapongan (4°42'S., 115°43'E.), the N island of the group is 285m high. A village stands on the NE extremity of the island.

Kepulauan Marabatua (4°22'S., 115°48'E.) consists of one island, three small islets, and three rocks, all above-water and rocky to the water's edge. The slopes of Pulau Marabatua, the main island, rise to a fairly regular cone and are heavily wooded. A sandy beach is found on the E side of the island, and also on the N side of North Islet, the N islet of the group.

Pulau Sambargalang (The Brothers) (4°24'S., 116°10'E.), lies about 20 miles E of the Kepulauan Marabatua group, and consists of two rocks covered with vegetation and joined by a nearly drying reef of sand and coral. From a distance they appear as three islets, as the S rock has two summits. The N summit is 45m high. A light is shown from a 30m high white metal framework tower on the S rock.

Birah Birahan (Dwaalder Island) (4°14'S., 116°07'E.), 63m high, narrow, wooded, reef-fringed, and marked by a light, lies about 11 miles NNW of Pulau Sambargalang. The island is visible 15 miles. The island appears saddle-shaped when viewed from the S. A shoal, with a least depth of 10m, lies centered about 2.5 miles NE of the island. Georges Bank, with a least depth of 8.2m, lies about 6 miles E of the island.

9.16 Pulau Laut (3°40'S., 116°10'E.) is an island separated from the SE coast of Kalimantan by Selat Laut. The S part of this island is hilly and the N part is mountainous rising to a height of 710m. The island is densely wooded and the coast is fringed by a broad drying reef.

Gunung Sebatung (3°17'S., 116°15'E.), a high range, forms the N part of the island and rises to North Summit, a 710m high peak about 4 miles S of the N extremity of the island. The 450m and 235m peaks are prominent from the NE and E because of their conical shape. The S peak attains a height of 679m. A prominent black hill, which shows plainly against the surrounding green country, stands close SW of the NE end of the island. The hill is 87m high.

Gunung Sejaka (3°30'S., 116°11'E.) is an isolated peak 208m high. Gunung Sumbawa, standing in the middle of the E part of the island, is 521m high and surrounded by a chain of hills. Flat Hill, 337m high, is conspicuous.

The 95m hill on the beach N of **Tanjung Lalak** (3°59'S., 116°12'E.) is steep and has a round-topped tree on its summit. The 119m peak, the central of the three hills N of the above hill, is very sharp in form.

Gunung Sebakau has three small peaks, the summit of which attains a height of 243m. It is covered by a darkly covered forest above which, when viewed from E or W, a tree projects like a broom. The S slope in contrast to the surrounding area is somewhat bare and is strewn with very large rocks, which from a distance have the appearance of a large village. A 189m hill, with a small dark tree on its summit, stands NE of this hill.

The **Palopalo Mountains** (3°32'S., 116°02'E.) stand near the middle of the W side of the island. When viewed from the SW, they clearly show five small peaks. Gunung Djambangan, the summit of this range, is 484m high and quite conspicuous. It is conical with a double peak standing N and S of it.

Tjapee, a round hill 162m high, has dark woods on its top. Gunung Labatan is prominent because of a tall conspicuous tree on the thinly covered peak at the S end. The hills to the N can be distinguished by their lighter green vegetation.

Pulau Kunyit (4°06'S., 116°03'E.), a wooded islet, lies 1.5 miles S of the SW extremity of Pulau Laut and is connected to it by a drying reef. The S end of the islet rises steeply from the sea to a height of 74m. The center rises to a conical hill, 140m high. A light is shown from a 13m high white metal tower on

this summit.

A shoal, with a depth of 5.5m, lies about 1.25 miles ESE of the S end of the islet. An extensive bank, covered to 18.3m, lies centered about 4 miles W of the islet.

9.17 Tanjung Layar (Lojar) (4°05'S., 116°05'E.), 3 miles E of Pulau Kunyit, is low and marked by dense vegetation. Between this point and Tanjung Lalak, 9 miles NE, a densely wooded point, there are two shallow bights. Tanjung Seloka, 7 miles NE of Tanjung Lalak, is rocky covered with high trees and prominent. Two shallow bights lie between this point and Tanjung Lalak.

The 20m curve lies up to 7 miles off this coast and encloses a number of small islets. Numerous rocks and dangers lie within the 10m curve.

Pulau Karajaan (4°06'S., 116°12'E.), 6.5 miles E of Tanjung Lojar, is 102m high and has a broad summit. A conspicuous round-topped tree stands on the NW point of the island. The S and E sides of the island are rocky, but there is a narrow, sandy beach on the N and W sides. A small sandy islet stands on the NW side of the reef.

Pulau Karumputan (4°03'S., 116°10'E.), 2.5 miles NW of Pulau Karajaan, has three small peaks, the SW being the lowest, and the NE the highest, which is 146m high. The NW side is flat, reef-fringed, and joined to the shore by foul ground.

The passage between Pulau Karajaan and Pulau Karumputan is free from dangers.

Pulau Anakkarajaan (Knoop Island) (4°05'S., 116°15'E.), lying 2 miles E of Pulau Karajaan, is a rocky islet covered with vegetation. A round-topped tree, 30m high, stands on the islet. A drying rock lies 91m off the SW side of the islet.

9.18 Pulau Kerisian (4°02'S., 116°12'E.), 1.5 miles NE of Pulau Karumputan, is about 143m high and has a tree standing on its conical summit. The E and W ends of the island are rocky and steep. The NW side of the island is low, sandy, and is joined to the shore by foul ground.

On the E coast of Pulau Laut between Tanjung Seloka and Tanjung Alangalang, 11.5 miles N, the coast is indented by a shoal, reef-fringed bay. The latter point is formed by a prominent hill 61.9m high. Pulau Serudung, which is not visible from seaward, stands in the S part of this bay. Tanjung Terudung, which forms the N point of this island, appears as a separate islet with a group of dead trees to the S of it.

Pulau Sebuku (3°32'S., 116°22'E.) is densely wooded. Gunung Saung, 206m high, with some white cliffs to the N, and South Hill, 140m high, are all prominent.

Tanjung Mangkok, the NE end of the island, is marked by a light and by a grove with one tree somewhat higher than the rest. Selat Sebuku, a strait of little importance to shipping, is shoal and fouled by dangers. Pulau Kapak, 1 mile N of Tanjung Alangalang, and Pulau Aur, lying 1.25 miles S of the S extremity of Pulau Sebuku, are reef-fringed islets standing in the S entrance of the strait. The former is surrounded by a broad strip of sand. The latter is covered with dense vegetation and rises to a fairly regular cone, 85m high. The channel between Pulau Aur and Pulau Sebuku is foul. The N part of the strait is filled by a large mud bank.

Pulau Gosongmangkok (3°20'S., 116°25'E.), 1.5 miles from the N point of the island, is a drying reef. The passage between this reef and the N end of the island has strong currents. Pulau Manti, reef-fringed and covered with coconut palms, stands in the N entrance of the strait, 2 miles W of Tanjung Mangkok.

9.19 Kepulauan Sambergelap (3°40'S., 116°36'E.) consists of a group of four islets and some rocks all lying on the same drying reef. The largest islet is 0.2 mile long and has a light shown on its W side from a 14m high white metal framework tower. A prominent tree is also visible from a great distance when viewed from the NW or SE.

This group of islets has been reported to be a good radar target up to 8 miles.

An 11m patch, showing no discoloration, is charted 9 miles E of the light on Kepulauan Sambergelap, and there may be other shoals in the vicinity. A 10.9m patch was reported to lie about 32 miles E of Kepulauan Sambergelap. An 8.8m shoal, about 0.2 mile wide and 0.25 mile long, was reported to lie about 27 miles NE of the same light. A dangerous wreck, marked by a buoy, lies about 5 miles WSW of the light on Kepulauan Sambergelap; caution is necessary as this buoy has been reported off station. Another dangerous wreck, which is unmarked, lies 11.25 miles N of the island.

On the W coast of Pulau Laut between Pulau Kunyit and Tanjung Kahidupan, about 10 miles to the N, the coast rises steeply to the previously-described range of hills, and is fronted by a sandy beach.

The latter point is low and densely covered by high trees. Numerous rocks lie on the fringing reef, including Pulau Tokong, which has the appearance of two islets.

The summit of Gunung Semiaran, bearing 000°, leads about 1.25 miles W of the outer edge of the fringing reef.

Between Tanjung Kahidupan and Tanjung Karambu, 3.5 miles N, the coast is bordered by a wide drying reef.

The latter point is densely wooded. Between this point and Sekojang Village there is a narrow, sandy beach, fronted by a mud bank. A few huts are visible in the village and there is a prominent, isolated house near the N entrance point of a small river which flows out near the village. A group of trees on the same side of the river shows up dark against the background.

Tanjung Lauran (3°44'S., 116°01'E.), 8 miles N of Tanjung Karambu, is formed by a salient rocky hill covered with tall straight trees with white trunks. This hill is 81m high and can be seen for a great distance.

Between Tanjung Lauran and Tanjung Semisir, 3 miles NNE, there are some small islets and rocks on the coastal reef. One of these, just N of the former point, is quite prominent because of its light brown color and grayish top. Tanjung Semisir is rocky and densely wooded.

Tanjung Kiwi, a low rocky point that marks the SE entrance to Selat Laut, lies 2.75 miles N of Tanjung Semisir.

9.20 Selat Laut (3°40'S., 115°58'E.), the strait which separates Pulau Laut from the mainland, is narrow and tortuous. The S entrance is considerably narrowed by two large sand banks and a number of smaller ones which are intersected by three channels. The W channel is the best and is the one most used. The NE entrance is wider, and except for some charted wrecks, is clear of dangers.

Depths of 4.6 to 7.6m exist in the fairways of the strait.

Setagin and Kotabaru, on the NW coast of Pulau Laut, are shipping places of some importance.

Tides—Currents.—Tidal currents in Selat Laut set N or S, but it is impossible to predict the direction of the current beforehand.

As a rule, the maximum rate of 1.5 to 2.5 knots seems to occur shortly after the changes in the vertical movement of the water. It often happens that the direction of the current in the N part of the strait is opposite to that in the S part.

Caution.—Danger areas exist in the NE and SW entrances of Selat Laut. A swept channel leads through the NE entrance of the swept area W of Pulau Laut.

It was reported (2002) that the approach to Selat Laut from the N by night is difficult due to numerous shore lights, and also because the North Pulau Laut Coal Terminal protrudes into the channel.

Many islands and dangers exist in the channel of Selat Laut. These are described from S to N.

9.21 Kramat Bank (3°32'S., 116°00'E.), parts of which dry, has a channel on either side. The E channel is recommended.

Pulau Suwangi, 158m high, is covered with high trees, some of which grow in the water. The N and S sides of the island are shelving and its S end is rocky. A light is shown about 0.5 mile N of the S end of the island. Pulau Anak Suwangi, a thickly-covered islet, lies close off the E side of the larger islet. A drying rock lies on a projecting bank off the E side of the islet.

Suwangi Bank, an extensive area of foul ground, extends from the coast of Pulau Laut abreast Pulau Suwangi. The depths in the channel leading between this bank and Pulau Suwangi are very irregular, and in spite of close and careful soundings.

Pulau Tampakan, connected to Pulau Suwangi by a shoal sand flat, is low and densely wooded. Two prominent trees stand along the S shore. A dangerous drying rock lies on the E side of the channel abreast Pulau Tampakan.

Gosong Payung is a large sand bank, parts of which dry.

There is a good channel on each side of the bank but the E channel is preferable.

On the W side of Selat Laut the Borneo side of the strait, consists mainly of low, densely wooded land with some high trees.

9.22 Tanjung Petang (3°37'S., 116°58'E.), the SW entrance point to Selat Laut, is low. A light is shown from a 19m high white metal framework tower situated on the point.

Between Tanjung Petang and Tanjung Kramat, 3.5 miles NNE, fish stakes border the shore. The Sungai Kusan (Sungai Pegatan) discharges along the N side of Tanjung Kramat. A conspicuous white house also stands 0.75 mile SSW of Tanjung Kramat.

The Sungai Kusan is reported to be navigable by small coasters with local knowledge. Vessels up to 49m in length can turn off the pier near the village of Pegatan, 4.5 miles upstream. A report states that the channel cannot be entered from Pulau Laut because of shallow water and fishing stakes in the approach. A waterway leads into the river from the S and W of the above village.

Between Tanjung Kramat and Tanjung Kersikputih, about 5 miles to the N, the coast is fronted by Kramat Bank. The Sungai Merah discharges close N of the latter point.

The Sungai Batulitjin, shallow and narrow, discharges abreast of Pulau Suwangi, about 2.25 miles farther N. Batulitjin, a large village, stands on the S side of the mouth of the river. A wire cable ferry crosses the river just above the village.

Between the mouth of this river and Tanjung Langadel, 11 miles NNE, the coast is intersected by numerous small rivers and marked by a few villages. The latter point is low and covered with dense vegetation.

Tanjung Dewa (3°08'S., 116°16'E.), a low coconut-covered point lying 9.5 miles NE of Tanjung Langadei is the NW entrance point of Selat Laut. Between Tanjung Langadei and Tanjung Dewa is a bay entirely occupied by a drying mud bank.

9.23 The Pulau Laut coast forming the SE side of the strait is high, but in the narrows it becomes low and has dense vegetation to the water's edge.

Tanjung Kiwi (3°39'S., 116°00'E.), the SE entrance point to Selat Laut, is a rocky salient point with a prominent white house close E of it. The coast here rises to the highland of the Palopalo Mountains. The shore is rocky near the foot of Gunung Semiaran. A wreck was reported (2020), best seen on the chart, 1 mile SE of Tanjung Kiwi.

Between **Tanjung Serdang** (3°29'S., 116°02'E.) and Tanjung Ayun, 12 miles NNE, the coast is intersected by many small rivers and marked by some scattered villages. Selukutan is visible from the strait. The latter point is low and marked by dense vegetation.

Between Tanjung Ayun and Tanjung Kemuning, 9.5 miles NE, the coast is intersected by many small rivers. Between Tanjung Kemuning and Tanjung Pemancingan, 1.5 miles E, the coast is indented by a shallow reef-fringed bight. A light is shown from the point.

A conspicuous black hill, 87m high, stands 0.75 mile SSW of Tanjung Pemancingan and is plainly visible among the surrounding bright green country.

9.24 Kotabaru (3°14'S., 116°13'E.) (World Port Index No. 51860), the most important port in Selat Laut, stands on the NW coast of Pulau Laut about 3 miles within the N entrance of the strait. A government official resides in the town.

Depths—Limitations.—Vessels up to 150,000 dwt, with a maximum draft of18.0m and a maximum loa of 320m, can be accommodated. For additional details see table titled **Kotabaru—Berth Information.**

Vessels approach the facility through Northeast Channel; departure is made through Southeast Channel, which has a minimum depth of 18.4m over a width of 400m.

Heavy traffic may be encountered in the approaches, includ-

ing fishing vessels and coal barges.

Kotabaru—Berth Information							
Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
Indocement Terminal							
Container Berth	27m	—	—	—	—	—	Containers. Berthing length of 84m (including dolphins).
East Berth	170m	—	—	—	—	—	Aggregates, cement, containers, and readymix. Berthing length of 446m including dolphins.
West Berth	170m	—	—	—	—	—	
North Pulau Laut Coal Terminal (NPLCT)							
Coal Berth No 01	243m	18.0m	320m	14.0m	47m	150,000 dwt	Coal. Berthing length 388m (including dolphins). Waterline to hatch coaming height (HW) of 17.0m.
Coal Berth 02	—	—	—	14.0m	—	—	Coal. Continuous berthing length of 290m.
Ro-ro Berth	26m	—	—	14.0m	—	—	Ro-ro/lo-lo.
Tanjung Pemancingan Anchorage Terminal							
Tanjung Pemancingan Anchorage	—	—	320m	10.0m	47m	150,000 dwt	Coal.
Tanjung Sabau Anchorage Terminal							
Tanjung Sabau Anchorage	—	—	—	—	—	—	—
Stagen Terminal							
Stagen Berth I	90m	8.0m	—	—	—	—	Chemicals, clean products, vegetable oils, coal, and general cargo.
Stagen Berth II	26m	8.0m	—	—	—	—	Clean products, vegetable oils, coal, ro/pax, and general cargo. Berthing length 82m (including dolphins).
Stagen Berth III	26m	8.0m	—	—	—	—	
AKR Stagen Terminal							
AKR Stagen Liquid Berth	25m	12.0m	222m	—	35m	50,000 dwt	Chemicals, clean products, crude products, and bunkers. Berthing length of 245m (including dolphins).
BBM Terminal							
East Jetty	21m	7.0m	130m	—	—	6,500 dwt	Clean products, Berthing length of 250m (including dolphins).
West Jetty	16m	—	—	—	—	—	Clean products. Berthing length of 163m (including dolphins).
Golden Hope Nusantara Terminal							
Oil Jetty	20m	—	130m	—	—	6,500 dwt	Chemicals and vegetable oils. Berthing length of 246m (including dolphins).
PT Smart TBK Terminal							
Inner Jetty	5m	—	—	—	—	—	Vegetable oils. Continuous berthing length of 94m.
Smart Jetty	122m	—	—	—	—	—	Vegetable oils. Continuous berthing length of 436m.

North Pulau Laut Coal Terminal

Pilotage.—Pilotage is not compulsory for vessels entering Kotabaru Port but is available. Pilotage is compulsory for vessels entering the North Pulau Laut Coal Terminal. Pilots should be ordered via the local agent. The pilot boards in the anchorage area 2 miles E of Tanjung Pemancingan.

9.25 Stagen (Setagen) (3°17'S., 116°09'E.) (World Port Index No. 51870), situated about 4 miles SW of Kotabaru.

It has a T-head, with depths of 3.7 to 6.1m alongside, with a dolphin off each end.

Tides—Currents.—Tide and current signals are displayed from the pier to aid berthing vessels. A red flag indicates a NE current, a blue or black flag indicates a SW current, and a white flag indicates slack water.

Aspect.—Some of the islands and shoals within the strait are marked by beacons and buoys which are moved as necessary to indicate the best water through the various reaches of the channels.

A light on Gunung Balingkar, NE of Kotabaru, and the light on Tanjung Pemancingan are in range 257° and 077°.

Anchorage.—Good anchorage can be taken in Selat Laut except in the narrows where the bottom is rocky and uneven.

Small vessels can anchor about 0.2 mile off the pier at Kotabaru, in a depth of 9.1m. A swell sets up in the roadstead during the Southeast Monsoon.

Directions.—When approaching the NE entrance to Selat Laut from the E, Tanjung Pemancingan Light and Balingkar Light should not be brought into line bearing less than 257°.

This course leads 0.75 mile S of a dangerous wreck, with its mast above water, which lies 3 miles ENE of Tanjung Pemantjingan.

Selat Laut is entered through a swept channel at its NE end, the centerline of which is joined by the following positions:

a. 8.7 miles, 081° from Tanjung Pemancingan Light
b. 1.4 miles, 077° from the same light
c. 1.3 miles, 357.5° from the same light
d. 1.9 miles, 319.5° from the same light
e. 2.7 miles, 243° from Balingkar Light
f. 5.9 miles, 238.5° from the same light

The channel between Point a and Point b is 1 mile wide; the remainder of the channel is 0.6 mile wide.

Caution.— The pier has been reported to be in bad condition but is in operation. Extreme caution is advised when berthing alongside.

A ship wreck has been reported lying in the vicinity of 3°17'.42S., 116°06'.67E.

Makassar Strait—South Entrance

9.26 Borneo Bank, which extends far into Makassar Strait from the SE part of Borneo, encloses in its N part the **Little Paternoster Islands** (2°22'S., 117°34'E.) and in the S part the **Kepulauan Masalima** (5°04'S., 117°04'E.).

That part of the bank S of 3°S contains few islands, but many coral heads. The latter are usually of small extent and rise abruptly from the bottom.

Between the E edge of Borneo Bank and Spermonde Archipelago, a number of isolated coral banks rise abruptly from great depths. Raised ridges and islets are found on the N and E edges of these banks.

Most of the islets are inhabited. These islets are a part of the residency of the Sulawesi and are governed by a native chief who resides on Pulau Dewakang-lompo, the N islet on Laars Bank.

Tides—Currents.—Tidal currents, which flow N or S close to Pulau Laut, must be taken into account. Wind drift currents prevail farther out and in the vicinity of the Kepulauan Masalima. There is sometimes a rate of 1.5 knots. Tides are mostly diurnal and of small range.

9.27 Kepulauan Masalima (5°04'S., 117°04'E.) consists of a group of five, low, wooded islets covering an area of about 6 miles in length in a N and S direction, and 4 miles in width in an E and W direction.

Pulau Masalima (5°03'S., 117°03'E.), the W and the highest of the Masalima Islands, is covered with tall trees. The fringing reef is narrowest on the E side, and the stones along the N edge cover only at HW. The fringing reef is reported to be extending to the SW.

Pulau Sabaru (5°06'S., 117°03'E.), the largest and southernmost island, is about 1 mile long and densely wooded with tall trees. Pulau Sabaru Light is shown at a height of 43m from the SE extremity of the island. The fringing reef, which lies close offshore along the N side, lies about 0.5 mile off the other sides. The reef is reported to be extending in a WNW direction. A raised ridge of stones stands along the outer edge of the reef. The island is visible at a distance of 15 miles and was reported to be radar conspicuous at 23 miles. The other islets of the group are lower and treeless. Each islet is reef-fringed and separated from the others by deep passages. Strong currents run through these passages. In the passage between Pulau Sabaru and Pulau Masalima, the current may attain a rate of 2.5 knots.

Numerous shoal patches, with depths of 4.9 to 11m, lie within the curve between Pulau Sabaru and Aurora Bank, about 22 miles SSW. Trinidad Reef, with a least depth of 4.8m, is located 2 miles SSW of the above islet. Aurora Bank has a least depth of 7.6m. Many shoal patches, with depths of 11 to 27.4m, have been reported to exist along the 200m curve be-

tween Aurora Bank and Pulau Sakala (6°57'S., 116°15'E.).

A bank, with a depth of 15.8m, was reported to lie about 32 miles WSW of Trinidad Reef. A depth of 20.1m lies about 1.5 miles farther WSW.

A shoal bank, with a depth of 17.4m, was reported about 32 miles WSW of Aurora Bank. Depths of 17m and 11m were reported to lie 16 miles WSW and 30 miles NW, respectively, of Pulau Sabaru.

Further isolated shoals have been reported up to 20 miles N of the former depth and NW of the latter depth.

9.28 Laurel Reefs (4°40'S., 117°04'E.), consisting of numerous shoal patches with deep water between, lie between Kepulauan Masalima and **Martaban Bank** (4°11'S., 117°03'E.). These dangers lie mostly from 3 to 15 miles within the 200m curve and have depths of 3.7 to 11m. Patches, with depths of 9.1m or less, are usually marked by discoloration. Karang Suling Light is shown from a 13m high beacon standing on the reef.

Lari Larian (3°31'S., 117°28'E.), 46 miles NNE of Martaban Bank, is a small reef-fringed islet about 0.2 mile long. The islet is covered with small trees and bushes. A light is shown from the islet. A reef, about 0.3 mile wide with a least depth of 8.5m, lies 6.5 miles SSW of the islet.

A 6.1m patch lies 5 miles W of this reef. These dangers are not easily seen. Some dangers, with depths of 10.9 to 20.1m, have been reported to lie between the reef and Martaban Bank.

A depth of 13m was reported to be 19 miles NE of the islet.

Pulau Takatalu (3°04'S., 117°42'E.) is a small islet of dead coral standing on a submerged reef. It is about 3m high and can be seen from a distance of 5 miles. The formation is subject to change according to the monsoon. It was reported that the islet has been covered at HW. An 11.9m coral patch lies 8 miles ENE of the islet.

A depth of 13m was reported 13 miles S of Pulau Takatalu. A lighted beacon is shown from the islet.

Gosong Union, with a depth of 12.6m, lies 37.5 miles E of Pulau Takatalu.

Pulau Lumulumu (2°56'S., 117°42'E.) is a small sand bank standing on a submerged reef which dries in places and is visible for 6 miles in clear weather. An 11m coral patch lies about 15 miles E of Pulau Lumulumu.

Coral Reef (2°50'S., 117°04'E.), with a least depth of 0.9m, lies 30 miles WNW of Pulau Lumulumu. It is not marked by surf or discoloration but is marked by a lighted beacon.

Tanjung Dewa to Tanjung Aru

9.29 Tanjung Dewa (3°08'S., 116°16'E.), the NW entrance point to Selat Laut, has been previously descrubed in paragraph 9.22.

Between Tanjung Dewa and Tanjung Aru, about 61 miles NNE, the coast is low, marshy, and for the most part covered with vegetation. Teluk Klumpaug and Teluk Pamukan, two rather unimportant bays, indent this coast.

Both bays are frequented by coastal shipping because of the coal mines on Pulau Nangka and Gunung Batu Besar.

Some 6 or 7 miles inland between the two bays, a range of prominent hills run parallel with the coast. In fine weather, the mountains in the interior, which attain heights of over 1,829m, are visible from the offing.

Tides—Currents.—Strong currents set in or out of the bays and rivers along this coast. Between Tanjung Dewa and Tanjung Aur, at distances up to 10 to 12 miles offshore, the N currents had a preponderance of two to one during the month of May. The direction varied from N to NW. The rate did not exceed 0.75 knot. In July the currents set mostly N to NE. The maximum rate was 1.75 knots for N and 1.5 knots for S currents. The average rate was 0.5 knot.

During the first half of August, the directions varied from NE and SW. The maximum rate was 1.75 knots for N and 1.5 knots for S currents. During the latter part of this month, the maximum rate was 0.75 knot.

During September, a SE current prevailed but later there were SSE and S currents. The maximum rate was 1 knot.

The currents between Laurel Reefs and the Little Paternoster Islands is determined by the wind direction. During the Northwest Monsoon, S currents prevail. During the Southeast Monsoon, which blows mostly from a SSE direction, the main direction of the current is NW. The maximum rate is 1.5 knots.

Numerous dangers lie within the 10m curve which lies from 2.5 to 7 miles off this coast. A group of reefs and shoal patches lie outside the 20m curve, between it and the Little Paternoster Islands to the E. In addition, the silt-laden water from the rivers causes a turbulent sea far offshore, so reefs are seldom sighted by discoloration.

Karang Grogot (Addington Reef) (2°44'S., 116°46'E.), dark coral and stones, has a least depth of 0.9m. A 0.9m patch lies 20 miles ESE.

The reef is not marked by discoloration, but in a very calm sea it is marked by slight ripples. The light shown from the reef has been reported extinguished.

9.30 Karang Kendang Kecil (Cora Reef) (2°29'S., 116°53'E.), a coral reef marked by dangerous heads just below the surface at LW, lies about 16 miles NNE of Karang Grogot.

Karang Kendang Besar (Blenheim Reefs) (2°27'S., 116°51'E.), which are made up of several separate parts with depths of 3.7 to 7.9m, with deeper water in between, lie close N of Karang Kendang Kecil. The shallowest part, near the middle of the reef, is almost awash at LW.

Karang Gong (Coral Bank) (2°27'S., 116°47'E.), marked by dangerous submerged heads, lies about 3.5 miles W of Karang Kendang Besar and is sometimes marked by discoloration.

Karang Gender (Anna Reefs) (2°25'S., 116°55'E.), two drying coral heads with a depth of 5.7m in between, lie centered about 3.5 miles NE of Karang Kendang Besar. A detached coral patch with a dangerous submerged head lies about 1 mile E of Karang Gender. A similar patch was reported to lie about 3 miles ENE of the N drying patch on Karang Gender.

Karang Tifa (Cecil Reefs) (2°22'S., 116°54'E.) consist of a number of shoal patches with deep water in between. The largest patch, which uncovers, stands about 2.5 miles NW of the N drying patch on Karang Gender. It is circular in shape and about 0.5 mile in diameter. The channel E of Karang Gender and Karang Tifa and between these reefs and the Little Paternoster Islands to the E, is 6 miles wide but care should be taken to avoid the two previously-mentioned coral patches lying E and ENE of Karang Gender.

Karang Suling (Hercules Reef) (2°22'S., 116°43'E.), which

consists of coral with sand and stone, lies about 6.5 miles NW of Karang Gong. A circular part, about 0.1 mile in diameter dries and a portion of this area is above HW. Karang Suling Light is shown from a 13m high beacon, stands on the reef.

Karang Saron (September Reef) (2°17'S., 116°49'E.), about 2.75 miles long in a N to S direction, lies with its S end about 6.6 miles ENE of Karang Suling. A drying patch lies near the center of the reef and several coral heads with shoal depths lie within the limits of the reef.

Two detached coral patches, with depths of 11m and 8.9m, lie 2.5 miles and 4.25 miles S, of Karang Saron.

Vessels usually pass W of Hercules Reef, E of Aru Bank, and W of the wreck which lies 6 miles ENE of Aru Bank.

Teluk Klumpang

9.31 Teluk Klumpang (3°05'S., 116°18'E.), entered between Tanjung Dewa and Tanjung Berlajar about 7.25 miles to the N, is irregular in shape and has several shallow rivers discharging into it. A village, with a flagstaff and a prominent mosque, stands on the SE side of Tanjung Batu, about 3.25 miles to the W of Tanjung Berlajar. Another village stands at the mouth of the Sungai Terusan. Some coal mining facilities are situated on Pulau Nangka.

Tides—Currents.—The tides are mostly semidiurnal. The semidiurnal range is 1.9m at springs and negligible at neaps. The diurnal range is 0.9m at springs and 0.3m at neaps.

After heavy rains, currents of 1.5 to 2 knots flow out of the bay. Strong currents run through the narrow passages between the islands in the S entrance of the bay.

Four small islands stand on the S side of the entrance of the bay. Pulau Nangka, the largest, is 58m high and is the site of some coal mines. Pulau Pabuan, the outermost, is 42m high and reef fringed. A small islet stands about 0.5 mile NW of the summit of Pulau Pabuan. A rock awash at LW lies on the S side of the channel about 0.75 mile N of Pulau Pabuan.

The shore bank, as defined by the 5.5m curve, extends about 8 miles ESE from the N entrance point of the bay.

Gosong Karbau, a group of reefs that dry at half tide, stand on this bank about 1.5 miles SSE of Tanjung Berlajar. Some shoal patches with depths of 3.7 to 5m lie on the N side of the channel to the S of these dangers.

9.32 Batu Timbal (3°01'S., 116°12'E.), a dangerous rock, awash, lies about 1 mile SSW of Tanjung Batu. A reef, with a depth of less than 1.8m, lies close off this point.

The main channel into the bay leads between these dangers over a depth of 22m. Elsewhere in the channel leading into the bay, the depths are 9.1m and more. The bottom in the outer bay is of mud, sand, and small stones. Mud and sand is found in the inner bay.

Directions.—There are no suitable marks for entering the bay. The channel is unmarked and the shoals are not marked by discoloration.

Between Tanjung Berlajar and Tanjung Samalantakan, the W entrance point of Teluk Pamukau, about 27 miles to the N, the low coast is backed by hills. All coastal dangers are contained within the 9.1m curve which lies up to 7.5 miles off the entrances of the two bays.

Teluk Pamukan

9.33 Teluk Pamukan (2°35'S., 116°28'E.), entered between Tanjung Samalantakan and Tanjung Pamukan, about 4 miles to the E, is irregular in shape and has several rivers discharging into it. The bay shores are low, muddy, and overgrown with mangroves except for a rocky portion midway between Tanjung Samalantakan and Tanjung Kersik Hitam, about 3.75 miles to the WNW.

The former point is formed by a sandy beach and a village, built mostly over the water, standing close W of it. A white customhouse stands on the former point. The Sungai Sampanahang, which is navigable by small vessels, flows out along the W side of Tanjung Kersik Hitam.

The N side of the entrance between Tanjung Pamukan and Tanjung Sapada-ketcil is steep and covered with tall trees. From the offing it appears as an island. Tanjung Merah, about 2.25 miles ENE of Tanjung Pamukan, can be identified by the conspicuous red rocks forming it.

The N side of the entrance of the bay has been reported to be a good radar target up to 16 miles.

A large village on the right bank of the Sungai Tjengal stands about 1 mile upriver. The entrance of this river lies about 6.25 miles NW of Tanjung Pamukan.

Tides—Currents.—The tides are mixed but predominantly semidiurnal. The semidiurnal range is 1m at springs and 0.4m at neaps. The diurnal range is 1m at springs and 0.1m at neaps.

The currents set across the entrance of the bay. Within the bay there are strong tidal currents which flow very strongly around the S entrance point. The maximum rate is 1.5 knots. A maximum rate of 2.5 knots sometimes occurs in the Sungai Sampanahang.

Depths—Limitations.—A depth of 3.9m exists over the bar. This depth can be carried at all times through the channel inside the bay between the mud banks on either side.

A wide bank, with depths of less than 5.5m, extends up to 7.5 miles off the entrance points. A number of small patches, with depths of 2.7 to 5m, lie in the entrance.

These dangers lie from 1.25 to 2.25 miles SSE of Tanjung Pamukan and consist of stones, sand, and mud.

A danger area, with a diameter of 1.5 miles, is centered on a dangerous wreck with mast and funnel showing lying about 4.25 miles ESE of Tanjung Pamukan.

A drying rock lies near the edge of the shoal bank extending from the N shore, about 2.25 miles N of Tanjung Samalantakan.

Parak, a small islet, lies close offshore about 2.5 miles WNW of the above point. A shoal, with depths of less than 1.8m, lies about 1 mile N of this islet.

Caution.—Tanjung Samalantakan is reported to be extending seaward. Uncharted dangers may exist in this area.

9.34 Gunung Batu Besar (2°37'S., 116°18'E.) (World Port Index No. 51850) lies on the E bank of the Sungai Sampanahang. This is a coal mining settlement. A 24m long pier extends from the shore abreast the town. Vessels can anchor off the pier, in a depth of 9.1m.

Directions.—The channel in Teluk Pamukan is easily navigated if the navigational aids are in place.

A vessel should approach to a position about 5.5 miles, bearing 127° from Tanjung Pamukan and then proceed W toward the outer red beacon. When about 0.4 mile from this beacon course can be altered to the NNW to enter the channel. Care should be taken not to bring the above beacon to bear less than 285° before entering the channel because of a 3.2m patch which lies close N of the approach.

The coast between Tanjung Sapada-ketcil and Tanjung Aru, about 22.5 miles NNE, continues low and muddy and is covered with trees. The N part of the latter point is sandy and has some coconut trees on it. A small village stands on its W side.

The shoreline in the vicinity of Tanjung Aru has been reported to be a good radar target up to 11 miles.

The 5.5m curve fronts this coast at a distance of 3 miles. Riouw Reefs lie within this curve about midway between the above points. The N reef, which dries, lies about 11.5 miles NNE of Tanjung Sapada-Ketcil.

Aru Bank (2°15'S., 116°40'E.), located 7.5 miles SSE of Tanjung Aru, consists of three detached drying reefs of stone and coral, covered with mud and sand. The S reef consists of two drying parts lying close together. The NW part of the W reef is covered with fine white sand and only covers at HWS. Two 5.5m patches lie about 2.5 miles N of Aru Bank Light and a dangerous wreck lies 6 miles NE.

It has been reported that Aru Bank Light, a 28m high black metal framework tower with a white stripe, is a good radar target up to 11 miles. A stranded wreck on the E side of Aru Bank has been reported to be a good radar target at the same distance.

The Little Paternoster Islands

9.35 The Little Paternoster Islands (Kepulauan Balangan) lie between the parallels of 2°00'S and 2°44'S, and between the meridians of 117°00'E and 118°08'E, and consist of several groups of islets and reefs lying on the NE edge of Great Borneo Bank. Large quantities of dried fish and related products are exported.

The islets are formed of coral and sand, and covered with driftwood and other debris. Vegetation is found on most of the islets, and trees up to 54.9m high are found on the larger islets.

A chain of reefs, drying in many places, is found along the NE edge of Borneo Bank. This chain rises steeply from depths where no bottom has been found at 183m.

Many small islets are found on these reefs. This chain has little width and has deep water between it and the inner reefs.

A group of islets and reefs, lying from 9 to 17 miles within the above chain, forms an irregular line roughly parallel to that chain. Between the two there are depths of 29.3 to 54.9m, coral bottom, and occasionally sand and shells. Southward of this group the bottom consists of sand and shells, and growing coral is found in some places.

A double row of reefs, which extend N and S and which partly dry, lie W of this inner group. The channel, between the W row of reefs on one side and Karang Gender (Anna Reefs) and Karang Tifa (Cecil Reefs) on the other side, has been previously described in paragraph 9.30. **Pulau Sangai (Pulau Sanga)** (2°14'S., 117°08'E.) lies about in the middle of the E row of reefs.

Tides—Currents.—The currents in this area are mostly wind drifts. The influence of the S setting currents through the deep part of Makassar Strait can be felt near and along the outer side of the 200m curve. It is marked by rips and overfalls when the current sets with any strength. They are more pronounced during the Northwest Monsoon. The currents run through the deep channels between the reefs at a considerable rate at times and are quite variable.

Caution.—Vessels without local knowledge should not attempt to pass between these dangers.

Outer Chain of Islets and Reefs

9.36 Pulau Balabalangan (2°32'S., 117°57'E.), the SE islet of the group, is almost 0.3 mile long, covered with tall trees, and serves as a distinct landmark. The island, which is teardrop in shape, protrudes from a coral sand reef which is about 3 times the size of the island. Breakers are noticeable when approaching the island from any direction. There is also a distinguishable discoloration of the water around the reef. Distinguishing the island from others in the area is its 40m high white metal framework light, which is visible up to 18 miles on the N side of the island. It stands noticeably above the treetops. It has been reported that this island is a good radar target up to 14 miles away.

Union Bank (3°02'S., 118°20'E.), located SE of the Little Paternoster Islands and near the E edge of Great Borneo Bank, is small and has a least depth of 12.6m.

Heavy breakers were reported close N of Union Bank.

The water in this area is very clear so that depths of up to 18.3m may appear as dangers.

A narrow ridge, with depths of 8.2 to 11.9m, extends 7.5 miles SE from a position 7 miles SE of Pulau Balabalangan. Semarang Shoal, with a depth of 5.7m, lies at the SE end of the ridge. Depths of 11 to 36.6m are found along the edge of the bank between Semarang Shoal and Union Bank. A bank, consisting of a 14.6m patch and a 13.7m patch about 0.75 mile apart in a NNE-WSW direction, lies about 17 miles SE of Pulau Balabalangan. An extensive bank, with a least depth of 17m, lies 3 miles NE of Semarang Shoal.

Djaitan Shoal (2°33'S., 117°58'E.), a reef which uncovers at half tide, stands on a ledge of foul ground which extends about 4 miles SE from Pulau Balabalangan.

9.37 Pulau Kabaladua (2°30'S., 117°54'E.), partly covered with grass and brushwood, stands near the NW end of a partly drying reef which extends almost 4 miles NW from a position about 0.5 mile NW of Pulau Balabalangan. The islet has some tall trees. Two above-water sand banks stand on the S part of this reef. The passage between the reef and Pulau Balabalangan is almost closed by an inner ridge of shoal ground.

Pulau Seturian (2°16'S., 117°40'E.), about 19 miles NW of Pulau Kalaladua, is small and densely wooded and can be seen for a distance of 16 miles. Breakers are noticeable when approaching from any direction. There is also a distinguishable discoloration of the water surrounding the reef. A grass-covered sand bank lies about 11 miles SE of Pulau Seturiar. A light is shown from the N shore of the island.

Several partly drying reefs, with narrow gullies of deep water, lie between the sand bank and the islet. Reefs and shoal ground extend 5 miles SE from the sand bank. A number of drying reefs and shoals lie up to 7 miles NW and 9 miles W of

Pulau Seturiar.

Pulau Sebangkatan (2°13'S., 117°25'E.), a small islet, is thickly wooded with coconut trees and is generally visible at 13 miles. The E side of the islet is steep-to.

Reefs and shoals extend 1.75 miles S and 3 miles NNW from the islet.

Pulau Ambungi (2°04'S., 117°16'E.), marked by a light and located 12 miles NW of Pulau Sebangkatan, is a drying reef; a very small portion is always dry. Shoals, with depths of 4.6 to 11.9m, lie up to 3 miles NW of Pulau Ambungi and between that reef and Pulau Sebangkatan.

Inner Islets and Reefs

9.38 Karang Gamelan (Byron Reef) (2°34'S., 117°48'E.) is about 0.4 mile in diameter. On it is a small sand bank which always drys and is overgrown with small shrubs. Discolored water, marked by tide rips, was reported to lie from 1 to 6 miles W of Buron Reef. A small detached reef which dries at LW, marked by discoloration and tide rips when covered, lies about 1 mile NW of the same islet, and a reef, with a depth of 0.9m, lies E of Buron Reef about 4 miles W of Pulau Balabalangan.

Pulau Seloang (2°27'S., 117°40'E.), located about 11.5 miles NW of Buron Reef, is fringed by a narrow reef. The wooded islet is about 0.5 mile long. The trees are not as high as those on the other islets. Sunken coral heads lie within 1 mile N and S of this islet.

A steep-to reef, almost awash and 0.5 mile long, lies 6 miles ESE of the islet. A shoal, with a least depth of 6.7m, lies about 1.75 miles NNE of the islet. A 2.7m patch lies 5 miles NE of the islet.

Pulau Pinaat (2°25'S., 117°35'E.) stands on the N end of a narrow reef about 4 miles NW of Pulau Seloang. Two tall trees which stand on the islet are higher than the others. Detached reefs lie up to 3 miles NE and 1.75 miles SW of the islet. A small sand bank, nearly always visible, lies on one of these reefs.

Pulau Melambir (2°27'S., 117°33'E.), small in extent and densely wooded, stands near the middle of a narrow ledge of reef and foul ground that extends 3.5 miles SW from a position 2 miles W of Pulau Pinaat. A tall tree near its center can be seen from a distance of 16 miles. A sand bank, always above-water, lies on the S end of the reef.

Pulau Lamudaan-ketcil (2°27'S., 117°30'E.) and Pulau Lamudaan-besar stand about 0.75 mile apart on parallel reefs, about 3.25 and 4 miles W of Pulau Melambir. These islets lie near the NE end of a group of reefs that extends 5 miles SW. The larger islet is covered with tall trees. The smaller islet is wooded.

Pulau Semanga-ketcil (2°25'S., 117°24'E.) stands near the center of a narrow ridge of foul ground that extends 4.5 miles N from a position 4 miles W of Pulau Lamudaan-besar. The island is low with one small tree.

Semanga-besar, located 1 mile SW of the smaller islet, is covered with tall trees, one of which is considerably taller than the others. Foul ground extends almost 2 miles S from this islet.

9.39 Pulau Poong Poong (2°28'S., 117°23'E.), a very small islet, stands near the NE end of a triangular area of foul ground which extends 4 miles SW and then 5 miles NW from the islet. Some trees rise to a height of 30.5m on the islet. Pulau Samataha, located 3 miles W of this islet, stands near the NW edge of this foul ground. It is wooded and visible for a distance of 16 miles.

Pulau Kamarian-besar (2°22'S., 117°17'E.) and Pulau Kamarian-ketcil are two small islets standing on a shoal bank that extends 2.75 miles N from a position about 5.25 miles NNW of Pulau Samataha. The larger islet is covered with high trees; whereas, the smaller islet has only one tree.

Pulau Saboyan (Sabojan) (2°21'S., 117°19'E.), located 3 miles E of Pulau Kamarian-besar, has a clump of trees on its N part which attain a height of 55m.

Pulau Salingsingan (2°19'S., 117°14'E.), lying 3.25 miles NW of Pulau Kamarian-ketjil, is small and surrounded by foul ground. A small reef, part of which is always above water, lies 2 miles N of the islet. Reefs and foul ground extend up to 17.5 miles NNW from the islet.

A double row of reefs which extend N and S and which partly dry lie W of the inner islets and reefs of the Little Paternoster Islands. This area is about 30 miles long, N and S, and 15 miles wide in an E and W direction. Some of these reefs never cover.

Pulau Sangai (Pulau Sanga) (2°14'S., 117°08'E.), lying 7 miles NW of Pulau Salingsingan, is partly covered with brushwood and has one small tree that is visible from a distance of 8 miles.

9.40 Karang Unarang (2°29'S., 117°03'E.), the southernmost danger of the group lying 16 miles SSW of Pulau Sangai, is nearly always dry. A large reef, which dries in parts lies 8 miles W. A stranded wreck lies 4 miles N.

Vessels can anchor anywhere on the bank in suitable depths over a coral and sand bottom. The water usually deepens approaching the reefs which are steep-to.

Only vessels having local knowledge should attempt to pass between these dangers, and then only under the most favorable of conditions. Such vessels should be on the alert for charted and uncharted dangers.

Directions.—From the SW vessels should steer 045° with the high trees on Pulau Samataha ahead and then pass 2 miles W of that islet. They should then steer to pass E of Pulau Sabojan. A NE course should then be steered passing out through the 6-mile wide passage SE of Pulau Sebangkatan.

From the N vessels may follow the reverse of the above directions. The reefs and dangers extending W from Pulau Seturian can be avoided by keeping Pulau Lamadaan-besar bearing less than 193°. These dangers are hard to identify when submerged.

From the NE a passage, about 1 mile wide, leads between Pulau Seturian and the large drying reef to the NW. At half-tide, a small sand bank near the E edge of the reef is visible. Depths of 29.3 to 34.7m exist in the passage.

From the E a passage, about 3 miles wide, leads between the reef enclosing Pulau Kabaladua and the reefs and dangers to the NW. The high trees on the S part of Pulau Seloang and the light structure on Pulau Balabalangan can usually be seen and used as landmarks.

Caution.—The passage between Semarang Shoal and Pulau Balabalangan should not be used due to the lack of available

landmarks.

A wide berth should be given to Kepulauan Balangan when passing E or N of them, because of the prevailing S current outside the charted 200m curve.

Tanjung Aru to Tanjung Mangkalihat

9.41 Tanjung Aru (2°10'S., 116°35'E.) is sandy at its N point and has some coconut trees on it. A small fishing village stands on the W side of the point. The 20m curve fronts the point about 10 miles offshore. Keep a safe distance to avoid a dangerous wreck, marked by a lighted buoy, lying 6 miles NE of Aru Bank. This lighted buoy was reported missing.

Between Tanjung Aru and Tanjung Giling, about 11 miles NW, the coast is very low and intersected by a number of rivers. Drying reefs and other dangers lie within the 5.5m curve, which lies up to 8.5 miles offshore in places.

Teluk Apar (2°04'S., 116°28'E.), is the estuary for two large rivers which flow out close S of Tanjung Giling. The outer bar has depths of 5.5m and less.

There is an area in the middle part of the entrance with depths of 5.5 to 11m. Within this area, the depths decrease sharply and the stream is only navigable by small craft. An ebb current of 2 knots is felt between the 9.1m and 18.3m curves during the rainy season.

Taluk Apar Lighted Beacon (2°03'S., 116°33'E.) stands in the entrance to the bay.

The **Sungai Pasir** (1°52'S., 116°26'E.) enters the sea 9.5 miles NNW of Tanjung Giling.

9.42 Karangan Reef (1°55'S., 116°33'E.), Batu Meha Reef, Palambu Reef, and Anyirsabon Reef, all partly drying, lie within the 9.1m curve in the SE approach to the river. A 7.8m patch lies about 1.75 miles E of the beacon marking Karangan Reef.

The entrance buoy is moored about 7 miles E of Tanjung Teriti, the S entrance point of the river. The entrance channel is marked by navigational aids but is suitable only for light-draft craft.

Tanjung Mandu (1°46'S., 116°27'E.), lying 6.5 miles NNE of the Sungai Pasir, is covered with mangroves and is the S entrance point to Teluk Adang.

A dangerous wreck, with its masts visible, lies 4.75 miles E of Tanjung Mandu. Another dangerous wreck lies 3.75 miles further E. A light is shown about 1.75 miles NE of the point.

Tanah Merah Coal Terminal(1°49'S., 116°09'E.) stands 18 miles W of Tanjung Mandu. The mean tidal range is 2.6m at springs and 1.5m at neaps. The berth is 230m long, with an alongside depths of 11m.

Vessels up to 160m long, with a maximum beam of 24m, have been accommodated. The depth in the channel, which is 120m wide, is 8m; the turning basin has a depth of 8.5m. The approach channel is marked by lighted buoys.

The Adang Bay STS Anchorage consists of the STS Coal Transhipment Area which handles coal and breakbulk. Vessels up to 15,000 dwt, with a maximum draft (HW) of 29.0m and a maximum beam of 45m, can be accommodated.

The Tanah Merah Coal Terminal (TMCT) consists of three barge berths. Barge Berth No. 01 is 230m long, handles coal and breakbulk, and can accommodate vessels up to 60,000 dwt, with a maximum loa of 160m, a maximum draft (HW) of 11.0m, and a maximum beam of 24m. Barge Berth No. 02 and 03 handle coal. Barge Berth No. 3 has a depth of 8.0m and uses barge and tug services.

Pilotage is compulsory and is available during daylight hours only. The pilot boards at Entrance Lighted Buoy and should be requested from the harbormaster, via the agent, at least 24 hours prior to arrival at Entrance Lighted Buoy.

9.43 Teluk Adang (1°43'S., 116°28'E.), entered between Tanjung Mandu and Tanjung Maruat, 12 miles NE, is a broad estuary which indents the coast up to 15 miles.

Some fairly important rivers intersect the low shores of this estuary. Taluk Adang Light is shown from a white tower situated 1.5 miles NE of Tanjung Mandu. A fairway lighted buoy also indicating the seaward end of the bay, from its center, is moored 12 miles NE of Tanjung Mandu.

Pasirmajang, a large village, stands on the left bank of the Sungai Kuaro, 15 miles W of Tanjung Mandu.

A mud bank, 2.75 miles wide in places, lies along the N shore of the estuary. A 5m patch lies about 4.25 miles NE of Tanjung Mandu.

The channel leading into the river has depths of 4.6 to 9.1m in the fairway leading along the S shore. The entrances of the rivers for the most part are blocked by mud banks. Vessels having local knowledge and a draft of 5.5m can proceed as far as Pasirmajang.

Vessels having drafts of 4.9 and 3.4m, respectively, can reach the mouths of the Sungai Samunta and the Sungai Adang, but a pilot should be used.

Pilotage.—Pilotage is compulsory, but is available during daylight hours only. Vessels should send a request for pilotage and their ETA to the harbormaster via their agent 24 hours prior to arriving at Fairway Lighted Buoy. The pilot boards 2 miles S of Fairway Lighted Buoy.

Anchorage.—Small craft with local knowledge can anchor within the river mouths. The estuary itself is open to E winds and seas. Strong currents have been reported at times within the estuary and its approaches.

Between Tanjung Maruat and Tanjung Jumalai, 19 miles NE, the coast is low and muddy. All dangers are contained within the 10m curve which lies up to 3.5 miles offshore. Several drying reefs lie within this curve to the S and SE of the latter point.

Tanjung Jumalai is the S entrance point to Teluk Balikpapan.

Indonesian Marine Police have recommended ships to anchor where they conduct patrol on the vicinity of 1°40'S, 116°40'E.

Caution.—Offshore oil rig platforms are situated in Sepingan Oil Field, 10.5 miles SE, and in Yakin Oil Field, 2 miles E of Tanjung Jumelai. Additional platforms have been established (2001) in the vicinity of both oil fields. Gas and oil pipelines connect these fields and the shore, landing 3.5 miles WSW of Tanjung Jumelai. Anchoring is prohibited within 0.5 mile of these pipelines. Entry is prohibited in an area extending from the E side of the Sepingan Oil Field and W to the Lawi-Lawi Oil Terminal anchorage.

9.44 Teluk Balikpapan (1°20'S., 116°49'E.), entered between Tanjung Jumalai and Tanjung Tokong, about 5.25 miles NNE, is the deep and spacious estuary of several rivers. It ex-

tends 12 miles inland in a N direction to the Sungai Semoi. The Sungai Sepaku enters the river 5 miles farther N.

Balikpapan, the site of an oil refinery, stands along the E shore of the estuary close N and E of Tanjung Tokong.

Balikpapan

Lawi-Lawi Oil Terminal (1°27'S., 116°45'E.) (World Port Index No. 51845) is a lighted SBM situated about 6 miles S of Tanjung Jumalai. The terminal is approached from the E through a wire-swept channel, 21.3m deep. There is an anchorage for tankers about 2 miles E of the terminal. A Mooring Master will board in the anchorage area. Night berthing is permitted only when conditions are favorable. The vessel's ETA should be sent 72 hours in advance via Balikpapan Coast Radio Station, and confirmed 48 hours and 24 hours before arrival.

Depths—Limitations.—Vessels up to 135,000 dwt, with a maximum length of 290m and a maximum draft of 18m, can be accommodated. Vessels must be at least 15,000 dwt, with a minimum length of 145m. A depth of 21.3m is reported at the SBM. Vessels are berthed during daylight hours only; unberthing is possible during darkness.

Caution.—Incidents of piracy have occurred while ships were at anchor in Lawi-Lawi.

Balikpapan (1°16'S., 116°49'E.)

World Port Index No. 51840

9.45 Balikpapan, the site of a large refinery, stands N and E of Gunung Tokong. The office of the port captain stands on the side of a hill to the E of Gunung Tokong.

The harbor office and customs office are situated near the site of the old Government Jetty. The office of the superintendent of pilotage for the E coast of Borneo is situated in this area. Ample, modern alongside berthing facilities are provided for both cargo and tanker vessels. Balikpapan is a first port of entry.

Tides—Currents.—The tides are mixed but are mostly of a semidiurnal nature. The semidiurnal rise at springs is about 2.6m and is about 1.5m at neaps. The diurnal range is about 0.5m at springs with the neap range negligible.

The tidal currents set in a N to S direction with the S current the stronger of the two. The maximum rate of the S current has been known to reach 3 knots. During the rainy season the ebb current usually prevails. The change of direction usually occurs at about HW and LW. A strong current sets between Pulau Tokong and the coast to the E.

The flood current sets away from the piers and the ebb sets toward them. Vessels approaching the piers should take into account the currents when berthing. The approach to the piers should be made on the flood or at slack water.

Balikpapan—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Balikpapan Coal Terminal						
Export Jetty	235m	17.0m	300m	13.0m	160,000 dwt	Coal and bunkers. Berthing length of 350m (including dolphins).
Unloading Jetty	330m	—	225m	—	73,852 dwt	Coal and bunkers.
Pt. Kaltim Kariangau Terminal						
Container Berth	270m	14.0m	269m	—	51,870 dwt	Container, bunkers, and reefer.
Semayang Terminal						
No. 1-3	—	13.0m	165m	—	15,000 dwt	Ro/pax, PCC, breakbulk, containers, steel products, others, livestock, and bunkers. Continuous berthing length of 194m.
No. 4-5	—	13.0m	165m	—	12,740 dwt	Ro/pax, PCC, breakbulk, containers, steel products, others, livestock, and bunkers. Continuous berthing length of 137m.

Balikpapan—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
No. 6-8	—	13.0m	165m	—	19,950 dwt	Ro/pax, PCC, breakbulk, containers, steel products, others, livestock, project/heavy, and bunkers. Continuous berthing length of 160m.
Tanjung Batu Marine Terminal						
Outer Quay	188m	8.0m	168m	—	19,381 dwt	Project/heavy, steel products, breakbulk, offshore, and bunkers.
Balikpapan Refinery Unit V Terminal						
STS Operations	—	24.0m	—	—	—	—
Sulphur Jetty	—	—	144m	—	16,989 dwt	Under construction. Chemicals, breakbulk, multipurpose, and bunkers.
Wharf No. 1	—	9.0m	190m	8.5m	35,000 dwt	Clean products, crude, dirty products, and bunkers. Continuous berthing length of 298m.
Wharf No. 2	—	12.0m	190m	11.5m	46,092 dwt	Aviation fuel, clean products, crude, dirty products, and bunkers. Continuous berthing length of 298m.
Wharf No. 3	47m	12.0m	190m	11.5m	35,000 dwt	Aviation fuel, clean products, dirty products, bunkers, and LPG. Berthing length of 200m (including dolphins).
Wharf No. 4	46m	12.0m	190m	11.5m	35,000 dwt	Aviation fuel, clean products, dirty products, bunkers. Berthing length of 178m (including dolphins).
Wharf No. 5	47m	12.0m	190m	11.5m	50,215 dwt	Aviation fuel, clean products, crude, dirty products, and bunkers. Berthing length of 198m (including dolphins).
Wharf No. 5b (outer south)	30m	12.6m	190m	12.0m	46,986 dwt	Clean products, crude, dirty products, bunkers. Berthing length of 202m (including dolphins).
Wharf No. 5c (outer north)	30m	10.5m	190m	—	46,986 dwt	Clean products, crude, dirty products, and bunkers. Berthing length of 200m (including dolphins).
Kutai Refinery Nusantara						
Tanker Jetty	116m	—	184m	—	50,000 dwt	Chemicals, vegetables oils, and bunkers. Berthing length of 196m (including dolphins).
Woodchip Berth	198m	—	215m	—	70,475 dwt	Chemicals, vegetable oils, wood chips, multipurpose and bunkers. Berthing length of 275m (including dolphins).
PT Dermaga Kencana Indonesia Terminal						
Oil Jetty	13m	—	189m	—	51,678 dwt	Chemicals, clean products. Berthing length of 170m (including dolphins).
PT Wilmar Nabati Terminal						
Wilmar Jetty	153m	—	185m	—	50,000 dwt	Vegetable oils. Berthing length of 276m (including dolphins).

Depths—Limitations.—The times of entering or departing the harbor are governed by the depth of water over the bar and in the swept channel. The channel was dredged to 13m over a width of 150m. The maximum size of ships permitted to use the port is 240m, with a draft of 11m. In the inner roadstead off the oil refinery, there were depths of 11 to 16.5m. Vessels having a length of 259m and a draft of 8.5m could berth at the oil piers. A report states that vessels drawing up to 11.4m could berth alongside the oil berths. Vessels drawing up to 10.5m were allowed to depart from these oil berths.

General Wharf, 0.2 mile N of Gunung Tokong Light, is 194m long, with a depth of 7m alongside.

There are eight tanker berths, located at Pier No. 1 through Pier No. 5, and Pier No.5A through Pier No.5C. Three dry cargo berths are located at Pier No. 6, Pier No. 7, and Pier No. 7A. Two utility berths, including at lighter pier, are located at Pier No. 8 and Pier No. 9.

Depths alongside the tanker berths vary between 5m at Pier No. 5A, for a tanker of up to 5,000 dwt, to a depth of 12m at Pier No. 2, for vessels up to 35,000 dwt displacement and 195m in length.

Dry cargo berths Located at Pier No. 6 and Pier No. 7 have depths of 12m alongside for vessels of 35,000 dwt and a length of 213m.

Balikpapan Coal Terminal has a wharf, 235m long, with a least depth of 15m alongside. A turning basin off the wharf has a depth of 20m. A channel leading to the wharf is 150m wide, with a depth of 13m. Vessels up to 80,000 dwt can be accommodated.

Vessels of moderate draft berth at the oil piers on a N heading and when leaving, can safely pass E and N of the reef 0.25 mile offshore. Deep-draft vessels berthing at Pier No. 6 or Pier No. 7 should berth port side-to.

More berthing details can be seen in the table titled **Balikpapan—Berthing Information**.

Aspect.—Gunung Beratus (1°01'S., 116°20'E.), 1227m high, can be seen from a considerable distance in clear weather. On bearings S of W, the peak appears to be an irregularly-shaped trapezoid, and on bearings N of W, it appears conical in shape. Gunung Konut, 1,050m high, stands 6 miles SW of Gunung Beratus.

Gunung Tokong (Tokong Hill), 90m high, stands close E of Tanjung Tokong and is prominent because of its conical shape. There is a yellowish scar on a hill 1.5 miles ENE of Gunung Tokong, but only the top of the scar is visible from a distance. The yellow hangar of the airport, situated 5.5 miles E of Balikpapan, is prominent as well as a building of similar color close to it.

White oil tanks can be seen during the daylight hours. At night, the loom of the lights at the oil refinery can be seen for a considerable distance.

A prominent hotel is situated 1.5 miles E of Gunung Tokong. A flare 1.5 miles NNE of Gunung Tokong is reported to be visible at night for 20 miles.

Pilotage.—Pilotage is compulsory. They board near the outer lighted buoy; a berthing pilot boards about 1 mile SW of Gunung Tokong. Vessels with drafts over 11.5m are only berthed during daylight hours.

Request for a pilot should be made via the radio station or to the signal station on Gunung Tokong. Vessels arriving at night should anchor in the vicinity of the sea buoy and give their call sign to the signal station.

Vessels leaving should order a pilot at least 6 hours prior to departure; when leaving between 0600 and 1200 request should be made prior to 2000 the preceding day.

In order to make the harbor before dark a vessel should arrive at the pilot boarding position not later than 1600. If a vessel's draft exceeds 7m this information should be mentioned in the request for a pilot.

Contact Information.—See the table titled **Balikpapan—Contact Information**.

Regulations.—Vessels with drafts exceeding 8.8m, when between Lighted Buoy 1 and Lighted Buoy 10 must exhibit two black balls by day or two red lights at night.

Balikpapan—Contact Information	
Port Authority	
Telephone	62-542-737457
	62-542-422246
Facsimile	62-542-731227
E-mail	pelindobpp4@plasa.com
Harbormaster	
Telephone	62-542-422096
PT Kaltim Kariangau Terminal	
Telephone	62-852-48898504
	62-811-5377087
E-mail	admin@kariangauterminal.co.id
Web site	http://www.kariangauterminal.co.id
Pilots	
VHF	VHF channels 12, 14, and 16
Telephone	62-542-411930
Vessel Traffic Service	
Call sign	VTS Balikpapan
VHF	VHF channels 67 and 68
MMSI	005250009
Telephone	62-542-735333
Facsimile	62-542-749190
E-mail	vtsllbalikpapan@gmail.com

In case two vessels approach this section of the channel from opposite directions the vessel entering from seaward will have the right of way.

Vessels secured to the piers or at the mooring buoys must keep a wire tow rope ready on the offshore side at all times.

Signals.—There is a signal station situated on Gunung Tokong. In the event of failure of the main light, two horizontal white lights are shown from the signal station.

When a vessel is sighted, a black drum is displayed at the yardarm of the flagstaff at the signal station; a black drum on

each yardarm indicates two vessels have been sighted. These signals are taken down when the vessel or vessels have passed the signal station.

Vessels arriving at night should anchor in the vicinity of the outer lighted buoy and signal the vessel's name to the signal station.

Anchorage.—Anchorage can be taken in the middle of the roadstead off the town, in depths of 11 to 22m. A number of mooring buoys and hauling off buoys are situated near the piers.

Vessels awaiting a pilot can anchor about 2 miles SE of the swept channel entrance.

Anchorage is prohibited in the vicinity of the submarine pipeline which extends from the shore close N of Pier 8 to the opposite shore. Numerous incidents of piracy and robbery continue to be reported (2003) at Balikpapan Anchorage and on the adjacent waters. Mariners should take appropriate precautions while at anchor awaiting a berth and when transiting the above-mentioned area.

Indonesian Marine Police has recommended ships to anchor where they conduct patrol on the vicinity of 1°22'S, 116°53'E.

Caution.—Many submerged and stranded wrecks lie in the approach to and within Teluk Balikpapan. Some of these wrecks are marked by buoys and some have masts and funnels showing. All of the wrecks and obstructions are charted but caution is necessary when passing them. It was reported that the navigation aids and a wreck in the approaches to Balikpapan are not as charted.

The buoyage in the approach channel and within the harbor should not be relied on. Caution is necessary when approaching Balikpapan because of the heavy refraction encountered at various times of the day. It has been reported that numerous small fishing boats lie in the vicinity of the sea buoy. Fishing stakes are widespread, especially in depths of less than 20m. Their positions are frequently changed.

A restricted area, 2 miles wide with a submerged oil pipeline in its middle and two loading platforms near its outer end, extends 13.25 miles ESE from the shore, about 3.5 miles WSW of Tanjung Jumalai. Vessels are prohibited from anchoring or passing through this area.

It is recommended, because of the unreliability of aids and the danger of drifting mines, that the approach to Balikpapan be made only during daylight hours. Vessels not possessing local knowledge should not attempt to enter the swept channel without a pilot aboard.

Tankers should enter with clean water ballast because the winds are strong at times.

9.46 The coast between Tanjung Tokong and Tanjung Tambangongot, about 35 miles NE, is somewhat higher than that to the S of Teluk Balikpapan. A sandy beach fronts some tall trees which stand on the hills backing the shore.

Tangjung Lamaru (Manggar) (1°11'S., 117°00'E.), 13.5 miles ENE of Gunung Tokong, turns N to Sembodjalama. Tanjung Manggar Light is shown, and a radiobeacon transmits from a height of 43m, 2.5 miles SW of the point. Eight miles NE of the point, Tanjung Tanahmerah can be identified by a small, steep hill of red sand standing near it. The sandy beach terminates at the settlement of Senipah and the shore to the N becomes low and marshy.

Sembodjalama (1°02'S., 117°07'E.), a small oil refinery settlement, stands 10.75 miles SW of Tanjung Tambangongot.

Between Tanjung Tokong and Tanjung Tambangongot, the 10m curve is parallel with and about 3 to 5 miles off the coast. Within this curve the depths decrease gradually over a bottom of mostly mud.

9.47 Senipah Oil Terminal (1°03'S., 117°13'E.) (World Port Index No. 51830) consists of a lighted SBM at the seaward end of a pipeline extending 5.75 miles SE from the shore, about 3 miles SW of the village of Senipah. The terminal is used for loading crude oil by tankers.

Depths—Limitations.—Vessels up to 150,000 dwt may be accepted on a partial-cargo first port-of-call basis, with displacement equal to a fully laden 125,000 dwt tanker.

Vessels smaller than 50,000 dwt may be accepted under exceptional circumstances. The absolute minimum size of vessels allowed is 32,000 dwt and length overall of 195m.

Pilotage.—There are no pilots, but a mooring master boards at the sea anchorage within 2 miles of position 1°05.60'S, 117°13.10'E.

Regulations.—The ETA for Senipah Oil Terminal should be sent 72 hours, 48 hours, and 24 hours prior to arrival through Pertamina Coast Radio Stations at Jakarta, Merak, or Balikpapan. There is a port radio station at the terminal.

Berthing takes place in daylight only; unberthing by day or night.

Vessels under 60,000 dwt arriving at the terminal should have a draft forward of 5m and a draft aft of 8m.

Vessels over 60,000 dwt should have a draft forward of 7m and a draft aft of 9m.

Anchorage.—An anchorage area, 2 miles in diameter, is situated about 3 miles SE of the SBM.

Another pipeline, which joins the terminal pipeline about halfway between the SBM and the shore, extends E about 19 miles. This pipeline ends in a Restricted Area.

Anchoring is prohibited within 0.75 mile of the pipelines.

Indonesian Marine Police have recommended ships to anchor where they conduct patrol on the vicinity of 1°09S, 117°13'E.

Caution.—A wreck is reported (2004) to lie on the 50m curve, 9 miles SE of the Senipah Oil Terminal SBM. Another wreck is reported (2005) to lie approximately 2.7 miles ESE of the Senipah Oil Terminal SBM.

There have been many buoys and beacons established, some lighted, in the vicinity of the Senipah Oil Terminal, the Senipah Processing complex and approaches to Maura Pegah. Lighted oil platforms and submerged well heads have also been established. Navigate with caution and consult local authorities for the most recent information.

Sungai Mahakam Delta

9.48 Tanjung Timbangongot (0°55'S., 117°15'E.), the SW entrance point of the delta, is low but can be identified by a group of tall trees about 0.75 mile within its extremity. A stranded wreck lies 0.5 mile SE of this point.

The **Sungai Mahakam** (Kutei) (0°35'S., 117°17'E.), the most important river on the E coast of Borneo, is navigable by small vessels with local knowledge as far as Muara Pahu, a village about 150 miles upriver from Samerinda. The latter village is an important river port.

Between Tanjung Tambangongot and Tanjung Marangkayu, about 43 miles NNE, the coast is formed by a wide delta intersected by four main channels and numerous small connecting passages. The outer shores of the islands forming the delta are low, swampy, and covered with stunted trees.

Muara Pegah, Muara Bekapai, and Muara Bayor are the three main channels leading across the delta to the Sungai Mahakam. Muara Jawa, the W channel, has a very shallow outer bar; however, it becomes the main channel N of its intersection with the Muara Pegah. Muara Berau, the N channel, is foul in its approach and shallow in its entrance.

Depths—Limitations.—A restricted area, with two oil production platforms in its E part, centered about 16.5 miles ESE of Tanjung Tambangongot.

A fringing bank about 3 to 7 miles wide extends offshore from the islands which lie within the limits of the delta. This bank dries in many places and drops off sharply to depths of 9.1m and then 18.3m along its outer edge. The various channels leading through this bank have depths of up to 2.1m.

Tide gauges, graduated in decimeters and giving the depths on the shallowest part of the outer bar of the Muara Pegah, stand 4.75 miles SSW and 4.5 miles NNW of **Tanjung Paraparangatan** (0°55'S., 117°20'E.).

A tide gauge for departing vessels stands about 1.75 miles NNW of **Tanjung Pemarung** (0°53'S., 117°26'E.).

The gauge indicates the depths in meters on the outer bar channel of the Muara Bekapai.

Tides—Currents.—In the Muara Jawa, the maximum spring rise of the tide is about 1.6m and the maximum rise of the neap tide is 0.5m. In the Muara Pegah, the tide is mixed but predominately semidiurnal. The average spring range of the semidiurnal tides is 1.6m; the range of the neaps is about 0.1m. The average spring range of the diurnal tides is 0.8m; the neap range is 0.1m.

The mean tidal range in the entrance of the Muara Bayor near Pulau Nubi is 1.4m; the spring range is 2m.

For a considerable distance outside the delta there is either an inset or a strong outset of the current. Outside the influence of the delta the constant S current setting through Makassar Strait is felt.

Tidal currents of up to 2.5 knots at ebb and 2 knots at flood were experienced in Muara Jawa during the months of September through December. During the rainy season and at neap tide, the ebb current prevails. Near the outer bars of the Muara Pegah and the Muara Bekapai, the tidal currents set mostly in an E direction. At a position about 5 miles of Tanjung Tambangongot, the tidal currents vary between E and SE with an average rate of 0.5 knot. At a position about 6 miles E of Tanjung Paraparangatan, the tidal currents vary between SE and NE with an average rate of 1.5 knots. At a position about 5 miles SE of Tanjung Pemarung, the tidal currents vary between SE and NE and have an average rate of 1.5 knots.

The tidal currents in the Muara Pegah are semidiurnal. During spring tide the maximum rate at ebb is 3.5 knots and at flood 2.5 knots. During the rainy season, the ebb current may be stronger. At spring tides the current changes its directions from 30 minutes to 1 hour after the times of HW and LW. At neap tides the ebb current predominates. The flood current sets NW and the ebb current sets SE. The current, especially on the bar, frequently sets across the channel.

The tidal currents in the Muara Bayor are semidiurnal. The change in direction of the current near Pulau Nubi occurs from 30 minutes to 1 hour 30 minutes after H and LW. The maximum rate is 2 knots, but this may be higher due to flooding. In the mouth of the Muara Bayor the ebb current prevails because of the water discharged by the river. This influence is greater farther upstream. The currents in the Muara Berau are of a semidiurnal character. The flood current starts 1 hour after LW and the ebb current starts 1 hour after HW. The flood current is strongest and can attain a rate of 2.5 knots.

Aspect.—It is reported that flaming gases on the N banks of the Sungai Mahakam, abreast the mouth of the **Sungai Sanga Sanga** (0°34'S., 117°16'E.), are visible from the offing and serve as good marks for making the approach to the Muara Pegah, the entrance of which is marked by lights and buoys.

With the exception of **Muara Pegah Light** (0°51.6'S., 117°17.8'E.), situated on SE shore of Pulan Bukuan, landmarks are not easily recognizable in the approaches to the channels.

Tanjung Pemarung (0°53'S., 117°26'E.) can be identified by tall trees with a wide opening on the N side. This point and the tree-covered Pulau Data serve as useful marks for vessels approaching the Sungai Bekapai.

Bekapai Oil Field, is situated 7 miles SE of Tanjung Pemarung, 11.25 miles E of Tanjung Timbangongot. A flare, numerous lighted structures, unlit objects, and below-water obstructions exist in the field which is an Entry Restricted Area.

Bekapai Offshore Terminal (1°01'S., 117°29'E.) is situated 14.5 miles SE of Muara Pegah Light. Vessels load oil alongside a hulk of 35,000 dwt, which is moored to an SBM and fitted with a radar reflector.

There is a port radio station at the terminal.

Pilotage.—A mooring master boards at the anchorage. The minimum size tanker acceptable is 17,000 dwt; the maximum size tanker acceptable is 80,000 dwt, if the vessel is not longer than 295m.

The ETA at the anchorage should be radioed to Balikpapan Radio Station 72 hours, 48 hours, and 24 hours prior to arrival, amending or confirming this as necessary.

Anchorage.—An anchorage area, with a radius of 2 miles, is centered at position 1°03'S, 117°31'E.

Caution.—A lookout for floating logs should be kept in this vicinity.

9.49 Tanjung Bayor (0°44'S., 117°37'E.) is a well-defined point. A grove of high trees, which appear from the offing as an islet, stand near a village situated on the S side of the Muara Bayor, about 7 miles W of Tanjung Bayor.

Tanjung Sisi (0°31'S., 117°35'E.) can be identified by a conspicuous group of trees. A similar group of trees stands on the E side of Muara Berau in the vicinity of **Tanjung Lerung** (0°21'S., 117°33'E.). The hill on Pulau Tunu is prominent from the SE.

Aspect.—Muara Pegah Light (0°51.6'S., 117°17.8'E.) is shown from the SE shore of Pulan Bukuan. A lighted buoy (safe water) is moored on the seaward side of the bar, 4.5 miles S of Tanjung Pegah, and pilots board vessels in the vicinity. A dangerous wreck lying 5 miles S of Tanjung Pegah is marked on its E side by a buoy; the buoy was reported missing.

Three pairs of lighted beacons lead into Pegah channel from its entrance to close E of Pegah Light. The southernmost lead-

ing lighted beacon, which contains a racon, is situated 1 mile WNW of the safe water lighted buoy. Approximately 1.5 miles S of the same buoy, a submarine oil pipeline runs 19 miles almost E to W from the center of Bekpai Oil Field, W to 2.75 miles NW of Senipah Oil Terminal.

Anchoring is prohibited within 0.75 mile of the pipeline.

Pilotage.—Pilotage is compulsory for the Muara Djawa, the Muara Pegah, the Muara Bekapai, and the Muara Bayor, except for certain exceptions. Pilot vessels are not on station. The pilots are qualified to take vessels up the Sungai Sanga Sanga and the Sungai Mahakam above Samarinda as far as Sebula.

The pilot for inbound vessels should be requested by radio through their agent from the harbor master. The pilot will board vessels close outside the lighted buoy at the outer entrance of Muara Pegah. The pilot also boards vessels in the anchorage area centered on position 1°03'S, 117° 31'E.

Pilotage at night is only permitted for certain vessels.

In case the pilot is unable to board the vessels outside the bar of the Muara Pegah, the pilot boat will show a white light and will lead the vessel across the bar. The pilot will then board about 3.75 miles N of the outer tide-gauge beacon.

Anchorage.—An anchorage W of the entrance to Muara Pegah is bound by lines joining the following positions:

a. 0°58.87'S, 117°14.57'E.
b. 0°58.87'S, 117°18.54'E.
c. 0°59.58'S, 117°18.54'E.
d. 0°59.58'S, 117°14.57'E.

Caution.—The water of the delta channels and surrounding coast are always muddy, and in the rainy season trees and large patches of vegetation are carried out to sea. These sometimes resemble islands or praus under sail. Vessels should keep well outside the 18.3m curve in rounding the delta.

The passages over the bars and through the delta channels are subject to change and are only marked in places. Local knowledge is necessary and pilotage is compulsory.

A star-shaped Prohibited Area, enclosed by a star-shaped Restricted Area, lies just off the bar and main channel entrance of the Muara Pegah and can be best seen on the chart. A dangerous wreck, best seen on the chart, lies approximately 0.6 mile due S of the southernmost reaches of the Restricted Area. This wreck lies just S of the 50m curve.

Additionally, in the Peciko Prohibited Area and the Bekapai Prohibited Area, both of which are marked by lighted buoys, entering, navigating, and anchoring are prohibited. Mariners are advised to exercise caution when navigating in these areas and consult local authorities for the most recent information.

9.50 Muara Jawa (0°54'S., 117°15'E.), the W passage, is unmarked and suitable only for prau traffic. The charted depths are unreliable. The inner bar at Pulau Tjerotjok and the strong currents hinder passage by vessels of any size. The channel is about 25 miles long from the outer bar to its junction with the main stream. The Sungai Dondang, which is spanned by a bridge, flows into the Muara Jawa about 6 miles N of Tanjung Tambangongot. It is navigable by small craft for a distance of 4 miles above the entrance.

Muara Pegah (0°55'S., 117°18'E.) is reported to be the deepest channel in the delta and is reported to be the one now in use. The channel over the bar is marked. There was a least depth of 2.3m over the bar. The Muara Pegah joins the Muara Jawa to the N of Pulau Kerbau.

It has been reported that the flares on the N bank of the Sungai Mahakam opposite **Tanjung Ruwana** (0°35'S., 117°17'E.) are visible from the offing, and if kept bearing 354°, lead to the outer buoys at the entrance of the Muara Pegah. It should be noted that the distance from the flares is great and that the bearing will change very slowly.

Caution.—The tidal currents, especially on the bar, frequently set across the channel.

9.51 Muara Bekapai (0°53'S., 117°27'E.) can be entered by vessels at HW with a draft not exceeding 3m. The passage, which is entered through the Sungai Bagusan joins the Muara Jawa off the W entrance of Kleine Kali.

A shoal, with a depth of 2.4m, was reported 9 miles ESE of Tanjung Pemarung. The outer bar has a reported depth of 2.7m and the inner bar, located 3 miles N of Tanjung Pemarung, has a depth of 1.5m, hard sand.

The S part of the Sungai Bagusan is fairly straight but the N part is narrow and winding. The channels are unmarked and should only be attempted by small craft with local knowledge.

Caution is necessary when rounding the unnamed point, about 2.6 miles N of Tanjung Pemarung, because the ebb sets E and the flood to the W. Signal posts stand at the entrance of the narrows and at the junction of the Sungai Bagusan and Muara Bekapai.

Muara Bayor (0°43'S., 117°34'E.) should only be entered by vessels with local knowledge. Pilotage is compulsory. The bar channel is unmarked and the entrance is difficult to discern.

There is a depth of 3.3m over the outer bar and 2.4m over the inner bar. An obstruction is reported to lie in the channel to the N of Pulau Nubi.

The main channel leads N of Pulau Nubi and extends in a NW direction for 4.75 miles to the entrance of the Trusan Klambu, which can be identified by the small but prominent islet standing at its entrance.

Here, the passage known as Kleine Kali turns sharply to the S and is narrow and tortuous for about 5 miles. Traffic signal posts are reported to stand at each end of the narrows.

At the W end of Kleine Kali, the main channel, having been joined by the Muara Bekapai, widens and trends in a NW direction to its junction with the Muara Jawa. Pulau Tungku Kaju, covered with high trees, stands in midriver about 2 miles NW of the W entrance of Kleine Kali. The channel passes E of this islet.

Muara Berau (0°16'S., 117°32'E.) is unmarked and has dangerous reefs N of the entrance. It is suitable only for small craft with local knowledge. Pilotage is not available.

Muara Berau Light (0°20.2'S., 117°29.7'E.) is shown from a white beacon standing close NE of Tanjung Panyilatan.

Main Channels North and West

9.52 Tanjung Dewa (0°37'S., 117°18'E.), a fairly sharp point fronted by a mud bank, stands at the intersection of the Muara Jawa and Muara Bayor.

Between this point and Tanjung Muara Berau, the channel widens and intersects the main part of the Sungai Mahakam. The Sungai Sanga Sanga, an important waterway, flows into the wide channel about 1 mile S of Tanjung Muara Berau. The

Muara Berau intersects the main channel to the N of the latter point. Sungaimariam, just W of the inner entrance of the Muara Berau, is the site of an oil establishment.

From **Tanjung Muara Berau** (0°35'S., 117°17'E.) submarine pipelines extend 2.5 miles E in Berau channel and 1.5 miles SE in Jawa channel; the limits of the areas are marked by lighted buoys. Anchoring and dredging are prohibited in the area.

Tides—Currents.—The time of HW and LW from the sea to Tanjung Dewa, occurs 30 minutes later for each 8 miles. The tides off Tanjung Dewa are mixed, but predominantly semidiurnal. The average spring range of the semidiurnal tides is 1.6m; the average neap range is 0.4m. The average spring range of the diurnal tide is 0.6m; the average neap range is negligible.

The tides between Sungaimariam and Samarinda are mixed, but predominately semidiurnal. The average spring range of the semidiurnal tide is 1.3m; the average neap range is 0.3m. The average spring range of the diurnal tide is 0.9m; the average neap range is 0.3m.

A tide gauge, marked in centimeters, stands near the harbor office at Samarinda. The readings of the gauge must be decreased by 15cm to obtain the exact level of water above chart datum.

At Samarinda, HW occurs simultaneously with Muara Jawa and low occurs about 1 hour later. The spring range is from 1.1 to 1.5m. It is highest from February to May and lowest from July to October, but it depends on the volume of water discharged from the river.

Strong currents are encountered around Tanjung Dewa. A counter current flows close along the shore. During the months of July to October, the flood is frequently apparent at Samarinda, making it advisable for vessels to anchor far enough from the shore to allow for swinging.

In other months only the ebb is experienced. Day and night current signals are displayed from the main pier.

A shoal flat extends almost 0.6 mile SE from Tanjung Sanga Sanga. A wreck lies S of this point. The channel into the Sungai Sanga Sanga leads between this flat and the S side of the entrance of the river, and between the wreck and the same shore.

Aspect.—A number of lighted and unlighted beacons are found along the shores of the channel between Tanjung Dewa and Sungaimariam. Some of these beacons mark prohibited anchorage areas.

The **Sungai Sanga Sanga** (0°34'S., 117°16'E.) is navigable by small vessels with local knowledge for a distance of 4 miles to an oil settlement. The channel is marked and a flagstaff stands near the inner S entrance point. Loading wharves for small vessels are situated at the settlement.

Sungaimariam (0°35'S., 117°18'E.), an oil-shipping settlement, can be identified by its tanks and oil derricks.

There are also some buildings and small piers. Some drilling towers stand on Tanjung Muara Berau and Tanjung Sanga Sanga. These towers are lighted at night.

A rocky patch, with a depth of 3m, lies 0.2 mile S of the piers and is marked on its W side by a buoy. Vessels should pass S of the buoy. Another rocky patch, with a depth of 4m, lies 0.17 mile NE of the 3m patch. There are also some rocks, with a depth of 3.7m, 0.2 mile off the piers.

Between Sungaimariam and Samarinda, the Sungai Mahakam is wide and deep. Three small islets stand in the river between these two places.

Anchorage.—Anchorage is prohibited S of Sungaimariam between two lighted buoys marking a submarine power cable, and in an area 1.25 miles above Sungaimariam; the outer limits of the area is marked by beacons.

9.53 Samarinda (0°31'S., 117°09'E.) (World Port Index No. 51820) is located some 30 miles from the mouth of the Sungai Kutei. This timber port is the seat of a government administrator and lines both banks of the river for 2.5 miles. The town is one of the principal trading center on the E coast of Borneo. The residential section stands along the N bank; whereas, the S bank is bordered by houses on rafts.

A rock, with a depth of 2.4m, lies near the N bank close E of the flagstaff at Samarinda. With the exception of this rock there is deep water alongside the N bank.

A bank, with a depth of less than 4.6m, extends almost into mid-river from the S bank of the river, 0.25 mile SW of the flagstaff. A small detached bank, with a depth of 4.9m, lies close off the opposite bank, 1 mile SW of the flagstaff.

A wreck marked by a lighted buoy situated 2.5 miles SE of the flagstaff.

Several submarine cables cross the river 0.25 mile below the flagstaff at Samarinda. Notice boards mark the landing places and anchorage is prohibited in their vicinity.

Depths—Limitations.—Vessels up o 94,225 dwt, with a maximum loa of 223m, maximum draft of 6.0m and a maximum beam of 42.5m, can be accommodated.For additional details see table titled **Samarinda—Berth Information.**

Samarinda—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Beam	Size	
Adimitra Baratama Nusantara Terminal						
Coal Berth (N)	—	—	—	—	—	Coal by barge. Berthing length of 150m (including dolphins).
Coal Berth (S)	—	—	—	—	—	Coal by barge. Berthing length of 140m (including dolphins).
Anugerah Bara Kaltim Terminal						

Samarinda—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Beam	Size	
Coal Berth	—	—	—	—	—	Coal and transhipment by barge. Berthing length of 62m (including dolphins).
Bukit Baiduri Energi Terminal						
Coal Berth (E)	—	—	—	—	—	Coal and transhipment by barge.
Coal Berth (W)	—	—	—	—	—	Coal and transhipment by barge.
Indocement Terminal						
Cement Berth	92m	-	117m	18.8m	8,581 dwt	Cement.
Kalimanis Terminal						
General Cargo Berth	40m	—	—	—	—	Breakbulk
Kayu Alam Perkasa Raya Termianl						
Timber Berth	36m	—	—	—	5,000 dwt	Closed.
Muara Berau Anchorage Terminal						
Muara Berau Anchorage	—	—	—	—	—	Breakbulk
Muara Jawa Anchorage Terminal						
Muara Jawa Anchorage	—	—	—	—	—	Breakbulk
PT Punj Llyod Terminal						
PT Punj Llyod Berth	—	—	—	—	—	Closed. Project/heavy cargo and steel products.
PT Syam Surya Mandiri Terminal						
PT Syam Surya Mandiri Berth	14m	—	—	—	—	Closed. Frozen seafood.
Samarinda Logistic Hub Terminal						
No. 01	50m	5.0-7.0m	87m	14m	3,098 dwt	Fertilizer and steel products. Maximum draft (HW) of 7.0m,
No. 02	28m	7.0-12.0m	78m	20m	4,608 dwt	Fertilizer and steel products. Maximum draft (HW) of 12.0m
No. 03	—	—	90m	17.6m	6,565 dwt	Fertilizer and steel products. Maximum draft (HW) of 7.0m,
Samarinda Port Terminal						
No. 01	272m	5.0-7.9m	233m	42.6m	94,225 dwt	Ro/pax, ro-ro/lo-lo, and containers.
No. 02	264m	5.0-7.9m	95m	19.2m	9,762 dwt	Ro/pax and containers.
No. 03	293m	5.0-7.9m	103m	15.6m	5,374 dwt	Ro/pax and containers.
Semen Bosowa Terminal						
Cement Berth	30m	—	93m	15.6m	5,365 dwt	Cement. Berthing length of 104m Coal by barge. Berthing length of 150m (including dolphins).

Samarinda—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Beam	Size	
TPK Palaran Container Terminal						
Container Berth	270m	—	128m	21.9m	9,400 dwt	Container and reefer. Maximum draft (HW) of 6.0m.
Wana Hijau Pesaguan Terminal						
Timber Berth	24m	—	—	—	—	By barge.
Palaran Terminal						
Multipurpose Berth	56m	—	112m	24m	8,397 dwt	Clean products and cement. Berthing length of 70m Coal by barge. Berthing length of 150m (including dolphins).
Sarana Abadi Lestari Terminal						
No. 01	25m	—	96m	14.6m	6,000 dwt	Chemicals and breakbulk. Berthing length of 70m Coal by barge. Berthing length of 150m (including dolphins).
No. 02	—	—	—	—	—	Chemicals and clean products. Berthing length of 48m (including dolphins).
No. 03	—	—	88m	21.9m	6,624 dwt	Chemicals and clean products. Berthing length of 70m (including dolphins).
No. 04	45m	—	95m	21.9m	6,624 dwt	Chemicals, clean products, and breakbulk. Berthing length of 140m (including dolphins).
AKR Corporindo Palaran Terminal						
No. 01	15m	—	—	—	—	Clean products. Berthing length of 40m (including dolphins).
No. 02	42m	—	39m	10.0m	—	Clean products. Berthing length of 86m (including dolphins).
No. 03	40m	—	—	—	—	Clean products. Berthing length of 85m (including dolphins).
Astiku Sakti Terminal						
No. 01	20m	—	—	—	—	Clean products. Berthing length 77m (including dolphins).
No. 02	20m	—	90m	24m	4,998 dwt	Clean products. Berthing length of 73m (including dolphins).
Lakosta Indah Terminal						
Lakosta Berth	10m	—	—	—	—	Chemicals by barge.
Pertamina Samarinda Terminal						
Oil Jetty 01	15m	5.0-7.0m	100m	—	5,000 dwt	Clean products. Berthing length of 42m (including dolphins).
Oil Jetty 02	28m	—	42m	9.1m	—	Clean products by barge.
Pro Tank Terminal						
Tanker Berth	20m	—	90m	24m	4,998 dwt	By barge.

Samarinda—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Beam	Size	
Sarana Aspal Nusantara Terminal						
SAN Berth	—	—	106m	24m	8,397 dwt	Dirty products. Berthing length of 80m (including dolphins).

Pilotage.—The pilot boards in the following positions:

1. In the vicinity of Fairway Lighted Beacon (0°59.6'S, 117°20.4'E) in Muara Pegah.
2. In the anchorage area centered on position 1°03'S, 117°31'E.

Signals.—The following tidal current signals are displayed from one of the Government Piers at Samarinda:

Day signal	Night signal	Meaning
A cylinder, with a cone, point up, above and a cone, point down, below	Three white lights, disposed horizontally	Slack water
A cylinder, with a cone point up, below	Three white lights, disposed in the form of a triangle, point up	Flood current
A cylinder, with a cone point down, below	Three white lights, disposed in the form of a triangle, point up	Ebb current

Caution.—Piracy and thievery has been reported (2002) at Samarinda anchorage and in the adjacent waters. All vessels should navigate with caution in this area.

The Sungai Mahakam Upriver from Samarinda

9.54 Between Samarinda and Tenggarong, about 22 miles upriver, the stream is about 0.3 to 0.4 mile wide, except near the bends where it sometimes narrows to a width of 0.15 mile. The banks are steep and fronted by depths of 7.3 to 54.9m.

The flood current has been encountered as far upriver as Sebulu.

There are many dangers, most of which are shown on the chart and are marked by warning boards on the river banks.

A large sawmill stands on the E point of the mouth of a small stream about 0.5 mile above Samarinda. A pier, 46m long, with a depth of 3.2m alongside, stands 0.75 mile above Samarinda. Another pier, 20m long with a depth of 8.5m alongside, stands close N of the mouth of the Sungai Mangles.

Several submarine cables cross the river between Samarinda and Sebulu. The landing places on the banks are marked by warning boards.

A coal pier, 60m long with a depth of 4m, is situated at Loakula, a village of some size. The pier is the shipping place for the nearby coal mines. Four hatches can be loaded simultaneously at a total rate of 400 tons per hour.

A cargo pier, 58m long with a depth of 4.5m alongside, together with a 42m long pontoon pier, are situated upriver from the coal pier. Signals, identical to those displayed at Samarinda, are displayed at Loakula.

Tenggarong, a fairly large village, stands on the right bank close upriver from Pulau Tenggarong. A submarine cable, marked by warning boards on both banks, crosses the river here.

A pier, which can accommodate vessels up to 79m long, stands along the left bank of the river at Lua Bukit.

There is a depth of 2m alongside the pier.

Sebulu (0°17'S., 116°59'E.), 44 miles above Samarinda, is a trading place for forest products.

A vessel, with a draft of 3.7m, can ascend the Sungai Mahakam at the lowest water level as far as Long Iram, 220 miles above Samarinda. Vessels without local knowledge should obtain instructions from the harbor master at Samarinda.

The coast between **Tanjung Marangkayu** (0°13'S., 117°26'E.), which forms the N point of the delta of the Sungai Mahakam and Tanjung Santan, about 12.5 miles to the NNE, is low and flat. The latter point can be identified by a row of casuarina trees. A small river flows out near the point.

Attaka Oil Field lies 12 miles SE of Tanjung Santan. Within the oil field there are several oil production platforms, exhibiting lights, and a conspicuous flare.

The charted area within approximately 2 miles of the oil platforms and 1 mile of the submarine pipelines is a restricted area and anchoring is prohibited. Unauthorized navigation within 0.25 mile of an oil platform is prohibited.

Oil and gas pipelines are laid from the oil field to the shore, 5.5 miles SSW of Tanjung Santan, at the entrance to a canal that leads to Samarinda. A lighted beacon stands at each side of the work boat canal entrance. The channel leading to the canal entrance is marked by Lighted Buoy No. 15 and Lighted Buoy No. 18. Lighted Buoy No. 18 is moored 0.75 mile E of the canal entrance. A patch of drying reef, marked by Lighted Beacon No. 16, stands 1.5 miles ESE of the canal entrance. A coral shoal, with a depth of 5.9m, lies 1 mile E of the drying reef.

Anchorage.—Indonesian Marine Police have recommended ships to anchor where they conduct patrol on the vicinity of 0°017S, 117°36'E.

Caution.—Less water than charted is reported 1.25 miles ENE of Santan oil terminal.

9.55 Santan Oil Terminal (0°06'N., 117°32'E.) (World Port Index No. 51815), with numerous platforms, wells, mooring buoys, pipelines, and an approach channel marked by lighted buoys, is situated between Tanjung Marangkayu and Tanjung Santan.

Additional platforms and pipelines extend N along the coast for about 11 miles above Tanjung Santan. Anchoring is prohibited within 1 mile of the platforms and pipelines. Vessels inbound to the anchorage area, which lies centered about 5.25

miles SE of Tanjung Santan, should keep to the N of the approach channel lighted buoys. The facility can handle tankers up to 120,000 dwt, with a maximum length of 275m and a maximum draft of 25m.

Gas LPG Platform, marked by a light, is situated 1.75 miles WNW of the terminal. Vessels up to 5,000 dwt, with an overall length between 60 and 110m and draft of 7.0m, are permitted to berth and load propane. The depth alongside this berth is 11.6m.

SMB No 1 has a depth of 28.0m and is used for handling crude, chemicals, clean products, and dirty products. Vessels up to 125,000 dwt, with a maximum loa of 275m, a maximum draft of 18m, and a maximum beam of 76.2m, can be accommodated.

The ETA should be sent to the terminal 72 hours, 48 hours, and 24 hours prior to arrival. Vessels should contact "Santan Control" on VHF channel 9 or 16 for mooring or anchoring instructions. There is a depth of 28m in the vicinity of the mooring buoy.

Pilotage by a Mooring Master is compulsory. Vessels berth between 0600 and 1800. Berthing may be allowed at night with permission of the harbormaster. The pilot will board in the anchorage area at position 0°06'S, 117°34'E.

Prohibited and restricted areas, best seen on the chart, lie in the area. All vessels should navigate with caution.

Santan Oil Terminal—Contact Info	
Terminal	
Call sign	Santan Control
VHF	VHF channels 9 and 16
Telephone	62-542-548100
Facsimile	62-542-548210
E mail	stnmo@unocal.com
Pilots	
Telephone	62-542-548107
	62-542-548321
E-mail	stnmmaster@unocal.com
	stnmarine@unocal.com

9.56 Attaka Reef (0°08'S., 117°52'E.) is an extensive coral patch with a least depth of 10m. It lies 21 miles ESE of Tanjung Santan, outside the charted 200m curve.

Between Tanjung Santan and Tanjung Sengata, about 26 miles NNE, the coast up to 3 or more miles offshore, is foul, lined with reefs, and densely wooded islets, usually flooded at HW.

Kepulauan Keringdingan, the principal group of islets, lie 7 miles NNE of Tanjung Santan and are visible for a distance of 12 to 14 miles. Barat Basa, a white coral islet with some trees, lies about 1.5 miles S of this group of islets.

Bontang, a village built on piles, lies 9.5 miles N of Tanjung Santan. Kepulauan Agar-Agar lies on the coastal reef on the S side of the approach to this village, about 3 miles NW of the outer islet of Kepulauan Keringingan. Badak-Badak lies 1.25 miles farther NW.

The village can be reached through a channel between Kepulauan Agar-Agar and Badak-Badak. Karang Segajah, a detached reef, lies on the N side of this channel. The channels S and W of this reef both have depths of over 20m and are marked by beacons. It is advisable to use these channels only at LW, when the edges of the reefs can be seen, and to keep to the N side of the channel as there are shoals extending up to 0.3 mile off the reef on the S side.

Anchorage can be taken by vessels with local knowledge along the S side of the detached reef, in a depth of 27m, soft mud. An anchorage area, with a radius of 0.5 mile, has been established (2005) 1 mile E of Karang Segajah, close N of the outer approach channel to Lhotuan harbor.

The inner part of the channel terminates in a basin in which there are depths of 7 to 9m, 0.25 mile off Bontang.

Alur Pelayaran Bontang is entered between Beras Basah and the coastal reef N of Tanjung Meranggas; this leads to Bontang Terminal.

Bontang Coal Terminal (0°02'N., 117°31'E.) extends about 1 mile ENE from a position just N of Tanjung Meranggas. The berth was reported (1997) to have 14.5m of water alongside. Range lights mark the approach to the jetty.

9.57 Bontang LNG Terminal (0°06'N., 117°29'E.) (World Port Index No. 51811) consists of two facilities**.** LNG Terminal I is fronted by a T-headed concrete wharf, about 450m in length, with catwalks extending from each end. A depth of 14m alongside the wharf was reported and vessels up to 100,000 dwt and a maximum length of 300m can use the berth. LNG/LPG Terminal II consists of a similar jetty to Terminal I, with mooring dolphins extending from each end. The approach to this terminal is dredged to a depth of 14m, and the turning basin, with a diameter of 750m, lies SSW of it. The basin is also dredged to the same depth.

Two general cargo berths are situated in a basin close N of the terminal. One berth is 300m long, with alongside depths of 8.5m; the other is 50m long with depths of 3m alongside.

Conspicuous landmarks from sea include the installations at the terminal and four large white tanks.

Bontang—Berth Information							
Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
Bontang Coal Terminal							
Coal Berth	—	—	250m	13.5m	43.0m	95,000 dwt	Coal. Berthing length of 375m (including dolphins).

Bontang—Berth Information							
Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
Loktuan Terminal							
General Cargo East Berth	100m	—	112m	—	—	6,000 gt	Ro/pax, ro-ro passengers/vehicles/ rail, breakbulk, and general cargo.
General Cargo North Berth	110m	—	109m	—	—	—	
General Cargo West Berth	100m	—	97m	—	—	6,000 gt	
Pupuk Kaltim Terminal							
Coal Berth	176m	—	—	—	—	—	Coal
Pier I (Construction Jetty) North	122m	5.0m	80m	4.0m	—	2,000 dwt	Breakbulk.
Pier I (Construction Jetty) South	170m	5.0m	80m	4.0m	—	2,000 dwt	Breakbulk.
Pier I (Construction Jetty) West	160m	5.0m	80m	4.0m	—	2,000 dwt	Breakbulk.
Pier II (Production Jetty)	300m	—	190m	13.0m	—	40,000 dwt	Fertilizer.
Pier III (Tursina Jetty)	270m	9.0m	200m	8.0m	—	20,000 dwt	Breakbulk.
Quadrant Arm Loader Dock	—	13.5m	200m	12.0m	—	40,000 dwt	Fertilizer. Berthing length of 245m (including dolphins).
Bontang Tanker Terminal							
LNG Loading Dock #1	32m	14.0m	300m	12.6m	50.0m	135,000 dwt	LNG. Berthing length of 425m (including dolphins). Gas capacity 135,000m^3.
LNG/LPG Loading Dock #2	55m	14.8m	255m	12.6m	40.0m	100,000 dwt	LNG and LPG. Berthing length of 490m (including dolphins). Gas capacity 133,000m^3.
LNG/LPG Loading Dock #3	49m	14.8m	300m	12.6m	50.0m	—	LNG and LPG. Berthing length of 367m (including dolphins). Gas capacity 145,000m^3.
Bontang Palm Oil Terminal							
Palm Oil Berth N	—	—	150m	—	24.2m	19,854 dwt	Vegetable oils. Berthing length of 175m (including dolphins).
Palm Oil Berth S	—	—	152m	—	25.2m	20,000 dwt	Vegetable oils. Berthing length of 175m (including dolphins).
KMI Terminal							
Dermaga KMI	—	11.5m	175m	11.0m	—	30,000 dwt	Chemicals. Berthing length of 206m (including dolphins).
KPA Terminal							
Dermaga KPA	20m	13.0m	225m	—	34.0m	55,000 dwt	LPG. Berthing length of 300m (including dolphins).
KPI Terminal							
Dermaga KPI	20m	12.0m	210m	—	34.0m	40,000 dwt	LPG. Berthing length of 235m (including dolphins).

The channel is 0.5 mile wide at the entrance narrowing to 0.25 mile before reaching the terminal. The channel has been reported dredged and swept to at least depth of 13.6m.

The centerline of the fairway is marked by four sets of range lights which lead from the vicinity of the outer lighted buoy to within 0.5 mile of the terminal.

The front lights of the first and fourth pair are painted with red and white bands; those of the second and third pair are painted with black and white bands. All rear lights are painted white. These range lights, in line, bear, as follows:

First pair	310°
Second pair	337°
Third pair	307°
Fourth pair	269°

The Kaltim Fertilizer Complex is situated in Lhotuan Harbor at the head of an inlet, 5 miles N of Bontang LNG Terminal. The loading berth, about 200m long, has a charted depth of 10m.

The channel is 0.15 mile wide, narrowing to 91m at the inner end. Depths are 22 to 30m in the outer part of the channel, reducing to about 10m at the inner end.

Three sets of range lights mark the centerline of the channel that leads to the loading dock at the fertilizer plant. The leading range beacons to the berth bear, as follows:

First pair	284°
Second pair	328°
Third pair	296°

A navigable channel marked by lighted buoys leads into Teluk Selangan, a small bay lying S of Bontang. The channel is marked by range lights bearing 304°.

Pilotage.—Pilotage is compulsory. Pilot boards at the fairway lighted buoy in position 0°08.34'N, 117°34.98'E. Pilotage is available 24 hours but should be requested 6 hours prior to arrival.

A reef, with a depth of 3m, lies about 10.75 miles NE of the outer islet of the Kepulauan Keringingan Group. A 6.4m patch lies 1 mile W of this reef. A reef, which dries at LW, lies 12.5 miles N of the above islet. Shoal patches, with depths of 0.9 to 6.4m, lie within 0.5 mile E, N, and W of this reef.

Sangata Reef (0°20'N., 117°43'E.), marked by a light, lies outside the 200m curve about 7 miles SE of Tanjung Sangata.

The reef consists of two parts; the S part dries at LW. A least depth of 4.8m is found on the N part. The reef is steep-to on its E side and can be identified by discolored water and rips.

A small detached reef, with a swept depth of 2.1m, lies 2 miles NW of Sangata Reef.

Teluk Lombok (0°23'N., 117°35'E.), a reef-fringed islet located about 2 miles W of Tanjung Sangata, can be identified from the vicinity of Sangata Reef.

Anchorage can be taken off the entrance, in a depth of 7m, between the coast and the N reef of two drying reefs, which lie 2 miles SSW of Tanjung Sangata. Strong currents are felt at spring tides within the inlet but the currents seldom exceed 1 knot at the anchorage.

A submarine pipeline extends 1 mile ESE from the coast, 3 miles SW of Tanjung Sangata. This pipeline supplies the Marine Export Terminal where tankers up to 36,500 dwt with a length of 220m berth to load crude oil.

Tankers secure to four mooring buoys in a depth of 21m. Berthings take place in daylight only; unberthings may be conducted any time.

Vessels waiting to berth may anchor about 3 miles SE of the terminal, where a mooring master embarks.

Bontang LNG Terminal—Berth No. 3

Courtesy of UNOCAL Indonesia

Bontang Harbor

9.58 Tanjung Bara Coal Terminal (0°32'N., 117°39'E.) (World Port Index No. 52100) lies about 9.5 miles NE of Tanjung Sangata. The approaches to the terminal are marked by lighted beacons positioned approximately 7 miles E and 5.5 miles ESE of the terminal.

Tides—Currents.—Tidal currents at the berth run approximately N-S, with a maximum velocity of 1 knot. The tidal

range at springs is about 2.5m.

Pilotage.—Pilotage is compulsory. The pilot boards either 10 miles ENE or 9 miles ESE of the terminal.

Vessels should contact the port authority on VHF channel 16 at least 2 hours before arrival at the pilot boarding area. Vessels are notified of the boarding place prior to their arrival.

Allowable maximum draft on arrival is 22m; in the event of exceeding this height above water line, vessels should notify the Marine Superintendent for possible allowance prior to arrival.

Depths—Limitations.—Vessels with a maximum length of 300m and a beam of 50m can be accommodated. The depth alongside the terminal is 17m; depths in the channel range from 18 to 22m. There is a turning basin, with a radius of 500m, which lies off of the berth.

Vessels are required to have an underkeel clearance of 0.75m at the berth and 1.25m when sailing. Vessels berth starboard side-to at the dock.

Two tugs are allocated to assist berthing and sailing of all vessels.

Caution.—A coral reef, located in position 0°30'N, 117°14'E, is marked by a lighted beacon. There are many isolated shallow areas marked by lighted beacons between the pilot boarding area and the berth.

A new pier lies close N of the Tanjung Bara Coal Terminal.

9.59 Between Tanjung Sengata and **Pulau Miangkecil** (0°47'N., 118°03'E.), 37 miles NE, the coast is intersected by a number of small, shallow rivers.

Tanjung Bungalun (0°38'N., 117°43'E.), about 15.25 miles NNE, can be recognized at a distance of 2 miles by the trees which stand S of it.

Caution.—Almost the entire stretch of coast between Tanjung Sengata and Teluk Golok, about 27 miles to the NE, is foul within the 20m curve. Because of the many coral reefs lying close within the 200m curve, some with depths as shallow as 0.9m, passing vessel should not approach the coast within a distance of 14 or 15 miles.

At this distance the trees on the coast can be seen in clear weather as well as Gunung Sekaret, about 7 miles WNW of Teluk Golok. The mountain peak is a good landmark.

9.60 Midway between Tanjung Sengata and Tanjung Bungalun, there is an isolated hill 173m high, and Batuta Light is shown on its eastern slopes.

Several detached reefs lie within the 200m curve, about 6 to 8 miles SSE of Tanjung Bungalun. The N reef has a depth of 0.9m, the middle reef a depth of 3m, and the S reef a depth of 1.5m. A detached reef, with a least depth of 1.5m, lies about 7 miles NE of Tanjung Sengata. This danger is marked by discoloration. A reef, with a depth of 0.9m, lies about 7 miles ESE of Tanjung Bungalun.

Numerous other dangers lie within the 20m curve.

Teluk Golok (0°49'N., 117°54'E.), a small shoal bay, indents the N part of this coast. A rock, with a depth of 1.8m, lies about midway between the entrance points.

Anchorage can be taken, in depths of 11 to 18.3m, in the entrance of this bay.

Pulau Miang-besar (0°44'N., 118°01'E.), a densely-wooded coral island, is surrounded by a belt of mangroves and fringed by a drying reef.

This prominent island is 85m high. Reefs and shoals lie up to 3.5 miles WNW and W of the N point of the island. A drying reef lies 4 miles W of the S point of the island. A 6.7m shoal lies close W of this drying reef.

Pulau Miang-kecil (0°47'N., 118°03'E.) lies 0.75 mile E of the W entrance point to Teluk Sangkulirang. The islet is overgrown with mangroves, and covers at HW. A lighted beacon, with a pile close E of it, is situated 2 miles E of Pulau Miangkecil.

Anchorage can be taken off the N side of the island, in depths of 22 to 23.8m, mud, 0.25 mile from the reef in the line of direction of the pier, which will bear about 172°. This anchorage should be approached from the E.

A settlement stands at the head of a small basin on the N side of the island. A pier is situated off the settlement.

Only small craft with local knowledge should attempt to enter the basin.

9.61 Teluk Sangkulirang (0°49'N., 118°07'E.), entered between Pulau Miangkecil and Tanjung Pager, is the outer estuary of the Sungai Sangkulirang. The W shore of the bay is low and covered with tall trees.

Tanjung Tanah Merah, about midway along the W shore, is prominent and has a rocky port with some huts nearby.

The E shore of the bay is hilly and densely wooded. There are prominent hills on Tanjung Batu, about 5 miles NNE of Tanjung Tanah Merah, and on the small peninsula about 4.75 miles to the NW.

Tides—Current.—The tides are mixed but mostly of a semidiurnal nature. The semidiurnal range at springs averages about 1.6m, and the range at neaps is about 0.3m. The diurnal range at springs averages about 0.7m and the range at neaps is negligible. During the period from December through February, springs rise 2.4m and the neaps 1.2m at Pulau Miang-besar. The evening tide was higher than the morning tide.

A NE current of about 0.5 knot is usually experienced in the approach to the bay. The tidal currents in the outer part of the bay are usually weak.

Depths—Limitations.—The 20m curve lies between the E side of Pulau Miang-besar and a position close off Tanjung Pager. The least depth in the channel leading into the bay was reported to be 5.8m on the bar, about 3.5 miles NE of the above island.

An extensive mud bank, with depths of less than 5.5m, lies up to 5.75 miles off the E shore of the bay between Tanjung Batu and Tanjung Pager. The W edge of this bank forms the E side of the outer part of the channel.

Numerous reefs, islands, and mud banks can be found in the bay. Pulau Miang-ketcil is a low mangrove-covered island, separated from the W entrance point of the bay by a narrow intricate channel. Foul ground extends 2 miles E from the island.

An extensive bank of mud and stones, the greater part drying, fronts the W side of the river entrance. Pulau Rending, Pulau Sirrih, and Pulau Senumpa stand on this bank. Muara Suwalang, foul at both ends, separates this bank from the shore to the W.

Pulau Rending is low, but prominent, and is divided into two parts by a drying creek. The N part of the island is swampy; the S part is bordered by a white, sandy beach about 2.1m high.

Some coconut trees stand in the middle of the island. Two

settlements are situated on the island. Pulau Sirrih is a red, rocky islet covered with vegetation. Pulau Senumpa, the largest island, is swampy in its S part; whereas, the N part is hilly with some coconut trees.

A shoal spit, defined by the 5.5m curve, extends about 2.25 miles SSE from a position about 0.75 mile E of the S end of Pulau Rending. A small drying patch lies on the N end of this spit.

Pulau Badjo and Pulau Antung stand on the drying mud bank extending from the E shore of the bay, close N of Tanjung Batu.

A conspicuous small rocky islet, with some bushes, stands 1 mile WNW of Tanjung Batu. The islet is surrounded by a drying bank of mud and stones, but is steep-to on its W side.

The principal dangers which lie on the sides of the channel leading into the bay are marked by colored beacons and one buoy.

The outer beacon, which exhibits a light that is painted black, stands on the E edge of the foul ground which extends E from Pulau Miang-ketcil.

Steer for the lighted beacon 1.75 miles E of Pulau Miang Kecil, in line with Tanjung Tanah Merah, bearing 324°. Unless proceeding to the anchorage off Pulau Miang Besar, vessels should not proceed W of this line.

Steer a N course to pass 1 mile E of the lighted beacon. When the lighted beacon bears 250°, steer about 335° over the outer bar. When past the bar the beacons are a sufficient guide, passing W of the beacon 1 mile E Pulau Sirrah.

9.62 Benoa Baru (Sangkulirang) (0°59'N., 117°58'E.) (World Port Index No. 51810), the seat of a local administrator, stands on the SE side of Pulau Sinkuang. A small pier, with a depth of 5.2m alongside its head, extends from the shore abreast of the settlement.

Strong currents are experienced in the vicinity of the pier. The ebb, which may attain a rate of 3.25 knots, sets towards the pier. The flood sets off the pier.

Sampajau, an oil settlement, stands on the W side of the river, about 11 miles above Benoa Baru. The tidal currents between Benoa Baru and Sampajau attain a rate of 3 to 3.5 knots.

Vessels drawing up to 6.1m can reach Benoa Baru at all stages of the tide. Depths in the river between Benoa Baru and Sampajau range between 2.6m and 5m. Depths of 2.7 to 5.9m are found above Sampajau, but the channel is very narrow.

9.63 Tanjung Pager (Pagger) (0°49'N., 118°23'E.), lying 20 miles E of Pulau Miangkecil, is the E entrance point to Teluk Sangkulirang and is formed by a hilly ridge with a strip of low mangroves at its base. The point is steep-to a short distance offshore. Between this point and Tanjung Labuanbini, about 26 miles to the E, the coast is indented by two open bays.

Teluk Menumbar (0°49'N., 118°27'E.), the W bay, lies close E of Tanjung Pager and is mostly filled by a bank of mud and sand. A small shallow river, navigable only by small craft, discharges into its NE part.

Anchorage can be taken in the W part of the bay, in a depth of 14m, with Pulau Birah Birahan bearing 157° and Tanjung Pager bearing 259°.

Teluk Bakong (0°50'N., 118°40'E.), entered between Tanjung Menumbar and Tanjung Pulu Setebah, about 6.25 miles ESE, is fronted by a tongue of relatively moderate depths. The latter point is low and covered with mangroves; whereas, the former point is high and backed by a prominent range. Reefs and shoals border part of the bay shores and extend up to 0.75 mile off in places. A 7.9m shoal and a 5.5m shoal lie 2.75 miles and 3.25 miles WSW of Tanjung Pulu Setebah. A small wooded islet stands close offshore in the small bight close E of the above point.

The 200m curve lies fairly close offshore between Tanjung Pager and Tanjung Labuanbini; however, it lies up 6.5 miles off the head of Teluk Bakong.

9.64 Pulau Birah Birahan (0°41'N., 118°28'E.), the outer danger is marked by a light, stands 9 miles SE of Tanjung Pager. The islet is fringed by a partly drying reef. The center of the islet is grown over with trees, 42.7m high. A belt of mangroves stands along its shores. A 6.7m patch lies 2.5 miles S of Tanjung Pager.

Johanna Antonia (0°44'N., 118°34'E.), a small steep-to shoal with a least depth of 5.8m, lies 5.5 miles ENE of Pulau Birah Birahan. The water over it is discolored.

A narrow reef, with some small islets, fringes the coast to the W of Tanjung Labuanbini.

Between Tanjung Labuanbini and Tanjung Mangkalihat, about 19 miles NE, the low coast is backed by some hills. The coast is fairly steep-to with some small islets lying on the narrow coastal reef. A reef, with a least depth of 4.5m, lies about 0.5 mile NE of Tanjung Jaran Jaran, which lies about 3 miles NE of Tanjung Labuanbini. Teluk Sandaran provides anchorage in its N part, in depths of 14.6 to 18m.

Some protection is provided from NE winds.

Tanjung Mangkalihat to Tanjung Ahus

9.65 Tanjung Mangkalihat (1°01'N., 119°00'E.), the E extremity of Borneo, is the seaward termination of a mountain ridge that extends well into the interior. The extremity of the cape is low, overgrown with mangroves, and fringed by a narrow steep-to reef.

The coast becomes rocky about 2 miles W of the NE extremity of the cape. The point can be rounded safely at a distance of 1 mile. Sudden squalls are liable to sweep down from the mountains in the vicinity.

Tanjung Mangkalihat Light, a white metal framework tower, 32m high, stands 2 miles S of the point. A racon transmits from the light.

A shoal, with a depth of 20.1m, and a wreck, lie 10 miles NE and 29 miles NNE, respectively, of Tanjung Mangkalihat.

Gunung Mangkalihat (1°01'N., 118°57'E.), 330m high, rises about 2.75 miles WSW of the cape and is difficult to discern because of the other hills in the vicinity. Gunung Antu, 750m high, stands about 7.25 miles W of Tanjung Mangkalihat and is fairly prominent from the N. Its W side is steep and has a cone near it.

Tanjung Mangkalihat has been reported to be a good radar target up to 20 miles. The land in the vicinity of Tanjung Mangkalihat has been sighted by radar in excess of 40 miles.

The constant S current in the vicinity of Tanjung Mangkalihat is sometimes very strong.

Between Tanjung Mangkalihat and Tanjung Batu, about 94 miles to the NW, the low coast is overgrown with mangroves,

except to the SE of Teluk Suleman near Tanjung Dumaring, where it becomes rocky.

The Sungai Berau, suitable only for small vessels, discharges through an extensive delta on the N part of this coast.

Tanjungredeb (2°10'N., 117°29'E.), located at the junction of the Sungai Kelai and the Sungai Segah and described in paragraph 9.80, is the site of a river port of some importance.

Between Tanjung Batu and the S entrance of the Muara Selor, the low coast is mostly covered with trees. Tanjung Tanahguning is the only rocky point along this coast.

The coast between the mouth of the Muara Selor and Tanjung Ahus is intersected by the vast delta of the Sungai Sesayap and many smaller rivers.

The low shores are not always seen against the mountainous background. The latter point is covered with tall trees.

Lingkas, an oil-shipping port of some importance, stands on the SW side of the Pulau Tarakan in the estuary of the Sungai Sesayap.

Pegunungan Kaniungan, 780m high, stands 14 miles WNW of Tanjung Mangkalihat. This mountain range consists of two peaks standing close together in its E part. The highest peak is conical in shape.

A range of hills, with peaks attaining heights of 360m and 375m, stands 21.5 miles NW of Pegunungan Kaniungan.

9.66 Gunung Briun (1°20'N., 117°55'E.) has two summits 900m and 930m high. This range projects well above the surrounding hills. A prominent 689m peak stands 25 miles ESE of Gunung Briun.

The **Limestone Mountains** (1°34'N., 117°50'E.), located N of Gunung Briun, are a long ridge running parallel with the coast. The NW part of the ridge attains a height of 1,110m.

Near the coast, and between this range and Tanjung Dumaring, is a range of hills attaining a height of 180m in its N and S parts and 240m in its middle part.

Sugarloaf Mountain (1°51'N., 117°45'E.), 525m high, is the most prominent peak of a range of hills which lie N of the Limestone Mountains.

Gunung Suwaran (1°45'N., 117°35'E.), a broad-topped mountain of peculiar shape, rises to a height of 1,239m. This peak appears isolated when viewed from the NE.

Pegunungan Inaran and Pegunungan Niupa are two prominent ranges. The first range has a very rugged crest and rises to a height of 945m. There are no conspicuous peaks. The last has three lofty, conspicuous summits in the shapes of blunt cones, rising to a height of 1,380m.

Gunung Samiroa, a dome-shaped isolated hill, 102m high, stands close to the coast near the entrance of the Muara Pantai.

Gunung Padai (1°58'N., 117°47'E.), standing near the N end of a ridge located S of the above hill, is 345m high and can be seen from the vicinity of Karang Malalungan. Gunung Simrut, 210m high and prominent, stands 2 miles inland, about 11 miles SSE of Gunung Samiroa.

9.67 Gunung Kegelberg (2°37'N., 117°24'E.) and Gunung Zadelberg, located S of the delta of the Sungai Sesayap, are prominent from the offing. Pegunungan Salinbatu and Pegunungan Bulungan, standing to the SW of the above delta, can usually be seen. Gunung Sekata, 450m high and prominent, stands 21.5 miles W of Lingkas.

Winds—Weather.—Regular monsoons, as well as land and sea breezes, are less distinctly marked in the area covered by this part than in other parts of the Borneo coast. South winds prevail from July to October; N winds prevail from December to May. The average direction of the wind in July is SSE during the daytime; in August, SE; and in September, SSW. At nights, during these three months, the average direction is SSW.

Slight variable winds, with frequent calms, occur in October and November and also in May and June.

The Northwest Monsoon is considered the wet season, and the Southeast Monsoon the dry season. Rains are abundant at all times and sudden squalls occur frequently. Cloudiness is more marked by day.

In the delta of Sungai Sesayap, land and sea breezes are not noticeable and there are no regular monsoons. East and NE winds are prevalent from December to April. Frequent rain, squalls, and bad weather occur during the months. Westerly winds are more usual from July to October, and are accompanied by frequent rain storms. The remaining months of the year are changeable. The rainfall is heavy, seldom a week passing without rain.

Between Tanjung Mangkalihat and Tanjung Batu, the 200m curve lies up to 30 miles offshore and encloses numerous islands, reefs, and other dangers. Between the latter point and Tanjung Ahus, about 93 miles NNW, the same curve lies up to 35 miles off the islands lying in the estuary of the Sungai Sesayap.

Between Tanjung Mangkalihat and Tanjung Giring Giring, the coast is backed by mountains, fringed by a narrow steep-to reef, and indented by two small bays. The latter point is low, but is prominent from the N.

Teluk Sumbang (1°05'N., 118°51'E.), entered 9 miles WNW of Tanjung Mankaliat, is fringed by a narrow steep-to reef, the 200m curve never lying more than 0.5 mile offshore. Gunung Antu, which stands SE of the head of the bay, has been previously described in paragraph 9.65. Anchorage can be taken off the mouth of a small stream in the SW corner of the bay. Some houses stand in the vicinity.

Teluk Suleman (1°10'N., 118°46'E.), a narrow reef-fringed inlet, is protected to the E by Pulau Singenting Besar and Pulau Singenting Kecil, two high, densely wooded islands lying in the entrance of the bay. The reefs on both sides of the entrance extend well offshore, but there is a narrow passage in between with a depth of 10m and a deep hole within a depth of 42m. Small vessels with local knowledge can anchor, in depths of 11 to 16m, mud.

Entry should only be made at LW when the reefs are clearly visible.

A large circular bank, marked by reefs, shoals, and other dangers, lies 9.5 miles off the N part of this coast. A narrow, but very deep channel, separates this bank from the coast.

9.68 Pulau Kaniungan-besar (1°07'N., 118°51'E.), at the S end of this bank, is wooded, the tree tops being 72m above water. The islet is surrounded by reefs on all except its SW side, where a deep gully separates it from the coast.

A settlement stands on the W side of the islet. Pulau Kaniungan-ketcil to the NE, is small, low, and partly covered with trees.

Depths of less than 10.9m extend up to 6 miles NW of Pulau

Kaniungan-ketcil. This islet is also visible up to 10 miles away in clear weather.

Anchorage can be taken, in depths of 10.9 to 12.8m, sand, off the W side of Pulau Kaniungan-ketcil. Some protection is provided from NE winds and seas.

Diurnal and semidiurnal tides occur at Pulau Tanjungbuajabuaja from March through July. The greater range of the latter was 2.7 to 3m while the lesser range was 0.6 to 1.2m. Single tides only ranged from 0.3 to 0.9m.

Between **Tanjung Giring Giring** (1°11'N., 118°46'E.), 2 miles N of Teluk Suleman, and Tanjung Kalidakkan, about 16 miles NW, the coast is low and swampy, a great portion covering at HW.

The coast between Tanjung Semuntai, 11.5 miles NW of Tanjung Kalidakkan, and Tanjung Dumaring, about 18 miles further NW, is low and intersected by a number of small streams. The latter point is high and rocky, being formed by a spur of the coastal hills.

Pulau Tandjungbuajabuaja (Buaya Buaya) (1°25'N., 118°30'E.), a fairly large island lying in a bay between Tanjung Kalindakkan and Tanjung Semuntai, is separated from the coast by a narrow foul channel. The limits of the island are not easily defined due mangroves on the reef. A large tree stands in the center of the island.

A small village on piles stands on the NW end of the island. The N and E sides of the island are fringed by a drying reef which extends up to 2.5 miles offshore.

Anchorage can be taken, by vessels with local knowledge, about 0.75 mile W of the village. The approach should only be made at LW when the edges of the reefs are clearly visible.

Pulau Ulaban (1°24'N., 118°32'E.), a small islet standing on the drying reef fringing the SE side of the above island, has a few huts standing on a white sandy beach. A grove of coconut trees stand on the islet. Two shoals of 5.7m, rock, lie 5 and 6 miles E of the islet.

Pulau Manimbora (1°28'N., 118°32'E.), a coral reef-fringed islet, is covered with coconut trees. A foul passage separates the islet from the drying reef fringing the NE side of Pulau Tanjungbuajabuaja. A deep passage leads NE and N of the islet, and between it and Karang Besar.

Several detached patches, with depths of 9.1 to 11m, lie in the immediate vicinity of these shoals.

The current in the vicinity of Pulau Manimbora usually sets in a SE to ESE direction. A rate of 2.5 knots has been reported.

Karang Besar and Dangers to the East and Southeast

9.69 A bank, defined by the 91.4m curve, extends up to 28 miles offshore between Tanjung Giring Giring and Tanjung Dumaring. Karang Besar and other drying reefs form the N edge of this bank. Numerous detached reefs and shoals lie between these reefs and the circular bank enclosing the Kaniungan Islands.

Taka Sangalan (1°19'N., 118°46'E.), 7.5 miles N of Tanjung Giring Giring, is a reef with a depth of less than 4.8m. The reef has a small drying part on its SW side.

Two detached 10.1m patches lie 3 miles and 4 miles E of the beacon which marks the reef.

Taka Lintjang (Lincang) (1°25'N., 118°42'E.) consists of a chain of reefs with deep water between them. A least depth of 4.9m lies about 9 miles ENE of Pulau Ulaban. A 0.6m patch lies the same distance E of this islet. A 4.6m patch lies about midway between Taka Lintjang and Taka Sangalan. A 4.9m patch, with a 10m patch about 1.5 miles NE, lies about 9 miles NE of the islet. It is generally marked by discoloration, but there are numerous patches of false discolorations.

Karang Besar (1°35'N., 118°30'E.), separated from the coastal reef by a narrow deep channel, is a drying reef of considerable size. Its N part is broken and some detached patches lie up to 2 miles seaward of its edge. Northward of Karang Besar, along and near the meridian of 118°30'E and to the E, there is a constant S current which bends to the SSE to the S of Karang Malalungan. Close along the outer edge of Karang Besar, as well as along the S side of that reef, and along the reefs to the E, a constant SSE to SE current occurs with an average rate of 1 knot. The rate sometimes decreases to 0.5 knot and sometimes increases to 2.5 knots. Pulau Blikkukup, a small islet with trees visible 14 miles, stands on the SE part of this reef.

A drying rock lies about 4 miles E of this rock. This danger lies on a ridge which connects Karang Besar with Karang Daengalahan. This ridge is very steep on its N side, with depths of over 183m lying close off its edge.

Depths of 22 to 36.6m lie along its S edge.

A shoal, with a least depth of 3m, lies about 2.5 miles NE of the beacon on the N part of Karang Besar. A detached patch, with a least depth of 7m, lies 1.5 miles ENE of the same beacon. A light is shown on Karang Besar 6.2 miles off the beacon.

Karang Daengalahan (1°31'N., 118°48'E.), located 9 miles E of Pulau Blikkukup, is a large reef usually marked by discoloration when covered. A 4.9m patch lies 2 miles S of this reef.

Pulau Bilangbilangan (1°34'N., 118°57'E.) marked by a light, and Pulau Mataha are two wooded, coral islets lying on the outer end of the N side of the large bank. Pulau Mataha is separated from Karang Daengalahan by a channel 10 to 15.8m deep. Both islets are bordered by a fringing reef which is narrow and steep-to on its NW side. On a clear day the islets are visible from a distance of 13 of 14 miles.

Most of the fringing reef dries and detached patches lie from 0.5 to 1 mile off its SE side. The channel between the islets has depths of 7.6 to 16.5m in the fairway. Pulau Bilangbilangan has been reported to be a good radar target to 16 miles.

Caution.—The area between the Kaniungan Islands and Karang Besar has very irregular depths. Most of the reefs that are dangerous to shipping lie close to a line joining Pulau Kaniungan-ketjil and Pulau Balikkukup, but E of this line there are several patches with depths of 4.9 to 18.3m.

9.70 Between **Tanjung Dumaring** (1°38'N., 118°10'E.) and Tanjung Perupu, about 10.75 miles NW, the coast has a uniform appearance. The latter point is low but conspicuous. A small river flows out through two mouths, one to the S and the other to the W of the point. The latter mouth has a small wooded islet in its entrance.

Directions.—Navigating without local knowledge and during the night or in thick weather vessels should set course a prudent distance off Tanjung Mangkalihat in order to pass 2 miles or more E of the reef surrounding Pulau Bilangbilangan.

If the weather is sufficiently clear, vessels may pass over the narrow ledge between Pulau Mataha and Karang Daengalahan, in depths of 10 to 16.5m.

Vessels with local knowledge can pass E of Pulau Kaniungan-ketcil and Taka Sangalan, and then E of Karang Besar, and then between it and the drying rock which lies 4 miles E of Pulau Balikkukup.

Vessels bound for the passage between Karang Besar and the coastal reef may pass E of Pulau Kaniungan-ketcil, W of Taka Sangalan and Taka Lintjang, close NE of the reef surrounding Pulau Manimbora, and then in mid-channel through the passage. An inner route leads between the bank surrounding the Kaniungan Islands and the coast, then outside the 10m curve to a position E and NE of the reef surrounding Pulau Manimbora. These passages should only be attempted by vessels with local knowledge and then only under the most favorable conditions because of the numerous detached dangers in this area.

Caution.—There is very little reef discoloration because of the muddy river discharge. Vessels should keep well outside the 91.4m curve when passing along this coast. Landmarks are few and the edge of the coastal bank is so steep-to it gives no warning of its proximity by soundings.

Between Tanjung Perupu and Tanjung Batu, about 30.5 miles to the N, the coast is indented by the vast delta of the Sungai Berau. Between the latter point and Tanjung Karangtigau, the coast is low and sandy, and in some places marshy. A vast complex of reefs extends up to 9 miles off this coast.

Islands and Dangers in the Approach to the Sungai Berau

9.71 Muaras Reef (1°50'N., 118°54'E.), a large drying lagoon-type reef, lies well offshore in the SE approach to the Sungai Berau. The reef is steep-to on all sides, except the S end, and has depths of over 183m close offshore.

Pulau Sambit (1°46'N., 119°02'E.), a small sand bank lying at the SE end of the reef above, is overgrown with low trees. Pulau Sambit Light is a 31m high white metal framework tower with a black top and has been reported to be a good radar target up to 13 miles

Pulau Balambangan (1°47'N., 119°00'E.), about 2.5 miles W of Pulau Sambit, is higher and can be seen up to 11 miles. Karang Gosungan, standing near the N end of Muaras Reef, is a drying sand bank and is marked on its W side by a light. A reef, with a depth of 2.4m, lies close S of this sand bank. Detached shoals, with depths of 4.6 to 7.1m, lie up to 3.5 miles SE of the SW end of Muaras Reef.

Anchorage may be taken S of Pulau Sambit and Pulau Balambangan, but care should be taken to avoid a reef with a least depth of 2.1m, close S of Pulau Balambangan. The passage between the islets should not be attempted, as a 4.9m patch lies in mid-channel.

9.72 Pulau Maratua (2°15'N., 118°37'E.), a V-shaped atoll reef, lies in the approach to the Sungai Berau. It consists mostly of broken coral. The highest part, 120m, is located near the middle of the W side. In clear weather, the highest part can be seen from a distance of about 25 miles. Tanjung Bolituwatan Light stands on the N extremity of the island.

Three islets and numerous scattered stones are found near the SE end of the reef. Pulau Bakungan, the southernmost, is covered with small trees and is visible for about 10 miles. A light is shown from the reef about 2 miles SE of the island. Pulau Nunakan consists of bare coral, but is 6.1 to 9.1m high. Several small islets stand on the E side of the reef, to the S of Tanjung Bahaba.

Pulau Maratua is steep-to and in many places broken through by the sea. The bottom near the reef is coral and at some distance to the E, it is black sand and to the W, it is composed of mud.

Pulau Maratua has been reported to be a good radar target up to 23 miles.

Anchorage.—A pass through the reef S of Tanjung Bahaba can be used by vessels up to 52m in length with local knowledge. These vessels can enter under favorable conditions of light. The outer part of the reef runs in a WSW direction and its inner part in a W direction. There are depths of 16.5 to 21.9m in the entrance, shoaling to depths of 7.3m off Tanjung Bahaba. The inner part of the opening is wider and deeper.

Anchorage can be taken here, in depths of 11 to 12.8m. A short sea is sometimes experienced in the entrance, which is caused by the SE current. Strong tidal currents are sometimes felt in the passage.

Anchorage can be taken W of Tanjung Dewatta, in depths of 45.7 to 54.9m, at a convenient distance from the reef. Westerly or NW winds quickly raise a sea.

9.73 Pulau Kakaban (2°09'N., 118°32'E.), a closed atoll lying SW of Pulau Maratua, consists of raised coral reefs with coconut trees standing along its shores. The atoll rises to a height of 90m near S its end. Two settlements stand on the atoll, one on the W side and the other on the S coast.

The prevailing SE current sets across and near the SE end of Pulau Maratua. A strong N countercurrent sometimes is felt along the SW edge of the reef. The constant SE current sometimes runs past Pulau Kakaban at a rate of 2.5 knots.

Karang Malalungan (1°55'N., 118°27'E.), a triangular-shaped drying reef lying 14 miles SW of Pulau Kakaban, is steep-to on all but its S side. A light is shown and a racon transmits from an 8m high, red metal framework tower situated on the N side of the reef. A 17.7m shoal lies 6 miles N of the light.

A SE current flows on either side of Karang Malalungan; on the E side of the reef it is stronger than that on the W side. At times there is a countercurrent running N along the W side of the reef. The ebb current, which flows out of the Muara Pantai in an ESE direction, sometimes is noticeable as far E as this reef.

9.74 Pulau Sangalakki (2°06'N., 118°24'E.), which stands 7 miles SW of Pulau Kakaban, is a small coral islet fringed by a steep-to reef and topped by trees visible for 14 miles. The reef extends 0.6 mile from the E side of the island. Sangalakki Light is shown from a rock, close SE of the island.

There is a constant SE current in the vicinity of Pulau Sangalakki, but it may be affected by the strong current flowing out of the delta of the Sungai Berau. This current passes on both sides of the island.

A chain of reefs, steep-to on their NE side, extends about 32 miles NW from a position about 3 miles WSW of Pulau Sangalakki.

Karang Buliulin (2°06'N., 118°20'E.), a large drying reef, forms the S end of the above chain. The S end of this reef should not be approached too closely during the flood, because

as soon as the reef covers, a counter current sets N toward and over it. The S point of the reef can be cleared by keeping the N point of Pulau Kakaban in range, bearing 057° with the SE end of Pulau Sangalakki.

9.75 Pulau Samama (2°08'N., 118°20'E.), a tree-covered islet, stands on a drying reef. The islet is almost entirely covered at HW and has a small part close N which appears as a detached islet. The high trees on Pulau Samama are visible for 12 miles.

Karang Pinaka (2°11'N., 118°19'E.), separated from the reef surrounding Pulau Samama by a channel with a least depth of 3m, appears as a white sandy beach and is completely covered at HWS.

Karang Masimbung (2°14'N., 118°17'E.), separated from Pulau Samama by a channel with a least depth of 3m, is a large reef, the greater part of which dries. A light is on the NW side of the reef.

Karang Tababinga (2°15'N., 118°14'E.), separated from the NW side of Karang Masimbung by a deep, clear passage, seldom dries. The passage is navigable when the reefs are seen, particularly at LW. Shoal depths, defined by the 20m curve, extend about 0.75 mile NW from the NW side of the visible edge of the reef. A shoal, with a least depth of 2.4m, and a 6.7m patch about 0.5 mile S of it, lies 9 miles W of Pulau Samama.

9.76 Pulau Derawan (2°17'N., 118°14'E.) is a low cultivated coral island with a few tall trees, visible 14 to 16 miles in clear weather. Derawan Passage, the channel S of the reef enclosing this island, is used by vessels approaching the Sungai Berau from the E.

The passage between the N edge of the island reef and the coral flats SE of Pulau Panjang, should only be entered near LW, when the reefs are visible and with the sun behind.

Anchorage can be taken in either channel, in a depth of 43.9m. From November to May, vessels should anchor S of the island and N of it during the other months. Beacons mark the S and N sides of Derawan Passage.

Tides—Currents.—In the vicinity of Pulau Derawan, the tides are almost entirely semidiurnal. There is a slight diurnal tide. In July and August, the morning tide is higher and in November and December, the evening tide is higher. Springs, which occur 2 or 3 days after a full and new moon, rise 2.1 to 2.7m; neaps rise 0.9 to 1.2m.

Semidiurnal tides occur in the delta of the Sungai Sesajap. There is a rise of 3.3 to 3.6m at springs, and 0.9 to 1.2m at neaps.

Between Pulau Derawan and the coast, the flood current sets S and the ebb N. A tidal current of 2 knots has been experienced in Derawan Passage.

Pilotage.—Pilotage or other assistance can be obtained upon request to the resident chief.

Pulau Panjang (2°22'N., 118°12'E.), covered with vegetation and visible 16 miles because of the tall trees, stands on the SE side of a vast complex of reefs which front the coast to a distance of 9 miles NE of Tanjung Batu. The greater part of the reef floods at HW. A small rocky islet lies off the NW side of the island. Panjang Light is shown from the NE point of the island. The large reef enclosing Pulau Panjang dries over a great part at LW and can usually be seen.

Rabu Rabu (2°20'N., 118°07'E.), a small wooded islet, is partially flooded at HW. The tall trees on the islet are visible for 14 miles. This islet stands about 5.5 miles WSW of the S end of Pulau Panjang.

Delta of the Sungai Berau

9.77 Tanjung Perupu (1°47'N., 118°04'E.), the S entrance point of the delta, is low but conspicuous. An extensive estuary, formed by numerous islands, lies between Tanjung Perupu and Tanjung Batu, 31 miles N.

The islands are mostly low and have no prominent features. The delta channels between the islands are suitable only for small vessels with local knowledge. The principal channel of approach leads through Muara Guntung and then through the upper reaches of the Muara Garura and Muara Tidung. There are also navigable approaches through Muara Pantai and Muara Tidung; these are seldom used.

Gunung Padai and the dome-shaped Gunung Samiroa, both previously described in paragraph 9.66, serve as useful marks in approaching the delta. The former, bearing 280°, leads to a position ESE of the outer approach buoy. Tanjung Birai, the N entrance point of the Muara Pantai, is covered with isolated tall trees which stand out from the dense vegetation.

Tides—Currents.—In the Sungai Berau, the ebb and flood currents run for 7 and 5 hours, respectively. The ebb current commences about the time of HW and the flood current starts 1 hour 30 minutes after LW. The ebb has a rate of about 3 knots at springs and 1.5 knots at neaps.

The flood has a rate of 2 knots at springs and 1 knot at neaps.

Depths—Limitations.—The least depths at mean water level, which is 1.8m above LWS tides, in the principal arms of the delta up to the village of **Sokan** (Sokkan) (2°11'N., 117°41'E.), on the S bank of the entrance to the Sungai Berau, where the arms of the delta unite, are, as follows:

Location	Description	Depth
Muara Pantai	Channel through outer bank	5.2m
Muara Pantai	Bar close W of Pulau Sodong Besar dries	1.0m
Muara Guntung	Channel through outer bank	3.4m
Muara Guntung	River arm	4.0m
Muara Garora	Bar SE of Pulau Sodong Besar	3.5m
Muara Tidung	Channel through outer bank	5.5m
Muara Tiding	Bar S of Pulau Badakbadak	0.9m
Muara Tidung	Channel E of Pulau Badakbadak	0.9m
Muara Tidun	Between Muara Garora and Sokan (Sokkan) on the bar N of Pulau Baru	3.7m
Bar N of Sokan	Dredged channel	4.5m

Between the outer and inner buoys, in the outer part of Muara Guntung, the tidal currents flow in the direction of the channel; between the inner buoy and the narrow entrance N of the E end of Pulau Guntung, the flood sets WNW and the ebb ESE.

A tide gauge stands just above Sokan.

Elsewhere, a least depth of 4.9m can be expected at mean sea level in the main channel through Muara Guntung, and then through the upper reaches of Muara Garora and Muara Tidung up to Sokan (Sokkan).

A vessel with a draft of 4.9m can safely reach Tanjungredeb (Tanjung Redeb), located at the junction of the Sungai Kelai and the Sungai Segah (Makam River), 12 miles W of Sokan, and then through the Sungai Segah to Telukbayur, 4.5 miles farther W, at HW. The channels of the Muara Pantai and Muara Guntung are marked by buoys, beacons, and lights.

Caution.—Exploration and drilling operations occasionally take place in the Sungai Berau delta area and numerous uncharted buoys may be encountered in the vicinity. There is very little discoloration because of the murky waters in the delta of the Sungai Berau, and there are but few prominent land features.

Vessels approaching the delta should keep well outside the 20m curve until the buoys or beacons have been identified.

9.78 **Muara Pantai** (1°57'N., 118°00'E.), the principal entrance to the Sungai Berau delta, comprises a facility for multiple offshore loading and discharge of bulk cargo vessels. The S channel, is deep in its outer part, but is seldom used because of less favorable conditions farther in. Pantai Light is situated on the N shore, 4 miles WSW of Tanjung Birai. A lighted buoy is moored in the outer approaches, 13 miles ESE of the entrance in position 1°56.0'N, 118° 05.5'E.

Pilotage is compulsory and available 24 hours. Pilot boarding location is 1°56.0'N, 118° 14.0'E.

Kertas Nusantara (2°01.41'N., 177°45.32'E), a bleached craft pulp mill, is one of the largest pulp mills in SE Asia. There is one 150m long jetty used to export the mill products.

The outer channel is 12 miles long and partly marked. Between the inner entrance points, Tanjung Buasin and Tanjung Birai, the channel narrows to a width of 0.3 mile and extends in a W direction for 12 miles, then turns N for another 8 miles to its intersection with the Muara Tidung and the Sungai Berau, NW of Pulau Sodang-besar.

Two bars, with depths of 1.5 to 1.8m, are found in this stretch. Vessels with a draft of 4m can reach these bars, but must wait for HW before attempting to cross them.

The **PT Berau Coal Anchorage** (1°59'N., 118°08'E.) is located at Muara Pantai, has a depth of 20m, and can accommodate vessels up to 150,000 tons. Barges are loaded at the Suaran barge-loading facility, which stockpiles coal from the Binungan Mine located 20 miles inland.

All vessels entering or leaving the coal anchorage must report on VHF channel 71 or 16. Inbound vessels must provide an entry report stating the vessel's name, call sign, gt, nrt, number of crew members, date and time of arrival, and position. Outbound vessels must provide an exit report stating: the vessel's name, call sign, and date and time of departure.

Contact Information.—See the table titled **Muara Pantai—Contact Information**.

Muara Guntung (2°07'N., 118°00'E), the recommended channel, is hard to identify from the offing. Its outer part is buoyed and is about 12.5 miles long.

Muara Pantai—Contact Information	
Port	
Call sign	LATI Radio (PKO-22)
VHF	VHF channel 71
Harbormaster (PSO)	
Telephone	62-554-21160
	62-812-922-6018 (mobile)
Pilots	
VHF	VHF channel 71
PFSO	
Telephone	62-554-23401 (extension 231)
	62-881-594-619 (mobile)
Facsimile	62-554-21160
E-mail	hasanul.batubara@beraucoal.co.id

The entrance lies between the E end of Pulau Guntung and Tanjung Binkar, 2.75 miles NE. The narrow channel then leads between the N side of this island and the S side of Pulau Lalawan, and is only 0.1 mile wide in places.

The upper reach leads between the W side of the latter island and the E side of Pulau Sodang-besar to its intersection with the Muara Tidung. Here, the channel turns to the W and lies close off the N or left bank for about 3 miles or until abreast the E end of Pulau Baru. Shoals, with a least depth of 0.6m, lie 13 miles E of Tanjung Bingkar.

Pulau Baru, about 0.75 mile long, is a narrow, wooded islet lying close off the N side of Pulau Telassau. The fairway abreast this islet passes S of a rock located about midriver. Depths of 0.3 to 0.6m exist over this rock.

From abreast the W end of Pulau Baru, the fairway lies about 0.2 mile from the N or left bank until a position with the W end of Pulau Telassau, bearing 180°, is reached. Sokan Bar lies W of this position.

The inner part of Muara Guntung is marked by beacons or buoys. Some of the beacons are fitted with reflectors.

Muara Tidung (2°10'N., 118°00'E.), the N entrance channel, is entered about 1 mile S of Tanjung Ulingan. This sandy point, which is surrounded by swampy land, is fairly prominent when viewed from the E. A village, with a coconut plantation close by, stands near the point.

The outer part of the channel is unmarked, subject to change, and is seldom used.

A depth of 2.6m is reported to exist on the bar. The inner part of the channel, W of its junction with the Muara Garura, is described with the Muara Guntung.

The Sungai Berau

9.79 The **Sungai Berau** (2°10'N., 117°42'E.), the main river W of Sokan Bar, extends in a general W direction for 15

miles to Tanjungredeb, where it divides into two branches, the Sungai Makam (Sungai Makam) continuing in a W direction and the Sungai Kelai in a S direction.

A shallow flat, which almost dries, blocks the channel about 7 miles above Sokan Bar. The channel here leads through Kleine Kali, which passes E and S of Pulau Sapinang-besar. This channel is very narrow and winding, but small vessels with local knowledge can pass through it.

The navigable channel between Sokan and Tanjungredeb is marked by buoys and beacons.

Caution.—For many years, a number of buoys and beacons have been reported missing. A further report, confirmed that some buoys and beacons in the approach and in the river were missing.

9.80 Tanjungredeb (Tanjung Redub) (2°10'N., 117°29'E.) (World Port Index No. 51800), a river port of some importance, stands at the junction of the Sungai Makam and the Sungai Kelai. The residence of a government official stands on the right bank of the Sungai Makam. The customs house stands close NNE of this residence.

The Government Wharf, 49m long with a depth of 4.9m alongside, fronts the customs house. The current often sets for the Government Wharf. There are also some smaller wharves at the junction of the Sungai Kelai and Sungai Makam.

Tanjung Redeb Harbor contains North Quay and South Quay, with a continuous berth length of 182m handling containers and breakbulk cargo.

Sungai Berau—Current Signals.		
Day signal	**Night signal**	**Meaning**
A cylinder, with a cone, point up, above it, and a cone, point down, below it	Three white lights, disposed horizontally	Slack water
A cylinder, with a cone, point up, above it	Three white lights, disposed in a triangle, point up	Flood current
A cylinder, with two cones, points up, above it	—	Strong flood current
A cylinder, with a cone, point down, below it	Three white lights, disposed in a triangle, point down	Ebb current

Vessels not going alongside should anchor near the right bank abeam of a mosque in order to leave the channel clear.

The **Sungai Makam** (Sungai Segah) (2°09'N., 117°30'E.) is navigable by small vessels with local knowledge as far as its junction with the Sungai Sidung, 22 miles above Tanjungredeb. A depth of 3m can be carried.

The **Sungai Kelai** (2°09'N., 117°30'E.) is navigable by vessels with a draft of 3m as far S as the village of Lepithumbak, 23 miles above Tanjungredeb.

Telukbajur, a coal exporting place, stands on the S bank of the Sungai Makam, about 5 miles above Tanjungredeb.

Current signals are displayed in the table titled **Sungai Berau—Current Signals**.

Commercial Wharf, which fronts the settlement, has a berthing length of 274m with depths of 7.3 to 9.1m alongside. Cement Wharf is 96m long with a depth of 8.2m alongside. The coal berth, 30m long, has depths of 6.4 to 7m alongside. Other small berthing facilities are available.

Vessels approaching the wharves at slack water or during the flood must turn in the river and then approach the berths as closely parallel as possible.

The Sungai Berau at Tanjungredeb

9.81 Between **Tanjung Batu** (2°18'N., 118°05'E.) and Tanjung Sepikat, about 32 miles NW, the coast is low and for the most part covered with trees and backed by hilly land. Between the latter point and Pulau Dua, about 23 miles farther NW, the coast is intersected by the vast delta of the Sungai Kayan (Sungai Bulungan). There is a noticeable point near the settlement of Datu Mahuta, which stands at the mouth of a small stream about 18 miles NW of Tanjung Batu. Here the forests are replaced by rice fields. Tanjung Tanahkuning, about 6.75 miles farther NW, is the only rocky point in this area.

On the near approach to the delta of the Sungai Kayan, Pulau Baru, covered with tall trees and located off the NW end of Pulau Pekin, can be seen over the low Pulau Mening. Pulau Makapan has some tall trees on its N side.

Pulau Dua has some high vegetation on it.

Vessels approaching the delta from the S can see the isolated square-topped Gunung Surawan and Pegunungan Njapa. The latter has three lofty peaks of about equal height. Gunung Zadelberg and Gunung Kegelberg to the SW are prominent. Pegunungan Bulungan and Pegunungan Salinbatu are visible to the W.

The vast chain of reefs fronting Tanjung Batu has been previously described above.

The 5.5m curve fronting the delta lies up to 12.5 miles off the islands forming the delta. Outside this curve, the water deepens rapidly to depths of over 18.3m. Within the 91.4m curve, the bottom consists of mud. Outside this curve it consists of black sand, and toward the 200m curve the black sand is mixed with small shells and coral.

Balik Taba (2°35'N., 118°00'E.), a partly-drying shoal, separated from the NW end of the reef extending from Pulau Pand-

jung by a 5.75 mile wide channel with a 3m patch in its mid-part, has a depth of 5.5m in its N part and dries in its S part.

Several reefs, with depths of less than 1.8m, lie within the 20m curve fronting the coast between the settlement of Datu Mahuta and Tanjung Tanahkuning.

The Sungai Kayan

9.82 **Muara Selor** (2°48'N., 117°42'E.), the S channel, has shallow depths over the outer bar, is unmarked, and can only be used by small vessels with local knowledge at HW. Muara Klambu, Muara Biwan, and Muara Pekin, the middle channels, all have shallow depths and are available only to small craft with local knowledge.

Muara Makapan (3°03'N., 117°41'E.), the N passage, is the only channel of any importance to shipping in the delta. It is connected to the main river by the Sungai Temenggah, and with the Sungai Salimbatu by the Sungai Kubil. The Sungai Temenggah is very narrow and winding. A bar of hard ground, having a depth of 1.7m, is found at its junction with the main river. It has been reported that there is a bar channel with a depth of 3.7m here.

9.83 Near **Tanjung Selor** (2°50'N., 117°22'E.), the Sungai Kayan, which rises in the interior mountains, divides into three main branches, connected by many cross channels, thus forming a considerable delta with low shores. Trusan Bulungan, a connecting passage, joins this junction with the Sungai Salimbatu to the N.

Tides—Currents.—Currents in the entrances of the delta are almost entirely semidiurnal, the flood running for about 5 hours 30 minutes and the ebb for about 7 hours. The flood begins about 1 hour after the time of LW, and attains a maximum rate of 1.5 knots at springs.

The ebb begins at the time of HW, and attains a maximum rate of 2.5 knots. At neaps these rates are 1 knot and 2 knots. These particulars may be considerably influenced by the conditions in the upper reaches of the Sungai Kayan, especially in May or October when floods are liable to occur.

Off the entrance of the Muara Makapan, the flood sets in a WNW direction and the ebb in the opposite direction. In the Sungai Temenggah, the ebb sets N and occurs 1 hour later than in the Muara Makapan. The flood sets S and at about the same time as in the Muara Makapan.

The changes of direction in both currents are to correspond with the changes in the vertical movement of the water at Ujung Steile, at the S entrance of the Sungai Temenggah.

Tide and current signals, similar to those displayed at Telukbajur, are displayed from the government pier at Tanjung Selar by day, and when a vessel is expected, by night.

Depths—Limitations.—Vessels of 3.4m draft can reach Tanjung Selor via Muara Makapan, the Sungai Temenggah, and the Sungai Kayan at all times. Such vessels must wait for high tide before crossing the bar off the S end of the Sungai Temenggah.

Vessels drawing 4m, from 4 days before to 4 days after springs, can reach the above port. Depths of from 3 to 4.6m, have been reported to be found in the roadstead at Tanjung Selor.

It has been reported that considerable shoaling has taken place in the delta area.

Only small vessels with local knowledge should attempt to enter any of the channels.

Pilotage.—Pilots can be obtained at Lingkas. Because local knowledge or the service of a pilot is necessary for entering the Muara Makapan, no written directions will be given.

9.84 **Tanjung Selor** (2°50'N., 117°22'E.) (World Port Index No. 51790), a river port of some importance, is the administrative headquarters of the local district. Coal is exported from the mines in the vicinity.

The Government Pier at the settlement has a depth of 3.4m alongside. The ebb current attains a rate of 2 knots at springs, while the flood current is weak.

The Sungai Sesayap

9.85 Between **Pulau Dua** (3°04'N., 117°37'E.) and Tanjung Ahus, about 46 miles NNE, the coast is intersected by the broad delta of the Sungai Sesayap which is formed by a large number of small islands. Three main passages intersect these islands and provide access to the sea. The coast NW of Pulau Dua is indented by a large shoal bay. Muara Salimbatu, a shoal unmarked channel, leads through the S part of this bay into the Sungai Salimbatu.

An unmarked channel, the Muara Sekata, leads through the S side of the inner part of the bay into the Sungai Sekata. It is reported that the channel can be navigated by vessels with a draft of up to 3.7m for a distance of about 6 miles.

The three principal mouths, named Muara Batagau, Muara Sebawang, and Muara Serban, lead into Sesayap Selatan, Sesayap Tengah, and Sesayap Utara. The latter channels lead into the Sungai Sesayap, N of the NW end of Pulau Bangkadulisbesar.

Aspect.—The coast is low and flat, the only recognizable points from seaward being Pulau Menulun, Pulau Tarakan, Pulau Bunyu, and the hills on Pulau Mandul. A war memorial NW of Lingkas has been reported to be a good landmark.

A gas flare, which stands 1 mile N of the S end of Pulau Bunyu, burns constantly and has been reported to be visible up to 27 miles seaward. The loom of this flare has been reported sighted at a distance of 60 miles.

Kaletiak, a small islet topped by some high trees, stands 4.5 miles S of Pulau Tarakan. It serves as a good landmark for vessels approaching the Muara Salimbatu.

The off-lying shoals fronting the delta have been previously described. The 20m curve lies up to 18 miles off the islands that form the delta. From Tanjung Batu and the shoal area about 1.5 miles S of this point, this curve extends in an E direction for 15 miles and then turns sharply to the N and S leaving a deep fairway in between. This fairway leads to the oil port at Lingkas Road.

Numerous mud banks, reefs, and detached dangers lie within the 20m curve.

9.86 **Gosong Menulun** (Menulun) (3°13'N., 117°38'E.), marked by a beacon which lies on a detached drying shoal about 1.5 miles S of Tanjung Batu, has been reported to have disappeared. Deep channels lead N and S of this shoal.

Depths of 1.5m and less lie within 1 mile S of Tanjung Arang, the S point of Pulau Bunyu, and from this position similar depths extend almost 4 miles NW along the SW side of the island.

Johanna Reef (3°23'N., 117°54'E.), with a least depth of 0.9m, lies about 4 miles S of Tanjung Arang and on the S side of the channel leading to the pipeline berth at the SW end of Pulau Bunyu. The reef is steep-to and shows no discoloration.

Kruys Reef (3°25'N., 117°55'E.), a 4.1m patch, lies 3.5 miles ESE of Tanjung Arang. This reef shows no discoloration, but is marked at times by a few ripples.

A shoal, with a least depth of 5.9m, lies about 21 miles E of the SE end of Pulau Bunyu. The position is approximate.

A 15.5m bank (position approximate) lies 36.5 miles E of the S end of Pulau Tarakan.

A 7.8m shoal lies about 18.25 miles ESE of the light structure on Tanjung Arang.

9.87 Lingkas Road (Tarakan) (3°17'N., 117°36'E.) (World Port Index No. 51780), an oil-exporting port, is situated on the SW side of Pulau Tarakan. Tarakan, the headquarters of an oil refinery, is situated about 2 miles inland and is connected with Lingkas by a good road. Ample berthing facilities are available for any vessel capable of entering the port.

The port is centered on the head of the oil jetty containing two jetties and a pier. The pier is 0.5 mile NW of the oil jetty. The general cargo jetty is situated 3.75 miles NW of Tanjung Batu and the oil jetty is 0.32 mile farther NW.

Lingkas Road is a first port of entry and has a coast radio station.

Tides—Currents.—Offshore of Pulau Tarakan and Pulau Bunyu, the current flows in a constant SSW or SW direction at a rate of 0.5 knot during the flood tide and 2 knots with the ebb. Strong currents are experienced in the delta of the Sungai Sesayap. The ebb currents attain a rate of more than 3 knots after a heavy rainfall. Strong NE and SE sets have been experienced in making the approach. A constant S set occurs well offshore of the delta.

East of Gosong Menulun, the flood current sets strongly to the N and the ebb sets to the S.

In the roadstead, currents may reach a speed of 4 knots. Drifting trees are carried downstream by the ebb current.

Depths—Limitations.—A swept channel, clear for all types of surface vessels, leads into Lingkas Road. The centerline of the channel is joined by the following points, with a bearing and distance from Tanjung Batu:

a. 090°, distant 11.1 miles.
b. 098°, distant 3.6 miles.
c. 228.5°, distant 1.0 mile.
d. 274.5°, distant 2.8 miles.
e. 300.5°, distant 3.6 miles.

The channel between Point a and Point b is 1 mile wide; the remainder of the channel to the roadstead is 0.5 mile wide.

Berthing details are shown in table titled **Tarakan—Berth Information.**

Vessels can safely lie alongside these piers throughout the year. From July to December, when strong W winds or squalls may be expected, it is advisable to let go the port anchor.

Pilotage.—Pilotage is compulsory. Sea pilots are available during daylight only; the harbor pilot is available from 0600 to 1800. Vessels arriving outside these hours anchor off the berths. Vessels may depart up to 2130.

Tarakan—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Port Tarakan						
Cargo Jetty	250m	—	—	—	—	Ro/pax and general cargo.
Container Jetty	130m	—	—	—	—	Ro/pax, containers, and general cargo.
Tarakan Island Lightering Anchorage STS	—	—	—	—	—	Coal and iron ore.
Tanjung Bato Anchorage Terminal						
A STS	—	—	—	—	—	Coal.
B STS	—	—	—	—	—	Coal.
Tanjung Pasir Anchorage Terminal						
A STS	64m	-	—	—	—	Coal and transhipment.
B STS	—	-	—	—	—	Coal.
C STS	—	-	—	—	—	Coal.
PT Pertamina Tanker Terminal						
Pertamina Jetty	—	7.0m	130m	5.5m	6,000 dwt	Aviation fuel and clean products. Berthing length of 202m (including dolphins).
Tarakan MBM	—	18.5m	230m	—	55,000 dwt	Crude.

Vessels bound for Lingkas Road should give 72 hours, 48 hours, and 24 hours notice of their estimated time of arrival and include their draft and the total amount of cargo aboard.

An unlicensed pilot is available for berthing at Bunyu offshore oil berth. A vessel must give its estimated time of arrival to the local harbor authorities at least 4 days prior to arrival. The pilot boards about 1.5 miles S of Tanjung Arang.

Anchorage.—Safe anchorage is provided, in depths of 10.1 to 14.6m off the piers. Because of floating obstructions, strong currents, and heavy squalls it is advisable to veer a good length of chain. Vessels bunkering anchor about 1.5 miles from the oil or commercial piers. Vessels working cargo into lighter anchor 1 to 2 miles S of the oil pier in depths of 14.6m or greater.

Anchorage can be taken in a depth of 14.6m about 1.75 miles WSW of Tanjung Arang on the S end of Pulau Bunyu, but caution is necessary to avoid the 8.2m patch N of this position.

Directions.—Vessels bound for Lingkas Road should steer for the outer lighted buoy moored 15 miles E of Tanjung Batu. From this lighted buoy, pass S of the dangerous wreck 13.25 miles E of the same point and enter the swept channel steering 267° for the lighted range beacons which stand on the NW end of the drying shoal about 1.75 miles SW of Tanjung Batu. When Tanjung Mengatju bears 331°, alter course to 294°. When the head of the general cargo jetty bears 347.5°, alter course and steer for it, this leads to Lingkas Roads and the pier.

Caution.—Less water than charted has been reported to exist in the approach to the entrance channel leading to Tarakan Roadstead.

Vessels are cautioned not to navigate in Tarakan Roadstead in the area N of the parallel of 3°17'15”S, because of obstructions.

Care should be taken in navigating the channel between Pulau Tarakan and the shoals about 1.5 miles to the S because of the set of the currents toward these shoals at LW.

Pulau Bunyu

9.88 About 0.75 mile W of **Tanjung Arang** (3°28'N., 117°52'E.) (World Port Index No. 51770), a submarine pipeline extends 1.5 miles S from the shore. A buoy marks the outer end of the pipeline, and there are two pairs of mooring buoys where tankers of 21,000 dwt and 175m in length have berthed. Mooring operations begin at the start of the ebb; unmooring operations begin at the first daylight slack water after completion. The pilot remains aboard during the loading operation.

In the vicinity of the pipeline is a platform with a depth of about 14.5m alongside. Tankers up to 30,000 dwt and 185m length overall can secure here to load methanol.

Tides—Currents.—A S current E of meridian 118°E is sometimes influenced by currents mainly following the direction of the channels W of 118°E. Through this influence, the current may attain a rate exceeding 4 knots, especially the outgoing current.

There is a T-head pier 1 mile NW of the oil berth. The berth should be approached through the buoyed channel.

A shoal, with a depth of 1.5m, marked by a buoy on the SW side, lies 1.5 miles W of the pier. A dangerous wreck lies about 6.25 miles WNW of Karang Banda.

For additional details see the table titled **Bunyu—Berth Information.**

A swept area lies on the SW side of Pulau Bunyu. Another swept channel, 0.27 mile wide, leads into **Muara Sabawang** (3°30'N., 117°40'E.). Its centerline joins the following positions:

a. 3°26'10”N, 117°50'00”E.
b. 3°26'10”N, 117°43'00”E.
c. 3°30'00”N, 117°39'20”E.

9.89 **Sesayap Selatan** (3°29'N., 117°20'E.) can be approached through the channel leading S of Pulau Bunyu and then through the channel leading S of Pulau Bangkudulis-besar. It then curves around the W side of the latter island and unites with the main river. Four small islets are located off the S side of the same island. A considerable mud bank lines the S shore of the channel. A number of waterways intersect this shore. From abreast Tanjung Djuata, the Tarakan shore must be held closely in order to keep clear of the bank extending out from the E shore of Pulau Bangkudulis-besar.

Bunyu—Berth Information

Berth	Length	Depth	Maximum Vessel		Remarks
			LOA	Size	
Bunyu Island Terminal					
Outer Jetty	106m	—	—	—	Dry cargo and passengers.
Inner Jetty (N)	35m	—	—	—	Ro-ro and passengers.
Inner Jetty (S)	35m	—	—	—	Ro-ro and passengers.
PT Garda Tujuh Buana Terminal					
Garda Tujuh Buana Jetty	178m	—	—	—	Coal and conveyor.
PT Adani Global Terminal					
Adani Jetty (Ex Lamindo Jetty)	118m	—	—	—	Coal and conveyor.
Bunyu Terminal					
Pertamina North CBM	—	15.3m	—	21,000 dwt	Crude oil.

Bunyu—Berth Information					
Berth	Length	Depth	Maximum Vessel		Remarks
			LOA	Size	
Pertamina Platform	265m	14.5m	185m	30,000 dwt	Chemicals.
Dermaga TPI Terminal					
Dermaga TPI Berth	24m	—	—	—	Liquids.

The **Sungai Teladan** (3°27'N., 117°20'E.), which is entered S of Tanjung Tiram, has a width of about 0.35 mile and depths of 6.9 to 9.1m as far as the junction of the Sungai Bu kit Pondak, 4 miles upriver. Coastal vessels sometimes proceed as far as this junction.

Muara Batagau (Straat Batagau) (3°22'N., 117°31'E.), the S channel leading into the Sesayap Selatan between Pulau Tarakan and Pulau Payau, is dangerous to navigation due to obstructions N of 3°17'15"N.

9.90 Sesayap Tengah (3°30'N., 117°31'E.) flows between Pulau Tibi and Pulau Bangkudulis-besar, and then between the latter island and Pulau Bangkudulis-kecil to the junction with the main river. From a position about 1.5 miles S of the S end of Pulau Bunyu, vessels should steer 270° until the W side of that island bears 360°.

Vessels should then steer direct for **Tanjung Tibi** (3°29'N., 117°37'E.), passing S of the dangers lying between Pulau Tibi and Pulau Bunyu. Caution is necessary to avoid a 5.5m patch which lies close N of the latter track, about 3.5 miles WSW of the S end of Pulau Bunyu. This danger is marked by a red buoy.

With local knowledge, steer to pass between Johanna Reef and Adat Reef to the S, passing N of the extensive bank projecting E from Pulau Tarakan.

A mid-channel course should be steered when the passage between Pulau Tibi and Pulau Tarakan is entirely open, making for the entrance of the Sesayap Tengah when just W of Djuanta Hill on the NW end of Pulau Tarakan. The W entrance point should be steered for, being careful to clear the bank fronting the E side of Pulau Bangkudulis-besar and the bank fronting the mouth of the Sungai Tibi. A mid-channel course should then be steered until abeam of the islands S of Pulau Bangkudulis-ketcil, at which time the S shore should be favored.

A 5.5m patch lies close off the SW end of the above island. Vessels should cross over and pass between the patch and the island. Vessels should then pass E and N of Pulau Bahap and over the bar, which has a least depth of 2.7m, 1.25 miles W of Pulau Bahap.

9.91 Sesayap Utara (3°37'N., 117°24'E.) is divided into two mouths by the Pulau Baru. Muara Sebawang, the S mouth, is entered between this island and the banks extending SE, on the N, and Pulau Tibi, on the S. Muara Serban flows between Pulau Baru and Pulau Bangkudulis-ketcil, on the S, and Pulau Mandul, Pulau Tembagan, and the main coast, on the N. A large bank, that extends E from the E side of Pulau Mandul, forms the N side of the outer part of Muara Serban.

Muara Serban unites with the Sesayap Utara through the narrow, but deep passage between Pulau Tembagan and Pulau Baru. A bank, with a least depth of 3m, fronts the E end of this passage. The entrance channel is marked by a pair of beacons in range 241°, which stand on the SE end of Pulau Tembagan.

After it joins the Muara Sebawang and the Muara Serban, near the W end of Pulau Baru, Sesayap Utara runs along the N shore, passing N of Pulau Tipus. Abeam of the N extremity of Pulau Bangkudulis-ketcil, the channel crosses over and leads along the N shore of that island, between it and Pulau Tigor. The channel then leads N of Pulau Bahap and over the bar and into the main river. Beacons mark the channel of the Sesayap Utara.

Directions.—Vessels may approach the Muara Sebawang through the channel leading about 1.5 miles S of the S end of Pulau Bunyu, and then through the approach channels leading to the Sesayap Tengah. When the S high point on the E coast of Pulau Tarakan is closed behind the middle point of the coast, a course of 008° is made good, passing between the bank extending E from Pulau Tibi and then S of the banks between that island and Pulau Bunyu.

Vessels then turn into the Muara Sebawang, when open, and steer a mid-channel course, first keeping over to the Pulau Tibi shore and then crossing over to the Pulau Baru shore, when clear of the bank that extends from the W side of Pulau Batok. Less water than charted has been reported to exist in Muara Sebawang.

When Pulau Tiga is wholly open from Pulau Bangkudulis-ketcil, cross over to the S shore, passing S of Pulau Tiga and N of Pulau Bahap, and then across the bar leading into the main river.

Vessels may approach the Muara Serban by keeping outside the 20m curve until Tanjung Utara, the N point of Pulau Bunyu is identified.

A course of 270° should then be steered with that point ahead. Course should be altered to 278° when Tanjung Arang, the S point of the island, bears 223°.

Depths of 5.5 to 6.7m are found along this range. When abeam of Tanjung Atara, make good a course of 263°.

When abeam of the E point of Pulau Baru, course should be altered to 272°, steering for the narrow channel between Pulau Baru and Pulau Tembangan, when it is open. The bar over the entrance of this channel has a depth of 3m. The remainder of the channel is clear. The S side of the channel must be held at the W entrance of the narrow channel. Vessels then cross over to the N shore of the Sesayap Utara and proceed as previously directed.

9.92 The **Sungai Sesayap** (3°36'N., 117°14'E.) is formed by several streams rising in the mountains of central Borneo. Several large villages stand along the banks of this river which is fairly wide, deep, and mostly clear. Just above its junction with the delta channels, **Pulau Belanak** (3°37'N., 117°11'E.) lies along the right bank with a drying bank to the N. Farther

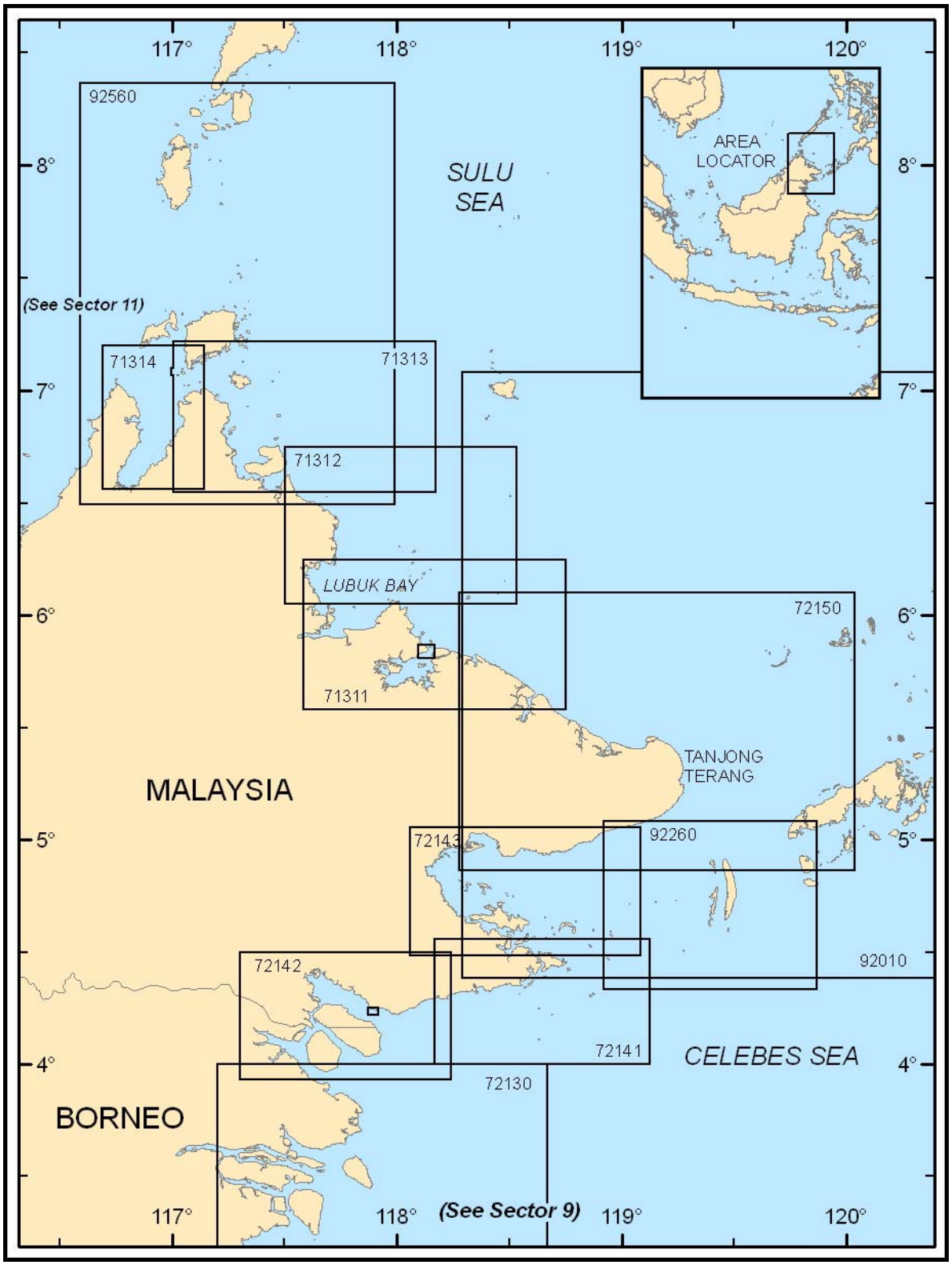
upriver there are numerous islands, islets, and banks.

Depths of 5.5 to 16.5m are found in the river as far as Sesayap.

The **Sungai Sembakung** (3°44'N., 117°48'E.), just N of Muara Serban, reaches the sea by two branches. The N branch, which flows out N of Pulau Mandul, is fronted by a shallow, unmarked bank and is suitable only for small craft with local knowledge. The S branch flows into the Muara Serban via the connecting channels of Trusan Gelagan and Muara Ledung.

The depths in the Sungai Sembakung as far as Tagol, a village 56 miles above the mouth of the river, vary between 2.4 to 3m.

Tanjung Ahus (3°48'N., 117°50'E.) is low, flat, and covered with short trees.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **10** — CHART INFORMATION

SECTOR 10

BORNEO—NORTHEAST COAST

Plan.—This sector describes the NE coast of Borneo from Tanjung Ahus to Sandakan Harbor, and then NW to Tanjong Sempang Mangayau and includes Pulau Banggi. The geographical sequence is NE and NW.

General Remarks

10.1 Between **Tanjung Ahus** (3°48'N., 117°50'E.) and **Pulau Bum Bum** (4°28'N., 118°41'E.), about 65 miles NE and then 58 miles farther NE to **Dent Haven** (5°16'N., 119°16'E.), the coast is indented by **Teluk Sibuko** (4°00'N., 118°20'E.) and **Darvel Bay** (4°45'N., 118°35'E.), both containing some small ports of importance to shipping.

The land bordering both bays is high, rugged, and fronted by numerous islands, rocks, and other dangers. Near Dent Haven, the land on the NE side of Darvel Bay becomes low and densely wooded. Some hills of moderate height rise close W of Dent Haven.

The coast between Dent Haven and **Sandakan Harbor** (5°49'N., 118°08'E.), about 75 miles to the NW, continues very low and is covered with dense jungle and high trees. A few scattered hills of moderate height rise inland.

Sandakan (5°49'N., 118°08'E.), the chief port on the NE coast of Borneo, stands on the N shore and is available to ocean-going vessels. Extensive trade is carried out with other ports throughout the Far East. For further information, see paragraph 10.61.

The coast between Sandakan and **Tanjong Naruntong** (7°01'N., 117°09'E.), about 93 miles NW, is indented by several large bays and fronted by numerous above and below-water dangers that extend up to 21 miles and more offshore in places. Inland, some of the high peaks are conspicuous and serve as useful navigational landmarks. There are no ports of commercial importance for ocean-going vessels along this section of coast.

Winds—Weather.—For a description of the general weather conditions which may be encountered in the area described in this sector, refer to the weather in paragraph 9.1.

Tides—Currents.—As a general rule, the currents encountered off the NE coast of Borneo are affected by the flow of water in the Celebes Sea which is initially directed towards Makassar Strait.

This flow divides as it approaches the strait. One branch continues into the strait, where it is joined on its W flank by a current which sets S along the N part of the E and NE coasts of Borneo; the other branch recurves to set E along the N coast of Sulawesi. The S current is replaced in April by a N current, which is a recurved branch from the main SW current of the Celebes Sea.

The constancy of the SW and E current is high, but that of the S current or N current off the E and NE coasts of Borneo is only moderate or even low.

The mean rates of the SW and E currents lie in the range of 1 to 1.5 knots, while that of the other currents is less than 1 knot.

For a detailed description of local currents which may be encountered, refer to the principal description of that part of the coast which they affect.

10.2 Sibuko Bay (4°00'N., 118°20'E.) comprises part of the E coast of Borneo between the E extremity of **Pulau Mandul** (3°42'N., 117°49'E.) and the E extremity of Pulau Bum Bum, about 71 miles NE. The bay covers a vast area and there are many channels leading through its reef obstructed waters. Numerous rivers discharge into this bay, but most of them are fronted by mud banks and flats and are available only to small craft.

The mountain ranges on the N side of Sibuko Bay center in **Mount Magdalena** (4°30'N., 117°55'E.), 1,347m high and densely wooded. It appears as a sharp peak from all directions.

A high range of peaks, forming a backbone, extends in a general SSE direction for 15 miles from Mount Magdalena, terminating in Chinaga Timor, 424m high, 1.75 miles NNW of **Batu Tinagat** (4°13'N., 117°59'E.).

Several very conspicuous peaks stand on this range, including Mount Lucia, 1,241m high; Maria Peak, 1,122m high; Mount Andrassy, 671m high; and Mount Putri, 311m high, which stands on a spur of this range about 1 mile S of Cinaga Timor and close to the coast.

A secondary range of lower elevations branches off from Mount Lucia and extends to the E, eventually terminating in Mount Wullerstorf, 13.5 miles ESE of Mount Magdalena. To the W, it forms a high ridge which curves to the S and terminates in Mount Kukusan, about 1.75 miles N of Tawau. Three other conspicuous elevations are found on this ridge.

The first of these elevations, which stands 3.5 miles SW of Mount Lucia, consists of a high saddle with two conspicuous peaks, 814m and 805m high. Table Mountain, 604m high, stands about midway between Mount Magdalena and Mount Kukusan and is perfectly flat-topped. A spur extends in a NW direction from Table Mountain for about 3.75 miles terminating in Tiger Hill, a prominent peak about 472m high. Mount Gemok, a large flat-topped peak about 428m high, stands 2 miles N of Mount Kukusan.

Lesser spurs also branch away from Mount Magdalena in a NW and NE direction.

10.3 Mount Wullerstorf (4°27'N., 118°09'E.), 762m high with a conical summit, is one of the most conspicuous peaks on the N side of Sibuko Bay. It slopes steeply on its E side to the plains below, but a range of mountains from 645 to 512m high, stretches NNW from it. The latter elevations stand 5.25 miles from Mount Wullerstorf and rise to a conspicuous, sharp cone. A densely wooded valley, 7 miles wide, lies between this range and the low spurs of the mountains to the E. The Sungai Kalumpang rises in this valley.

The principal landmarks on the N side of Sibuko Bay are easily identified. The summits of the highest peaks, such as Mount Magdalena, Mount Lucia, and Maria Peak, are often

obscured by clouds, but those of lower elevations are usually visible.

Quoin Hill (4°25'N., 118°01'E.), 600m high, stands 4.25 miles ESE of Maria Peak, and shows up conspicuously on the plain E of the main ridge running S from Mount Magdalena.

A range of hills, which reach a highest elevation of 424m, stands close N of Batu Tinagat. The N slope of these hills are steep and appears isolated from the E. Gunong Batu Chinaga, the northernmost and highest of this range, stands about 2 miles NNW of Batu Tinagat. Mount Andrassy, a rounded summit on the main range mentioned above, is the first prominent peak N of these hills.

Mount Putri, 311m high, is a spur of the Batu Tinagat range and stands close to the coast, about 1 mile NW of this point.

Mount Kukusan, 223m high, stands 1.75 miles N of Tawau and is a very conspicuous, pyramidal-shaped hill which is easily identified.

Pulau Ahus to Batu Tinagat

10.4 Pulau Ahus (3°50'N., 117°48'E.) is low and heavily wooded. Tanjung Ahus, the SE point of the island, has been previously described in paragraph 9.92.

The coast between Pulau Ahus and Batu Tinagat, about 27 miles NNE, is indented by several rivers in its SW part and by Cowie Harbor in its NW part. Several large islands lie in the approaches to these rivers and Cowie Harbor. Vessels frequent this harbor to load lumber. Tawau stands on the N side of the entrance of this harbor.

Banda Reef (3°50'N., 118°01'E.), a coral formation with a least depth of 1.2m, does not show discoloration and lies 11 miles SE of Tanjung Ahus; it is marked close SE by a lighted beacon. A sunken rock, with a least depth of 4.9m, lies about 21 miles ENE of the same point. The existence of this rock is doubtful.

A depth of 22m was reported to lie 15.5 miles ESE of Tanjung Ahus. Less water than charted was reported to exist in this area between the 36.6m and 54.9m curves. A dangerous wreck lies about 6.25 miles WNW of Karang Banda.

10.5 Sibuko Bay Marine Tanker Terminal (3°51.0'N., 118°06.5'E.), which consists of an anchored storage tanker used to load oil on visiting tankers, lies about 5.75 miles ENE of Karang Banda.

The area within a 0.65-mile radius of this position is a restricted area and the anchoring of vessels other than the storage tanker is strictly prohibited. This area must not be entered without a mooring master on board.

Pilotage is compulsory; the pilot boards in the vicinity of position 3°55.2'N, 188°05.8'E. Mariners must not enter the restricted area centered on the storage tanker without a pilot on board.

Vessels required to anchor must do so in an area 3 miles long and 2 miles wide, in depths of 36 to 55m, which lies centered about 4.5 miles N of the storage tanker.

Inbound vessels are required to give Sibuko Bay Marine Terminal 72 hours advance notice of their ETA at the terminal. Additional notice should be given 24 hours and 12 hours prior to arrival.

Vessels are advised to use VHF channel 16 when within range of the terminal to receive berthing or anchoring instructions.

Vessels berthing alongside the storage tanker will then shift to walkie-talkies to communicate with the mooring master.

The **Sungai Sebuku** (4°04'N., 117°29'E.), which is entered about 26 miles NW of Tanjung Ahus, leads to the village of Sebuku, about 46 miles above its entrance. Small craft with local knowledge can reach this village.

The approach to the Sungai Sebuku from the SE lies between Pulau Nunukan Timur on the N and Pulau Ahus, Pulau Bukat, and Pulau Itai on the S.

10.6 Pulau Nunukan Timur (4°03'N., 117°41'E.) is 266m high near its SE side and densely wooded. A dangerous wreck lies about 6.25 miles WNW of Karang Banda. Close W of the N extremity of the island is a rock above-water. Two rocks awash lie about 1.25 miles SW of this rock and a sunken rock lies about 0.5 mile farther SW.

Nunukan (4°05'N., 117°37'E.) is an anchorage port specializing in the export of cut lumber and logs. It also handles general imports and has a regular passenger service.

Tides—Currents.—The flood current sets SW at the anchorage; the ebb current sets NE.

Depths—Limitations.—Vessels up to 30,000 dwt, with a maximum loa of 100m loa and a maximum draft (LW) of 12.0m, can be accommodated. A T-head pier is 60m in length with a depth alongside of 6.0m. Two wharfs, both 100m in length, have depths alongside of 7.0 to 15.0m and can accommodate vessels up to 30,000 dwt and a maximum draft of 12.0m.

Aspect.—Some buildings stand in the vicinity. of the piers

Pilotage.—Pilotage is compulsory for vessels over 250 dwt. A pilot can be obtained for Pulau Nunukan Timur from the harbormaster at Tarakan, provided 24 hours advance notice is given. The pilot boards at the outer buoy moored at the E end of the swept channel leading to Lingkas Road (Tarakan) (see paragraph 9.87).

Anchorage.—Good anchorages lie in the channel between Pulau Nunukan Timur and Pulau Sebatik, in depths of 10 to 16m, mud.

Directions.—The channel leading to the entrance of the Sungai Sebuku leads in a NW direction from its entrance between the N side of the tongue of water fronting the N and NE sides of Pulau Ahus, and the S side of the shoal spit which extends 13 miles E from the S point of Pulau Nunukan Timur. The entrance is about 4.5 miles wide between the fringing dangers and has a least depth of 6.7m. Between the S end of Pulau Nunukan Timur and Pulau Bukat to the S, the channel is 2.5 miles wide and has a least depth of 10m. Between Pulau Nunukan Timur and Pulau Itai, the channel is 2 miles wide and has a least depth of 5.5m. Elsewhere the depths range from 7.3 to 13m.

10.7 The mouth of the Sungai Sebuku is fronted by Pulau Senelak, a narrow island with three hills which can be seen over the surrounding low islands; the N hill is 60m high and the S hill 105m high. Banks, which dry at LW, extend 0.25 mile SW and W from the island.

Sikapal and Pelanduk are steep-to wooded rocks lying 0.75 mile NE and close S, respectively, of **Tanjung Tidung Salang**

(4°05'N., 117°28'E.), the NW entrance point of the river. Tembalan, a similar rock, lies close S of Pulau Sinelak.

The channel lying to the SE of the island appears to be deep, while that to the NW has a least depth of 6.4m.

A tidal bore which occurs from about 3 days before to 3 days after spring tides, takes place above the village of Pangeran Anam, 32 miles upstream. The advance of the wave, which is about 0.9m high, is rapid and generally does considerable damage to small craft. The flood and the ebb run at a rate of 3.5 knots at springs.

Sebuku Village stands about 46 miles from the entrance and is accessible to small craft with local knowledge.

The Sungai Itai and the Sungai Ahus join one another between the NW end of Pulau Ahus and the SE side of Pulau Bukat.

The Sungai Itai flows W and NW and connects with the Sungai Sebuku about 3.25 miles above Pulau Sinelak. A shallow bar, clear of rocks, lies at the junction of the Sunga iItai and the Sungai Ahus. The land bordering these rivers is swampy and wooded.

The Sungai Simangaris and the Sungai Sebakis discharge through a common mouth, about 4 miles WNW of Tanjung Tidung Salang. Neither river is of any importance.

The **Sungai Serudong** (4°13'N., 117°36'E.), a narrow winding river used by small craft with local knowledge, is approached from the SE between the SW side of Pulau Sebatik and the NE side of Pulau Nunukan Timur. A channel about 1 to 2 miles wide, with a least depth reported to be 3.6m, separates the two islands.

10.8 Makasser Banks (3°59'N., 117°57'E.), lying 4.25 to 5.25 miles SSE of Stone Point (Steenenhoek), the SE extremity of Pulau Sebatik, are the main dangers on the N side of the SE approach to the Sungai Serudong.

The W end of this bank lies 4.25 miles S of Stone Point and consists of an elongated shoal with two parts awash.

Shoal depths of less than 11m extend 3.25 miles E from the E extremity of these shoals. The easternmost part of this shoal lies 9.25 miles SE of Stone Point.

Padang Bank (4°02'N., 117°56'E.), a shoal with a depth of 0.9m and on which the sea breaks, lies 2 miles SSE of Stone Point.

The channel between Makassar Banks and Padang Bank has depths of 9.1 to 12.8m. The W part has not been examined and it would be imprudent to pass through it.

Unarang Rock (4°00'N., 118°04'E.), which dries 0.3m and is steep-to, lies 10 miles ESE of Stone Point.

A detached 4.6m patch lies 1.5 miles SSE of a red cliff on the S extremity of Pulau Sebatik.

A shoal spit, with depths of less than 5.5m, extends 13 miles E from the S point of Pulau Nunukan Timur, and 10.75 miles SE from the E point of the island. This spit constitutes the main danger on the S side of the approach to the Sungai Serudong.

The entrance to the main channel, which has a least depth of 11m, lies between Makassar Banks and the shoal spit extending E from the S point of Pulau Nunukan Timur. This channel extends 18.5 miles NW from its entrance to a point abreast the N point of Pulau Nunukan Timur. A least depth of 7.9m exists in the fairway.

The channel between the S end of Pulau Nunukan Timur and the mouth of the Sungai Serudong is intricate and has a least depth of 2.1m N of the N end of Pulau Nunukan Timur. The channel between Pulau Sebatik and Pulau Sedam, a small triangular islet close off the NW extremity of Pulau Sebatik, is only 0.15 mile wide but has a least depth of 7.6m.

A channel 2 miles wide, with a least depth of 3m at its S end, lies between the NW side of Pulau Nunukan Timur and Pulau Tinabasan, a small island on the NE side of the common entrance of the Sungai Sibakis and the Sungai Sebuku. This small island is separated from the main coast by Trusan Tinabassan, a narrow channel 0.35 mile with a depth of 1.5m at its N and S ends. Mariners are advised to navigate with caution in the area.

10.9 The Sungai Serudong, a narrow winding river, separates the S side of Pulau Simandalan from the mainland to the SW, and is connected to the Sungai Simandalan to the N by Trusan Merlin, a narrow, twisting passage which passes W of the island. The river is entered between Doris Point, the S extremity of Pulau Simandalan and Monk Point, 0.75 mile to the SW. It extends in a general NW direction for about 4 miles as far as the entrance of the Trusan Merlin, and then curves to the SW for almost 2 miles. Here it resumes its NW direction for about 1 mile to Merlin Point, which lies on the S shore of the river. The river at this point is less than 0.15 mile wide and vessels of any size should not proceed upstream any further than this point.

The navigation of the river presents no difficulty as far as Merlin Point, and the currents seldom exceed a rate of 1 knot. There is a least depth of 6.7m on Entry Flat which fronts the entrance of the river between Doris and Monk Points. A least depth of 8.2m is found on Watson Ridge which crosses the river about 1 mile below Merlin Point. The mangrove-covered banks are generally steep-to.

Directions.—When entering the Sungai Serudong, Doris Point should be passed about 0.2 mile to the S in order to avoid Duke Bank, a shoal with depths of less than 0.5m, which extends about 0.3 mile ENE from Monk Point. The tangent of the land on the NE side of Harvey Reach, almost 2 miles WNW of Doris Point, in range, bearing 301° with Junction Point 3.5 miles NW of Monk Point, leads close NE of Duke Bank as defined by the 5.5m curve.

When Doris Point comes in range, bearing 054° with **Tanjong Agas** (4°15'N., 117°39'E.), Duke Point will have been safely passed. Course should now be altered a little to the W and a mid-channel course maintained as the vessel proceeds up river. Moderate size vessels should not proceed beyond Junction Point, about 3.5 miles NW of Monk Point, where swinging room will be found if anchored, in a depth of 16.5m, about 0.35 mile E of that point.

A vessel has anchored in mid-channel about 0.2 mile NW of Merlin Point, where sufficient swinging room was found.

10.10 Trusan Merlin (4°16'N., 117°33'E.), a narrow, tortuous passage about 4 miles long, lies to the W of Pulau Simandalan and joins the Sungai Simandalan with the Sungai Serudong. This passage has a least depth of 9.6m in the fairway near its S end. Tidal currents do not exceed 1 knot.

Clarke Creek (4°19'N., 117°32'E.), of no commercial importance, discharges into the Trusan Merlin and the Sungai Simandalan close SW of Caution Point. Only launches can be accommodated because of its extreme narrowness.

Directions.—Vessels entering the Trusan Merlin from the Sungai Simandalan should pass Caution Point close offshore so as to avoid the flats extending from the opposite shore. The sharp turn at the point makes a rapid course change necessary. Vessels should then maintain a mid-channel course and after passing the narrowest part of the Trusan Merlin at Herald Point, about 2.25 miles below Caution Point, care should be taken not to mistake the entrance of Deceive Creek for the main channel.

The **Sungai Simandalan** (4°16'N., 117°39'E.), a narrow river, extends about 7 miles in a general WNW direction to Caution Point at the NW end of Pulau Simandalan.

This river, which separates the N side of Pulau Simandalan from the mainland, is connected to the Sungai Serudong by a narrow passage known as the Trusan Merlin.

The shores of the river are bordered by mangroves and are generally steep-to. No difficulty will be experienced in proceeding as far as Rendezvous Point, on the N shore about 6.25 miles above the entrance. The least depth in this reach is 6.7m, on the S side of Reyne Reach, 0.75 mile WNW of Griffin Point. The tidal currents do not exceed a rate of 1 knot.

Directions.—To enter the river, steer 290° for the extremity of the land on the S bank, about 0.5 mile W of Griffith Point. This course leads about midway between the dangers off Llewellyn Bank, to the SE of Griffith Point, and those close off Adolphy Point. After passing Adolphy Point, alter course to the N as Griffith Point is approached, in order to maintain a mid-channel course which should be carried through the river. A vessel of moderate size will find just enough room to swing if anchored, in a depth of 18m, in the middle of Long Reach, where the river banks are about 0.15 mile apart.

Care should be taken when rounding Adolphy Point, because the ebb at springs sets rapidly around it.

Coal Mine Reach (4°15'N., 117°39'E.) lies with its N entrance between Grassy Point and Adolphy Point, about 1 mile to the NW, and extends SW between the NW side of Pulau Sebatik and the E side of Pulau Simandalan. The reach has a least width of 0.5 mile at its N entrance, but narrows to a width of about 0.2 mile at its SW end. Lights are shown from Adolphy Point and in Coal Mine Reach, 1.5 miles SW of Agas Point.

10.11 Wallace Bay (4°15'N., 117°39'E.), a timber-loading center, is a shallow indentation located on the NW side of Pulau Sebatik, about 1 mile SW of Grassy Point. A wooden, T-head jetty, with a depth of 6.1m alongside, extends from the shore in the vicinity of the powerhouse chimney. Lighters are available to work cargo.

Pilot Bank, a shoal with depths of less than 5.5m at its outer end, extends about 4.5 miles ENE from Adolphy Point. Shoal water, as defined by the 11m curve, extends about 1.25 miles farther E. Both this bank and the bank extending from Grassy Point are steep-to. Soundings give little warning, especially between Grassy Point and Adolphy Point, where the navigable channel is about 0.5 mile wide.

Llewellyn Bank (4°16'N., 117°39'E.), an extensive mud flat which dries in places, extends from the E end of Pulau Simandalan between Griffith Point and Tanjong Agas. The bank extends 1 mile NE from Tanjong Agas and the same distance ESE from Griffith Point, leaving a channel between its N edge and Adolphy Point about 0.15 mile wide. This channel leads through the entrance of the Sungai Simandalan. Coal Mine Reach Channel is about 0.62 mile wide between this bank and the NW shore of Pulau Sebatik.

The shoals which border Grassy Point, Adolphy Point, and Agas Point vary considerably during the year because of the silt brought down by the heavy rains.

10.12 Drake Bank (4°13'N., 117°36'E.), a hard, clay shoal with a least depth of 6m, lies mid-channel near the SW end of Coal Mine Reach. Depths of over 10m lie W of this bank.

An abandoned coal depot and disused pier are situated on the SE side of Coal Mine Reach, 3 miles SW of Grassy Point.

A beacon, 0.45 mile E of Adolphy Point, lies in range, bearing 264° with the light shown on Adolphy Point.

Tides—Currents.—In Coal Mine Reach, the ebb starts 1 hour after HW by the shore and attains a maximum rate of 2.5 knots at springs. The flood begins about 1 hour 15 minutes after LW by the shore and attains a maximum rate of 2.75 knots at springs. Both the ebb and the flood set at a rate of 3.5 knots off Grassy Point and over Drake Bank at times.

Anchorage.—Anchorage can be taken about 0.2 mile N of the pier and about 0.2 mile offshore, in a depth of 12.8m. Smaller vessels can anchor closer in.

Vessels loading timber in Wallace Bay usually anchor opposite the timber ponds, in depths of 14.6 to 16.5m, 0.15 mile offshore. The anchorage is sometimes subject to severe squalls blowing down Coal Mine Reach.

Directions.—Vessels approaching from the E should pass about 1.5 miles off the N shore of Pulau Sebatik. When the lighted beacons in the vicinity of Adolphy Point come in range, bearing 264°, course should be altered to that bearing until the conspicuous sawmill or its light at Wallace Bay bears 214°. Then steer WSW to bring the Coal Mine Reach Light to bear 222°, and then steer that bearing until the anchorage.

10.13 Pulau Sebatik (4°10'N., 117°47'E.), a large island which lies on the S side of the channel leading to Tawau and Cowie Harbor, is about 20 miles in length and has a maximum width of 8 miles.

The channel separating this island from the mainland to the N is 3.5 to 5 miles wide; whereas, the channel to the W is only 0.5 mile wide.

A range of densely-wooded hills traverses the island throughout its length. Mount Antoinette, the summit of this range, rises to a height of 472m near the center of the island. Cornelis Peak, 168m high, stands near the E end of the island and serves as a good landmark for vessels approaching Tawau and Cowie Harbor from the E and S.

The boundary line between the Malaysian and Indonesian territories passes through the middle of the island on the parallel of 4°10'N. Boundary beacons mark the E and W coasts of the island where the line cuts the coasts.

Pulau Sebatik East Light (4°09.9'N., 117°53.92'E), on the NE side of the island, is shown from a 40m high white tower.

The E side of Pulau Sebatik, between **Stone Point** (4°04'N., 117°55'E.) and East Point, about 3.75 miles to the N, is bordered by a sandy beach backed by conspicuous red cliffs. The country inland is low and densely wooded.

A reef of sand and coral, which dries 0.3m, lies 1.75 miles SE of Stone Point. Padang Bank, Makassar Banks, and Unarang Rock, which lie SE and ESE of Stone Point, have been

previously described in paragraph 10.8.

Dutch Spit (4°04'N., 118°01'E.) is the E extremity of a shoal which extends about 5.75 miles E from Stone Point and the coast to the N of it. A detached shoal, with depths of less than 5.5m, lies at the E end of Dutch Spit. Another detached shoal, with a depth of 4.9m, lies 1.5 miles NNW of the extremity of the spit.

East Point (4°08'N., 117°55'E.) is backed by high casuarina trees and fronted by a drying sand and mud flat which extends 1.5 miles E from the point. A drying sand bank lies about 1.75 miles N of East Point and is steep-on its outer edge.

Tanjong Saima (4°11'N., 117°53'E.), low and bordered by mangroves, lies about 4.25 miles NW of East Point and is not easily identified. A detached sand bank lies about 0.5 mile N of the point and dries 1.2m. A 6.1m patch lies close W of the sand bank.

A shoal bank, as defined by the 11m curve, extends irregularly SE from Tanjong Saima to a position about 2.5 miles N of Unarang Rock, and then in a general WSW direction to a position about 4 miles SW of Stone Point.

Caution.—Vessels approaching Tawau or Cowie Harbor from the S should be careful in passing Unarang Rock and the E end of the 11m curve off Dutch Spit, especially when the tide is flooding.

The tidal currents off the E end of Palau Sebatik set NW at 1.25 knots and SE at 1.5 knots.

A shoal patch with a depth of 0.9m lies 2 miles WSW of Batu Tinagat.

The coast between Tanjong Saima and Prescott Point, about 7 miles to the WNW, is bordered by a slight indentation with shallow depths.

The coast then extends 6.5 miles W to Grassy Point, the NW tip of the island.

10.14 Grassy Point (4°16'N., 117°40'E.), the NW extremity of Pulau Sebatik located 13.5 miles WNW of Tanjung Saima, is fairly conspicuous being the only solid ground on the N coast of Pulau Sebatik, and appears as a grassy opening of flat land bordered by low clay cliffs.

A shoal, with shallow depths, lies off this point and then extends about 1 mile to the E as a narrow spit.

A channel, with a least depth of 10.3m, passes to the N of this spit and connects Cowie Harbor with Coal Mine Reach to the South.

The channel leading to Tawau and Cowie Harbor to the W is entered between Unarang Rock and Hand Rock, about 9.75 miles to the NE.

The NE side of the channel is bordered by an area of shoal ground which extends about 8.5 miles SE from Batu Tinagat.

The SW side of the channel is bordered by a similar shoal that extends 9.25 miles E and 5.75 miles NE from Stone Point. The channel has a least width of about 5 miles at its outer end and narrows to a width of about 2.75 miles between Tawau and Tanjong Saima, the NE extremity of Pulau Sebatik.

The channel has a least depth of 11.9m and is generally free from dangers, except for a 11m patch lying 7.75 miles WNW of Hand Rock.

Hand Rock (4°08'N., 118°10'E.), just awash, consists of rock on a small coral bank about 0.1 mile long and 91m wide.

The beacon which marks it is difficult to make out when bearing between N and W because of the dark coastal background. The beacon is equipped with a radar reflector.

The beacon was reported destroyed and replaced by a lighted buoy. This rock marks the turning point between the SW approach to Friedrich Haven and the channel leading to Tawau and Cowie Harbor.

Batu Tinagat (4°13'N., 117°59'E.), a small mushroom-shaped rock, 4.6m high, stands close to the coast off a point formed by a spur of the Batu Tinagat Hills.

Swirl Patch (4°12'N., 117°57'E.), with a depth of 3.6m, lies 2 miles WSW of Batu Tinagat, and almost 0.5 mile outside the 10m curve fronting the shore. It is easily made out because of the swirls and eddies.

Between the point 1 mile W of Batu Tinagat and the entrance of the Sungai Tawau 4.75 miles to the W, the coast is bordered by a shallow bay which is fringed by mud flats which extend from 0.25 to 0.75 mile offshore.

The coast between the entrance of the Sungai Tawau and the port of Tawau, about 1.25 miles to the W, is bordered by plantations and fronted by a drying bank of mud and sand which extends from 0.1 to 0.4 mile offshore.

10.15 Tawau (4°15'N., 117°53'E.) (World Port Index No. 51586) an export center of some importance, extends along the shore from Tawau Point for about 1 mile on the N side of the entrance of Cowie Harbor. Tawau is a first port of entry.

Tawau, Sabah Authority Home Page
http://www.suriagroupcom.my/spsb/ports/tawau-port

Tides—Currents.—The spring range of the tide off Tawau government pier is about 2.1m. At springs, the flood may attain a maximum rate of 1.75 knots about 45 minutes after LW. The ebb starts 30 minutes after HW, with a maximum rate of 2.75 knots. The direction and speed of tidal currents may be affected by freshets.

The average direction of the flood is 308°, which is 9° different from the 119° to 229° alignment of the government pier. A vessel stemming the flood and berthing 1 hour 30 minutes after LWS will be likely to find a component of the current equal to almost 0.5 knot setting on to the pier.

The average direction of the ebb is 131°, which is 12° different from the pier alignment. A vessel stemming the ebb and berthing 2 hours after HW will be likely to find a component of the current equal to more than 0.5 knot setting off the pier, though eddies may occur in this area. Maximum current conditions, such as those described in the above examples, are comparatively rare. A neap range as little as 0.9m may occur; at which time the current may be barely appreciable. With a neap range of 1.5m, a maximum flood rate of 1 knot and an ebb rate of 1.25 knots may be expected.

South of English Spit, the flood sets WNW at a rate of 0.5 knot and the ebb sets ESE at a rate of 0.75 knot.

Depths—Limitations.—With the exception of the dangers mentioned below, depths in the approach to Tawau range from 36.6m in the channel, to depths of less than 18.3m in the approach to the principal berthing facility.

Courtesy of Google

Tawau Port

Moysey Shoals (4°14'N., 117°54'E.), with a least swept depth of 2.7m, lies about 0.75 mile SSW of the S entrance point of the Sungai Tawau and about 0.25 mile off the 11m curve fronting the shore.

Harbor Shoals (4°14'N., 117°53'E.) consists of several patches with depths of 6.7 to 10.1m which lie about 0.75 mile NW of Moysey Shoals.

Wicks Rock (4°15'N., 117°52'E.), awash and marked by a light, lies about 0.7 mile NW of Tawau Point. A 9.7m shoal lies 0.45 mile SSE of Wicks Rock. There have been reports that material from the reclamation works at the oil jetty off Tanjung Batu was being dumped in an area about 3.5 miles SW of Wicks Rock.

Two general cargo wharfs project approximately 100m SW from the shore at Tanjong Tawau.

The NW wharf, also called the Main Wharf, has two access piers and is 460m in length. Depths range from 5 to 10m alongside. Vessels up to 16,000 dwt can be accepted

The SE wharf, also known as the Old Wharf, is 200m in length and has a single access pier. The depth alongside is reported to be 7.5m. Mooring dolphins stand off each end of the SE wharf. Vessels up to 10,000 dwt can be accepted

A jetty extends 0.15 mile W from the Malaysian Naval Base, about 0.65 mile NNW of Tawau Point in the immediate vicinity of Wicks Rock.

SPA Jetty, used for handling bulk palm oil, is situated about 1.65 miles NW of Tawau Point and extends to a length of 975m in a SW direction from the shore. The face of the jetty is 75m long with a breasting dolphin off each end. A controlling depth of 9.75m was reported alongside, and vessels up to 20,000 dwt can be accepted.

There is a area of land, reclaimed for industrial use, which extends 0.3 to 0.8 mile E from Tanjong Tawau. Further land has been reclaimed close W of Kuala Tawau.

Tawau—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Nunukan Ferry Terminal						
E Jetty	20m	—	—	—	—	Fast ferry.
West Pier	20m	—	—	—	—	Fast ferry.
Tawau Ferry Terminal						
Inner Jetty A	30m	—	—	—	—	Fast ferry.
Inner Jetty B	30m	—	—	—	—	Fast ferry.
Inner Jetty C	30m	—	—	—	—	Fast ferry.
Inner Jetty D	30m	—	—	—	—	Fast ferry.
Outer Jetty A	30m	—	—	—	—	Fast ferry.
Outer Jetty B	30m	—	—	—	—	Fast ferry.
Outer Jetty C	30m	—	—	—	—	Fast ferry.
Outer Jetty D	30m	—	—	—	—	Fast ferry.
Tawau Terminal						
Berth 01	100m	6.0m	—	—	10,000 dwt	Breakbulk. Berthing length of 265m (including dolphins). Continuous berthing length of 200m.
Berth 02	100m	6.0m	—	—	10,000 dwt	
Berth 03	100m	9.0m	—	—	16,000 dwt	Containers, breakbulk, and reefer. Continuous berthing length of302m.
Berth 04	100m	9.0m	—	—	16,000 dwt	
Berth 05	102m	9.0m	—	—	16,000 dwt	

Tawau—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Berth 06	75m	5.4m	—	—	16,000 dwt	Containers, reefer, and breakbulk. Continuous berthing length of 150m.
Berth 07	75m	5.4m	—	—	16,000 dwt	
Tanjung Batu Oil Terminal						
Tanjung Batu Oil Jetty	20m	9.7m	200m	9.0m	30,000 dwt.	Clean products, LPG, vegetable oils, and bunkers. Berthing length of 320m (including dolphins).

Aspect.—Vessels approaching from the E or SE and bound for Tawau or Cowie Harbor, should have no trouble identifying Cornelis Peak and Mount Antoinette on Pulau Sebatik. Both of these peaks are good landmarks. On the N side of the approach, Mount Putri, 311m high about 1 mile WNW of Batu Tinagat, and Mount Kukusan, 222m high about 2 miles NNW of Tawau, are useful marks.

Upon closer approach, the buildings in the town and the numerous plantations will be made out.

Kuala Tawau enters the sea about 4.75 miles W of Batu Tinaget. A number of high buildings stand within the port area on the reclaimed land W of Kuala Tawau. A conspicuous building stands 0.8 mile W of Kuala Tawau.

A conspicuous domed building stands 0.75 mile NNW of Harbor Shoals.

Conspicuous radio towers are situated 2.5 miles ESE and 1.5 miles NW of Mount Kukusan, and 4.5 miles WNW of the light on Batu Tinagat.

A shoal with a depth of 10.3m was reported 2 miles S of the Government Wharf at Tawau.

Pilotage.—A pilot is available to assist in berthing vessels between 0600 and 1800; 48 hours notice should be given.

Contact Information.—See the table titled **Tawau—Contact Information**.

Tawau—Contact Information	
Port Authority	
Call sign	Marine Control
VHF	VHF channels 12 and 16
Telephone	60-89-773700
Facsimile	60-89-761808
E-mail	subardjoe@spsb.com.my
Website	http://www.spsb.com.my/?q=ports/tawau-port-0
Pilots	
VHF	VHF channel 16
Telephone	60-89-773510

Regulations.—Vessels entering Cowie Harbor for the purpose of proceeding to Wallace Bay must anchor 0.5 to 1 mile S of Tawau, in 27.4 to 34.7m, for clearance by customs and immigration authorities. Vessels will be cleared between 0600 and 2200, provided advance notice of arrival is given.

Anchorage.—The immediate approaches to Tawau and Cowie Harbor offer spacious anchorage areas for large deep-draft vessels. There are depths of 12.8m and greater in the approaches and depths of 7.3 to 33m in Cowie Harbor.

The positions of the quarantine anchorage (2 miles SE of Tawau), the explosives anchorage (2 miles SW of Tawau), and the petroleum anchorage (1.5 miles NW of Tawau) may best be seen on the chart.

Anchorage is prohibited within 0.3 mile of the NW and SE wharfs.

Directions.—Vessels approaching Tawau or Cowie Harbor from the SE should give Unarang Rock and the outer tip of the shoal area, about 2.5 miles N, a wide berth when passing. When Mount Kukusan, bearing 297°, is well clear SW of Mount Putri, steer 287°. To avoid Swirl Patch care should be taken to bring Mount Kukusan to bear more than 312° by the time Mount Putri is abeam.

The danger will be passed when **Saddle Hill** (4°18'N., 118°11'E.) is lost behind Batu Tinagat.

When Mount Kukasan bears 357° W of Tawau Point, course should then be altered to this bearing, which leads to the anchorage and clear of Moysey Shoals and Harbor Shoals.

10.16 Cowie Harbor (4°17'N., 117°46'E.), a broad expanse of water, lies W of an imaginary line extending between Tawau and Tanjong Saima. Mangroves line the shores of the numerous creeks and rivers which intersect the shallow delta at its head, with Kalabakang being the principal river.

The harbor has been surveyed as far as the limits of navigation, about 12 miles above Tawau; above this limit the harbor is fouled by numerous mud flats intersected by deep but intricate channels leading to the various rivers. Both shores of the harbor are lined by mangroves fronted by extensive mud flats and present no distinguishing features.

The depths within the harbor are regular over a bottom of soft mud. Depths in the central part of the harbor range from 12.8 to 14.6m.

From Tawau, the N coast of the harbor extends in a general WNW direction for 12 miles (the limits of the survey) and is broken by numerous small creeks and rivers.

The principal river is the Sungai Merutai, which discharges about 7 miles WNW of Tawau. Only small local craft can be accommodated.

Anchorage.—Anchorage can be taken, in depths of 12.8 to 14.6m, about 0.5 mile SW of Heherr Point. Vessels use this anchorage to load timber.

It was reported that the coast between Morrell Bluff and Heherr Point had extended seaward about 0.4 mile.

Batu Tinagat to Friedrich Haven

10.17 The coast between Batu Tinagat, previously described in paragraph 10.14, and Friedrich Haven, about 24.5 miles to the E, is backed by dense jungle growth with some high mountain ranges and peaks rising inland. The Sungai Balung and the Sungai Kalumpang, two small rivers of little or no commercial importance, discharge along this section of coast. A large area of shoal ground extends about 8.5 miles SE from Batu Tinagat, turns abruptly to the N, and then E to a position about 4.5 miles SE of the entrance of the Sungai Kalumpang and borders the N side of Friedrich Haven. Seaward of this shoal and parallel to it, a chain of off-lying dangers extends NE and borders the S side of the SW approach to Friedrich Haven.

Depths—Limitations.—The shoal bank, defined by the 11m curve, which extends 8.5 miles SE from Batu Tinagat and then extends N to a position about 3 miles S of the entrance of the Sungai Balung, has depths of less than 11m and in many places has depths of 5.5m and less.

English Spit (4°12'N., 118°08'E.), with depths of less than 5.5m, lies on this shoal bank with its SE end about 5.5 miles SSW of the entrance of the Sungai Balung. Its inner part fringes the coast between the Sungai Balung and Batu Tinagat. The shoal water to the N of English Spit has been reported to be extending to the E. A patch 2.7m lies 2 miles SW of English Spit.

Hand Rock, which lies about 12 miles SE of Batu Tinagat, has been previously described in paragraph 10.14. A detached shoal, with a least depth of 0.3m, sand and coral, lies 3 miles NNE of Hand Rock.

10.18 Darby Bank (4°07'N., 118°13'E.), a coral bank with a least depth of 11m, lies about 3.25 miles SE of Hand Rock and is the outermost danger in the SW approach to Friedrich Haven. Mount Kukusan, bearing 300° and kept well open SW of Mount Putri, leads SW of Hand Rock and Darby Bank.

Alert Patches (4°09'N., 118°15'E.), which consist of three coral patches with a least depth of 7m over each one, extend 1.5 to 4.5 miles NNE of Darby Bank. Vessels are cautioned not to cross Darby Bank or Alert Patches because depths less than charted may exist.

Roach Reefs (4°10'N., 118°18'E.), two detached reefs 0.25 mile apart, lie within the limits of a narrow shoal located about 1 mile ENE of the N Alert Patch. The NE reef dries 0.9m. A detached coral patch, with a least depth of 7m, lies about 1.25 miles NE of the larger reef.

Egeria Shoal (4°12'N., 118°15'E.), a small coral patch with a least depth of 3.5m, lies 3.25 miles NW of Roach Reef. It lies on the NW side of the fairway to Friedrich Haven, and has a clear passage 3 miles wide between it and the Roach Reefs.

A small narrow reef, almost awash, lies 0.75 mile NNE of Egeria Shoal.

Heel Reef (4°14'N., 118°14'E.), a small coral and mud patch which dries 0.6m, lies about 0.5 mile NNW of Egeria Shoal. The reef is marked by a light shown from a 6m metal tower. It was reported that the beacon was destroyed and had been replaced by a lighted buoy.

10.19 Lehnert Reef (4°15'N., 118°15'E.), a sand and coral patch which dries 0.6m near its S end, lies 3 miles N of Egeria Shoal. Discolored water exists in the vicinity of the drying part of this reef.

Chance Rock (4°14'N., 118°18'E.), a steep-to detached coral head with a least depth of 2.5m, lies 2.75 miles ENE of Egeria Shoal.

Caution.—Egeria Shoal, Heel Reef, Chance Rock, and Lehnert Reef are all difficult to make out because of the muddy water in their vicinity.

10.20 Friedrich Reef (4°14'N., 118°21'E.), a small detached coral reef with a sand cay on its N side which dries 2m, lies about 0.65 mile ENE of Chance Rock.

Erzherzog Reef (4°15'N., 118°23'E.), a detached reef with a sand cay that dries 1.8m on its N side, lies 2 miles E of Friedrich Reef. The coast between Batu Tinagat and the entrance of the Sungai Balung, about 12 miles ENE, is low and fronted by a mud flat which extends up to 0.5 mile offshore.

The Sungai Apas, a small shallow river, discharges about 5 miles ENE of Batu Tinagat.

The **Sungai Balung** (4°18'N., 118°10'E.), a narrow, winding river fronted by a drying mud flat, is available only to small craft with local knowledge. Saddle Hill, which rises to a height of 101m on its E side and 137m on its W side, stands on the E side of the entrance of this river. The two summits of this hill are about 1.25 miles apart.

The coast between the Sungai Balung and the Sungai Kalumpang, about 10 miles to the ENE, continues low and is bordered by mangroves. Shoal ground, as defined by about the 10m curve, extends from 2.5 to 5 miles offshore along this section of coast.

The **Sungai Kalumpang** (4°20'N., 118°20'E.) is obstructed by a bar with depths of not more than 0.9 to 1.2m. Within the river, the depths range from 2.7 to 11m. On entering, it appears as a fine broad river with two branches passing on either side of a long narrow island. Only small craft with local knowledge can be accommodated.

Pulau Kalumpang, 85m high and densely wooded, stands at the mouth of the river and is bordered by two channels with the E channel of the two being the preferred entrance. The W channel almost dries. A small village stands on the N side of the island.

10.21 Friedrich Haven (4°16'N., 118°24'E.) lies between the shore bank to the N and Friedrich, Erzherzog, and Horn Reefs to the S and E. The least width of almost 1 mile lies between the 10m curve fronting the W horn of the Ligitan Reefs. This horn can generally be made out. Depths in the haven range from 11 to 33m.

Anchorage.—Anchorage can be taken, in a depth of about 11m, mud, with the NW extremity of Pulau Silungan, about 5.75 miles E of the SE end of Pulau Kalumpang, in range, bearing 055°, with **Mount Conner** (4°24'N., 118°34'E.), and Pulau Kalumpang, bearing 324°.

The flood sets S and W through Friedrich Haven and the ebb to the N and E at a rate of 0.75 knot.

Directions.—The outer route from Friedrich Haven passes SE of Chance Rock and Egeria Shoal, and between Alert Patches and Hand Rock. After passing close NW of Friedrich

Reef vessels should keep the N extremity of Pulau Silungan in range, bearing 055° with Mount Conner astern. This course leads between the above dangers, and 0.75 mile SE of the lighted beacon on Hand Rock, which marks the turning point for Tawau.

From a position about 0.5 mile N of Friedrich Reef, after the sand cay on it has been sighted, steer 265° which will lead about 0.6 mile S of the beacon on Lehnert Reef, and the same distance N of the light structure on Heel Reef. When the W summit of Saddle Hill bears 345°, alter course to 210° which will lead 1 mile NW of the 0.3m shoal lying 3 miles NNE of the light structure on Hand Rock, then about 0.25 mile SE of the elbow of the 11m curve off English Spit, and 1.25 miles NW of the light structure on Hand Rock.

Hand Rock and the 0.3m shoal are considered dangerous along this route and great caution should be observed when passing them. Soundings should give warning if the SE edge of English Spit is being approached too closely. If depths of 12.8 to 14.6m are maintained, a vessel will pass a safe distance off this spit.

Directions for entering the main channel leading to Tawau are given under the principal description of that port.

Friedrich Haven to Pulau Bum Bum

10.22 The coast between Friedrich Haven and Pulau Bum Bum, about 17 miles NE, is bordered by densely wooded hills, ranges, and indented by a few shallow inlets.

Terusan Tando Bulong, the passage entered about 9.5 miles NE of Friedrich Haven, leads between the mainland and the large reefs and shoals which lie to the S and SW of the S side of Pulau Bum Bum. Semporna, the only port of any importance, is situated on the W side of this passage to the W of the NW extremity of Pulau Bum Bum.

The Ligitan Reefs and the Ligitan Group of reefs and shoals extend up to 30 miles E from Friedrich Haven. Narrow passages separate some of the dangers. Ligitan Channel, wide, deep, and clear of dangers in the fairway separates these two groups from Creagh Reef and Beaufort Reef to the N. These latter two dangers are separated by a narrow channel known as Silapag Passage.

Ligitan Reefs (4°15'N., 118°30'E.) consist of a group of reefs, some of which dry or are awash at LW, which extend about 6.5 miles E from Horn Reef, the westernmost danger. The N side of these reefs is fringed by moderate depths, whereas their S sides are steep-to close offshore.

10.23 Horn Reef (4°15'N., 118°26'E.), L-shaped and the westernmost danger of Ligitan Reefs, is separated from Erzherzog Reef to the W by a deep channel about 0.5 mile wide. A detached reef lies on the W side of this channel about 0.5 mile NNE of the E end of Erzherzog Reef. A detached 6m patch lies almost 1 mile ESE of the light on the NW end of Horn Reef.

A narrow channel, with a least depth of 12.8m in mid-channel, separates the E part of Horn Reef from the dangers to the E.

The two E reefs lie on a shoal bank which extends from the above channel to Mabul Passage about 8.25 miles to the E.

Mabul Passage is about 3.5 miles wide between the easternmost reef of the Ligitan Reefs and Mabul Reef to the E. A shoal, with a least depth of 5.5m, obstructs the central part of this passage. A detached shoal, with a least depth of 7.9m, lies on the E side of this passage. The deepest part of the passage, which is a little more than 0.5 mile wide, lies between these two shoals and carries a depth of 12 to 14m.

Collins Patch (4°16'N., 118°36'E.), a detached shoal with a least depth of 4.9m on its S part, lies about 1.5 miles N of the center of Mabul Passage. A small 11m patch lies about 0.5 mile E of the S end of Collins Patch, and a similar patch, with a least depth of 8m, lies about the same distance SE of the same end. Vessels should not cross these shoals because the depths are uneven and it is possible that other shallow patches may exist.

Mount Sedungal (4°38'N., 118°34'E.) in range 356° with the W extremity of Pulau Sipanggau on the W side of Creagh Reef, leads to the W of Collins Patch and through Mabul Passage.

10.24 Ligitan Group (4°14'N., 118°45'E.) consists of a group of islets and reefs which extend 18 miles E from Mabul Passage and form part of the S side of Ligitan Channel. The E part of the Ligitan Reefs also borders the S side of this channel.

Mabul Reef (4°14'N., 118°38'E.), the W reef of the Ligitan Group, borders the E side of Mabul Passage.

Pulau Mabul, a small and densely wooded islet, 49m high, stands on the N side of this reef.

Three detached patches, with depths of 10.9m and less, lie within 0.75 mile NE through N to NNW of the SE end of the island.

Pulau Kapalai (4°13'N., 118°41'E.), a small narrow bush-covered islet 12m high, on the NE side of a detached reef, which lies with its NW end about 2.5 miles SE of Pulau Mabul. A narrow channel about 0.25 mile wide, with a least depth of 11m in the fairway, lies between the shoals extending SE from Mabul Reef and NW from Pulau Kapalai.

Vessels are advised not to use this channel because of the shallow depths which fringe its sides. Mabul Passage should be used instead.

Cust Reef (4°17'N., 118°43'E.), awash at LW, lies on the NW part of a shoal bank 3 miles long and 1.5 miles wide which lies centered 4 miles NE of Pulau Kapalai. A larger reef lies to the SE of Cust Reef and is separated from it by a narrow shallow channel. The channel E of this reef, between it and a projecting spur of the main reef about 2 miles to the E, has been examined in a very general way and although no shoal patches were found, vessels are advised not to use it. A light is shown on the N edge of the N reef.

Pulau Danawan (4°18'N., 118°51'E.), a high, wooded, and flat-topped island, stands at the N end of the largest reef in the Ligitan Group about 11.5 miles NE of Pulau Kapalai. A cliff, 17m high, stands on its E point and its N point is of the same height. A village is situated on the W side of the island.

10.25 Pulau Si Amil (4°19'N., 118°52'E.), densely wooded and high, stands 0.5 miles NE of Pulau Danawan and is the site of a canning factory. A bay lies between the two islands. A deep passage, about 0.2 mile wide, enters this bay from the N and a similar passage enters from the SE.

A light is shown from an 11m high metal framework tower.

Protected anchorage can be taken within this bay, in a depth

of 29m, about 0.15 mile off the shore of Pulau Danawan.

The main body of the large reef extends 10.5 miles SSE from Pulau Danawan, then extends in a gentle curve for 8.5 miles to the W to the SW extremity, and then irregularly NNE back to the point of origin.

In coasting along the E side of this reef, care should be taken not to approach too closely because considerably less water than charted has been reported to exist about midway along this side within the 200m curve which extends up to 2 miles offshore.

Heavy overfalls and tide rips are usually encountered off this side of the reef. The water in this area is also considerably discolored.

Pulau Ligitan (4°10'N., 118°53'E.), 9.1m high and partially bush-covered, stands on the S part of the main reef about 8.5 miles S of Pulau Danawan. A detached 4.9m patch lies about 2.25 miles S of Pulau Ligitan and 0.5 mile S of the 11m curve fronting the main reef.

Great care should be taken when approaching this end of the reef to be certain of the position because the currents run at a rate of 2 to 3 knots raising heavy overfalls and whirlpools.

Foul ground with shallow depths extends 2.5 miles W from the SW end of the main reef. The channel between this foul ground and the reef extending 1.25 miles SSE from Pulau Kapalai is almost 1.5 miles wide, but is obstructed in its middle part by a detached 9m patch.

This channel has not been closely examined and less water than charted may exist.

10.26 Pulau Sipadan (4°07'N., 118°38'E.), a small wooded islet 50m high to the tops of the trees, stands on the NW side of a steep-to reef that lies 7.5 miles S of Pulau Mabul. The islet has been reported to be a good radar target up to 18 miles.

A light, with a racon, is shown from a 22m high metal framework tower situated on the fringing reef close S of the island.

Ligitan Channel (4°18'N., 118°40'E.), which lies between the Ligitan Group and the Ligitan Reefs to the S and Beaufort Reef and Creagh Reef to the N, is 18 miles long in an E and W direction and varies in width from 6 miles abreast of Pulau Si Amil to 1.5 miles at its W entrance between Pulau Gusungan, and the E reef for the Ligitan Reefs.

The general depths in the E part range from 20 to 25.6m, with patches of 11 to 18.3m. Farther to the W are depths of 33 to 36.6m. With the exception of Collins Patch, no other dangers are known to exist in the channel seaward of the fringing dangers along the edges of the reefs. However, the depths N and NW of Pulau Mabul are very uneven up to 2.5 miles offshore. Vessels should keep N of this uneven ground when passing Pulau Mabul.

The flood current in Ligitan Channel sets to the S and W and the ebb to the N and E at a rate of 1 knot at springs.

Webb Shoal (4°24'N., 118°52'E.), lying off the NE side of the approach to Ligitan Channel about 5.5 miles N of Pulau Si Amil, has a least depth of 9m. The shoal has not been closely examined and vessels are advised not to pass over this shoal because lesser depths may exist.

A detached 11m patch lies about 6 miles SW of Webb Shoal.

Beaufort Reef (4°23'N., 118°44'E.), sand and coral and drying in patches, lies S of the E part of Pulau Bum Bum and is separated from it by the NE part of Silapag Passage. The reef is about 6 miles long and has a greatest width of 4 miles.

Pulau Omadel (4°25'N., 118°45'E.), low, wooded, and 46m high to the tops of the trees, stands on the NE side of this reef. A village stands on the NW side of the islet.

Three shoals lie off the NE side of Beaufort Reef. The N patch, with a least depth of 5.5m, lies 2 miles E of the E extremity of Pulau Omadel. The S patch, with a least depth of 6m, lies 1.75 miles SE of the same point. A 9m patch lies close N of this latter patch.

10.27 Creagh Reef (4°20'N., 118°37'E.), an extensive flat of sand and coral which dries in patches, extends about 5.5 miles S and 7.5 miles SW from the SW point of Pulau Bum Bum. Pulau Menampilik, 105m high, lies SW of the SW point of Pulau Bum Bum. Pulau Nusatongga, with two hills 126m and 111m high, stands 1 mile NE of the above islet, and Pulau Sipanggau, 119m high, stands almost 0.5 mile NE of the latter islet.

A wooded islet, 24m high, stands near the center of the reef about 1.75 miles SSE of the SW point of Pulau Bum Bum.

Silapag Passage (4°20'N., 118°41'E.), a narrow winding passage, with a least depth of 12m, lies between Creagh Reef on the W, Beaufort Reef on the E, and Pulau Bum Bum to the N. The passage in its S part has a navigable width of about 0.25 mile up to a distance of 4 miles above the entrance, and widens out to a width of about 0.6 mile for the remaining distance until the NE entrance is cleared. Within the passage, the flood sets to the S and W and the ebb to the N and E. During springs the currents run at a considerable rate.

Anchorage.—Anchorage has been taken in the N part of this passage about 0.15 mile N of the village on Pulau Omadel, but this anchorage is not recommended because the currents are strong and the swinging room is restricted.

10.28 The low coast, between Tanjong Nagos on the mainland to the N of Friedrich Haven, and Tanjong Tutup about 8.5 miles ENE, is fringed by a shoal bank with depths of 11m and less. The bank extends about 2.5 miles offshore from Tanjung Nagos, but closes the coast in the vicinity of Tanjong Tutup.

Pulau Gusungan (4°18'N., 118°33'E.), a small, low sand cay 1m high and partially bush covered, stands on the NW extremity of a drying reef which lies about 1.75 miles SW of the SW extremity of Pulau Menampilik.

Pulau Silungan (4°19'N., 118°27'E.), a small wooded islet 52m high, stands 2.5 miles ESE of Tanjong Nagos. Immediately N of Tanjong Nagos there is a wooded range of hills from 256 to 366m high, and 6.25 miles NNW of the point is Mount Pock, 567m high, the W peak of a range extending to the NE.

This range is separated from the wooded range to the S by a deep valley. Mount Pock is the summit of the ranges on the E side of the valley of the Sungai Kalumpang. Double Hill, with two summits of almost equal height, rises about 5.5 miles NNE of Tanjong Nagos. Mount Conner, a densely-wooded peak 390m high, stands about 3.5 miles NNE of Tanjong Tutup and is a good mark for vessels approaching from the SW.

10.29 Trusan Tando Bulong (Treacher) (4°20'N., 118°33'E.), a narrow winding strait, is entered between Tanjong Tutup and the SW side of Creagh Reef to the E, and extends about 8.5 miles NE and then extends 5 miles NNW to the

N entrance off the NW extremity of Pulau Bum Bum. The strait is about 0.5 mile wide in its S part, but contracts to a width of less than 0.25 mile in its N part.

The least depth in the fairway near the S entrance is 12m increasing gradually to a depth of 14.3m in the N entrance. A shallow bank, with depths of 9.1m and less, extends more than half way across the fairway from the E side of the N entrance.

The tidal current sets through this strait with considerable strength at times and the edges of the reefs are difficult to make out. Numerous small fishing stakes are placed along the channel edges, but they are frequently moved and do not always mark the outer limits of the reefs.

A detached 4.9m depth lies on the E side of the N entrance about 1.5 miles NNW of the NW extremity of Pulau Bum Bum.

Pulau Sipanggua, Pulau Nusatongga, and Pulau Menampilik are the islands standing along the outer edge of the SW part of Creagh Reef, which has been previously described in paragraph 10.27. The W side of Pulau Bum Bum, which forms the E side of the N part of the strait, is densely wooded and cliffy and is fringed by a shore bank about 0.25 mile wide. Daisy Islet stands near the edge of this bank about 2.25 miles S of the NW extremity of Pulau Bum Bum.

The W side of the strait N of Tanjong Tutup is indented by four shallow inlets of no importance and backed by high hills up to 8.5 miles NE, and then backed by low coastal plains for the remaining distance. Mount Conner, which has been previously described in paragraph 10.28, stands along this stretch of coast about 3.5 miles NNE of Tanjon Tutup and Hood Hill, 160m high, stands 3 miles farther NE.

Lighted and unlighted beacons are placed on the reefs on both sides of the strait to mark the channel sides.

Tides—Currents.—The mean range of the tide is 1.1m and the spring range is 1.6m.

In Trusan Tando Bulong, the flood sets to the S and the ebb to the N at a rate of 3 to 4 knots at springs. The currents are strongest in the narrow N part of the strait between Pulau Bum Bum and the coast to the W. These rates are subject to change at various seasons of the year.

Directions.—Vessels approaching from the S and entering the S end of the strait from Ligitan Channel may pass between Pulau Gusungan Reef and the SW extremity of Creagh Reef. The channel is about 0.5 mile wide but the edges of the reefs are not always visible. Vessels using this channel should bring the N summit of Double Hill in range, bearing 309° with the W extremity of Tanjong Tutup which leads between Gusungan and Creagh Reefs.

Vessels approaching from the SW should keep the NW extremity of Pulau Menampilik in range, bearing 066° with the SE extremity of Pulau Nusatongga which leads NW of Pulau Gusungan Reef and into the S entrance of the strait.

The S part of the strait, being wider and well marked by beacons on the reefs, a mid-channel course should be followed for about 8 miles to the NE at which place the channel then turns to the NNW.

The only known dangers outside the reefs on either side of the channel are two small coral patches.

The E side patch lies NW of Pulau Sipanggau and 0.2 mile beyond the edge of the reef.

The other lies W of the S part of Pulau Nusatongga and 0.15 mile beyond the edge of that part of the reef.

Having passed the bend, course should be altered to the NNW and a mid-channel course maintained, passing about 0.2 mile SW of Daisy Islet, and 91m off the head of the pier at Semporna.

Having cleared the pier, course should be altered to 350° with the outer end of the pier bearing 170° astern.

This course will clear the 9.1m shoal bank extending into the channel NW of the NW extremity of Pulau Bum Bum.

When the N extremity of Pulau Bum Bum bears 104°, course should be altered to 012° with **Lok Bakong Hill** (4°26'N., 118°36'E.) kept bearing 192° astern.

This course clears the 4.9m depth which lies about 1.5 miles NNW of the NW extremity of Pulau Bum Bum.

Having cleared this danger, course should then be altered as necessary in order to pass between **Pulau Larapan** (4°34'N., 118°36'E.) and the reef extending N from Pulau Sabangkat to the E and proceed to the N into Darvel Bay.

10.30 Semporna (4°29'N., 118°37'E.), a small fish and timber-exporting center, stands on the W bank of the strait about 1.5 miles within the N entrance.

About 0.25 mile SE of the settlement, a coral causeway extends in a NE direction across the reef to deep water.

A concrete pier, 46m in length and 12m wide, with a least depth of 9m alongside, stands at the head of the causeway.

Pilotage.—Pilots are not available.

Anchorage.—Anchorage can be taken about 0.2 mile off the reefs off Semporna. The holding ground is mud and sand over coral.

Vessels loading timber usually anchor SW of Pulau Harapin.

Vessels having explosives on board must not anchor in Trusan Tando Bulong S of 4°30'N. Also, vessels must not anchor in the approach fairway.

Vessels with dangerous petroleum on board must not anchor within 305m of the piers.

10.31 Pulau Bum Bum (4°28'N., 118°41'E.), roughly triangular in shape, densely-wooded, and 46 to 52m high to the tree tops, forms the E side of Terusan Tando Bulong and the N side of Silapag Passage.

The N coast of the island extends about 8.5 miles ESE to Tanjong Pantau Pantau and is fringed by a drying sand and coral reef which extends about 1.35 miles offshore.

Some small islets lie within the limits of this reef.

Several small villages line the shore along this section of coast.

The S coast between Tanjong Pantau Pantau and the SW extremity of the island about 7 miles WSW, is fringed by a reef which forms the N and W sides of Silapag Passage.

Islands and Dangers East and North of Pulau Bum Bum

10.32 Pasalat Reef (4°30'N., 118°44'E.), awash, lies near the middle of a long narrow shoal 3 miles long, which lies with its E end 2.75 miles N of Tanjong Pantau Pantau. A deep 0.75 mile wide channel lies between this reef and the reef fringing Pulau Bum Bum.

Bulipatuid Shoal (4°29'N., 118°47'E.), with a least depth of

7.9m in its central part, lies about 2.75 miles NE of Tanjong Pantau Pantau. Vessels should not attempt to cross this shoal because less water than charted may exist.

Baturua Reef (4°31'N., 118°49'E.), which dries, lies within the limits of a shoal about 4 miles long which lies with its S end about 5.5 miles ENE of Tanjong Pantau Pantau. Tidal currents run strongly round the reef. A deep channel separates this reef from Bulipatuid Shoal.

Pulau Kulapuan (4°32'N., 118°51'E.), a flat-topped island, 39m high to the tops of the trees, stands 7 miles NE of Tanjong Pantau Pantau and on the N part of a reef that extends about 2.5 miles SSE from the island. This reef uncovers in patches. A small drying sand cay lies near the S end of the reef. The reef is steep-to on all except its S side from which depths of less than 18.3m extend about 0.75 mile. Clear deep channels pass on either side of this reef.

Pulau Gaya and Pulau Bahadulong, two high densely-wooded islands standing on the same reef and almost joined, are the most conspicuous landmarks seen when approaching Darvel Bay from the S. Together they form a crescent 4 miles wide between the horns. These islands together with Pulau Timbun Mata, which lies close off the coast about 8 miles to the W, are visible from the N part of Sibuku Bay over the low islands to the S.

Pulau Bohaydulong (4°36'N., 118°47'E.), which stands 8 miles N of Tanjong Pantau Pantau, forms the E horn of the crescent and rises to a height of 366m. A radio mast and a single tree stand on this conspicuous peak.

Pulau Gaya (4°37'N., 118°45'E.), lying with its E extremity close W of the NW point of Pulau Bohaydulong, extends 2.25 miles WNW and then 2.25 miles SW. The SW part of this island rises to a height of 469m with two slightly lower peaks close to it. From the N and E these peaks present a remarkable outline. The E part of Pulau Gaya terminates in a conspicuous peak, 378m high. The low land between the E and W parts of the island makes the island appear as two from some directions. A shoal, foul lagoon, enclosed by the island reef, lies close off the NW part of the island.

10.33 Pulau Tatagan (4°36'N., 118°43'E.), 97m high and partially cleared near its summit, stands close S of the SW point of Pulau Gaya. A village stands on the N side of the island.

Detached reefs and foul ground extend 2.25 miles SW from the S side of Pulau Bohaydulong and 2.5 miles NW forming a protected lagoon on the S side of the crescent formed by the two islands. The inner part of this lagoon is fairly clear with depths of 12.8 to 23m being found in the middle part. The entrance of the lagoon lies S of Pulau Tatagan and is less than 0.1 mile wide with a least depth of 6.4m in the fairway. Less water than charted in the fairway has been reported. There are no aids to assist in entering and only vessels with local knowledge should attempt it.

Anchorage can be taken, in a depth of about 18m, sand, E of the village on the N side of Pulau Tatagan. Anchorage can also be taken outside the lagoon in a similar depth with Pulau Tatagan bearing 036°, distant 0.5 mile, but strong currents are experienced.

Clear deep channels surround this group of reefs and islands, but care should be taken to clear the shoal, with a least depth of 8.2m, which lies about 1.5 miles NE of the N end of Pulau Bohaydulong.

Pulau Sabangkat (4°34'N., 118°40'E.), a small island 49m high to the top of the trees, lies about 3.75 miles SW of Pulau Tatagan. This island stands at the SW end of a reef which extends 3 miles E and 4.5 miles NNW. This reef encloses a foul shallow lagoon with no entrances leading into it.

Pulau Salakan (4°34'N., 118°42'E.), 73m high and wooded, stands 1.5 miles SW of Pulau Tatagan and within the limits of the same reef.

Pulau Maiga (4°36'N., 118°41'E.), 38m high, stands on the S and W sides of a narrow reef 1.5 miles long, which lies with its S end about 1.25 miles N of Pulau Salakan. A narrow, deep, clear passage lies to the E of the reefs surrounding Pulau Maiga and Pulau Salakan, and to the W of the reefs surrounding Pulau Gaya.

10.34 Pulau Sibuan (4°39'N., 118°40'E.), 460m high to the tops of the trees, stands on the S end of a reef about 0.75 mile long which lies with its S extremity about 5 miles N of Pulau Sabangkat.

Two high prominent trees stand close together on the center of the island and are useful landmarks. Clear deep channels pass on all sides of this reef and island. Magnetic compass variations up to 20° were reported observed 0.3 mile W of Pulau Sibuan.

Church Reef (4°41'N., 118°39'E.), awash and about 1.5 miles long and 1 mile wide, lies with its S extremity 1.25 miles NW of Pulau Sibuan.

Tides—Currents.—The currents run very strongly around and between these islands and reefs. Generally speaking, the ebb sets to the N and E and the flood to the S and W at a rate of 1 to 1.25 knots.

Directions.—The NE extremity of Pulau Sabangkat in range, bearing 297° with Mount Tannaballu leads NE of Bulipatuid Shoal and Pasalat Reef and between them and Baturua Reef.

Richards Reef (4°44'N., 118°43'E.), lying centered about 6 miles NE of Pulau Sibuan, consists of a group of partly drying reefs separated by narrow channels. The reefs are steep-to on all except their NW and NE sides.

Freemante Shoal (4°44'N., 118°46'E.), an irregularly-shaped bank with a least depth on its S part, lies about 2 miles ENE of Richards Reef and is steep-to on all sides.

Pulau Mantabuan (4°38'N., 118°47'E.), a small bell-shaped islet about 30m high to the top of the trees, lies 1.5 miles NE of the E end of Pulau Gaya. A triangular-shaped reef, enclosing a lagoon, extends 1.5 miles NW from the islet.

A reef, topped by a drying sand bank, extends 1.75 miles N from a position about 2.35 miles ESE of Pulau Mantabuan. The reef is steep-to on all except its S side, from which a shoal extends 0.5 mile to the S. A least depth of 7.3m lies near the S edge of this shoal.

Pulau Pom Pom (4°36'N., 118°52'E.), a small, wooded, and circular islet, 24m high to the tops of the trees, stands 4.5 miles SE of Pulau Mantabuan. A narrow steep-to reef surrounds this islet.

10.35 Pulau Pandanan (Pulau Kapale) (4°35'N., 118°55'E.), wooded and about 15m high to the tops of the trees, stands on the SW side of a reef almost 1 mile long which

lies with its N end about 3 miles ESE of Pulau Pom Pom. A bush-covered islet stands on a drying sand spit which extends 0.25 mile N from the island. A shallow bank joins this reef with the N extremity of a reef about 0.65 mile to the S.

Pulau Timba Timba (4°33'N., 118°55'E.), a small wooded islet about 10m high, lies near the N end of a narrow steep-to reef about 7 miles long which lies close S of the reef on which Pulau Pandanan stands. A drying sand bank extends 0.5 mile S from this islet.

Pulau Bohayan, 36m high and densely wooded, lies near the S end of the same reef on which Pulau Timba Timba stands.

Two small detached shoal patches, with depths of 11.6m and 14.6m, lie about 8.5 miles ENE of Pulau Bohayan.

Pulau Mataking (4°34'N., 118°57'E.) and Pulau Mataking Kechil stand on the W side of a narrow steep-to reef which extends 2.5 miles N from a position 2 miles ENE of the S end of Pulau Timba Timba. The E side of this reef forms the W side of Alice Channel and a deep channel, 1.5 miles wide lies between this reef and the reefs to the W and SW.

Pulau Mataking is wooded and 24m high to the tops of the trees, while Pulau Mataking Kechil is only 15m high.

A narrow, drying sand ridge joins the two islands.

Alice Channel (4°35'N., 119°00'E.), the S entrance leading into Darvel Bay to the N, is a deep passage about 6.25 miles wide at its narrowest part. It connects Darvel Bay with the N side of Sibuku Bay, and separates the islands and reefs to the W from the islands and reefs which lie near the W extremity of the Sulu Archipelago. These dangers are described in Pub. 162, Sailing Directions (Enroute) Philippine Islands.

10.36 Bajapa Reef (Sikorong Reef) (4°41'N., 119°05'E.), which marks the E side of Alice Channel, extends NNE 9 miles from a position 6.75 miles E of Pulau Mataking Kechil. The reef dries in places and encloses a lagoon in the center which is entered from the SW side. The reef is steep-to on all but its N side, which is marked by shoal water for a short distance.

Panguan Islet (Maranas Islet) (4°43'N., 119°02'E.), a small, wooded islet 23m high, stands on the S half of a narrow steep-to reef which lies about 8.75 miles NE of Pulau Mataking Kechil. A shoal, with a least depth of 9.1m, extends 0.2 mile N and SW from this reef.

Alice Reef (4°45'N., 119°04'E.), which encloses a lagoon and is 5.5 miles long, lies with its S end about 1.25 miles SE of Panguan Islet. The reef is steep-to on all except its NE point, which is bordered by a shoal, which extends about 0.5 mile offshore. Alice Reef bares in spots at LW.

In Alice Channel tidal currents are strong, especially in the vicinity of Panguan Island and Bajapa Reef and set straight through the channel between the steep-to edges of Alice Reef and Bajapa Reef. The flood sets S and W and the ebb to the N and E at a maximum rate of 2 to 2.5 knots.

10.37 Darvel Bay (4°48'N., 118°47'E.) is located on the S side of the peninsula of which Tanjong Unsang is the NE extremity and is entered between Tanjong Labian and the islands and reefs to the W of Alice Channel.

The N shore of the bay, W of Tanjong Labian, is clear of offlying dangers except Howard Shoal, a 4.1m patch about 35 miles WSW of Tanjong Labian, and Kinabalu Shoal, a 4.9m patch 6.75 miles farther W; there are numerous islands and coral reefs in the W and S parts of the bay.

Several rivers discharge into the bay, but none have any commercial value to ocean-going vessels.

The hills on the N side are densely wooded and mostly low and undulating, of uniform height, presenting but few definite features, and terminate in the Bagahak Range midway along the coast. The S side is also thickly wooded with mountainous ranges some distance inland, but these are generally more remarkable in shape and more easily identified than those on the N shore.

Most prominent among them are Mount Madai and Sinalong; on a clear day Mount Silam, at the head of the bay, towers above all others in the vicinity.

Of the islands in the bay, Timbun Mata separated from the mainland by a narrow channel, is by far the largest and Mount Tannabalu, with its sharp summit, is an excellent landmark. Pulau Gaya, farther to the E, stands well out from the land, and is so remarkably shaped it is easily identified from most directions.

Pulau Bum Bum to Pulau Timbun Mata

10.38 Pulau Timbun Mata (4°39'N., 118°25'E.), mountainous, densely wooded, and the largest island on the S side of Darvel Bay, extends 16.25 miles W from Tanjong Sidungal, its E extremity, located about 8.25 miles NNW of the NW extremity of Pulau Bum Bum, and has an extreme width of 5.75 miles. It rises from a low W point to Mount Tannaballu near its center. This sharp conspicuous conical peak rises to a height of 620m. At the E extremity of the island Gunung Sedungal rises to a height of 489m and is also conspicuous.

The N side of the island is very irregular and is fronted by reefs and dangers. Its S side is separated from the mainland by a shallow passage known as Trusan Sigalong.

The fringing shore reef extends about 0.32 mile E of Tanjong Sidungal and then curves in a convex curve to Tanjong Timbun Mata, which lies 3.25 miles SW of Tanjong Sidungal. Two low islets stand near the SW side of this fringing reef.

Pulau Larapan (4°34'N., 118°36'E.), about 61m high to the tops of the trees on its SW part and wooded, stands 3.5 miles NNW of the NW extremity of Pulau Bum Bum. The intervening channel is deep and clear seaward of the fringing dangers. A village stands on the W side of the island.

Pulau Silawa (4°33'N., 118°33'E.), which lies almost 1 mile W of Pulau Larapan and is separated from it by a narrow channel about 0.3 mile wide, is flat-topped and wooded with a conspicuous hill, 110m high, near its SW end. The channel between Pulau Silawa and the mainland is 0.5 mile wide and between Pulau Silawa and another island W of it nearly 1 mile wide, with a least depth of 6.1m in the fairway. Depths of less than 5.5m extend 0.3 to 0.8 mile off this last island. To keep in the greatest depths, the SW point of Pulau Silawa should be rounded at a distance of about 0.2 mile.

A shoal, with a least depth of 5.9m, lies in the entrance of the channel between Pulau Silawa and the shore reef fronting the SE side of Pulau Timbun Mata.

Vessels should pass to the S of the above shoal which is located about 2.5 miles ENE of Tanjong Timbun Mata.

The SE extremity of an high islet located about 0.75 mile SW of Tanjong Timbun Mata, in range bearing 252° with the

SE extremity of a wooded island 2.25 miles WSW, leads S of this shoal and through the fairway into Trusan Sigalong.

A rock, with a depth of 0.9m, lies 0.5 mile SW of the SW extremity of Pulau Silawa.

Trusan Sigalong (4°34'N., 118°31'E.), a narrow shallow tortuous channel, separates Pulau Timbun Mata from the mainland to the S. It has a least width of 0.65 mile and is navigable only by small craft with local knowledge. A mud bank, with a depth of 2.4m, extends across the channel near its midpoint.

10.39 Tanjong Timbun Mata (4°35'N., 118°33'E.) is formed by a spur that extends S from the mountains on the E side of Pulau Timbun Mata. The S end of the point is fringed by a shoal which extends about 0.25 mile offshore. A small foul bay lies W of the point.

A long narrow reef fronts this bay and extends 2.5 miles WNW from a position 0.5 mile SW of Tanjong Timbun Mata. A small islet stands on the E end of this reef and a similar islet stands near the center of the reef.

Two wooded islets, 72 and 117m high, lie 2 and 3.5 miles NNW of the SW extremity of Pulau Silawa.

Trusan Sigalong entrance channel passes S of the above long reef and then between the two islets, at which point it shoals rapidly to a least depth of 2.7m.

The Sungai Sigalong discharges into the SE part of Trusan Sigalong about 3.5 miles SW of Pulau Silawa, but has no commercial value.

Pyramid Hill, conspicuous and 314m high, stands close to the coast about midway along the S shore of Trusan Sigalong. It is the N peak of an isolated range of hills which stand on the peninsula E of the Sungai Sipit.

The Sungai Sipit discharges along the S side of Trusan Sigalong, close W of Pyramid Hill. This shallow river is navigable only by small boats.

Anchorage.—A vessel has anchored, in a depth of 21.9m, with Tanjong Timbun Mata bearing 267°, distant 0.5 mile. A vessel might anchor out of the strength of the current, in a depth of 11 to 12.8m, with the S extremity of Tanjong Timbun Mata bearing 079°, distance 0.5 mile, by passing between the shoal water off the point and the reef fringing the small islet 0.75 mile SW. This anchorage has not been closely examined.

The tidal current through the E entrance of the Trusan Sigalong sets NE at a rate of 0.75 knot during the ebb and SW during the flood, at a rate of 1 knot.

Between Tanjong Sidungal and the N point of the island, about 8.75 miles WNW, the N coast is deeply indented by reef-fringed bays which are encumbered by reefs and other dangers. As the approaches to these bays are foul, vessels should not approach this coast in a depth of less than 40m.

10.40 Pulau Balusuan (4°41'N., 118°32'E.), a small islet 18m high with a light green treeless summit, stands 1.5 miles offshore about 4 miles NW of Tanjong Sidungal. Foul ground extends up to 0.7 mile offshore from all sides of the islet, and then extends in a SE direction for 3.75 miles toward Tanjong Sidungal. An 18.3m patch lies 1 mile N of the islet and a 14.6m shoal lies 2.25 miles NNW of it.

Pulau Tatagan Tatagan (4°40'N., 118°33'E.), 76m high, stands S of Pulau Balusuan and is joined to Pulau Timbun Mata by a narrow drying sand ridge.

Vessels are advised not to pass S of Pulau Balusuan because the coast of Timbun Mata to the W and NW of this islet is fronted by dangers which lie up to 1.5 miles offshore.

Pulau Batik (4°43'N., 118°27'E.), 245m high to the tops of the trees, is separated from the N point to Pulau Timbun Mata by a narrow channel with a depth of 3.7m in the fairway.

Pulau Batik Kulambu, 249m high to the tops of the trees, densely wooded and steep-to, stands with its E end close off the NW coast of Pulau Timbun Mata.

Anchorage can be taken by vessels, in a depth of 23.8m, at the head of the bay, formed by the S side of Pulau Batik Kulambu and the coast of Timbun Mata to the S and E.

This bay, which is 2.25 miles wide at its entrance, extends 3.25 miles E to its head and is clear of dangers except along its S side. Hambly Reef, drying 0.9m, lies almost in the middle of the entrance of this bay. A rock, 1.8m high, stands close E of the N part of this reef. Vessels entering this bay should pass between this rock and the coast of Pulau Batik Kulambu to the NE.

An islet, 64m high to the tops of the trees, stands almost 1 mile S of Hamby Reef and close N of the coast of Timbun Mata. Two detached reefs lie near the parallel of this islet and within 1 mile W of it.

Islands and Dangers North and Northwest of Pulau Timbun Mata

10.41 Pulau Adal (4°45'N., 118°31'E.), a conspicuous wooded conical island 110m high, stands 2.75 miles NE of the E end of Pulau Batik. A drying sand spit extends about 0.25 mile SW from the S point of this reef-fringed island. A detached shoal, with a least depth of 11.9m on its E part, lies 1 mile NNE of the N end of the island. A detached 14.6m patch lies about 1.75 miles SSE of the SW extremity of Pulau Adal.

Bakuhang (4°45'N., 118°29'E.), Bakungan, and Gatahan are three small islets lying on reefs that are almost joined. These islets extend 1.5 miles WNW from a position 1.5 miles WNW of Pulau Adal. Bakuhang, 87m high, is the E islet and the largest of the three.

Pulau Tabawan (4°48'N., 118°23'E.), the largest of a group of thickly wooded islands standing in the SW part of Darvel Bay, lies with its E end about 4.5 miles NW of the N end of Pulau Batik. Being higher than the other islands of the group and standing well offshore, it may be easily identified when approaching from the E. The W peak of two, which stands near the center of the island, is 275m high and shows up well from all directions.

A small bay, with depths of 23.8 to 36.6m in its center, lies between two promontories near the middle of the S side of the island. The head of the bay is foul.

Pulau Silumpat (4°46'N., 118°23'E.), 168m high and wooded, stands close S of Pulau Tabawan and is almost divided into two parts. Both parts are joined by a narrow peninsula.

Learmouth Reef (4°44'N., 118°25'E.), dries 0.3m, lies 2 miles SE of Pulau Silumpat.

Pudsey Reefs (4°45'N., 118°21'E.), two drying reefs 1.5 miles apart, lie centered about 2.65 miles W of Pulau Silumpat.

Dawson Rock (4°45'N., 118°20'E.), a pinnacle with a depth of 1.8m, lies 3 miles WSW of the W end of Pulau Silumpat.

Pulau Bohayan (4°48'N., 118°19'E.), the timber loading site

for the port of Lahad Datu, is a small triangular-shaped island 238m high to the tree tops and densely wooded, standing 2 miles W of Pulau Tabawan.

Pulau Malundangan, 101m high to the tops of the trees, stands 0.2 mile S of Pulau Bohayan and is separated from it by a narrow foul passage. Pulau Tanah, 120m high, stands 0.75 mile SW of the SW end of Pulau Bohayan. A long narrow reef lies in the passage between Pulau Bohayan and Pulau Tanah, and a 8.5m patch lies close off the NW end of Pulau Bohayan.

Pulau Majinkil (4°47'N., 118°18'E.), 131m high, is a narrow island which stands about 0.5 mile S of Pulau Malundangan. Two small islets lie close S and W of Pulau Majinkil.

The offices of this loading site are situated at the SW end of Pulau Bohayan. Customs officials board at the anchorage. Vessels loading timber use the anchorage between Pulau Tanah and Pulau Malundangan during the Northwest Monsoon, and W of Pulau Bohayan during the Southeast Monsoon. Vessels anchor, in depths of 40.2 to 49.4m, in the former anchorage.

Beacons in range, bearing 326°, stand on the SW end of Pulau Bohayan and yellow range beacons stand close ENE of the same point. These ranges indicate the anchorages.

10.42 There are three passages leading into the S anchorage; the E passage leads E of Pulau Bohayan and then between Pulau Malundungan and Pulau Majinkil; the W passage leads W of Pulau Bohayan and then between the SW end of Pulau Bohayan and the narrow reef to the SW; the third passage leads S of Pulau Tanah.

Pulau Maganting (4°49'N., 118°17'E.), the W island of this group, is topped by two hills of almost equal height and stands 1 mile WNW of Pulau Bohayan. A small reef awash lies about 0.3 mile S of the middle part of the S coast of the island.

Little Reef (4°51'N., 118°16'E.), about 0.65 mile in extent and dries, lies centered about 1.75 miles NNW of Pulau Maganting.

A chain of small coral reefs, which almost dry, lie between the above islands and the coast, and extend to the NW for about 7.25 miles from a position about 3 miles W of Pulau Batik Kulambu. Deep channels pass in between these reefs.

Walton Reef (4°42'N., 118°21'E.), the southeasternmost reef of this chain, lies 3 miles W of Pulau Batik Kulambu.

McKinlay Reef, composed of drying coral at its NE end and drying sand at its SW end, lies 1.75 miles NW of Walton Reef. Rashleigh Reefs, composed of drying coral, lie 2.25 miles farther NW. Reefs and shoals extend about 0.75 mile E from this latter reef.

Normanhurst Reef (4°45'N., 118°18'E.), crescent shaped and drying, lies about 1.5 miles NE of Rashleigh Reefs and Sheppard Reef, with a small drying pinnacle, lies 1.25 miles W of the same reefs.

Lawler Reef (4°47'N., 118°15'E.), the NW reef of the chain, is a small steep-to drying coral ridge lying 2 miles NW of Sheppard Reef.

The W extremities of Pulau Tanah and Pulau Maganting in range, bearing 343°, lead very close W of Normanhurst Reef and E of Sheppard and Rashleigh Reefs.

Nichols Reef (4°49'N., 118°14'E.), a small coral patch almost awash, lies about 2 miles WSW of the NW extremity of Pulau Maganting.

Caution.—Mariners are advised to exercise extreme caution in the area S of 4°50'N. Also, use caution W of 118°26'E. Uncharted reefs exists in the area.

From the W entrance point of Trusan Sigalong, which lies 1 mile W of the W extremity of Pulau Timbun Mata, the coast extends NW for about 7 miles to the mouth of the Sungai Madai. The irregular coastline is bordered by mangroves and fringed by reefs and foul ground which extend up to 0.75 mile offshore. Many reefs lie off this section of coast.

10.43 Merrett Reefs (4°41'N., 118°18'E.) lie at the N end of a chain of reefs and shoals which extend about 2.5 miles N from the W entrance point of Trusan Sigalong. Detached shoals, with depths of 3.9 to 5.7m, lie within 0.85 mile E and 0.45 mile N of the N end of Merrett Reefs. A detached 1.2m patch lies E of the Merrett Reefs, about 1.75 miles N of the W entrance point of Trusan Sigalong.

A 2.4m depth lies about 0.5 mile S of the latter depth.

Greep Reefs (4°42'N., 118°15'E.), several in number, lie from about 1 to 2.25 miles offshore, 4.75 miles NW of the W extremity of Pulau Timbun Mata.

Lloyd Reefs (4°42'N., 118°16'E.) consist of two groups of drying reefs and shoals about 137m apart which lie 0.75 mile SE of Greep Reefs.

Beacons mark some of the numerous reefs and dangers which lie between Merrett and Lloyd Reefs and the coast.

10.44 Mostyn (Kunak) (4°41'N., 118°15'E.), a small village and export center, stands on the coast about 3.5 miles NW of the W entrance point of Trusan Sigalong.

Depths—Limitations.—Kunak Oil Jetty consists of three jetties. The Cargo Jetty has a depth alongside of 11.0m, handles general cargo, and can accommodate vessel up to 28,000 dwt. New Jetty East and New Jetty West both handle vegetable oils and crude palm oil, and can accommodate vessels up to 45,000 dwt with a maximum draft (HW) of 17.0m.

Pilotage.—Pilotage is not compulsory but is recommended. Vessels proceeding to Mostyn from foreign ports are required to proceed to Lahad Datu for clearance and board a pilot. Coastwise vessels board a pilot at Pulau Bohihan. Pilots are also available at Sandakan. A daylight arrival is recommended.

Directions.—Mostyn should be approached from the NE on a course of 212°, passing the NW point of Pulau Tabawan at a distance of 0.5 mile and then 1 mile NW of the beacon marking Dawson Rock.

This course will lead 1 mile NW of the beacon marking Dawson Rock, 1 mile NW of the bacon marking McKinley Reefs, and 0.8 mile NW of the N end of Merrett Reefs.

When the beacon on the SW extremity of Lloyd Reefs bears 275°, course should be altered to 228° in order to clear Batt Reef and Michael Shoal and pass midway between James and Collins Reefs. The S end of James Reef should be rounded at a distance of not less than 0.15 mile, and when the timber derrick on the old jetty at Mostyn bears 305°, it should be steered for on that bearing.

10.45 The Sungai Madai, a shallow river fronted by a mud bank, discharges about 3.75 miles NW of Mostyn. A small islet lies 0.75 mile E of the entrance at the end of a drying mud and sand spit. A broad spit of reef extends 0.75 mile N from the islet.

Pulau Tagabua (4°46'N., 118°14'E.), a small islet, stands 2.25 miles NNE of the above islet and 2 miles offshore. Foul ground lies within 0.5 mile WNW, 1 mile SE and 1.25 miles SW of Pulau Tagabua. The passage between this islet and the coast is foul.

Anchorage.—Anchorage can be taken, in a depth of 16.5m, mud, with Pulau Tagabua bearing 047°, distance 1.25 miles.

Head of Darvel Bay

10.46 The coast between the mouth of the Sungai Madai and Tanjong Batai, 7 miles NNW, is intersected by two salt water creeks. A ridge of coastal hills, from 87 to 120m high, runs parallel to the coast for 2 miles from the N entrance point of the Sungai Madai. This ridge assists in identifying the river entrance.

Lubock Sabahan (4°52'N., 118°09'E.), entered between Tanjong Batai and Tanjong Bangkuruan, about 2.5 miles to the N, penetrates the coast for about 2 miles to the W and provides anchorage, in depths of 9 to 14.6m, mud.

Tanjong Batai, the S entrance point, is low and mangrove covered and fronted by a drying spit which extends about 0.75 mile to the NNE. The outer edge of the spit is steep-to. The Sungai Tingkayu, a small shallow river discharges close S of the point.

The S and W sides of the bay are shallow with depths of 5.5m lying up to 1 mile offshore in places. The shores of the bay are fringed by an extensive mud flat. Several small rivers flow into the bay but none have any commercial importance.

Moorhen Reefs (4°52'N., 118°12'E.) consist of a line of four small reefs which lie centered about 2.75 miles NE of Tanjong Batai.

The summit of Tanjong Bangkuruan in range, bearing 301°, with the W Stewart Peak leads SW of Moorhen Reefs.

The summit of **Pulau Baik** (4°57'N., 118°15'E.), bearing 038°, and well open SE of Giffard Islet, leads close SE of these reefs.

The coast between Tanjong Bangkuruan and Tanjong Batu, about 3.5 miles NE, is fronted by many small detached reefs extending about 2.5 miles offshore.

Tanjong Bangkuruan may be identified by a conspicuous small knoll, 79m high near its extremity, and by the conspicuous Stewart Peaks, 460m and 491m high, rising 3.75 and 4.5 miles, respectively, WNW of it.

Kiddle Reefs (4°54'N., 118°12'E.) consists of two narrow drying reefs separated by shallow water. The reefs extend WNW 0.7 mile from a position about 1.75 miles SSE of Tanjong Batu. Foul ground extends S from the S side of the E reef for about 0.12 mile and a 6.1m patch lies about 0.15 mile N of it. A 11m patch lies close off the E side of the E reef.

Mount Mark (4°59'N., 118°11'E.), bearing 338° in line with the W extremity of Pulau Sagai, leads E of Kiddle Reefs.

Pulau Saranga (4°55'N., 118°12'E.), which lies close E of Tanjong Batu, consists of two wooded hills joined by a narrow strip of mangroves. The N hill is 52m high and the S hill is 76m high. The S side of the island is fringed by a reef which extends about 0.25 mile offshore.

The passage between this island and the point to the W is reported to be foul.

A small detached reef lies about 0.65 mile E of the E end of the island.

10.47 Silam Harbor (4°57'N., 118°14'E.) lies in the NW part of Darvel Bay between Tanjong Batu and the W end of Pulau Sakar about 6.75 miles ENE.

Several channels lead into the harbor through the reefs which lie across the entrance but the main channel, about 0.75 mile wide, leads between Pulau Kalungan and Misanmisan Reef in the middle of the chain. A boat channel marked by stakes leads to the old pier at Silam Village.

The shores are irregular and fronted by reefs and islands within almost 1 mile of the coast. Pulau Baik, near the middle of the harbor, and the Saddle Islands to the SW of it, protect the anchorage off Silam. The harbor depths are very irregular and range from over 36.6m at the entrance to about 18.3m at the anchorage.

Aspect.—Mount Silam, a flat-topped wooded mountain, 890m high, stands about 2.5 miles E of Silam Pier and is conspicuous as the highest mountains in that vicinity. It stands up boldly, being separated from the other mountains W and S of it by a deep valley, and slopes steeply to the NE. The ridge rises again to Mount Mark and continues to the E as a coastal range with a gradually diminishing altitude.

Mount Mark, with a well-defined summit, 466m high, stands about 1.5 miles NW of Silam Pier and about 2 miles NE of Mount Silam. It is easily identified as the first summit showing on the skyline NE of Mount Silam, and has a long spur extending down toward Silam.

Tanjong Batu, the S point of Silam Harbor, is the E extremity of a low range of coastal hills and is conspicuous.

Adams Reef, small in extent, lies awash at LW about 2.5 miles SE of Pulau Saranga. A small drying sand bank lies at its E end.

Wanderer Reef, awash at HW, lies about 0.5 mile ENE of Adams Reef. The reef is about 0.5 mile long and 0.2 mile wide.

10.48 Gusong Dilaut (4°55'N., 118°15'E.), a narrow reef about 0.3 mile long and awash at LW, lies about 0.5 mile NNE of Wanderer Reef. The passage between this reef and Pulau Kalung Kalungun is clear.

Pulau Kalung Kalungun, a small islet with a round top 44m high stands on a small reef about 0.5 mile E of Gusung Dilaut. A light is shown from a metal framework tower on the islet.

Kissing Hill, which stands on the N shore about 1.75 miles N of Pulau Baik, in range 356° with the E extremity of this island, leads between Gusung Dilaut and Pulau Kalungan.

Misanmisan Reef (4°56'N., 118°16'E.), awash and sometimes difficult to see, lies about 0.9 mile NNE of Pulau Kalungan. A reef, awash at LW, lies about 0.5 mile ENE of Misanmisan Reef and from it, reefs and foul ground extend 1.65 miles ENE to the SW extremity of Pulau Sakar. Pulau Baik, near the middle of Silam Harbor, stands 1.65 miles NNW of Pulau Kalung Kalungan. This island is thickly wooded and has a conspicuous conical summit 114m high near its E end.

White Rocks, just above water at high tide, lie at the outer end of a narrow tongue of reefs that extend 0.4 mile NW from the island. A light is shown at the end of this reef.

Vessels loading lumber may anchor W of Pulau Baik.

The NE extremity of Pulau Baik is fringed by a reef that extends about 0.12 mile to the N. A narrow detached reef, sepa-

rated from the fringing reef by a narrow, deep channel, lies over 0.1 mile N and extends 0.2 mile farther N.

Woodhall Reefs (4°58'N., 118°15'E.), two detached drying patches, lie 0.65 mile N of Pulau Baik. A deep channel, 0.25 mile wide, lies between these reefs and the detached reef N of Pulau Baik.

The SW end of Pulau Baik, in range 299° with Mount Mark, leads SW of Misanmisan Reef. The NE end of Pulau Baik, in range 296° with Mount Mark, leads between Misanmisan Reef and the reefs E of it.

Wise Hill, 140m high, about 1 mile NE of Silam Pier, in range 290° with Mount Mark, leads between Woodhall Reefs and the narrow detached reef N of Pulau Baik.

10.49 The **Saddle Islands** (4°56'N., 118°14'E.) consist of six wooded islands extending 2.25 miles in a NW direction from a position about 1.5 miles W of Pulau Kalung Kalungun.

Giffard Islet, 37m high and the E islet of the chain, stands 1.5 miles W of Pulau Kalung Kalungun and is fringed by a narrow reef. The reef on the NW side of the islet extends 0.25 mile WNW to the S side of Pulau Tabauwan. A small islet lies about midway between these two islands.

Pulau Laila (Pulau Tabauwan) (4°56'N., 118°14'E.) rises to a 93m summit near its center and a 53m hill near its N end. Powers Spit, a coral ledge with a least depth of 1.8m, extends about 0.35 mile NNW from the N extremity of the island.

The W extremity of the island is joined to the SE extremity of Pulau Sumabun to the WNW by a reef. Pulau Nipa Nipa, a small islet 61m high, lies on this reef about midway between the two islands. Pulau Sumabun, 85m high, is about 0.5 mile long and 0.25 mile wide.

Pulau Sagai, 59m high and the W island of this chain, stands on a reef that is separated from the reef fringing the W side of Pulau Sumabun by a very narrow passage.

The W end of Pulau Sumabun in range, bearing 330° with Mount Mark, leads SW of Adams Reef.

The E extremity of Giffard Islet, in range 024° with the NW point of Pulau Baik, leads W of Adams Reef.

Tides—Currents.—The tidal currents off Silam Harbor are very weak and appear to turn about at HW and LW by the shore.

Silam Harbor—West and North Shores

10.50 From **Tanjong Batu**, the W entrance point of Silam Harbor, the coast extends in a general NE direction for 3.75 miles to the W entrance point of Soai Soaium Bay. The coast between these two points is indented, irregular, and fronted by reefs and foul ground up to 1 mile offshore. The settlement of Silam is situated along this section of coast about 2 miles NNE of Tanjong Batu.

Soai Soaium Bay (4°58'N., 118°14'E.) is entered about 2.25 miles NE of Silam through an entrance about 0.45 mile wide with depths of 12.8 to 14.6m.

The W side of the bay is very irregular and has two shallow finger-like arms at the head. Foul ground extends about 0.5 mile S from the W entrance point. A 4.6m patch lies in the entrance of the bay.

A small jetty in Soai Soaium Bay, with a depth of 1m alongside, will accommodate vessels up to 500 dwt. Larger vessels anchor W of Woodhall Reefs to work cargo into barges.

The coast between Soai Soaium Bay and the W extremity of Pulau Sakar, about 4 miles ESE, is indented in its E half by a shallow bay that extends 1 mile inland.

Anchorage.—Anchorage can be taken about 0.5 mile SE of the pier at Silam, in depths of about 13 to 15m, sand and coral. The anchorage should be used only by small and medium sized vessels as it lies over a very uneven bottom and is fouled by three 5.5m coral heads to the S and E and by Holmes Rock, with a depth of 4.6m, lying 0.5 mile N of the N end of Pulau Sumabun.

Good bearings can be taken at this anchorage, which has limited swinging room.

Larger vessels should anchor outside these patches, lying on the irregular shore reef fronting Silam, in depths of 27 to 29m.

Good anchorage can be taken, in depths of 33 to 36.6m, close N of the reef extending NW from Pulau Baik and W of Woodhall Reefs.

Sheltered anchorage can be taken, in depths of 14.6 to 18.3m, mud, in the bight on the N side of Tanjung Batu with the N extremity of that point bearing 154°, distance 0.5 mile.

Directions.—The anchorage off Silam may be approached by passing on either the N or S sides of the Saddle Islands. The approach from the E passing to the N of the Saddle Islands is clear of dangers after passing in between Pulau Kalungan and Misanmisan Reef, but Power Spit must be given a wide berth. The passage from the S, between Pulau Sagai and Pulau Saranga, and then between Pulau Sagai and the coast is clear but narrow.

Vessels approaching Silam from the E should pass at least 2 miles off the Darvel Peninsula and then steer for Pulau Kalungan. After passing 0.3 mile N of Pulau Kalungan, vessels should then steer 305° for Mount Mark until the N extremity of Pulau Baik is in range 095° with the S extremity of the S islet lying off the SW end of Pulau Sakar.

Vessels should then keep this range dead astern until the W extremity of Pulau Sagai is in range, bearing 199° with the E extremity of the S part of Pulau Saranga, at which time anchorage should be taken. This range clears Holmes Rock by about 0.1 mile and leads to the inner anchorage for small and medium-sized vessels.

Vessels approaching Silam from the S should pass about 1 mile SW of Adams Reef, bringing the W extremity of Pulau Sagai in range 338° with Mount Mark and steering for it. This course leads about 0.25 mile E of the small detached reef lying off Pulau Saranga. Pulau Sagai should then be rounded about 0.1 to 0.2 mile off after which they should bring the W extremity of Pulau Sagai in range, bearing 205° with the summit of the S hill on Pulau Saranga. Course should then be altered to this range dead astern up to the anchorage, passing between the two W patches of depths of 7.3m.

Darvel Bay—North Side

10.51 Lahad Datu Harbor (5°00'N., 118°23'E.) is entered between the E extremity of Pulau Sakar and the W coast of the Darvel Peninsula, about 4 miles to the E and recedes about 5.5 miles WNW to its head. The depths in the approach are deep and clear seaward of the coastal reefs and range from 25.6 to 40.2m. From WNW of the entrance, which has depths of 18.3

to 34.7m, the depths decrease gradually toward the head of the bay, which has a depth of 9.1m at the anchorage 0.25 mile off the pier head. This major port in the area has two small anchorages and maximum vessel size includes loa 308m, draft 20m, and 100,000dwt. For berthing details see table titled **Lahad Datu—Berth Information.**

Pulau Sakar (4°58'N., 118°20'E.), a densely-wooded and irregularly-shaped island, rises near the center of its S side to a conspicuous knob, 218m high. It extends 5 miles in a WSW direction from its E end and has a greatest width of about 2.4 miles. A narrow shallow channel less than 0.1 mile wide separates its W side from the mainland.

The S coast of the island is straight and fringed by a very narrow steep-to reef. The small islets off its SW end have been previously described. Pulau Sakar has been reported a good radar target at distances up to 21 miles.

Crook Reef (Terumbu Sakar) (4°47'N., 118°20'E.), which dries, lies 3.25 miles WSW of the E end of Pulau Sakar and 0.7 mile offshore. A small detached reef lies about 0.7 mile W of Crook Reef and some small islets lie within 1 mile farther W.

Lahad Datu—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
POIC Container Terminal						
Container Berth	308m	—	308m	15.0m	65,000 dwt	Container and reefer.
POIC Dry Bulk Terminal						
No. 01	188m	—	—	12.8m	30,000 dwt	Fertilizer and breakbulk.
No. 02	138m	—	—	10.8m	10,000 dwt	Fertilizer and breakbulk.
No. 03	188m	—	—	12.8m	30,000 dwt	Fertilizer and breakbulk.
No. 04	138m	—	—	10.8m	10,000 dwt	Fertilizer and breakbulk.
Lahad Datu Port Terminal						
North Berth	172m	—	100m	—	15,000 dwt	Breakbulk.
Oil Berth	110m	10.3m	200m	—	10,000 dwt	Chemicals and vegetable oils. Berthing length of 295m (including dolphins).
South Berth	194m	10.0m	200m	—	30.000 dwt	Breakbulk.
West Berth	104m	—	—	—	—	Breakbulk
Asphalt Terminal						
Berth	32m	—	—	—	—	Dirty products. Berthing length of 146m (including dolphins).
Felda Wilayah Sahabat Terminal						
Jetty 01	76m	—	—	—	—	Vegetable oils.
Jetty 02	—	—	180m	—	20,000 dwt	Vegetable oils. Berthing length of 160m (including dolphins).
Kwantas Refinery Terminal						
Kwantas Berth	30m	10m	180m	—	30,000 dwt	Vegetable oils. Berthing length of 226m (including dolphins).
POIC Liquid Bulk Terminal						
No. 01	—	—	274m	20.0m	100,000 dwt	Vegetable oils. Berthing length of 300m (including dolphins).
No. 02	—	—	—	20.0m	100,000 dwt	Vegetable oils. Berthing length of 300m (including dolphins).
No. 03	—	—	—	12.0m	20,000 dwt	Under construction. Vegetable oils. Berthing length of 195m (including dolphins).
No. 04	—	—	—	12.0m	20,000 dwt	Vegetable oils. Berthing length of 195m (including dolphins).

Lahad Datu—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
No. 05	—	—	—	12.0m	3,000 dwt	Under construction. Vegetable oils.
No. 06	—	—	—	12.0m	6,000 dwt	Under construction. Vegetable oils.
No. 07	—	—	—	12.0m	3,000 dwt	Under construction. Vegetable oils.

The N coast of the island is irregular and indented in several places by narrow shoal inlets. Some inlets lie close offshore along this side of the island. The NE extremity of the island slopes steeply down to a low point from which a reef extends E for 0.75 mile. The edge of this reef cannot always be seen and vessels rounding it are advised to exercise caution. A light is shown at the end of the reef.

Halloran Reef (Terumbu Belasu) (4°59'N., 118°21'E.), lying about 0.32 mile off the center of the N coast of the island and about 0.5 mile WNW of the NE point of the island, is a small, drying reef. Shoal water extends for a short distance off its NE side.

Directions.—The summit of **Pulau Adal** (4°45'N., 118°31'E.), in range bearing 153°, astern, with the SW peak of Gunung Sedongal, just clears the edge of the reef off the NE end of Pulau Sakar, and Pulau Adal must be brought slightly to the SW of this peak before rounding the reef.

The NE extremity of Pulau Sakar, in range bearing 124° with Tanjong Melandong, leads about 0.25 mile NE of Halloran Reef.

Courtesy of Google

Lahad Datu

10.52 The W coast of the Darvel Peninsula, between Tanjong Melandong and the delta of two small rivers about 2.5 miles NNW, is fringed by a bank which extends up to 1.5 miles offshore in places.

Armstrong Reef (4°56'N., 118°26'E.), which dries 1.5m, lies outside this bank about 2.25 miles WNW of Tanjong Melandong.

Directions.—The summit of Pulau Adal in range, bearing 153° with the SW peak of Gunung Sedongal leads 0.5 mile SW of Armstrong Reef and 0.5 mile SW of the shore bank fronting the coast. Both Pulau Adal and the SW peak of Gunung Sidungal, 8 miles SW, show as sharp well-defined summits.

The coast between the river delta and the settlement of Lahad Datu, about 8 miles WNW, is fronted by detached reefs which lie within 1 mile from the shores. From Lahad Datu, for a distance of about 3 miles S, the coast is fringed by mangroves and fronted by shoal water up to a distance of over 1 mile.

10.53 Lahad Datu (5°01'N., 118°19'E.) (World Port Index No. 51730), a small coastal settlement, is the headquarters of the District Office and also the tobacco company.

Sabah Ports Authority Home Page
http://www.infosabah.com.my/spa

Tides—Currents.—The water at Lahad Datu is usually stationary, but a very slight E current is experienced at times. The range of spring tides is 1.8m.

Depths—Limitations.—A coral mole extends 0.17 mile SE from the SW corner of Lahad Datu. Government Wharf and the customs shed are situated at the seaward end of the mole. The wharf is 96m long, 17m wide at the head, and has a least depth of 4.6m alongside.

Contact Information.—See tha table titled**Lahad Datu—Contact Information**.

Lahad Datu—Contact Information	
Port Authority	
VHF	VHF channels 12, 14, and 16
Telephone	60-89-889722
Facsimile	60-89-882749
E-mail	clarence@spsb.com.my
Web site	https://www.spsb.com.my/?q=ports/lahad-datu-port-0

Sabah Port Authority Wharf, situated about 2 miles E of the town, is an L-shaped jetty extending S from the shore. The berthing face is 91m long and 12m wide, with an alongside depth of 9.75m, and is aligned in an E-W direction. Mooring dolphins are situated off each end of the wharf. The maximum size of vessels which may be accepted is 25,000 dwt.

Port development and land reclamation is taking place to the E of the SPA Wharf.

Three drying reefs extend from 0.5 to 1.5 miles SE from the head of the pier at Lahad Datu. These steep-to reefs are bordered by depths of 9 to 12.8m.

The N reef is named Gosungan, the center and largest reef is Voorwyk, and the S reef is named Tinggeri. Navigational aids

mark all of these dangers. A coral patch named Bershesherk lies between Gosungan Reef and the shore to the N of it. A navigational aid also marks this danger.

Gray Reef (5°01'N., 118°20'E.), a small coral patch, with a least depth of 5.5m close to its edge, lies about 0.5 mile S of the pierhead. A beacon marks this danger.

Pilotage.—Pilots are available; however, 24-hour advance notice is required. The pilot boat is equipped with VHF radiotelephone.

Anchorage.—Anchorage can be taken by vessels up to 91m in length between Gray Reef and Gosungan Reef, in a depth of 9.1m, mud, with the light structure on the pier bearing 325°, and Gray Reef Beacon bearing 215°. Larger vessels can anchor, in a depth of 11m, with the same light bearing 333° and Tinggeri Reef Beacon bearing 080°.

Anchorage can be taken N of Pulau Sekar, in depths of 12.8 to 25m, good holding ground.

Anchorage is prohibited to vessels carrying explosives or dangerous petroleum products in the approach fairway, or within 0.7 mile of the pier head.

Directions.—After passing about 0.25 mile NE of Halloran Reef, vessels should steer WNW to pass W of Tinggeri Reef. When the S mast of the two radio masts at Lahad Datu is in range, bearing 326° with the light structure on the pier, course should be changed to the NW to the anchorage.

Tanjong Melandong to Tanjong Labian

10.54 The coast between Tanjong Melandong and Shoal Point, the SE extremity of the Darvel Peninsula, about 2.75 miles to the E continues low and is marked by trees, 30 to 35m high.

The S side of the peninsula is fronted by shallow water extending almost 1 mile S. Depths decrease rapidly from 20 to 5.5m SE of Shoal Point. Vessels should give this area a wide berth because the soundings give little warning.

The E coast of the peninsula extends about 3 miles NE from Shoal Point to the head of Kennedy Bay and continues low and swampy and is densely wooded.

Kennedy Bay (4°57'N., 118°33'E.), a small partially-examined inlet, appears to provide good anchorage, in a depth of 18m, mud, about 0.65 mile from its head.

The E side of the bay is formed by a reef that extends about 0.5 mile SSW from Tanjong Tambak the E entrance point of the bay.

The W side of the bay is formed by a mud flat, parts of which dry, that extends about 1.5 miles E and NE from Shoal Point.

The bay is about 0.75 mile wide at its entrance. Several detached reefs lie in the NE corner of the bay close to the fringing reef.

Turner Patch (4°56'N., 118°35'E.), a small coral shoal with a depth of 12.8m, lies 1.5 miles SE of Tanjong Tambak.

Websper Patch (4°56'N., 118°34'E.), with a least depth of 10.4m, lies almost 1.25 miles SSE of Tanjong Tambak.

Tambak Reef, which dries 0.6m, lies 0.5 mile SE of Tanjong Tambak.

Kinabalu Shoal, with a least depth of 4.9m, lies 3.25 miles ESE of Shoal Point.

Kennedy Bay may be entered by bringing the 102m summit, located about 2.5 miles NNE of Shoal Point, to bear 312° and steering for it. This course will lead 0.5 mile SW of Turner Patch and to the anchorage. Shoal Point bears 235°, with the W extremity of Pulau Tabauwan just open SE of it, from this position.

Along the N shore of the bay the flood sets to the W and the ebb to the E at a rate of about 1 knot at springs. The current appears to turn at about the time of HW and LW by the shore.

Everest Bay (4°57'N., 118°34'E.), a small inlet to the E of Kennedy Bay, is entered between Tanjong Tambak and Tanjong Bakapit. Numerous shoals and reefs foul the entrance, some of which dry at LW.

Bakapit (4°57'N., 118°35'E.), situated on the W shore of Basilan Bay, just E of Everest Bay, is a timber loading port. A small, narrow pier is situated at Bakapit.

A beacon stands on the drying reef about 0.3 mile E of Tanjong Bakapit. This beacon, bearing 000°, leads between Brantian Reef and Ireton Patch, lying about 0.5 mile SSE and 0.75 mile SE, respectively, of Tanjong Bakapit. A beacon marks the SE end of Brantian Reef.

Anchorage.—Anchorage can be taken about 1 mile S or 1.25 miles SW of Tanjong Bakapit. Anchorage is prohibited in the approach fairway or within 0.65 mile of the beacon which stands on a point on the E side of Basilan Bay, to vessels carrying explosives or dangerous petroleum. A pilot is available and can usually be boarded in the vicinity of Turner Patch. Several tugs are available for hauling logs.

The coast between Tanjong Bakapit and Tanjong Membatu (Bagahak Point), about 4 miles ESE, is fringed by reefs and shoals which extend up to about 0.75 mile offshore in places. This latter point is low and covered with mangroves. A light is shown from an 11m high white metal framework tower situated on an 82m hill, 1 mile WNW of Tanjong Membatu. A conspicuous spur, 159m high, runs in a S direction to within 1.25 miles E of the point. This spur is prominent when viewed from the E or W, and a summit, 289m high and 1 mile inland, forms an easily identified landmark from those directions but not from the S because of the higher land behind it.

10.55 Howard Shoal (4°54'N., 118°40'E.), a narrow steep-to coral shoal with a least depth of 4.3m, lies 2.5 miles SE of Tanjong Membatu.

A bank, with a depth of 22m, lies 0.75 mile SW of Howard Shoal.

The coast between Tanjong Membatu and Tanjong Tungku, about 13.5 miles to the E, continues high, mountainous, and steep-to within a short distance offshore. Several small rivers flow into the sea along this stretch of coast.

A light is shown from a 23m high white metal framework tower situated on Tanjong Tungku.

To the W of Tanjong Tungku, which is low, the land rises to the Bagahak Range, the spurs from which slope steeply to the coast.

Mount Bagahak (5°03'N., 118°46'E.), 835m high, standing 7 miles WNW of Tanjong Tungku, is the summit of this range. North of Tanjung Tungku, there is a well-defined ridge of rolling hills, 120 to 155m high, lying about 1.5 miles inland. The Sungai Tungku, a shallow river of no importance, flows into the sea close W of the point. A village stands on its E bank about 0.75 mile within the entrance.

A drying mud flat extends almost 0.5 mile S from the point and shoal water extends 0.25 mile farther S, falling steeply into a depth of 25.6m. As this shoal does not show clearly because of the discoloration of the river water, vessels should keep outside the 30m curve when passing.

The coast between Tanjong Tungku and Tanjong Labian, about 23 miles ENE, remains high for about 12.5 miles and then becomes low and densely wooded for the remaining distance. With the exception of a narrow fringing reef bordering the coast, there are no off-lying dangers.

Tolibas Village stands at the mouth of a small stream about midway between Tanjong Tungku and a red cliff about 10 miles to the ENE. Telok Sabahat, a small river, discharges about 1 mile ENE of this red cliff. A rounded point, which can be identified by the prominent high trees, stands close E of the river and a similar point stands 7.5 miles farther ENE.

The tidal currents on the E end of the N shore of Darvel Bay are weak and run about 1 knot at springs, with the flood to the W and the ebb to the E.

Tanjong Labian (5°09'N., 119°13'E.) is low and difficult to identify. A light is shown from a white metal framework tower.

Caution.—A dangerous wreck lies about 1 mile SSW of the mouth of Telok Sabahat.

Tanjong Labian to Sandakan Harbor

10.56 The coast between Tanjong Labian and Dent Haven, about 7.5 miles NNE, consists of a hard sandy beach backed by jungle which becomes swampy as Dent Haven is approached.

Between Dent Haven and Tanjong Labian, the currents run strongly from 1.5 to 3 knots at times with the flood setting to the S and the ebb to the N, but the currents are extremely variable in strength and there is no certainty as to their direction. Occasionally the current was observed to run strongly in one direction for one or two days and then in the opposite direction for one day for no apparent reason. At other times the currents changed at about high and LW by the shore.

Dent Haven (5°16'N., 119°15'E.), a small bay which slightly indents the coast and which is partially protected to the NE by Hull Rock, is entered between Mangrove Point and Reef Point about 2 miles to the N. The bay is generally free from dangers and provides good anchorage during the Southwest Monsoon, in depths of 6.1 to 7.3m, sand and mud. A slight swell sometimes sets into the bay. The S part of the bay close inshore is foul. The whole shoreline of the bay is the barrier of a great swamp.

Vessels should pass in between the S end of the shoal ground surrounding Hull Rock and Hardy Patch. The extremity of the coast S of Mangrove Point should not be brought to bear less than 217°, until the S end of the long sandy beach in the bay N of Alfred Point bears 255°. Vessels may then steer for a convenient anchorage.

Reef Point, the N entrance point of the bay is fringed by a reef that extends about 137m from it.

Mangrove Point, the S entrance point, is the N extremity of an island covered by mangroves lying close offshore. The island is fringed by a narrow reef on its E and N sides.

In Dent Haven the current begins to set to the N 3 hours before HW and to the S 3 hours before LW. It appears probable that this is an eddy.

Caution.—Hull Rock, located about 1.5 miles NE of Reef Point, has a least depth of 1.2m and breaks at times. The rock lies on a long narrow bank of hard sand, with depths of 1.8 to 9.1m, that stretches almost 1.25 miles N and 1 mile S.

A sand bank, awash, extends about 0.32 mile N from a position about 0.3 mile ENE of Reef Point, and has a greatest width of about 0.13 mile. A shoal patch, with a least depth of 4.8m, lies close N of this sand bank.

A 7.6m patch lies 1 mile ENE of Reef Point.

Between the sand bank and the N tongue of the shoal area surrounding Hull Rock, there is a channel 0.5 mile wide with depths of 11 to 12.8m. This channel is not recommended because it is fouled by a sandy patch with a least depth of 5.5m, which lies 1.5 miles NNE of Reef Point. The depths are irregular and numerous 6.4 to 7.3m patches exist.

Hardy Patch, a coral shoal with a depth of 5.5m, lies to the SE of Hull Rock and is located about 2.75 miles ESE of Reef Point. Strong tide rips mark it and discolored water is usually formed. This shoal is not only a danger to vessels approaching Dent Haven, but also to vessels passing along the coast at night or in thick weather. It may be avoided by passing E of the 36.6m curve.

There are several 4.8 to 5.5m patches lying within 0.8 mile N of Mangrove Point.

10.57 The coast from Reef Point extends N and NW in a gentle curve for 10 miles to Tanjong Unsang, and then WNW for 3.25 miles to Pulau Tambisan. This section of coast is low, swampy, covered with jungle growth, and fringed by a narrow strip of steep-to coral.

Pulau Tambisan (5°28'N., 119°07'E.) rises to a uniform height of 18 to 21m with the top of the trees on the unclear portion about 61m high. The island is fringed by a coral reef along its shores which is about 0.75 mile wide in places. A narrow channel, available only to small boats, lies between the island and the mainland. The W end of the island is easily made out from seaward during the day, but the E end is low and hard to identify.

Between Dent Haven and Pulau Tambisan, the tidal currents run at a rate of 2 to 3 knots with the flood to the S and the ebb to the N.

Tangusu Bay (5°27'N., 119°03'E.), a shallow bight formed by the receding coast and protected to the NE by Pulau Tambisan, lies SW of the island. A rock, with a depth of 1.2m, lies in the bay about 1 mile SW of the SW end of Pulau Tambisan. A coral reef, with a least depth of 0.9m, lies about 2.75 miles W of the SW extremity of Pulau Tambisan.

Off-lying Dangers and Banks

10.58 Rene Shoal (5°30'N., 119°09'E.), with a least known depth of 3.7m, coral and sand, extends NW for about 4.25 miles from a position about 3 miles ENE of Pulau Tambisan.

Gem Reef (5°35'N., 119°08'E.), coral and sand and with a least depth of 0.9m, lies to the N of Rene Shoal about 7.75 miles N of the E end of Pulau Tambisan.

From Gem Reef SE to Sibutu Passage, frequent and sharply-defined tide rips occur which have the appearance of shoal water.

Magpie Bank (5°45'N., 119°05'E.), with a least depth of

16.5m on its SW side, is an extensive bank of rotten coral which lies centered about 17.25 miles N of Pulau Tambisan.

A 9m patch was reported to lie about 1.5 miles W of the 16.5m head on Magpie Bank. A 9.6m depth was reported to lie outside the bank about 5 miles NE of the 16.5m head.

A patch with a depth of 9.6m was reported to lie about 1.5 miles NE of Magpie Bank in the fairway between Magpie and Sandy Bank.

Sunday Bank (5°49'N., 119°09'E.), with a least depth of 11.9m near its W side, lies about 20 miles N of Pulau Tambisan.

Normanby Bank (5°48'N., 119°13'E.), a shoal coral bank with a least depth of 11m, lies centered about 21 miles NNE of Pulau Tambisan.

Sentry Bank (5°42'N., 119°19'E.), with a least depth of 12.8m, lies about 17 miles NE of the E end of Pulau Tambisan and consists of coral and sand formation.

Tides—Currents.—During two days on Sentry Bank, in the month of August, the current was observed to set almost constantly between NE and SE, varying from 0.25 to 1.5 knots. The tidal currents appeared to exercise a marked influence on the strength and direction of the current. The flood was observed to set to the S and the ebb to the N.

10.59 Talantam Shoal (5°42'N., 119°28'E.), with a least charted depth of 9.1m, lies about 23.25 miles NE of Pulau Tambisan. Deep draft vessels should avoid this shoal because a depth of 7.9m was reported. Less depths than charted may exist over this shoal.

When the wind and tide are in opposition, heavy tide rips form over this shoal and resemble broken water.

A shoal patch with a least depth of 6.7m was reported to lie about 20.5 miles NE of the E extremity of Pulau Tambisan.

A shoal, with a least depth of 9.1m, was reported to lie about 33 miles NW of Talantam Bank and 40 miles N of the E end of Pulau Tambisan.

An unexamined area, with a least known depth of 19.2m, is located about 10 miles SE of Talantam Bank; a depth of 13m was reported (1993) to lie 8 miles SSE of the bank.

The coast between Pulau Tambisan and the Kuala Maruap, about 9.75 miles to the W, continues low and swampy. The mouth of this river is about 0.75 miles wide, with depths of 5 to 9m in the entrance. There is a least depth of 1.8m over the bar which extends 3.25 miles offshore from the entrance.

Caution.—Caution is necessary crossing the bar as the sea breaks during SE winds. Evans Island lies about 3 miles S of the entrance where the river divides into several branches.

The Kuala Segama, which lies about 9.25 miles WNW of the Kuala Maruap, is about 0.5 mile wide at the entrance and has a depth of about 4.3m. A shallow flat, over which there is a depth of 3.3m at HWS, extends about 3 miles offshore from the mouth. An island stands 2 miles inside the entrance and to the S the river splits up into several creeks. The river is fouled by shifting sand bars and other dangers, and is available only to small craft with local knowledge.

The coast between the Kuala Segama and the Kuala Kinabatangan Besar, about 14 miles to the NW, is jungle covered and bordered by grass and bushes.

10.60 The **Sungai Kinabatangan** (5°39'N., 118°37'E.), which discharges through the Kuala Kinabatangan Besar, has depths of 6.7 to 9m, is 0.6 mile wide at the entrance, and fronted by a bar that extends 3.5 miles offshore. The bar has a depth of 2.7m at LWS Vessels not having local knowledge and drawing more than 2.4m should not attempt to cross the bar because the tides are greatly influenced by the winds, making the time of HW uncertain.

Driftwood Point (5°39'N., 118°37'E.), the E entrance point, is a wooded, sharp, and well-defined projection. A light is situated on the W entrance point from a white metal framework tower with red bands.

From the entrance the river extends SW and then S for 5 miles to Dewhurst Bay, where there are depths from 1.8 to 10.9m. The main branch of the river turns W about 5 miles from the entrance and becomes narrow. Some settlements and rubber plantations stand along the river banks farther upstream.

Royalist Rock (5°43'N., 118°40'E.), with a least depth of 1.8m, coral near its SW end and steep-to, lies 4.75 miles NNE of Driftwood Point.

Nymphe Reef (5°44'N., 118°40'E.), about 0.75 mile in extent with a least depth of 0.3m, coral and sand, lies 6 miles NNE of Driftwood Point. The discolored water from the river extends as far N as this reef. The reef is seldom seen but it is marked by a slight ripple and breaks in heavy weather. Patches with depths of 10.3m and 12.8m lie between Nymphe Reef and Royalist Rock.

Pegasus Reef (5°46'N., 118°50'E.), 14 miles NE of Driftwood Point, has a least depth of 0.9m and is composed of live coral with patches of sand. The discolored water over this reef can be seen from aloft. Pegasus Reef Lighted Beacon stands on the N side of the reef.

10.61 Benrinnes Reef (4°51'N., 118°45'E.), with a least depth of 8.2m, lies 7 miles NW of Pegasus Reef. A lighted beacon has been added in vicinity of this reef. A 2.1m patch lies 0.5 mile W of Benrinnes Reef. Caution should be exercised when navigating in the vicinity of Pegasus Reef, because numerous other dangerous shoals have been reported.

The coast between the Sungai Rinabatangan and Tanjong Aru, the E entrance point of Sandakan Harbor about 30 miles WNW, is bordered by shoal ground which lies up to 8 miles offshore in places. Several small rivers and streams discharge along this section of coast which remains low, swampy, and densely covered by jungle growth.

Aspect.—About 20 miles SE of Tanjong Aru and 11 miles from the coast are the Kinabatangan Hills, 293m high. These hills appear from seaward as a long range with a slight peak. Confusion Hill, about 4.5 miles SE of the Kinabatangan Hills, shows as a round top when seen from the NE. Aguia Peak, which stands about midway between Confusion Hill and the coast to the NE, is 194m high and from the E appears as a double cone. Notch Hill, about 10 miles ESE of Confusion Hill and 8.5 miles from the coast, is 245m high and is the most conspicuous hill in the vicinity of the Sungai Kinabatangan. It has a sharp steep fall near its summit.

Mount Hatton (5°15'N., 118°42'E.), 606m high and standing about 16 miles SSE of Notch Hill, is the most conspicuous mountain on the coast, appearing as a sharp peak from all directions. Ragged Hill, 444m high, stands 7 miles W of Mount Hatton and appears as two cone-shaped hills when viewed

from the E.

Mount Bagahak, previously described in paragraph 10.54, stands 12.5 miles SSE of Mount Hatton.

Sandakan (5°49'N., 118°08'E.)

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10.62 Sandakan, the principal port on the NE coast of Borneo, stands on the NW side of Sandakan Harbor about 0.75 mile SW of Tanjong Papat. Ample, modern alongside berthing facilities are provided for cargo and tanker vessels. Sandakan is a first port of entry. It comprises the area lying between the indented coast extending in a general SW direction from Tanjong Papat, and the low land extending S from Tanjong Aru, the broad point lying 2 miles ESE. Pulau Bai, an island 96m high, lies about 4 miles SSW of Tanjong Papat and forms the S part of the harbor.

The harbor entrance lies between the SE side of Pulau Berhala and Tanjong Aru about 1.5 miles SE. The width of the entrance between the 11m curves is about 1 mile.

Sandakan

Pulau Berhala extends about 2 miles N from its S end, located 1 mile NE of Tanjong Papat and is about 0.6 mile wide. The N part of the island is low and very narrow. Its S part rises to two conspicuous hills of almost equal height which slope gradually to the W. The E face of the N hill is marked by two white streaks running from top to bottom. A light is shown from a 20m high, white metal framework tower situated near the summit of the N hill.

The harbor extends S and W from Pulau Bai for about 15 miles from the entrance, but the only part accurately surveyed is that part N of Pulau Bai and the N approach to Sapagaya Bay, located on the S shore 9 miles S of Tanjong Aru.

Sandakan Port

The NW side of the harbor extends SW from Tanjong Papat for about 1 mile to the principal cargo wharf.

Between this wharf and Pavitt Point, 3 miles to the SW, there is an extensive bight fouled by Allard Bank. The area to the SW and S of Pavitt Point has not been fully examined. Two T-head piers and an island wharf extend from the shore at Pavitt Point.

Tides—Currents.—Tidal currents change at the time of high and LW. The maximum flood current is 1.5 knots and the maximum ebb current is 2 knots.

Alongside the wharf, the current frequently sets in a reverse direction to the harbor. Swells enter the harbor only when the Northeast Monsoon blows strongly.

Depths—Limitations.—The approach to the entrance of Sandakan Harbor is fronted by a large shoal area which extends up to 8.5 miles N from Tanjong Aru. Depths over the outer part range from 6.7 to 11m up to a position 3.5 miles N of Tanjong Aru. Less water than charted has been reported in this area. From this position the depths increase to the S to depths of 23 to 27m through the entrance and depths of 14 to 17m off the wharf at Sandakan.

Atjeh Rock, with a depth of 4.2m, lies about 0.65 mile ESE of the wharf at Sandakan.

An obstruction, with a depth of 7.6m, lies about 0.1 mile S of the SW end of the wharf. A foul area, with a depth of 7.9m, lies 0.1 mile E of this obstruction.

A depth of 8.2m exists about 0.5 mile E of Pavitt Point. A 9.4m spot lies 0.43 mile SE of Pavitt Point.

Sandakan—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Main Wharf Terminal						
01	213m	11.0m	200m	—	20,000 dwt	Ro-ro passengers/vehicles/rail, container, breakbulk, and reefer.
03	76m	6.0m	—	—	5,000 dwt	Ro/pax and breakbulk.

Sandakan—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
04	164m	9.0m	190m	—	8,500 dwt	Ro-ro passengers/vehicles/rail and breakbulk.
2A (Outer)	281m	10.0m	172m	—	—	Berthing length of 300m (including dolphins).
2B (Inner)	261m	6.0m	160m	—	8,500 dwt	Breakbulk. Berthing length of 280m (including dolphins).
Karamunting Bulk Oil Terminal						
Oil Jetty	14m	9.0m	145m	—	30,000 dwt	Clean products and bunkers. Berthing length of 216m (including dolphins).
Karamunting Palm Oil Terminal						
Inner Jetty	16m	10.3m	105m	—	8,000 dwt	Vegetable oils and bunkers. Berthing length of 130m (including dolphins).
Outer Berth	15m	11.14m	184m	—	30,000 dwt	Vegetable oils and bunkers. Berthing length of 200m (including dolphins).
Mowtas Oil Terminal						
Mowtas Oil Jetty	32m	9.0m	190m	12.0m	20,000 dwt	Vegetable oils. Berthing length of 170m (including dolphins).
Sawit Bulkes Terminal						
Oil Jetty	12m	—	128.6m	—	—	Berthing length of 195m (including dolphins).
Shell Oil Deport Terminal						
Shell Oil Jetty	11m	9.0m	—	—	20,000 dwt	Clean products, dirty products, and bunkers. Berthing length of 137m (including dolphins).

Elton Bank, an extensive area of shoal water, extends almost 1.75 miles NE from Pulau Bai. The N limit of this shoal area, defined by the 11m curve, lies about 1.5 miles SSE of the wharf at Sandakan.

A rock, 0.6m high and marked by a beacon, stands near the E extremity of the rocks bordering the channel to the E of Pulau Bai.

Borneo Rock, with a depth of 1.2m, lies on the E side of the same channel about 2 miles S of the above mentioned beacon.

Sandakan Wharf (Government Wharf) is 229m long. There were depths of 5.8m alongside the length of the wharf. A dolphin stands almost 30.4m off each end of the wharf.

Considerable reclamation work has been carried out in the vicinity of Sandakan Wharf.

Sandakan Port, an island wharf, is situated E of the oil jetties. The wharf is connected to the shore by two access bridges. This wharf has several berths, two which are currently under construction. Berth information is shown in the table titled **Sandakan—Berth Information**.

Aspect.—The N shore of the harbor rises to many summits conspicuous from seaward. Bukit Mekarah, 255m high, is the highest of these summits and rises about 2.25 miles W of Tanjong Papat. These hills slope gradually on their N and W sides and are generally steep-to on their S and E sides. Two radio masts are reported to stand close NW of the summit of Bukit Mekarah and are very conspicuous.

Pilotage.—Pilotage is not compulsory, but is available 24 hours. The Harbor Master acts as pilot. A private pilot may be flown in from Kota Kinabalu. Prior notice of at least 24 hours is required. Port operating hours are from 0730 to 2200. Work beyond these hours is subject to prior arrangement and approval.

Regulations.—All vessels carrying cargo must load and discharge cargo at Sandakan Wharf unless written permission to do so elsewhere has been obtained from the Superintendent of Customs. Berthing at the Pavitt Point Oil Jetties is forbidden after 1900. Unberthing may take place at night only by prior arrangement.

Signals.—During daylight hours a continuous watch is maintained by the signal station on the E end of the Custom House. The International Code of Signals is used. Tide signals are displayed at the signal station, as follows:

Signal	Meaning
Cone, point up	Ebb current
Cone, point down	Flood current
Ball	Slack water

The berthing flag may also be displayed on the wharf to indicate the position of the bow and/or stern at the berth allocated.

Pennant No.	Berth
0	Anchorage
1	Sandakan Wharf, inner side

Pennant No.	Berth
2	Sandakan Wharf, outer side, E berth
3	Sandakan Wharf, outer side, W berth
4	Small boat jetty
9	Pavitt Point Oil Jetties

Contact Information.—See the table titled **Sandakan—Contact Information**.

Sandakan—Contact Information	
Port Authority	
VHF	VHF channels 12 and 16
Telephone	60-89-612411
Facsimile	60-89-612975
E-mail	raiman.ali@spsb.com.my
Web site	https://www.spsb.com.my/?q=ports/sandakan-port-0

Anchorage.—The most convenient anchorage lies about 0.3 mile S of Sandakan Wharf, in depths of 12.8 to 16.5m.

Vessels loading timber are required to anchor, in a depth of 9.1m, in the vicinity of the black and white buoy situated about 1.25 miles SW of Sandakan Wharf.

The quarantine anchorage lies on the E side of the harbor with its center almost 2 miles E of the Sandakan Wharf.

The explosives anchorage lies close SW of the quarantine anchorage.

Anchorage is prohibited within an arc of a circle extending about 610m from Sandakan Wharf.

Directions.—Vessels approaching Sandakan, after passing between Taganak Island and Taganak Patches, should steer for the approach lighted buoy moored about 9.5 miles NE of the S extremity of Pulau Berhala. Having passed the buoy close-to, steer 218° for the S extremity of Pulau Berhala. This leads across the bar in a least depth of 7.3m.

When the bar has been crossed and depths of 9.8 to 11m are sounded, course should be altered a little to the S and pass about 0.5 mile E of the S extremity of Pulau Berhala and then to the anchorage taking care to avoid Atjeh Rock.

Sandakan to Marchesa Bay

10.63 The coast between Tanjong Papat, the W entrance point to Sandakan and Tanjong Pisau, about 15.75 miles NE, is low, densely wooded, and intersected by numerous small rivers. A large shoal area, defined by the 10m curve, extends up to 6.75 miles off the N half of this section of coast. Two low, wooded islands stand on this shoal about 4 miles NNW of Tanjong Papat.

Labuk Bay (6°07'N., 117°50'E.), entered between Tanjong Pisau and Tanjong Niug, the S point of Pulau Pura Pura about 19.5 miles NE, is fouled by numerous sand banks over most of its area. A narrow channel leads to the Bongaya River on the NW side and another channel on the SE side provides passage to the Kuala Labuk in the SW corner of the bay.

These channels are used only by small boats with local knowledge. The W and SE sides of the bay are densely wooded and the shores are fringed by islets and rocks which extend some distance offshore. The N part of Pulau Torongohok, which stands in the SW part of the bay about 17 miles W of Tanjong Pisau, is covered with trees, 43m high, and is conspicuous when approaching from the NE.

10.64 Tanjong Niug (6°15'N., 117°43'E.) is a well-defined point covered with trees about 43m high. Quoin Hill and Flat Hill, 198 and 192m high, respectively, stand about 8 miles NW of the point.

Some low islets, which are merely clumps of mangroves on the fringing reef, extend about 0.75 mile N and 2.25 miles E from Tanjong Pisau. Pulau Kawan (Bankawan), about 31m high to the tops of the trees, lies outside this fringing reef about 1.5 miles NE of Tanjong Pisau.

Pulau Tikus, a wooded pyramidal-shaped island 56m high to the tops of the trees, lies about 1 mile WNW of Tanjong Pisau. A rock that dries 2.4m stands 0.5 mile N of this island.

Pulau Gusong, a small sandy, treeless islet, lies at the NE end of a large sand bank near the middle of the bay about 10 miles W of Tanjong Pisau.

A chain of islets, which Pulau Torongohok is the northernmost, lies in the SW part of the bay.

Tides—Currents.—The maximum rate of the ebb observed in Kuala Labuk was 3 knots. The tidal influence is felt for a distance of about 20 miles from the entrance. In the N part of Labuk Bay the flood sets WSW and the ebb ENE at a rate of 1 knot at springs. The ebb is the stronger and tends to run for longer than the flood.

Anchorage.—Anchorage can be taken in the N part of Labuk Bay, almost 1 mile SE of Tanjong Niug, in a depth of 5.5m. A vessel should approach from the E with Tanjong Niug bearing 260°, which leads over a least depth of 6.4m, between the two detached shoals with depths of 4.6m and 5.5m which lie 5.5 miles ENE and 6.5 miles E, respectively, of the point. When about 4 miles E of Tanjong Niug, course should be altered WSW for the anchorage.

Caution.—A vessel drawing more than 4.5m should approach the anchorage only at HW because of the difficulty of accurately determining the vessel's position.

10.65 Off-lying dangers.—The following islands, which lie in the NE and N approach to Sandakan Harbor, are known collectively as the Turtle Islands.

Gubbins Rock (6°03'N., 118°12'E.), with a depth of 2.1m and steep-to, lies about 10.75 miles NNE of the N end of Pulau Berhala. A 3.7m patch, marked by a lighted beacon, lies about 0.3 mile S of Gubbins Rock. A coral patch, with a depth of 2.7m, lies 2.5 miles SW of Gubbins Rock.

Taganak Island (6°05'N., 118°19'E.) lies about 20 miles E of Tanjong Pisau and rises to a height of 137m. A fringing reef extends up to 0.5 mile offshore in places.

An abandoned lighthouse tower stands on the summit of the island.

Taganak Patches (6°06'N., 118°15'E.), with depths of 8.2 to 16.5m, lie with their shallowest part 4.5 miles WNW of the summit of Taganak Island. Tide rips are occasionally seen in

the vicinity.

A 7.9m patch lies 6.5 miles WNW of Taganak Island.

Baguan Island (6°05'N., 118°27'E.), 70m high and densely wooded, is located about 7.75 miles ENE of Taganak Island and is surrounded by a coral reef that extends 0.75 mile offshore in places. Shoal depths extend about 2.25 miles ENE from the N extremity of the island. A pinnacle rock, with a depth of 5.5m, lies 2 miles NW of Baguan Island.

Laurel Rock, 1.6m high, stands 3.25 miles NNE of Baguan Island. The channel between Baguan Island and Laurel Rock is reported to be clear, but it is not recommended.

Clotilde Rock (6°14'N., 118°23'E.), a small coral reef 0.6m high and steep-to, lies about 9.5 miles NNE of Taganak Island. A 3.3m shoal lies 0.5 mile SW of Clotilde Rock.

10.66 Pulau Libaran (6°07'N., 118°01'E.), 43m high and wooded, lies 3.25 miles NE of Tanjong Pisau. A coral reef extends 1.25 miles E from the island and 0.75 mile W from the island. Black Rock and White Rock, both above-water, lie on the E reef and Pulau Bonting, which exhibits a light, and Tree Rock, also above water, lie on the W reef.

Pulau Gulisaan (Gulisan) (6°09'N., 118°03'E.), an islet with a conspicuous clump of trees 23m high, stands on the S edge of a coral reef 2 miles NE of Pulau Libaran.

Pulau Silingaan (6°10'N., 118°04'E.), about 31m high to the tops of the trees, lies about 1.5 miles N of Pulau Gulisaan. The islet is coral fringed and foul ground extends 0.75 mile NW from it. A light is shown on the S end of the island from a white metal framework tower with red bands.

Turtle Rock (6°12'N., 118°03'E.), with a least depth of 3.3m, lies 2 miles NNW of Pulau Silingaan.

Regulations.—Pulau Penyu Marine Park extends from Pulau Gulisan to Pulau Bakungaan Kecil 5 miles E and includes Pulau Silingaan and the extensive reef 1 mile to the E. The limits of the park are best seen on the chart. Special permission from the Director of Sabah Parks is required before entry or transit.

10.67 Great Bakkungaan (Bakungaan) (6°11'N., 118°07'E.) and Pulau Bakkungaan Kechil, two wooded islands fringed by coral reefs, are about 44m and 31m high to the tops of the trees. These islands lie 3.5 miles ENE and 3 miles E, respectively, of Pulau Silingaan.

Shoals and reefs lie between Pulau Silingaan and Great Bakkungaan and up to 2 miles NW of Great Bakkungaan.

Langaan Island (6°12'N., 118°09'E.), about 27m high to the tops of the trees, stands 1.75 miles NE of Great Bakkungaan Island. The island is fringed by a reef that extends 1 mile NW and N, 1.25 miles NE, and 0.5 mile SE from it.

An above-water sand bank lies about 0.5 mile from the islet on the E edge of the reef.

The passage between Great Bakkungaan and Langaan Island is fouled by reefs and shoals. Three reefs and shoals lie within 2 miles WNW of Great Bakkungaan Island.

Johnston Rock (6°13'N., 118°11'E.), a shoal with a least depth of 2.4m, lies 2.25 miles NE of Langaan Island. Several shoal patches, with depths of less than 11m, extend W from Johnston Rock. A 8.5m patch lies 1.25 miles E of the rock.

Several patches, with depths of 6.1 to 18.3m, lie centered about 3 miles NNE of Langaan Island.

A coral patch, with a least depth of 8.5m, lies about 4.5 miles ESE of Langaan Island. A 15.8m patch lies about 1 mile N of this coral patch.

Lihiman Island (6°14'N., 118°04'E.), about 67m high to the tops of the trees and densely wooded, lies about 4.75 miles WNW of Langaan Island. An islet, about 20m high to the tops of the trees, lies on the outer edge of a reef which extends about 0.75 mile NE of the island.

Boaan Island (6°17'N., 118°05'E.), 78m high to the tops of the trees and conspicuous, stands almost 3 miles N of Lihiman Island. A shoal, with a least depth of 4.3m, lies about 1.75 miles ESE of Boaan Island.

Lihiman Island and Boaan Island are mud volcanoes. Lihiman Island was reported active a half century ago.

Powell Shoal (6°18'N., 118°06'E.), with a least depth of 7.6m, lies about 1.5 miles NE of Boaan Island.

Sibaung Island (6°18'N., 118°00'E.), about 12m high to the tops of the trees, stands 4 miles WNW of Boaan Island. Glen Shoal, with a least depth of 9.1m, lies 2 miles NNE of Sibaung Island.

Flying Fish Rock (6°17'N., 118°08'E.), with a least depth of 2.7m and steep-to, lies 2.5 miles E of Boaan Island.

10.68 The coast between Tanjong Niug and Tanjong Sesip, about 11.5 miles to the N, is broken by several shallow rivers and creeks, and bordered by shoal ground which extends up to 10.5 miles off the former point and 2 miles off the latter point. From Tanjong Sesip, the coast extends about 18 miles NW to Tanjong Semangut and is fringed by reefs which extend up to 2.5 miles offshore in places.

Several shallow rivers and streams discharge along this section of coast, which is bordered by a low sandy beach.

Marchesa Bay (6°40'N., 117°34'E.) lies between the chain of reefs extending NE from the coast for 9.5 miles to Pulau Billean, and the chain of reefs extending NE for 7.5 miles from Tanjong Taroh to Pulau Leonan. This latter point marks the SE point of Pulau Jambongan.

Between these chains of reefs, the bay ranges in width from 10 to 12 miles with depths in the entrance of 18.3 to 31m, mud and shells, decreasing gradually SW to the shore. The shore of the bay is fringed by drying sand banks and reefs which extend from 0.5 to 2.75 miles offshore.

Numerous reefs lie within the bay, but the approach entered between Tanjong Semangut and Tanjong Taroh is free from dangers.

Claire Rock (6°41'N., 117°37'E.), with a least depth of 2.4m, lies 7.5 miles NE of Tanjong Semangut.

Green Patches (6°40'N., 117°40'E.), with a least depth of 1.3m, consists of a group of four detached coral heads, the S reef of which dries, which lie about 8 miles ENE of Tanjong Semangut.

March Reef (6°38'N., 117°37'E.), which dries about 0.3m and which is surrounded by dangers with depths less than 1.6m, lies about 5.5 miles E of Tanjong Semangut. Sealark, which dries 0.3m, lies about 1.5 miles SW of March Reef.

Off-lying Dangers and Islands

10.69 Kestrel Shoal (6°30'N., 117°59'E.), with a least depth of 2.4m, lies about 15.5 miles ENE of Tanjong Sesip.

Kechil Reef (6°35'N., 118°01'E.), a coral patch with a least depth of 5.5m, lies about 19 miles NE of Tanjong Sesip.

Miller Rock (6°34'N., 117°59'E.), with a least depth of 7.9m, lies about 1.25 miles WSW of Kechil Reef. A detached coral head, with a depth of 9.4m, lies about 2 miles NE of the rock.

DeCourcy Dangers (6°34'N., 117°56'E.), with depths of 4.1 to 17.6m, lie from 2 to 5 miles N of Pulau Lankayan.

Pulau Lankayan (6°30'N., 117°55'E.), an islet about 34m high to the tops of the trees, lies about 11.75 miles NE of Tanjong Sesip. Numerous dangers, with depths of 1.6 to 11m, lie within 1.5 miles E and W, and 1 mile N of the island.

Cranefield Dangers (6°26'N., 117°50'E.) consists of a large number of shoals with depths of less than 1.8m in places, lying midway between Pulau Lankayan and Tanjong Sesip.

10.70 Pulau Billean (6°37'N., 117°46'E.), about 11m high and marked by a few bushes, lies about 11.5 miles NNE of Tanjong Sesip. A cay lies about 0.25 mile SE. Pulau Billean is surrounded by coral reefs and dangers which extend about 4 miles NE, 1.5 miles E, and 3.5 miles W. Similar dangers lie between this island and the coast, about 9.5 miles SW. Some of these reefs are marked.

Pulau Tegipil (6°33'N., 117°43'E.), a densely wooded and conspicuous islet about 27m high to the tops of the trees, lies on this chain of reefs about midway between Pulau Billean and the coast.

Bankuruan Cays (6°32'N., 117°41'E.), two small wooded islets about 11 and 20m high to the tops of the trees, lie on this chain about 2 miles SW of Pulau Tegipil.

Harcourt Reef, Chambers Reef, and Mitchell Rocks, together with numerous patches with depths of 9.1m and less, lie between the chains of reefs extending SW from Pulau Lankayan and Pulau Billean to the coast. The positions of these dangers can best be seen on the chart.

Billean South Dangers (6°40'N., 117°53'E.) consist of a group of coral reefs lying from 7 to 11 miles ENE of Pulau Bilean. They consist of Ground Rock, a 3.3m patch about 7.5 miles NE of Pulau Bilean; Sunbeam Rock, with a depth of 2.7m, about 7 miles ENE of Pulau Bilean, with Irene Rock, a 3.3m patch about 1.5 miles farther in the same direction; Paknam Shoal, with a depth of 5.5m, about 3.5 miles E of Irene Rock; and an 8.2m patch lying about 1.75 miles SSW of it.

All of these shoals are steep-to and less water than charted may exist. The recommended track shown on the chart has been followed with safety, but vessels are advised to use caution when navigating in the vicinity of these dangers.

Billean North Dangers (6°46'N., 117°45'E.), a group of coral reefs with a least known depth of 0.9m, lie centered about 9.25 miles N of Pulau Bilean. These dangers have not been completely examined and should be avoided.

Sedgeman Rocks (6°43'N., 117°44'E.), with a least depth of 8.2m, lie about 6.5 miles NNW of Pulau Bilean.

10.71 Pulau Leonan (6°44'N., 117°37'E.), a small drying sand cay, lies about 7.5 miles NE of Tanjong Taroh and about 0.75 mile within the NE end of an extensive chain of reefs which extend 8 miles NE from the E side of **Pulau Jambongan** (6°41'N., 117°27'E.). Numerous shoals, the positions of which may best be seen on the chart, extend up to 5 miles NW from Pulau Leonan.

Pole Reef (6°46'N., 117°40'E.), a small drying atoll, lies about 2.75 miles ENE of Pulau Leonan. A clear channel, about 2 miles wide, lies between this reef and the dangers fringing Pulau Leonan. Two detached reefs, with depths of 2.4m and 1.8m, lie 1 and 1.5 miles, respectively, NE of Pole Reef.

Pole Reef Lighted Beacon stands on the W side of the reef. It was reported that the lighted beacon was replaced by a lighted buoy.

Dingle Rock (6°47'N., 117°36'E.), with a least depth of 7.6m, lies about 3.5 miles NW of the beacon, reported destroyed, marking Pole Reef. John Rock, with a similar depth, lies about 1.3 miles farther NW. A detached coral patch, with a least depth of 10m, lies 0.5 mile SSW of this latter rock.

Sandy Cay is located W of Sandy Island. A beacon stands 0.1 mile SW and Sandy Cay West Lighted Beacon stands on the S side of this patch. The light was reported extinguished.

Sandy Island (6°49'N., 117°37'E.), a small sand atoll 1.6m high, stands 5 miles N of Pulau Leonan. A chain of shoals, with depths of 7.3 to 18.3m, extends 3.25 miles NE from a position about 0.5 mile SE of Sandy Island.

Some shoal patches lie within 0.5 mile SW and 0.6 mile W of Sandy Island.

Harrison Reef (6°50'N., 117°34'E.), a coral reef with a least depth of 0.6m, lies about 2.5 miles WNW of Sandy Island. It is marked on its S side by a beacon. The beacon was reported destroyed.

Caution.—Numerous dangers lie between John Rock and Dingle Rock, and the coast of Pulau Jambongan, 7.5 miles SW. Inshore navigation is possible with caution, noting that dirty water may make the shoals invisible.

10.72 Pulau Sipindung (6°52'N., 117°33'E.), a sand cay about 0.6m high and covered at HW, stands on the W side of a reef about 1.32 miles in extent, which lies 4 miles NW of Sandy Island. A group of shoals, some uncovering, lie up to 2.5 miles N and NE and 0.5 mile S of the island.

Gibson Reef (6°51'N., 117°32'E.), which uncovers, lies on the W side of a shoal 0.5 mile in extent, which lies about 1.3 miles SW of Pulau Sipindung.

A large number of shoals and reefs, some of which uncover and others marked by cays, extend up to 4.5 miles W through 7.75 miles SW of Gibson Reef.

Gibson Reef Lighted Beacon stands on a patch lying 1 mile ESE of the reef. The lighted beacon was missing and was replaced by a (starboard hand) lighted buoy.

Dampier Rock (6°52'N., 117°32'E.), a 4.9m coral patch with an 8.2m patch 0.32 mile SW of it, lies almost 1.5 miles W of Pulau Sipindung.

An area, measuring about 20 miles wide from W to E and 14 miles long in a N and S direction, lies centered in position 6°56'N, 117°50'E, about 17.5 miles ENE of Pulau Sipindung. Numerous reefs, with depths of 1.6 to 3.7m, are reported to lie within this area, which may best be seen on the chart. This area has not been surveyed and vessels are cautioned not to enter it.

Numerous detached shoals and reefs lie between this foul ground and Bilean South Dangers and Bilean North Dangers to the S, and between this area and Sandy Island and Pulau Sipindung to the SW, and to Malawali Eastern Dangers about 11 miles W of the NW side of this area.

10.73 Pudsey Dawson Dangers (7°03'N., 117°46'E.) are a group of shoals which border the NW and N sides of this unsurveyed area. The W patch has a least depth of 4.6m and the remaining patches, which extend about 17.5 miles ENE from this patch, have depths of 4.6 to 18.3m.

Numerous shoal patches, with depths of 11m and less, lie within 8 miles N, NW, and WNW of Pudsey Dawson Dangers.

Muligi Patches (6°56'N., 118°02'E.) consist of a group of shoals, with depths of 8.2 to 18.3m, which lie close off the middle of the side of the unsurveyed area.

Monmouth Shoals (6°42'N., 118°07'E.) lie about 11 miles SE of the unsurveyed area. They consist of a group of five detached shoals with depths of about 4 to 8m and deep water between.

Meander Patch (7°10'N., 117°37'E.), about 1 mile long and narrow with a least depth of 3m near its center, lies about 10.5 miles NNW of the 4.6m patch on the W end of Pudsey Dawson Dangers.

Numerous shoals lie within 15 miles radius of Meander Patch. A 5.9m shoal was reported to lie 4.5 miles SE of Meander Patch.

Tides—Currents.—Off the coast between Malawali Channel and Sandakan Harbor, no regular tidal current was perceptible, but when the Northeast Monsoon blew steadily there appeared to be a constant set that tended to flow to the NW.

Directions.—From Sandakan Harbor to Malawali Channel are generally followed by the deep draft vessels as guided by recommended trackline shown on the charts. The NE coast of Borneo, from Sandakan Harbor to Marchesa Bay, Pulau Jambongan, and then to Maliwali Channel, is generally low, densely-wooded, and intersected by many streams and rivers.

For a considerable distance, the coast is fronted by numerous coral reefs and a good lookout from aloft should be exercised.

This passage is best made with the sun overhead or astern.

Caution.—The recommended track has been followed with safety, but there may be less water than charted on some of the shoals and other uncharted dangers may exist.

It should be borne in mind that no reliance can be placed on the positions of the sand cays which have no vegetation on them.

The action of the sea frequently causes them to shift considerably and even disappear. The beacons are often difficult to make out.

Marchesa Bay to Tanjong Inaruntong

10.74 Pulau Jembongan (6°41'N., 117°27'E.), which lies with Tanjong Taroh its SE extremity about 2.5 miles NNW of Tanjong Semangut, is about 7.5 miles long and 11 miles wide and densely wooded. Its SW part is separated from the mainland to the S by a shallow unexamined channel about 0.75 mile wide.

The village of Jembongan stands on the SE side of the island about midway between two low cliffs 2 miles apart. The SW cliff is red colored.

The E side of the island is bordered by mangroves and a clump of trees, 61m high, which stand close inland about 3 miles NNW of Tanjong Taroh. In the vicinity of Tanjong Landung Hayang, the NE point of the island, the coast becomes cliffy and rises to a height of 52m.

The channel to the logging settlement is about 0.32 mile wide with depths of 7.3 to 18.3m. The S side of the channel is marked by beacons and a buoy moored 2.5 miles WSW of Claire Rock that marks the W end of the bar. The bar, with a least reported depth of 4.6m and 2 miles wide, fronts the entrance of the channel which leads along the SE side of Pulau Jambongan as far as the red cliff; beyond this position the channel appears to shoal.

A black and white checkered buoy is moored about 6.5 miles WSW of Claire Rock. Shallow depths lie to the S of this channel. About 5 miles SSW of Tanjong Semangut and S of this extensive area of shoal ground lies the estuary of the Sungai Paitan, a small river. Three small islands lie in this estuary and about 4 miles to the W is a larger wooded island. The coast and the waters lying to the W of this extensive shoal have only been partially examined.

The N coast of the island between Tanjong Landung Taroh and Tanjong Buli Gantungan (Northwest Bluff), the NW point of the island, is bordered by cliffs about 6 to 15m high. The N point of the island rises to a hill about 0.75 mile within the point.

10.75 Tanjong Buli Gantungan (Northwest Bluff) (6°44'N., 117°23'E.), 156m high, and Southwest Bluff, 140m high, lying about 5.5 miles SW, are prominent headlands on the W side of the island. An inlet lies between these headlands and penetrates the island in an ESE direction for over 3 miles. The entrance of the inlet is 1.5 miles wide with a least depth of 3.7m The shores and the low head of the inlet are wooded.

The W shore of Pulau Jambongan appears to be clear, but the water is shallow. A drying sand patch and a reef lie a little less than 2.5 miles WSW of Tanjong Buli Gantungan.

Reefs and other dangers extend about 5.5 miles N and NE from the NE coast of Pulau Jambongan and about 8 miles to the E. On these reefs are many sand cays, two of which are especially conspicuous.

Pulau Bunkuduan, 21m high and tree covered, stands 1.75 miles NNW of the NE point of the island, and Pulau Kalangaan, 3m high and bush covered, stands 2.25 miles NE of the same point.

Reefs and foul ground extend 2.25 miles ENE from this latter cay.

A danger area, 4 miles in diameter, is centered around a point 2 miles N of Tanjung Limau.

The E side of the island, as far S as Tanjong Taroh, is fringed by reefs and foul ground which extend up to 2.5 miles offshore in places.

The coast between Tanjong Landung Hayan and Tanjong Layang Layang, about 17.25 miles NW, is indented by Paitan Bay, a large expanse of shoal water, most of which has not been examined. Numerous reefs, some drying and marked by islands and islets, lie scattered throughout the bay especially across the entrance. Depths in the bay range from 11m across the entrance to depths of 1.6m and less in its inner reaches.

Pulau Landayang (Bush Island) (6°48'N., 117°21'E.), a sandy bush-covered cay about 6m high, lies near the middle of a reef, 7.75 miles WNW of Tanjong Landung Hayang. Pulau Musa, densely wooded, lies on a similar reef about 4.5 miles farther WNW. Two additional small islets lie about 0.5 mile S of the S end of Pulau Musa.

Benkoka (6°53'N., 117°13'E.), a prominent wooded hill 179m high, stands 4.5 miles SSW of Tanjong Layang Layang.

The coast between Tanjong Layang Layang and Tanjong Naruntong, about 7.25 miles NW, is bordered by reefs and foul ground which extend up to 3 miles offshore in places, as defined by the 10m curve. Some of these reefs are marked by cays and islands.

Pulau Membatuaan (Tree Rock) (6°57'N., 117°15'E.), small in extent and 6.4m high, lies on the coastal reef almost 0.5 mile NE of Tanjong Layang Layang.

10.76 Pulau Mandidarah (Mandiralla) (6°56'N., 117°20'E.), a palm-covered island about 26m high to the tops of the trees, lies about 4.75 miles ESE of Tanjong Layang Layang. It lies on a coral reef which extends about 0.7 mile from its N side and 1 mile ENE from its E side.

Numerous scattered sunken and drying reefs lie from 2 miles E to 5 miles SSE of Pulau Mandidarah.

Fly Rock (6°58'N., 117°18'E.), drying, lies about 3.5 miles NE of Tanjong Layang Layang. Numerous drying coral reefs lie up to 1 mile S of Fly Rock and between it and Tanjong Layang Layang. Pulau Nangka lies near the edge of the coastal reef about 2.25 miles W of Fly Rock.

Passage Reef (6°59'N., 117°17'E.), awash, lies about 1.5 miles NE of Pulau Nangka. A small drying coral reef lies about 2.75 miles E of Passage Reef.

Passage Reef Lighted Beacon stands on the N side of the reef. A drying reef, marked by a beacon (port hand), lies 2.75 miles E of Passage Reef.

Pulau Lakataan (6°59'N., 117°12'E.), about 3.5 miles SE of Tanjong Naruntong, is bordered on its NE side by a red cliff 11m high. A reef extends about 0.75 mile from its E side.

Off-lying Islands and Dangers

10.77 Pulau Tigabu (6°53'N., 117°28'E.), 61m high to the treetops on the NW end and 52m high to the treetops on the SE end, lies on the S part of a drying reef about 4.5 miles NW of Pulau Sipindung. A 12m high metal framework tower stands on the summit of the island. Detached reefs, marked by several sand cays, extend about 3.5 miles ENE and 3 miles NE from the NE extremity of the island.

Pulau Tibakan (6°56'N., 117°28'E.), bush covered and 3m high, lies about 2.32 miles N of Pulau Tigabu. Foul ground extends about 0.5 mile SW from the island and up to 1.25 miles NE. Two detached drying coral reefs lie centered about 2 miles NW of Pulau Tibakan.

Sky Rock (6°54'N., 117°25'E.), awash, lies 3.25 miles WNW of Pulau Tigabu and is marked by a lighted beacon. Several detached shoals and reefs lie within about 1.3 miles ENE, 2 miles NE, and 2 miles NNE of this rock. Merlin Rock, with a depth of 2.1m and dark colored, lies near the center of this foul ground, 1 mile NE of Sky Rock.

Pulau Kukuban (6°56'N., 117°24'E.), covered with trees about 26m high, lies about 2 miles NNW of Sky Rock. A rock, awash, lies 1.25 miles SSE of Pulau Kukuban. Lubani Rock, marked by a lighted beacon, lies 2.5 miles SSW of Pulau Kukuban.

Mosquito Rock (6°58'N., 117°29'E.), with a least depth of 0.9m, lies almost 2.5 miles NE of Pulau Tibakan.

10.78 Pulau Buaning (6°59'N., 117°30'E.), a sand cay, lies on the S edge of a reef about 1.5 miles long in an E and W direction, which lies about 1 mile N of Mosquito Rock. A detached 1.8m patch lies about midway between this rock and the reef.

Pulau Tamboulian (6°58'N., 117°28'E.), about 21m high to the tree tops and surrounded by a reef, lies 2.25 miles N of Pulau Tibakan. A large number of detached coral reefs, some of which uncover at LW lie up to 7.5 miles WNW of Pulau Tamboulian.

Pulau Malawali (7°03'N., 117°18'E.), about 169m high in its NW part, lies with Tanjong Tobo its S extremity, about 5.25 miles NE of Tanjong Layang Layang. Pulau Mati and Pulau Tanjong lie off the NW and N sides of the island. The island is fringed by a reef which extends almost 1 mile offshore NE, N, and NW and about 0.5 mile from the S and SW sides.

Pulau Malawali is sparsely populated, the main village being at the N end of Pulau Tanjong.

Two shoals, with depths of 3m and 4.3m, lie about 1.25 miles and 1.75 miles WNW of the N extremity of Pulau Tanjong.

A sand cay lies on a reef about 0.6 mile NE of Pulau Tanjong. This reef extends, with drying patches, about 2.5 miles to the E. Another drying reef lies about 2 miles NNE of the E end of Pulau Malawali, and two reefs lie within 1 mile WNW of it. A spit of coral, which dries in places, extends ENE from the E end of Pulau Malawali for about 2.5 miles. There is an islet, 9.1m high, and a sand cay, 0.6m high, on the coral spit close to the E end of Pulau Malawali. Two other reefs, the N of which dries at its NE end, lie from 1 mile to 2.25 miles farther ENE.

Malawali Eastern Dangers (7°01'N., 117°27'E.) comprise a large number of detached reefs and shoals which extend up to 12 miles between ENE and SE from Pulau Malawali. No vessel should attempt to navigate through these dangers.

Drying reefs extend for 1.75 miles ENE from the 0.6m sand cay located about 0.75 mile E of the E end of Pulau Malawali. Two extensive reefs, the NE ends of which dry, lie about 2.75 and 4.5 miles, respectively, ENE of the above sand cay. About 6.75 miles ENE of the above sand cay and NW of Straggler Island, there is a reef with a depth of 2.1m.

10.79 Straggler Island (7°05'N., 117°29'E.), 6m high and wooded, lies 8.25 miles ENE of the E extremity of Pulau Malawali. The reef on which the island stands extends about 1 mile E and about 0.5 mile SW.

A reef, with a depth of less than 1.8m, lies 1.25 miles SE of Straggler Island. Another reef, with a similar depth, lies 2 miles SE of the same island; 0.5 mile ENE of the latter reef is a 5.8m coral patch. Other dangers of the group, which may best be seen on the chart, extend 7 miles farther S.

Fairway Shoal (7°07'N., 117°30'E.), with a rock awash on its S side, lies 2.75 miles NE of Straggler Island. The channel between this shoal and the E end of Southeast Banggi Dangers to the NW is 3 miles wide and deep.

A steep-to 5.8m patch lies 1.5 miles E of Fairway Shoal, and 3.5 miles to the NE there is a 12.8m patch. A 7.3m shoal was reported to lie 1 mile SW of the 12.8m patch.

South Channel Dangers (7°06'N., 117°11'E.) consist of numerous coral shoals lying to the W of Pulau Malawali and on the S side of Banggi South Channel. The westernmost patch

dries 0.6m and lies 6.5 miles W of Pulau Mati, an island off the NW extremity of Pulau Malawali.

A 7.6m patch extends into the fairway of Banggi South Channel about 0.75 mile NE of the 0.6m drying patch. The NE shoal, which dries at its S end, lies 3 miles NW of Pulau Mati. The S shoal, with a depth of 1.5m, lies 4 miles W of the same island.

There is a channel leading from Banggi South Channel to Malawali Channel to the S, passing between South Channel Dangers and Egeria Rocks to the W and Pulau Malawali to the E, but there is a 6.1m patch at the S end about 1.25 miles SSE of Egeria Rocks.

There are numerous underwater rocks in the vicinity north of 7′00'N and east of 117°30'E.

10.80 Egeria Rocks (7°03'N., 117°13'E.), with a depth of 0.6m and steep-to, lies 2.5 miles SW of Pulau Mali. A shoal patch, with a least depth of 1.2m and marked by a light, lies about 1.25 miles W of the rocks. The light was reported extinguished. An 8.2m patch lies 0.5 mile NW Egeria Rock.

Malawali Channel (7°00'N., 117°17'E.) NW entrance lies between the dangers fronting the N and NE coasts of Sabah (North Borneo) to the S and Pulau Malawali and the dangers to the W of it, on the N side. This channel leads SE to Sandakan Harbor through the islands, shoals, and reefs previously described.

Directions.—Vessels approaching Malawali Channel NW entrance should follow the recommended tracks as shown on the chart as far SE as Passage Reef. After passing NE of this reef at a distance of about 0.75 mile, keep the right extremity of Pulau Kukuban in range, bearing 121° with the summit of Pulau Tigabu; this is a good mark and is easily picked up.

When about 0.75 mile distance from Pulau Kukuban, alter course S to pass between the foul ground lying to the SE of Pulau Mandidarah and the reefs lying between Pulau Kukuban and Pulau Tigabu. When about 4 miles WSW of the NW summit of Pulau Tigabu, alter course to about 095° and steer for Pulau Sipindung. The reverse of these directions is followed by vessels bound NW.

Tanjong Naruntong (7°01'N., 117°09'E.) is the N extremity of a peninsula which extends N for about 23 miles between Paitan Bay on the E, and Marudu Bay on the W. The NE side of Tanjung Naruntong, toward Malawali Channel, is fringed by a bank on which there are numerous reefs and rocks, sunken and awash, extending 2.5 miles offshore.

Caution.—A stranded wreck has been reported (2014) W of Tanjung Naruntong at position 7°02'27.0"N, 117°07'15.6"E.

Pulau Banggi—Islands and Channels North of Borneo

10.81 Pulau Banggi (7°14'N., 117°10'E.), a densely wooded and hilly island, is separated from Tanjong Naruntong by Banggi Channel. Tanjong Kammaung, the S extremity of Pulau Banggi, lies 7 miles NNW of Tanjong Naruntong.

Pulau Banggi is fringed by a reef. The SE coast is fronted by several smaller islands with deep channels between them. Off the NE side of the island there are numerous islets and dangers which lie within 5.5 miles of the coast. A reef extends about 0.5 mile off the NW side of the island, and the water is foul to a distance of about 1 mile. Between Mayangit Point, the W extremity of the island, and Tanjong Kammaung (Kalutan Point), 11.5 miles S, the coast is slightly irregular and has numerous sunken rocks and dangers lying up to 1.25 miles off the projecting points. Islands and dangers extend 4.5 miles WSW from Tanjong Kammaung.

Karakit Village, Pulau Banggi

Courtesy of http://www.BorneoWetnWild.com

Karakit Village, Pulau Banggi—Main Dock

10.82 Bukit Banggi (Banguey Peak) (7°17'N., 117°06'E.), 528m high, is a prominent peak that stands near the NW extremity of Pulau Banggi. When viewed from NE or SW, the apex appears as a nipple, but from other directions the nipple shape becomes less apparent and the summit assumes a more rounded form. A range of hills extends E for 6 miles and terminates in East Hill.

A peak 328m high, then a range of smaller hills extends about 3 miles N and terminates in North Hill near the coast, which **Tanjong Samarang** (Samarang Point) (7°21'N., 117°09'E.) lies 5 miles WSW of the N extremity of Pulau Banggi. The coast between these two points is indented by two small bays. The W bay is fringed by reefs to a distance of 0.2

mile and has a sandy beach at its head.

Vessels can anchor, in 7.3m, in the entrance of this bay.

The E bay is foul and has a small islet in its entrance.

10.83 Mangsi Great Reef (Mangsee Great Reef) (7°29'N., 117°14'E.) lies 5.5 miles N of the N extremity of Pulau Banggi. It lies on the N side of Main Channel and separates that channel from Mangsi Channel (Mangsee Channel).

The reef is mostly covered at HW, but there is usually a sand cay on some part of it awash. Several lighted beacons were added to the northeastern corner of the reef between Mangsee Channel. At LW the reef dries 1.4m and presents a vast expanse of coral and sand, with lagoons here and there. A shoal spit, defined by about the 20m curve extends about 2 miles WSW from the W edge of the reef. A pinnacle rock, with a depth of 9.1m, lies close off the E extremity of the reef. A 16.4m patch was reported in the fairway, about 2.75 miles SW off the E extremity of the reef. A 15m patch was reported (1995) in the fairway, about 2.8 miles SW of the E extremity of Mangsi Great Reef.

10.84 Black Watch Rock (7°26'N., 117°17'E.), a sunken danger, lies on the S side of Main Channel about 5.5 miles NE of the N extremity of Pulau Banggi. The area between Black Watch Rock and Pulau Banggi is fouled by shoals, reefs, and small islets whose positions are charted.

Banggi Outer Northeast Reefs (Banguey Outer Northeast Reefs) (7°23'N., 117°21'E.), a group of reefs and shoals, parts of which dry, extend 4.5 miles SE from a position 2.25 miles SE of Black Watch Rock.

Mangsee Channel separates Mangsi Great Reef from North Mangsee Island and South Mangsee Island. This channel is seldom used and should be attempted only by vessels with local knowledge and only under the most favorable of conditions. Several lighted beacons have been placed on the northeastern edge of the reef.

Main Channel (7°26'N., 117°14'E.) passes between Mangsi Great Reef on the N and Black Watch Rock on the S. This channel is 5.5 miles wide, but the navigable width is reduced to 1.5 miles between the charted 18m lines on either side.

This channel is sometimes used by vessels coming from the SW and bound through Balabac Strait during the Northeast Monsoon. Such vessels should steer a course of 124° for a position, with the N extremity of Pulau Balambangan, bearing 234°, distant about 5.75 miles. Then a course of 080° should be steered to a position about 0.75 mile S of the S edge of Mangsi Great Reef, then a mid-channel course should be steered, passing 2 miles S of South Mangsee Island, then as required.

Vessels coming from the Sulu Sea should steer for South Mangsee Island on a course of 272°. When about 5 miles from the island the course should be altered so as to pass about 2 miles S of it. Then a reverse of the directions given above should be followed.

The dangers lying N, NE, and E of Mangsi Great Reef are described in Pub. 162, Sailing Directions (Enroute) Philippine Islands.

10.85 Southeast Banggi Dangers (7°07'N., 117°24'E.) are an extensive group of reefs and shoals, drying in parts and steep-to on its S side, that lie about 6 miles off the SE coast of Pulau Banggi. The water between these dangers, N to Banggi Outer Northeast Reefs, is encumbered by many dangers which may best be seen on the chart.

Carrington Reefs, a large mass of drying reefs, lie on the N side of Banggi South Channel, about 2 miles W of Southeast Banggi Dangers.

Pulau Balak (7°08'N., 117°08'E.) reaches a height of 88m in its W part. The island lies close off the SE coast of Pulau Banggi, about 4.25 miles W of Carrington Reefs.

Pulau Patanunan (Patanunam) (7°06'N., 117°05'E.) lies 0.75 mile E of the S extremity of Pulau Banggi. The island rises to a height of 99m near its S end. Shoal water extends 0.2 mile S and 0.45 mile SW of the island.

Pulau Maliangin Kechil (7°05'N., 117°01'E.), 47m high, lies on the S side of the foul ground that extends 4.25 miles WSW from Tanjong Kammaung. Pulau Maliangin Besar, 123m high, is located on the foul ground 1 mile NE of Pulau Maliangin Kechil.

Pulau Langisan, 9m high, is located on foul ground 1.75 miles WNW of Tanjong Kammaung.

Pulau Balambangan (7°16'N., 116°56'E.), a large irregularly-shaped island, is located 2.25 miles W of Pulau Banggi and is separated from that island by Banggi West Channel. The N portion of the island is flat and densely wooded with high trees, and the S part is hilly and attains a height of 134m.

Tanjung Siagut, the N extremity of the island is fringed by reefs and dangers to a distance of 2.5 miles W and 1.5 miles N. Detached patches, with depths of 11.3 to 14.6m, lie up to 4.5 miles NNE of the point. Siagut Shoal, consisting of a number of coral heads with depths of 1.8 to 7.3m, and one coral head awash, extends 2 miles SW from a position about 1.5 miles W of the N extremity of Pulau Balambangan.

The E coast of Pulau Balambangan is indented by North and South Harbors. North Harbor is entered between Tanjong Batang (Battang Point), located 5 miles S of the N extremity of the island and Tanjong Sempriok (Saparoak Point), 3 miles farther SSW. The entrance channel is about 0.5 mile wide between the reefs fringing the above points. A reef awash lies 1 mile W of Tanjong Batang. A reef extends NNE from Tanjong Sempriok to a position 0.5 mile S of the above reef that is awash. Depths of 12.8 to 18.3m are found in the outer part of the harbor, but vessels are cautioned against entering unless the reefs are clearly visible. A dangerous submerged rock, best seen on the chart, lies 2 miles S of Tanjung Periok.

Anchorage.—Anchorage can be taken, in 18m, in a position about 0.35 mile W of the above mentioned awash reef. In this position Tanjong Batang bears 083° and Tanjong Sempriok bears 204°. South Harbor is entered N of Tanjong Raha (Raha Point), which is located 5.5 miles SW of Tanjong Sempriok. Foul ground extends 2 miles E and 0.5 mile S from the N entrance point of South Harbor and reefs which dry extend 0.5 mile E of Tanjong Raha.

The entire SE coast of Pulau Balambangan is fronted by reefs whose positions are charted.

Banggi West Channel (Selat Banggi Barat) is encumbered by foul ground.

10.86 Pulau Tiga (7°20'N., 117°03'E.), a low wooded islet, located about 2.75 miles ESE of the N extremity of Pulau Balambangan, stands near the middle of a steep-to reef that ex-

tends 1 mile N and 1 mile SE from the islet. The channel W of Pulau Tiga should only be used by small vessels with local knowledge and only then if the dangers are clearly discernible.

Rifleman Rock, a small coral patch with a depth of 2.7m, lies 1.75 miles ESE of Pulau Tiga. Labuan Rock, with a depth of 2.7m, lies 2 miles SSE of Pulau Tiga.

A shoal, with a depth of 3.6m, has been reported to extend NE from the rock to a position about 0.25 mile NW of Rifleman Rock.

Half Channel Patch (7°13'N., 117°01'E.) has a depth of 0.9m, breaks at times, and lies near the middle of the fairway in a position 2 miles SE of Tanjong Sempriok.

The channel between it and the reef fringing Pulau Banggi is about 2.5 miles wide and has depths of 24m in the fairway.

Vessels entering Banggi West Channel from the N should pass W of Rifleman Rock, and between the shoal extending NE from Labuan Rock and the reef that extends from Pulau Tiga. After having passed W of the rock, the course should pass about 0.5 mile off Manyangit Point, lying S of Labuan Rock, then from 1 to 1.5 miles off the coast of Pulau Banggi, passing E of Half Channel Patch. Having passed the patch, course should be altered as required.

Vessels coming from the W should round the S extremity of Pulau Balambangan at a distance of about 2 miles, then keep that point on a bearing of more than 261° in shaping a course to pass well E of Half Channel Patch.

When clear of that danger, vessels should follow the reverse of the directions given above.

10.87 Banggi South Channel (Selat Banggi Selatan) (7°07'N., 117°10'E.) is bound on the N side by Pulau Balambangan and Pulau Banggi. The N coast of Borneo and adjacent dangers form the S side of the channel.

The dangers that form the S side of Banggi South Channel lying N, NE, and E of Tanjong Naruntong have been previously described in paragraph 10.82.

Petrel Shoals (7°04'N., 117°07'E.) is a group of shoals that range in depth from 3 to 8.5m, which extends about 1.25 miles WSW from a position 4 miles NNW of Tanjong Naruntong. A light is situated on the E end of the shoal area. Ten Foot Rock, with a depth of 3m, lies 0.75 mile SW of Petrel Shoals. There are heavy tide rips over a shoal, with a depth of 4.9m, about 0.5 mile S of Ten Foot Rock.

North Borneo Dangers, an extensive bank with drying rocks, lies about midway between Ten Foot Rock and Tanjong Naruntong.

Outer Shoal (7°02'N., 117°00'E.), which is bordered on its E and S sides by drying patches, lies on the S side of the W entrance of the channel about 2.5 miles SSW of **Pulau Maliangin Kechil** (7°04.5'N., 117°01.5'E.). It is the largest and farthest NW of the Northwest Borneo Dangers. The shoals in this area extend E about 4.5 miles from Outer Shoal, then NE 2.5 miles to Ten Foot Rock. A light is shown on Outer Shoal.

Tides—Currents.—Tidal currents in Banggi South Channel are weak but currents up to one knot in velocity have been experienced.

Directions.—This channel connects the South China Sea with the Sulu Sea and is used primarily by coasting vessels rounding the N end of Borneo. The channel is intricate and requires local knowledge. The channels N of Pulau Banggi are considered safer and easier to navigate.

The best time for proceeding through the channel from the W is during the afternoon with the sun overhead or astern, at which time reefs and dangers are easier to identify.

Vessels having rounded Pulau Kalampunian, which is marked by a light and will be discussed later, at a distance of 2.5 miles, should steer 098° to pass about 1 mile N of Outer Shoal Light and 1.25 miles S of Pulau Maliangin Kechil. When the summit of Pulau Maliangin Kechil bears 341°, course should be altered to 061° to pass 1.25 miles SE of Tanjong Kammaung. About 2.5 miles E of Tanjong Kammaung course should be slowly altered to 085°, which will lead midway between Carrington Reefs on the N, and the dangers that lie N of Pulau Malawali on the S. When the N extremity of Pulau Malawali bears 180°, about 2.5 miles, a course of 110° should be steered for about 5.25 miles, at which time the E extremity of Pulau Malawali will bear 222° about 3 miles distance, thence a course of 068° should be steered. This course leads SE of Southeast Banggi Dangers and about 1 mile N of Fairway Shoal, and then into the Sulu Sea.

Tanjong Naruntong to Tanjong Sempang Mangayau

10.88 From Tanjong Naruntong, the coast, which is indented by two bays, trends 9 miles SW to **Cape Mafsie** (6°56'N., 117°01'E.), which is 15m high. There are conspicuous white cliffs close NE of the cape.

The Sungai Tigatarok enters the sea through a shoal reef-filled bay 2 miles SW of Tanjong Naruntong.

Pulau Sapirak (6°59'N., 117°03'E.) lies on the edge of the coastal reef 6 miles WSW of Tanjong Naruntong and 0.25 mile offshore. The perimeter of this thickly wooded island is surmounted by steep cliffs about 15m and rises to an elevation of 34m to the tops of the coconut trees which stand on it.

Due to the dangers of coral reefs and rocks lying within a 4 mile radius of the island, vessels should not pass between the island and Outer Shoal Light, 5 miles NW.

From Pulau Sapirak, the coast trends 1 mile S to the entrance of the inlet leading to the Sungai Melobong. Both entrance points of the inlet are fringed by reefs which reduce the width of the channel to about 0.6 mile. The head of the inlet is encumbered by mud banks, which leave a narrow channel toward the NE shore with charted depths of 2.7 to 5.5m.

Tanjong Berungus, the W entrance point of the above-described inlet, is located 1 mile N of Cape Mafsie. A reef extends 1 mile N and 0.75 mile W of the point.

Marudu Bay (6°58'N., 116°56'E.), into which the Sungai Bandau (Marudu River) flows, is entered between Cape Mafsie and Tanjong Sempang Mangayau, 18 miles WNW. This bay is about 25 miles long in a general N and S direction and has general depths of 11 to 33m. Several rivers, which shift their channel after each rainy season, flow into this bay.

From Cape Mafsie, which is fringed by a reef that extends 0.5 mile W, the coast trends in a S direction, 2.5 miles to Tanjong Perawan, which is 17m high and may be identified by its red cliffs.

The **Sungai Telaga** (6°50'N., 117°02'E.), the largest river flowing into Marudu Bay, is about 0.4 mile wide but decreases inside. The channel leading into the river's entrance is about

1m deep over the bar, but boats of 2.5m draft can ascend the river at HW for a distance of about 12 miles. Pulau Bengkoka, 8m high to the tops of the trees, is located in the mouth of the river at the S end of a sand spit extending 1.5 miles off the mainland.

The Sungai Taka flows out into the bay about 3.25 miles SW of the mouth of the Sungai Telega. Zebra Reefs are several coral patches, one of which dries, lying within about the 20m curve fronting the shore about 2 miles SW of the mouth of the Sungai Taka. A patch, with a depth of 1.2m, lies near the middle of the bay about 2.75 miles W of Zebra Reefs and Barraut Reef, a rocky shoal with a least depth of 1.2m, lies on a coral patch near the middle of the bay 1.25 miles SSW of the 1.2m patch above.

10.89 Mempakad (6°41'N., 116°57'E.) is a small village situated 5 miles SSW of the mouth of the Sungai Taka. Powell Rock, with a least depth of less than 1.8m, lies 0.75 mile N of Mempakad. Good anchorage for small vessels, in a depth of 12.8m, mud, is found 0.35 mile NW of the village.

From Mempakad to Tanjong Batu, 7.5 miles SW, the coast is fringed with a reef of sand and coral and foul ground to a distance of 1 mile offshore. Hills up to 265m high lie within 1 mile of the coast, and a peak, with a height of 692m, lies 5 miles SE of Tanjong Batu.

The Sungai Taritipan enters the bay 2 miles S of Tanjong Batu. From the Sungai Taritipan, the head of Marudu Bay trends W 5 miles to the Sungai Bandau (Marudu River), which enters the bay in its SW extremity. The coast between these rivers is covered with dense mangroves. mud banks, which dry from 0.3 to 0.6m, front the shore.

The channel leading to the entrance of the Sungai Bandau has a least depth of 0.5m and follows a general WSW direction for about 3 miles, between extensive mud banks. Small boats of 2m draft can ascend the river for about 1.5 miles at HW, but the channel must be marked by beacons.

Vessels with a draft of 6.1m may anchor, in 9.4m, mud, with Tanjong Batu bearing 060° about 1 mile and those with less draft may anchor further S. Vessels with a draft of 4.5m may anchor, in 6.4m, mud, off the entrance of the Sungai Bandau, with the S extremity of Tanjong Batu, bearing 104° at a distance of 2.5 miles. Deeper draft vessels should anchor about 0.3 mile NE of this anchorage, in 10 to 11m, with the S extremity of Tanjong Batu bearing 115°, distant 2.25 miles.

From the Sungai Bandau, the shore is fringed by mangroves and extensive flats as far N as abeam of Pulau Matunggong, about 4.5 miles distant. Pulau Matunggong is about 5.5m high and consists of a small mound surrounded by low rocks, mangroves, and is connected with the Sungai Matunggong to the W by a drying sand bank.

10.90 Brandon Reefs (6°42'N., 116°50'E.), several large coral patches which almost dry, lie 3 to 4 miles NE of Pulau Matunggang. The outer patch, with a depth of 3.2m, lies 2 miles offshore.

Pirate Point (6°46'N., 116°51'E.), low and mangrove covered, lies 4.5 miles N of the N Brandon Reef. A sand spit extends about 0.5 mile E and 0.5 mile N of this point.

Matunggong, a conspicuous wooded hill 389m high, lies 6 miles SW of Pirate Point.

Pulau Limau Limauan (6°50'N., 116°52'E.), a triangular-shaped island about 19.8m high, is joined to the coast at LW and lies 3 miles N of Pirate Point. A drying reef extends about 0.5 mile ESE and S from the island. A 3m patch lies 1.32 miles NE of the island and is marked by a beacon.

Between Pulau Limau Limauan and Tanjong Tigasamil, the S entrance point to Kudat Harbor, about 1.75 miles NNW, the coast is indented by a bay with depths of 14.6 to 18.3m.

Kudat Harbor (6°52'N., 116°50'E.) is 1.25 miles wide between Tanjong Tigasamil and the reclaimed land which has absorbed Tanjung Bornugas. Depths in the entrance range from 11 to 16.5m, shoaling gradually toward the bay head.

A shallow bay lies on the N side of the harbor between a point located about 0.5 mile W of Tanjung Bornugus and Egeria Bluff, about 1.25 miles farther W. Low overhead telegraph wires cross the entrance of a river in the NW part of this bay.

The three bays, which lie in the inner reaches of the harbor to the W, are shallow and fouled by numerous flats and shoals.

10.91 Kudat (6°53'N., 116°51'E.) (World Port Index No. 51710), a small town, is situated on the N point of the entrance of the harbor. The town is built on the flat land N and W of Tanjong Bornugus and was once the capital of North Borneo. Kudat's importance has decreased in the advent of the road system linking it to Kota Kinabalu. Timber and wood products are the major exports.

Winds—Weather.—The dry time of year is from April to October. Fever is most prevalent during this time.

Strong NE winds with heavy rain usually occur during December and January.

Tides—Currents.—Tidal heights above datum of soundings are: MHHW, 1.7m; MLHW, 1.2m; MHLW, 1.2m; and MLLW, 0.5m.

The tidal currents are weak, the maximum observed was about 0.5 knot.

Depths—Limitations.—Sandilands Rocks, with a depth of 2.1m, lies in the middle of the entrance to Kudat Harbor, 0.75 mile ESE of Gueritz Rock.

Witti Rocks, two in number with least depths of 1.8m, lie close N of Sandilands Rock. A 5.5m patch lies close N of each rock.

Tigasamil Spit, which dries, extends about 0.4 mile NE from Tanjong Tigasamil. An islet, 6.1m high, lies close off Tanjong Tigasamil. Tern Rock, 1.2m high, lies on a drying reef which extends 0.25 mile N from Tanjong Tigasamil.

Gueritz Rock, with a depth of 0.6m, lies 0.3 mile SE of the Government Pier, close off the reclaimed land and is marked by a light. Datum Rock, covered only at the highest spring tides, dries 2.1m and lies 0.2 mile WNW of the Government Wharf.

A rock, with a least depth of 1.8m, lies in the middle of the harbor about 0.75 mile WSW of Datum Rock. An overhead cable crosses the bay between a point 0.1 mile N of Government Wharf and Residency Point.

Government Wharf, an open-pile pier, extends 99m SSW from the shore, about 0.4 mile E of Residency Point, and then 102m SW. The W side (outer) berth is 114m long (148m including dolphins) with a depth alongside of 6.4m. The E side (inner) berth is 94m long (128m including dolphins) with a depth alongside of 6.2m. Breakbulk, general cargo, and forest

products are handled by both piers. Vessels up to 4,000 dwt with a maximum loa of 114m can be accommodated.

A ro-ro berth, 38m long, handles fast ferry and ro-pax with a maximum of 1,000 dwt and varying water depths of 3.0-4.0m.

Aspect.—Conspicuous objects which mark the approach to Kudat Harbor are the Government Pier, the radio tower, Gueritz Rock Lighted Beacon, Sandilands Rock Lighted Beacon, and a water tower 0.75 mile NNW of Gueritz Rock Lighted Beacon.

Pilotage.—Vessels desiring a pilot should give at least 24 hours notice prior to arrival. Pilots normally board within the harbor limits.

Signals.—Berthing signals are indicated by two hoists; the vessel's call sign and by a red and white checkered flag above the International Code pennant, as shown in the table titled **Kudat—Berthing Signals**.

Kudat—Berthing Signals	
Pennant No.	**Berth**
0	Anchor
1	Government Wharf—seaward face
2	Government Wharf—inside face
1. A vessel should acknowledge the berthing signal with the Answering Pennant. The hoist at "half-mast" indicates that the vessel should prepare to move, but should not get underway until the hoist is "close-up."	
2. Red and white checkered flags are displayed on the wharf to indicate the position of the bow and/or stern of the vessel at the berth indicated.	
3. International Code flag "B" is displayed on the opposite yardarm to the berthing signal when a vessel loaded with inflammable or dangerous cargo is berthing or unberthing.	

Signals denoting the state of the current alongside Government Wharf are displayed, as follows:

Signal	Meaning
Cone, point up	Ebb current
Cone, point down	Flood current
Ball	Slack water

Anchorage.—Anchorage is recommended, in a depth of 11.9m, about 0.75 mile ESE of Gueritz Rock, with the conspicuous radio tower, in range bearing 354° with Gueritz Rock, and Sandilands Rock Lighted Beacon bearing 085° or nearer the town if draft permits.

Anchorage is prohibited within 0.3 mile of the head of Government Wharf. No vessel carrying explosives or dangerous petroleum is permitted to anchor in the approach fairway or within 0.65 mile of the head of Government Wharf.

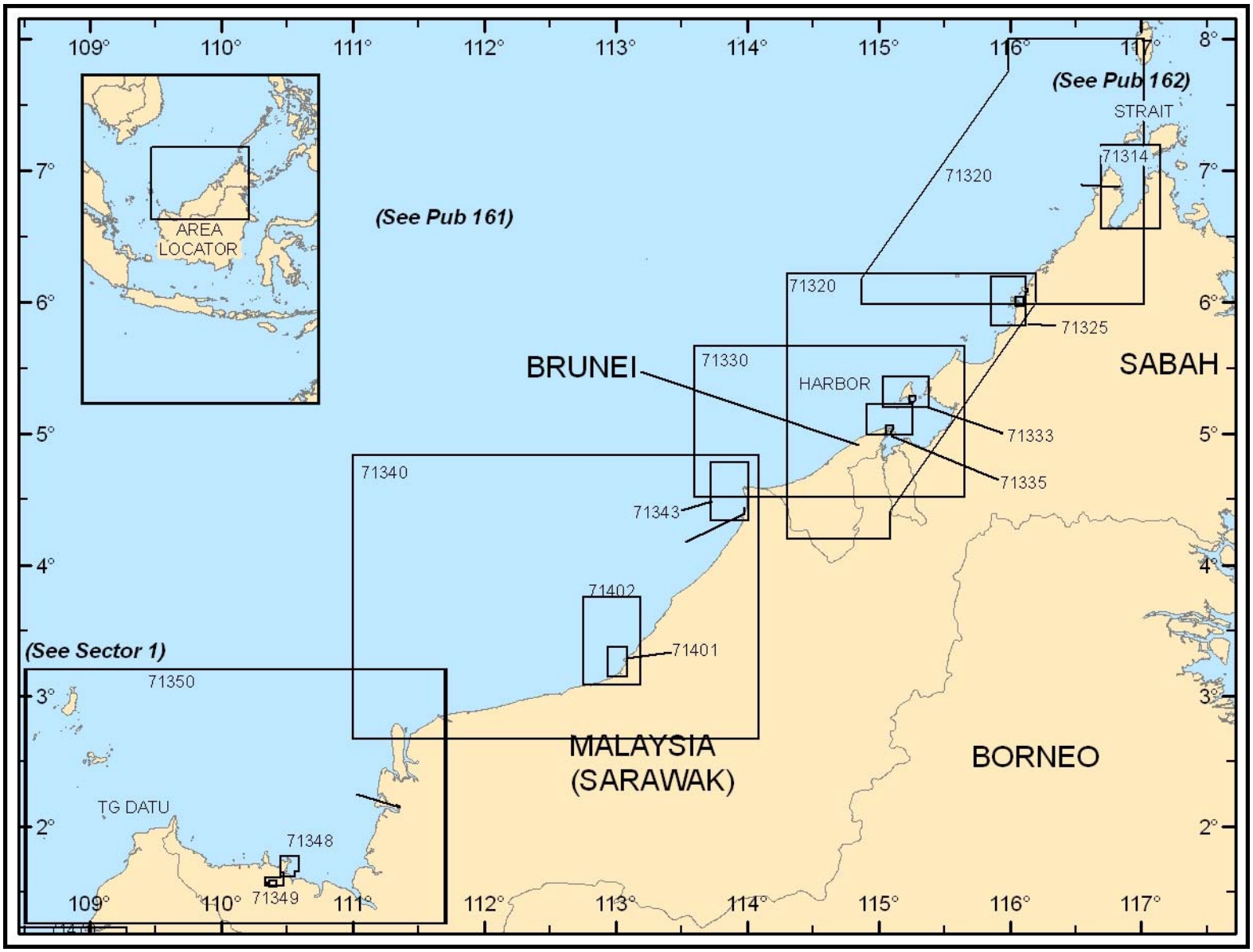
10.92 Between the N entrance point of Kudat Harbor and Tanjong Kapor, 1 mile NNW, the land has been reclaimed and a small boat marina has been constructed. Coral shoals, with depths of 3.7m and 5.5m, lie close E of the reclaimed land.

From Tanjong Kapor to Tanjong Tajau, 4.5 miles NNW, the coast is foul for a distance of 0.5 mile offshore. The Sungai Agong Agong flows into the bay 2.75 miles NNW of Tanjong Kapor.

Tanjung Agong Agong lies 0.5 mile NNE of this river; Tanjong Tajau lies 1.5 miles NNW of Tanjong Agong Agong.

Tanjong Sempang Mangayau (7°02'N., 116°45'E.), the N extremity of Borneo lying NW of Tanjong Tajau, is also the NW entrance point to Marudu Bay. The point is readily distinguished by its grassy bluff and by Pulau Kalampunian, which lies about 1 mile N of it. Low hills rise from the NW side of the bay to an elevation over 183m.

Melau Besar (6°47'N., 116°50'E.), about 17 miles SSE of Tanjong Sempang Mangayau, is a conspicuous hill with a bare flat summit 207m high. Matunggong, 414m high, is a thickly-wooded conspicuous peak located 5 miles SW of Melau Besar.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR **11** — CHART INFORMATION

SECTOR 11

BORNEO—NORTHWEST COAST

Plan.—This sector describes the NW coast of Borneo, from Tanjong Datu to Tanjong Naruntong, and includes South and North Luconia Shoals. The geographical sequence is NE.

General Remarks

11.1 The NW coast of Borneo, from Tanjong Datu to Tanjong Sempang Mangayau, which lies about 413 miles NE of Tanjong Datu, consists of Sarawak, Brunei, and a part of Sabah.

The coast is fairly regular, but is indented by two large bays. The larger of these bays is located between Tanjong Datu and Tanjong Sirik, a point about 110 miles to the ENE. The other is Brunei Bay, located about 145 miles SW of Tanjong Sampanmangio.

Much of the coast is fronted by tidal mud or sand flats, but is fairly free of fringing reef. Approaches to the coast are fouled in some places by detached shoals and coral reefs.

A number of rivers discharge into the sea along this section of coast, with many of them being navigable for some distance inland by small craft.

Much of the coastal land is low, but about 25 miles inland a mountain range extends in a NE direction and terminates at Mount Kinabalu, which rises to a height of 4,100m.

Labuan, which stands near the entrance of Brunei Bay, is the only island of any importance or size along the NW coast of Borneo.

Kuching, Miri, Brunei, Kota Kinabalu, Kudat, and Victoria are the principal towns on or near the coast.

A number of gas and oil fields have been established off the NW coast of Borneo. They include the Bakau, Baram, Baronia, Betty, Champion, Gannet, Kinabalu, Maharaja, Maspie, and Samarang gas and oil fields to name a few. These fields are best viewed on the chart. These fields contain numerous structures, most of which exhibit lights. They also contain below-water obstructions, some of which may be marked by buoys. As these features are not all charted, special caution should be exercised by vessels navigating in their vicinity.

Oil and gas pipelines are laid between the various platforms and fields, and also from them to collecting stations ashore. Gas pipelines contain flammable natural gas at high pressure. A vessel damaging a pipe could face an immediate fire hazard.

Mariners are strongly advised not to anchor or trawl near these pipelines. Pipelines are not always buried and may effectively reduce the charted depth by as much as 2m.

Mobile oil drilling rigs may be encountered off the NW coast of Borneo, between the 200m curve and the coast. When on location, a rig's moorings may extend 610m and will be marked by unlighted yellow buoys. At night, the rigs will display working lights.

Off the NW coast of Borneo and in Palawan Passage, between the parallels of 2°N, 11°N, currents may set in any direction throughout the year with rates up to 1 knot or more and have caused stranding of vessels on either side of the passage.

There are numerous wrecks in the waters along the Indonesian boarder between Sarawak and Brunei, which are best seen on the chart. Mariners should use caution.

Winds—Weather.—Along the W and NW coastal areas of Borneo, which is N of the equator, the winds blowing from N directions, November to April, and from S directions, May to October, are usually referred to as the Northeast Monsoon and the Southwest Monsoon. From November to April, N winds predominate and from May to October the prevailing winds are from the S. Land and sea breezes are effective throughout the year, modifying the prevailing flow to the extent where both N and S winds tend to become W by day and E by night. Both monsoons are characterized by cloudy skies with but few clear days. Light rain squalls are characteristic of the Northeast Monsoon season, while thunderstorms and heavy rain squalls are experienced during the S wind flow.

In the low latitudes in this part of the Pacific Ocean, gales appear to be infrequent; at least they are rarely recorded. Near the Equator, however, gales have been known to read force 10 or higher from some E direction. Among the records for instance, a SE gale of force 12 hurricane intensity was recorded in April within the ocean area 0° to 5°N, 115°E to 120°E. This was not classed as a typhoon wind since cyclonic depressions do not form so near the equator in these longitudes.

Along the N coast of Borneo, one of the few land areas that had a record of gales, it appeared that the incident was low or nonexistent. It is possible that the gales and squalls, during which higher velocities occurred, were sometimes of brief duration and some may have escaped recording.

Waterspouts and small whirlwinds, also known as windspouts, occur occasionally throughout this area and are most frequent during December or January. In these whirls the wind may attain velocities of 45 miles per hour over land and 55 miles per hour over the sea.

Tropical cyclones are rarely experienced in an area within 5° to 8° of the Equator and thus that part of Borneo described in this sector can be expected to be free of these cyclonic storms. So far as is known, the first typhoon recorded over Borneo, occurred on the NE coast in 1904. This storm was very destructive and destroyed numerous plantations and other properties.

In December 1892, a similar storm passed about 60 miles N of the N part of Borneo; on other occasions, they have occurred S of the Philippines and at these times the coasts of N Borneo and adjacent waters have experienced high winds and swells.

In a study based on ships observations, and published by the Netherlands Meteorological Institute, there is no record of any typhoon having occurred S of 8°N, latitude during the year 1910 through 1935.

Temperatures remain equable throughout this area with marked uniformity from day to day and month to month. The noteworthy variations occur with evaluation, the lowlands being consistently warm and sultry while the mountain elevations offer a comfortable, bracing climate.

At Labuan, an island off the NW coast of Borneo, the temperatures average 26.7°C from September through March, but there are daily extremes of 35.6°C in May and 15.6°C in April and June.

In general, rainfall is heavy over the area and occurs at all locations every month of the year. Large variations occur from year to year and most of the heavy downpours are confined to a limited area. The heaviest falls occur when the monsoon meets a mountain range close to the coastline. The monthly rainfall at all the stations along the NW coast of Borneo are consistently high with the N coast being relatively dry during the Southwest Monsoon because of the extensive shelter formed by the mountains inland. In general, September and October are the months with the heaviest rainfall whereas the months of January through March are the months with the least fall.

Mean cloud amount in the tropical zone varies little from day to day or from month to month. On land near the coast, however, there is a marked increase during the morning and massive cumulonimbus cloud accumulates in the afternoon and extensive thunder activity occurs during the evening; most of these clouds disperse overnight. The diurnal range of cloud amount is reversed over the sea, with clear areas during the day and a gradual increase during the night to a maximum around dawn; some of this cloud may spread inland with onshore winds.

Borneo has more thunderstorms than any other region in the World. Many places inland experience two out of three days of heavy atmospheric turbulence that product many lightning strikes. Coastal weather stations are reporting significant storm activity on one out of every three days. Some of the more violent storms cause considerable havoc with severe squalls and torrential rain. Most of these thunderstorms occur between May and September.

Tides—Currents.—Tides are mainly diurnal throughout this area but off the coast of Brunei there are stretches of coast where there is seldom more than one tide a day. The average rise of the tide range from 1 to 1.5m.

In the vicinity of the offshore reef there are local tidal currents which set onto and away from the reefs on all sides. In the narrow channel through the reefs these currents attain greater rates, but generally they are weak and during the strength of the seasonal currents they may be inappreciable.

As a general rule the current along the coast described in this sector sets SW from January through March and September and sets in the opposite direction during the other months.

Over the greater part of the area the currents are generally weak, setting at a velocity of less than 0.5 knots. During the months when the monsoons are fully developed (July, August, December to February) the mean rate increase to between 0.5 to 1 knots. Currents up to 2 knots may be experienced at times in any part of the area in any month and on rare occasions the current may increase up to 3 knots.

Aspect.—Automatic Identification Systems (AIS) are in place at lights in the anchorage areas from Tanjung Baram to Tanjung Datu. They are best seen on the chart.

Caution.—Numerous oil fields and gas fields exist off the coasts of Sarawak, Brunei, and Sabah. Prominent oilfields and platforms has been reported, including; Samarang Oilfield, Ketam Oilfield, Tembungo Oil Terminal. Each field contains clusters of installations, lighted and unlighted, permanent and movable, awash and submerged structures. However, most structures exhibit lights, especially the platforms. Since not all features are charted or marked, mariners are cautioned to exercise special care when navigating in these waters.

Fishing stakes exist in the area covered by this sector, particularly in depths of less than 10m, and their positions are frequently changed.

Tanjong Datu to the Sungai Sarawak

11.2 Tanjong Datu (2°05'N., 109°39'E.), rugged and precipitous, is the termination of a mountainous peninsula and has been previously described in paragraph 1.64.

Niger Bank (Permatang Naga) (2°09'N., 109°39'E.), with a last depth of 7.9m, lies 4.5 miles N of Tanjong Datu and was previously described in paragraph 1.65.

From Tanjong Datu, the coast of Sarawak extends 6 miles SSE to Tanjong Serabang (Pirate Point) and then about 20 miles S and SE to the entrance of the Batang Kayan.

A drying rock lies 0.5 mile offshore, about 1.75 miles SSE of Tanjong Datu. This rock lies at the outer end of a foul spit that extends from the shore in a NNE direction for about 1 mile.

Between the extremity of this spit and Tanjong Serabang, the coast is fringed by rocks that extend up to 0.5 mile offshore.

Pulau Datu, an islet 37m high, stands close offshore about 1.5 miles SSW of Tanjong Serabang.

Telok Serabang (1°59'N., 109°39'E.), a small bay lying between Pulau Datu and Tanjong Serabang, is shallow and rock-strewn.

Pulau Serabang (Pulau Kera), an islet 16m high, stands in the entrance of Telok Serabang about 0.8 mile SSE of Tanjong Serabang.

Between Pulau Datu and Tanjong Balinsha (Kelapa Empat), a point about 5.25 miles SSE, shoal water with depths of less than 5.5m extends up to 2 miles offshore. The N half of this shoal area is foul and marked by some above-water rocks.

From Tanjong Balinsah to Tanjong Batu, a point about 11.5 miles ESE, the coast is fronted by shoal water with depths of less than 5.5m, which extends 0.5 to 1.4 miles offshore.

A rock, which dries 2.1m, lies near the edge of the shoal water about 0.6 mile N of Tanjong Batu.

Pulau Talang Talang Besar (1°55'N., 109°47'E.), 113m high, lies about 6 miles ENE of Tanjong Balinsah.

Shoal water, with a depth of less than 1.8m, extends a short distance S of a sandy beach on the E side of this island.

11.3 Pulau Talang Talang Kechil (1°53'N., 109°46'E.), an islet 78m high, lies about 1 mile SSW of Pulau Talang Talang Besar.

Both of the above islands are turtle sanctuaries and have caretakers living on them.

Turtle Rock, which dries 3.6m, lies 1 mile SSW of Pulau Talang Talang Kechil.

The mouths of the Sungai Sirru Besar and the Sungai Sematan lie 2.5 miles SE and 7.33 miles ESE of Tanjong Balinsah. Neither river is of much importance to shipping.

The entrance channel leading into the latter river has a least reported depth of 0.6m on the alignment of the entrance range and leads between two drying sand spits.

The channel is subject to change, particularly during the Northeast Monsoon, and entry should not be attempted without

local knowledge. The average rise of the tide is about 0.6m.

Anchorage.—Anchorage can be taken by vessels up to 30.5m in length, in depths of 5.5m within the bar, but it is exposed to the Northeast Monsoon.

Lighted beacons, in range bearing 205.3°, lead over the bar and through the entrance of the river but they do not always indicate the best water.

A radio mast stands about 0.3 mile S of the W entrance point of the river.

Sematan (1°49'N., 109°47'E.), the westernmost port in Sarawak, is the site of a government station. All cargo is lightered to the offshore anchorage. All operations cease during the Northeast Monsoon.

Some small jetties, for the use of small local craft, lie on the W bank of the river about 0.3 mile above the entrance.

Vessels loading from Sematan should anchor in an area 2 miles in extent, which lies with its center about 3.32 miles ESE of Pulau Talang Talang Kechil. Vessels should not anchor W of 109°48.6'E, the W limit of the area. There are no restrictions on light-draft vessels anchoring S of the area.

A mooring buoy lies 1.4 miles SW of the E entrance point of the river. There are also several small moorings for lighters.

Tanjong Pelandek (Baugh Point) lies 2.32 miles SE of Tanjong Batu. A rock, with a depth of 0.4m, lies 0.3 miles E of Tanjong Pelandek.

The Sungai Sekambal, of little importance, enters the sea about 1 mile SSW of Tanjong Pelandek.

11.4 Batu Lundu (Batu Mandi) (1°44'N., 109°56'E.), which dries 4m, lies 3.32 miles ESE of Tanjong Pelandek. A light is shown from the NE side of the bank.

The Sungai Lundu entrance lies between Tanjong Bandang and Tanjong Sireh, located 2 miles SW and 1.5 miles SSE, respectively, of Batu Mandi. A shallow channel runs through a drying sand bank which extends 1.5 miles seaward of the river entrance.

There is a depth of 0.3m on the bar of the Sungai Mandi, but passage should only be attempted by vessels with local knowledge. The channel is entered 2 miles E of Batu Mandi and is marked by piles.

Pilotage.—Pilotage is compulsory.

11.5 The town of **Lundu** (1°41'N., 109°51'E.) stands on the left bank of the river 12 miles above the entrance. Three small wharves front the town along the river bank. The limiting dimensions at Lundu are a length of 48m, a beam of 10m, a draft of 2.4m, and up to 700 gt.

The **Sungai Sampadi** (1°41'N., 109°58'E.) discharges through two entrances 2.5 miles SSW and 3.5 miles SE of Batu Mandi. The W entrance can be approached through the channel to the Sungai Lundu. The E entrance is fouled by drying sand banks.

A group of fairly high mountains lies NW of Lundu, about 4 miles SW of Tanjong Pelandek. Gunung Perigi, with an elevation of 909m, is the highest.

Pulau Sampadi (1°44'N., 110°05'E.), 122m high, lies about 1.3 miles offshore and 9 miles E of Batu Lundu. Rocks and foul ground extend 0.3 mile from the W side of the island. The N above-water rock is 3m high.

Pulau Satang Besar (1°47'N., 110°10'E.), a densely wooded island 207m high, stands 5 miles NE of Pulau Sampadi. Its SE and S sides are fringed by foul ground; whereas, its other sides are steep-to and clear. A small plantation lies on its SE side.

Pulau Satang Kechil (1°46'N., 110°09'E.), a densely wooded islet, lies 1.3 miles S of the above island. It is fringed by a reef which extends 0.5 mile from its S side. An artificial reef has been established as a fish breeding ground, about 8 miles NNE of Pulau Satang Besar.

Other fish reefs lie 2.5 miles NNW, and 2 miles NE of Pulau Satung Besar. Artificial reefs of used tires are piled in these areas, and mariners are requested to avoid them.

Pulau Tukong Ara and Pulau Tukong Banun, both small in extent, lie 1.5 miles E and 2 miles SE of Pulau Satang Kechil. The above-described islands lie near the outer edge of the shoal water, with depths of less than 7.3m, which extends about 4.5 miles N from the low coast.

11.6 Batu Samarang (Cruizer Rock) (1°52'N., 110°21'E.), awash, lies about 12 miles ENE of Pulau Satang Besar.

During bad weather or with a heavy swell, this rock breaks; at such times it should be given a wide berth. Tanjong Buloh and Tanjong Embang, two points located on the E side of the Tanjong Sipang Peninsula, in range bearing 171°, leads about 0.62 mile W of Batu Samarang, and a tangent on the W side of Tanjong Sipang, in range bearing about 212° with Gunung Serapi, leads about 0.3 mile E of it. At night, Tanjong Po Light, bearing not less than 132°, will lead N of Batu Samarang.

Two dangerous wrecks lie about 10.5 miles NW of Tanjong Sipang; they are each marked on their N side by a lighted buoy. Two additional wrecks, with depths of 22 and 21m, lie approximately 11 miles N of Tanjong Sipang but are not marked by buoys. This area of wrecks should be given a wide berth on its N side.

A stranded wreck, the position of which is approximate, lies 6 miles W of Tanjong Sipang. A light is shown from the wreck.

A dangerous wreck, which dries, is situated 1.5 miles W of Tanjong Sipang. A lighted buoy lies 183m NNW of it.

The **Sungai Rambungan** (1°42'N., 110°08'E.) and the Sungai Rayu have a common entrance lying 3.5 miles SE of Pulau Sampadi. A bar, with a depth of 0.3m, lies 1 mile N of the entrance.Within the bar the depths increase to 9.8m abreast the entrance.

The **Sungai Sibu Laut** (1°42'N., 110°12'E.) lies 7 miles ESE of Pulau Sampadi. A bar, with depths from 0.3 to 1.2m, obstructs the entrance 1 to 2 miles offshore.

Approaches to the Sungai Sarawak

11.7 Tanjong Sipang (1°48'N., 110°20'E.), marked by a light, is the N extremity of a mountainous peninsula which projects N from the mainland. It may be identified from the E or W by two remarkable sugarloaf peaks, which are prominent from these directions. The northernmost peak, known as The Pouce, is 515m high and conspicuous. Gunung Santubong, 844m high and the S peak, stands 4 miles S of Tanjong Sipang near the S end of the peninsula. A dangerous wreck lies 14 miles N of Tanjong Sipang. A lighted buoy marks close N of two dangerous wrecks, 11 miles NNW of the same point. A dangerous wreck lies 14 miles ENE of the point. Another wreck lies 4 miles SW of Tanjong Sipang and is marked by a

lighted buoy.

Gunung Serapi (1°34'N., 110°12'E.), which rises to a very sharp peak 911m high, stands about 12 miles SW of Gunung Santubong. Close W and at a slightly lesser elevation, stands a lump resembling a castle which is not visible E of Gunung Santubong. A conspicuous radio mast stands on the summit.

The **Sungai Sarawak** (1°43'N., 110°17'E.) has two navigable entrances; Santubong is entered close W of Tanjong Sipang, while Muara Tebas is entered close E of Tanjong Po, 12.5 miles ESE. The latter entrance is the one most generally used.

Kuching, the capital of the State of Sarawak, stands on both banks of the river 20 miles above the entrance of either branch.

Vessels up to 175m in length, with a draft of 7.6m, can reach the anchorage off Kampong Sejinkat, 6 miles above Muara Tebas. Vessels up to 100m long, with a draft of 5.2m, can reach Tanah Puteh Wharf, 2 miles below Kuching.

Dense early morning fog over the river is frequent, especially after heavy rain during the previous night. Normally the fog lifts 2 to 2.5 hours after sunrise.

Another peninsula, which projects in a NNE direction from the mainland for a distance of about 6 miles, is located about 10.5 miles ESE of the Tanjong Sipang Peninsula.

Pulau Lakei (1°45'N., 110°30'E.), a small islet, lies close off the N extremity of the above peninsula. A small rock, with a tide gauge hut, stands close S of this islet. The bay between the two peninsulas has shallow depths and dries in patches near its head. Pulau Lakei has been reported to be a good radar target at 25 miles.

11.8 Tanjong Po (1°44'N., 110°31'E.), the E extremity of the Pulau Lakei Peninsula, is located about 2 miles SE of the peninsula's N end. There is a white streak near the E end of the point. Shoal water, with depths of less than 7.3m, extends almost 0.5 mile offshore between Tanjong Po and the N extremity of the peninsula.

Aspects.—A light is shown from a 18m aluminum pyramidal tower, 0.15 mile W of Tanjong Po. Batu Mandi (White Rock), 2m high, lies near the SE end of this shoal water about 0.5 mile N of Tanjong Po, and drying rocks extend a short distance SE from it.

Caution.—Numerous dangerous wrecks has been reported within 10 miles offshore of Tanjong Po as best seen on chart.

Shoal water, with depths of less than 7.3m, extends from 3.5 to 5 miles offshore between Pulau Satang Kechil and Tanjong Sipang. From Tanjong Sipang, the coast extends SSW for about 4.5 miles to Tanjong Tambak.

Foul ground extends up to 0.5 mile off this section of coast. Shoal water, with depths of less than 1.8m, extends in a WNW direction for about 1.5 miles, from Telok Penyok, a small bay located about 3 miles SSW of Tanjong Sipang. Two detached 1.8m patches lie 0.5 mile and 1.3 miles WNW of the W extremity of this shoal water. These patches lie on either side of the fairway across the bar.

Between Tanjong Tambak and Tanjong Batuboya, which is located about 1.5 miles SSE, the coast recedes forming a bay that dries almost 0.3 mile from its head.

Batuan Tambak (Nap Rocks) (1°43'N., 110°18'E.), which dry 1.2m, lie 1 mile NW of Tanjong Batuboya.

Batuan Kera (Royalist Rocks) (1°43'N., 110°18'E.), which dry 1.2m, lie about 0.3 mile SW of the same point.

Pulau Kra (1°42'N., 110°18'E.), a small islet, lies on the S side of the entrance channel about 1 mile SSW of Tanjong Batuboya and is joined to the coast to the SE of it by a chain of rocks. This islet is rather difficult to distinguish from seaward.

11.9 Terumbu Salak (Rainbow Reef) (1°42'N., 110°18'E.), which dries, lies 0.35 mile NNW of Pulau Kra.

The bar of the Sungai Santubong has a depth of 1.8m. Its outer 5.5m edge lies about 6 miles NNW of Pulau Kra. This bar is possibly subject to change because of its sandy nature and because of the freshets that occur. It should not be attempted without local knowledge.

During the Northeast Monsoon, this entrance is not practicable because of the heavy swell on the bar. Inside the bar the depths increase rapidly, but there are several dangers between its entrance and its junction with the Sungai Sarawak.

Local knowledge is essential for vessels proceeding beyond Tanjong Batuboya.

Tides—Currents.—The flood sets E across the bar and the ebb to the W. In the entrance of the river the flood sets toward Royalist Rock. Close inside the river entrance the strength of both the flood and the ebb is increased.

There are usually two tides a day with the tidal range being 1.5 to 3.3m.

At the entrance of the Muara Tebas springs rise about 4.2m and the neaps about 3.4m.

Directions.—When approaching Santubong Entrance from the W, steer 131° for the peak of Gunung Santubong until Tanjong Sipang bears 072°, then steer 162° on the leading lights situated about 0.3 mile S of Pulau Kra. This course leads over the bar in a least depth of 1.8m. A wreck lies 4 miles SSW of Tanjung Sipang.

When Tanjong Batuboya bears 103°, alter course gradually to the E and steer between the point and Batuan Kera. If entering with the flood, care should be taken to alter course in ample time to avoid being set onto these rocks and the rocks SW of it.

As local knowledge is essential for proceeding above Tanjong Batuboya, no further directions are given.

11.10 The entrance to Muara Tebas provides the most generally used entry to the Sungai Sarawak which leads to Kuching. The entrance lies about 1 mile E of Tanjong Po. There is an outer and inner bar.

Tanjong Selabat (1°40'N., 110°29'E.) lies 3.5 miles SW of Tanjong Po. A bay which lies in between is fronted by a mud and sand shoal extending 1.5 miles to the E and dries up to 3.6m.

An islet, 34m high, lies close off Tanjong Selabat. Two other islets, both about 15m high to the tops of the trees, lie 0.2 mile SSE of Tanjong Selabat. Batu Menaul (Rocky Islet), 3m high, lies 0.5 mile SSE of the same point.

Tanjong Muara Tebas (1°39'N., 110°30'E.) lies 1.5 miles S of Tanjong Selabat. A small drying bay lies in between.

Gunung Ayer, 116m high, is the N hill on the above point. The beacon which stands on it is difficult to distinguish from seaward.

A rock, 3.7m high, lies close NNW of Tanjong Muara Tebas.

Caution.—It has been reported (1998) that a rock, with a depth of less than 0.2m, lies close NW of the Muara Tebas En-

trance range line, less than 0.7 mile ESE of Tanjung Muara Tebas.

11.11 Beting Matong (1°44'N., 110°33'E.), a sandy spit with depths less than 5m at its N end and drying to the S, lies on the E side of the entrance in the N and S direction with its N end about 1.5 miles NE of Tanjong Po.

The outer bar, which is composed of hard sand, lies about 2 miles SE of Tanjong Po and 0.5 mile NW of the outer alignment of the entrance range. There was a depth of 5.2m over the outer bar. The least depth over Beting Matong, on the alignment of the outer entrance range, was 4.6m.

Caution.—During the Northeast Monsoon, an underwater clearance of at least 2m should be allowed when crossing the outer bar because of the swell.

11.12 Tanjong Embang (1°38'N., 110°31'E.) comprises the coastal area on the S side of the river about 1 mile SE of Tanjong Muara Tebas. A drying spit extends almost 1 mile NE from Tanjong Embang.

The inner bar is formed 1 mile E of Tanjong Muara Tebas. There was a depth of 4.6m on the range line leading over this bar.

Muara Tebas Entrance No. 1 Lighted Beacons, in range bearing 209.5°, lead across the outer bar. Muara Tebas Entrance No. 2 Lighted Beacons, in range bearing 247.33°, lead across the inner bar. The channel between the outer and inner bars, and the channel leading to Tanjong Pending is marked by numbered lighted buoys.

A detached 3.4m patch lies 0.5 mile ESE of Tanjong Muara Tebas and 137m NW of the alignment of the range leading across the inner bar.

Anchorage—Anchorage can be taken about 1.5 miles N of Tanjong Po, in depths of 9m, by vessels waiting for the tide to enter the river,

McDougall Point (1°37'N., 110°27'E.) lies on the S bank of the Sungai Sarawak, 3 miles WSW of the inner bar. The river then follows a winding course to North Junction Point where it joins the Santubong branch.

Kampong Muara Tebas lies on the N bank 0.3 mile WSW of Tanjong Muara Tebas. A drying jetty is situated here.

Tanjong Batu (1°38'N., 110°28'E.) lies on the N bank about 2.3 miles WSW of Tanjong Muara Tebas.

Batu Jernang (Belcher Rocks), marked by No. 9 Lighted Buoy moored close E, with a depth of 0.2m, lie 0.5 mile SW of Tanjong Batu. A notice board stands on the NW bank of the river abreast of these rocks.

A bar, with depths of 5.5m or less, lies 0.5 mile S of McDougall Point.

Tanjong Renard (Renard Point) (1°35'N., 110°27'E.), on the W bank of the river, lies about 1.3 miles S of McDougall Point. A rock, with a depth of 4.3m and marked by No. 10 Lighted Buoy, lies 0.5 mile N of Tanjong Renard. A light is shown from No. 3 Lighted Beacon standing on Tanjong Renard.

A submarine pipeline crosses the river in an ESE direction from Tanjong Renard.

Bukit Sejinkat, 85m high, stands 1.3 miles W of Tanjong Renard. Kampong Sejinkat, where there is a small pier, lies at the foot of this hill.

Beting Tanju, a shoal with a least reported depth of 2.7m, lies in the middle of the river S of Tanjong Renard and extends about 0.8 mile to the W. It is marked by No. 11 Lighted Buoy.

The entrance of the Loba Batu Blat lies between Tanjong Sedap and Tanjong Buaya 0.2 mile SW.

Tanjong Bakau lies 1 mile W of Tanjong Sedap; Batu Blat Reach lies in between. A bank, with depths of less than 1.8m, lies in this reach and extends 0.2 mile from the S bank. Another bank, with depths of less than 5.5m, extends 0.3 mile off the NW bank between Tanjong Batau and Pending Point.

Caution.—It has been reported (1998) that power lines, with an estimated vertical clearance of 61m, cross the Sungai Sarawak in the vicinity of Tanjung Bako. Overhead power cables, with a vertical clearance of 45m, cross the channel close W of Sejingkat Marine Terminal.

11.13 Kuching (Sejingkat) (1°34'N., 110°21'E.) (World Port Index No. 51560), the main commercial port and capital of the State of Sarawak, stands on the S bank of the Sungai Sarawak, about 22 miles above the entrance.

The principal government buildings and the commercial facilities are situated near the center of the Main Bazaar, which extends along the riverfront behind the wharves and warehouses. Kuching is a first port of entry.

Tides—Currents.—Tidal heights above datum soundings are:

MHWS	4.8m
MHWN	4.1m
MLWN	1.6m
MLLW	1.1m

The ebb sets out of the Sungai Kuap at a rate of 2 to 3 knots, and the flood sets in at a rate of 1.5 to 2 knots. Off Kuching, the ebb runs at a rate up to 3 knots at springs, but after a heavy rain it almost doubles this rate in the narrows. The flood off Kuching may attain a rate up to 1.32 knots. There is only a short period of slack water in the river.

Kuching—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
CMS Cement Terminal						
Main Jetty	105m	—	—	7.5m	7,000 dwt	Cement and clinker. Berthing length of 177m (including dolphins).

Kuching—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Service Jetty	18m	—	—	—	—	Cement. Berthing length of 94m (including dolphins).
Kuching Sejingkat Power Corporations Terminal						
Coal Jetty	90m	—	—	—	—	Coal.
Pending Terminal						
1	—	8.5m	175m	7.5m	12,500 dwt	Bunkers, general cargo, and bulk cargo. Continuous berthing length of 285m.
2	—	8.5m	175m	7.5m	12,500 dwt	
3	—	8.5m	175m	7.5m	12,500 dwt	
4	—	8.5m	175m	7.5m	12,500 dwt	Bunkers, general, and bulk cargo. Continuous berthing length of 350m.
5	—	8.5m	175m	7.5m	12,500 dwt	
6	—	8.5m	175m	7.5m	12,500 dwt	
Ro-ro Berth	—	8.5m	—	—	—	Ro-ro passengers/vehicles/rail and bunkers.
Sejingkat Terminal						
Main Pier	125m	—	95m	5.2m	6,000 dwt	Grain, containers, and reefer.
Senari Terminal						
Container Wharf	635m	11.0m	200m	17.5m	20,000 dwt	Containers, bunkers, and reefer. Berth pocket width of 45m.
Tanah Puteh						
Poh Kwong Dolphin	—	2.8m	—	—	—	Damaged. Project/heavy cargo.
Tanah Puteh Wharf	244m	—	95m	5.2m	6,000 dwt	Damaged. Ro-ro/lo-lo. Berthing length of 285m (including dolphins). Ro-ro ramp 95m in length.
Hexachem Chemicals Terminal						
Jetty	46m	—	—	—	—	Chemicals and project/heavy cargo. Berthing length of 97m (including dolphins).
Biawak Oil Terminal						
BOJ 1	48m	6.7m	110m	6.4m	9,144 dwt	Closed. Vegetable oils.
BOJ 2	45m	6.7m	110m	6.4m	8,000 dwt	Closed. Vegetable oils.
Senari Synergy Terminal						
North Berth	30m	—	—	—	—	Chemicals, clean products, and crude. Berthing length of 192m (including dolphins).
South Berth	30m	—	—	—	—	LPG. Berthing length of 140m (including dolphins).

When the height of HW at Pulau Lakei exceeds 4.7m, the flood continues to run at Kuching for 1 hour. In the entrances of the Sungai Sarawak, the rates of the currents are about 0.5 of those off Kuching. The tidal currents meet and separate near North Junction Point.

Depths—Limitations.—The Sungai Sarawak above Tanjong Pending passes through Turnabout Reach, Prima Donna Reach, Horseshoe Reach, and Town Reach to Kuching. Vessels, with a draft of 5.2m, can navigate these reaches as far as Tanah Puteh Wharf, 2 miles below Kuching. Vessels of lesser draft can reach the berths at Kuching. It has been reported (1997) that the river has been dredged and depths may be greater than charted.

A causeway has been constructed across Turnabout Reach about 0.7 mile above Tanjong Pending. Vessels no longer transit Turnabout Reach. Vessels now access Prima Donna Reach and points further upstream through the lock in the **Sungai Sarawak Barrage** (1°34.4'N., 110°24.3'E.) about 1.3 miles NE of Tanjong Pending.

For additional details see table titled **Kuching—Berth Information.**

A road bridge, with a vertical clearance of 6.1m and a navi-

Image by Michael Lo http://www.ibanorum.netfirms.com

City of Kuching on the Sungai Sarawak

Kuching—Brooke Dockyard

gable width of 65m, spans the Sungai Sarawak between Warren Point Wharf and Tanah Puteh Wharf.

Pilotage.—Pilotage is compulsory but berthing is done during daylight hours only. The vessel's ETA should be sent 36 hours in advance; pilots should be requested 24 hours in advance

Vessels are required to report to the Marine Signal Station at least 2 hours before arrival and are to maintain a continuous listening watch for pilotage and boarding information.

The pilot boards 1 mile NE of the light on Tanjong Po. During the Northeast Monsoon (October through March), the pilot boards at the intersection of the Tanjong Embang and Senari range lines.

Aspect.—Several silver painted oil tanks stand on the summit of Bukit Biawak, about 0.5 mile WNW of Tanjong Pending.

Regulations.—The following are extracts from the shipping regulations:

1. No vessels exceeding 80 nrt shall be underway in the Sungai Sarawak above Pending Point between the hours of 1930 and 0500 without the permission of the Director of Marine.
2. Powered vessels approaching Prima Donna and Dido Rocks, located about 1.3 and 3.5 miles, respectively, above North Junction Point, and when approaching a bend, shall give one prolonged blast on the whistle or siren.
3. Powered vessels exceeding 80 nrt may not overtake or pass another vessel in the Sungai Sarawak upstream of a point 0.5 mile E of Bintawak Rocks.
4. All vessels over 40 gt are required to anchor in the examination area off Kampong Sejinkat or if carrying dangerous goods in the explosives and dangerous cargo anchorage, and report their arrival to the Marine Signal Station at Pending; they must not proceed any further until permission has been granted.
5. Vessels transiting the Sungai Sarawak Barrage must contact "Kuching Barrage" on VHF channel 61 at least 1 hour prior to arrival and must monitor VHF channel 61 until being instructed by Kuching Barrage to enter the ship lock.

The maximum vessel dimensions allowed in the ship lock are, as follows:

Ship Lock Maximum Vessel	
Length	95m
Width	23m
Draft (HW)	5.2m
Draft (LW)	3.5m
Air Draft	12m

Vessel speed in the shiplock is limited to a maximum speed of 0.4 knot.

Anchorage.—Anchorage for three vessels up to 11,000 dwt, 170m in length with a draft of 7.6m, can be taken off Kampong Sejinkat. Beacons stand on the banks to assist in the selection of a berth.

This anchorage is a main timber-loading point; loading continues throughout the year. Vessels are not permitted to anchor off Pending Point.

An explosive and dangerous cargo anchorage extends 0.5 mile upriver from Tanjong Bako. Its limits are marked by beacons. This anchorage space is suitable for one vessel only with a length not exceeding 100m.

An examination anchorage has been established off Tanjong Sejinkat. Its limits are marked by beacons.

Vessels are recommended to anchor in the N half of the area. Shallow draft vessels should anchor as close to the N bank of the river as practicable.

A temporary examination anchorage is established on the E side of the bend in the river, opposite Tanjong Renard, between latitudes 1°35.05'N and 1°36.6'N.

Anchorage is prohibited between Lighted Buoy No. 11 and the NE limit of the explosives and dangerous cargo anchorage, except for vessels loading logs under pilotage and vessels of less than 4m draft may be allowed anchorage at Beting Tanju.

A stranded wreck lies in the SW of the dangerous cargo an-

chorage.

Anchoring and fishing are prohibited between the explosives and dangerous cargo anchorage and the entrances of the Sungai Kuap and Turnabout Reach. The SW limit of the area is marked by beacons.

Anchorage is prohibited in Turnabout Reach, except in an emergency; at such time the Director of Marine should be notified immediately.

Anchorage is prohibited in the channel between the channel mark opposite Warren Point and Brooks Dockyard, except in an emergency; at such time the Director of Marine should be notified immediately.

Directions.—When approaching Muara Tebas entrance from the W, pass on either side of Batu Samarang, but if passing to the S the spit extending 0.5 mile NE from Tanjong Buloh should be given a wide berth. In the early morning, the mist and fog banks may reduce visibility.

After rounding Pulau Lakei, steer to pass 1 mile E of Tanjong Po, then steer to cross the middle of the outer bar. When the lighthouse bears 304°, distance 2 miles, keep the outer lighted beacons in range, bearing 209.5° until the inner lighted beacons are in range bearing 247.3°. Keep on the alignment of this inner range which leads over the inner bar in a least depth of 4.6m.

To reach Kuching on one flood tide from the anchorage N of Tanjong Po, it is necessary to leave 3 hours before HW. It is advisable to arrive at Kuching 1 hour before HW if going alongside the wharves, because the turn can only be made on the flood.

Caution.—A good lookout must be kept for small tugs towing lumber rafts in the lower reaches of the river.

Considerable amounts of debris and large tree trunks may be encountered and should be given a wide berth if possible. When approaching the wharves, the whistle or siren should be sounded at frequent intervals to clear the numerous small craft and ferries out of the way.

A submarine cable crosses the river between Fort Maigherita and the opposite shore about 2 miles W of Warren Point. Each end is marked by a notice board. A pipeline crosses the river E of this cable. Similarly marked submarine cable crosses the river about 1 mile W of Warren Point.

The Sungai Sarawak to Tanjong Sirik

11.14 From the E extremity of Tanjong Embang, 5.5 miles S of Tanjong Po, the coast extends S for about 3 miles to the mouth of the Batang Samarahan, and then in an E direction for about 11 miles to the entrance of the Batang Sadong. Shoal water, with depths of 7.3m and less, extends in a N direction from this section of coast for a distance of 7 to 10 miles. Drying flats extend from 1 to 2 miles offshore. Numerous fishing stakes exist within 3 miles of the coast.

Batang Sadong (1°34'N., 110°44'E.), which has an entrance about 2.5 miles wide, lies between Tanjong Piling (Tanjong Stok) on its W side and Tanjong Melaban on its E side. An extensive bar of soft mud, with a least depth of 0.6m in its center, lies across the entrance. After crossing the bar there are no known dangers in the river from its mouth to its junction with the Simunjan branch about 20 miles upstream, but a tidal bore occurs in the river at spring tides. Tidal currents in the river are strong, reaching a spring rate of 3.5 knots in the entrance and 5 knots off Simunjan. Numerous fish traps exist in the mouth of the river.

Simunjan (1°24'N., 110°45'E.), a small town standing on the E bank of the river, is fronted by a wharf.

From Tanjong Melaban, the coast extends in an ESE direction for about 9.5 miles to the mouth of the Sungai Sebuyau, which discharges on the W side of the mouth of the Batang Lupar. Gunung Silabu, 436m high, and Gunung Berdiri, 412m high, standing 5.32 miles and 8 miles SE of Tanjong Melaban are useful landmarks.

Sebuyau Village (1°31'N., 110°55'E.) stands near the coast about 9 miles ESE of Tanjong Melaban at the mouth of the Sungai Sebuyau. Two wharves, both concrete, one with 2.7m alongside and the other with 1.2m alongside, are situated abreast of the town.

A soft mud bar, with a depth of 1.2m, crosses the entrance of the Sungai Sebuyau.

A large amount of stone is quarried locally and shipped from this port. Vessels up to 63m in length, with a draft of 5m, have used the port.

Bukit Sebuyau (1°31'N., 110°56'E.), 168m high to the tops of the trees, stands 0.3 mile S of Sebuyau Village. A hill, 125m high to the tops of the trees, stands 1 mile W of Bukit Sebuyau and Bukit Bruang, 375m high to the tops of the trees, stands 2.5 miles WSW of Bukit Sebuyau.

Pulau Burong (1°38'N., 110°48'E.), an islet about 105m high to the tops of the trees and marked by a light, stands 3.32 miles NNE of Tanjong Melaban. A rock, 26m high, lies close NW off the island. Shoal water extends up to 6.5 miles N from this islet.

The E entrance point of the Batang Lupar is located about 5.5 miles NE of the 125m hill near Sebuyau Village.

Batang Lupar (1°31'N., 110°59'E.) is entered between the mouth of the Sungai Sebuyan and the above point.

Triso Darat, 119m high to the tops of the trees, stands on the E bank of the river, about 3 miles S of the E entrance point.

11.15 Pulau Triso (1°31'N., 110°59'E.), an islet 92m high to the tops of the trees, lies 0.5 mile WSW of Triso Darat. A rock, with a depth of less than 1.8m, lies 183m ENE of the islet, and a 3m patch lies 0.13 mile NW of Pulau Triso.

The bar, which consists of very soft mud and has a least depth of 1.8m, lies with its outer end about 18 miles NW of Pulau Triso. An obstruction lies on the bar about 3.3 miles NE of Pulau Burong. The depths are reported to be greater and the bottom softer on the SW part of the bar than on its NE part.

At the entrance of the river the flood and ebb begin about 1 hour 50 minutes after LW and HW at Pulau Satang. The mean velocity of the flood is about 2.5 knots at springs and about 3.5 knots at ebb.

Pilotage.—Pilots for Batang Lupar and Batang Saribas can be arranged through Kuching. The pilot for Batang Lupar will board 1 mile NE of Tanjong Po Light. In bad weather pilots board E of Tanjong Muara Tebas.

Vessels, with a draft up to 5m, have entered the Batang Lupar at high tide.

The coast from the E entrance point of the Batang Lupar extends NNE for about 6 miles to Tanjong Edit (Tanjong Riong), the W entrance point of the Batang Saribas. Maludam Village

stands on this point. Tanjong Batang Marow (Tanjong Batang Marau), the E entrance point of the Batang Saribas, is located about 6.5 miles NNE of Tanjong Edit.

Directions.—To enter the river from the NW, steer 160° for Pulau Burong and pass NE of it. Then steer toward the SW side of the entrance and pass SW of Pulau Triso. The channel to the E of this islet is subject to strong eddies.

Caution.—A large number of fishing stakes exist in the approach to Batang Lupar. The seaward ends of these stakes are of solid construction and care must be taken to avoid them.

The Batang Lupar, from Pulau Teriso to its junction with the Sungai Lingga, about 14 miles upstream, has depths of 3.7 to 7.9m. It flows through a dense jungle consisting mostly of mangroves and palm trees.

Navigation is hampered by tidal bores in the Batang Lupar and the Sungai Lingga. The largest bores occur 3 days after full and new moon;, those occurring after the new moon are greater. The largest bores are usually first sighted just below Pulau Seduku, an islet mid-channel about 25 miles upriver from the mouth of the river, and travel about 40 miles farther upriver.

At times of very LW these bores have reached as far as 50 miles upriver from Pulau Seduku. In the large bores it is reported that the advancing wave attains a height of 2m when about 3 miles upriver from Pulau Seduku, and the speed of advance, which is dependent on the configuration of the river bed, is estimated to be about 10 knots at Simanggang, which is situated about 19 miles upriver from Pulau Seduku.

11.16 Simanggang, 44 miles upstream from the river mouth, has a wharf, a jetty, and a concrete ramp for use of bow-door landing craft. Vessels up to 36m and drawing up to 2m have entered the port, but it was necessary to utilize the flood tide in proceeding upriver.

Batang Saribas (1°43'N., 111°04'E.), entered between the two previously-mentioned points, is fronted by a bar which has a depth of 3m and a tidal range of up to 5.8m. Inside the bar the depths increase to 9.7m in the fairway. There is a minimum depth of 6.1m in the fairway from Pusa to Manggut. The tidal currents in the river are strong.

The Batang Saribas is over 100 miles long. Vessels with a draft of 1.5m can ascend to Betong, about 50 miles above the entrance.

11.17 Maludam Spit (1°42'N., 111°02'E.), a drying mud bank, extends about 3.3 miles NW from Tanjong Edit, the W entrance point of the river.

Depths of less than 9.1m extend in a NW direction from the mouth of the Batang Saribas for about 15 miles. Shoal water, with depths of 5.5m and less, extends about 11 miles N and NW from Tanjong Batang Marow. A drying sand bank extends almost 2.3 miles N from this point.

A bank, with depths of less than 5.5m, extends 12 miles NW and W from Tanjong Batang Marow.

Three narrow shoals lie on this bank as follows: Pasir Dua Blas, which dries 0.3m at its S end, lies 7 miles NW of Tanjong Batang Marow and extends 6 miles NNW.

Beting Maro (Beting Marau), which lies 2 miles NW of Tanjong Batang Marow, dries 2.1m in its S part and extends 7.5 miles N.

Pasir Lomba-lomba, which lies midway between the above two shoals and 6 miles NW of Tanjong Batang Marow, dries 2.4m.

Breakers were reported NW of Pasir Lomba-lomba at LW and shoal water appeared to extend for several miles in that direction.

Tanjong Paloh (1°47'N., 111°06'E.), the S entrance point of the Sungai Krian, lies 2 miles NE of Tanjong Batang Marow. Tanjong Kabong, the N entrance point, lies about 0.5 mile farther NE. A conspicuous casuarina tree stands 0.3 mile NW of Tanjong Kabong.

The drying part of Kabong Sand, which lies on the W side of the entrance channel, extends 3.32 miles from Tanjong Batang Marow. Kuala Kabong, the entrance of the Sungai Krian, lies close N of Kabong Sand.

A shoal, with a depth of 1.2m, lies about 3.2 miles NNW of Tanjong Kabong. A stake stood on this shoal. A spit, with depths of less than 1.8m, extends from Tanjong Kabong to a position 0.5 mile E of the S end of the above shoal.

Lighted range beacons are situated about 2 miles NE and 4 miles NNE, respectively, of Tanjong Batang Marow. These ranges, which should be used only E of Betang Maraw, lead into the Sungai Krian. These beacons are moved as necessary to conform to the changes in the channel. A depth of 1.5m could be entered into the river on the alignment of the above range.

Kabong, a fishing village and government station, is situated just inside the entrance on the N side of the river. A radio mast stands close S of the village.

The Sunagi Seblok, about 2.3 miles above Tanjong Kabong, has depths of 1.8 to 11.9m in the fairway for about 11.5 miles above its mouth.

In the entrance of the Sungai Krian the ebb attains a rate of about 4.5 knots at springs and a rate of 4 knots at floods. In the deep channel on either side of Beting Marau the ebb sets N at a rate of 3.5 knots at springs, while the flood sets S at a rate of about 3 knots.

11.18 From Tanjong Batang Marow, the coast extends in a NNE direction for about 21 miles to Tanjong Selalang, the S entrance point of the Kuala Rajang. The land in the vicinity of this point is very low and densely wooded.

Tanjong Jerijeh (2°09'N., 110°11'E.), the N entrance point of the Kuala Rajang, is located about 4.5 miles NNW of Tanjong Selalang, and the Batang Rajang is entered between these two points. A light is shown from a 37m high white metal framework tower standing 0.4 mile SSE of Tanjong Jerijeh. A wreck, with a depth of 3.3m and marked by a buoy, lies 3 miles SW of Tanjong Jerijeh; another wreck, with a depth of 5.9m, lies 2 miles W of the same point. Another wreck, marked by a light, lies 7.5 miles SSE of Tanjong Jerijeh.

Batang Rajang (2°08'N., 111°13'E.) is navigable by vessels drawing 4m as far as Sibu, 70 miles above its mouth. There are two difficult bends between Sarikei, 27 miles above the entrance, and Sibu. One is at the junction of the Maura Payang, 4.5 miles above Sarikei, and the other is at the junction of Batang Lebaan, 19.5 miles above Sarikeu. The latter needs care and should not be attempted during the ebb. Because of shoaling in the vicinity of this bend, the size of the vessels using the Batang Rajang as far as Sibu was limited to 61m in length with a draft of 4m. Additional shoaling has taken place.

Vessels up to 8.8m draft have crossed the bar at the entrance

Typical "Express Boat" plying the Sungai Rajang.

of the Kuala Rajang, but this draft will only permit access to the deep-water anchorage at Tanjong Mani. Vessels of up to 2,000 gt proceed to Sarikei and Binatang, 11 miles above Sarikeu. A bar, 3 miles below Sarikei, limits the draft of vessels proceeding to Sarikei to 7m. Light-draft power vessels can proceed to Kapit, 90 miles above Sibu, which has been reached by a vessel 61m in length with a draft of 4.3m.

The route to Sibu via the Kuala Rajang entrance is generally used by smaller vessels trading from Singapore. Larger vessels normally use the Kuala Paloh entrance.

Tanjong Jerijeh Light, previously described, shows up well in the afternoon but is difficult to make out when the sun is in the E. The motor house, with an aluminum roof close to the lighthouse, shows up well and may be used for bearings without appreciable error.

Karang Jerijeh, also marked by a light, stands 2 miles SE of Tanjong Jerijeh.

Anchorage.—A dangerous cargo anchorage is centered at about (2°08.3'N., 111°16'E.) and can be seen on the chart.

Caution.—An overhead power line with vertical clearance unknown is reported (2014) to cross upstream 3 miles from Sibu.

Kuala Rajang is obstructed by shoals, which as defined by the 5.5m curve, extend up to 6 miles offshore to form a bar. A channel, with a least charted depth of 5.8m, leads across this bar into depths of 11m. Numerous wrecks, best seen on the chart, lie in the approaches to Kuala Rajang. A dangerous wreck lies approximately 6 miles WSW of Tanjong Jeriyeh.

Bohari Bank (2°09'N., 111°06'E.), with a least depth of 2.1m, lies on the N side of the channel 2.3 miles W of Tanjong Jerijeh.

11.19 Wong Sands (2°06'N., 111°11'E.), which dry up into 4.3m, lie on the S side of the channel and extend 3 miles WNW from Tanjong Selalang. A depth of 2.7m lies almost 0.5 mile SW of the channel 6 miles WNW of the same point.

Fairway Lighted Buoy is moored at the entrance of the channel, 5.5 miles W of Tanjong Jerijeh. A stranded wreck which dries 1.2m, lies on Wong Sand, 2.5 miles WNW of Tanjong Selalang Light. Another wreck, with a depth of 3.5m, lies about 5.3 miles WNW of the same point. Another stranded wreck that dries 1m, lies about 4.3 miles farther W on the edge of Wong Sand.

Dangerous wrecks lie about 2.5 and 5.3 miles WNW of Tanjong Selalang.

Tides—Currents.—At springs, the N current attains a rate of 2 knots and the S current a rate of 1.5 knots in the vicinity of Fairway Lighted Buoy.

At Lighted Buoy No. 1, the ebb attains a rate of 3.5 knots and the flood a rate of 1.33 knots.

Pilotage.—Government pilots are boarded in a position between Lighted Buoy No. 2 and Lighted Buoy No. 4; other positions may be used if notified in the ETA message.

A request for their services should be made to "Shipping Sibu" and repeated to "Shipping Sarikei." The message should mention "Rajang Channel," and 24 hours notice is required. The pilot launch is equipped with radiotelephones.

A full time pilot is stationed at Sarikei, and the services of the Marine Officer, Sibu, are also available; at least 24 hours advance notice must be given to Sarikei and Sibu. Vessels should not proceed above the anchorage off Rajang without a pilot aboard because local knowledge is essential.

Kuala Rajang should be approached with Loba Ketan Light bearing 123°, passing close S of Fairway Lighted Buoy and N of Lighted Buoy No. 1. A course can then be shaped for the pilot boarding area.

The town of **Rajang** (2°09'N., 111°15'E.) stands on the N bank of the river about 5 miles E of the entrance and is fronted by a small jetty. A conspicuous sawmill stands close W of the town.

A jetty with a loading arm extends about 0.15 mile SSW from the sawmill. Mooring buoys lie E and W of the head of the jetty. Three jetties for small craft are situated close W of the sawmill jetty.

A stranded wreck lies on the S side of the channel, 0.8 mile SSW of the conspicuous sawmill. It is marked on its E side by a lighted buoy.

Caution.—At LW on a calm day, a ascend of about 0.45m has been observed on the bar. Depths are subject to considerable change and great care should be used when navigating through this area. During the Northeast Monsoon (October to March), an under keel clearance of 2m is recommended when crossing the bar.

11.20 Tanjong Sebubal (2°07'N., 111°19'E.), on the N bank of the river, lies about 5 miles ESE of Rajang.

Middle Bank (2°07'N., 111°19'E.), which consists of a group of drying mud banks, extends about 1.3 miles WNW from a position about 0.3 mile WSW of Tanjong Sebubal.

Tanjong Mani (Tanjung Manis) (2°09'N., 111°21'E.) lies on the S bank of the river about 2.5 miles NNE of Tanjong Sebubal.

Mani Bank, which dries 1.5m, lies with its SW end about 1 mile SW of Tanjong Mani. It stands on a spit, with depths of less than 5.5m, which extends about 0.3 mile off the bank of the river between Tanjong Mani and the small stream close S.

Tides—Currents.—The tides at Rajang are semidiurnal, the average spring range being about 3.4m.

The mean tidal range at Sibu is 2.7m. However, actual levels vary with the fresh water flow in the river and at times of flood may rise 1.8 to 2.4m above predicted levels.

The flood at Rajang commences about 5 hours before HW and has a velocity of about 3 knots. The ebb commences about 1 hour after HW and has a velocity of about 3.3 knots. The velocity of the current alongside the wharf at Sibu is reported to be about 0.5 knot.

Depths—Limitations.—Vessels up to 3,200 dwt, with a

maximum loa of185m loa and a maximum draft of 10.0m, can be accommodatedt.

Tanjung Manis Integrated Port consists of a 303m long main quay with a depth alongside of 11.0m. The quay handles containers, breakbulk, multipurpose, and reefer cargo.

Tanjung Manis Oil Terminal has two berths, both 25m long, each with a depth of 12.0m alongside. Each berth has a berthing length of 200m including dolphins. The berths handle chemicals, clean products (CPP), vegetable oils, and general cargo.

Anchorage.—The best anchorage for small vessels lies in mid-channel off Rajang, in depths of 9 to 12.8m, mud. Although the holding ground is good, the tidal currents are strong and the frequent squalls are heavy. Vessels are advised to veer an ample scope of chain.

Anchorage for deep-water vessels exists off Tanjong Mani. It can accommodate up to ten vessels at the same time, six up to 150m long and four between 90m and 120m in length; the holding ground is good.

The best anchorage lies from 0.25 to 0.35 mile S of the notice board about 0.65 mile N of Tanjong Mani. This anchorage is used by vessels loading timber whose size is only limited to those which can cross the bar.

11.21 North Jerijeh Sands (2°14'N., 111°10'E.), an extensive bank which dries in patches, extends 4.5 miles NNW from Tanjong Jerijeh.

Kuala Belawai (2°14'N., 111°09'E.), which can only be entered by small craft with local knowledge, lies between Tanjong Jerijeh and Tanjong Manat, about 4.5 miles NNE. This entrance leads into the Batang Belawl which connects with the Batang Rajang, and also with the Batang Paloh.

The entrance channel was found to lie 0.5 mile S of its charted position. A depth of 2.3m could be carried over the bar in a position about 3.3 miles WSW of Tanjong Manat. From this position the channel leads 090° to a position about 1.3 miles SSW of the point.

Approaching from the W, Tanjong Manat appears first as a line of trees with its S end considerably darker and denser than its other end. It forms a good landmark.

Manat Spit, which dries from 0.3 to 1.5m, extends 3 miles W from Tanjong Manat.

Kuala Paloh (2°26'N., 111°17'E.), the mouth of the Batang Paloh, is entered between Tanjong Pasir, about 17.5 miles NNE of Tanjong Jerijeh, and Tanjong Sedi. A bar, with depths of less than 2m, fronts Kuala Paloh between 1.5 and 9 miles NW of Tanjong Pasir. The bar is shallower than that fronting Kuala Rajang, but once crossed the river to Sibu via Muara Seredeng, Loba Semah, and Lebaan is easier to navigate and has fewer dangers.

This entrance is used almost exclusively by ocean-going vessels. The services of a pilot are recommended as he has knowledge of other ship movements in the river.

When the channel was opened, larger vessels have been able to reach Sibu. The limits imposed, 36 years ago, were drafts of 6.1m in summer and 5.2m during the Northeast Monsoon (October to March); although, 5.5m is occasionally acceptable at HW springs and after prior consultation with the pilotage authorities. Length is limited to 152m. These limits are revised from time to time.

Caution.—A stranded wreck, from which a light is shown, lies on the N side of the fairway 1.5 miles N of Tanjong Pasir.

11.22 Beting Osman (2°27'N., 111°13'E.), which dries 0.9m, lies on the S side of Kuala Paloh 1.5 miles NW of Tanjong Pasir. Depths of less than 1.8m extend 1.5 miles W from it.

Beting Mapal, Beting Timon, and Beting Bagus are three of several banks, which dry up to 2.8m, lying on the N side of the fairway from 1 to 5.5 miles NW of Tanjong Sedi. Depths of less than 1m extend 3 miles farther NW.

The approach channel is marked by two pairs of lighted buoys and passes S of a stranded wreck, marked by a light, lying 1.5 miles NNW of Tanjong Pasir.

At springs, the tidal current at the outer end of the approach channel runs N or S at a rate up to 2 knots. In the channel, the ebb current is 3.5 knots and the flood current is 1.8 knots.

While in the approach channel, care should be taken to avoid being set N on the ebb tide.

Anchorage for vessels awaiting a pilot is located at position 2°30'N, 111°09'E. If the bar is crossed, there is good anchorage 0.3 mile S of Tanjong Sedi.

Pilotage.—Government pilots are normally boarded off Tanjong Sedi. Request for their services should be made to "Shipping Sibu." The message should mention Paloh Channel. A prior notice of 24 hours is required. If the pilot is required to board outside the bar, this should be stated in the message.

In 1994, the least depth across the bar was 2m. Strong cross currents, tidal currents and swell necessitate caution when entering especially during the Northeast Monsoon.

As local knowledge is necessary to navigate the river no further directions will be given.

Two pairs of lighted beacons in range bearing 082.5° to 262.5°, stand at the junction of the Batang Paloh with the Muara Seredeng, about 12 miles upriver from Tanjong Sedi. These ranges indicate the fairway over the bar in a depth of 3.7m.

11.23 Sarikei (2°08'N., 111°32'E.) (World Port Index No. 51583), a small river port, lies on the S bank of the river about 27 miles above the mouth of the Batang Rajang. Vessels up to 3,000 gt, 79m in length, and a draft of 7.6m can be accommodated.

The main wharf at the port consists of a T-shaped structure with a berthing face 146m in length and a depth of 7.6m alongside. Container,s breakbulk, and general cargo are handled.

There is also a concrete pontoon, 30.5m in length, with a depth of 3m alongside. Two pontoons for launches with depths of 2.7m alongside are also available. A small jetty with shallow depths alongside is also available for launches.

A submarine water pipeline crosses the river in a N to S direction 0.45 mile NW of the mouth of the Sungai Sarikei. Another submarine pipeline crosses the Kuala Rajang approximately 2 miles W of Sarikei. A wreck, with a depth of 5.5m over, it lies approximately 2 miles N of Sarikei.

Binatang (Bintangor) (2°10'N., 111°38'E.), about 11 miles upriver from Sarikei, is a small river port of some commercial importance.

The main concrete wharf at the port is 49m long with a depth of 4.6m alongside. Vessels up to 2,500 gt can be accommodat-

Sarikei

ed. Two short jetties with depths of 2.1m and 3.7m are also available.

Tide signals are displayed, as follows:

Signal	Meaning
Flag E	Ebb tide
Flag F	Flood tide
Flag S	Slack water

11.24 Sibu (2°17'N., 111°49'E.) (World Port Index No. 51580), situated about 70 miles upriver from the mouth of the Batang Rajang, is one of the principal ports of Sarawak and the residence of a government official.

The town stands on a small island that lies near the confluence of the Batang Rajang and the Batang Igan. It is separated from the mainland by a small creek. Most of the principal offices are situated near the SE end of the town.

Depths—Limitations.—There are several wharves at Sibu. Main (Commercial) Wharf is 448m long with a depth of 8.5 alongside and used for general cargo and container traffic, can accommodate vessels up to 10,000 gt.

Within 0.3 mile SE of Main Wharf are four wharves, from 60 to 80m in length, with depths from 3.4 to 7.6m alongside.

The largest vessel to have used the port was of 7,372 gt and the deepest laden had a draft of 7.1m.

There are several floating wharves for launches.

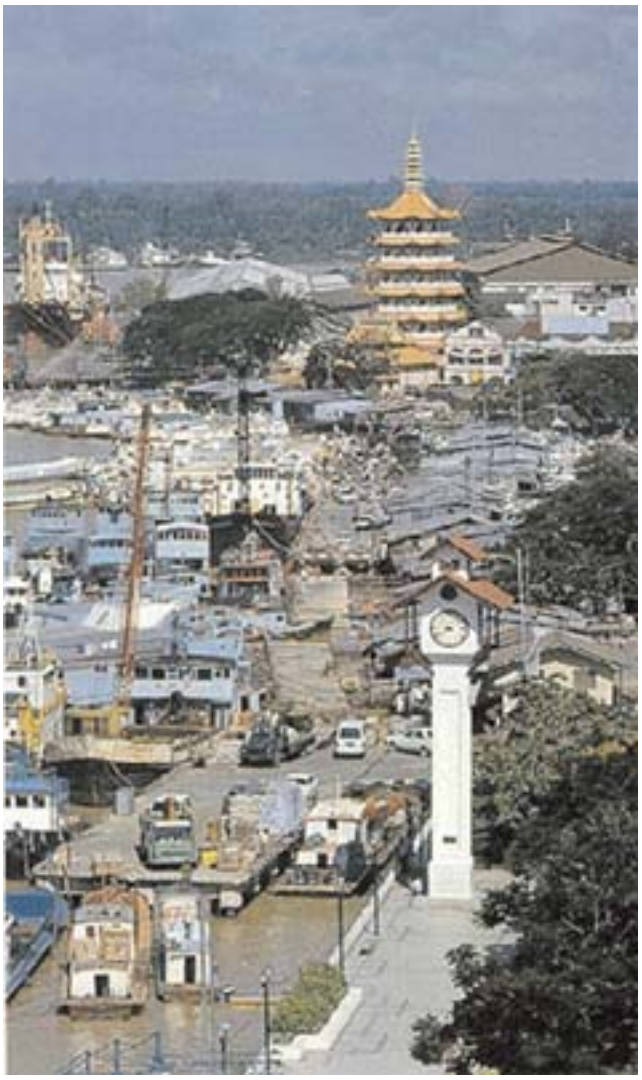
Bukit Lima Wharf is 23m long with a depth of 4m alongside. A depth of 4.9m exists about 0.1 mile NNW of this wharf. A wreck, with a depth of 0.4m, lies about 300m SSW of Bukit Lima Wharf.

Sungai Merah Oil Depot stands on the E bank of the Batang Igan, 2.33 miles N of Sibu. There is a T-head wharf at the depot, 49m long, with a depth of 4.6m alongside. Vessels up to 2,000 dwt, with a maximum loa of 74m and a maximum draft of 7.4m, can be accommodated. Small tankers up to 2,000 gt and 74m in length can berth alongside. Vessels should turn 0.5 mile above the wharf and berth port side-to, using an anchor.

Pilotage.—Pilotage is compulsory for tankers and foreign vessels and recommended for all others. Notice of ETA should be given 24 hours prior to expected arrival and should indicate which channel will be used.

Pilots board on the following positions:

1. Kuala Paloh (2°25.51'N, 111°17.93'E), or at the fairway lighted bouy if requested.
2. Kuala Rajang (2°07.70'N, 111°05'E), or at another position if notified in the ETA message.



Crowded waterfront at Sibu

Contact Information.—See the table titled **Sibu—Contact Information**.

Sibu—Contact Information	
Port Operations	
VHF	VHF channels 16 and 18
RT Freq	2182 kHz
Telephone	60-84-319-009
	60-84-319-004
Facsimile	60-84-318-754
E-mail	rpa@rajangport.gov.my
Web site	http://www.rajangport.gov.my

Anchorage.—Anchorage for vessels waiting for the tide or pilot can be obtained WNW of Tanjung Sedi, in the vicinity of 02°30' N., 111°40'E., in depths of 8.5m. Depths of 11m may be obtained about 1 mile ENE of Tanjung Pendam (2°17'N., 111°40'E.).

Anchorage is prohibited SE of the entrance of the Batang Igan.

There is restricted anchorage for loading and discharging of dangerous cargo other than petroleum off the NE side of Pulau Kerto, which lies directly opposite Sibu.

11.25 Tanjong Sirik (2°47'N., 111°19'E.), the low and densely-wooded W entrance point of Muara Lasa, lies about 21 miles N of Kuala Paloh. The intervening coast is low and covered by jungle growth. It has been reported that the light, a 38m high metal framework tower standing 0.6 mile SW of the N extremity of Tanjong Sirik, was difficult to see by day from the W because of the trees.

The coastline in the vicinity of Tanjong Sirik was reported to be extending NW and N.

A bank, with depths of less than 5.5m, lies from 3 to 5 miles offshore between Kuala Paloh and Tanjong Sirik.

Drying flats extend almost 4 miles NNW from Tanjong Sirik Light; the bank, with depths of less than 5.5m, extends 7 miles N of the light. A visible wreck lies 3 miles W of the light. A drying bank is situated 5 miles E of Tanjong Sirik Light; a stranded wreck is located 1 mile beyond the drying bank.

Tides—Currents.—The tidal currents in the offing set NE and SW, but inshore they follow more closely the trend of the coast. West of Tanjong Sirik the currents set N and S at a rate of from 2 to 3 knots; E of the point the currents set E and W.

There are tide rips and overfalls near the shoals off the point especially with the N and E setting currents.

There is considerable indraft with the NE setting current into the rivers between the Sungai Sarawak and Tanjong Sirik.

Caution.—Dangerous wrecks, best seen on the chart, lie 5.5 miles E and 10 miles N of Tanjong Sirik. Another dangerous wreck lies 25 miles NNE of the same point. And yet another dangerous wreck lies 55 miles NNE of Tanjong Sirik. These wrecks can best be seen on the chart.

A dangerous wreck, the position of which is approximate, was reported to lie about 67 miles NNW of Tanjong Sirik.

Dangerous wrecks lie in positions approximately 4 miles NE, and 15.5 miles WSW, and an unsurveyed wreck with a depth of 25m lie 34 miles NNW of Tanjong Sirik. A shoal sounding a depth of 20m was reported to exist 25 miles N of the same point.

Tanjong Sirik to Tanjong Kidurong

11.26 From Tanjong Sirik, the coast extends in an ENE direction for about 110 miles to Tanjong Kidurong. Between Tanjong Sirik and the entrance of the Batang Balingian, which lies about 32 miles WSW of Tanjong Kidurong, the coast is low and wooded. A mud bank, with depths of less than 5.5m, extends from this section of the coast for a distance of about 2.5 miles. This mud bank has not been closely examined. About 8 miles SE of the mouth of the Batang Balingian there is a range of hills that extends in a SE direction. Table Hill is the most prominent peak of the group.

Kuala Bruit (2°47'N., 111°22'E.) and Kuala Matu are located close E of Tanjong Sirik and are the two mouths of the Muara Lasa, a large river that extends in a general S direction and joins the Batang Paloh, about 24 miles SSE of Tanjong Sirik.

Both river mouths are separated by Pulau Patok, a pear-shaped island about 2 miles long. Pasir Jungau, a drying shoal, extends about 2.3 miles NNE from the N end of the island. A bank, with less than 1.8m, extends 6 miles N.

Kuala Bruit had a least depth of 1.2m over the bar, which lies from 4.5 to 5.5 miles NNW of Pulau Patok. This channel is subject to change and should not be attempted, especially after the Northeast Monsoon.

11.27 Pasir Dua Belas (2°48'N., 111°26'E.), a narrow sand spit with depths of less than 1.8m and which dries in places, extends from 3 to 6 miles N of Tanjong Jol, the E entrance point of the Muara Lassa.

Tides—Currents.—There are tide rips and overfalls over the shoals in the entrance of the Muara Lasa. The current runs strongly through the channels reaching a rate of 4 knots on the ebb after rains, close E of Pulau Patok.

Depths—Limitations.—The main entrance of the Muara Lassa lies between Pasir Dua Belas and Pasir Jungau, and E of Pulau Patok. Two detached patches, with depths of 3.9m and 3.6m, lie in the entrance 1.5 miles NE and 1.32 miles ENE, respectively, of the N end of Pulau Patok.

A least depth of 3.4m could be carried over the bar of the main entrance, which lies 6.5 miles NNE of Pulau Patok.

Numerous detached shoals consisting of stiff clay and rotting vegetable matter, with depths of 2.1 to 4.9m, lie 0.3 mile E of Pulau Patok. These can be avoided by passing close E of the island where depths of 4.9m exist about 0.2 mile offshore.

Directions.—When close S of the bar, pass close W of a row of fish traps on a course of 190°. Then pass about 0.3 mile E of Pasir Jungau and 0.4 mile E of Pulau Patok.

The above fish traps stood about 8.3 miles N of Tanjong Jol, but they are subject to be moved or destroyed.

Muara Lasa is clear of dangers on its W side when S of Pulau Patok.

11.28 Batang Igan (2°51'N., 111°39'E.) is entered E of Tanjong Budu, about 19.5 miles ENE of Tanjong Sirik. The lighthouse which stands on Tanjong Budu was reported difficult to see from the NW by day. A dangerous wreck lies 1.5 miles N of Tanjong Budu.

Wrecks, with depths of from 0.2 to 0.5m, lie in the outer part of Kuala Igan. The approach channel over the bar is subject to frequent change. Leading lights with an alignment of 188° stand 0.5 mile WNW of the light, close NE of which depths increase.

It has been reported that there are depths of 3.7 to 22m for 60 miles upriver to the junction of Batang Igan with Batang Rajang at Sibu. The channel has not been fully surveyed but vessels with a draft of up to 2.7m use the river regularly.

Igan Village stands on the E bank of the river 3 miles above the entrance.

Kuala Oya (2°53'N., 111°52'E.), the mouth of the Batang Oya, lies 13.5 miles E of Tanjong Budu. A clump of trees, 61m high to the tree tops, stand 3.5 miles W of Kuala Oya and are

prominent when viewed from the N and E. A dangerous wreck lies 28 miles N of Kuala Oya.

A light is shown from the W bank of the entrance to Batang Oya. A beacon stands S of the light. In line, bearing 190°, the light and the beacon lead across the bar.

Drying sand banks extend 0.3 mile NE from the W entrance point and 0.3 mile NNW from the E entrance point. In 1981, a bar with a least depth of 0.3m lay between N extremities of these sand banks. The bar is subject to change.

The channel across the bar and into Batang Oya is marked by stakes and could be approached years ago, with a white beacon 0.65 mile W of the light, bearing 247° ahead. It has been reported that vessels with draft of 1.8m can navigate this river as far as Kekan Village, 17 miles above the entrance.

Oya Village stands close within the river entrance.

11.29 Kuala Mukah (2°55'N., 112°05'E.), the mouth of Batang Mukah, is located 13.5 miles E of Kuala Oya. A narrow sand bank fringes the intervening coast. The several small rivers which discharge along this section of coast have no commercial importance.

Drying sand banks extended 0.3 mile NNW from both entrance points of Batang Mukah. A depth of 0.2m could be carried between their extremities. The range leads across the outer part of the E sand bank, which just dries.

Dangerous wrecks lie 2 miles and 3.5 miles N of the entrance.

Vessels at anchor have loaded logs off Kuala Mukah, but the anchorage is exposed to the Northeast Monsoon.

A light stands on the W bank of the river about 0.5 mile with the entrance. The stakes which mark the fairway across the bar are moved as necessary.

Signals.—Tide and depth signals are displayed from the rear range beacon on the E and W yardarms, as follows:

Signal	Meaning
One white ball	Flood tide
One red ball	Ebb tide
Three white balls	2.1m or more on the bar
Two white balls	1.8m on the bar
One white ball	0.5m on the bar
No signal	Less than 1.5m on the bar
Note.—At night, red and white lights are displayed in lieu of the red and white balls.	

Mukah (2°54'N., 112°06'E.) stands on the W bank of the river. A radio mast stands at Mukah close WSW of the rear range beacon.

Government Jetty, with a depth of 5.5m alongside, stands on the W bank of the river 0.5 mile within the entrance. A short commercial wharf, with shallow depths alongside, stands 0.2 mile further upriver.

11.30 Kuala Bintulu (3°11'N., 113°02'E.), the mouth of Batang Kemena, lies about 58 miles ENE of the mouth of Batang Mukah. Several other rivers, including Batang Balingian and Batang Tatau, discharge into the sea between these two rivers but none is of any importance to shipping.

Bukit Setiam, 639m high to the tops of the trees, standing 14.32 miles SW of Kuala Bintula, has a conspicuous summit and is a useful mark. Bukit Buan, 630m high to the tops of the trees, stands about 3.3 miles S of Bukit Setiam.

Bukit Ujan, 315m high to the tops of the trees, stands 10.5 miles ENE of Bukit Setiam. A dangerous wreck lies about 7.3 miles NW of Kuala Bintulu.

Bukit Nyabau (3°13'N., 113°05'E.), 220m high to the tops of the trees, standing 3.5 miles ENE of Kuala Bintulu is the highest and most prominent hill in the vicinity. A conspicuous radio tower, 277m high and marked by an obstruction light, stands 0.3 mile ENE of Bukit Nyabau. A radio tower stands on the W bank of the river opposite Bintulu.

Tanjong Batu (3°12'N., 113°02'E.), which is fringed by drying rocks, lies 1.5 miles NE of Kuala Bintulu. Bukit Jepak, 79m high to the tops of the trees, stands on the SW side of Bantang Kemena, about 1.3 miles from its entrance. A conspicuous radio tower stands near its summit.

In rainy weather, discolored water from the Batang Kemena extends several miles offshore. Large tree trunks are carried down by the river and may be a danger to navigation. From the vicinity of the Fairway Lighted Buoy (safe water) (3°13'N., 113°01'E.) the channel is marked by lighted buoys, the positions of which may change due to silting. Multiple wrecks lie in the approaches to Batang Kemena.

Depths of less than 5.5m extend about 1.3 miles NW from Kuala Bintulu.

A bar lies about 1 mile from the river entrance. It has been reported to be very unstable and mariners not having recent local knowledge were advised to obtain pilotage assistance. The shoal water on each side of the channel over the bar breaks.

Kuala Bintulu Lighted Range Beacons, standing on the E side of the entrance are in line bearing 098.5°. The front light is moved to indicate the deepest channel.

A wreck lies 0.6 mile NW and a stranded wreck 0.35 mile NNW of the front light structure.

The stranded wreck of a steel lighter, from which a light is shown, lies 0.5 mile WNW of the same light structure and close N of the leading line.

Numerous wrecks, best seen on the chart, lie in the approaches to Kuala Bintulu. The area should be navigated with caution.

A drying mud bank extends about 0.5 mile NW from the W entrance point of the Kuala Bintulu. A drying sand bank extends 0.7 mile NW from the E entrance point. Rocks, which dry 1.2m and 0.3m, lie 0.15 mile and 0.3 mile S of Tanjong Batu.

Tides—Currents.—The flow in the river and immediate approaches is mainly due to the ebb in the surface layer. The maximum rate is 1.5 knots and the maximum ebb flow of 2.5 knots occurs midway between HHW at Miri and the following LLW. The maximum flood rate of 0.3 knot occurs midway between LLW at Miri and the following HHW.

In the immediate approaches, the ebb underwater is apparent in the movement of floating debris, but there is little movement below a depth of 0.3m.

Signals.—Tidal signals are shown from the NE yardarm of

the rear leading light structure at the river entrance. One white ball represents the flood tide and one red ball for the ebb tide.

Depths signals are shown from the SW yardarm of the rear leading light, as follows:

Signal	Meaning
Three white balls	2.4m on the bar
Two white balls	1.8m on the bar
One white ball	1.2m on the bar
No signal	Less than 1.2m on the bar
Note.—At night, red and white lights are displayed in lieu of the red and white balls.	

Anchorage.—Anchorage can be taken, in a depth of 7.3m, good holding ground, about 2.3 miles NW of the front range beacon.

11.31 Bintulu (3°10'N., 113°02'E.) stands on the E bank of the river about 0.3 mile within the entrance. The principal berthing facility is 49m long, with depths of 0.8 to 1.3m alongside.

Batang Kemena is navigable by any vessel with local knowledge that can cross the bar, as far as Tubau, 50 miles upriver. A bridge, with a vertical clearance of 11.8m, crosses the river about 3.5 miles upstream from the above-mentioned berthing facility. The width of the navigation channel between the piers is 37m.

A shoal, with depths of 10 to 11m, lies 10.5 miles NE of Kuala Mukah. Its limits have not been defined. Depths of 11.9 and 11m lie 12 miles ENE and 13.5 miles E, respectively, of the above shoal, but they have not been examined.

Lydie Shoal (Beting Mukah) (3°51'N., 112°03'E.), a small coral patch with a depth of 34.7m, lies about 71 miles NW of Tanjong Kidurong.

Parsons Shoal (Beting Tugau) (3°54'N., 112°15'E.), with a depth of 20m, lies 12.32 miles ENE of Lydie Shoal. James Shoal (Beting Serupai), Beting Serupai, with a depth of 22m, lies 15 miles NE of the same shoal.

Caution.—Lighted and unlighted production platforms are located in the vicinity of Lydie Shoal and Parsons Shoal and can best be seen on the chart.

During the Northeast Monsoon (October to March), a distinct line of tide rips may be seen in the vicinity, particularly W of Lydie and Parsons Shoals. Beting Tugau is marked by Beting Tugau Lighted Buoy. A shoal, with two heads having depths of 21m and 22m, lies 13 miles SSE of Parsons Shoal.

Beting Safri (3°34'N., 112°21'E.), a coral shoal with a depth of 16m, lies 6.5 miles farther S.

A dangerous wreck lies 19.5 miles SSW, and an obstruction lies 10 miles WSW of Beting Tugau. An obstruction, with a depth of 22m, the remains of an abandoned oil well, lies 21 miles S of Parsons Shoal.

11.32 Acis North Shoal (Beting Liku Utara) (3°46'N., 112°38'E.), with a depth of 16.2m, lies 39 miles NW of Tanjong Kidurong. Two detached shoals with depths of 16.1 and 21.5m, were reported to lie 6.5 miles and 9.5 miles NW of Acis North Shoal.

Another shoal, with a depth of 26.5m, was reported to lie 1 mile E of the 21.5m shoal. A shoal with a depth of 17.6m, was reported to lie 0.5 mile S of the 21.5m shoal. A 25m shoal lies 14 miles NW of Acis South Shoal.

Acis South Shoal, a ridge of coral extending for 2.32 miles in a NE and SW direction, lies 7 miles SSE of the N shoal. The least depth over this ridge is 9.1m near its center.

Marie Shoal (Beting Tatau) (3°41'N., 112°48'E.), with a least depth of 12.5m, lies about 29 miles NNW of Tanjong Kidurong. An obstruction, whose position is approximate, is charted 6.5 miles SSE of Marie Shoal.

Ruth Shoals (Beting Kidurong) (3°44'N., 112°55'E.), three detached patches, lie between 6 miles and 8 miles ENE of Marie Shoal. The E patch has a least depth of 10.7m. The other two patches have depths of 12.8m and 13.4m.

Isobel Shoals (Beting Jepat) (3°50'N., 112°48'E.), which consist of a coral ridge extending in a NE and SW direction, with a depth of 12.5m, and a shoal, with a depth of 11m, lie 10 and 14 miles, respectively, NW of Ruth Shoals.

Madalene Shoals (Beting Bintulo) (3°50'N., 112°47'E.), a large group of detached coral patches, extend about 6 miles NNE to 15 miles N of the N end of Ruth Shoals. There is a least depth of 10.4m at the S end of this shoal.

Patricia Shoals (Beting Nyabau) (3°38'N., 113°03'E.), with a least depth of 9.1m, lies about 22 miles N of Tanjong Kidurong. Shoal patches, with depths of 13.7 to 18.3m, lie between this shoal and the 20m curve fronting the coast.

Wilson Shoal (Beting Nyalau) (3°47'N., 113°04'E.), with a depth of 15.2m, lies about 8.5 miles N of Patricia Shoal.

11.33 Christine Shoals (Beting Suai) (3°51'N., 113°02'E.), with the shallowest part having a depth of 10.4m, lie about 3.5 miles NW of Wilson Shoal. A dangerous wreck, whose position is approximate, lies 4 miles NNW of Christine Shoals.

Cochrane Bank (Permatang Payong) (3°49'N., 113°15'E.), having general depths of 15.5 to 18.3m, lies about 10 miles NW of Tanjong Payong. The bank is about 11 miles long in a NE and SW direction.

Elizabeth Shoals (Beting Bungai) (3°55'N., 113°10'E.), four attached coral patches with a least depth of about 9.7m, lie about 18 miles to the NW of Tanjong Payong.

Kenneth Bank (Permatang Mashor) (3°58'N., 113°22'E.) lies about 14 miles N of Tanjong Payong and has a least depth of 22m.

Ursula Shoals (Beting Niah) (3°58'N., 113°32'E.), a group of three shoals with depths of 3.7m, 8.5m, and 10.4m, lie between 12 and 15 miles NE of Tanjong Payong and 6 to 7 miles offshore. The NE and shallowest is steep-to and should be given a wide berth.

An offshore oil well with a lighted platform (3°36'N., 112°23'E.) is situated 4 miles NE of Beting Safri shoal. A pipeline leads 10 miles SSW to Bayan Oil Field platforms. From Bayan Oil Field, the pipeline continues 28 miles SSE to Tamana-B Oil Field platforms.

Offshore production platforms of Tamana-A Oil Field and Tamana-B Oil Field lie 21 miles and 15 miles W, respectively, of Tanjong Kidurong. An oil pipeline is laid from Temana-A Oil Field to Temana-B Oil Field, then to the shore 1.5 miles NE of Tanjong Kidurong. The West Patricia Oil Field lies in posi-

tion 3°34'N, 112°49'E.

A gas pipeline from the central Luconia Gas Field lands 2 miles NE of Tanjong Kidurong.

Caution.—Numerous lighted production platforms are located in the vicinity of West Patricia Oilfield and can best be seen on the chart.

Tanjong Kidurong to Tanjong Baram

11.34 Tanjong Kidurong (3°16'N., 113°03'E.) is located about 5.5 miles NNE of Kuala Bintulu. This point forms the N extremity of Telok Plan, a small bay that indents the coast for about 1.5 miles. A lighthouse stands about 10.2 mile ENE of Tanjong Kidurong.

Sheltered anchorage for small vessels may be taken during the Northeast Monsoon, in a depth of 5m, 0.3 mile SSE of Tanjong Kidurong.

Bintulu Offshore Terminal (3°20'N., 113°01'E.), consisting of a tanker mooring from which a light is shown, lies 4.5 miles NW of Tanjong Kidurong. An oil pipeline is laid from the shore 4.5 miles NE of the same point to the tanker mooring.

A recommended deep water track for deep draft vessels leads approximately 50 miles SE from a position 3 miles SW of Parsons Shoal (Beting Tugau) to Bintulu Harbor limits. Another deep water track leads about 23 miles SW and then SSW from a position 9 miles NW of Tanjong Payong to the harbor limits.

The terminal can accept tankers up to 320,000 dwt, with a length of up to 305m and a sailing draft of 15.9m. The pilot and berthing master board at the pilot boarding area at the inner end of the traffic separation scheme.

Anchorage.—Anchorage have been established for general cargo vessels, vessels waiting to enter, LNG carriers, tankers and vessels carrying explosives. Their limits are best seen on the chart. Advanced notice should be given 72 hours before arrival and then confirmed 6 hours and 3 hours before arrival. The use of a tug to assist with berthing and unberthing is compulsory.

Bintulu Port (3°16'N., 113°04'E.)

World Port Index No. 51585

11.35 Bintulu Port is situated on the S side of Tanjong Kidurong and contains an outer and an inner harbor. Extensive development of the port facilities, including a new S approach channel, has taking place (2002). The Port Authority should be consulted for the latest information.

The outer harbor facilitates LNG, LPG, and ammonia carriers. The inner harbor is for general cargo vessels. The port exports liquefied natural gas (LNG), palm oil, and fertilizers.

Bintulu—Berth Information

Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
Bintulu International Container Terminal (BICT)							
No. 04	225m	14.0m	200m	12.5m	32.26m	55,000 dwt	Containers and reefer. Continuous berthing length of 450m.
No. 05	225m	14.0m	200m	12.5m	32.8m	55,000 dwt	
General Cargo Terminal							
No. 01	171m	10.5m	190m	10.0m	27.2m	25,000 dwt	Containers, and breakbulk. Continuous berthing length of 514m.
No. 02	171m	10.5m	190m	10.0m	28.2m	25,000 dwt	
No. 03	172m	10.5m	190m	10.0m	32.26m	25,000 dwt	
Asean Bintulu Fertilizer (ABF) Bulk Cargo Terminal							
Bulk Cargo Wharf	270m	13.5m	200m	12.0m	30.6m	60,000 dwt	LPG, fertilizer, ro-ro freight, and breakbulk.
Multipurpose Terminal							
No. 06	200m	14.0m	188m	—	31.0m	55,000 dwt	Vegetable oils, cement, wood chips, breakbulk, palm oil, dry bulk, and general cargo. Continuous berthing length of 1,000m.
No. 07	200m	14.0m	200m	—	32.26m	55,000 dwt	
No. 08	200m	14.0m	204m	—	37.2m	55,000 dwt	
No. 09	200m	14.0m	225m	—	32.26m	55,000 dwt	
No. 10	200m	14.0m	200m	—	32.26m	55,000 dwt	
Bintulu Terminal							
LNG No. 01	124m	15.0m	300m	12.5m	50.0m	80.000 dwt	Dirty products, LNG, and bunkers. Berth length 315m including dolphins. Maximum displacement of 100,000t.

Bintulu—Berth Information							
Berth	Length	Depth	Maximum Vessel				Remarks
			LOA	Draft	Beam	Size	
LNG No. 02	120m	15.0m	300m	12.5m	50.0m	80.000 dwt	Dirty products, LNG, and bunkers. Berthing length of 340m (including dolphins). Maximum displacement of 100,000t.
LNG No. 03	122m	15.0m	300m	12.5m	47.0m	80.000 dwt	Dirty products, LNG, and bunkers. Berthing length of 323m (including dolphins). Maximum displacement of 100,000t.
SBM B1	—	18.0m	380m	15.0m	44.0m	150,000 dwt	Crude. Maximum displacement of 400,000t.
SBM B2	—	18.9m	380m	15.8m	32.26m	350,000 dwt	Clean products and bunkers. Maximum displacement of 400,000t.
Liquid Bulk Shell/Petronas-1st Inner Harbor							
BPA Petroleum Jetty—North Berth	45m	11.0m	200m	—	20.4m	30,000 dwt	Chemicals, dirty products, and bunkers. Berthing length of 266m (including dolphins).
BPA Petroleum Jetty—South Berth	45m	11.0m	200m	—	20.0m	30,000 dwt	Chemicals, dirty products, and bunkers. Berthing length of 266m (including dolphins).
LPG Sarawak							
Shell/Petronas	30m	11.0m	230m	—	—	51,000 dwt	LPG and bunkers. Berthing length of 290m (including dolphins).
Palm Oil Terminal-2nd Inner Harbor							
Palm Oil Northern 1 (PON 1)	—	14.0m	220m	11.0m	32.2m	50,000 dwt	Chemicals, clean products, vegetable oils, and bunkers. Berthing length of 230m (including dolphins).
Palm Oil Northern 2 (PON 2)	65m	10.0m	120m	—	—	10,000 dwt	Chemicals, vegetable oils, and bunkers. Berthing length of 105m (including dolphins).
Palm Oil Southern (POS)	—	14.0m	220m	11.0m	32.26m	50,000 dwt	Chemicals, clean products, vegetable oils, and bunkers. Berthing length of 230m (including dolphins).
Shell-MDS							
SMDS Jetty 1	25m	13.0m	180m	11.0m	20.5m	40,000 dwt	Chemicals, clean products, crude, and bunkers. Berthing length of 175m (including dolphins).

A major industrial development is in progress, and Bintulu port is expected to become the export capital of East Malaysia. Bintulu Port, an all-weather-deep sea port, is East Malaysia's largest container port and currently one of the largest LNG export terminals in the world (2020).

The harbor limit is defined by the arc of a circle drawn with a radius of 10 miles centered on Tanjong Kidurong.

A Traffic Separation Scheme is established in the outer approach from the harbor limit to 4 miles inward, NW of Tanjong Kidurong. It was submitted for approval by IMO.

Depths—Limitations.—The harbor can accommodate vessels up to 80,000 dwt, with a maximum loa of 300m, a maximum beam of 50m, and a maximum draft of 12.5mt. Offshore vessels up to 350,000 dwt, with a maximum loa of 380m, a

Port of Bintulu in Central Sarawak Region, Borneo in Malaysia

maximum beam of 180m, and a maximum draft of 15,8m, can be accommodated.

For additional details see table titled **Bintulu—Berth Information.**

Pilotage.—Pilotage is compulsory for vessels over 25m in length entering or leaving the port limits. Services are available 24 hours. Pilots board at 5 miles WNW of Tanjong Kidurong, near the inner end of the traffic separation scheme.

Anchorage.—Anchoring is prohibited within the harbor limit except in the designated areas that are for general cargo vessels, vessels waiting, LNG carriers, tankers, and vessels carrying explosives. The limits of these anchorages are portrayed on the charts.

Caution.—A dangerous wreck lies in the General Cargo Anchorage, 4.8 miles WSW of the Fairway Buoy, moored 4.5 miles W of Tanjong Kidurong.

Several offshore submarine cables, best seen on the chart, extend from Bintulu and run towards Mira and then N of Tanjong Batu.

LNG Jetty—Bintulu

11.36 Tanjong Batu (4°06'N., 113°48'E.) lies 68 miles NE of Tanjong Kidurong. This section of coast is low and featureless, but densely wooded with the trees extending to the HW line in most places. Gunong Subis, 413m high, which stands 18.5 miles S of Tanjong Batu, is the only natural feature which is readily identifiable.

The coast is flanked by a series of gently rising ridges, 305m high in places, which gradually diverge from the shore towards Gunong Subis. From this position they extend again toward the coast in the vicinity of Tanjong Batu. It is difficult to identify individual summits along this coast.

A number of rivers discharge into the sea along this section of coast, the most important being Batang Suai, Batang Niah, and the Sungai Sibuti, about 26, 10, and 8 miles, respectively, SW of Tanjong Batu.

Any craft which can cross the bars can navigate the rivers without much difficulty, and they are extensively used for trade and communication by small coastal craft with local knowledge.

The river entrances are difficult to make out from seaward, the range beacons leading over the bars are, in most cases, the only indication of their positions. All have shallow bars, and the best crossing is usually indicated by stakes or range beacons, or both. In some cases lights are shown when vessels are expected. The depths and channels are constantly changing and entry should not be attempted without local knowledge.

On the ebb, and particularly after heavy rain, a surface layer of river water extends a considerable distance seaward from the rivers. Much debris is brought down, which includes large logs, and may constitute a danger to navigation. These may be encountered at any distance offshore. Off the mouths of the Batang Niah and the Sungai Sibuti, the line of discolored water was encountered 10 miles offshore.

Patches of discolored water often give the impression of shallow water, and by contrast, there is rarely any visual indication of the off-lying shoals until the vessel is right over them.

After heavy weather, sand in suspension is found all along the coast up to a considerable distance offshore, and this again gives the impression of shallow water.

Anchorage.—Anchorage can be taken anywhere along this coast, provided charted shoals are avoided; the holding ground is generally good. The general nature of the bottom is soft gray mud and sand, while the rocky shoals are covered with coral and sand.

Fishing boats will be met along this section of coast, but no fish stakes will be encountered.

Caution.—When navigating on this coast between Tanjong Kidurong and Tanjong Lobang it is recommended to stay in depths more than 18.3m, taking care to avoid the off-lying

shoals and dangers.

Oil drilling rigs may be encountered along this section of coast. Some rigs are situated several miles offshore.

11.37 Kuala Similajau (3°32'N., 113°18'E.) lies about 20 miles NE of Tanjong Kidurong, and is an open bight protected on its N side by Tanjong Similajau and the coast to the SE. The Sungai Similajau discharges into the head of this bight.

Stag Point is the S entrance point of Kuala Similajau. A rock, with a depth of less than 1.8m, lies about 1.1 miles SW of Stag Point.

Tanjong Similajau, the N entrance point of Kuala Similajau, about 1.3 miles NNW of Stag Point, is fringed by rocky ledges which extend 0.3 mile offshore.

A drying rocky ledge extends 0.2 mile offshore from a position 0.35 mile N of Stag Point. White Rock (Batuan Putih), which dries 0.9m and constitutes the chief danger when entering the river, lies 0.15 mile WSW of this ledge. The drying spit extending NW from Stag Point almost extends to White Rock. The intervening ground is foul.

Basket Rock (Batuan Bakal) and Horn Rock (Batuan Tandok), with depths of less than 1.8m and on which the sea sometimes breaks, lie about 1.3 miles WNW and 1.5 miles W, respectively, of Stag Point.

James Reef (Terumbu Subis) (3°32'N., 113°15'E.), with a depth of 5.5m, lies 2 miles WSW of Tanjong Similajau. Mark Reef (Terumbu Pandan), with a depth of 4.9m, lies 1.32 miles W of the point. A 10.4m rocky patch lies about 0.6 mile farther W.

Jonah Shoal (Beting Semilajau) (3°33'N., 113°16'E.), with a depth of 6.4m, coral, lies 1.5 miles WNW of Tanjong Similajau. A 7.3m patch lies 0.5 mile WSW of this shoal.

Inner Shoals (Beting Dalam) are an area of foul ground, with many sunken rocks, which lie within 0.6 mile of Tanjong Similajau; a rock shoal, with a least depth of 3.4m, extends up to 1 mile NW from this point. A detached 5.2m patch lies 0.3 mile N of the 3.4m shoal.

The bar at Kuala Similajau consists of hard sand over rock, with a depth of 0.3m.

Anchorage.—Anchorage can be taken S of the parallel of White Rock, in depths of 10 to 11m. The bottom consists of soft gray mud, good holding ground.

Directions.—When approaching Kuala Similajau, keep outside about the 20m curve until due W of Kuala Similajau and then steer for the mouth of the river. Local knowledge is necessary for entering the river.

The ebb at the river entrance may increase from a normal maximum of 2 knots to as much as 4 knots after heavy rains. There is an abandoned lumber camp about 0.5 mile upriver which is fronted by a jetty, with a depth of 3.7m alongside.

11.38 Wiser Bay (Telukan Tubau) (Samalaju) (3°35'N., 113°19'E.), shallow and 1 mile wide, lies 2 miles NE of Tanjong Similajau. The intervening coast is fronted by rocky ledges extending up to 0.2 mile offshore and backed by low sandstone cliffs. The port of Samalaju is a developing, purpose-built port catering primarily to the energy-intensive industries located at the Samalaju Industrial Park. The initial phase and Phase 1 are mainly complete, which include eight operational berths. Additional details are shown in the table titled **Samalaju—Berth Information.**

An isolated rock, with a depth of 1.8m, lies 0.2 mile offshore in the middle of the bay.

Tanjong Bregum (3°38'N., 113°22'E.) lies 4.5 miles NE of Wiser Bay. Hills, up to 150m high to the tops of the trees, stand within 2 miles of the intervening coast.

The Sungai Nyalau enters the sea 1 mile NE of Tanjong Bregum but has no commercial value. A small village stands on the S bank of the river near the entrance.

Tanjong Payong (3°44'N., 113°25'E.), low and rocky, stands 7 miles NE of Tanjong Bregum. It is low and consists of rocky outcrops and ledges. A rock, which dries 1.2m, lies 1.5 miles NE of Tanjong Payong and 0.4 mile offshore. A light is shown from a 9m high white metal mast situated on Tanjong Payong.

Kuala Suai (3°48'N., 113°29'E.), the mouth of Batang Suai, lies 5.5 miles NE of Tanjong Payong. The least depth over the bar was reported to be 0.8m. Lighted range beacons lead up to the river entrance, but the channel markings should be used for crossing the bar.

The outer anchorage, 3.5 miles off Kuala Suai, is generally used by vessels loading logs.

Samalaju—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Beam	Size	
Samalaju Industrial Park						
W1	250m	13.5m	200m	32.26m	50,000dwt	Alumina, others, project/heavy, breakbulk, and bunkers. Continuous berth length 880m.
W2	210m	13.5m	200m	32.26m	50,000 dwt	
W3	210m	13.5m	200m	32.26m	50,000 dwt	
W4	210m	13.5m	197m	32.26m	50,000 dwt	
W5	160m	7.0m	127.6m	21.2m	8,000 dwt	Containers, project/heavy, cargo steel products, breakbulk, and bunkers.
W6	160m	7.0m	104.83m	20.0m	8,000 dwt	Project/heavy cargo, steel products, breakbulk, and bunkers.
W8	230m	11.0m	179.99m	31.0m	20,000 dwt	Steel products, breakbulk, and bunkers.

Caution.—Caution should be observed in the event of sudden wind squalls from the W.

Only shallow draft local craft can enter the river and proceed to Suai, about 13 miles upriver.

11.39 Gunong Subis (3°48'N., 113°47'E.), 413m high, stands 22 miles ENE of Tanjong Payong. This peak is very conspicuous and can be seen for a great distance offshore. It is easily made out because of the white patches on its seaward side.

The coast from Tanjong Payong, almost to Tanjong Batu, is low, featureless, and bordered by a sandy beach for the whole distance.

Kuala Niah (3°58'N., 113°42'E.), the mouth of Batang Niah, enters the sea 16 miles NE of Kuala Suai. The bar of this river had a least reported depth of 0.4m. A clump of very high trees, close NE of Kuala Niah, is a good guide to the position of the river mouth.

The outer anchorage, 3.5 miles off Kuala Niah, has a depth of 9m and is usually used by vessels to load logs.

A pair of lighted beacons, in range bearing 125°, indicate the best channel across the bar. The rear day mark should be left open, left of the front day mark, about one-third the width of the triangle; the channel is unmarked.

The unmarked channel from the SW can be used by vessels with local knowledge, in about the same depth, but there is no range to steer on. A sand spit, marked at its outer end by a stake, extends from the S bank of the entrance. A stranded wreck lies off the entrance to Kuala Niah.

The river is navigable, by small craft with a draft of 1.8m, as far as Subis about 14 miles above the entrance.

Kuala Sibuti (3°59'N., 113°43'E.), the mouth of the Batang Sibuti, lies 2 miles NE of Kuala Niah. The bar across the entrance had a least depth of 0.2m. A clump of very high trees close N of Kuala Sibuti is a good guide to the position of the river mouth.

The outer anchorage, 3.5 miles offshore, has a depth of 9m and is usually used by vessels to load logs.

A pair of lighted beacons in range lead up to the approach, but the channel markings should be used to enter the river.

Only small craft with a draft of 1.5m can enter the river.

Fish Aggregating Devices have been reported to be moored about 4 miles offshore between Kuala Sibuti and Kuala Bakam. The positions of these devices are not charted.

Tanjong Batu (4°06'N., 113°48'E.) lies 8 miles NE of Kuala Sibuti. In this vicinity the coast is bordered by white limestone cliffs up to 24m high extending 4 miles along the coast. They are conspicuous from seaward but when the sun is high there are no prominent points for position fixing. The land above the cliffs rises steeply and forms a series of hills which rise gradually and extend NE toward Bukit Lambir, 464m high, about 13 miles ENE of Tanjong Batu. This peak is very conspicuous.

11.40 Tanjong Lobang (4°22'N., 113°57'E.), 18 miles NE of Tanjong Batu, has yellow cliffs, 30m high. Between these points the coast is covered with dense jungle.

Two conspicuous framework radio towers stand 0.5 mile and 0.65 mile E, respectively, of Tanjong Lobang. A light is shown from an 18m high gray metal framework tower on Tanjong Lobang.

Siwa Shoal (4°16'N., 113°49'E.), with a depth of 5.2m, coral, lies 10.5 miles SW of Tanjong Lobang. Two patches, with depths of 8.2 and 10.1m, lie within 1.5 miles NNE of this shoal.

A small area of foul ground lies about 2.3 miles WSW of the 5.2m shoal. It was formerly the site of an oil drilling platform. A few pipes extend up to 1.5m above the sea bed in this position.

A shoal, with a depth of 2.1m, lies 4 miles WSW of Tanjong Lobang and a 2.7m patch lies 2.5 miles SW of the same point. Less than charted depths were reported between these two shoals. A detached 11m patch lies 4.5 miles W of Tanjong Lobang. Less water than charted has been reported to exist in this area.

A 17.7m coral patch lies 32 miles WNW of Tanjong Batu. An 18.3m bank lies 9 miles NE of this patch.

Takau Shoal, with a depth of 20m, lies 13.5 miles WNW of Tanjong Lobang.

Tides—Currents.—In the month of May, a WNW current is generally found offshore with a velocity of 1 knot. Close inshore the current sets SW.

Miri (4°32'N., 113°58'E.)

World Port Index No. 51590

11.41 Miri Roads is an open roadstead in a shallow bay contained within Tanjong Baram, 13 miles to the N, and Tanjong Lobang, 2.5 miles to the S. Miri, one of the principal towns in Sarawak, lies on the SE side of the Sungai Miri, discharging at 2.5 miles NNE of Tanjong Lobang. The town of Lutong lies 4 miles N, with offshore Lutong Oil Field lying 8 miles NW of it.

Miri includes the offshore loading berths at Lutong which serve the Sarawak Oil Field and the Brunei Oil Field.

Tides—Currents.—During the Southwest Monsoon, the offshore current sets steadily along the coast between Miri and Tanjong Baram to the N.

Miri from N

The currents are usually weak within 5 miles of the coast and the rate experienced was 0.5 knot, with rates of up to 2.5 knots being reported.

Depths—Limitations.—Between Tanjong Lobang and Lutong, depths of less than 5.5m extend about 1.3 miles offshore; a depth of less than 11m extends up to 3 miles offshore. Wrecks, with depths of 5.3m and 3.4m, lie 3 miles NW and about 1.3 miles NNW of Tanjong Lobang. A stranded wreck, marked by a light, lies 0.7 mile WNW of the entrance to the Sungai Miri.

A bar with a depth of about 0.3m extended across the entrance of the Sungai Miri. There is always a surf on the bar and a dangerous sea at times. Normally there is no swell in the offing during the Southwest Monsoon.

A cable-operated ferry connects Miri with the W bank of the river. All vessels should proceed at a moderate speed within the river, and when approaching the ferry to ascertain that it has reached one of the terminals before passing over the cable.

Customs Wharf, 44m long with a depth of 0.9m alongside, lies on the E bank of the river.

Immigration Wharf is 61m long with a depth of 2.1m alongside.

Coastal Wharf is 62m long, with a depth of 2.1m alongside.

The MPA Terminal, a 390m long wharf with an alongside depth of 5.0m, handles container, project/heavy cargo, breakbulk, bunkers, and reefer. Vessels up to 1,500 dwt or 2,700 gt, with a maximum loa of 65m and a maximum beam of 15m, can be accommodated.Maximum vessel size is 65m loa, beam 15m, 1,500dwt and 2,700gt.

Miri Cude Oil Terminal (MCOT), consisting of SMB No. 5 Berth, has a depth alongside of 20m and handles crude products and can accommodate vessels up to 125,000 dwt, with a maximum loa of 335m and a maximum draft of 17m draft. There are also two small privately-owned jetties.

Aspect.—A range of coastal hills, 91m high, extends 4 miles NNE from Tanjong Lobang. North of this range, the land is low and densely wooded. A conspicuous tower stands 3 miles NE of Tanjong Lobang.

The oil tanks at Lutong, 7.3 miles NNE of Tanjong Lobang Light, are conspicuous. The oil tanks at Miri are prominent. At night, the lights at the oil works are very prominent.

A radio tower, 67m high, stands 5.5 miles NNE of Tanjong Lobang.

Two conspicuous flares are occasionally visible in the vicinity of Lutong.

Pilotage.—Pilotage is compulsory for vessels using the oiling berths off Lutong. The berthing master and assistant, who are stationed at Miri, will board in the anchorage area at position 4°25.3'N, 113°54.0'E. Berthing may be carried out both by day and night. A mooring launch is provided for berthing and unberthing; unberthing may be carried out without a berthing master. At least 24 hours notice is required. Messages should be sent through Radio Kuching.

Regulations.—Port of Miri Regulations copies may be obtained from the pilot when he boards.

Vessels entering the channel shall give way to vessels leaving the entrance allowing safe navigation in the center of the channel.

Vessels are required to establish communications on VHF channel 16 prior to leaving or entering the channel

Vessels for loading should anchor off Miri to embark a pilot who will take them to the moorings off Lutong. The pilot will provide mooring wires, a launch, and a gang of men to assist in mooring.

Under no circumstances should a vessel anchor off Lutong unless in charge of a pilot.

Vessels for quarantine should anchor as close to the mouth of the Sungai Miri as safety permits.

Vessels with immigrants should anchor 3.5 miles NNW of Tanjong Lobang and 2 miles offshore.

Vessels entering the Sungai Miri must call at the Immigration Wharf for inspection, unless proceeding to the Customs Wharf.

Vessels entering the channel shall give way to vessels departing the entrance in such a manner to allow safe navigation in the middle of the channel.

Prior to entering or leaving the channel vessels are required to establish communications on VHF channel 16.

Anchorage.—Anchorage can be taken in a depth of 9m, 3 miles NNW of Tanjong Lobang. Loading and discharging of cargo is done by lighters from 25 to 150 tons capacity.

Vessels intending to proceed to the single point oil mooring berths off Lutong should await the berthing master, clear of the cautionary area, in the anchorage bounded by lines joining the following positions:

a. 4°23.7'N, 113°53.0'E.
b. 4°23.7'N, 113°55.0'E.
c. 4°25.7'N, 113°55.0'E.
d. 4°25.7'N, 113°53.0'E.

When at anchor off Miri, even in a gale with high seas, vessels always lie head to the current with the swell on the beam. Swell often restricts work on the landside only.

Lighters can be provided for vessels handling cargo at the offshore anchorage area.

Directions.—When approaching Miri in thick weather and if unable to reach either anchorage, vessels are advised to anchor further W, in depths of 18.3 to 22m, rather than remain underway.

When approaching the inner anchorage from the W, steer for the oil tanks at Miri, bearing 115°. In reduced visibility, keep in depths greater than 22m until Tanjong Lobang is sighted. At night, the oil tanks at Miri usually show up well.

The bar at the entrance of the Sungai Miri changes frequently and should only be crossed by vessels having small underkeel clearance and local knowledge. Channel changes are published in local Notice to Mariners.

Caution.—Two pairs of portable lighted range beacons stand on the S side of the entrance of the Sungai Miri. This side of the entrance had extended to the NW. These beacons are moved over a wide area to meet frequent changes in the channel and only indicate the approximate line of the fairway across the bar. Only the outer pair of range lights were reported in use. The best time to cross the bar is at HW. Vessels are advised to use a tug.

11.42 Takau Oil Field (4°25'N., 113°43'E.) is situated about 15 miles WNW of a pipeline. The pipeline connects Takau Oil Field and Siwa Oil Field. A dangerous wreck, marked by a lighted buoy close W, lies about 4 miles ESE of Takau Oil Field.

Siwa Oil Field (4°18'N., 113°48'E.) is situated about 8 miles SE of Tukau Oil Field. Within the field are platforms from which lights are shown.

An oil pipeline extends 18 miles NW from the W part of West Lutong Oil Field to **Baronia Oil Field** (4°45'N., 113°45'E.), with a connection through **Bakau Oil Field** (4°34'N., 113°50'E.), situated 6.5 miles NW of Lutong Light.

11.43 Lutong (4°28'N., 114°00'E.) (World Port Index No. 51600) stands at the entrance of the Sungai Lutong, 7 miles NNE of Tanjong Lubong.

West Lutong Oil Field (4°30'N., 113°54'E.) lies in an offshore area, 7 miles W of Lutong.

Three SBMs, numbered 1, 3, and 5, lie 3 miles W, 3 miles WNW, and 6 miles WSW, respectively, of Lutong. Longer vessels of 125,000 dwt and a draft of 17m can be accommodated on No. 5 SBM, from which a submarine pipeline runs E to the shore.

The SBMs are lighted. The vessel's radio must not be used when moored to the SBMs.

Monsoon winds may cause interruptions to loading and vessels may have to vacate their berths at short notice. There are no tugs available.

Caution.—Special attention should be exercised by mariners navigating in the area where very large crude carriers maneuver under constraint conditions in the vicinity of the oil fields and in the offing of Lutong. Mariners are cautioned against anchoring in the area due to existing pipelines; some may be uncharted.

11.44 Betty Oil Field (4°37'N., 113°37'E.) is situated 20 miles W of **Tanjong Baram** (4°36'N., 113°58'E.).

Bokor Oil Field (4°33'N., 113°37'E.) lies 4 miles SSW of Betty Oil Field. Each field contains lighted production platforms. A pipeline runs from these platforms NNE to Betty Oil Field, another continues NE to Baronia Oil Field, while a third pipeline leads E to Bakau Oil Field.

A pipeline also connects between Bakau Oil Field and Betty Oil Fields. One platform stands 3 miles S of the main group.

Caution.—Vessels navigating in the vicinity of these oil well structures should exercise caution and avoid anchoring near the pipeline.

Tanjong Baram lies on the N side of Kuala Baram, the entrance of the Batang Baram, 14 miles N of Tanjong Lobang. The light which stands on the point, a gray metal framework tower, is difficult to make out from the N and W unless the sun is shining on it. A beacon stands about.2 mile WNW of the light

A radio mast, from which red lights are shown, stands on the S side of the entrance to Batang Baram.

Tanjong Baram has been reported to be a good radar target at 15 miles and was reported to be identifiable with charted features at 12 miles.

Discolored water, in which large floating logs and other debris may be found, extends from 4 to 8 miles seaward from the mouth of the Batang Baram. The line of demarcation is usually very conspicuous.

A bank, with depths of less than 11m, extends 4 miles W and 5.5 miles N of Tanjong Baram. Depths of less than 1.3m extend about 2.3 miles WNW of Tanjong Baram; depths of less than 5.5m extend about 3.3 miles NW of the point. A sandpit extends about 2.3 miles WNW from Tanjong Baram, and is marked by several drying patches. The NW drying patch was reported to have extended SW. Two dangerous wrecks lie 4 miles NNE and 5 miles NW of the lighthouse on Tanjong Baram.

Numerous dangerous wrecks, some of which are marked by lights, lie on the bar as far as 2 miles W and about 3.3 miles WNW of the river mouth.

11.45 Baram Oil Field (4°40'N., 113°56'E.) spreads about 5.5 miles from E to W and two pipelines connect between the two groups. A pipeline extends from less than 1 mile E of Tanjong Baram Light; leading from shore 8 miles NNW to an offshore platform situated on the E group of Baram Oil Field. From the W group, a pipeline leads about 9 miles WNW to Baronia Oil Field and another (gas pipeline) leads 11 miles SSE to West Lutong Oil Field.

Five lighted well heads stand 1.5 miles N of the SW extremity of the above pipeline. A platform is situated 18 miles W of Tanjong Baram.

New platforms and underwater pipelines may not be charted in this area. Mariners should use caution when transiting this area.

Currents N of Tanjong Baram set NE and ENE. In the vicinity of Tanjong Baram the current appears to be principally influenced by the winds.

Directions.—When approaching Tanjong Baram from the N, a berth of at least 6 miles should be given to the point. For directions to the S, refer to the information found under Miri.

The area E of Tanjong Baram should be avoided because of the numerous platforms and pipelines which exist.

Vessels loading logs during the Northeast Monsoon are advised to anchor about 4 miles SW of Tanjong Baram, in a depth of 9.1m.

11.46 Batang Baram (4°35'N., 113°58'E.) is entered through a bar which obstructs the Kuala Baram. This bar has a depth of 0.9m but it is subject to change. Vessels with a draft of 2m and local knowledge can enter the river at HW in good weather. A radio mast stands on the S side of the entrance to Batang Baram.

A stranded wreck, marked by a light, lies about 2.7 miles W of Tanjong Baram. Other stranded wrecks are best seen on the chart.

Depths over the bar at Kuala Baram are reported to shoal after the river has been low for a time particularly during the Northeast Monsoon (October to March), but deepen again after heavy rain inland. Logs may be found stranded on the bar.

Tanjong Baram Light, bearing 105°, indicated the deepest water on the bar.

The shore on both sides of the entrance to the Batang Baram is covered with logs and stranded trees. Large quantities of timber are trapped on the upriver side of each jetty in the river. The entrance is difficult and should not to be attempted without local knowledge.

During a survey of the river, the flood was never observed, but the ebb attained a rate of 3 knots. After heavy rains the ebb may attain considerably greater rates.

Batang Baram is navigable for about 106 miles by vessels that can cross the bar.

Anchorage is prohibited in the vicinity of a pipeline and submarine cable crossing about 1 mile above the entrance.

A ferry crosses the river about 0.8 mile above the river entrance. Government Jetty, 27.5m long with a depth of 2.7m alongside, lies on the S side of the river close upriver of the ferry landing.

Marudi, a government station and the principal town of the district, is fronted by a wharf 22m long with a depth of 6.1m alongside. Several small jetties used by launches are available.

Off-lying Shoals and Dangers

11.47 South Luconia Shoals (5°04'N., 112°38'E.), consisting of a group of coral reefs, lie about 85 miles WNW of Tanjong Baram. The group is steep-to, breaks in places, and can usually be seen from aloft.

Herald Reef (4°59'N., 112°37'E.) the S of the South Luconia Shoals, is a small coral head about 0.4 mile in diameter. It lies about 86 miles WNW of Tanjong Baram.

Depths of less than 2m exist on the head, with depths of about 55m near its center. This steep-to reef gives very little indication of its presence. A rock, with a shoal depth of 4.6m, lies approximately 11.5 miles SW of Herald Reef.

Stigant Reef (5°02'N., 112°29'E.), located about 9 miles WNW of Herald Reef, is horseshoe shaped, and has general depths of 4.6 to 11m. A 4.6m patch lies near the NW extremity of this reef.

Luconia Breakers, dry and on which the sea breaks heavily, lie about 3.3 miles NE of Herald Reef.

Richmond Reef, with a least known depth of 3.6m near its center, lies 2.5 miles NE of Luconia Breakers. It consists of a ridge about 2 miles long.

Comus Shoal, with least depth of 8.2m, lies about 13 miles E of the N part of South Luconia Shoals.

Connell Reef, with a least depth of 1.8m, lies about 6.5 miles NW of Richmond Reef. A 16.5m patch lies 4 miles E and a 5.5m patch 2 miles S of Connell Reef. A stranded wreck lies on the SW edge of this reef.

The area within the various reefs which comprise South Luconia Shoals has not been examined and there may be other reefs in this vicinity.

11.48 Central Luconia Gas Field (5°02'N., 112°40'E.) is situated 68 miles NNW of Tanjong Kidurong. Gas pipelines lead from numerous lighted platforms in the gas field to shore landings 2 miles NE of Tanjong Kidurong. From Central Luconia Gas Field gas pipelines connect to a lighted platform situated 24 miles NNW and to another platform that lies 29 miles NW; a third gas pipeline extends ENE to **Baronia Oil Field** (4°45'N., 113°45'E.). Vessels should avoid anchoring within 1 mile of the pipelines.

North Luconia Shoals (5°30'N., 112°34'E.) consist of group of shoals and reefs which lie between 92 and 120 miles NW of Tanjong Baram, and from 14 to 50 miles N of South Luconia Shoals. They were partially examined many years ago and no safe passages were found between them. The channel between South and North Luconia Shoals and the area W of North Luconia Shoals have not been examined.

Hayes Reef (5°22'N., 112°36'E.), the S of the North Luconia Shoals, is a small steep-to drying reef which breaks heavily in all kinds of weather. A shoal head lies about 2.7 miles E of Hayes Reef.

Seahorse Breakers, with depths of less than 2m, are steep-to on their E side. They lie about 10 miles NNW of Hayes Reef. A small drying patch, which breaks heavily, lies 2 miles W of Seahorse Breakers and a detached coral reef lies close S.

Tripp Reef (5°29'N., 112°30'E.), with a least depth of 3.7m, lies 8 miles NW of Hayes Reef.

Moody Reef (5°35'N., 112°23'E.), with a depth of 7.3m, lies 20 miles NW of Hayes Reef. Two dangerous reefs lie between Tripp and Moody Reefs and a 12.2m patch with a small reef close W of it, lies 3 miles NE of Moody Reef.

Hardie Reef (5°56'N., 112°32'E.), with a least depth of 5.1m, extends between 15 and 19 miles NNE from Moody Reef. Another reef extends 8 miles S from the S end of Hardie Reef and has a depth of 5.4m. An unexamined dangerous reef lies 10 miles ENE of Moody Reef.

Buck Reef (5°52'N., 112°34'E.), with a least depth of 4.9m, lies about 15 miles NE of Moody Reef.

Aitken Reef (5°42'N., 112°33'E.), with a depth of 9.4m, lies 4 miles N of Buck Reef.

Friendship Shoal (5°57'N., 112°33'E.), the N of the North Luconia Shoals, has a least depth of 8.2m, but less depths may exist. This shoal lies about 26 miles N of Seahorse Breakers. Friendship Shoal has been reported to lie 3 miles W of its charted position.

Dangers Northeast of North Luconia Shoals

11.49 Louisa Reef (6°20'N., 113°14'E.), a steep-to coral reef about 1m high, is located 113 miles NNW of Tanjong Baram.

Caution.—A dangerous ground is known to abound within an area bound by lines joining the following positions:

a. 7°33'N, 115°25'E.
b. 10°25'N, 117°50'E.
c. 12°00'N, 117°50'E.
d. 12°00'N, 114°50'E.
e. 8°40'N, 111°30'E.
f. 7°33'N, 111°30'E.

Vessels are cautioned not to pass through this area.

11.50 Royal Charlotte Reef (6°57'N., 113°36'E.), which is almost rectangular in shape, is located about 42 miles NNE of Louisa Reef. Several boulders, 0.6 to 1.2m high, lie near its SE side and some rocks awash lie on its NE side. An area of sunken dangers extends about 8 miles NNE from this reef and it was reported that it extends NW and SE. Breakers were observed over this reef.

Swallow Reef (7°24'N., 113°49'E.), located about 27 miles NNE of Royal Charlotte Reef, consists of a shallow basin surrounded by a narrow belt of coral. Several rocks, 1.5 to 3m high, lie near its E end and there are also several above-water rocks near its SE side. A stranded wreck lies near the W end of the reef. The rocks at the E end of the reef are plainly visible. The entire reef is marked by breakers and was reported to be larger in area than charted.

Swallow Reef has been reported to be a good radar target at 9 miles.

Dallas Reef (7°38'N., 113°51'E.), which dries, lies 5 miles W of Ardasier Reef. The reef entirely encloses a small lagoon, probably accessible to boats at HW.

Anchorage is not available in the area. A shoal, with a depth of 16.5m, exists in position 7°35'N, 114°39'E, about 18 miles SE of Ardasier Bank. A bank, with a depth of 82m, lies 24 miles farther SSE.

Ardasier Bank (7°45'N., 114°14'E.), which has a least depth of 3.7m, lies 14 miles NE of Swallow Reef but has not been fully examined. This bank is about 20 miles long.

Tanjong Baram to Brunei Bay

11.51 From Tanjong Baram, the coast extends in an E direction for about 12 miles to the mouth of the Sungai Belait, and then in an ENE and NE direction for about 28 miles to the mouth of the Sungai Tutong. This sector of coast is low, densely wooded, and intersected by numerous creeks. Shoal water, with depths of less than 5.5m, extends from 1 to 2 miles offshore.

Aspect.—Bukit Teraja (Mount Scott), a conspicuous isolated whale-backed mountain, 416m high, stands about 33 miles ESE of Tanjong Baram.

Offshore Drilling Operations

11.52 Numerous production platforms, oil and gas pipelines, drilling and associated structures, gas vents, and other unlit obstructions exist up to 25 miles offshore between Tanjong Baram and **Champion Shoals** (5°12'N., 114°45'E.), and between Tanjong Baram and a position 15 miles E of Seria. Within this area are Fairley-Baram Oil Field, Gannet Oil Field, Fairley Oil Field, Southwest Ampa Oil Field, and Tali Oil Field (Seria Oil Field). At night, the wellheads and surface obstructions exhibit lights. The production platforms are brightly illuminated. The W platform on the Fairley Oil Field is fitted with a racon.

Oil and gas pipelines link within and between the oil fields. Vessels should avoid anchoring and trawling near the pipelines. A vessel damaging a pipe could face an immediate fire hazard.

In addition to the 0.27 mile radius around a structure, Brunei has declared Safety Zones up to 1.37 miles from the charted offshore platforms in the following areas:

Area	Location
Champion Oil Field	5°13'N, 114°45'E.
Magpie Oil Field	5°06'N, 114°27'E.
Fairley Oil Field	4°57'N, 114°06'E.
Southwest Ampa Oil Field	4°44'N, 114°09'E.
Fairley-Baram Oil Field	4°48'N, 113°58'E.

Mobile oil drilling rigs may be encountered off the NW coasts of Sarawak, Brunei, and Sabah, between 200m contour and the shore. When on location, moorings extend 0.33 mile from the rigs and are usually marked by unlit buoys (yellow). At night, the rigs display working lights. When under tow, the rigs display the proper lights.

Vessels should give a wide berth to these structures. If required to navigate in their vicinity, it is advised to reduce to a safe speed and proceed with caution.

11.53 Bukit Ambok (4°49'N., 114°40'E.), a high hill, stands near the N bank of the Sungai Tutong about 4.5 miles ENE of its entrance. This hill is fairly conspicuous in contrast to the densely-wooded country which surrounds it.

Gunung Mulu, one of the highest mountains in this part of Borneo, stands 68 miles ESE of Tanjong Baram. This conical-shaped mountain has a slightly-flattened top and rises to a height of 2,407m. Several sharp-pointed conical peaks stand to the E.

The **Sungai Belait** (4°35'N., 114°11'E.), whose banks are almost always flooded, had a depth of 0.6m on the entrance range over the bar. Within the entrance there are general depths of 3.5m but the channel is obstructed by snags embedded in the mud. Only small craft can be accommodated within the river.

Kuala Belait (4°35'N., 114°11'E.), a town which has been developed as the headquarters of Seria Oil Field, stands on the E bank of the river just within the entrance.

A pair of range beacons, which indicate the best water over the bar, stand on the W side of the entrance of the river. These beacons are liable to be moved without notice.

A least depth of 0.7m at LW over the bar was reported to exist on the leading line. Waves break over the bar during onshore winds causing dangerous crossings for small craft.

Two wharves, one 0.17 mile long with a depth of 2.4m alongside, are situated about 0.3 mile within the bar. A government wharf, 91m long with a depth of 0.6m alongside, lies abreast the town 1 mile farther upriver.

11.54 Seria Oil-Loading Terminal (4°37'N., 114°19'E.) (World Port Index No. 51645) is an open bay sea port situated 21.5 miles ENE of Tanjong Baram Light.

Depths—Limitations.—There are five piers at Seria. The E pier is 251m long.

Two SBMs are moored 6 miles N of Seria and are fitted with two floating hose strings. Maximum permissible drafts are 18.9m at mooring No. 1 and 17.4m at mooring No. 2.

Aspect.—Bukit Tunggulian, 128m high, stands 12 miles ENE of Seria. Bukit Tuan, 113m high, stands 1.3 miles farther NE.

Bukit Ambok, 76m high and covered with low scrub, lies near the N bank of the Sungai Tutong, 4.5 miles ENE of its entrance. It is fairly prominent in contrast to the densely-wooded country which surrounds it.

The “gushers” of Seria Oil Field, which resemble pylons and are prominent, stand about 2 miles E of the village of Seria. Lighted drilling platforms lie up to 3.32 miles NE of Seria. Near Seria, several bright flares are visible up to 50 miles distant on a clear night

Pilotage.—A berthing master boards vessels bound for the SBM or LNG jetty off Kampong Lamut in the appropriate anchorage area.

Regulations.—There is a port radio station at Seria Oil Loading Terminal. Vessels should transmit their ETA 72 hours and confirm 24 hours in advance.

Anchorage.—Extreme caution should be exercised when navigating in this area. Vessels should anchor only in the following quarantine areas which are indicated on the chart:

1. ALFA—2.5 miles NE of the Sungai Belait—for vessels using the port.
2. BRAVO—9 miles N of Seria—for vessels using the

mooring buoys.

3. CHARLIE—10 miles NE of Seria—for vessels using the LNG Jetty.

Anchorage is available for vessels calling at the SBMs N of Seria. A patch, with a depth of 4.9m, lies (between the SBMs and the shore) about 3.3 miles N of the piers at Seria. Anchorage is available for vessels calling at the LNG jetty at Kampong Lamut.

11.55 A liquid natural gas (LNG) jetty, 9.5 miles ENE of Seria and close NW of **Kampong Lamut** (4°40'N., 114°28'E.), extends 2.5 miles NNW from the coast.

Dolphins stand 91m E and W of the jetty head. Three mooring buoys are laid in an arc 0.25 mile to seaward and a buoy is moored about 0.3 mile ENE of the jetty head.

The depth alongside is about 9m. Tankers normally berth stern to the jetty head, using the dolphins for stern moorings. Bow ropes are secured to the mooring buoys. The berth is not tenable in all weathers. Vessels may approach the berth from either E or W.

A wreck, with a least depth of 17.6m, lies about 1.3 miles NW of the head of the LNG jetty. A 4m patch lies about 2 miles SW of the jetty head.

The **Sungai Tutong** (4°47'N., 114°36'E.) lies with its entrance 20 miles ENE of Seria. There was a depth of 0.6m over the bar, but it is continually shifting. A light is shown from the SW extremity of the spit of land forming the N bank of the river mouth.

Vessels able to cross the bar can ascend to Dixon Reach about 14 miles upriver.

Tutong Village stands on the N bank of the river 6 miles above the entrance. A customs house is situated in the village.

Off-lying Dangers

11.56 Brock Patch (4°46'N., 114°30'E.), with a depth of 3.7m, lies 5 miles W of the mouth of the Sungai Tutong and 3 miles offshore. An extraction area, marked by yellow special lighted buoys has been established in the vicinity. Two additional yellow special lighted buoys mark artificial reefs in the area. Mariners are advised to navigate with caution.

Browne Patch (4°54'N., 114°18'E.), with a depth of 5.4m, lies 17 miles N of Seria.

Chearnley Shoal (4°51'N., 114°19'E.), with a depth of 5.2m, lies 3.5 miles SSE of Browne Patch.

Fairley Patches (4°56'N., 114°20'E.), a narrow shoal ridge with a least depth of 6.4m, lies 4 miles N of Chearnley Shoal.

Porter Patch (4°54'N., 114°24'E.), with a depth of 11m, lies 5.5 miles NE of Chearnley Shoal.

Ampa Patches, marked by a light, lie from 1.5 miles to 5 miles ENE of Fairley Patches. The light was reported extinguished.

Magpie Rock (4°57'N., 114°22'E.), a patch with a least depth of 4.6m, lies on the shallowest part of these shoals. There are several other patches with depths of less than 9m.

Several shoals, with depths of 9 to 18m, lie within 1 mile W and 1.5 miles SW of Ampa Patches.

An ammunition dumping ground lies centered about 39 miles NNW of Ampa Patches and is bounded by lines joining the following positions:

a. 5°25'N, 114°00'E.
b. 5°25'N, 114°16'E.
c. 5°40'N, 114°16'E.
d. 5°40'N, 114°00'E.

From the entrance of the Sungai Tutong, the coast extends about 19 miles NE to Brunei Cliffs, which are about 24 to 27m high and consist of white sand and short grass.

11.57 Pulau Punyit (4°58'N., 114°51'E.), an islet 18.3m high, lies about 0.5 mile NW of Tanjong Punyit, a point of land close E of Brunei Cliffs. This islet is almost joined to the point by a rocky ridge. A rock, awash, lies about 0.2 mile NW of the islet.

The coast between the Sungai Tutong and Pulau Punyit is sandy and backed by dull reddish cliffs about 12 to 18m high. High casuarina trees stand on some of the beaches and near the mouths of the small rivers.

Binturan Firing Range and Bukit Agok Firing Range lie between the Sungai Tutong entrance and Tanjung Pungit, 19 miles NE. The range extends approximately 8 miles offshore. The Binturan Firing Range limit is marked by Lighted Beacon B1 (4°53'N., 114°40'E.), at the SW extremity, and Lighted Beacon B2, situated about 5.5 miles ENE, marking the NE extremity. The ranges are best viewed on the chart.

Caution.—Mariners are advised to exercise caution in this area. No restrictions are placed on the right to transit the firing practice areas. Red flags or red lights are displayed to warn that the areas are in use.

The extensive firing practice areas are operated using a clear range procedure. Exercises and firings only take place when the areas are considered to be clear of all shipping. Details of firing are promulgated in the Brunei Darussalam Notices to Mariners.

Brunei Cliffs to Brunei Bluff

11.58 From Brunei Cliffs, the coast extends 14 miles ENE to Brunei Bluff where the cliffs are 11m high and the tops of trees are 30m high. Shoal water, with depths of less than 5.5m, extends about 0.5 to 1.5 miles from the coast between the Sungai Tutong and Brunei Bluff.

Aspect.—Bukit Menteri Kedayo (Woody Peak), 138m high and located about 2.3 miles SW of Brunei Cliffs, is the highest peak of a range of hills, 76 to 138m high, which parallels the coast about 1 mile inland.

Bukit Sabandar (Jerudung) (4°56'N., 114°51'E.), a grassy ridge with numerous indistinguishable sharp peaks from 119 to 143m high, extends 4 miles S from Brunei Cliffs. Close E of this ridge the coastal range of hills, 61 to 109m high and densely wooded, stretches ENE to Brunei Bluff.

Bukit Cowie (5°02'N., 115°03'E.), more than 61m high, stands 0.3 mile S of Brunei Bluff.

Off-lying Dangers

11.59 Victoria Patches (4°55'N., 114°39'E.), consisting of a number of coral shoals with depths of less than 5.5m, lies from 3 to 4.5 miles offshore. The shallowest patch, with a depth of 2.7m, lies 8.32 miles NNE of the entrance of the Sungai Tutong. A submarine gas pipeline runs from Victoria Patches SE

directly to shore.

Scout Patches (4°56'N., 114°38'E.) consist of two shoals: **Scout Rock** (4°56'N., 114°39'E.), with a depth of less than 1.8m, lies on the SE shoal 10 miles NNE of the entrance of the Sungai Tutong; the NW shoal, with a depth of 6.4m, lies 1.5 miles NW of Scout Rock.

Cunningham Patch (4°59'N., 114°38'E.), with a depth of 6.4m, lies about 3.3 miles NW of Scout Rock. Blunt Rock, with a depth of 4.6m, lies 2.32 miles NNE of Scout Rock.

Brunei Patches (5°01'N., 114°42'E.) consist of several shoals with depths of less than 5.5m. The shallowest spot, a rock with a depth of less than 1.8m, lies on the northeastern most patch, 7.5 miles WNW of Pulau Punyit.

A dangerous wreck lies 1 mile SW of this rock. Another wreck, with a depth of 11m, lies 2 miles WNW of the rock.

Amcotts Rock (5°02'N., 114°37'E.), with a depth of 8.2m, lies 14 miles WNW of Pulau Punyit. A 10.1m patch lies 2.3 miles ESE of this rock and a 11m patch lies the same distance E of the same rock.

11.60 Iron Duke Shoals (5°06'N., 114°38'E.) consist of three distinct shoals: Otterspool Rock, the southernmost, with a depth of 4m, lies 13 miles NW of Pulau Punyit; Nankivell Rock, with a depth of 8.2m, lies 2 miles NW of Otterspool Rock; and Silk Rock, with a depth of 9.1m, lies 2.5 miles NE of Nankivell Rock.

Littledale Shoal (5°06'N., 114°46'E.), with a depth of 7.6m coral, lies 9 miles NNW of Pulau Punyit. Colombo Shoal, with a depth of 7.3m, lies 7 miles farther NNW.

Champion Shoals, consisting of two groups of shoal heads, lie 13 miles NNW of Pulau Punyit and extend 2 miles N. The S group has a depth of 6.4m, and the N group has a least depth of 8.2m.

Champion Oil Field (5°14'N., 114°45'E.), production platforms and well heads, from which lights are displayed, are situated between 1 and 2 miles NNW of the N group of Champion Shoals. An underwater wellhead, with a depth of 27m, is situated 3.5 miles NNW of the N group of the Champion Shoals. Numerous oil structures and pipelines exist in the vicinity of Colombo Shoal and Champion Shoal. Mariners should avoid the area if possible. Mariners required to enter the area should navigate with extreme caution and should only anchor within the charted anchorages. The platforms which stand in this area have been reported to be radar conspicuous. One of the structures in the oil field is fitted with a racon.

Two Fathom Rock (5°06'N., 114°58'E.), with a depth of 3m, coral, lies about 6.3 miles WNW of Brunei Bluff. A 4.6m patch lies 1 mile WNW of this rock. A detached 9.1m patch lies 0.3 mile N of the same rock.

A dangerous wreck lies 5.5 miles SW of Two Fathom Rock and another dangerous wreck, whose position is approximate, lies 1.5 miles SSW of Two Fathom Rock.

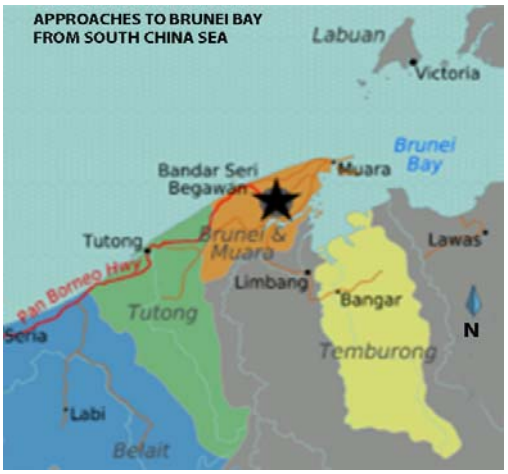
Approaches to Brunei Bay

11.61 The entrance of Brunei Bay lies between Brunei Bluff and Tanjon Klias, 23 miles NE. The islands of the Labuan Group, of which Pulau Labuan is the largest, stretch across the entrance and divide it into two channels, one S and one E of these islands. The channel E of the islands is known as East Channel.

Pulau Labuan (5°20'N., 115°13'E.) lies 13.5 miles NNE of Brunei Bluff and 4.5 miles W of Tanjong Klias. This densely wooded island is roughly triangular in shape and rises to the height of 102m in its N part. Most of the S part of the island is low, marshy, and intersected by streams. When viewed from the N, the island appears as two peaks.

Tanjong Kubong (Bethune Head) (5°24'N., 115°15'E.), the N end of the island, is 6m high. Foul ground, with rocks awash and on which the sea occasionally breaks, extends 2 miles N from the island. A light is shown from a 24m high white metal framework tower.

Tanjong Layang Layangan (5°21'N., 115°12'E.), a cliffy headland 24m high, lies 4.32 miles SW of Tanjong Kubong. A prominent islet, 9.1m high, lies 0.5 mile SW of the headland.



Approaches to Brunei Bay from South China Sea

Tanjong Punei (5°15'N., 115°10'E.), the SW extremity of Pulau Labuan, lies 6.5 miles SSW of Tanjong Layang Layangan.

The W coast of Pulau Labuan consists of sandy beaches fronted by rocks and coral reefs which extend from 0.5 to 1 mile offshore.

A range of hills rising to an elevation of 102m and grass-covered, runs parallel to the coast between Tanjong Kubong and Tanjong Layang Layangan. A densely wooded range of hills extends NE from Tanjong Punei. Bukit Kalam, 83m high and on which the tops of the trees attain an elevation of 90m, is the northernmost and highest hill of the range; it stands 5 miles NE of Tanjong Punei. Bukit Timbalai, 71m high with a single tree on its summit, stands 2.5 miles NE of Tanjong Punei.

Rocky reefs, some above-water, extend 0.3 mile from Tanjong Punei. A wreck, with a depth of 18m and whose position is approximate, lies 9.5 miles of Tanjong Punei.

11.62 Labuan Offshore Terminal (5°16'N., 115°07'E.), can accommodate tankers up to 230,000 dwt and 22.5m draft at the SBM, which moored about 2.3 miles WNW of Tanjung Pandan. The least depth in the maneuvering area is 25.6m. Submarine oil pipelines extend from the terminal to the buoy and to **Samarang Bank** (5°35'N., 114°55'E.).

Another pipeline connects Labuan Shore Terminal to **Barton**

Oil Field (6°50'N., 116°20'E.), leading through; South Furious Oil Field, Saint Joseph Oil Field, Erb West Oil Field, and **Ketam Oil Field** (6°06'N., 115°36'E.).

A vessel bound for the SBM should radio her ETA to "Crosfield, Labuan," via Singapore Coast Radio Station, at least 48 hours in advance. There is a port radio station at the oil terminal. Vessels must not use their main radio when berthed at the SBM.

A tanker anchorage area, 2 miles in diameter, is established with its center 5.32 miles W of Tanjong Punei. A berthing master boards at the anchorage. Berthing is carried out 24 hours. There are no facilities at the terminal.

Caution.—Numerous fairly shoal patches lie within an area extending 12 miles WNW to 12 miles NW of Bethune Head.

11.63 Glayzer Rock (5°27'N., 115°04'E.), with a depth of 9.1m, coral, lies 12 miles WNW of Tanjong Kubong.

Four Fathom Patches (5°27'N., 115°13'E.), consisting of several small shoals with a least depth of 7.3m, lie about 3.3 miles NW of Tanjong Kubong.

A shoal, with a least depth of 3.7m, lies 3.5 miles W of Tanjong Kubong. Other shoal patches lie within about 1 mile of this least depth.

These shoals and dangers are all steep-to. Others may exist and great caution should be exercised when navigating in these waters.

Other shoals lie 15 miles N and NW of Tanjong Kubong.

Islands and Dangers Southwest of Pulau Labuan

11.64 Pulau Keraman (5°14'N., 115°08'E.), 58m high to the tops of the trees, lies 2 miles SW of Tanjong Punei, from which it is separated by Keraman Channel. The island is mostly fringed by drying reefs and foul ground extends up to 0.5 mile offshore in places. A light is shown from a 15m high white tower with a red cupola situated on the summit of Pulau Keraman.

A wreck, with a least depth of 2m, lies 3.3 miles WSW of the light.

Undaunted Rock (5°14'N., 115°08'E.), with a depth of 3.7m, coral, lies in mid-channel between Tanjong Punei and Pulau Keraman.

Keraman Channel should only be used by those with local knowledge. Undaunted Rock is unmarked.

Pulau Rusukan Kecil (5°12'N., 115°09'E.), 46m high, lies 1 mile SSE of Pulau Keraman. A reef, with depths of less than 1.8m, extends about 1 mile SE from this islet.

Pulau Keraman and Pulau Rusukan Kecil lie on an extensive bank, with depths of less than 5.5m.

A reef, which dries 0.9m, lies 1.5 miles W of Pulau Rusukan Kecil.

A detached 8.5m shoal lies 0.5 mile ESE of the SE extremity of Pulau Keraman.

11.65 Pulau Rusukan Besar (5°11'N., 115°08'E.), marked by a prominent clump of trees, lies 0.3 mile SSW of Pulau Rusukan Kecil. Rocks and reefs surround this islet; a low rock lies 0.3 mile SSW of its SW extremity.

A shoal, with a depth of 2.7m, lies 1 mile ESE of Pulau Rusukan Besar; an 8.2m patch lies a close S of this shoal.

A shoal, with a depth of 6.7m, lies about 1.3 miles WSW of Pulau Rusukan Besar. A 6.7m coral patch lies 1.32 miles S of this island.

Barat Banks (5°10'N., 115°06'E.) are two shoals consisting of coral and sand. The NE bank, with a depth of 4.1m, lies 3 miles SW of Pulau Keraman. The SW bank, with a depth of 4.6m, lies 0.3 mile farther SW.

Barat Banks are separated from Pulau Rusukan Besar by a channel, with a least depth of 6.7m in the fairway, but this channel should not be attempted without local knowledge.

Two wrecks, with least depths of 11.9 and 12.8m, respectively, lie 1 mile SSW and 1 mile SW of the SW bank.

Abana Rock (5°06'N., 115°04'E.), with a depth of 5.5m coral, lies on the S side of the channel about 3.3 miles N of Brunei Bluff. A buoy lies close NW of the rock.

Pelong Rocks (Palau Pelong-Pelongan Island) (5°05'N., 115°03'E.) are a group of sandstone rocks which lie 2 miles N of Brunei Bluff. The largest rock is 12m high. Coral reefs extend 0.3 mile N and 91m SW from the highest rock.

Depths of less than 3m extend 0.37 mile N and 0.27 mile SE from the rock. A marine farm, best seen on the chart, lies close WNW.

A light is shown from a 12m high aluminum framework tower situated on the S summit of Pelong Rocks.

Both Pelong Rocks and Brunei Bluff are prominent when viewed from the outer bar at Muara.

Directions.—When approaching Brunei Bay from the W, the off-lying dangers E of Tanjong Baram should be given a wide berth and the channel S of Barat Banks should be approached on a course of 120°. Then steer to pass between Barat Banks Lighted Buoy and Abana Rock on an E course. Bukit Menteri Kedayao (Woody Peak), Bukit Tempayang Pisang, and Pulau Keraman can easily be identified.

In thick weather keep in depths of more than 46m to ensure passing outside all dangers. Vessels working against the monsoons will find the tidal currents more regular inshore, but with the E current they should guard against the set into the several coastal rivers.

Pulau Labuan—South Coast

11.66 Richardson Point (5°15'N., 115°10'E.) lies 0.5 mile ESE of Tanjong Punei.

A detached shoal, with depths of 10.1 to 11m, lies between 0.3 and 1.32 miles S of Richardson Point.

Pulau Burong (5°14'N., 115°11'E.), which is bare, lies 1.5 miles ESE of Richardson Point and close within the edge of a bank. It has been reported to be only about 3m high, a large quantity of material for reclamation having been taken from it.

An obstruction, with a depth of 6.4m, lies about 1.3 miles ENE of Pulau Burong. A detached 9.1m patch lies about 0.3 mile SSW of the islet.

Tanjong Rancha Rancha (Hamilton Point) (5°15'N., 115°14'E.), now within an area of reclaimed land which rises abruptly to a hill 34m high, is located 4.3 miles E of Richardson Point; the bay which lies in between the two points is fouled by numerous rocks and banks which extend 0.5 mile outside a line joining the entrance points.

The three small rivers which discharge into the head of the bay have no commercial value.

Pulau Enoe (5°15'N., 115°14'E.), once an island, is now connected to the shore by reclaimed land which forms a peninsula extending 0.9 mile SSE from Tanjong Rancha Rancha.

A flour mill, which is prominent and from whose highest point an obstruction light is shown, stands on the SE point of the peninsula.

A rock, with a depth of less than 1.8m, lies 1.5 miles SW of Pulau Enoe. There are many other outcrops of drying rocks between this island and Tanjong Rancha Rancha.

Outer Shoal (5°15'N., 115°15'E.), a coral patch with a least depth of 0.6m, lies about 1.3 miles E of Hamilton Point and is marked by a lighted buoy.

Harbor Shoal, with a least depth of 2m, coral, lies 1 mile ENE of Tanjong Rancha Rancha.

Trident Shoal (5°14'N., 115°14'E.), with a least depth of 1.2m, lies 2.5 miles E Pulau Burong. Several patches, the shallowest of which has a depth of 3.7m, lie 0.2 mile WSW of Trident Shoal. A rock, with a depth of less than 2m, lies about 0.8 mile W of Trident Shoal. A tangent on the NW side of Pulau Daat, in range about 054° with the SE extremity of Pulau Papan, leads SE of Trident Shoal.

Pulau Labuan—East Side

11.67 Kubong Bluff (Coal Point) (5°23'N., 115°15'E.) lies 0.5 mile SE of Tanjong Kubong. The remains of a pier lie near the bluff and a conspicuous chimney stands 0.5 mile WSW.

Foul rocky ground, some of which dries, extends 2 miles NNE of the bay between Tanjong Kubong and Kubong Bluff.

Tanjong Aru stands 2.5 miles S of Kubong Bluff.

Tanjong Taras (Collier Head) (5°17'N., 115°16'E.), wooded and bordered by cliffs, stands 5.32 miles S of Kubong Bluff. A bank, with depths of less than 5.5m on which there are some rocky ledges which dry, extends up to 1.5 miles offshore between them. Several detached shoals exist near the E edge of the bank.

Drying ledges extend 0.1 mile from Tanjong Taras; some below-water rocks lie up to 0.1 mile further offshore.

A shoal, with a depth of 7.6m, lies 0.3 mile E of Buoy G, which stands about 1.3 miles NE of Tanjong Taras.

East Channel lies between Tanjong Kubong and Tanjong Toulak on the mainland about 8.5 miles ENE. It has a least depth in the fairway of 9.1m.

Tanjong Sakat (5°23'N., 115°22'E.), a thickly wooded point, lies 2 miles SW of Tanjong Toulak. Foul ground extends from 0.3 to 1 mile offshore between them. A shoal, with a depth of 3.2m, lies about 1.3 miles N of Tanjong Sakat. A drying rock lies almost 1 mile NW of this point.

A hill, 133m high to the tops of the trees, stands about 2.3 miles E of Tanjong Sakat.

Pulau Lambidan (Lubidan) (5°23'N., 115°21'E.), covered with trees, the tops of which are 37m high, stands 0.4 mile W of Tanjong Sakat. Both the islet and the point are difficult to make out from the W.

Tanjong Liba (Liba Point) is located 2.5 miles S of Tanjong Sakat. A hill, 113m high, stands 0.5 mile E of the point.

A submarine cable area nearly a mile wide crosses East Channel from about 1.5 miles S of Kubong Bluff, to 1 mile S of Tanjong Sakat. Anchoring within this area is prohibited.

Tanjong Klias (5°18'N., 115°21'E.), marked by a flagstaff, a village, and some trees, stands 3.3 miles SSW of Tanjong Liba.

11.68 Pulau Daat (5°16'N., 115°19'E.) lies on the coastal bank about 1.3 miles SW of Tanjong Klias. That part of the coastal bank extending 4 miles N from Pulau Daat is known as Eastern Bank.

The island is separated from Tanjong Klias by a channel with a least depth of 1.8m. Several rocks, with drying heights between 0.1 and 2.1m, lie close N of Pulau Daat and are best seen on the chart. The island is covered over most of its area by coconut trees, but other parts are densely wooded.

The coastal bank continues in a WSW direction for an additional 2 miles. Two rocks, 2m and 4m high, lie 0.3 mile NE of the SW extremity of Pulau Daat. Two other above-water rocks lie 0.5 mile WSW and 1 mile SW of the same point. Other rocks, some of which dry, lie on the bank between Pulau Daat and Pulau Papan.

Pulau Papan (5°15'N., 115°16'E.), located 2.32 miles WSW of Pulau Daat, is flat and wooded. The tallest tree on the E end of the island is 33m high. The lighthouse, a white framework tower near the W end of the island, is not easily made out from the NNE until close to the lighted buoy which stands about 1.3 miles NE of Tanjong Taras. The light is obscured by trees from the ENE and the SW.

Pulau Papan is fringed by a reef which extends up to 0.3 mile offshore. Between this reef and the bank which extends WSW from Pulau Daat, there is a narrow channel with a least depth of 7.6m in the fairway. This channel is recommended only for small local craft.

Caution.—A dangerous wreck was reported to lie approximately 0.5 mile SW of Pulau Papan.

Tanjong Bendera (Ramsay Point) (5°16'N., 115°15'E.), on the SE side of Pulau Labuan, is located 1.32 miles SW of Tanjong Taras. The coastal bank, with depths of less than 5m and which is marked by some drying reefs, extends 0.3 mile offshore between these points.

Directions.—The following directions should be used with caution. Pass between Samarang Bank and Vernon Bank. This channel is 4.5 miles wide with depths of more than 18.3m. Fury Rocks, on the S part of Vernon Bank, are usually marked by breakers and these are the only visible means of identifying this shoal. Pass S of Mackenzie-Grieve Shoals and NE of Four Fathoms Patches.

Medium-draft vessels should pass between Jahat Shoals and Pine Point Shoals, and then W of Iris Shoals.

From a position W of Iris Shoals, steer a S course to pass 2.5 miles E of Kubong Bluff. Then steer through East Channel on course of about 185° to pass 0.4 mile E of the lighted buoy; there are depths of 7m at a distance closer. Then steer for the E extremity of Pulau Papan, bearing 202°, passing 0.35 mile ESE of the beacons standing on 5m contour.

When Outer Shoal Light bears 230°, steer for it on that bearing until Lighted Beacon No. 3 bears 300°, at which time course may be set to enter the harbor between Harbor Shoal and Tanjong Bendera.

Remain on course 230° (see above) with Outer Shoal Light ahead, until Lighted Beacon No. 4 bears 013°, at which time course should be altered to 193° to keep it open of Tanjong Taras astern.

This course leads between Outer Shoal and Pulau Papan into Brunei Bay.

The route passing N of Outer Shoal and then between Enoe Beacon and Outer Shoal may also be followed, but it is less convenient than the former.

Victoria (Labuan Port) (5°17'N., 115°14'E.)

World Port Index No. 51680

11.69 Victoria, a free port, is the only harbor on Pulau Labuan. Victoria is the principal town and a transshipment port for Brunei Bay area, and also functions as an extension port for Kuala Baram.

The harbor, which is sheltered from both monsoons, is entered between Tanjong Rancha Rancha and Tanjong Bendera. Depths in the entrance range from 8 to 11m and decrease gradually toward its head. A vessel with a draft of 9.4m has entered the harbor without difficulty.

A channel had been dredged to 18m between a position 2.5 miles SSW of Pulau Papan to the Iron Ore Jetty.

The entrance to the dredged channel is marked by a safe water lighted buoy. The channel is followed between the lighted buoys into the harbor.

Winds—Weather.—The Northeast Monsoon prevails from December through April. The Southwest Monsoon prevails from the middle of May to the middle of October.

Tides—Currents.—The tidal heights above datum soundings are, as follows:

MHHW	2.2m
MLHW	1.6m
MHLW	1.4m
MLLW	0.8m

Victoria (Labuan Port)—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Antara Steel Mills Terminal						
Iron Ore Jetty	218m	18.0m	238m	—	150,000 dwt	Iron ore and breakbulk. Continuous berthing length of 320m.
Labuan Ferry Terminal						
Ro-Ro Berth	20m	—	—	—	—	Ro/pax.
Labuan International Ferry Terminal						
Inner East Passenger A Berth	20m	—	—	—	—	Fast ferry.
Inner East Passenger B Berth	22m	—	—	—	—	Fast ferry.
Inner West Passenger Berth	58m	—	—	—	—	Fast ferry.
Outer East Passenger A Berth	20m	—	—	—	—	Fast ferry.
Outer East Passenger B Berth	22m	—	—	—	—	Fast ferry.
Outer West Passenger Berth	66m	—	—	—	—	Fast ferry.
Labuan Liberty Port Terminal						
Liberty Inner Jetty 01	122m	—	—	8.54m	16,000 dwt	Ro-ro passengers/vehicles/rail, containers, breakbulk, and reefer. Continuous berthing length of 244m (310m including dolphins).
Liberty Inner Jetty 02	122m	—	—	8.54m	16,000 dwt	
Liberty Outer Jetty 01	122m	8.68m	—	8.54m	16,000 dwt	
Liberty Outer Jetty 02	122m	—	—	8.54m	16,000 dwt	
Sabah Flour & Feed Mills Terminal						
Flour Jetty	92m	—	—	—	—	Grain, breakbulk, and wheat. Berthing length of 240m (including dolphins).
Asian Supply Base Labuan Terminal						
Asian Supply Base Jetty	120m	8.0m	—	—	6,000 dwt	Chemicals, clean products, ro-ro/lo-lo, breakbulk, and bunkers. Berthing length of 154m (including dolphins).

Victoria (Labuan Port)—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
East Wharf	155m	—	—	—	—	Steel products, breakbulk, and bunkers.
Quay Wharf	170m	—	—	—	—	Chemicals, project/heavy cargo, breakbulk, and bunkers.
Labuan Crude Oil Terminal (LCOT)						
Single Buoy Mooring	—	21.95m	370m	18.9m	350,000 dwt	Crude.
Labuan Terminal						
Shell Jetty	54m	9.45m	—	—	6,000 dwt	Clean products and bunkers. Berthing length of 212m (including dolphins).
Petronas LNG Ltd (PLL) Terminal						
LNG STS	—	23.5m	—	—	—	LNG.
Petronas Methanol Labuan 1 Terminal (PML1)						
PML1 Inner Jetty	35m	—	—	—	—	Aviation fuel, chemicals, and clean products.
PML1 Outer Jetty	28m	12.0m	180m	10.8m	43,000 dwt	Aviation fuel, chemicals, and clean products. Berthing length of 232m (including dolphins).
Petronas Methanol Labuan 2 Terminal (PML2)						
PML2 Inner Jetty	22m	—	—	—	—	Aviation fuel, chemicals, and clean products. Berthing length of 140m (including dolphins).
PML2 Outer Jetty	52m	—	—	—	—	Aviation fuel, chemicals, and clean products. Berthing length of 220m (including dolphins).

The tidal currents in Victoria Harbor have a rate of 0.5 to 1 knot; the flood sets NW and the ebb SE.

Depths—Limitations.—Depths in the entrance range from 8 to 11m shoaling gradually to a depth of 6m in the area off the berths. The S and W parts of the harbor as well as the inner reaches are bordered by shallow depths and drying mud banks.

Berthing details are shown in the table titled **Victoria (Labuan Port—Berth Information.**

Aspects.—From a position 0.7 mile NE of Trident Shoal, the W shore of the harbor consists of reclaimed land. A village built on stilts stands on a drying bank close N of the reclaimed area opposite the town of Victoria.

Outer Shoal, a 0.6m coral patch marked by a light, lies 1 mile NE of the S extremity of the reclaimed land on the W side of the entrance.

A beacon stands on the NE side of the coastal bank about 0.5 mile NNW of Outer Shoal.

Harbor Shoal Lighted Beacon stands on the N part of the Harbor Shoal, a coral shoal with a least depth of 2m, which lies 0.6 mile NNW of Outer Shoal.

Labuan Island—Ports and Approach

Pilotage.—Pilotage is compulsory for vessels entering and leaving the Laid-Up Vessels Anchorage at Brunei Bay. Berth-

New Liberty Wharf

ing Masters for the iron ore and methanol jetties are provided by Sabah Gas Industries. Pilotage is not compulsory for vessels entering and using Liberty Wharf but the harbormaster undertakes these duties on request. Vessels normally berth between 0600 and 1800 and unberth at any hour by day or night, provided prior notice is given.

Vessels requiring a pilot should notify the harbor master through Kota Kinabalu Radio. The pilot usually boards off Pulau Papan. The pilot launch is equipped with VHF radiotelephones.

Regulations.—Mariners should note that no vessels can enter or transit the Laid-Up Vessels Anchorage without the prior written permission of the Director of Ports and Harbors.

Signals.—A signal station is situated on the roof of the Marine Office, near the inner end of Liberty Wharf about 0.7 mile WNW of Tanjong Bendera.

Tidal and berthing signals are displayed from a flagstaff at the signal station, as follows:

Signal	Meaning
Cone, point up	Ebb current
Cone, point down	Flood current
Ball	Slack water

Berths to which vessels are assigned are indicated by two hoists; the vessels signal letters and by a red and white checkered flag superior to the International Code pennant.

Pennant No.	Berth
0	Anchor
1	Esso Wharf
2	Landing Craft Wharf
3	Victoria Wharf
4	Liberty Wharf (inside face)
5	Liberty Wharf (seaward face)
6	New Liberty Wharf (inside face)
7	New Liberty Wharf (seaward face)
8	Brown and Root Wharf
9	Shell Wharf

1. A vessel should acknowledge the berthing signal with the Answering Pennant. The hoist at "half mast" indicates that the vessel should prepare to move, but should not get under way until the hoist is "close up."

2. Red and white checkered flags are displayed on the wharf to indicate the position of bow and/or stern of vessel on the berth allocated.

3. International Code Flag "B" is displayed on the opposite yardarm to the berthing signal when a vessel loaded with inflammable or dangerous cargo is berthing or unberthing.

Anchorage.—Vessels should anchor if the harbor is congested, in suitable depths, clear of the fairway to the inner part of the harbor with open hawse to the SW.

A prohibited anchorage area exists within 0.33 mile of the SE head of New Liberty Wharf.

The positions of the explosive, quarantine, and petroleum anchorages can best be seen on the chart.

Directions.—When approaching from the W and having passed S of Barat Banks, steer 045° for Pulau Papan until Harbor Shoal Lighted Beacon is in range 007° with the center of the Shell Wharf. Then maintain these marks in range until the beacon lying 0.5 mile WNW of Outer Shoal bears 277°, at which time course may be set as necessary for the anchorage or the allocated berth.

If preferred, a vessel may steer for Pulau Papan Light until Outer Shoal Light and Harbor Shoal Lighted Beacon are in range, bearing 342°. Then steer 013° with Lighted Beacon No. 3 just open of the right tangent of Tanjong Taras, passing midway between Outer Shoal and Pulau Papan, and then into the harbor.

It was reported that Outer Shoal Light and Harbor Shoal Light were difficult to distinguish because of the glare of car headlights.

Caution.—Foul ground with numerous submerged objects, indicated on the chart, lies in an area between a position 0.5 mile W of Harbor Shoal and the coastal bank. Caution should be observed when anchoring in this area.

Brunei Bay—West Side

11.70 Lumut (4°43'N., 114°27'E.), is located on the W Brunei coastline about 2.5 miles offshore of Lumut town.

Winds—Weather.—Prevailing winds are from the NE between December and March, turning SW from June until October. The area is affected by squalls associated with occasionally severe thunderstorms, causing wind gusts as high as 75 knots, accompanied by torrential rains.

Depths—Limitations.—There are offshore berths for LNG and methanol. The port can accommodate vessels up to 46,000 dwt, with a maximum length of 290m, a maximum draft of

11.6m, and a maximum beam of 50m. There is an open unprotected sea berth without breakwaters, for dry cargo and tanker vessels. Berthing will be canceled on winds exceeding 20 knots and seas exceeding 2m during the daytime. During the nighttime winds cannot exceed 15 knots or seas 1.5m or berthing will not be allowed.

Pilotage.—Pilotage is compulsory for all vessels. Pilot (called berthing master) boards the vessel 2 miles N of the terminal. Tugs are available. Pilots should be contacted 12 hours before expected arrival at the pilot boarding area.

ETA should be advised to BLNG (Brunei Liquified National Gas) and agents by telex 72 and 24 hours before expected arrival. When within range of the port, vessels should contact Lumut Control on VHF channel 73 to confirm ETA.

Contact Information.—The terminal can be contacted, as follows:

Lumut—Contact Information	
Terminal	
Call sign	Lumut Control
VHF	VHF channels 16 and 73
Telephone	673-3-378-119
	673-3-378-222 (Emergency)
Facsimile	673-3-378-378
Brunei Shell Radio	
Call sign	Brunei Shell Radio (V8L1)
VHF	VHF channels 16 and 19
RT Frequency	4028 kHz
Operators	
Telephone	673-3-236901-912
Facsimile	673-3-236749
E-mail	enquiry@bruneilng.com
Website	http://www.bruneilng.com
Pilots	
Call sign	Lumut Pilot
VHF	VHF channels 16 and 73
Telex	809-3313 (BSPVSLA BU3313)
Telephone	673-8-718-5442 (Duty Pilot)
	673-3-374-997
Facsimile	673-3-374-973
	673-3-374-985
Tugs and Mooring	
VHF	VHF channels 16, 15, and 73

Anchorage.—Vessels should anchor at anchorage ‘C’ located 3 miles N of the terminal, as best seen on the chart.

Caution.—Extreme caution should be taken during navigation in this area due to numerous platforms, drilling rigs, support vessels and barges under tow reported in the area.

Lumut Terminal BEDB SBM (4°47'N., 114°28'E.), is a sub port of Lumut. This SBM is equipped with a Racon.

11.71 Bukit Selila (4°55'N., 114°58'E.), a sharp peak 195m high with a solitary tree, stands 10 miles SW of Brunei Bluff. The hill is the summit of a ridge which extends NE and SW.

Jaja Ridge (4°56'N., 115°00'E.), steep and heavily wooded except for occasional clearings, lies close E of and parallel with the ridge extending from Bukit Selila. Jajak Ridge, which attains an elevation of 164m, terminates 3.3 miles SW of Brunei Bluff.

Bukit Buang Sakar (4°51'N., 114°57'E.), a sharp peak, 234m high, and Bukit Say, 218m high and rounded, are two prominent wooded hills standing 3.3 miles SSW of Bukit Selila.

Bukit Tempayang Pisang (5°01'N., 115°03'E.), 165m high with a small beacon on its summit, which is prominent when seen from Muara Outer Bar, stands about 2.3 miles SSW of Brunei Bluff.

Tanjong Pelompong (5°02'N., 115°07'E.), the NW entrance point of the Sungai Brunei, lies on the S side of the entrance of Brunei Bay, 4 miles E of Brunei Bluff. This sandy point is covered with driftwood and is almost awash at HWS. The point extends E at a rate of 30m a year.

Caution.—Dead trees and logs may be encountered for a considerable distance from this coast. After heavy rains in the interior, miniature islands of trees and earth float down the rivers and eventually find their way out to sea.

11.72 A compact grove of trees, 18 to 37m high, extends W from Tanjong Pelompong for about 1.3 miles; farther W, the low coast is covered by trees 18m high.

Muara Spit, composed of sand, extends about 3.3 miles ENE from Tanjong Pelompong. The spit is awash for about 1.3 miles E from the point, but from there the depths increase to 4.3m at its outer end which is usually marked by tide rips.

Tanjong Trusan (4°58'N., 115°11'E.), the SE entrance point of the Sungai Brunei, is low and tree-covered. This point, which lies 6.5 miles SE of Tanjong Pelompong is the NW extremity of a promontory of the mainland.

Tanjong Gosok lies 0.5 mile E of Tanjong Trusan and Tanjong Perepat (Tanjong Sundar) lies 1.5 miles E of the same point. Pulau Sunda lies close W of this latter point.

11.73 Sunda Spit (4°59'N., 115°11'E.), which dries, extends 2.5 miles NW from Tanjong Trusan. Sunda Bank, with depths of less than 5.5m, extends 5.5 miles NNE from Sunda Spit.

Batang Trusan, a shallow river available only to small boats, is entered close SW of Tanjong Trusan.

Pulau Alang (4°57'N., 115°11'E.), a small islet 24m high, lies 0.3 mile SSW of Tanjong Trusan.

The Sungai Brunei is entered from NE between Maura Spit and Sunda Bank, crossing Muara Outer Bar through a channel about 2.5 miles wide.

A patch with a least charted depth of 4.9m lay in the middle of the outer bar, about 3.3 miles E of Tanjong Pelompong. By passing E and then S of the 4.9m patch, a vessel should be able to carry a depth of 6.7m across the bar over a width of about

0.3 mile.

Within the outer bar depths increase to over 14m off Ujong Sapoh, where the channel is about 1.3 miles wide.

The passage across the bar is considered to be safe for vessels with a draft of 6.1m in clear weather at 0.3 flood. Deeper draft vessels should not attempt to enter unless the shoals have been previously buoyed.

Pulau Muara Besar (5°00'N., 115°07'E.), which shelters Muara Harbor from the E, lies 2 miles S of Tanjong Pelompong, from which it is separated by Anson Passage. The flat marshy island is wooded in places, with the tops of the trees up to 30m high.

Ujong Sapoh (5°00'N., 115°08'E.), the E end of Pulau Muara Besar, lies 3 miles S of Tanjong Pelompong. Ujong Sapoh Light is shown from a silver metal framework tower situated on the point.

Tanjong Kramati (Tanjong Keramut) lies 1 mile NNW of Ujong Sapoh. The intervening coast is bordered by a bank, with depths of less than 1.8m, which extends 3.32 miles NE from Pulau Muara Besar. The inner part of the bank dries.

Ledong Point (5°01'N., 115°04'E.), the NW extremity of the island, lies 2.32 miles WNW of Tanjong Kramati. The coast in between is fringed by mangroves.

Tanjong Bowong lies 2.5 miles W of Ujong Sapoh. The coast in between is fringed by a mud and sand bank. A drying bank extends 183m offshore from Tanjong Bowong. Passage S of the island is obstructed by Muara Bar.

Muara (5°02'N., 115°04'E.)

11.74 Muara is a modern port located at Brunei Bay to the N of Sarawak and S of Sabah.

Muara Container Terminal, Brunei
http://www.psamuara.com.bn/default.htm

Tides—Currents.—The tidal currents set strongly across the entrance of the deep-water channel. Within the shelter of the W breakwater, both the ebb and the flood set in the direction of the channel. At springs a rate of 2 knots has been observed when the ebb is running. The flood seldom exceeds 1 knot.

Tidal heights above datum soundings are, as follows:

MHHW	2.0m
MLHW	1.5m
MLLW	0.7m
MHLW	1.4m

It is advisable to enter and leave Muara Harbor at slack water because of the strong currents; the strongest currents occur from 2 hours before HW until HW, and from LW until 1 hour after LW.

Depths—Limitations.—The port facilities are situated at Brooketon on the NW side of the harbor. The harbor has depths of 5.5 to 15m, mud, and is completely sheltered.

The port facilities were able to accommodate all coastal and ocean-going shipping operations formerly carried out by the port of Bandar Seri Begawan (Brunei Harbor).

The port control are giving berthing priority to mother and feeder vessels having fixed day sailing schedules.

The entrance of the dredged channel leading into Muara Harbor lies about 2.75 miles ENE of **Brunei Bluff** (5°03'N., 115°03'E.).

Muara Harbor can be approached as follows: From the NE through the deep-water channel, cut through Muara Spit which is the principal entrance; from the E through Anson Passage between Muara Spit and Pulau Muara Besar; from the SE by passing S of Pulau Muara Besar and crossing Muara Bar.

Muara Bar lies between the S side of Pulau Muara Besar and the N end of Rambler Banks, 0.3 mile to the S. Vessels up to 5m draft can use this approach.

Muara Bar, lying 0.2 mile S of Tanjong Bowong, had a depth of 3.4m, soft mud. A vessel crossed the bar four times at HW and did not sound a depth of less than 3.4m reduced to chart datum.

The sides of the channel leading across Muara Bar are marked by beacons, some of which are lighted.

Muara Port Wharf is about 0.2 mile long with a depth of 9m alongside. It is divided into five equal sections numbered 1 to 5 from the SW end. There are three berths: a container berth 152m long but with no container crane; a general cargo berth 183m long; and a sand and gravel berth 93m long.

Muara Jetty, situated near the SW corner of Muara Port Wharf, has a pontoon at its head for berthing fishing boats and small craft. The area 0.5 mile SSW of this jetty was being reclaimed.

A ramp for landing craft exists in the bight between the above jetty and wharf.

A T-shaped jetty extends 180m SE from a position 250m NE of the NE spur of Maura Port Wharf. There are depths of 8.5m alongside. A dolphin stands midway between this jetty and the Shell Jetty.

Shell Jetty lies 0.3 mile NE of the NE spur of Muara Port Wharf. The jetty extends 150m SE from the shore and has two breasting dolphins at its head. It is planned to dredge the head to a depth of 9m. The berthing face is 67m long. A tank farm stands at the root of this jetty.

Ocean Inchcape Supply Base Jetty is situated 183m NE of Shell Jetty. There are depths of 6.1m alongside the face of this jetty. A radio mast, marked by red obstruction lights, lies about 0.12 mile NNW of this jetty.

The Naval Base Jetty is situated about 0.3 mile NE of the NE spur of Muara Port Wharf. The jetty has two faces which form an angle of about 165°. The E face is connected to the shore by reclaimed land and is 90m in length. The W face lies on the outer side of an arm extending about 0.11 mile WSW. There are depths of 4 to 5.5m alongside. A new fuel terminal has been reported located across a cruise ship terminal.

A small L-shaped jetty and ramp lie about 87m W of the WSW end of the Naval Base Jetty.

See the table titled **Muara—Berthing Information** for latest details on details on berthing accommodations.

Aspect.—A radio tower, about 24m high, stands 0.3 mile SSW of Brunei Bluff.

Lighted beacons, in range bearing about 209°, lead through

Istana Nurul Iman—Brunei Palace in Bandar Seri Begawan, Brunei River in the background towards Brunei Bay

Muara Harbor with Pulau Muara Besar and Brunei Bay on the background

Muara—Berth Information			
Berth	**Length**	**Depth**	**Remarks**
Cement Terminal			
Cement Jetty	201m	8.0m	Cement, clinker, and gypsum. Berthing length of 230m (including dolphins).
Muara Container Terminal			
Container Berth	250m	12.5m	Containers and reefer.
Serasa Passenger Ferry Terminal			
Ferry Jetty	—	—	Fast ferry.
Passenger/Vehicle Ferry Jetty	54m	5.0m	Ro/pax and ro-ro/lo-lo.

Muara—Berth Information			
Berth	**Length**	**Depth**	**Remarks**
BSP STL Muara Supply Base Terminal			
Muara Supply Base Jetty	120m	7.5m	Chemicals, multipurpose, bunkers, and bentonites.
Muara Conventional Terminal			
Conventional Berth 01	203m	12.5m	Dirty products, cruise vessels, ro-ro passengers/vehicles/rail, breakbulk, multipurpose, and livestock. Continuous berthing length (with Berth 02 and Berth 03) of 611m.
Conventional Berth 02	203m	12.5m	Cruise vessels, ro-ro passengers/vehicles/rail, breakbulk, and livestock. Continuous berthing length (with Berth 01) of 611m.
Conventional Berth 03	203m	12.5m	
Brunei Shell Marketing (BSM) Terminal			
Shell Jetty	18m	7.5m	Chemicals, dirty products, and bunkers. Berthing length of 72m (including dolphins).
Hengyi Terminal			
East Berth	76m	—	Chemicals. Berthing length of 230m (including dolphins). Maximum loa 238m. Maximum draft (HW) 10.0m.
Petrochemical East Berth	120m	—	Chemicals, Maximum draft (HW) 10.0m
Petrochemical West Berth	236m	—	
West Berth	76m	—	Chemicals. Berthing length of 230m (including dolphins). Maximum loa 238m. Maximum draft (HW) 10.0m.
PMB Petrochemical Terminal			
North Berth	96m	—	Chemicals. Maximum loa 238m. Maximum draft (HW) 10.0m.
South Berth	96m	—	

this channel and into the harbor.

Lighted beacons and buoys mark the sides of the channel and the deep water area within the harbor.

USS Spruance docked at Port of Muara, Brunei

Pilotage.—Pilotage is compulsory for merchant vessels over 46m in length using the deep water entrance channel. Pilots are boarded in position 5°04.65'N, 115°06.48'E. Pilots can be contacted on VHF channel 8.

Requests for pilots should be made to the Director of Marine, Serasa Muara, Brunei Darussalam at least 24 hours in advance.

Contact Information.—See the table titled **Muara—Contact Information**.

Regulations.—Entry into the Deep Water Channel (NE approach) is controlled to prevent vessels from entering the channel from opposite directions at the same time. This control is exercised by signals from the port signal station and mast situated on Maura Spit near the root of the W training wall.

Muara—Contact Information	
Port Operations	
Call sign	Muara Harbour (V8L3)
VHF	VHF channel 16
RT Frequency	2182 kHz
Telephone	673-2770270
Facsimile	673-2770293
Pilots	
VHF	VHF channels 8 and 16
Facsimile	673-2-772-717
Pilot Vessel and Tugs	
VHF	VHF channel 8

Anchorage.—The deep water quarantine anchorage within Muara harbor is situated between about 0.2 mile and 0.75 mile

SSW of the SW end of Muara Port Wharf. Two anchors should be used because of the restricted swinging room.

Tanjong Sapo Quarantine Anchorage lies almost 1 mile S of Tanjong Sapo Light, in a depth of 10.7m. This is also the quarantine anchorage for vessels proceeding to Tanjong Salirong Anchorage.

Directions.—When entering Brunei Bay from the W, pass either between Abana Rock and Barat Banks, or between Abana Rock and Pelong Rocks.

When the pilot is boarded, proceed to a position about 140m E of Lighted Beacon No. 1 West on a heading of 210°. Then proceed through the dredged channel, keeping strictly to the range lights in line, bearing about 209°. Mariners are cautioned that passage through this channel is strictly controlled during dredging operations. The course should be altered to 246° when Buoy No. 7W is abeam, for Muara Port Wharf or the anchorage.

If entering the Sungai Brunei E of Muara Spit, make for a position of 9 miles E of Pelong Rocks, when the NE extremity of Pulau Rusukan Besar is in line with the W extremity of Pulau Kuraman, bearing 332°. From this position, steer 175° for 1 mile with Pulau Burong nearly astern. Pulau Rusukan Besar should be kept bearing less than 337°.

When Tanjong Trusan Light bears 189°, steer for it on that bearing, which leads about 0.5 mile E of the shallowest part of the outer bar. When Tanjong Sapo Light bears 243°, steer for it on that bearing until it is distant about 1.5 miles, at which time course should be altered for Tanjong Sapo Quarantine Anchorage or for the SE entrance of Muara Harbor.

The sand knolls on the Outer Bar, on the W side, and Sunda Bank on the E side, may also be avoided by keeping the angle between Bukit Tempayang Pisang and the summit of Pelong Rocks between 024.5° and 025° until Tanjong Sapo Light bears 243°.

Muara Bar should be approached with Muara Bar Lighted Beacon No. 27 bearing 277°. When about 0.3 mile from this light structure, Bukit Tempayang Bisang should be steered for bearing 294°. Pass N of Muara Bar Lighted Beacon No. 27 and alter course slowly to starboard to 300°, with Muara Bar Lighted Beacon No. 26 bearing 120° astern. When Muara Jetty, near the SW corner of Muara Port Wharf bears 356°, steer 345° for the wharf or deep water anchorage.

Caution.—After heavy rains numerous logs creating floating islands drift downstream into the harbor and sometimes cause heavy damage to small craft. Mariners are cautioned that passage through the channel is strictly controlled during dredging operations. The center line of the dredged channel lies approximately 137m W and 320m E of the training wall.

The Sungai Brunei and Approaches

11.75 Pulau Badu Kang (4°59'N., 115°04'E.), 32m high to the tops of the trees, densely wooded, and surrounded by swamps, lies on the W side of the estuary 4 miles WSW of Tanjong Sapo. This island lies in the SE approach to a bay, almost all of which dries. Only small boats can navigate within this section of the bay. A causeway has been constructed W of Muara Bar and 1 mile NE of Pulau Badu Kang.

Oyster Rocks, 1m high, lie on the coastal bank 0.5 mile SW of Pulau Badu Kang.

Brunei Channel (4°59'N., 115°05'E.) is entered close SE of Muara Bar and then leads SW for 4 miles to abeam of Kaingarin. This section ranges from 0.1 to 0.2 mile wide and has a least depth of 5.5m. Vessels drawing 5.5m can proceed as far as this spit, but except in an emergency, it is recommended that vessels drawing more than 4.6m should not proceed beyond the anchorage off Ujong Sapoh.

Two beacons in range, bearing about 51.5° astern, lead through the NE part of Brunei Channel. The beacons stand in a clearing, but because of the surrounding trees are visible only over a limited arc.

Rambler Banks (4°58'N., 115°06'E.), which mostly dry and which stand on the E side of the channel, extend 7 miles NE from Tanjong Semastra.

11.76 Tanjong Kindana (Tanjong Semastra) (4°55'N., 115°01'E.), the N extremity of Pulau Berambang and the E entry point of the Sungai Brunei, lies 4 miles SSW of Pulau Badu Kang. It may be identified by Bukit Kindana, 157m high to the top of a conspicuous clump of trees, standing 0.8 mile SSW of the point. The hill is densely wooded.

Pulau Kingaran (4°57'N., 115°01'E.), densely wooded and 37m high to the tops of the trees, lies 2.5 miles SW of Pulau Badu Kang. A narrow deep channel separates the island from the mainland.

Kaingarin (4°57'N., 115°02'E.), which dries, extends almost 1 mile ENE from the N end of the island. Some prominent rocks lie close off the S end of the island.

11.77 Pulau Chermin (Pulau Churmin) (4°56'N., 115°01'E.), 33m high to the tops of the trees, lies 0.6 mile S of Pulau Kingaran. The island is densely wooded.

Brunei Inner Bar extends from Kaingarin to Pulau Chermin and forms the principal obstruction in the approach to the Port of Bandar Seri Begawan. The principal shoals which make up this bar are:

North Bar Bank, with a depth of 0.6m, lies 0.5 mile E of Pulau Kingaran; South Bar Bank, with a depth of 0.3m, 183m farther E; Barrier Bar, which almost crosses the channel close SW of the two banks, has a depth of 0.3m. There was a clear boat passage leading W from the vicinity of South Bar Bank Lighted Beacon No. 30 over the central part with depths of 1.8m. A 1.2m patch lies on the S side of the passage 183m W of South Bar Bank Lighted Beacon No. 30. Simpson Channel, which leads over Brunei Inner Bar, lies between North Bar and South Bar Banks, has a least depth of 2.1m and a width of 183m in the fairway.

Chermin Rock (4°56'N., 115°01'E.), lies 183m NW of the N end of Pulau Chermin. A beacon marks this danger.

Vessels not intending to cross Brunei Inner Bar can anchor, in a depth of 6m, about 1 mile E of the N end of Pulau Kingaran, with Pulau Chermin Light bearing 227°.

Anchorage.—The quarantine anchorage lies about 0.3 mile S of Lighted Beacon No. 40. This anchorage should be used by a vessel waiting to anchor off the town or waiting to go alongside Bandar Seri Begawan Wharf.

Good anchorage has been reported, in a depth of 13m, off the entrance of the Sungai Meragang, at the W end of the town with sufficient room for a vessel, 52m in length to swing.

A vessel has anchored, in a depth of 11m, in the fairway

Bandar Seri Begawan

about 183m E of Bandar Seri Begawan Wharf.

11.78 Bandar Seri Begawan (Brunei) (4°53'N., 114°56'E.) (World Port Index No. 51630), the capital of the State of Brunei, stands at a bend in the river about 9 miles above its entrance. The old town is built on mud flats in the river, the houses standing on piles in 0.9 to 1.2m of water. The new town, which contains the government buildings, stands on the N bank of the river. The British High Commissioner and the Sultan of the State of Brunei reside in the town.

Tides—Currents.—Tidal currents in Brunei Channel abeam of Muara Bar sometimes set across the fairway; in the remainder of this channel they set up and down the fairway.

In Simpson Channel, the flood has a rate of 2 knots and the ebb a rate of about 3 knots.

Depths—Limitations.—The Sungai Brunei, between Chermin Rock and Lighted Beacon No. 35, about 4 miles SW has a depth of 5.5m and the fairway favors the W bank. In the vicinity of this lighted beacon, the channel trends to the SE and then SW to the W bank again in the vicinity of Lighted Beacon No. 36. About 1 mile SW of this latter beacon, the channel gradually turns at Lighted Beacon No. 37 to pass E and then S of **Pulau Sibungor** (4°52'N., 114°57'E.). The channel then turns N and leads into the port area fronting the town of Bandar Seri Begawan. The channel W of Pulau Sibungor becomes narrow and shoals to depths of 3.7m close to Lighted Beacon No. 39. Farther N, the fairway deepens again to depths of 5.5m, and to depths of 9.1m and more off the town.

Bandar Seri Begawan Wharf, of modern concrete construction, is 222m in length with depths of 4.9 to 5.8m alongside; the passenger pier is 38m long. Six lighters are available, but about 1 week notice is required for their use.

An oil wharf, 9m in length with two mooring dolphins and depths of 1.8 to 5.8m alongside, lies 0.5 mile downstream.

Pilotage.—Pilots for the Sungai Brunei are available on application to the Marine Office, Bandar Seri Bagawan.

Regulations.—Only the following vessels are permitted to proceed to the port of Bandar Seri Beagawan:

1. Small wooden coasters, operating within Brunei Bay, not exceeding 24m in length and 50 gt.
2. Vessels proceeding to the Shell Oil Depot at Kampong Subok.
3. Tugs and lighters carrying stone aggregates.
4. Passenger ferries operating between ports in Brunei Bay.
5. Ships under tow are not permitted to navigate the Sungai Brunei.

Signals.—Berthing signals are displayed from the Customs Station Check flagstaff at the head of the pier, 0.3 mile N of Pulau Sibungor, as follows:

Berthing Signals	
Day signal	One black ball
Night signal	One red light

A vessel may proceed alongside Bundar Seri Begawan Wharf when the signals are hauled down.

A red over white horizontally halved pennant is displayed at the upstream end of the wharf as an indication of the direction to lay the ship's head in order to come alongside against the current.

Anchorage.—The quarantine anchorage lies about 0.3 mile S of Lighted Beacon No. 40. This anchorage should be used by a vessel waiting to anchor off the town or waiting to go alongside Bandar Seri Begawan Wharf.

Good anchorage has been reported, in a depth of 13m, off the entrance of the Sungai Meragang at the W end of the town,

with sufficient room for a vessel, 52m in length to swing.

A vessel has anchored, in a depth of 11m, in the fairway about 183m E of Bandar Seri Begawan Wharf.

Caution.—Local knowledge is essential to make passage from Brunei Inner Bar WSW through Simpson Channel and through the Sungai Brunei.

No vessel should enter the channel S of Simpson Channel if there is any likelihood of having to pass another vessel.

11.79 The approach to the Sungai Limbang, S of Ujong Sapoh, is by a straight channel about 5.3 miles in length to a position about 1.3 miles NNW of **Tanjong Lumba Lumba** (4°53'N., 115°06'E.).

This channel, separated from Brunei Channel by Rambler Banks, has a depth in the fairway of 9.4m over a width of 183m, and of more than 7.3m over a width of 0.5 mile.

Pulau Pepatan (4°55'N., 115°03'E.) and Pulau Baru Baru lie on the inner part of Rambler Banks, 1.5 miles E of Bukit Kindana. Pulau Pepatan, the N islet, is flat and densely wooded. Pulau Baru Baru is also flat and wooded, except on the S side, where a bare hill rises to a height of 33m. Embankment construction works are taking place on Pulau Pepatan. Mariners must keep at least 100m clear of any construction works. Mariners are advised to navigate with caution and to contact the Local Port Authority for the latest information. For further information see http://ww.marine.gov.bn.

Pulau Berbunot, 0.4 mile SE of Pulau Baru Baru, has two summits joined by low land. The NE summit is wooded and the SE summit is scrub covered and has two conspicuous trees.

Pulau Lelipan and Pulau Selamok, two small islets, lie SE of Pulau Berbunot.

The **Sungai Temburong Entrance** (4°49'N., 115°03'E.) lies 5 miles SSW of Tanjong Lumba Lumba. The E shore of the estuary in this vicinity is composed of mangrove swamps, intersected by numerous unimportant rivers which are difficult to identify from offshore.

Sungai Temburong leads generally SSW from the vicinity of Tanjung Lumba-Lumba (4°53.35'N., 115°06.03E), then under the Temburong Bridge to several tributaries.

Batang Limbang is entered from Sungai Temburong immediately E of Tanjung Tobu-Tobu (4°51'10.2"N., 115°03'18.6"E), where there is a small anchorage port. The river is 122 miles long, marked by stakes, and is navigable by vessels of 2.5m draft only as far as Bandar Limbang, 8 miles above its entrance. Local knowledge is essential beyond the anchorage off Tanjung Lumba-Lumba. The vertical clearance under Temburong Bridge (paragraph 11.76), spanning the Eastern Channel, is 31.4m. The navigable passage under the bridge is marked by lighted beacons and is 175m wide.

Pulau Kitang (4°53'N., 115°06'E.), covered with mangroves, lies 0.6 mile S of Tanjong Lumba Lumba.

The mouths of the Sungai Limbang and the Sungai Pandaruan lie on the W side of the estuary between Pulau Berbunot and the Sungai Temburong. Sungai Limbang is entered close N of **Tanjong Tobu-Tobu** (4°51'N., 115°01'E.) which lies 1.33 miles SSW of the S extremity of Pulau Burbunot. The river can be navigated by vessels of 3m draft as far as Limbang, 8 miles above its entrance.

A narrow channel, 0.4 mile wide between the 2m contours, leads from a position 0.5 mile NW of Tanjong Lumba Lumba to a bar 3.5 miles SW; this channel also leads to the entrance of the Sungai Temburong and the Sungai Pandaruan.

A lighted buoy is moored about 1.3 miles E of Tanjong Tobu-Tobu and marks the starboard side of the entrance of the Sungai Limbang. This buoy is shifted as the channel changes.

The channel across the bar had a depth of 0.6m. Beacons mark the channel sides.

Within the bar, there are depths of 2 to 27m in the Sungai Limbang as far as Limbang, where the channel is obstructed by some sunken rocks, over which there are strong eddies. Above these rocks there are depths of 3.7 to 7.3m. There are very strong eddies at the sharp river bend, just below Limbang.

Anchorage.—Anchorage for ocean-going vessels can be taken, in a depth of 8m, about 1.3 miles NNW of Tanjong Lumba Lumba and 5 miles NE of the bar.

Vessels loading logs at Tanjong Lumba Lumba anchor 0.3 mile SW of the point.

The quarantine anchorage lies 0.9 mile S of Ujong Sapoh.

Directions.—From Ujong Sapoh, steer SSW through the approach channel, whose limits are usually marked by large fish traps, to a position 0.5 mile NW of Tanjong Lumba Lumba. No vessel should proceed beyond this point without local knowledge. Inquiries regarding pilots for the Sungai Limbang should be made to the Director of Marine, Kuching.

The river brings down quantities of lumber and a good lookout must be kept for stranded trees.

11.80 Limbang (4°48'N., 115°05'E.), a small river port with a main export of timber, stands on the E bank of the Sungai Limbang, about 7 miles above the entrance. Lawas lies close upriver. Berthing details can be seen in the table titled **Limbang—Berth Information.**

Limbang—Berth Information			
Berth	**Length**	**Depth**	**Remarks**
Limbang Terminal			
New Custom Wharf	24m	2.3m	Breakbulk.
Commercial Wharf	—	—	Breakbulk.
Main Bazaar Wharf	—	—	Breakbulk.
Custom Pontoon	—	—	Breakbulk.
Lawas Terminal			
Commercial Wharf	22m	2.4m	Breakbulk.

Limbang—Berth Information			
Berth	Length	Depth	Remarks
New Custom Wharf	—	—	Breakbulk.
Pontoon Berth	—	—	Breakbulk.

The **Sungai Pandaruan** (4°49'N., 115°02'E.) is entered 0.4 mile W of the N end of Pulau Siarau, 2.3 miles SSE of Tanjong Tubu-Tubu.

Kampong Rangau, from which a boat channel leads W into the Sungai Limbang, lies on the W side of the entrance. A depth of about 0.3m can be carried through this channel.

Courtesy of Google

Limbang

From abeam Tanjong Tobu-Tobu to the S end of Pulau Siarau, a depth of 2.7m can be carried in the Sungai Pandaruan. From here a depth of about 2m can be carried up the Sungai Pandaruan to a position abeam of Bukit Terumi, which is connected by road with Limbang. The Sungai Pandaruan, which runs for 30 miles S from its entrance, is navigable by small craft with a draft of 1.2m for 9 miles above its entrance.

The Sungai Temburong is entered 0.8 mile E of the N end of Pulau Siarau. There is a depth of 2.7m in the approach from abeam of Tanjong Tobu-Tobu as far as the entrance.

Above this position there are depths of 1.8 to 9.1m for a distance of 7 miles. The river is navigable by small craft, with a draft of 1.2m as far as Bangar, 8 miles above the entrance.

Brunei Bay—East Side

11.81 Between **Tanjong Lumba Lumba** (4°53'N., 115°06'E.) and **Tanjong Perepat** (Tanjong Sunda) (4°58'N., 115°12'E.), the coast is composed of mangrove swamps and backed by tall trees. The coast is intersected by numerous rivers and is entirely devoid of landmarks.

Between Tanjong Sunda and Tanjong Mengalong, 15 miles ENE, the area has not been fully surveyed.

Caution.—Floating logs and other debris, brought down by the rivers, may be encountered in the bay especially after heavy rains. Fish havens are present NNE of Sarawak in position 5°00.2'N., 115°15.6'E and 5°00.7'N., 115°25.7'E.

11.82 Bukit Sari (4°56'N., 115°23'E.), a small peninsula, 140m high and conspicuous, lies 10 miles E of Tanjong Perepat. Several small rivers flow into the bay which lies in between. The peninsula is sometimes difficult to make out because of the higher land behind it.

Bukit Selingai, 740m high, is located 10 miles SSW of Bukit Sari. Bukit Batanga, 1,777m high, stands 16 miles ESE of Bukit Sari, a high range of mountains extends 10 miles NNE and W, and 21 miles SW from this peak.

Batang Lawas (4°58'N., 115°25'E.), entered 2 miles NE of Bukit Sari, is available only to small craft.

Open anchorage can be taken by ocean vessels when loading timber about 1.5 miles E of the river entrance, in a depth of 18m.

A lighted buoy lies at the outer end of the channel leading across the flats to Batang Lawas. The buoy is moved as necessary to conform to changes in the channel. Vessels should pass NE of this buoy.

There was a depth of 0.5m over the bar at the entrance of the river. The channel is marked by stakes which are moved as necessary to conform with changes in the channel.

There is a customs wharf at Kuala Lawas village on the SW bank of the river 1 mile within the entrance.

Lawas, the principal town, is situated 11 miles above the river entrance. The Customs Wharf at Lawas is 20m long, with depths of 0.3 to 1.2m alongside.

11.83 Tanjong Mangalong (5°01'N., 115°28'E.) stands 6 miles NE of Bukit Sari.

The Sungai Mangalong, which is navigable only by small boats, discharges close S of this point. A village stands on the right bank of the river, 0.5 mile within the entrance.

Bukit Suai (4°58'N., 115°28'E.), 166m high and conspicuous, stands 2.3 miles S of Tanjong Mangalong.

Tanjong Marintaman (5°04'N., 115°32'E.) lies 5.5 miles NE of Tanjong Mangalong. A bay and a few rocky promontories lie in between the two points.

A jetty 120m long, 30m wide, approached via a bridge 300m long, extends WNW across the 11m depth contour 1,183m WSW of Tanjong Sebuboh. It serves a pulp and paper mill and can accommodate vessels up to 15,000 dwt.

A rubble jetty extends NW to the 5.5m depth contour from a position 0.2 mile SSW of Tanjong Sububoh.

A rock, 5m high, lies close W of Tanjong Sebuboh and a reef, which dries 2.7m, lies close N of the same point.

Off-lying Dangers

11.84 Takat Besar (5°04'N., 115°30'E.), a group of rocks with a least depth of 0.9m, lies 1.33 miles WSW of Tanjong Marintaman. Several other rocks lie between Takat Besar and the shore. The least depth on these is 2.4m.

Takat Kahar, with a depth of 10.3m, lies 1.33 miles WSW of

Tanjong Marintaman.

Passage between these rocks and the coast is possible, but because the dangers are unmarked, it should not be attempted.

Takat Ludin (5°04'N., 115°31'E.), a 5.1m rocky patch, and Takat Daim, a rock with a depth of 2.4m, lie about 1 mile E and ESE of Takat Besar.

Takal Mengal (5°05'N., 115°32'E.), a rocky ledge with a depth of 2.7m, lies between 0.2 mile and 0.35 mile N of Tanjong Marintaman.

Two unimportant rivers discharge at the head of Telok Batu Bedara, about 0.4 mile SE of Tanjong Marintaman.

A peak, 256m high, 3.3 miles SSE of Tanjong Marintaman, is the highest point of a range of hills which extend W from Croker Range, running about 18 miles parallel to the coast.

Sipitang (5°3'N., 115°31'E.) is a village stands at the mouth of the Sungai Sipitang, a small river available only to small boats, about 1.3 miles NE of Tanjong Marintaman. A bridge spans the river a short distance above the entrance. The maximum allowable draft within the port is 13.0m.

Sabah Forest Industries consists of North Jetty and a South Jetty, which handle bulk cargo. Each berth is 160m in length and can accommodate vessels up to 15,000 dwt. The Sabah

Ammonia Urea (Samur) Terminal consists of East Jetty and West Jetty; both are 440m long with a depth alongside of 13.0m and handle bulk cargo and chemicals.

Good anchorage can be taken, in a depth of 11m, mud, 0.3 mile offshore. The river should be approached with the entrance bearing 110° and anchor when Tanjong Marintaman bears 200°.

The coast between the mouth of the Sungai Sipitang and the S entrance point of Padas Bay, 3.5 miles N, is low and fringed with trees. The drying coastal bank extends from 0.2 to 0.5 mile offshore and depths of less than 5.5m extend from 0.4 mile offshore in the S part to 1.3 miles offshore in the N part.

It was reported that this coastal bank was extending S and W and that patches, with depths of 0.4 and 4.5m, lay 1.3 miles WNW and 1.3 miles SW, respectively, of the mouth of the Sungai Lukutan.

Padas Bay (5°10'N., 115°32'E.), fouled by sand and mud flats which dry, lies in the NE part of Brunei Bay.

The Sungai Lukutan enters the bay close to the S entrance point of Padas Bay.

A peak, 329m high, rises 4 miles E of the S entrance point of Padas Bay; a 181m high hill stands 1 mile NNW.

11.85 Tanjong Batu Batu (5°11'N., 115°34'E.) lies 6.5 miles N of the mouth of the Sungai Sipitang. The Sungai Padas channel, which runs close NW of Tanjong Batu Batu to Weston, was reported to have a depth of 1.8m at the entrance and 1.5m on the bar near Weston. The bar at the entrance of the Sungai Padas was reported to have extended 0.5 mile seaward.

The channel within the river is marked by beacons and a black conical buoy marks the entrance. The beacons are often destroyed by log rafts.

Weston (5°13'N., 115°36'E.), a small town and river port, lies on the SE side of Padas Bay 2.5 miles NE of Tanjong Batu Batu. A small jetty, 12m long, extends from the shore abreast of the town.

The Sungai Padas, about 100 miles long, lies on the N side of Padas Bay, but is available only to small craft.

Tanjong Klias (5°18'N., 115°21'E.) is located 15 miles NW of Padas Bay. The trees in the vicinity of the point are 27m high, whereas the land to the SE is low and flat.

A large anchorage for laid-up vessels extends from S of Pulau Papan to Padas Bay. Anchoring is prohibited within 0.27 mile of the submarine pipeline passing about 4.3 miles S of Tanjong Klias.

A detached 11m sandy patch lies 4.5 miles S of Tanjong Klias and clear of the coastal bank, which lies 4.3 miles SSE of the point.

The **Sungai Klias** (5°17'N., 115°22'E.) is entered 1.3 miles E of Tanjong Klias. A flat, which dries 0.9m, obstructs the entrance and divides the channel into two arms. Three small tree-covered islets lie on the flat.

The main approach channel lies close S of Tanjong Klias and can be reached by passing through the channel close E of Pulau Daat, which stands 1.3 miles SW of Tanjong Klias.

There is a depth of 1.8m over the bar and the same depth can be carried for several miles within the entrance.

In the S approach channel, E of Pulau Sarangtiong, there is a depth of 0.3m. Two beacons mark this channel NE of Pulau Sarangtiong.

A village stands on the S side of Tanjong Klias and a village stands within the river entrance about 1.3 miles to the ENE. Two jetties and a flagstaff are situated in the village S of Tanjong Klias.

Tanjong Toulak to Tanjong Nosong

11.86 From **Tanjong Toulak** (5°25'N., 115°23'E.), lying 8.5 miles ENE of Tanjong Kubong (Bethune Head), the W entrance to Brunei Bay, the coast extends regularly NE for about 18 miles to Tanjong Nosong without any pronounced indentation or projection. From a position about 3.5 miles NE of Tanjong Toulak to Pine Point, about 6.5 miles farther in the same direction, the coast rises to a range of hills, the highest elevation being a conspicuous 162m peak near the SW end of the range. Bukit (Nosong) Bantayan, 110m high, stands 1.5 miles S of Tanjong Nosong. A densely wooded range extends 2.3 miles SW from this hill.

The coastal bank, with depths of less than 11m, extends from 0.3 to 2 miles offshore between Tanjong Toulak and Tanjong Nosong. Many detached shoals, with depths from 1.8 to 5.5m, exist on this bank. Several spits, with depths of less than 5.5m, extend as far as the 11m curve.

A rock, with a depth of less than 1.8m, lies on a spit 3.3 miles NE of Tanjong Toulak. Sunken and drying rocks, one of which dries 1.5m, extend up to 0.4 mile offshore between 1.3 miles SW and 1 mile NE of Pine Point.

A spit, with depths of less than 5.5m, extends 1.5 miles N from Tanjong Nosong. Many above and below-water rocks exist on this spit.

Tangut Rock, 9m high, and Cake Rock, 7m high lie, respectively, 10.2 mile N and 0.2 mile NNE of Tanjong Nosong. A 4.6m patch lies 2 miles NNE of this point.

There are depths of less than 11m up to 3 miles NNE of Tanjong Nosong.

Caution.—The sea off this coast is usually very discolored and the shoals, even with good light, are difficult to make out.

11.87 Iris Shoals (5°30'N., 115°23'E.) consist of several shoal patches, with a least depth of 3.7m, lying 3.5 to 6 miles N of Tanjong Toulak. The two N patches each have a depth of 5.5m.

Several shoals, with depths of 2.7 to 8.7m, lie between Iris Shoals and Tanjong Toulak. The S shoal lies 1.5 miles N of the point and is the shallowest.

Pine Point Shoals (5°31'N., 115°27'E.), with depths of less than 5.5m, extend 4.5 miles NW from a position 3 miles SW of Pine Point. A coral patch, with a depth of 0.3m, lies 4.5 miles WNW of Pine Point.

Nosong Patch (5°39'N., 115°33'E.), with a depth of 6.4m, lies 2.3 miles WNW of Tanjong Nosong. Several patches, with depths of 5.5 to 6.4m, lie between Nosong Patch and the coastal bank to the SE.

Haselfoot Patches (5°28'N., 114°57'E.), consisting of two coral shoals each with a depth of 7.3m, lie 0.5 mile apart 19 miles WNW of **Tanjong Kubong** (5°24'N., 115°15'E.).

Samarang Bank (5°35'N., 114°55'E.), consisting of dead coral and sandy patches, has general depths of less than 11m, and a least depth of 6.4m. It lies between 21 and 26 miles WNW of Tanjong Kubong. An obstruction with a depth of 2.4m, was reported on the SW extremity of Samarang Bank; its position is approximate.

Caution.—Less water than charted has been reported (1997) on and in the vicinity of Samarang Bank.

11.88 Samarang Oil Field (5°37'N., 114°53'E.) is situated in the area of Samarang Bank. Within the oil field there are many production platforms, wellheads, and other structures. Submarine oil and gas pipelines are laid from a wellhead standing on the NW side of the bank to the oil terminal near Tanjong Punei.

Production platform in Samarang Oil Field

Fish Aggregating Devices, contained in steel boxes, may be encountered moored within an area triangular in shape. The base of the area lies between the ammunition dumping ground (5°30'N., 114°10'E) and Louisa Reef 70 miles NW; the apex lies at position 7°10'N, 115°30'E. The perimeter is patrolled and the devices are marked by red flags and some are fitted with radar reflectors.

11.89 Vernon Bank (5°46'N., 115°03'E.), with depths of less than 11m, lies 5 miles NE of Samarang Bank and between 22 and 29 miles NW of Tanjong Kubong; the bank extends 12.5 miles in a NE and SW direction.

Two patches, with depths of 5 and 5.5m lie on the bank 1.3 miles and 0.3 mile, SW of the N end, respectively, of Vernon Bank. Currents in the vicinity of Vernon Bank are uncertain.

Fury Rocks (5°43'N., 115°02'E.), consisting of several coral heads, some awash, lie on the S part of Vernon Bank. The sea seldom breaks over these rocks in calm weather.

Several passages, with depths of more than 11m, run into the large area between Fury Rocks and the NW dangers of Vernon Bank.

Local knowledge is necessary for the use of these passages.

Vernon Bank has not been completely examined and less water than charted may exist.

Hankin Shoal (5°48'N., 115°11'E.), coral and sand, lies 4.5 miles E of the N part of Vernon Shoal. The shoal is 0.5 mile in extent with a least depth of 10.1m.

A 14.6m coral patch lies about 3.3 miles WSW of Hankin Shoal.

Mackenzie-Grieve Shoals (5°35'N., 115°11'E.), consisting of three shoals with depths of 7.8, 8.7, and 10.1m lie between 11 and 13.5 miles NNW of Tanjong Kubong.

A shoal, with a depth of 10.5m, and two shoals, each with a depth of 12.8m, lie between the above shoals and Gordon Patches.

Gordon Patches (5°36'N., 115°15'E.) consist of several shoals with depths of less than 11m. The shallowest spot, with a depth of 6.9m, lies 14.5 miles NW of Tanjong Toulak. The maximum reported current is 0.5 knot.

A small mud area, with a depth of 117m and marked by sulfur and hydrogen bubbles, lies in the middle of Gordon Patches 0.3 mile E of the shallowest spot.

Three patches, with depths of 12.8m, 14.6m, and 16.5m lie 2 miles ESE of the shallowest part of Gordon Patches.

Between Gordon Patches and Fury Rocks, 14 miles NW, there are many detached shoals and patches with depths of 8.7 to 18.3m, whose positions can best be seen on the chart. One of these shoals, Scott Patches, with a least depth of 12.3m, lie 5.3 miles NW of the shallowest part of Gordon Patches.

11.90 Jahat Shoals (5°35'N., 115°22'E.), consisting of numerous rocky patches with depths of less than 5.5m, lie between 8 and 10.5 miles WNW of Pine Point. Jahat Rock, which dries, lies near the middle of these shoals. A rock, with a depth of less than 1.8m, lies 0.6 mile SW of Jahat Rock.

Several detached patches, with depths of 8.7 to 12.8m, some of which are coral, lie between Jahat Shoals and Iris Shoals and can best be seen on the chart.

Middle Patches (5°37'N., 115°19'E.), a group of four shoals with depths of less than 11m, and a least depth of 8.2m, lie about 3.3 miles NW of Jahat Rock.

Winchester Shoals (5°42'N., 115°21'E.), lying 15 miles WNW of Tanjong Nosong, consist of several patches close together, with a least depth of 3.2m on the N patch. At the S end, a shoal with a least depth of 10.1m, lies about 1.3 miles SSE of the N shoal patch, with two 11m patches in between.

Several patches, with depths of 11.9 to 16.5m, lie close W of Winchester Shoals.

The maximum current observed S of Gordon Patches and Winchester Shoals was setting N to NE at a rate of 1.5 knots.

Paisley Shoal (5°48'N., 115°20'E.), with a depth of 6.9m, lies 6 miles N of Winchester Shoals.

Growler Bank (5°40'N., 115°28'E.), with a depth of 8.2m, lies 8.3 miles WNW of Tanjong Nosong. A 12.8m patch lies 2.3 miles WSW of this bank.

A shoal, with a depth of 12.8m, lies 1.3 miles N of Growler Bank.

Nosong Shoals (5°43'N., 115°30'E.), with two islets near its center, lie about 7.3 miles NW of Tanjong Nosong. The SE and highest islet is 2m high. A drying patch lies 0.3 mile N of the highest islet.

Price Shoals (5°45'N., 115°32'E.), with depths of 9.1 and 8.2m, lie 3.3 miles and 4 miles, respectively, NE of the center of Nosong Shoals.

Tanjong Nosong to Kota Kinabalu

11.91 Pulau Tiga (5°44'N., 115°39'E.), 101m high, lies about 5.3 miles NE of Tanjong Nosong, from which it is separated by Tiga Channel. The island is densely wooded, except for its SE peak. Reefs and shoals, some of which dry, fringe the island and extend 0.5 mile S and SE from it. A light is shown from a 25m high white metal framework tower near the W end of the island. The light was reported extinguished.

A light is shown from an 8m high tripod standing on the edge of the reef 0.5 mile from the SE end of Pulau Tiga.

Regulations.—Pulau Tiga Marine Park has been established for the protection of the marine environment and resources in the immediate waters surrounding Pulau Tiga. The park extends from Dunlop Shoals to Deluar Shoals, 12.5 miles NNE, and includes Pulau Tiga and Tega Shoals.

The following activities are strictly prohibited in park waters:

1. Entering the park without permission from the Director of Sabah Parks.
2. Anchoring.
3. Fishing.
4. Discharging any oil, chemicals, sewage, hazardous substances, or pollutants into the park waters.
5. Damaging or removing from the park anything organic or inorganic, alive or dead.

11.92 Tiga Channel (5°41'N., 115°34'E.) is used by most of the shipping which runs up and down this coast.

A shoal, with a depth of 12.3m, was reported to lie about 3.3 miles W of Pulau Tiga.

A shoal, with a depth of 4.9m, lies 1.5 miles W of Pulau Tiga and near the outer end of a spit which extends W from that island.

Dunlop Shoal (5°42'N., 115°38'E.), with a depth of 5.5m, lies 2 miles S of the W end of Pulau Tiga and is marked by a lighted beacon. A 9.1m patch lies in between them.

Coleman Shoal (5°46'N., 115°35'E.), with a depth of 9.6m, lies 2.3 miles NW of the NW extremity of Pulau Tiga. A 12.8m patch lies 0.5 mile N of Coleman Shoal.

Tiga Shoals (5°46'N., 115°40'E.), of coral with depths of less than 11m, extend 4 miles NNE from Pulau Tiga. Several drying rocks mark these shoals.

Pulau Kalampunian Damit (Burong) (5°46'N., 115°41'E.), a rocky islet 34m high to the tops of the trees, lies 1.5 miles NE of Pulau Tiga.

Pulau Kalampunian Besar (5°45'N., 115°40'E.), 48m high to the tops of the trees, lies 0.5 mile S of the above islet.

Two rocks, which dry, lie 0.3 mile and 1.3 miles NNE of Pulau Kalampunian Damit.

Two shoals, with depths of 10.1m and 9.1m, lie about 2.3 miles and 3.3 miles, respectively, NNE of Pulau Kalampunian Damit.

11.93 Deluar Shoals (5°52'N., 115°42'E.) consist of two breaking patches, with depths of less than 5.5m which lie on a ledge, which extends from 6.3 to 10.5 miles NNE from Pulau Tiga. Several low, above-water rocks lie on the N patch of Deluar Shoals. A detached shoal, with a depth of 8.2m, lies 1 mile SW of the 0.6m high rock; a 12.8m patch lies 1.5 miles NE of the same rock.

Hayter Shoal (5°53'N., 115°34'E.), with a depth of 7.8m, coral, lies 10 miles NW of Pulau Tiga. The shoal is the southeastern-most SE of the Dampier Shoals. A detached 10.5m patch lies 0.3 mile S of Hayter Shoal. There is a wreck 1.1 miles SE of Hayter Shoal in position 5°50'04"N., 115°35'02"E.

Kimanis Bay (5°39'N., 115°45'E.) is entered between Tanjong Nosong and Tanjong Papar, about 20 miles ENE.

Kuala Penyu, the entrance of the Sungai Penyu, lies 3.5 miles S of Tanjong Nosong. The entrance is obstructed by a bar with a depth of 1.2m, and by a bank with depths of less than 5.5m which extends 2.3 miles seaward.

Caution.—Two single point moorings, designated SPM1 and SPM2, are located in Kimanis Bay about 12 miles and 13 miles, respectively, ENE of Tanjong Nosing.

Kuala Penyu (5°35'N., 115°36'E.) is marked by a beacon 1 mile offshore. Other beacons are marked in the Sungai Penyu for a mile to Kampong Kuala Penyu.

The Sungai Penyu leads to Lake Sitombok, a shallow expanse of water, 1.5 miles within its entrance. Kampong Kuala Penyu is situated on the W bank of Sungai Penyu.

The shore of Kimanis Bay is low and swampy between Kuala Penyu and Tanjong Kinandukan, 2.3 miles SSW of Tanjong Papar. For some distance inland, the country is flat and swampy or covered with dense jungle, particularly near the SE part of the bay.

The Crocker Range and the Suniatan Range, both densely wooded, lie from 13 to 17.5 miles inland from the E side of the bay and slope on their W side to the low coastal plain. The Suniatan Range rises to a height of 1,528m.

From Crocker Range, a serrated ridge extends NW and then N to **Tinamandukan** (5°38'N., 116°02'E.), 750m high, which is prominent from all directions.

Bukit Kilatuan (5°40'N., 115°58'E.), 467m high, with a round summit, and **Bukit Tebelong** (5°47'N., 116°03'E.), 619m high, with a bare conspicuous summit, lie 6.5 miles SSE and 9 miles E, respectively, of Tanjong Papar. Several detached hills rise from the plain between Crocker Range and the coast but none are conspicuous.

Several small rivers discharge along the shores of Kimanis Bay but all shoal and can only be used by small boats. Some villages stand at the mouths of some of these rivers.

11.94 Peak of Kinandukan (5°43'N., 115°54'E.), close S of Tanjong Kinandukan, is 145m high and covered with dark trees which are prominent against the distant hills. The latter are often partly obscured by mist or rain. During the Northeast Monsoon (October to March), vessels can anchor, in a depth of 14.5m, 1.5 miles SE of the S extremity of the W end of Pulau Tiga. During the Southwest Monsoon (May to September), they can anchor, in depths of 18 to 20m, N of the sand spit at the SE extremity of the island or, in depths of 22 to 26m, 0.5 mile E of Pulau Kalampunian Besar. Both monsoons raise a swell in Kimanis Bay.

Tides—Currents.—Tidal currents off the SE end of Pulau Tiga are irregular and apparently influenced by the currents set up in the offing by temporary or prevailing winds.

No current was experienced in Kimanis Bay. A NW set, with a rate of 0.5 knot, was observed off the mouth of the Sungai Papar close S of Tanjong Papar.

Anchorage.—There is good holding ground anywhere in Kimanis Bay. The best anchorage lies near the E side, where the depths are deeper close inshore and where the bottom is stiffer and less sandy.

11.95 Tanjong Pangalat (5°47'N., 115°58'E.), a densely-wooded bluff 88m high to the tops of the trees, lies 4.3 miles ENE of Tanjong Papar.

Pulau Lyang (Pulau Layang) (5°47'N., 115°53'E.), 31m high and bush covered, stands 1.5 miles NW of Tanjong Papar. This rocky islet stands in the middle of a shoal, which extends 0.3 mile E and W from it.

The **Sungai Kinarut** (5°50'N., 116°00'E.), a small river of no importance, discharges 3.3 miles NE of Tanjong Pangalat. The intervening coast is fronted by a bank, with depths of less than 5.5m, which extends 1 mile offshore. A village stands 1.5 miles within the mouth of the river.

Tanjong Dumpil (5°54'N., 116°02'E.), 5.5m high and marked by trees, lies 4.5 miles NNE of the entrance of the Sungai Kinarut. The bay which lies in between is fouled by drying reefs and shoals. A river discharges into the bay 1 mile S of the point.

Pulau Dinawan (5°51'N., 115°59'E.), 73m high and wooded, lies 1.3 miles NW of the entrance of the Sungai Kinarut. The island appears as three islets from seaward. Dinawan Anchorage lies E of Pulau Dinawan.

Flagstaff Point is the E extremity of the island and Costello Point, 0.3 mile to the N, is the NE extremity.

A low islet stands on a reef which dries in places and extends about 0.35 mile SSE of the S side of Pulau Dinawan. A drying coral reef lies on the SE edge of a bank, with a depth of 0.9m, which is located 0.5 mile SE of the S extremity of Pulau Dinawan. A 3.2m coral patch lies 183m farther SE. A reef, which dries in places, fringes the E side of the island, a bank extends 183m offshore from the N and W sides of the island.

Everett Reef (5°51'N., 115°59'E.), which dries in spots and which is marked by a low rock, lies 0.2 mile E of Flagstaff Point.

Small craft can anchor between Everett Reef and Flagstaff Point. The anchorage is entered through Flint Pass, S of Everett Reef. Anchorage can also be taken, in a depth of 16.5m, about 0.25 mile NE of Costello Point.

Several drying coral reefs lie between the S end of Everett Reef and the coral reef, 0.5 mile SE of Pulau Dinawan. There are other drying reefs from 0.2 mile to 0.5 mile E of a line joining these dangers.

11.96 Pulau Sugura (Pulau Mantukud) (5°50'N., 116°01'E.), 109m high and densely wooded, lies near the outer edge of a drying mud flat which extends 0.3 mile N from the entrance of the Sungai Kinarut. Drying rocky ledges extend 0.5 mile NW from this islet.

A small islet lies 0.4 mile WSW of Pulau Sugura and a similar islet lies 0.5 mile S of the same islet.

Pulau Panduan (5°52'N., 116°02'E.), 6.1m high, stands on the drying coastal reef 1.3 miles NE of Pulau Sugura.

Tinson Reefs (5°52'N., 116°01'E.), coral, steep-to, and marked by some above-water rocks, lie 1.3 miles SSW of Tanjong Dumpil.

Dumpil Rock (5°54'N., 116°01'E.), which dries, stands on a reef with depths of less than 2m, which lies with its outer edge 1 mile W of Tanjong Dumpil.

Tanjong Aru (5°57'N., 116°02'E.), low and flat, lies 3.3 miles N of Tanjong Dumpil. There is a small wooden jetty for boats at Tanjong Aru. Some drying rocks lie on a bank which extends 1 mile W from the point. Radio masts with red obstruction lights stand on a ridge of hills 1.5 miles E and SE of the point. The N mast is conspicuous.

A light is shown from the N end of a shoal, with a least depth of 0.9m, lying 1.3 miles WNW of Tanjong Aru.

The runway of Kota airport lies in a NNE-SSW direction with its S end 2 miles S of Tanjong Aru. No vessel or small craft should approach within 0.3 mile of the coast between the runway and Tanjong Dumpil.

The Sungai Simbulan and the Sungai Karamunsing flow into the sea through a common entrance 2 miles ENE of Tanjong Aru. The intervening coast is low and fringed by drying banks and flats which extend from 0.1 to 0.4 mile offshore.

Several detached patches, with depths of less than 2m, lie between over a mile W and 1 mile NNE of Tanjong Aru. A patch, which dries in places, lies 0.5 mile NNE of the point.

Offshore Islands and Dangers

11.97 Pulau Sulug (5°58'N., 116°00'E.), 114m high, lies 2.3 miles W of Tanjong Aru and is fringed by a drying reef on its S side. Banks extend 0.2 mile N and 0.15 mile S from this island.

Pulau Manukan (5°59'N., 116°00'E.), 127m high and reef fringed, lies with its SW end 0.5 mile N of Pulau Sulug. A detached reef, with an above-water rock near its S end, lies about 0.3 mile E of Pulau Manukan. Drying reefs extend 0.2 mile from the E end of the island and 183m from its S side.

During N winds, anchorage can be taken off the S side of Pulau Manukan, in a depth of 26m, mud.

Pulau Mamutik (5°58'N., 116°00'E.), 33m high, lies 0.5 mile SE of Pulau Manukan. Reefs, some above-water, extend 0.3 mile S and 137m N from this island.

A reef, with a depth of 1.8m, is located about 0.35 mile SE, and another almost awash, lies 0.5 mile NE of Pulau Mamutik. A shoal, with a depth of 6.4m, lies 1,183m E of that island.

South Hill Rock (5°59'N., 115°52'E.), with a depth of 5m, coral, lies 10.5 miles W of Tanjong Aru and is steep-to.

Pulau Gaya (6°01'N., 116°02'E.), 304m high and densely wooded except for its summit which is bare, lies with Tanjong Wokong, its S extremity, 2.3 miles N of Tanjong Aru. The island is almost joined to the mainland to the SE by reefs, parts of which dry. South Channel, narrow and available only to small craft, leads through these reefs into Kota Kinabulu.

A shoal, with a depth 2.1m, marked by two beacons, lies on the N side of the approach to South Channel, 0.3 mile SE of Tanjong Wokong. A 6.4m patch lies 91.5m S of the shoal and a 2.3m patch lies close E of the shoal.

Karei Bay, fouled by reefs, lies in a small bight on the SE side of Pulau Gaya.

Between Tanjong Wokong and the SW extremity of Pulau Gaya, the S side of the island is indented by bights.

Regulations.—Tunku Abdul Rahman Marine Park has been established for the protection of the marine environment and resources in the waters along the coast of Pulau Gaya. The park extends 3.8 miles SSW from the island to include Pulau Manukan, Pulau Mamutik, and Pulau Sulug.

The following activities are strictly prohibited in park waters:

1. Entering the park without permission from the Director of Sabah Parks.
2. Anchoring.
3. Fishing.
4. Discharging any oil, chemicals, sewage, hazardous substances, or pollutants into the park waters.
5. Damaging or removing from the park anything organic or inorganic, alive or dead.

11.98 Pulau Sinjataan (6°01'N., 116°00'E.), 60m high and densely wooded, lies close off the SW end of Pulau Gaya, to which it is connected by a flat which almost dries. Several shoal patches, with depths of 10m and less, lie within 0.3 mile through W to NW of Pulau Sinjataan.

Edgell Patches (6°01'N., 115°59'E.), in two parts each with a least depth of 12.8m, lie 0.3 and 1 mile W of Pulau Sinjataan.

Tanjong Bulijong (6°03'N., 116°01'E.), the NW extremity of Pulau Gaya, lies 2 miles NNE of Pulau Sinjataan.

Pulau Gaya Light, a 24m high white, metal framework tower with red bands, stands 0.3 mile SSE of Tanjong Bulijong.

Pulau Sapangar (6°04'N., 116°04'E.), 180m high and heavily wooded, lies 2 miles NW of Tanjong Torajung, the NE point of Pulau Gaya. It is fringed by a bank which extends up to 0.3 mile offshore in places. A drying reef extends about 0.3 mile S from the E extremity of the central part of the island.

Pulau Udar Besar (6°05'N., 116°05'E.), 36m high and reef fringed, lies about 0.4 mile E of the N extremity of Pulau Sapangar. The channel which separates this island from Pulau Sapangar is narrow but deep.

Pulau Udar Kechil (6°06'N., 116°05'E.), 39m high, and Pulau Udar Priok, 21m high, lie between Pulau Udar Besar and the coast NE. These islets are connected to each other and the coast by a reef, with depths of less than 5.5m, on which there are several drying patches.

Sapangar Bay (Sepangar) (6°05'N., 116°07'E.)

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11.99 Sapangar Bay is entered between Pulau Sapangar and Tanjong Tarak Tarak, about 2.5 miles ESE. The bay is sheltered and is available to all classes of vessels.

Depths—Limitations.—Sapangar Bay is one of the most secure harbors on the NW coast of Borneo. A prohibited area, best seen on the chart, follows the coast and stretches along the N end of the bay.

The oil terminal consists of a T-shaped jetty used for the import of petroleum products. The outer berth can accommodate vessels of 33,000 dwt; an inner berth is used for barges. Nearby there are two berths for handling cement and the export of timber.

On the SE side of the bay lies the Sapangar Bay Container Port.

Berth information is shown in the table titled **Sapangar Bay—Berth Information**.

The Royal Malaysian Naval Base lies along the W side of Sapangar Bay NE of Tanjung Melanim. The base consists of three piers. Pilotage is required.

Aspect.—A conspicuous building stands 0.3 mile E of Tanjong Tarak Tarak. A radio mast stands on Bukit Manawan, 6 miles farther E. Both exhibit red obstruction lights.

An industrial port has been developed on a reclaimed site on the E shore of Sapanger Bay.

Pulau Udar Besar is connected to the mainland with a stone breakwater and bridge. A green lighted beacon lies close off the SE end of Pulau Udar Besar. Only small boats with local knowledge can pass under the bridge.

Sapangar Bay—Berth Information

Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Cement Terminal						
Cement Jetty	110m	10.0m	—	9.0m	—	Cement, clinker. Berthing length of 210m (including dolphins).
Sapangar Bay Container Port						
Inner Berth (N)	230m	12.0m	—	—	45,000 dwt	Containers and reefer.
Inner Berth (S)	200m	12.0m	—	—	—	—
Outer Berth	500m	12.0m	—	—	45,000 dwt	Containers and reefer.

Sapangar Bay—Berth Information						
Berth	Length	Depth	Maximum Vessel			Remarks
			LOA	Draft	Size	
Sapangar Bay Oil Terminal						
Oil No 1 Main-Outer	60m	12.2m	248m	11.5m	30,000 dwt	Aviation fuel, clean products, dirty products, and LPG. Berthing length of 250m (including dolphins).
Oil No 2 Inner	36m	12.2m	60m	—	1,000 dwt	For barges use.

Gantisan (6°05'N., 116°08'E.), a conspicuous grassy summit 248m high, stands 2.5 miles NE of Tanjong Tarak Tarak.

Sepangar Naval Base (Port Borneo) in Kota Kinabalu

From Tanjong Tarak Tarak, the E side of the bay extends almost 1 mile NE to the Sungai Kabatuan. A conspicuous yellow patch is located on the hillside about 0.6 mile NE of Tanjong Tarak Tarak.

Coral reefs, some above-water, extend about 0.4 mile offshore from Tanjong Tarak Tarak and also from the coast between that point and the mouth of the Sungai Kabatuan.

Sapangar Bay Channel Markers		
Marker No.	Marker Position	Light
No. 1	6°04'39.6"N, 115°06'06.0"E	Red
No. 2	5°05'15.0"N, 115°06'46.2"E	Red
No. 3	5°05'30.0"N, 115°07'19.2"E	Red
No. 4	5°05'19.2"N, 115°07'34.2"E	Green
No. 5	5°04'39.0"N, 115°07'29.4"E	Green

The **Sungai Menggatal** (6°04'N., 116°07'E.) may be identified by a yellow sandstone bluff on its N side and by the sharp angle of the coast on the S side of the entrance. The river bar is very shallow, but the depths within the entrance increase rapidly.

From its entrance between the Sungai Menggatal and Tanjong Melanim, the inner part of Sapangar Bay extends 1.5 miles NE to its head. Coral reefs, some above water, extend from 0.15 to 0.35 mile from the shores of this part of the bay. Several drying reefs lie within the 10m curve about 1 mile N of the mouth of the Sungai Menggatal.

Anchorage.—Anchorage can be taken, in depths of 16 to 22m, off the mouth of the Sungai Menggatal, but vessels can anchor anywhere in the bay according to the prevailing wind. During the Northeast Monsoon, secure anchorage is provided.

Directions.—Sepangar Bay is approached from the N between Tanjung Bulijong and Tanjung Gaya, and entered between Tanjung Tavajun and the S extremity of Pulau Sapangar. It can also be entered between the S extremity of Pulau Sepangar and Tanjong Tarak Tarak. There are five channel markers in the bay, three are lashing red lights and two are flashing green. See the table titled **Sapangar Bay 5 Channel Markers** for the locations of these channel markers.

Caution.—A restricted area, best seen on the chart, lies along the N portion of Teluk Sapangar. Entry is prohibited within the area surrounding Tanjung Melanim. Pulau Udar Kecil is situated within the prohibited area.

11.100 The N coast of the Pulau Gaya, between Tanjong Bulijong and Tanjong Torajun, about 2.3 miles ESE, is identified by two bays separated by Tanjong Merangis. A reef extends about 0.3 mile NE from Tanjong Torajun.

Gaya Bay (6°03'N., 116°04'E.), the name given to the water area to the SW of Sapangar Bay, is entered from seaward between the S end of Pulau Sapangar and Tanjong Torajun.

Tanjong Lipat (6°00'N., 116°05'E.) lies 2 miles SW of **Tanjong Lita** (6°02'N., 116°06'E.). From Tanjong Tarak Tarak, the E side of the bay extends S for almost 1.5 miles to Tanjong Lita. Between this point and Tanjong Lipat, about 2 miles SW, the coast recedes to form a shallow bay most of which dries. The Sungai Inanam, which is available only to boats, flows into this bay.

A flat, almost awash in places with a reef on its outer part, extends about 0.65 mile W from Tanjong Lita. An above-water rock lies on the N part of the reef and a similar rock lies on its S part.

A coral patch, with a least depth of 2.7m, lies 1 mile SW of Tanjong Lita. A detached 7.3m patch lies 0.5 mile WNW of Tanjong Lita.

Tanjong Sindian (6°00'N., 116°04'E.), the E extremity of Pulau Gaya, lies 1 mile SSE of Tanjong Logong. Gaya Harbor lies between this latter point and the reef to the North. Steep-to reefs, almost awash, extend 0.3 mile offshore from the head of the harbor.

Creighton Patch (6°01'N., 116°05'E.), with a least depth of 8.6m, lies 1.5 miles WSW of Tanjong Lita.

Kota Kinabalu Port

Kota Kinabalu (5°59'N., 116°04'E.)

World Port Index No. 51690

11.101 Kota Kinabalu, sometimes referred to as "KK," is the principal port on the NW coast of Borneo and the capital of the state of Sabah. However, port operations are planned to shift to Sapangar Bay in 2006, at which time a 20-year waterfront redevelopment project is set to commence at Kota Kinabalu.

The harbor comprises the area lying between the E side of Pulau Gaya to the W, the Borneo shore to the SE, and the shallow ridge connecting Pulau Gaya to the mainland to the SW.

The harbor is partly exposed to the N, but receives some protection from Pulau Sapangar and the reefs extending from the NW side of the entrance. The main approach is made through Gaya Bay, but small local craft can enter from the SW through South Channel.

Depths within the harbor, seaward of the fringing reefs, range from 11 to 22m.

Ample alongside berthing facilities are provided for vessels capable of entering the harbor.

Tides—Currents.—Tidal heights above datum of soundings are, as follows:

Tidal Heights	
MHHW	1.7m
MLHW	1.2m
MHLW	1.1m
MLLW	0.5m

Depths—Limitations.—On the W side of the harbor, a reef extends about 0.3 mile E and SE from Tanjong Logong. On the E side of the harbor the coastal bank extends up to 0.2 mile offshore between Tanjong Lipat and Government Wharf. The charted 5.5m curve was reported to lie 61m farther W in the area NE of the wharf.

Normanhurst Reef, with a depth of 1m, lies about 0.35 mile NW of Tanjong Lipat.

Comber Reef, with a least depth of 0.5m, lies between Normanhurst Reef and Tanjong Lipat.

Kota Kinabalu—Berth Information

Berth	Length	Depth	Maximum Vessel Size	Remarks
Main Wharf				
No. 1	140m	9.6-9.75m	16,000 dwt	Ro-ro/lo-lo, breakbulk, and bunkers. Continuous berthing length of 350m.
No. 2	120m	9.6-9.75m	16,000 dwt	
No. 3	90m	9.6-9.75m	16,000 dwt	Cruise vessels, ro-ro passengers/vehicles/rail, breakbulk, and bunkers. Continuous berthing length of 350m.

Kota Kinabalu—Berth Information				
Berth	**Length**	**Depth**	**Maximum Vessel Size**	**Remarks**
No. 4	120m	6.8-9.5m	16,000 dwt	Ro-ro passengers/vehicles/rail, breakbulk, and bunkers.
No. 5	110m	5.6-7.7m	16,000 dwt	Breakbulk and bunkers. Continuous berthing length of 200m.
No. 6	90m	5.6-7.7m	16,000 dwt	Breakbulk and bunkers. Continuous berthing length of 200m.
No. 7	120m	7.8-9.75m	16,000 dwt	Ro-ro passengers/vehicles/rail, breakbulk, and bunkers.
North Jetty				
No. 8	94m	6.5m	10,000 dwt	Closed. Breakbulk. Berthing length of 140m (including dolphins).
No.9	94m	6.5m	10,000 dwt	Closed. Breakbulk. Berthing length of 140m (including dolphins).
Ro-Ro	—	—	10,000 dwt	Closed. Ro-ro/lo-lo and breakbulk. Berthing length of 160m (including dolphins) .
South Jetty				
No. 10	120m	8.5m	6,000 dwt	Closed. Breakbulk.
No. 11	120m	8.0m	6,000 dwt	Closed. Breakbulk.
No. 12	96m	6.5m	6,000 dwt	Closed. Breakbulk.

Gueritz Shoal, with a depth of 2.5m, lies 191m WNW of Tanjong Lipat.

Grieve Reef, with a depth of 1.5m, lies about 0.5 mile ENE of Tanjong Sindian.

Drying reefs extend 0.3 mile ESE of Tanjong Sindian. A detached reef, with a least depth of 0.3m, lies 0.4 mile ESE of Tanjong Sindian.

Harris Reef (6°00'N., 116°04'E.), with a depth of 0.3m, lies 0.5 mile ESE of Tanjong Sindian.

Snake Rock, 0.9m high, lies on a reef 0.5 mile S of Tanjong Sindian. Coral shoals, some marked by stakes, lie SSW of Harris Reef. Four detached shoals, with depths of 0.3 to 4.3m, lie up to 0.35 mile W of Old Wharf (Government Wharf). A beacon stands on the N extremity of the 0.4m shoal, 183m W from the S end of the wharf.

The port has 12 berths for vessels of up to 16,000 dwt and a cruise terminal which has accommodated cruise ships of 295m in length with 8.0m draft. See the table titled **Kota Kinabalu—Berth Information** for details on berthing accommodations.

Old Wharf (5°59.5'N., 116°04.5'E.), charted as Government Wharf, an L-shaped open wooden pile structure, is situated at the N end of town. It was reported closed.

Two dolphins stand off the S end of the wharf and oil installations stand close E of it.

South Jetty, 0.15 mile NE of Old Wharf, is an L-shaped jetty with three berths numbered 10, 11, and 12. The longest, No. 11, occupies the outer SW face. Depths on the berths range between 5.5m and 7.5m.

Main Wharf, 0.4 mile NE of Old Wharf, is a rectangular island wharf fronting the coast to which its S portion is connected by two roadways. It provides a total of 7 berths, on 4 faces, the outer and longest face of 0.2 mile on the NW side. Depths on the berths range between 7.6 and 9.4m.

A red obstruction light is reported to be shown from the Marine Tower in the center of the wharf.

North Jetty, 93m in length, is situated 191m NE of Old Wharf. This jetty, which extends NNE, is connected to the shore by a bridge 183m in length. There are berths on each side of the jetty, the W berth has alongside depths of 5.4m, and the E berth alongside depths of 5m. A light is shown from a mooring dolphin 30m NNE of the jetty head.

Ro-Ro Terminal lies close W of the root of North Jetty and accommodates vessels up to 180m long, 25m beam, and 5.5m draft.

The Marine Police Jetty, with a T-head and a reported depth of 7.3m alongside, projects 183m from the shore 0.13 mile SSW of Old Wharf (Government Wharf).

A jetty extends 0.2 mile N from Tanjong Lipat.

Aspect.—A building stands on the range of hills backing the town, 0.3 mile SW of Tanjong Lipat. The signal station at the inner end of Old Wharf (Government Wharf) is conspicuous. A combined radiomast and a red and white banded flagstaff stand on the station. The two hotels in the town are also conspicuous.

Kota Kinabalu is approached through an extensive bight formed between the NE side of Pulau Gaya and a mainland projection about 5 miles to the NE. Pulau Sapangar, a densely wooded island, lies just to the N of the middle of this bight; that part of the bight to the E of this island is known as Sapangar Bay and the part to the S is known as Gaya Bay.

The depths in the channel S of Pulau Sapangar and through Gaya Bay are ample for vessels of any draft, and with the exception of Creighton Patch there are no detached dangers along this route.

Tanjong Gaya, the W extremity of the peninsula on the NE side of the approach, stands almost 5.3 miles NE of Tanjong Bulijong. This heavily wooded bluff rises sharply to Bukit Penaga, a high peak, about 0.3 mile to the ESE.

From Tanjong Gaya, the coast extends SSE for a distance of 2 miles to Tanjong Melanim, the W entrance point of the inner part of Sapangar Bay. Several coral patches, with a least depth of 11m, lie about 1 mile S of Tanjong Gaya and about 0.3 to

0.5 mile off the coast.

Pilotage.—Pilotage is compulsory for vessels over 46m in length using the deepwater channel. Pilots should be notified 24 hours in advance. Vessels should confirm their ETA and pilotage requirements through the port radio station and verify the pilot boarding location prior to arrival.

Signals.—Berthing signals are displayed from the signal station flagstaff. Flag "B" will be displayed at the signal station when a vessel loaded with inflammable or dangerous cargo is berthing or unberthing.

Contact Information.—See the table titled **Kota Kinabalu—Contact Information**.

Kota Kinabalu—Contact Information	
Port	
Call sign	Control KK
VHF	VHF channels 12 and 16
Telephone	60-88-538500
Facsimile	60-88-254089
E-mail	john@spsb.com.my
Web site	http://www.spsb.com.my/?q=ports/kota-kinabalu-port-0
Port Authority	
Telephone	60-88-538500
Facsimile	60-88-223036
E-mail	sabport@lpps.gov.my
Web site	http://www.llps.sabah.gov.my
Pilots	
Telephone	60-88-252213

Anchorage.—Good anchorage is provided, in a depth of 16.5m, 0.3 mile NW of Grieve Reef. During the Northeast Monsoon, secure anchorage is provided in Sapangar Bay.

Anchorage is prohibited within 0.5 mile of the Old Wharf (Government Wharf) in Kota Kinabalu Harbor. Vessels of less than 46m in length may anchor E of a line joining the head of Old Wharf and Gueritz Shoal.

A dangerous petroleum anchorage area, about 1 mile long in a E to W direction and about 0.3 mile wide, lies centered about 1 mile NNE of Gueritz Shoal.

An explosives anchorage area of the same dimensions lies N of and adjacent to the dangerous petroleum anchorage area. The quarantine anchorage, a circular area with a radius of 0.5 mile, lies with its center 1 mile N of Tanjong Logong.

Directions.—Vessels approaching Kota Kinabalu should give the N coast of Pulau Gaya a berth of 0.3 mile and pass the extremity of the reef SE of Tanjong Logong at a safe distance; then pass between the light structure on Grieve Reef and Gueritz Shoal and then proceed to the Old Wharf.

Caution.—Kota Kinabalu does not have a large amount of usable navigation aids; however, Pulau Gaya Lighthouse and NAV marker located on the south end of Pulau Sapangar provide excellent daytime visual aids. Several navigation aids have been reported having no visual working lights to include markers identifying Normanhurst Reef, Guteritz Reef, and Harris Reef. Also of noted, that was reported, is an abandoned ship with no night time lights. It has been reported that swells from the Southwest Monsoon cause significant ship motion at the container pier.

Tanjong Gaya to Pulau Usukan

11.102 Gunung Kinabalu (Mount Kinabalu) (6°05'N., 116°33'E.), 4,100m high and the highest elevation in Borneo, stands 28 miles E of Tanjong Gaya. This peak is very conspicuous and may be seen in clear weather for a considerable distance.

The summit, which is usually obscured by clouds for the better part of the day, consists of a number of serrated peaks of almost equal height; N of these peaks it slopes gradually for about 4 miles and then falls away abruptly.

Gunung Sadok Sadok (6°06'N., 116°29'E.), 1,676m high, stands 4.5 miles W of Gunung Kinabalu. From the N, this peak appears as a sharp cone.

Tanjong Kaitan (6°07'N., 116°05'E.) lies about 1 mile NE of Tanjong Gaya.

The Sungai Mengkabong, of no commercial importance, is entered about 2.3 miles ENE of Tanjong Kaitan. A bank, with depths of less than 5.5m, extends 0.3 mile seaward from the mouth of the river.

Tanjong Dalit (6°10'N., 116°08'E.) lies 3.3 miles NE of Tanjong Kaitan. Bukit Dalit, 112m high to the top of the trees, stands close within the point.

Tanjong Indai (6°14'N., 116°11'E.) lies 5.3 miles NE of Tanjong Dalit. The intervening coast is low, sandy, and covered by trees.

Tanjong Torong Gusu (6°15'N., 116°13'E.) lies 1 mile ENE of Tanjong Indai. An islet, 24m high, stands between these points.

Tungai Sulaman (6°15'N., 116°13'E.) is entered between Tanjong Indai and the partly drying and breaking sand banks which extend 1.3 miles W from Tanjong Torong Gusu. The entrance channel is 0.15 mile wide. Within the entrance, a 3 mile long channel, with depths of more than 5.5m, leads to Sulaman Harbor. This harbor is shallow, fouled by flats and surrounded by mangrove swamps.

The muddy water, discharged from the small rivers which lie along this section of coast, extends up to 5 miles offshore where its limit is clearly defined.

Good anchorage can be taken about 0.5 mile offshore anywhere between Tanjong Gaya and a position about 1 mile S of Tanjong Indai, except off the mouths of the rivers.

Tanjong Tembungo (Junction Bluff) (6°17'N., 116°14'E.), lies 3 miles NE of Tanjong Torong Gusu. Lamas (Mount Lokpussok), a prominent densely-wooded peak, 436m high, stands 0.3 mile to the SE.

Tanjong Kombongo (6°18'N., 116°16'E.) is the extremity of a small peninsula, 109m high, 2.5 miles NE of Tanjong Tembungo.

A rock, 3m high, lies 1 mile ENE of Tanjong Tembungo and about 91m offshore.

Tanjong Torong Semburong (6°19'N., 116°17'E.), lies 3.5 miles NE of Tanjong Tembungo. It is a fairly bold headland,

rising to an elevation of 167m, 0.5 mile from its extremity.

Caution.—Vessels coasting should keep at least 2 miles off Tanjong Indai and the coast N of it, because there are reports from vessels of the shifting nature of the banks.

During the strength of the Northeast Monsoon (December to February), a strong current has been observed setting NE at a distance of 7 miles offshore.

Off-lying Islands and Dangers

11.103 Pulau Mengalum (6°12'N., 115°36'E.), low and tree covered, 52m high, lies 26 miles WNW of Tanjong Bulijong. The island is surrounded by coral reefs except near its SE side. Anchorage can be taken close off the SE side keeping a good lookout for shoals.

A small fishing village stands near the NW extremity of the island. During the fair weather season, numerous fishermen operate from the island.

Caution.—Sand waves are reported (1997) to exist in the channel NE of Pulau Mengalum.

A bank, with depths of less than 11m, extends 4 miles W and 2.5 miles SW from Pulau Mengalum.

Foul ground extends 1 mile E and NE from Tanjong Timor Laut, the NE end of the island. A bank, with depths of less than 11m, extends 2.5 miles NE of Pulau Mengalum.

A bank, with a depth of 5.9m, lies 2.5 miles N of the island. Another bank, with a depth of 7.8m, lies 2.5 miles WNW of Pulau Mengalum.

11.104 Ketam Oil Field (6°06'N., 115°36'E.) lies 5 miles S of Pulau Mengalum. A light is shown from the platform in the field and a flare stack stands close E. The pipeline from Tanjong Punei to Barton Oil Field passes close W of this platform.

Erb West Oil Field (6°26'N., 115°39'E.) is situated 9 miles NNE of Pulau Mengalum. The platforms on the field are lighted.

The pipeline from Tanjong Punei, as stated above, also passes through this oil field.

Saracen Bank (6°10'N., 115°22'E.), an extensive coral bank with depths of 1.8 to 9m, and marked by above and below-water rocks, lies 11 miles SW of Pulau Mengalum.

An oil drilling rig stands near the N end of the bank and another one stands near the S end. At night, lights may be seen on these rigs.

A bank, with a depth of 22m, lies 4 miles WSW of Saracen Bank.

11.105 Dampier Shoals (6°00'N., 115°30'E.), with depths of 6.4 to 18.3m, extend in a SE direction from Saracen Bank for 18 miles and terminate in Hayter Shoal. The shallowest head on Dampier Shoals lies 10 miles SSW of Pulau Mengalum.

Collins Shoals (5°57'N., 115°33'E.), forming the S part of Dampier Shoals with a least depth of 9.4m, lies 14 miles SSW of Pulau Mengalum.

Passage through these waters should not be attempted except during daylight in fine weather, when the shoals are usually visible. Soundings give very little warning of the proximity of these shoals.

Rizal Shoal (6°15'N., 115°26'E.), an extensive area with depths of less than 11m, lies with its shallowest part 10 miles WNW of Pulau Mengalum.

The least known depth over this shoal is 6.7m near its steep-to W side. Several shoals, with depths of 8.7 to 11m, lie between Rizal Shoal and the bank W of Pulau Mengalum.

Sunken Barrier Shoals (6°25'N., 115°53'E.) are a chain of coral shoals, with depths of 7 to 16m, with deep water in between, lying between Pulau Mengalum and the Mantanani Islands, 51 miles NE. Vessels should not attempt to cross these shoals.

Passage between Sunken Barrier Shoals and the mainland, about 16 miles SE, is believed to be clear of off-lying dangers beyond a distance of 5 miles from the coast.

11.106 Southwest Sunken Barrier Shoal (6°17'N., 115°48'E.), with a depth of 7.8m, is an extensive coral bank. The shallowest head lies 22 miles NW of Pulau Gaya.

Francis Bank (6°23'N., 115°53'E.), with a depth of 10.1m, lies 25 miles W of Tanjong Torong Semburong.

A depth of 7.8m on an extensive bank lies near the N extremity of Southwest Sunken Barrier Shoal, about 6 miles NW of Francis Bank.

Bunbury Shoals (6°28'N., 115°56'E.), with a depth of 7.3m, lie 2 miles NW of Francis Bank.

Saint Joseph Rock (6°35'N., 116°05'E.), awash, lies near the SW extremity of coral shoal, with depths of 4.6 to 11m, 8 miles NE of Bunbury Shoals. The rock lies near the middle of an extensive bank, with depths of 9.1 to 37m, which extends 6.5 miles W and 7 miles NE from the rock.

Saint Joseph Oil Field (6°38'N., 116°09'E.) lies 5.5 miles E of Saint Joseph Rock. Lighted platforms are situated in the area where the pipeline from Tanjong Punei leading to Barton Oil Field passes through here via South Furious Oil Field.

Pritchard Bank (6°39'N., 115°59'E.), with depths of 22 to 37m, lies 7 miles NW of Saint Joseph Rock.

Royds Shoal (6°38'N., 115°50'E.), with a depth of 11.9m, coral, and small in extent, lies 10 miles WNW of Saint Joseph Rock.

Tembungo Oil Field (6°37'N., 115°47'E.) is situated about 3 miles W of Royds Shoal and consists of a production platform. The production platform gives a good radar response up to a range of 30 miles and is brightly illuminated at night. A submarine oil pipeline runs SSW from the production platform to another in Erb West Oil Field. Ships should not anchor on the banks E and S of it, as there are inadequately surveyed coral patches.

Numerous detached patches, with depths of 14.6 to 37m, lie between Sunken Barrier Shoals and the mainland. A detached 14.6m shoal lies 13.5 miles WNW of Tanjong Torong Semburong. The positions of the other shoals can best be seen on the chart.

Teluk Ambong (6°20'N., 116°18'E.) is entered between Tanjong Torong Semburong and **Tanjong Perunjuk** (6°20'N., 116°19'E.), 1.3 miles to the E.

Belcher Shoal, with a least depth of 0.9m, coral, lies 0.3 mile NNE of Tanjong Torong Semburong. A shoal, with a depth of 2.3m, lies 0.4 mile N of the same point. A 5.5m patch lies 0.15 mile SSW of Tanjong Perunjuk.

11.107 Pulau Egot (6°18'N., 116°18'E.), a densely-wooded islet 71m high, stands at the head of Teluk Ambong, and di-

vides it into two coves. Close S of the head, a range of hills rises to a height of 382m, 1.3 miles SE of Tanjong Perunjuk. The twin peaks of Gunung Rigi stand at the W end of this range 2.5 miles SSE of Tanjong Torong Semburong. The highest peak is 311m high.

The reefs, which fringe the shores of the bay, extend up to 0.4 mile offshore; some of these reefs dry.

Large vessels can anchor 0.5 mile SW of Tanjong Perunjuk, mud, partially sheltered from the swell raised by either monsoon. Smaller vessels can anchor in the middle of either cove at the head of the bay, but space is very limited.

Directions.—When approaching, Telok Ambong from the N, keep Gunung Kinabalu, if visible, bearing 135°, or Tanjong Perunjuk bearing about 151°, either of which leads NE of Belcher Shoal. Then steer to pass not less than 0.3 mile W of Tanjong Perunjuk and then steer for the anchorage.

When approaching from the SW, steer for Pulau Pandan Pandan in range, bearing 064°, with Robertson Hill, a prominent grassy summit 187m high, 1.3 miles NE, which leads NW of Belcher Shoal. When Tanjong Perunjuk bears more than 135°, the above directions should be followed.

11.108 Tengah Bay (6°20'N., 116°19'E.) and Saundal Bay lie between Tanjong Perunjuk and Tanjong Sannoal, about 2 miles to the N. These small bays are separated from each other by a narrow peninsula terminating in Tanjong Tengah, 47m high. Shelter is provided during E winds. A village stands at the head of Tangah Bay.

Pulau Pandan Pandan (6°21'N., 116°18'E.), a conspicuous sandstone-cliffed island, 46m high and densely wooded, stands 0.3 mile S of Tanjong Saundal and close within the outer edge of a coral reef that extends S from the point. The extremity of the reef lies about 0.15 mile SE of Pulau Pandan Pandan.

From Tanjong Saundal, the coast extends NE for 1.3 miles to Tanjong Kaduko, the S entrance point of Usukan Bay. This section of coast forms the NW side of a prominent headland which separates Saundal Bay from Teluk Usukan. This headland rises to Robertson Hill, which has a conspicuous grassy top.

11.109 Preston Shoal (6°22'N., 116°18'E.), with a depth of 4.9m, lies almost 1 mile NW of Pulau Pandan Pandan.

An 8.5m patch lies about 0.4 mile N of Tanjong Saundal and about 0.3 mile offshore.

A rock, which dries 1.5m, lies near the edge of a shallow spit, located 1.5 miles N of Pulau Pandan.

Isolated 5.5m patches lie in the vicinity of this drying rock and a coral patch, with a least depth of 5.8m, lies about 0.2 mile NW of the rock.

The extremity of Abai Bluff, bearing 068°, and seen between Pulau Usukan and the mainland, leads NW of these dangers.

Pulau Usukan (6°25'N., 116°20'E.), 127m high and densely wooded, stands on the N side of Usukan Bay, 1.5 miles N of Tanjong Kaduko. This conspicuous island appears as a black bushy cone.

Near it, the rounded summits of the mountains on the mainland appear to rise from the level plain. This feature identifies Usukan Bay and Ambong Bay when viewed from the N.

11.110 Teluk Usukan (6°22'N., 116°20'E.) is the best protected anchorage on this coast N of Gaya Bay. A light is shown from a white metal framework tower situated on the W end of Pulau Usukan.

A bank, with depths of less than 5.5m, extends 0.3 mile SW from W extremity of Pulau Usukan. Iris Rock, which dries 0.9m, and Slime Rock, 4m high, lie on this bank 0.3 and 0.5 mile SW; respectively, of the W extremity of Pulau Usukan.

A 7.3m steep-to, coral shoal, lies in the outer part of the bay, 10.2 mile NE of Tanjong Kaduko.

A drying sand spit connects the SE end of Pulau Usukan to the extremity of a peninsula on the mainland to the S.

A hill, 198m high to the treetops, and a hill with a grassy summit, 143m high, stand 1.5 miles SE and 1.3 miles E, respectively, of Tanjong Kaduko. Both hills are prominent.

Small coastal vessels can berth alongside a rubble jetty in the E corner of the bay.

Anchorage.—Anchorage can be taken, in a depth of 14.6m, mud, about 0.55 mile W of the jetty. Small vessels can anchor in a depth of 12.8m about 0.3 mile S of this position, where they will be sheltered from the prevailing swell during the summer.

Directions.—When approaching Usukan Teluk from the W, steer 068° for Abai Bluff, and seen between Pulau Usukan and the mainland, the point 0.5 mile ESE of Tanjong Kaduko bearing 111°, opens NE of Tanjong Kaduko. Then steer 096° for the jetty until NE of Tanjong Kaduko, at which time course may be altered for the anchorage.

When approaching from the N and having passed Alert Rock, steer 187° for Pulau Pandan Pandan, and open W of the point 0.35 mile NNE of the islet. This leads 0.3 mile W of the dangers off Slime Rock. When Slime Rock bears 050°, alter course for the jetty, bearing about 104°, which leads 0.18 mile S of the 7.3m shoal in the bay and then to the anchorage.

Pulau Usukan to Tanjong Sempang Mangayau

11.111 Kuala Abai (6°24'N., 116°21'E.), a shallow bay, is entered between Pulau Usukan and Abai Bluff, about 1 mile SE, and has a least depth of 1.2m on its outer bar.

The Sungai Abai, a shallow river, empties into the head of the bay and the village of Abai stands on the W side of the bay near Abai Bluff. Only small boats can use the bay and the river.

From Kuala Abai, the coast extends about 12 miles NE to Tanjong Lokpadang and is densely wooded.

The Sungai Tempasuk and the Sungai Pandasan, two shallow rivers available only to boats, discharge along this section of coast.

Alert Rock (6°25'N., 116°20'E.), which breaks, lies 1.5 miles N of Pulau Usukan Light. This steep-to rock dries 1.8m. Rocky spits, with depths of less than 9m, extend 0.15 mile S from the rock.

The inner E entrance point of the Sungai Abai, bearing 160°, open E of the E extremity of Pulau Usukan, leads E of Alert Rock.

Mayne Rock (6°28'N., 116°18'E.), with a depth of 2.7m, lies 3 miles NW of Alert Rock. Two dangerous wrecks, both with depths of 25m over them, are located 3 miles W of Mayne Rock and can best be seen on the chart.

Arsat Rocks (6°30'N., 116°26'E.), which generally break, consist of two small rocks which dry 2.4m, lying 8.5 miles NE

of Pulau Usukan. A shallow spit, with a depth of 3.7m, extends 0.25 mile NE from these rocks.

The SE extremity of Pulau Usukan in range, bearing 216° with Tanjong Kaduko, leads 0.3 mile NW of Arsat Rocks.

North Hill Rock (6°28'N., 116°18'E.), with a depth of 1.8m, coral, lies 2.5 miles NNE of Alert Rock.

Kranga Point (Tanjong Lokpadang) (6°32'N., 116°30'E.) is a fairly high sloping grassy point rising to a height of 286m 2 miles ENE of the point, 12.5 miles N of Pulau Usukan.

Ant Islets (6°32'N., 116°30'E.), two in number, lie on the outer end of a reef which extends 0.5 mile N from Kranga Point. One of the islets is 23m high.

Ant Rocks consist of two groups of drying rocks lying 0.3 mile and 1.3 miles NW of Kranga Point. A 5.5m patch lies 1 mile NNW of Kranga Point. A 12.2m shoal lies 3 miles WNW of the same point.

11.112 Umpohl Shoals (6°34'N., 116°29'E.), with a depth of 7.9m, lie 2 miles N of Kranga Point.

Aspect.—This stretch of coast is backed by an extensive range of hills, the bases of some reaching the coastline. The Sir James Brooke Range extends about 16.5 miles N from a 1,038m peak located about 15 miles E of Usukan Bay, to **Mount Cochran** (6°37.5'N., 116°38.5'E.), a rounded 793m peak.

Included in this range is a rounded 1,207m peak lying close NE of the 1,038m peak, and Gunung Madalong, a rounded 1,128m peak, which stands 7.3 miles N of the same peak. The island between the S part of the Sir James Brooke Range and the coast is low. Up to about 14 miles N of Mount Cochran, the hills gradually decrease in height and finally terminate in a flat plain.

About 6.5 miles farther N, the land again becomes hilly, some of the peaks rising to heights of almost 244m.

Tanjong Dudar (Gasap Point) (6°37'N., 116°33'E.) lies 5.5 miles NE of Tanjong Lokpadang. Depths of less than 5.5m extend up to 0.5 mile offshore between these points.

A shoal, with depths of less than 1.8m, lies 0.5 mile WSW of Tanjong Dudar. A drying coral reef lies 0.5 mile NNE of the same point.

Pulau Silad (Bisa Island) (6°39'N., 116°34'E.), a thickly wooded islet, 34m high, composed of black basalt, is joined to a point on the mainland 3 miles NE of Tanjong Dudar at LW.

A 14.6m coral patch lies 2.5 miles W and another patch, with a depth of 11m, lies 1 mile NW of Tanjong Dudar.

Two coral shoals, with depths of 3m and 3.4m, lie 0.5 mile and 1.3 miles, respectively, SW of Pulau Silad. A pinnacle rock, with a depth of 11m, was reported to lie 2 miles NW of Pulau Silad.

11.113 White Rocks Bay (6°43'N., 116°38'E.) is entered between Pulau Silad and Tanjong Indarasan (Tanjong Jahat), about 7 miles NE. The approaches to the bay are fouled by reefs, rocks, and shoals.

Harry Shoals (6°41'N., 116°36'E.), with a least depth of 2.1m, lie 2.5 miles NE of Pulau Silad. These shoals are almost joined to a spit extending from the mainland.

Beehive Rocks (Batu Laya Laya) (6°42'N., 116°37'E.) are two conspicuous rocks which stand near the outer end of the coastal reef on the SE side of the bay. The 11.6m high SW rock stands 4 miles NE of Pulau Silad. The NE rock, 10.3m high, stands 0.7 mile farther NE. A rock, awash, lies 0.2 mile NNW of the SW rock.

White Rocks (6°42'N., 116°36'E.), a conspicuous group of rocks 13m high, stand 3.5 miles NNE of Pulau Silad. Reefs, with depths of less than 11m, extend 2 miles N and 1.3 miles SSW of these rocks.

White Rocks Reef (6°44'N., 116°36'E.), which dries, lies near the N extremity of the above reefs. A detached 6.4m rocky patch lies 1 mile W of White Rocks.

A 7.3m patch lies in the N entrance of the bay 1 mile WSW of Tanjong Indarasan. In 1961, a vessel reported a 5.5m patch lying 1.3 miles SSW of this point.

Anchorage.—Anchorage can be taken, in a depth of 20m, near the middle of the bay, 1.5 miles NE of White Rocks.

Directions.—When entering by the S entrance, keep the NW extremity of Pulau Silad bearing 217° astern, until the SW Beehive Rock bears about 081°, at which time course can be altered for the anchorage.

When entering by the N entrance, steer 154° for the NE Beehive Rock, then anchor as convenient near the middle of the bay.

Off-lying Islands and Dangers

11.114 The Mantanani Islands are a group of coral islands formed by reefs which lie on a bank about 14 miles WNW of Pulau Silad.

Pulau Mantanani Besar (6°43'N., 116°21'E.), the E island of the group, is low, flat, and densely wooded, except near its NW end where it rises abruptly to a well-defined wooded ridge, 63m high. Pulau Lungisan, 39m high, lies close W of Pulau Mantanani Besar.

Pulau Mantanani Kechil (6°42'N., 116°18'E.), the W island, is wooded; the trees near its W end are 49m high. A 1.2m high rock lies close off its W extremity. A light, shown from a 5m high round stone tower, stands near the W end of this island.

Good anchorage can be taken on either side of these islands, according to the monsoon.

A number of detached patches, with depths of from 9.6 to 19.8m, lie within 3.5 miles of the Mantanani Islands, as can be seen from the charts. A 12.8m coral patch lies 5.5 miles WSW of the light.

Caution.—Less depths than charted may exist in the vicinity of the Mantanani Islands.

11.115 South Furious Shoals (6°47'N., 116°12'E.) consist of a number of steep-to, detached coral banks lying between 4.5 miles NNW and 13 miles WNW of Mantanani Islands Light.

The westernmost and largest of these banks has a least depth of 12.8m. The next bank to the E has a similar depth.

The three other banks lying to the E have depths ranging from 12.8 to 14.6m. The depths around and between these banks are very irregular and shallower depths than charted may exist.

South Furious Oil Field (6°47'N., 116°14'E.) is situated 6 miles NW of Mantanani Islands Light. Within the oil field, lights are shown from the production platforms and also shown

from other structures. A submarine pipeline is laid SW from the oil field, passing W of Sunken Barrier Shoals, then E of Pulau Mengalum, and continuing SSW to the oil terminal near Tanjong Punei. This pipeline also connects the South Furious Oil Field with Barton Oil Field, lying 7.5 miles ENE.

Barton Shoal (6°51'N., 116°23'E.), with a least depth of 11.9m, coral, lies 9.5 miles NNE of Pulau Mantanani Kechil Light.

Barton Oil Field (6°50'N., 116°20'E.), with lighted production platforms, lies 2 miles WNW of Barton Shoal.

A submarine pipeline runs SW approximately 138 miles from a production platform to Tanjong Punei through various other oil fields.

Dolphin Bank (6°46'N., 115°58'E.), with a least depth of 22m, sand and coral, lies 20 miles WNW of Pulau Mantanani Kechil Light.

11.116 Emerald Shoals (6°56'N., 116°08'E.), so named because of their bright green color on the NW side, lie between 13 miles and 22 miles NW of the Mantanani Islands. They consist of an extensive area of coral heads marked by depths of 7.8 to 25.6m. The coral heads are so numerous and steep-to that it is possible that less water may exist within the charted limits.

The shallowest head discovered so far, with a depth of 7.8,m, lies near the NE side of Emerald Shoals. Three 10.5m coral heads lie 9 miles WSW, 2.3 miles NW, and 2.3 miles S of the shallowest head.

Several detached banks, with depths of 27 to 37m, lie between Emerald Shoals and Dolphin Bank.

Tanjong Ganda (Tanjong Dandulit) (6°47'N., 116°38'E.), a rocky bluff, is located about 2 miles N of Tanjong Indarasan. A bank, with depths of less than 5.5m, extends up to 0.3 mile offshore between these points. A detached shoal, with a depth of 7.3m, lies 1.3 miles SW of Tanjong Ganda.

A drying reef extends 0.3 mile NNE from Tanjong Ganda. Two rocks, one 5m high, stand at its N end.

Tanjong Tambuluran (6°52'N., 116°38'E.), lying 5 miles N of Tanjong Ganda, is low and difficult to make out.

Teluk Agal (6°49'N., 116°39'E.) lies in the bight between Tanjong Ganda and Tanjong Tambuluran. A 4.6m coral patch lies 1.5 miles N of Tanjong Ganda. A 10.1m coral patch lies 1.5 miles farther N.

The bay is obstructed by reefs which extend from both shores.

Secure anchorage is reported in Teluk Agal for small craft with local knowledge, in a depth of 7.3m.

Batumandi Rock (6°52'N., 116°36'E.), marked close S by a lighted buoy, 16m high, composed of yellow sandstone and surrounded by a steep-to reef, lies 0.3 mile W of the outer end of a reef which extends 1.3 miles W of Tanjong Tambuluran. Several above water rocks stand on this reef.

A rock, with a depth of less than 1.8m, lies 0.5 mile NW of Batumandi Rock; a drying rock lies in between. A 8.2m coral patch lies 1.5 miles SSE of Batumandi Rock.

11.117 Tanjong Bangau (6°57'N., 116°42'E.), a black rocky promontory 125m high, lies 6.5 miles NE of Tanjong Tambuluran. Hills rise E of Tanjong Bangau, attaining a height of 241m 2.5 miles NE of the point, and extend to Tanjong Sempang Mangayau.

Two detached cliffs, one 9.1m high and of reddish color, and the other 15.2m high and white lie 1 mile and 2.3 miles ENE, respectively, of Tanjong Tambuluran. These cliffs are the only distinctive features on this part of the coast.

The coast between Tanjong Tambuluran and Tanjong Bangau is fronted by foul ground and shoal depths which extend up to about 1.3 miles offshore in places.

Heavy rollers exist off the coast between Tanjong Tambuluran and Tanjong Sempang Mangayau, lying 13 miles NNE.

Tanjong Kadua, the W end of a small islet which lies close offshore, and Tanjong Tiga Papan lie about 2.5 miles and 3.3 miles, respectively, NNE of Tanjong Bangau. Tanjong Tiga Papan rises to a height of 134m about 0.5 mile E of its extremity.

Tanjong Sempang Mangayau (7°02'N., 116°45'E.), the NW point of Borneo, lies about 1.3 miles N of Tanjong Tiga Papan and was previously described in paragraph 10.90.

North Furious Shoals (7°02'N., 116°19'E.), with a least depth of 12.8m, coral, and surrounded by very irregular depths, lie 26 miles W of Tanjong Sempang Mangayau and extend 4 miles NW.

Harington Shoal (7°02'N., 116°30'E.), with a least depth of 12.8m, coral, lies centered about 14.3 miles W of Tanjong Sempang Mangayau.

11.118 Big Bonanza Shoal (7°06'N., 116°23'E.), with a least depth of 4.6m on its E part, lies about 17.3 miles WNW of Tanjong Sempang Mangayau. Depths of less than 18m extend 5.3 miles W and about 1.3 miles ESE from this least depth.

Depths of 20m lie 4 miles N of the shallowest head of Big Bonanza Shoal.

A depth of 37m was reported to lie 10 miles N of the shallowest head of Big Bonanza Shoal. A depth of 36m was reported to lie 3 miles further N. A depth of 119m was reported to lie 12.5 miles NNW of this shoal head.

A depth of 24m was reported to lie 33 miles NNW of Pulau Kalampunian. A depth of 128m lies 36 miles NNW of this island. A depth of 24m was reported in position 8°13'N, 116°36'E, approximately 71 miles N of Pulau Kalampunian.

Pulau Kalampunian (7°03'N., 116°45'E.), lying about 1 mile N of Tanjong Sempang Mangayau, is a small sandstone island which rises to a height of 23m from a flat composed of detached reefs. A drying reef extends about 0.5 mile SE from the island. A 7.8m coral patch lies 0.6 mile NW of the island. A light is shown from a 15m high red stone column with white bands situated on the island.

A safe channel, about 0.2 mile wide, lies between the island and Tanjong Sempang Mangayau. This channel has a least fairway depth of 11m and the reefs along the sides are visible.

A magnetic anomaly was observed between positions 10 miles W and 33 miles NNW of Pulau Kalampunian.

Indonesian

INDONESIAN — English

A

air ... water
air masin ... salt water
air mentah ... fresh water
air pasang ... high tide
air pelajaran ... bay, inlet, creek
air perpani ... neap tide
air surut ... low tide
ajer ... river, water
alang ... bar
alur ... channel
ambang ... shoal
angin ... wind
api ... light
arus ... current

B

baharu, baru ... new
bandar, bendar ... harbor, port
barat ... west, western
batang ... river
batu ... stone, rock, islet
bengawan ... river, large stream
besar ... large, great
beting ... reef, sand bank, shoal
biduk ... river boat
biru ... blue
bukit ... hill, mountain
bulan ... moon

D

darerah tingkat ... administrative division
dalam ... deep
danau ... lake
dnagkal ... shallow
darat ... landward
delapan ... eight
dua ... two

E

empat ... four
enam ... six

G

gosong ... shoal, sand bank
gunung ... mountain
gunung api ... volcano

H

hari ... day
hijau ... green
hilir ... downstream
hitam ... black, dark
hujan ... rain

INDONESIAN — English

hulu ... upper course of a river
hutan ... jungle, forest

I

inggris ... english

J

jalan ... street, road
jambatan ... bridge
jermal ... fishing stake, fish trap
jernih ... clear

K

kali ... river
kampung ... village
kapal ... ship
kapal api ... steamship
kapal dadang ... cargo ship
kapal lajar ... sailing vessel
kapal mualim ... pilot boat
kapal muatan ... freighter
kapal pandu ... pilot boat
kapal penambang ... ferry
kapal pangangkut ... cargo vessel
kapal penumpang ... passenger vessel
kapal perang ... warship
kapal peronda ... coastguard vessel
kapal tangki ... tanker
kapal uap ... steamship
kapal udara ... aircraft
karang ... coral, coral reef, atoll
kelelap ... submerged, sunk
kepulauan ... archipelago, large group of islands
kering ... dry
ketjil ... small
kota ... city, town, fort
kuala ... estuary, river mouth, confluence of two rivers
kulon ... west
kuning ... yellow

L

labuan, labuhan ... anchorage
lapan ... eight
laut ... sea, seaward
lebak ... valley
lebar ... broad, wide
lima ... fire
lubuk ... deep pool
lumpur ... mud
lurah ... valley, ravine, gully

M

malam ... night
malim ... pilot
mas ... golden

INDONESIAN	English
merah	red
mualim	pilot
muara	estuary, river mouth
musim	season
N	
nelajan	fisherman
nol	naught
nusa	island
O	
ombak	waves
ombak memetjah	breakers
ombak selabu	rollers
P	
pabean	customhouse
pagi	morning
paja	swamp
pangkalang	anchorage, landing place pier
panjang	long
pantai	beach, coast, shore
pantjang	stake, pile
parigi	well, spring
parit	ditch, small stream
pasang kering	ebb, low tide
pasang naik	high tide
pasang purnama	spring tide
pasang surut	the tides
pasanggrahan	rest house
pasir	sand, sandy beach
pegunungan	mountain range
pelabuhan	roadstead, anchorage
pelabuhan udara	airport
pekan	market town
pendaratan	llanding place, quay, pier
pengkapalan	shipping
perahu	boat
perahu majang	deep-sea fishing boat
perahu tambang	ferry, boat
perkapalan	fleet shipyard
petang	evening
pinggir laut	coast
pohon, pokok	tree
prau	boat, small craft
propinsi	province
pulau	island
pulau-pulau	small group of islands
puntjak	summit, peak
puri	town
putih	white

INDONESIAN	English
R	
rawa, rawang	swamp, marsh
rendah	low
riam	waterfall, rapids
rimba	jungle, forest
rujut	fish net
rumah	house
S	
sampan	small boat
satu	one
selat	strait, narrows, channel
selatan	south, southern
selatan dajh	southwest
sembilan	nine
sepulah	ten
sjarbandar	harbormaster
sumur	well
sungai	river
T	
tanjung	cape, point, promontory
teluk	bay, bend in a river
tengah	middle
tenggara	southeast
tepi	bank, shore
tepi laut	south
terumbu	rock awash at low water
terusan	canal
tiga	three
timur	east
timur laut	northeast
tinggi	high
tjetek	shallow
tji	stream
tjukuh	cape
tohor	shallow
tokong	reef, below-water bank
tongkang	lighter (for cargo)
tua	old
tujuh	seven
U	
ujung	cape, point, headland
ulu	upper reaches of a river
utara	north
utara barat	northwest
W	
waduk	reservoir
wai	river

Dutch

DUTCH	English
A	
aan	at, near, on
ankergebied	anchoring area
ankerplaats	anchorage
archipel	archipelago
B	
baai	bay
baak	beacon
bank	bank, shoal
beloodsen	embark (pilot)
berg	mountain
binnen	inner
blauw	blue
bocht	bight
boei	buoy
bol	ball
boom	tree
bosch	forest
breed	broad
brug	bridge
brul	whistle
buiten	outer
bult	hump
D	
dag	day
dam	dam, breakwater
de, den	the
diep	deep
diepgaande	deep-draft
dijk	dike
donker	dark
dorp	village
draaikalk	eddy
dremel	bar
drie	three
driehoek	triangle
droogte	shoal
duin	dune, sandhill
dwars	across, athwart
E	
eiland	island
eilanden	islands
eilandje	islet
G	
gat	channel
geel	yellow
gebergte	mountain range
getijseinen	tidal signals
geul	narrow channel
golf	gulf
groen	green
gronden	grounds
groot	great
H	
haven	harbor
helft	half
het	the
heuvel	hill
hoek	cape, point
hoofd	headland
hoog	high
hout	wood
K	
kaai	quay
kaap	cape, headland
kake	quay
kanaal	channel
kegel	cone
kil	channel
klein, kleine	little, small
klip	rock, cliff
kolen	coal
kop	head
kreek	creek
kust	coast
L	
laag, lage	low
lang	long
licht	light
lichtboei	light buoy
lichtenlijn	leading lights, range lights
loods	pilot
loodswegen	pilotage
M	
meer	inland sea, lake
midden	middle
moessan	monsoon
modder	mud
mond	mouth, estuary
N	
nauw	narrows
nieuw	new
nood	distress, emergency
noord, noorden	north, northern
noordoost	northeast
noordwest	northwest
O	
olie	oil

DUTCH	English
ondiepte	shoal
ontzeggen	forbidden
oost, ooster	east, eastern
oranje	orange
oud	old

P

peilschaal	tide gauge
plaat	shoal
plat	flat
polder	reclaimed land
punt	point

R

rak	channel
rechthoekig	rectangular
reddingboote	lifeboat
rede	roadstead
rif	reef
rood, ruode	red
riffen	reefs
rivier	river
rots	rocks
rug	ridge
ruitvormig	diamond-shaped

S

schaar	channel
schiereiland	peninsula
schor	shoal
sein	signal
smal	narrow
spits	pointed
spoorweg	railway
springtij	spring tide
staart	tail (of a bank)
stad	town
steen	stone
steiger	jetty, pier

Malay

MALAY	English
A	
alangan	bar
arus	current
ayer	water, stream
ayer masin	salt water
B	
bagan	landing place
baharu, bahru	new
bandar	port, trading town
barat	west, western
batang	river
batu	rock
besar	large, great
beting	shoal, bank
biru	blue
bukit	hill
C	
changkat	hillock, shoal
chetek	shallow
D	
dalam	deep
darat	land, the interior
G	
gosong, gusong	shoal, reef, islet
H	
hijau	green
hitam, itam	black, dark
hutan or utan	jungle, forest
K	
kampong	village
karang	coral, reef
kechil	small, little
kering, kring	dry
kuala	mouth or a river or confluence of two rivers
kuning	yellow
L	
labuan	anchorage
laut	sea, seaward
lumpur	mud
M	
malang	rock, reef, or shoal
mas	golden
merah	red
muara	mouth of a river
N	
negri	town, state
P	
paya	marsh, swamp
pangkalan	landing place
panjang	long
pantai	coast, seaboard, beach
parit	ditch, stream
pasir	sand, beach
pekan	town, market
pohon or pokok	tree
prau	boat
pulau	island
puteh, putih	white
R	
rendah	low
rumah	house
S	
selat	channel, strait
selatan	south, southern
sungai	river
T	
tanah	land, country
tanjong	cape, headland, point, promontory
telok	bay, bend in a river
terembu, trumbu	dangerous hidden shoal
terusan	connecting channel
timor	east
tinggi	high
tohor	shallow
tua	old
tukun	sunken rock
U	
utara	north

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.

Index—Gazetteer

	Position °	'	°	'	Sec. Para.
A					
AART VAN NES	8	32 S	117	53 E	5.47
ABANA ROCK	5	06 N	115	04 E	11.65
ACIS NORTH SHOAL	3	46 N	112	38 E	11.32
ADDINGTON REEF	2	44 S	116	46 E	9.29
AIR DAWAS	2	36 S	104	11 E	2.7
AIR MESUJI	4	10 S	105	49 E	2.20
AIR MUSI	2	18 S	104	55 E	2.8
AIR TELUKTENGGULAND	2	37 S	104	17 E	2.7
AITKEN REEF	5	42 N	112	33 E	11.48
AKBAR SHOAL	2	39 S	107	15 E	2.49
ALARM BANK	3	23 N	106	29 E	1.51
ALERT PATCHES	4	09 N	118	15 E	10.18
ALERT ROCK	6	25 N	116	20 E	11.111
ALIAMBATA	8	47 S	126	36 E	6.94
ALICE CHANNEL	4	35 N	119	00 E	10.35
ALICE REEF	4	45 N	119	04 E	10.36
ALIDA SHOAL	0	59 N	107	52 E	1.22
AMCOTTS ROCK	5	02 N	114	37 E	11.59
AMPENAN	8	34 S	116	04 E	5.26
AMPENAN ROAD	8	35 S	116	03 E	5.25
AMPIBABO	0	28 S	120	04 E	8.26
ANGELICA BANK	7	46 S	122	18 E	6.49
ANJER-LOR	6	03 S	105	55 E	4.17
ANNA REEFS	2	25 S	116	55 E	9.30
ANNIE FLORENCE REEF	5	12 S	113	17 E	3.74
ANOA NATUNA MARINE TERMINAL	5	13 N	105	36 E	1.62
ANT ISLETS	6	32 N	116	30 E	11.111
ANYER TERMINAL (ASAHIMAS)	6	02 S	105	56 E	4.16
ANYER-LOR	6	03 S	105	55 E	4.17
API PASSAGE	2	02 N	109	12 E	1.66
ARDASIER BANK	7	45 N	114	14 E	11.50
ARDJUNA MARINE TERMINAL	5	54 S	107	44 E	3.19
ARENDS EILAND	5	04 S	114	36 E	9.13
ARIMBI OIL FIELD	6	20 S	108	40 E	3.21
ARMSTRONG REEF	4	56 N	118	26 E	10.52
ARSAT ROCKS	6	30 N	116	26 E	11.111
ARU BANK	2	15 S	116	40 E	9.34
ARUBA BANKS	3	28 S	110	11 E	9.3
ATA NILA	8	19 S	123	45 E	6.67
ATANILA	8	19 S	123	45 E	6.67
ATAPOEPOE	9	00 S	124	52 E	6.103
ATAPUPU	9	00 S	124	52 E	6.103
ATTAKA REEF	0	08 S	117	52 E	9.56
AWALOLONG REEF	8	22 S	123	25 E	6.59
AYERABU AIRABU	2	46 N	106	14 E	1.38
B					
BAA	10	44 S	123	03 E	6.108
BAA ROAD	10	43 S	123	03 E	6.108
BADAS	8	28 S	117	23 E	5.43
BADIOA	4	33 S	120	23 E	8.94
BAGIENDA	3	13 S	107	37 E	2.64
BAGUAN ISLAND	6	05 N	118	27 E	10.65
BAHODOPI	2	48 S	122	09 E	8.57
BAHOELOEANG	6	29 S	120	26 E	7.5
BAJAK WUTUN	8	13 S	123	36 E	6.69
BAJAPA REEF	4	41 N	119	05 E	10.36
BAJOA	4	33 S	120	23 E	8.94
BAJOWE	4	33 S	120	23 E	8.94
BAKAPIT	4	57 N	118	35 E	10.54
BAKAU OILFIELD	4	34 N	113	50 E	11.42
BAKOE	5	08 S	119	21 E	7.11
BAKUHANG	4	45 N	118	29 E	10.41
BALABAC STRAIT	7	30 N	117	00 E	1.1
BALANGNIPA	5	56 S	120	27 E	7.3
BALI RIFFEN	3	10 S	120	36 E	8.97
BALI VAN TOLI TOLI	1	03 N	120	48 E	7.43
BALIK TABA	2	35 N	118	00 E	9.81
BALIKPAPAN	1	16 S	116	49 E	9.45
BALONGAN	6	20 S	108	22 E	3.21
BALONGAN OIL TERMINAL	6	16 S	108	28 E	3.21
BANDA REEF	3	50 N	118	01 E	10.4
BANDANG EILANDEN	1	41 S	123	27 E	8.46
BANDAR SERI BEGAWAN	4	53 N	114	56 E	11.78
BANGGAI	1	32 S	123	29 E	8.45
BANGGI OUTER NORTHEAST REEFS	7	23 N	117	21 E	10.84
BANGGI SOUTH CHANNEL	7	07 N	117	10 E	10.87
BANGUEY OUTER NORTHEAST REEFS	7	23 N	117	21 E	10.84
BANGUEY PEAK	7	17 N	117	06 E	10.82
BANJARMASIN	3	20 S	114	35 E	9.11
BANKURUAN CAYS	6	32 N	117	41 E	10.70
BANYUWANGI	8	13 S	114	23 E	5.3
BARAM OIL FIELD	4	40 N	113	56 E	11.45
BARAT BANKS	5	10 N	115	06 E	11.65
BARAT TWEELING	4	13 S	122	55 E	8.67
BAROE	8	24 S	116	06 E	5.27
BAROEGAIJA	6	02 S	120	33 E	8.99
BARONIA OIL FIELD	4	45 N	113	45 E	11.42
BARSOE BASSO	8	29 S	119	15 E	5.57
BARSOE MENJERIH	8	31 S	119	15 E	5.57
BARSOE PANDA	8	32 S	119	14 E	5.57
BARSU BASSO	8	29 S	119	15 E	5.57
BARSU MENYERIH	8	31 S	119	15 E	5.57
BARTON OIL FIELD	6	50 N	116	20 E	11.115
BARTON OILFIELD	6	50 N	116	20 E	11.62
BARTON SHOAL	6	51 N	116	23 E	11.115
BARU	8	24 S	116	06 E	5.27
BATANG BARAM	4	35 N	113	58 E	11.46
BATANG IGAN	2	51 N	111	39 E	11.28
BATANG LAWAS	4	58 N	115	25 E	11.82
BATANG LUPAR	1	31 N	110	59 E	11.14
BATANG RAJANG	2	08 N	111	13 E	11.18
BATANG SADONG	1	34 N	110	44 E	11.14
BATANG SARIBAS	1	43 N	111	04 E	11.16
BATANGMATA	5	56 S	120	27 E	7.3
BATOE	7	02 S	120	45 E	6.117
BATU ABA	8	47 S	115	38 E	5.21
BATU ABAH	8	47 S	115	38 E	5.21
BATU BELAJAR	8	46 S	116	32 E	5.31
BATU HITAM BATUHITAM	3	15 S	108	04 E	2.77
BATU IMUNG	4	38 N	107	59 E	1.3
BATU KARANG PEMATAN	5	24 S	106	16 E	4.6
BATU LAYA LAYA	6	42 N	116	37 E	11.113
BATU LUA	4	59 S	119	27 E	7.18

	Position °	'	°	'	Sec. Para
BATU LUNDU	1	44 N	109	56 E	11.4
BATU MALANG	3	15 S	107	28 E	2.53
BATU MANDI	1	44 N	109	56 E	11.4
BATU MOGUNG	2	57 S	110	29 E	9.4
BATU MONTJO	8	26 S	119	26 E	5.58
BATU NENEH	3	42 N	107	56 E	1.8
BATU PANKAJA	4	36 S	119	24 E	7.18
BATU PANKAYA	4	36 S	119	24 E	7.18
BATU PRIUK	3	01 N	108	52 E	1.13
BATU SAMARANG	1	52 N	110	21 E	11.6
BATU SORI LIGHT	5	20 S	122	39 E	8.77
BATU TIMBAL	3	01 S	116	12 E	9.32
BATU TINAGAT	4	13 N	117	59 E	10.14
BATUAN KERA	1	43 N	110	18 E	11.8
BATUAN TAMBAK	1	43 N	110	18 E	11.8
BATUBERIAN BESAR	2	30 N	108	57 E	1.15
BATUMANDI	5	53 S	105	42 E	4.22
BATUMANDI ROCK	6	52 N	116	36 E	11.116
BATUMOITO	0	29 N	122	18 E	8.18
BATUNAI BALO	5	04 S	119	10 E	7.15
BATUPUTIH	2	42 N	106	17 E	1.39
BATURUA REEF	4	31 N	118	49 E	10.32
BAUBAU	5	28 S	122	37 E	8.78
BAUCAU	8	27 S	126	30 E	6.90
BEATRICE REEFS	10	31 S	123	36 E	6.105
BEAUFORT REEF	4	23 N	118	44 E	10.26
BEDULAN	7	42 S	113	29 E	3.60
BEEHIVE ROCKS	6	42 N	116	37 E	11.113
BEKAPAI OFFSHORE TERMINAL	1	01 S	117	29 E	9.48
BELANG	0	56 N	124	47 E	8.9
BELANTAK	0	52 S	123	24 E	8.50
BELINYU	1	38 S	105	47 E	2.26
BENKOKA	6	53 N	117	13 E	10.75
BENOA BARU	0	59 N	117	58 E	9.62
BENOA-UJUNG	8	45 S	115	13 E	5.18
BENRINNES REEF	4	51 N	118	45 E	10.61
BENTENG	6	07 S	120	28 E	7.4
BERAPUN	8	35 S	122	55 E	6.63
BEREMPUN	3	09 S	107	37 E	2.63
BESAR SALUE	1	57 S	123	49 E	8.46
BESUKI	7	44 S	113	41 E	3.61
BETHUNE HEAD	5	24 N	115	15 E	11.61
BETING AKBAR	2	39 S	107	15 E	2.49
BETING BINTULO	3	50 N	112	47 E	11.32
BETING BUNGAI	3	55 N	113	10 E	11.33
BETING JEPAT	3	50 N	112	48 E	11.32
BETING KIDURONG	3	44 N	112	55 E	11.32
BETING LIKU UTARA	3	46 N	112	38 E	11.32
BETING MATONG	1	44 N	110	33 E	11.11
BETING MENJANGAN BANK	3	47 S	106	12 E	2.22
BETING MUKAH	3	51 N	112	03 E	11.31
BETING NIAH	3	58 N	113	32 E	11.33
BETING NYABAU	3	38 N	113	03 E	11.32
BETING NYALAU	3	47 N	113	04 E	11.32
BETING OSMAN	2	27 N	111	13 E	11.22
BETING RAJA	5	13 S	106	44 E	3.13
BETING SAFRI	3	34 N	112	21 E	11.31
BETING SEMILAJAU	3	33 N	113	16 E	11.37
BETING SUAI	3	51 N	113	02 E	11.33
BETING TATAU	3	41 N	112	48 E	11.32
BETING TUGAU	3	54 N	112	15 E	11.31
BETOENG	5	34 S	104	33 E	4.32
BETONG	6	24 S	110	55 E	3.28
BETTY OIL FIELD	4	37 N	113	37 E	11.44
BETUNG	5	33 S	104	33 E	4.33
BIG BONANZA SHOAL	7	06 N	116	23 E	11.118
BILA	5	45 S	112	36 E	3.74
BILLEAN NORTH DANGERS	6	46 N	117	45 E	10.70
BILLEAN SOUTH DANGERS	6	40 N	117	53 E	10.70
BIMA	8	27 S	118	43 E	5.50
BIMA MARINE TERMINAL	5	45 S	107	05 E	3.3
BINATANG	2	10 N	111	38 E	11.23
BINGKOKA BAY	4	08 S	121	30 E	8.87
BINTULU	3	10 N	113	02 E	11.31
BINTULU OFFSHORE TERMINAL	3	20 N	113	01 E	11.34
BINTULU PORT	3	16 N	113	04 E	11.35
BIRA	5	36 S	106	34 E	3.1
BIRAH BIRAHAN	4	14 S	116	07 E	9.15
BIRINGKASI	4	49 S	119	29 E	7.20
BISA ISLAND	6	39 N	116	34 E	11.112
BITIAN	5	52 S	112	52 E	3.71
BITUNG	1	26 N	125	11 E	8.7
BLACK WATCH ROCK	7	26 N	117	17 E	10.84
BLAMBANGAN PENINSULA	8	45 S	114	25 E	5.1
BLENHEIM REEFS	2	27 S	116	51 E	9.30
BLINYU	1	38 S	105	47 E	2.26
BOAAN ISLAND	6	17 N	118	05 E	10.67
BOEBOEJANG	5	11 S	119	22 E	7.11
BOELOENROEE	5	07 S	120	24 E	8.92
BOETOENG	5	28 S	122	37 E	8.78
BOHARI BANK	2	09 N	111	06 E	11.18
BOKOR OIL FIELD	4	33 N	113	37 E	11.44
BOLAANGITAM	0	55 N	123	19 E	7.51
BOLING	8	21 S	123	15 E	6.57
BONE LAISI	5	55 S	118	12 E	5.68
BONE MALALAJA	5	05 S	119	24 E	7.19
BONE MALALAYA	5	05 S	119	24 E	7.19
BONE MALONJO	5	14 S	119	06 E	7.14
BONE PAMAKEKE	5	12 S	119	13 E	7.14
BONE PINJING	5	19 S	119	13 E	7.14
BONE PUTE	5	43 S	118	18 E	5.68
BONE RATE	7	21 S	121	07 E	6.115
BONTANG COAL TERMINAL	0	02 N	117	31 E	9.56
BONTANG LNG TERMINAL	0	06 N	117	29 E	9.57
BOOMPJES ISLAND	2	28 S	106	58 E	2.39
BOWER REEF	3	28 S	108	37 E	2.76
BRANDON REEFS	6	42 N	116	50 E	10.90
BROCK PATCH	4	46 N	114	30 E	11.56
BROMO ROCK	8	16 S	114	25 E	5.2
BROUWER BANKEN	5	05 S	106	16 E	4.5
BROUWERS REEFS	5	05 S	106	16 E	4.5
BROWNE PATCH	4	54 N	114	18 E	11.56
BRUNEI	4	53 N	114	56 E	11.78
BRUNEI BLUFF	5	03 N	115	03 E	11.74
BRUNEI CHANNEL	4	59 N	115	05 E	11.75
BRUNEI PATCHES	5	01 N	114	42 E	11.59
BUAYA BUAYA	1	25 N	118	30 E	9.68
BUCK REEF	5	52 N	112	34 E	11.48
BUGBUG	8	30 S	115	36 E	5.15
BUKIT AMBOK	4	49 N	114	40 E	11.53
BUKIT BADUNG	8	48 S	115	10 E	5.6
BUKIT BANGGI	7	17 N	117	06 E	10.82
BUKIT BATUKAU	8	20 S	115	06 E	5.9
BUKIT BUANG SAKAR	4	51 N	114	57 E	11.71
BUKIT COWIE	5	02 N	115	03 E	11.58
BUKIT JERUDUNG	4	56 N	114	51 E	11.58
BUKIT KILATUAN	5	40 N	115	58 E	11.93
BUKIT SABANDAR	4	56 N	114	51 E	11.58
BUKIT SARI	4	56 N	115	23 E	11.82
BUKIT SEBUYAU	1	31 N	110	56 E	11.14
BUKIT SELILA	4	55 N	114	58 E	11.71
BUKIT SUAI	4	58 N	115	28 E	11.83
BUKIT TEBELONG	5	47 N	116	03 E	11.93
BUKIT TEMPAYANG PISANG	5	01 N	115	03 E	11.71
BULELENG	8	06 S	115	06 E	5.12
BULELENG ROAD	8	06 S	115	06 E	5.11
BULIPATUID SHOAL	4	29 N	118	47 E	10.32
BULUKUMBA	5	34 S	120	11 E	7.6
BUMBUN BAY	8	17 S	111	51 E	4.46
BUNBURY SHOALS	6	28 N	115	56 E	11.106
BUNGIN BAY	8	29 S	117	00 E	5.39
BUNGKU	2	33 S	121	58 E	8.55
BUNGURAN BESAR NATUNA BESAR	3	56 N	108	14 E	1.5
BUNTA	0	50 S	122	09 E	8.34
BURONG	5	46 N	115	41 E	11.92
BUSH ISLAND	6	48 N	117	21 E	10.75
BUSUNG MADAU	2	46 S	108	22 E	2.73
BUTON	5	28 S	122	37 E	8.78
BUTON STRAIT	5	00 S	122	45 E	8.74
BYLANDT REEF	6	18 S	120	24 E	7.5
BYRON REEF	2	34 S	117	48 E	9.38

C

CAMAR MARINE TERMINAL	6	18 S	113	00 E	3.72
CANDIKESUMA	8	19 S	114	31 E	5.8
CANTI	5	48 S	105	35 E	4.24
CAPE MAFSIE	6	56 N	117	01 E	10.88
CAPE MANDAR	3	35 S	118	56 E	7.27
CARNBEE	3	34 S	107	41 E	2.54
CARYSFORT REEF	2	40 S	109	49 E	2.103
CATHARINA ROSTEN	6	08 S	105	51 E	4.17
CECIL REEFS	2	22 S	116	54 E	9.30

	Position °	'	°	'	Sec. Para
CENKARENG OIL TERMINAL	5	58 S	106	44 E	3.9
CENTRAL LUCONIA GAS FIELD	5	02 N	112	40 E	11.48
CHABROI (CHABROL) BANK	3	08 N	106	22 E	1.60
CHAMPION OIL FIELD	5	14 N	114	45 E	11.60
CHAMPION SHOALS	5	12 N	114	45 E	11.52
CHANCE ROCK	4	14 N	118	18 E	10.19
CHEARNLEY SHOAL	4	51 N	114	19 E	11.56
CHERMIN ROCK	4	56 N	115	01 E	11.77
CHRISTINE SHOALS	3	51 N	113	02 E	11.33
CHURCH REEF	4	41 N	118	39 E	10.34
CIGADING	6	01 S	105	57 E	4.14, 4.15
CILACAP	7	44 S	109	00 E	4.40
CILACAP INLET	7	45 S	109	03 E	4.39
CIMIRING LIGHT	7	47 S	109	02 E	4.40
CINTA OIL TERMINAL	5	27 S	106	16 E	4.7
CIREBON	6	43 S	108	34 E	3.23
CIRENCESTER BANK	3	16 S	108	58 E	2.81
CIRENCESTER SHOAL	2	55 S	108	56 E	2.81
CLAIRE ROCK	6	41 N	117	37 E	10.68
CLARKE CREEK	4	19 N	117	32 E	10.10
CLEMENCIA BANK	3	23 S	110	08 E	9.3
CLOTILDE ROCK	6	14 N	118	23 E	10.65
COAL MINE REACH	4	15 N	117	39 E	10.10
COAL POINT	5	23 N	115	15 E	11.67
COCHRANE BANK	3	49 N	113	15 E	11.33
COLEMAN SHOAL	5	46 N	115	35 E	11.92
COLLIER HEAD	5	17 N	115	16 E	11.67
COLLINS PATCH	4	16 N	118	36 E	10.23
COLLINS SHOALS	5	57 N	115	33 E	11.105
CONDOR REEF	2	25 S	108	41 E	2.72
CONGKEH	7	29 S	113	11 E	3.46
COOPER REEF	3	22 S	107	35 E	2.54
CORA REEF	2	29 S	116	53 E	9.30
CORAL BANK	2	27 S	116	47 E	9.30
CORAL REEF	2	50 S	117	04 E	9.28
COREYRA BANK (GOSONG CORCYRA)	2	49 S	110	01 E	2.102
COWIE HARBOR	4	17 N	117	46 E	10.16
CRANEFIELD DANGERS	6	26 N	117	50 E	10.69
CREAGH REEF	4	20 N	118	37 E	10.27
CREIGHTON PATCH	6	01 N	116	05 E	11.100
CROOK REEF	4	47 N	118	20 E	10.51
CRUIZER ROCK	1	52 N	110	21 E	11.6
CUNNINGHAM PATCH	4	59 N	114	38 E	11.59
CUST REEF	4	17 N	118	43 E	10.24

D

DAJANGDAJANGAN	5	24 S	119	11 E	7.10
DALLAS REEF	7	38 N	113	51 E	11.50
DAMAR	2	45 N	105	23 E	1.40
DAMPIER ROCK	6	52 N	117	32 E	10.72
DAMPIER SHOALS	6	00 N	115	30 E	11.105
DANA	10	50 S	121	17 E	6.112
DAO BESAR ISLAND	10	49 S	122	40 E	6.108
DARBY BANK	4	07 N	118	13 E	10.18
DARVEL BAY	4	45 N	118	35 E	10.37
DAWSON ROCK	4	45 N	118	20 E	10.41
DE GREVE SHOAL	5	58 S	118	26 E	5.69
DECOURCY DANGERS	6	34 N	117	56 E	10.69
DELUAR SHOALS	5	52 N	115	42 E	11.93
DENPASAR	8	40 S	115	13 E	5.18
DENT HAVEN	5	16 N	119	15 E	10.56
DILI	8	32 S	125	35 E	6.87
DILLY	8	32 S	125	35 E	6.87
DINGLE ROCK	6	47 N	117	36 E	10.71
DISCOVERY EAST BANK	3	35 S	109	10 E	2.81
DISCOVERY REEF	3	36 S	108	50 E	2.82
DISCOVERY ROCKS	2	53 S	106	56 E	2.45
DJAGOENG	5	29 S	106	31 E	4.8
DJAILAMU	6	33 S	118	48 E	5.70
DJAITAN SHOAL	2	33 S	117	58 E	9.36
DJAKETRA BAAI	8	17 S	111	27 E	4.42
DJAWALLAN	8	05 S	127	13 E	6.84
DJIMBARAN	8	46 S	115	09 E	5.7
DJIMBARAN	8	46 S	115	11 E	5.6
DJOELAH	8	06 S	115	19 E	5.14
DOANGDOANGAN BESAR LIGHT	5	24 S	117	56 E	5.68
DOEA EILANDEN	5	25 S	106	28 E	4.8
DOENGI RIFFEN	3	57 S	121	06 E	8.90
DOG REEFS	6	44 S	118	50 E	5.70
DOLPHIN BANK	6	46 N	115	58 E	11.115
DOMPO BAY	8	19 S	118	19 E	5.49
DONDO BAY	8	29 S	121	53 E	6.48
DONGGALA	0	40 S	119	45 E	7.33
DORO MARIA	8	29 S	118	56 E	5.51
DORO RASA	8	48 S	118	43 E	5.61
DORO SIMPOSAI	8	43 S	118	42 E	5.60
DRAKE BANK	4	13 N	117	36 E	10.12
DRIFTWOOD POINT	5	39 N	118	37 E	10.60
DUMPIL ROCK	5	54 N	116	01 E	11.96
DUNGI REEFS	3	57 S	121	06 E	8.90
DUNLOP SHOAL	5	42 N	115	38 E	11.92
DUTCH SPIT	4	04 N	118	01 E	10.13
DWAALDER ISLAND	4	14 S	116	07 E	9.15

E

EAST POINT	4	08 N	117	55 E	10.13
EBELING SHOAL	0	28 N	107	25 E	1.32
EDEN TUTUN	7	58 S	126	28 E	6.84
EDGELL PATCHES	6	01 N	115	59 E	11.98
EGERIA ROCK	3	02 N	106	27 E	1.60
EGERIA ROCKS	7	03 N	117	13 E	10.80
EGERIA SHOAL	4	12 N	118	15 E	10.18
EKAS BAY	8	57 S	116	26 E	5.32
ELIZABETH SHOALS	3	55 N	113	10 E	11.33
ELLIOT REEF	2	04 S	106	19 E	2.32
ELOMAR	8	45 S	126	46 E	6.94
EMERALD SHOALS	6	56 N	116	08 E	11.116
ENDE	8	50 S	121	39 E	6.39
ENGLISH SPIT	4	12 N	118	08 E	10.17
ENSLIE REEF	1	07 S	106	31 E	2.38
ERB WEST OIL FIELD	6	26 N	115	39 E	11.104
ERZHERZOG REEF	4	15 N	118	23 E	10.20
EVEREST BAY	4	57 N	118	34 E	10.54
EVERETT REEF	5	51 N	115	59 E	11.95
EXSPAN MARINE TERMINAL	1	50 S	105	08 E	2.23

F

FAIRLEY PATCHES	4	56 N	114	20 E	11.56
FAIRWAY SHOAL	7	07 N	117	30 E	10.79
FATAMAILAU	8	55 S	125	29 E	6.86
FIVE FATHOM BANKS	3	48 S	106	28 E	2.22
FLORES HEAD	8	04 S	122	52 E	6.53
FLY ROCK	6	58 N	117	18 E	10.76
FLYING FISH REEF	2	13 S	108	37 E	2.81
FLYING FISH ROCK	6	17 N	118	08 E	10.67
FOUR FATHOM BANKS	4	13 S	106	12 E	2.22
FOUR FATHOM PATCHES	5	27 N	115	13 E	11.63
FOX BANKS	3	35 S	110	15 E	9.2
FRANCIS BANK	6	23 N	115	53 E	11.106
FREEMANTE SHOAL	4	44 N	118	46 E	10.34
FRIEDRICH HAVEN	4	16 N	118	24 E	10.21
FRIEDRICH REEF	4	14 N	118	21 E	10.20
FRIENDSHIP SHOAL	5	57 N	112	33 E	11.48
FURY ROCKS	5	43 N	115	02 E	11.89

G

GANTENG	8	36 S	117	50 E	5.47
GANTISAN	6	05 N	116	08 E	11.99
GASAP POINT	6	37 N	116	33 E	11.112
GAYA BAY	6	03 N	116	04 E	11.100
GAYAM	7	10 S	114	20 E	3.68
GEBROEDERS	5	10 S	106	06 E	4.6
GELUGALA WUTUN	8	26 S	123	41 E	6.67
GEM REEF	5	35 N	119	08 E	10.58
GIBSON REEF	6	51 N	117	32 E	10.72
GILA BANTA	8	26 S	119	18 E	5.57
GILI	5	48 S	112	46 E	3.71
GILI BATU	8	57 S	116	30 E	5.31
GILI BIAHA	8	30 S	115	37 E	5.15
GILI DUA	7	15 S	113	40 E	3.55
GILI GENTENG	7	12 S	113	55 E	3.54
GILI IYANG	6	59 S	114	11 E	3.52
GILI LAWADARAT	8	28 S	119	33 E	6.18
GILI LAWAK	7	12 S	114	03 E	3.54
GILI LAWALAUT	8	27 S	119	35 E	6.18

	Position °	'	°	'	Sec. Para
GILI LAWANG	8	18 S	116	42 E	5.29
GILI LEBUR	8	29 S	116	41 E	5.30
GILI MELAJU	8	56 S	116	30 E	5.31
GILI MELAYU	8	56 S	116	30 E	5.31
GILI NUSA	8	53 S	116	09 E	5.32
GILI PETAGAN	8	25 S	116	45 E	5.30
GILI RAJA	7	13 S	113	47 E	3.55
GILI TEPEKONG	8	32 S	115	35 E	5.15
GILIMOTA	8	48 S	119	48 E	6.31
GLAYZER ROCK	5	27 N	115	04 E	11.63
GOAT REEF	2	12 S	106	29 E	2.33
GOEMOEK	9	30 S	123	48 E	6.100
GOLF VAN BONE	4	00 S	120	45 E	8.85
GOLF VAN MANDAR	3	37 S	119	16 E	7.25
GOLF VAN TOLO	2	20 S	122	30 E	8.50
GORAU UPA	7	25 S	121	45 E	6.113
GORDON PATCHES	5	36 N	115	15 E	11.89
GORONTALO	0	30 N	123	03 E	8.16
GOSONG ABADI	3	39 S	108	45 E	2.82
GOSONG ALING	3	35 S	110	15 E	9.2
GOSONG AMELIA	2	13 S	105	15 E	2.6
GOSONG ARUBA	3	28 S	110	11 E	9.3
GOSONG BALAM	6	25 S	115	13 E	5.67
GOSONG BARAT	4	00 S	122	52 E	8.66
GOSONG BONI	8	22 S	122	14 E	6.52
GOSONG CORCYRA	2	49 S	110	01 E	2.102
GOSONG DAPUR	5	55 S	106	44 E	3.7
GOSONG DJELAI	3	23 S	110	08 E	9.3
GOSONG GIA	5	12 S	113	17 E	3.74
GOSONG JAG VIJAY	5	09 S	111	24 E	3.33
GOSONG KARANGMAS	7	40 S	114	26 E	3.65
GOSONG MADAU	2	46 S	108	22 E	2.73
GOSONG MAMPANGO	3	35 S	109	10 E	2.81
GOSONG MENULUN	3	13 N	117	38 E	9.86
GOSONG MIDDLE	4	00 S	122	54 E	8.66
GOSONG MUNTOK	2	09 S	105	12 E	2.6
GOSONG RANGAT	5	28 S	106	26 E	4.8
GOSONG RATU	8	35 S	114	39 E	5.1
GOSONG RAYA	2	40 S	106	53 E	2.44
GOSONG REEF	6	39 S	111	26 E	3.37
GOSONG SEKOPONG	4	56 S	106	04 E	4.3
GOSONG SELATAN	3	26 S	122	30 E	8.61
GOSONG SERDANG	5	05 S	106	16 E	4.5
GOSONG SYAHBANDAR	5	05 S	106	00 E	4.3
GOSONG UTARA	3	23 S	122	30 E	8.61
GRACE REEFS	3	43 S	108	06 E	2.77
GRASSY POINT	4	16 N	117	40 E	10.14
GRAY REEF	5	01 N	118	20 E	10.53
GREAT BAKKUNGAAN	6	11 N	118	07 E	10.67
GREAT CHANNEL	6	23 S	105	18 E	4.2
GREAT SALOEE	1	57 S	123	49 E	8.46
GREEN PATCHES	6	40 N	117	40 E	10.68
GREEP REEFS	4	42 N	118	15 E	10.43
GRESIK	7	09 S	112	39 E	3.42
GRINTING	7	42 S	113	29 E	3.60
GROWLER BANK	5	40 N	115	28 E	11.90
GUBBINS ROCK	6	03 N	118	12 E	10.65
GUNA NUSA	5	56 S	106	06 E	4.10
GUNONG SUBIS	3	48 N	113	47 E	11.39
GUNUNG ABANG	8	17 S	115	26 E	5.9
GUNUNG ABASONG	0	48 S	122	25 E	8.34
GUNUNG AGUNG	8	20 S	115	30 E	5.9
GUNUNG ARGOPURA	7	58 S	113	34 E	3.58
GUNUNG ARGOWULAN	7	54 S	112	58 E	3.58
GUNUNG BALURAN	7	50 S	114	22 E	3.62
GUNUNG BANGSEREH	6	56 S	112	58 E	3.50
GUNUNG BAROEGAIJA	6	02 S	120	33 E	8.99
GUNUNG BARUGAIYA	6	02 S	120	33 E	8.99
GUNUNG BATU BESAR	2	37 S	116	18 E	9.34
GUNUNG BATUR	8	14 S	115	23 E	5.9
GUNUNG BATUWANGKANG	0	23 S	109	19 E	1.77
GUNUNG BERATUS	1	01 S	116	20 E	9.45
GUNUNG BERUKUNG	6	56 S	113	07 E	3.50
GUNUNG BRIUN	1	20 N	117	55 E	9.66
GUNUNG CIMIRING	7	47 S	109	02 E	4.38
GUNUNG CIREMAY	6	54 S	108	24 E	3.16
GUNUNG GEDE	6	08 S	105	56 E	4.17
GUNUNG GEGER	7	02 S	112	56 E	3.43
GUNUNG INERIE	8	53 S	120	59 E	6.37
GUNUNG INGAS	8	49 S	115	09 E	5.19
GUNUNG KALABAT	1	27 N	125	00 E	8.2
GUNUNG KAWANG	8	40 S	116	05 E	5.24
GUNUNG KEDIJO	2	21 S	110	18 E	2.100
GUNUNG KEGELBERG	2	37 N	117	24 E	9.67
GUNUNG KINABALU	6	05 N	116	33 E	11.102
GUNUNG KUMBANG	6	56 S	113	24 E	3.50
GUNUNG LAMONGAN	7	59 S	113	20 E	3.58
GUNUNG LAWU	7	37 S	111	12 E	4.42
GUNUNG LOMPOBATANG	5	22 S	119	56 E	8.85
GUNUNG LOROS	7	44 S	113	35 E	3.58
GUNUNG LUDAI	3	09 S	107	44 E	2.55
GUNUNG MANGKALIHAT	1	01 N	118	57 E	9.65
GUNUNG MANGKOL	2	14 S	106	06 E	2.31
GUNUNG MAREJE	8	46 S	116	08 E	5.22
GUNUNG MERANGAN	6	56 S	113	42 E	3.51
GUNUNG MERBUK	8	14 S	114	39 E	5.9
GUNUNG NGLANGU	6	57 S	111	08 E	3.35
GUNUNG NIANGU	6	57 S	111	08 E	3.35
GUNUNG NUBI	8	07 S	122	51 E	6.53
GUNUNG OLEONUHE	0	35 N	121	50 E	8.15
GUNUNG OLIONUHE	0	35 N	121	50 E	8.15
GUNUNG PADAI	1	58 N	117	47 E	9.66
GUNUNG PALUNG	1	12 S	110	09 E	2.92
GUNUNG PANGRANGO	6	47 S	106	56 E	3.16
GUNUNG PANJANG	5	50 S	105	46 E	4.4
GUNUNG PENANGGUNGAN	7	37 S	112	37 E	3.56
GUNUNG PINANG	6	04 S	106	06 E	4.10
GUNUNG POLA	6	56 S	113	42 E	3.51
GUNUNG PRAPATAGUNG	8	08 S	114	29 E	5.9
GUNUNG PUTUNG	8	49 S	115	09 E	5.6
GUNUNG RADAK	0	33 S	109	26 E	1.78
GUNUNG RAJABASA (RADJABASA)	5	47 S	105	38 E	4.24
GUNUNG RAUNG	8	07 S	114	03 E	3.62
GUNUNG RINGGIH	7	59 S	114	13 E	3.62
GUNUNG RINGGIT	7	43 S	113	51 E	3.62
GUNUNG RINJANI	8	25 S	116	27 E	5.22
GUNUNG RUMAH	8	35 S	118	16 E	5.48
GUNUNG SADOK SADOK	6	06 N	116	29 E	11.102
GUNUNG SALAK	6	43 S	106	44 E	4.34
GUNUNG SANGIANG	8	13 S	114	36 E	5.9
GUNUNG SARAT	0	51 S	109	29 E	2.88
GUNUNG SEBATUNG	3	17 S	116	15 E	9.16
GUNUNG SEJAKA	3	30 S	116	11 E	9.16
GUNUNG SEMONGKRONG	7	41 S	113	01 E	3.58
GUNUNG SENDORO	7	18 S	110	00 E	3.22
GUNUNG SERAPI	1	34 N	110	12 E	11.7
GUNUNG SERAYA	8	23 S	115	40 E	5.9
GUNUNG SINDJAI	5	05 S	120	12 E	8.92
GUNUNG SINJAI	5	05 S	120	12 E	8.92
GUNUNG SLAMET	7	14 S	109	13 E	3.22
GUNUNG SUWARAN	1	45 N	117	35 E	9.66
GUNUNG TAMBORA	8	14 S	117	58 E	5.35
GUNUNG TAMBUKU	7	01 S	113	38 E	3.54
GUNUNG TANGGAMUS	5	26 S	104	40 E	4.31
GUNUNG TELOK	7	07 S	113	00 E	3.46
GUNUNG TENGGER	7	58 S	112	57 E	3.58
GUNUNG TJAREME	6	54 S	108	24 E	3.16
GUNUNG TJIMIRING	7	47 S	109	02 E	4.38
GUNUNG UNTU JOWI	1	22 S	121	11 E	8.35
GURUNG BURONG	1	25 S	109	13 E	2.97
GUSONG DILAUT	4	55 N	118	15 E	10.48

H

	Position °	'	°	'	Sec. Para
HAAI POINT	4	54 S	122	46 E	8.76
HAARLEMMERMEER	0	46 S	120	55 E	8.35
HADAKEWA	8	22 S	123	33 E	6.70
HALE BANK	3	17 N	106	22 E	1.59
HALF CHANNEL PATCH	7	13 N	117	01 E	10.86
HALLORAN REEF	4	59 N	118	21 E	10.51
HAMILTON POINT	5	15 N	115	14 E	11.66
HANCOCK SHOAL	3	34 S	107	05 E	2.42
HAND ROCK	4	08 N	118	10 E	10.14
HANKIN SHOAL	5	48 N	115	11 E	11.89
HANSISI	10	11 S	123	30 E	6.99
HARBOR SHOALS	4	14 N	117	53 E	10.15
HARDIE REEF	5	56 N	112	32 E	11.48
HARINGTON SHOAL	7	02 N	116	30 E	11.117
HARRIS REEF	6	00 N	116	04 E	11.101
HARRISON REEF	6	50 N	117	34 E	10.71
HARRY SHOALS	6	41 N	116	36 E	11.113
HASELFOOT PATCHES	5	28 N	114	57 E	11.87
HAYES REEF	5	22 N	112	36 E	11.48

	Position °	'	°	'	Sec. Para
HAYNES SHOAL	2	34 N	108	51 E	1.17
HAYTER SHOAL	5	53 N	115	34 E	11.93
HEEL REEF	4	14 N	118	14 E	10.18
HERALD REEF	4	59 N	112	37 E	11.47
HERCULES REEF	2	22 S	116	43 E	9.30
HIOE	5	45 S	105	01 E	4.31
HOOPER BANK	3	20 N	106	21 E	1.59
HORN REEF	4	15 N	118	26 E	10.23
HOWARD ROCK	3	05 N	106	22 E	1.60
HOWARD SHOAL	4	54 N	118	40 E	10.55
HYDROGRAAF REEF	2	35 S	108	25 E	2.71

I

ILI BERAPUN	8	35 S	122	55 E	6.63
ILI BERAPUN	8	35 S	122	55 E	6.63
ILI BOLENG	8	21 S	123	15 E	6.57
ILI BOLING	8	21 S	123	15 E	6.57
ILI KEDANG	8	13 S	123	47 E	6.72
ILI KERIWATU	8	28 S	122	59 E	6.62
ILI KIMANG	8	37 S	122	07 E	6.49
ILI KIMANGBOLENG	8	37 S	122	07 E	6.49
ILI LABALEKANG	8	33 S	123	23 E	6.64
ILI LAMARARAP	8	33 S	123	23 E	6.64
ILI LEWOTOBI-PEREMPUAN	8	33 S	122	47 E	6.40
ILI LEWOTOLO	8	16 S	123	30 E	6.69
ILI MINGAR	8	31 S	123	17 E	6.60
ILI UJOLEWUNG	8	13 S	123	47 E	6.72
ILI WATUOM	8	28 S	122	59 E	6.62
ILWAKI	7	56 S	126	26 E	6.84
INGAS PUTUNG	8	49 S	115	09 E	5.6
INI TENGAH	8	42 S	119	48 E	6.35
INTAN OIL FIELD	4	34 S	106	39 E	2.22
IPI VILLAGE	8	51 S	121	40 E	6.39
IRIS SHOALS	5	30 N	115	23 E	11.87
IRON DUKE SHOALS	5	06 N	114	38 E	11.60
ISKANAWATU TUTUN	7	45 S	126	50 E	6.84
ISOBEL SHOALS	3	50 N	112	48 E	11.32
IWAN REEF	1	40 S	106	18 E	2.30

J

JABAK	2	47 N	108	44 E	1.15
JAGA UTARA	5	12 S	106	28 E	4.5
JAHAT SHOALS	5	35 N	115	22 E	11.90
JAJA RIDGE	4	56 N	115	00 E	11.71
JAMES REEF	3	32 N	113	15 E	11.37
JANDIBAN	7	53 S	114	28 E	5.5
JANGKARLOR	7	43 S	114	12 E	3.64
JANSSENS REEF	4	36 S	114	25 E	9.14
JAWALLAN	8	05 S	127	13 E	6.84
JEBUS	1	45 S	105	27 E	2.24
JENEPONTO	5	42 S	119	43 E	7.7
JERUDUNG	4	56 N	114	51 E	11.58
JIMBARAN	8	46 S	115	11 E	5.6
JOHANNA ANTONIA	0	44 N	118	34 E	9.64
JOHANNA REEF	3	23 N	117	54 E	9.86
JOHNSTON ROCK	6	13 N	118	11 E	10.67
JONAH SHOAL	3	33 N	113	16 E	11.37
JULAH	8	06 S	115	19 E	5.14
JUNCTION BLUFF	6	17 N	116	14 E	11.102
JUWANA ROAD	6	39 S	111	12 E	3.35

K

KABIR	8	15 S	124	13 E	6.75
KABO	8	32 S	117	42 E	5.46
KABU KABU	0	15 N	120	11 E	8.25
KAINGARIN	4	57 N	115	02 E	11.76
KAJOE ADI	6	48 S	120	48 E	6.116
KAJU ARA	1	32 N	106	27 E	1.18
KAJU PANGANG	7	28 S	121	25 E	6.114
KAKABIA	6	54 S	122	13 E	6.113
KAKAP MARINE TERMINAL	5	01 N	105	55 E	1.62
KALABAHI	8	12 S	124	31 E	6.79
KALAO TOA	7	23 S	121	48 E	6.113
KALBANO	10	02 S	124	32 E	6.96
KALEDUPA	5	45 S	123	41 E	8.70
KALI BARU	8	37 S	114	07 E	4.47
KALI DONAN	7	44 S	109	00 E	4.39
KALI KONANG	8	17 S	111	27 E	4.42
KALI OPAK	8	01 S	110	17 E	4.42
KALI PORONG	7	32 S	112	51 E	3.45
KALIANDA	5	45 S	105	36 E	4.25
KALIANGET	7	35 S	113	57 E	3.53
KALIHAT	5	55 S	105	49 E	4.20
KALISANGKA	6	51 S	115	15 E	5.63
KAMARU BAY	5	11 S	123	04 E	8.72
KAMBING	8	15 S	125	34 E	6.83
KAMPONG LAMUT	4	40 N	114	28 E	11.55
KAOENA	7	26 S	122	05 E	6.113
KAPALA TAMBELAN	0	54 N	107	28 E	1.24
KARAMPUANG	5	35 S	119	33 E	7.8
KARANG BALI	3	10 S	120	36 E	8.97
KARANG BANKAULUANG	5	50 S	118	28 E	5.69
KARANG BAPANG	6	34 S	109	50 E	3.24
KARANG BASA	5	12 S	106	12 E	4.6
KARANG BATUAN	3	16 S	108	58 E	2.81
KARANG BERBATU	8	27 S	116	44 E	5.30
KARANG BESAR	1	35 N	118	30 E	9.69
KARANG BESAR	5	53 S	106	28 E	3.6
KARANG BITIAN	5	52 S	112	52 E	3.71
KARANG BOKER	6	38 S	110	36 E	3.27
KARANG BOWER	3	28 S	108	37 E	2.76
KARANG BROMBROM	2	13 S	105	20 E	2.6
KARANG BULIULIN	2	06 N	118	20 E	9.74
KARANG BULOLIO	1	08 N	122	22 E	7.49
KARANG BUNTA	4	21 N	107	57 E	1.11
KARANG BUSUNGJONG	2	59 S	108	20 E	2.68
KARANG BUSUNGSERLANG	2	35 S	108	19 E	2.67
KARANG CARNBEE	3	34 S	107	41 E	2.54
KARANG CELESTIAL	1	13 S	106	47 E	2.38
KARANG CONDOR	2	25 S	108	41 E	2.72
KARANG CONGKEH	7	29 S	113	11 E	3.46
KARANG CONKEH	7	29 S	113	11 E	3.46
KARANG COOPER	3	22 S	107	35 E	2.54
KARANG DAENGALAHAN	1	31 N	118	48 E	9.69
KARANG DIANA	3	06 N	107	45 E	1.12
KARANG DISCOVERY BARAT	3	39 S	108	45 E	2.82
KARANG DUNGI	3	57 S	121	06 E	8.90
KARANG ELLIOT	2	04 S	106	19 E	2.32
KARANG FLORENCE ADELAIDE	2	04 S	108	04 E	2.81
KARANG FLYING FISH	2	13 S	108	37 E	2.81
KARANG GAMELAN	2	34 S	117	48 E	9.38
KARANG GEMER	7	10 S	113	56 E	3.54
KARANG GENDER	2	25 S	116	55 E	9.30
KARANG GENTING	3	34 S	107	41 E	2.54
KARANG GONG	2	27 S	116	47 E	9.30
KARANG GOSONG	5	46 S	112	51 E	3.70
KARANG GREIG UTARA	0	52 S	108	33 E	2.82
KARANG GROGOT	2	44 S	116	46 E	9.29
KARANG GWALIA	1	06 S	108	34 E	2.82
KARANG HAARLEMNERMEER	1	02 N	122	50 E	7.49
KARANG HAJI	2	06 S	105	06 E	2.6
KARANG HANCOCK	3	34 S	107	05 E	2.42
KARANG HIDROGRAF BARAT	1	56 S	106	25 E	2.33
KARANG HINDER SELATAN	3	18 S	122	30 E	8.61
KARANG HINDER UTARA	3	16 S	122	28 E	8.61
KARANG HYDROGRAAF	2	35 S	108	25 E	2.71
KARANG IRIS	4	13 S	122	55 E	8.67
KARANG JAMUANG	6	56 S	112	44 E	3.43
KARANG JAMUNGANG	7	41 S	113	55 E	3.63
KARANG JERUK	6	49 S	109	12 E	3.24
KARANG JONG	5	51 S	106	39 E	3.6
KARANG JUANA	6	40 S	111	13 E	3.36
KARANG KABINI	0	48 S	122	06 E	8.34
KARANG KALEDOEPA	5	45 S	123	41 E	8.70
KARANG KALEDUPA	5	45 S	123	41 E	8.70
KARANG KAPAL	5	54 S	110	14 E	3.32
KARANG KAPOPOSANGBALI	7	36 S	117	12 E	5.76
KARANG KAPOTTA	5	31 S	123	25 E	8.70
KARANG KARANG BAGINDA	3	07 S	107	05 E	2.46
KARANG KARANG PENUNGAL	3	52 N	108	29 E	1.6
KARANG KARANG PROTET	3	03 S	108	29 E	2.74
KARANG KARYSFORT	2	40 S	109	49 E	2.103
KARANG KENDANG BESAR	2	27 S	116	51 E	9.30
KARANG KENDANG KECIL	2	29 S	116	53 E	9.30
KARANG KERANDJI	7	42 S	113	35 E	3.60
KARANG KLETA	7	19 S	112	52 E	3.47
KARANG KOKA	6	04 S	124	22 E	8.70
KARANG KORO MAHA	5	45 S	124	11 E	8.70

	Position °	'	°	'	Sec. Para
KARANG KRING	4	03 N	108	28 E	1.5
KARANG LALANGA	1	02 S	120	41 E	8.35
KARANG LANRICK	1	53 S	106	57 E	2.39
KARANG LAUT	0	46 S	120	55 E	8.35
KARANG LAUT	1	11 N	107	26 E	1.22
KARANG LAUT	1	50 S	106	10 E	2.29
KARANG LIAT	1	50 S	106	10 E	2.29
KARANG LIMPOGEH	4	56 S	120	45 E	8.91
KARANG MALALUNGAN	1	55 N	118	27 E	9.73
KARANG MASIMBUNG	2	14 N	118	17 E	9.75
KARANG MEDANG	3	22 S	106	56 E	2.42
KARANG MELAMBIRI	5	14 S	120	26 E	8.92
KARANG NAGA	3	27 S	107	37 E	2.54
KARANG NAUTILIS	7	56 S	125	44 E	6.83
KARANG ONTARIO	1	59 S	108	39 E	2.81
KARANG PANDAN	2	53 S	107	12 E	2.47
KARANG PASIR	3	29 S	107	10 E	2.42
KARANG PEDIS SELATAN	1	53 S	106	15 E	2.31
KARANG PERUT	6	02 S	106	43 E	3.10
KARANG PINAKA	2	11 N	118	19 E	9.75
KARANG PULUHARI	4	01 S	122	45 E	8.63
KARANG PULUPUTRI	6	04 S	106	51 E	3.14
KARANG PUTIH	7	41 S	114	10 E	3.64
KARANG RABA	8	32 S	117	53 E	5.47
KARANG ROBINHOOD	1	11 N	107	26 E	1.22
KARANG ROENDOEMA	5	24 S	124	25 E	8.70
KARANG RUNDUMA	5	24 S	124	25 E	8.70
KARANG SAMBAT	3	36 S	108	50 E	2.82
KARANG SARON	2	17 S	116	49 E	9.30
KARANG SATUNGGUL	7	32 S	118	00 E	5.74
KARANG SEBIDUNGUMA	1	56 S	105	08 E	2.23
KARANG SELATAN	3	07 S	107	25 E	2.52
KARANG SELATAN	3	46 S	122	31 E	8.61
KARANG SELATAN	4	36 S	114	25 E	9.14
KARANG SERDANG	3	24 S	122	32 E	8.61
KARANG SMIT VAN DE BROECKE	2	04 S	106	32 E	2.33
KARANG SUJI	3	34 S	106	55 E	2.42
KARANG SULING	2	22 S	116	43 E	9.30
KARANG TABABINGA	2	15 N	118	14 E	9.75
KARANG TAHAN	6	04 S	106	48 E	3.12
KARANG TAKAT	7	03 S	115	00 E	5.63
KARANG TELEGAPAHAT	2	33 S	108	39 E	2.71
KARANG TEMBAGA	2	41 S	105	51 E	2.14
KARANG TENGAH	2	43 S	107	33 E	2.58
KARANG TIFA	2	22 S	116	54 E	9.30
KARANG TIUNG	3	20 S	108	37 E	2.75
KARANG TRI	2	43 S	108	16 E	2.67
KARANG ULAR	1	58 S	104	57 E	2.3
KARANG UNARANG	2	29 S	117	03 E	9.40
KARANG UTARA	4	05 S	122	54 E	8.67
KARANG VESUVIUS	2	06 S	122	53 E	8.46
KARANG VON SITTARD	2	12 S	106	45 E	2.33
KARANG YAMSECIE	1	24 S	108	51 E	2.84
KARANGAN	4	26 S	119	12 E	7.17
KARANGAN REEF	1	55 S	116	33 E	9.42
KARANGASEM	8	26 S	115	37 E	5.14
KARANGBATA	7	46 S	109	24 E	4.41
KARANGBOTO KARANGBATA	7	46 S	109	24 E	4.39
KARANGBURUNG	6	41 S	105	11 E	4.19
KARANGSANE	6	58 S	120	27 E	6.116
KARANGTARADJE	6	57 S	106	14 E	4.36
KAROMPA LOMPO	7	17 S	121	46 E	6.113
KASIMBAR	0	09 S	120	02 E	8.26
KASSI	4	54 S	119	10 E	7.17
KAYU ARA	1	32 N	106	27 E	1.18
KEBOLA BAAI	8	15 S	124	29 E	6.77
KECHIL REEF	6	35 N	118	01 E	10.69
KEDANG	8	13 S	123	47 E	6.72
KEDINDI VILLAGE	8	17 S	120	27 E	6.43
KEMA	1	22 N	125	05 E	8.8
KEMBA BAY	5	15 S	122	37 E	8.77
KEMBANG	3	45 N	108	04 E	1.8
KEMUDJAN	5	48 S	110	29 E	3.31
KENDARI BAY	3	58 S	122	35 E	8.64
KENNEDY BAY	4	57 N	118	33 E	10.54
KENNETH BANK	3	58 N	113	22 E	11.33
KEPULAUAN AYER BESAR	5	48 S	106	31 E	3.5
KEPULAUAN BODAS	3	37 N	108	05 E	1.7
KEPULAUAN BURONG	1	25 S	109	13 E	2.97
KEPULAUAN DUA	5	25 S	106	28 E	4.8
KEPULAUAN KANGEAN	7	03 S	115	00 E	5.63
KEPULAUAN KARIMUNJAWA	5	50 S	110	20 E	3.29
KEPULAUAN LAUT KECIL	4	45 S	115	47 E	9.14
KEPULAUAN LAYAH	1	30 S	109	21 E	2.98
KEPULAUAN LEMAN	1	17 S	108	53 E	2.84
KEPULAUAN LIMA	3	03 S	107	23 E	2.51
KEPULAUAN LIUKANG TENGGAYA	6	33 S	118	48 E	5.63
KEPULAUAN MARABATUA	4	22 S	115	48 E	9.15
KEPULAUAN MASALIMA	5	04 S	117	04 E	9.27
KEPULAUAN NANGKA	2	24 S	105	47 E	2.13
KEPULAUAN SALABANGKA	3	04 S	122	28 E	8.58
KEPULAUAN SAMBERGELAP	3	40 S	116	36 E	9.19
KEPULAUAN SEGAMA	5	10 S	106	06 E	4.6
KEPULAUAN SERAM	5	45 S	105	48 E	4.4
KEPULAUAN SERIBU	5	29 S	106	31 E	4.2
KEPULAUAN SERIBU	5	35 S	106	34 E	3.13
KEPULAUAN SOLOR	8	29 S	123	21 E	6.54
KEPULAUAN TENGAH	7	30 S	117	29 E	5.63
KEPULAUAN TIGA	5	49 S	105	33 E	4.24
KEPULAUAN TUKANGBESI	5	30 S	123	40 E	8.68
KEPULAUAN WAKATOHI	5	30 S	123	40 E	8.68
KEPULAUANTUJU	1	13 S	105	16 E	2.27
KEPULAUN MARABATUA	4	23 S	115	48 E	9.12
KERAMIAH KRAMIAH	3	15 S	107	45 E	2.79
KERBAU REEF	5	46 S	106	26 E	3.5
KERIWATU	8	28 S	122	59 E	6.62
KERTA SARI BAY	8	45 S	116	46 E	5.37
KESTREL SHOAL	6	30 N	117	59 E	10.69
KETAM OIL FIELD	6	06 N	115	36 E	11.104
KETAPANG	8	09 S	114	24 E	5.3
KETAPANG	8	20 S	116	01 E	5.28
KIDDLE REEFS	4	54 N	118	12 E	10.46
KILOEAN	5	46 S	105	06 E	4.32
KIMANGBOLENG	8	37 S	122	07 E	6.49
KIMANIS BAY	5	39 N	115	45 E	11.93
KISAR	8	01 S	127	12 E	6.84
KLAPPER EIL	7	01 S	105	32 E	4.36
KNOOP ISLAND	4	05 S	116	15 E	9.17
KOBA	2	29 S	106	25 E	2.36
KOEMBA	8	16 S	124	24 E	6.78
KOEMBANG	1	05 S	109	49 E	2.91
KOEN	8	22 S	127	04 E	6.91
KOKOILA	3	29 S	122	54 E	8.62
KOKOK DJANGKOK	8	35 S	116	04 E	5.25
KOKOK JANGKOK	8	35 S	116	04 E	5.25
KOLAKA	4	03 S	121	35 E	8.89
KOLAKA LIGHT	4	03 S	121	36 E	8.89
KOLONODALE	1	59 S	121	20 E	8.54
KONJELAN	8	17 S	111	27 E	4.43
KORO BAAI	4	50 S	123	09 E	8.72
KOSET	7	04 S	114	29 E	3.69
KOTA KINABALU	5	59 N	116	04 E	11.101
KOTAAGUNG	5	30 S	104	37 E	4.32
KOTABARU	3	14 S	116	13 E	9.24
KRAKATAU STEEL WORKS	5	59 S	105	59 E	4.13
KRAMAT BANK	3	32 S	116	00 E	9.21
KRANGA POINT	6	32 N	116	30 E	11.111
KROKODIL	7	57 S	114	27 E	5.5
KRUYS REEF	3	25 N	117	55 E	9.86
KUALA ABAI	6	24 N	116	21 E	11.111
KUALA BELAIT	4	35 N	114	11 E	11.53
KUALA BELAIT	4	37 N	114	19 E	11.54
KUALA BELAWAI	2	14 N	111	09 E	11.21
KUALA BINTULU	3	11 N	113	02 E	11.30
KUALA BRUIT	2	47 N	111	22 E	11.26
KUALA MUKAH	2	55 N	112	05 E	11.29
KUALA NIAH	3	58 N	113	42 E	11.39
KUALA OYA	2	53 N	111	52 E	11.28
KUALA PALOH	2	26 N	111	17 E	11.21
KUALA PENYU	5	35 N	115	36 E	11.93
KUALA SIBUTI	3	59 N	113	43 E	11.39
KUALA SIMILAJAU	3	32 N	113	18 E	11.37
KUALA SUAI	3	48 N	113	29 E	11.38
KUANDANG	0	51 N	122	55 E	7.50
KUBONG BLUFF	5	23 N	115	15 E	11.67
KUCHING	1	34 N	110	21 E	11.13
KUDAT	6	53 N	116	51 E	10.91
KUDAT HARBOR	6	52 N	116	50 E	10.90
KUMAI	2	45 S	111	43 E	9.6
KUMBANG	1	05 S	109	49 E	2.91
KUNAK	4	41 N	118	15 E	10.44
KUPANG	10	10 S	123	35 E	6.102
KUTEI	0	35 S	117	17 E	9.48
KWONG ENG REEF	6	32 S	116	07 E	5.67

	Position °	'	°	'	Sec. Para
L					
LABALA	8	31 S	123	29 E	6.65
LABALA BAY	8	33 S	123	29 E	6.65
LABALA ONE	8	33 S	123	29 E	6.65
LABENGKE	3	27 S	122	26 E	8.60
LABOEAN BOTOE	8	38 S	119	11 E	5.55
LABOETOENG	4	29 S	119	30 E	7.18
LABUAN AMUK	8	31 S	115	32 E	5.9
LABUAN AMUK TERMINAL	8	31 S	115	32 E	5.15
LABUAN BLANDA	0	51 S	121	34 E	8.35
LABUAN BOTU	8	38 S	119	11 E	5.55
LABUAN DAMAS	8	20 S	111	42 E	4.44
LABUAN DJIMBARAN	8	46 S	115	09 E	5.7
LABUAN GANGSA	8	19 S	111	44 E	4.44
LABUAN JIMBARAN	8	46 S	115	11 E	5.7
LABUAN OFFSHORE TERMINAL	5	16 N	115	07 E	11.62
LABUAN TERIENG BAY	8	43 S	116	03 E	5.22
LABUHAN AMUK	8	31 S	115	32 E	5.15
LABUHAN POTA	8	20 S	120	45 E	6.43
LABUHAN TENGOR	5	40 S	104	54 E	4.32
LABUHANBADJO	8	29 S	119	53 E	6.33
LABUHANBAJO	8	29 S	119	53 E	6.33
LABUHANHAJI	8	42 S	116	34 E	5.31
LABUHANHAJI ROAD	8	42 S	116	34 E	5.34
LABUK BAY	6	07 N	117	50 E	10.63
LABUTUNG	4	29 S	119	30 E	7.18
LAHAD DATU	5	01 N	118	19 E	10.53
LAHAD DATU HARBOR	5	00 N	118	23 E	10.51
LAHALURA	10	19 S	120	12 E	6.11
LAIMULA REEF	1	03 N	122	40 E	7.49
LAKIMOLA	10	40 S	123	21 E	6.106
LALARI LELARI	2	49 S	105	57 E	2.12
LAMAR	9	03 S	117	13 E	5.62
LAMARARAP	8	33 S	123	23 E	6.64
LANGAAN ISLAND	6	12 N	118	09 E	10.67
LANGKA	2	28 S	106	27 E	2.30
LANGKOI	8	44 S	119	23 E	5.59
LAPAN	8	14 S	124	02 E	6.73
LARANTUKA	8	21 S	122	59 E	6.41
LARANTUKA TERMINAL	8	20 S	122	55 E	6.41
LARI LARIAN	3	31 S	117	28 E	9.28
LARIKO BAY	3	51 S	121	14 E	8.90
LASOLO RIVER	3	34 S	122	14 E	8.60
LASONGKO BAY	5	23 S	122	31 E	8.80
LATAMBERA	4	50 S	123	00 E	8.72
LAURANTUKA LIGHT	8	20 S	122	59 E	6.41
LAUREL REEFS	4	40 S	117	04 E	9.28
LAWAYONG	8	26 S	123	04 E	6.62
LAWI-LAWI OIL TERMINAL	1	27 S	116	45 E	9.44
LAWLER REEF	4	47 N	118	15 E	10.42
LAYANG-LAYANG (SWALLOW BANK)	5	18 S	106	04 E	4.6
LEARMOUTH REEF	4	44 N	118	25 E	10.41
LEDONG POINT	5	01 N	115	04 E	11.73
LEHNERT REEF	4	15 N	118	15 E	10.19
LEHOK BOI	8	31 S	119	26 E	5.58
LEHOK BOKO	8	29 S	119	26 E	5.58
LEHOK GINGGO	8	41 S	119	39 E	6.24
LELAMOE BAAI	4	39 S	123	12 E	8.71
LEMBAR	8	44 S	116	04 E	5.24
LESAMPOEANG	1	30 S	122	44 E	8.48
LETONG	2	59 N	105	42 E	1.29
LEWAHAJONG	8	26 S	123	04 E	6.62
LEWOETO KIDI	5	36 S	122	30 E	8.79
LEWOLEBA ONE	8	20 S	123	25 E	6.58
LEWOTOLO	8	16 S	123	30 E	6.69
LIAT	1	50 S	106	10 E	2.29
LIGITAN CHANNEL	4	18 N	118	40 E	10.26
LIGITAN GROUP	4	14 N	118	45 E	10.24
LIGITAN REEFS	4	15 N	118	30 E	10.22
LIHIMAN ISLAND	6	14 N	118	04 E	10.67
LIKIEWATANG	8	10 S	124	40 E	6.82
LIMBANG	4	45 N	115	00 E	11.80
LIMESTONE MOUNTAINS	1	34 N	117	50 E	9.66
LINCANG	1	25 N	118	42 E	9.69
LINGKAS ROAD	3	17 N	117	36 E	9.87
LITTLE PATERNOSTER ISLANDS	2	22 S	117	34 E	9.26
LITTLE REEF	4	51 N	118	16 E	10.42
LITTLEDALE SHOAL	5	06 N	114	46 E	11.60
LLEWELLYN BANK	4	16 N	117	39 E	10.11
LLOYD REEFS	4	42 N	118	16 E	10.43
LOEBOEK ANCHORAGE	5	42 S	105	33 E	4.25
LOHO BINGA	8	38 S	119	43 E	6.26
LOHO GINGGO	8	41 S	119	39 E	6.24
LOHO KARBAU	8	40 S	119	38 E	6.24
LOHO KENUPUR	8	45 S	119	48 E	6.35
LOHO KIMA	8	39 S	119	41 E	6.26
LOHO TALA	8	29 S	119	31 E	6.17
LOHO UADADASAMI	8	47 S	119	39 E	6.25
LOJAR	4	05 S	116	05 E	9.17
LOK BAKONG HILL	4	26 N	118	36 E	10.29
LORE	8	39 S	127	01 E	6.93
LOUISA REEF	6	20 N	113	14 E	11.49
LUBIDAN	5	23 N	115	21 E	11.67
LUBOCK SABAHAN	4	52 N	118	09 E	10.46
LUBUAN GILI BANTA	8	27 S	119	19 E	5.57
LUCIPERA POINT	3	14 S	106	05 E	2.17
LULUH TARE	8	31 S	119	22 E	5.59
LUMUT	4	43 N	114	27 E	11.70
LUNDU	1	41 N	109	51 E	11.5
LUTONG	4	28 N	114	00 E	11.43
LUWUK	0	57 S	122	48 E	8.51
LYDIE SHOAL	3	51 N	112	03 E	11.31
LYNN BANK	5	12 S	106	12 E	4.6
LYNN REEF	5	12 S	106	12 E	4.6
M					
MABUL REEF	4	14 N	118	38 E	10.24
MACKENZIE-GRIEVE SHOALS	5	35 N	115	11 E	11.89
MADALENE SHOALS	3	50 N	112	47 E	11.32
MADOE	7	30 S	121	46 E	6.113
MAGPIE BANK	5	45 N	119	05 E	10.58
MAGPIE ROCK	4	57 N	114	22 E	11.56
MAIN CHANNEL	7	26 N	117	14 E	10.84
MAKASSAR	5	08 S	119	24 E	7.12
MAKASSER BANKS	3	59 N	117	57 E	10.8
MALATAYUR BANK	3	48 S	113	36 E	9.9
MALAWALI CHANNEL	7	00 N	117	17 E	10.80
MALAWALI EASTERN DANGERS	7	01 N	117	27 E	10.78
MALUDAM SPIT	1	42 N	111	02 E	11.17
MANADO	1	30 N	124	50 E	7.55
MANATOETOE	8	31 S	126	01 E	6.89
MANATUTU	8	31 S	126	01 E	6.89
MANDIRALLA	6	56 N	117	20 E	10.76
MANDJAGA PEAK	8	34 S	119	50 E	6.30
MANDLIKA	6	23 S	110	55 E	3.28
MANGGAR	1	11 S	117	00 E	9.46
MANGGAR	2	53 S	108	18 E	2.69
MANGKASA OIL TERMINAL	2	44 S	121	04 E	8.98
MANGKOL MANGO	2	14 S	106	06 E	2.31
MANGSEE GREAT REEF	7	29 N	117	14 E	10.83
MANGSI GREAT REEF	7	29 N	117	14 E	10.83
MANOEK	10	55 S	123	00 E	6.107
MANSFIELD SHOAL	5	48 S	120	13 E	7.2
MAPIA	6	59 S	112	42 E	3.44
MARANAS ISLET	4	43 N	119	02 E	10.36
MARCH REEF	6	38 N	117	37 E	10.68
MARCHESA BAY	6	40 N	117	34 E	10.68
MARIANNE REEF	7	31 S	121	13 E	6.114
MARIE SHOAL	3	41 N	112	48 E	11.32
MARTABAN BANK	4	11 S	117	03 E	9.28
MARUDU BAY	6	58 N	116	56 E	10.88
MASALEMBO-BESAR	5	33 S	114	26 E	3.74
MASALEMBO-KECIL	5	26 S	114	26 E	3.74
MASPARI	3	13 S	106	13 E	2.18
MASSIRI STRAIT	5	35 S	122	33 E	8.79
MATA GATEH	8	34 S	119	12 E	5.54
MATANG WUTUN	8	37 S	122	53 E	6.63
MATARAM	8	35 S	116	06 E	5.26
MAU META	8	16 S	125	36 E	6.83
MAUBARA	8	37 S	125	12 E	6.86
MAUMERE	8	37 S	122	13 E	6.51
MAYNE ROCK	6	28 N	116	18 E	11.111
MCDOUGALL POINT	1	37 N	110	27 E	11.12
MEANDER PATCH	7	10 N	117	37 E	10.73
MEDUSA	5	46 S	105	16 E	4.24
MEDUSA REEF	8	35 S	116	03 E	5.25
MEEUWEN BAAI	6	42 S	105	18 E	4.19
MEEUWEN EIL	6	44 S	105	16 E	4.19
MELAJU	8	56 S	116	30 E	5.31
MELAMBIRI	5	14 S	120	26 E	8.92
MELANG WUTUN	8	17 S	123	47 E	6.68

	Position °	'	°	'	Sec. Para
MELAU BESAR	6	47 N	116	50 E	10.92
MELOLO ROAD	9	53 S	120	40 E	6.7
MEMPAKAD	6	41 N	116	57 E	10.89
MENADO	1	30 N	124	50 E	7.55
MENDONO	1	08 S	122	42 E	8.52
MENGARUN	3	04 S	107	59 E	2.77
MENULUN	3	13 N	117	38 E	9.86
MENUMBING	2	01 S	105	11 E	2.5
MERAK	5	56 S	106	00 E	4.13
MERAK BESAR	5	56 S	105	59 E	4.11
MERAK MAS TERMINAL	5	55 S	105	59 E	4.11
MERAK PETROLEUM BASE	5	55 S	106	00 E	4.11
MERANGAN	6	56 S	113	42 E	3.51
MERRETT REEFS	4	41 N	118	18 E	10.43
MIDDEN BANK	4	00 S	122	54 E	8.66
MIDDLE BANK	2	07 N	111	19 E	11.20
MIDDLE BANK	4	00 S	122	54 E	8.66
MIDDLE PATCHES	5	37 N	115	19 E	11.90
MIDDLE SAPONDA	3	59 S	122	46 E	8.63
MILLER ROCK	6	34 N	117	59 E	10.69
MIRI	4	32 N	113	58 E	11.41
MISANMISAN REEF	4	56 N	118	16 E	10.48
MISKAM	6	28 S	105	44 E	4.17
MOLLEANGAN KECHIL	7	05 N	117	01 E	10.85
MOLOSSO	0	55 N	123	58 E	7.53
MONMOUTH SHOALS	6	42 N	118	07 E	10.73
MOODY REEF	5	35 N	112	23 E	11.48
MOORHEN REEFS	4	52 N	118	12 E	10.46
MORESSES ISLANDS	4	23 S	115	48 E	9.12
MORO MAHO	6	07 S	124	37 E	8.70
MOSQUITO ROCK	6	58 N	117	29 E	10.77
MOSTYN	4	41 N	118	15 E	10.44
MOTA MASIN	9	28 S	125	05 E	6.86
MOTI TOI	8	19 S	118	16 E	5.49
MOUNT BAGAHAK	5	03 N	118	46 E	10.55
MOUNT COCHRAN	6	38 N	116	39 E	11.112
MOUNT CONNER	4	24 N	118	34 E	10.21
MOUNT HATTON	5	15 N	118	42 E	10.61
MOUNT KINABALU	6	05 N	116	33 E	11.102
MOUNT LAMBOLO	5	05 S	122	48 E	8.78
MOUNT MAGDALENA	4	30 N	117	55 E	10.2
MOUNT MARK	4	59 N	118	11 E	10.46
MOUNT SEDUNGAL	4	38 N	118	34 E	10.23
MOUNT WULLERSTORF	4	27 N	118	09 E	10.3
MOUTONG	0	27 N	121	14 E	8.23
MOYSEY SHOALS	4	14 N	117	54 E	10.15
MUARA BATAGAU	3	22 N	117	31 E	9.89
MUARA BAYOR	0	43 S	117	34 E	9.51
MUARA BEKAPAI	0	53 S	117	27 E	9.51
MUARA BERAU	0	16 S	117	32 E	9.51
MUARA BERAU LIGHT	0	20 S	117	30 E	9.51
MUARA GUNTUNG	2	07 N	118	00 E	9.78
MUARA HARBOR	5	02 N	115	04 E	11.74
MUARA JAWA	0	54 S	117	15 E	9.50
MUARA MAKAPAN	3	03 N	117	41 E	9.82
MUARA PANTAI	1	57 N	118	00 E	9.78
MUARA PEGAH	0	55 S	117	18 E	9.50
MUARA PEGAH LIGHT	0	52 S	117	18 E	9.49
MUARA SABAWANG	3	30 N	117	40 E	9.88
MUARA SELOR	2	48 N	117	42 E	9.82
MUARA TIDUNG	2	10 N	118	00 E	9.78
MUARAS REEF	1	50 N	118	54 E	9.71
MUKAH	2	54 N	112	06 E	11.29
MULIGI PATCHES	6	56 N	118	02 E	10.73
MUNA ISLAND	5	00 S	122	30 E	8.80
MUNDI	8	44 S	115	31 E	5.21
MUNTOK	2	04 S	105	10 E	2.4
MURI	1	54 N	108	39 E	1.17

N

NAMBO BAY	5	25 S	122	34 E	8.81
NAMBOLAKI	6	42 S	120	17 E	7.5
NANGA ROEDJONG BAY	8	30 S	121	41 E	6.47
NANGAELE BAY	8	48 S	120	09 E	6.37
NANGAMESI BAY	9	37 S	120	20 E	6.5
NAP ROCKS	1	43 N	110	18 E	11.8
NASSAU REEF	5	49 S	106	49 E	3.14
NASU PENIDA	8	44 S	115	32 E	5.20
NDAO	10	49 S	122	40 E	6.108
NEMESIS BANK	2	53 S	105	59 E	2.18
NGALU BU	8	29 S	121	50 E	6.47
NGALU LJUKATE	8	48 S	122	00 E	6.39
NGALU POLA BOKO	8	28 S	121	37 E	6.47
NGARU BERE	8	57 S	121	00 E	6.37
NGARU ITJU KATE	8	48 S	122	00 E	6.39
NGARU KELAHI	8	42 S	122	32 E	6.40
NICHOLS REEF	4	49 N	118	14 E	10.42
NIGER BANK	2	09 N	109	39 E	1.65
NILA TOETOEN	7	33 S	126	37 E	6.84
NILA TUTUN	7	33 S	126	37 E	6.84
NISA LEME	8	37 S	119	21 E	5.59
NISA TOSSO	8	34 S	119	02 E	5.53
NOESA	5	45 S	112	32 E	3.74
NOESA BESAR	8	44 S	115	31 E	5.21
NOESA BESAR	8	44 S	115	32 E	5.20
NORDWACHTER	0	35 N	119	48 E	7.39
NORMANBY BANK	5	48 N	119	13 E	10.58
NORMANHURST REEF	4	45 N	118	18 E	10.42
NORTH BANGKALAN	1	10 S	123	17 E	8.49
NORTH BANK	3	23 S	122	30 E	8.61
NORTH FURIOUS SHOALS	7	02 N	116	19 E	11.117
NORTH GREIG SHOAL	0	52 S	108	33 E	2.82
NORTH HAYCOCK	3	18 N	107	33 E	1.12
NORTH HILL ROCK	6	28 N	116	18 E	11.111
NORTH HINDER	3	16 S	122	28 E	8.61
NORTH ISLAND	5	39 S	120	26 E	7.2
NORTH JERIJEH SANDS	2	14 N	111	10 E	11.21
NORTH LUCONIA SHOALS	5	30 N	112	34 E	11.48
NORTH NARROWS	4	56 S	122	48 E	8.76
NORTH REEF	3	32 S	122	30 E	8.61
NORTH REEF	4	05 S	122	54 E	8.67
NORTH SAPONDA	3	53 S	122	49 E	8.63
NORTHWEST BLUFF	6	44 N	117	23 E	10.75
NOSONG PATCH	5	39 N	115	33 E	11.87
NOSONG SHOALS	5	43 N	115	30 E	11.90
NOVA KOEN	8	22 S	127	04 E	6.91
NOVA ZAZARA	8	22 S	127	04 E	6.91
NUHA LOBETOBI	8	36 S	122	51 E	6.55
NUSA	5	45 S	112	32 E	3.74
NUSA BARUNG	8	29 S	113	20 E	4.47
NUSA BELANG	8	09 S	123	01 E	6.55
NUSA CENINGAN	8	42 S	115	27 E	5.21
NUSA DUA	8	48 S	115	14 E	5.18
NUSA KAMBANGAN	7	44 S	108	55 E	4.38
NUSA LEMBONGAN	8	40 S	115	28 E	5.21
NUSA LONGGO	8	21 S	120	08 E	6.42
NUSA LONGOS	8	21 S	120	08 E	6.42
NUSA MANOEK	10	55 S	123	00 E	6.107
NUSA MANUK	10	55 S	123	00 E	6.107
NUSA PENIDA	8	44 S	115	32 E	5.21
NUSA TJENINGAN	8	42 S	115	27 E	5.21
NYMPHE REEF	5	44 N	118	40 E	10.60

O

OEDJOENG KANGGALAN	5	48 S	105	48 E	4.4
OEMBAR	5	43 S	104	54 E	4.32
OEMBELE ISLAND	3	04 S	122	30 E	8.58
OESOE BAAI	2	40 S	121	02 E	8.97
OLIONUHE	0	35 N	121	50 E	8.15
OMBAI STRAIT	8	40 S	124	40 E	6.83
ONTARIO REEF	1	59 S	108	39 E	2.80
OSTERLY REEFS	3	20 S	108	37 E	2.75
OUTER SHOAL	5	15 N	115	15 E	11.66
OUTER SHOAL	7	02 N	117	00 E	10.87

P

PABEAN SANUR	8	40 S	115	16 E	5.16
PADABALE	3	01 S	122	20 E	8.59
PADANG	6	11 S	120	26 E	7.5
PADANG BANK	4	02 N	117	56 E	10.8
PADAS BAY	5	10 N	115	32 E	11.84
PADEA KETJIL	3	33 S	123	02 E	8.62
PAGGER	0	49 N	118	23 E	9.63
PAGIMANA	0	47 S	122	39 E	8.34
PAISLEY SHOAL	5	48 N	115	20 E	11.90
PALAU DAMAR-BESAR	5	58 S	106	51 E	3.7
PALEMBANG	2	59 S	104	46 E	2.9
PALIMA	4	20 S	120	22 E	8.95

	Position °	'	°	'	Sec. Para
PALOE BAII	0	45 S	119	49 E	7.32
PALOH	8	22 S	116	08 E	5.28
PALOPALO MOUNTAINS	3	32 S	116	02 E	9.16
PALOPO BAY	2	59 S	120	13 E	8.97
PAMANUKAN ROCK	6	01 S	107	53 E	3.18
PAMUNGGUTAN	5	29 S	105	16 E	4.28
PANARUKAN	7	42 S	113	56 E	3.63
PANCALIRANG BESAR	5	27 S	106	34 E	3.13
PANCALIRANG KECIL	5	28 S	106	33 E	3.1
PANDAN HILL	4	04 S	114	38 E	9.10
PANDAN PUNEI	5	15 N	115	10 E	11.61
PANDJANG	6	58 S	120	47 E	6.116
PANGAH BATANG	8	29 S	122	28 E	6.52
PANGKALPINANG	2	07 S	106	07 E	2.35
PANGUAN ISLET	4	43 N	119	02 E	10.36
PANJANG	5	28 S	105	19 E	4.26
PANJUNG PANTJONG	5	50 S	105	46 E	4.4
PANKAMANDRA	4	17 S	119	17 E	7.17
PANTAI TIMUR	8	45 S	115	12 E	5.17
PANTAI WONRELI	8	05 S	127	08 E	6.84
PANTJONG	5	50 S	105	46 E	4.4
PANTOLOAN	0	42 S	119	51 E	7.35
PAPAJATO	0	29 N	121	28 E	8.20
PAPAYATO	0	29 N	121	28 E	8.20
PAREPARE	4	01 S	119	37 E	7.23
PARIGI ROAD	0	49 S	120	11 E	8.27
PARSONS SHOAL	3	54 N	112	15 E	11.31
PASALAT REEF	4	30 N	118	44 E	10.32
PASANG TENANG	6	08 S	105	51 E	4.17
PASANGTENENG ROAD	6	08 S	105	52 E	4.17
PASAR HADAKEWA	8	22 S	123	33 E	6.70
PASARWADJO BAY	5	28 S	122	53 E	8.73
PASI BELONGKA	3	32 S	120	26 E	8.96
PASI TANGAN	3	37 S	119	26 E	7.25
PASIE BULU MATA	1	09 N	120	37 E	7.44
PASIR DUA BELAS	2	48 N	111	26 E	11.27
PASIR LAYARAN	7	46 S	122	18 E	6.49
PASIR RITA	8	26 S	121	18 E	6.45
PASONGSONGAN	6	53 S	113	40 E	3.49
PASSAGE REEF	6	59 N	117	17 E	10.76
PASURUAN	7	37 S	112	55 E	3.57
PATIMBAN (PAMANUKAN)	6	14 S	107	54 E	3.17
PATJITAN	8	15 S	111	05 E	4.42
PATRICIA SHOALS	3	38 N	113	03 E	11.32
PEAK OF KINANDUKAN	5	43 N	115	54 E	11.94
PEDADA BAAI	5	45 S	105	13 E	4.30
PEGASUS REEF	5	46 N	118	50 E	10.60
PEKALONGAN	6	51 S	109	42 E	3.25
PEKATJANG	1	10 S	105	18 E	2.27
PELABUHAN LAMAKERA	8	27 S	123	10 E	6.62
PELABUHAN PARIGI	0	49 S	120	11 E	8.27
PELABUHAN SEMEN TUBAN	6	47 S	111	54 E	3.38
PELABUHAN SERASAN	2	30 N	109	01 E	1.16
PELABUHAN TUBANG	1	45 S	125	06 E	8.39
PELABUHANRATU	6	59 S	106	32 E	4.36
PELONG ROCKS	5	05 N	115	03 E	11.65
PEMUTUS	3	05 N	106	20 E	1.48
PENDEK ISLAND	5	13 S	122	44 E	8.77
PENGASTULAN	8	11 S	114	56 E	5.11
PENGRANGAN	5	46 S	105	12 E	4.30
PENIBUNGAN	0	24 N	108	56 E	1.72
PEPER BAAI	5	48 S	105	13 E	4.30
PERMATANG MASHOR	3	58 N	113	22 E	11.33
PERMATANG PAYONG	3	49 N	113	15 E	11.33
PERTAMINA LIGHT	0	56 S	122	49 E	8.51
PETREL SHOALS	7	04 N	117	07 E	10.87
PIABUNG	5	37 S	105	10 E	4.29
PIAPOENG	5	37 S	105	10 E	4.29
PIBIA TUTUN	8	01 S	125	48 E	6.84
PINANGKUNING	0	35 N	107	10 E	1.31
PINE POINT SHOALS	5	31 N	115	27 E	11.87
PIRATE POINT	6	46 N	116	51 E	10.90
PISANI BANK	6	07 S	118	17 E	5.68
PISING BAY	5	05 S	121	56 E	8.83
POEHAWANG	5	41 S	105	13 E	4.29
POELASI	6	41 S	120	26 E	6.117
POELOE DOEA	3	16 S	122	31 E	8.61
POELOE TIGA	3	23 S	122	36 E	8.62
POELOEHARI BANKS	4	01 S	122	45 E	8.63
POLE REEF	6	46 N	117	40 E	10.71
POLENG OIL FIELD	6	40 S	112	55 E	3.39
POLEWALI ROAD	3	28 S	119	20 E	7.26
POMALAA	4	10 S	121	36 E	8.88
PONTA CHATER	8	20 S	127	00 E	6.91
PONTIANAK	0	01 S	109	20 E	1.76
PORTER PATCH	4	54 N	114	24 E	11.56
POSO	1	22 S	120	45 E	8.37
POWELL SHOAL	6	18 N	118	06 E	10.67
PRESTON SHOAL	6	22 N	116	18 E	11.109
PRICE SHOALS	5	45 N	115	32 E	11.90
PRITCHARD BANK	6	39 N	115	59 E	11.106
PROBOLINGGO	7	45 S	113	13 E	3.59
PROTET REEFS	3	03 S	108	29 E	2.74
PT BERAU COAL ANCHORAGE	1	59 N	118	08 E	9.78
PUDSEY DAWSON DANGERS	7	03 N	117	46 E	10.73
PUDSEY REEFS	4	45 N	118	21 E	10.41
PULAI LANGKAI	5	02 S	119	05 E	7.14
PULAU ADAL	4	45 N	118	31 E	10.41
PULAU ADUNARA	8	09 S	123	12 E	6.56
PULAU AERMASIN	1	17 S	109	08 E	2.96
PULAU AHUS	3	50 N	117	48 E	10.4
PULAU AIR ASUK	3	15 N	106	18 E	1.46
PULAU AKAR	3	02 N	106	24 E	1.50
PULAU ALANG	4	57 N	115	11 E	11.73
PULAU ALOANG	7	23 S	117	48 E	5.74
PULAU AMBUNGI	2	04 S	117	16 E	9.37
PULAU ANAKAWUR	0	33 N	106	59 E	1.30
PULAU ANAKKARAJAAN	4	05 S	116	15 E	9.17
PULAU ARAAN	6	29 S	115	45 E	5.66
PULAU ATAURO	8	15 S	125	34 E	6.83
PULAU AYERABU	2	46 N	106	14 E	1.38
PULAU AYERABU (PULAU AIRABU)	2	46 N	106	14 E	1.38
PULAU AYER-BESAR	6	00 S	106	47 E	3.9
PULAU AYERMASIN	3	15 S	108	23 E	2.75
PULAU BABABAN	8	24 S	111	42 E	4.44
PULAU BABAJIE	8	24 S	121	01 E	6.44
PULAU BABI	8	26 S	122	30 E	6.52
PULAU BADJO	8	29 S	119	52 E	6.33
PULAU BADU KANG	4	59 N	115	04 E	11.75
PULAU BAHOELOEANG	6	29 S	120	26 E	7.5
PULAU BAHULUANG	6	29 S	120	26 E	7.5
PULAU BAIK	4	57 N	118	15 E	10.46
PULAU BAJAU	3	08 N	106	19 E	1.47
PULAU BAJO	8	29 S	119	52 E	6.33
PULAU BAKAU	2	41 S	108	25 E	2.70
PULAU BAKAU	2	54 N	108	44 E	1.14
PULAU BAKAU	3	02 S	107	09 E	2.48
PULAU BAKAU	8	42 S	118	01 E	5.47
PULAU BAKI	4	09 S	119	36 E	7.23
PULAU BAKUNG-KECIL	1	35 S	109	12 E	2.85
PULAU BALABALANGAN	2	32 S	117	57 E	9.36
PULAU BALAI	1	17 S	109	10 E	2.96
PULAU BALAK	7	08 N	117	08 E	10.85
PULAU BALAMBANGAN	1	47 N	119	00 E	9.71
PULAU BALAMBANGAN	7	16 N	116	56 E	10.85
PULAU BALANG-CADI	4	57 S	119	25 E	7.19
PULAU BALANG-TJADI	4	57 S	119	25 E	7.19
PULAU BALAOHONG	6	53 S	118	55 E	5.71
PULAU BALUSUAN	4	41 N	118	32 E	10.40
PULAU BANAWAYA	6	50 S	119	12 E	5.70
PULAU BANDANG	1	41 S	123	27 E	8.46
PULAU BANGGAI	1	36 S	123	31 E	8.45
PULAU BANGGI	7	14 N	117	10 E	10.81
PULAU BANGKA	1	48 N	125	09 E	8.5
PULAU BANGKALAN PAUNO	1	10 S	123	17 E	8.49
PULAU BANGKAN	7	01 S	115	41 E	5.64
PULAU BANGKAU	8	33 S	119	47 E	6.29
PULAU BANGKIL	1	03 N	123	06 E	7.50
PULAU BANGKOELOE	1	50 S	123	06 E	8.46
PULAU BANKA OELUANG	5	30 S	118	38 E	5.69
PULAU BANKOBANKOANG	4	47 S	119	26 E	7.18
PULAU BANKULU	1	50 S	123	06 E	8.46
PULAU BANTA	8	26 S	119	18 E	5.57
PULAU BARANGLOMPO	5	03 S	119	20 E	7.19
PULAU BARSOE PANDA	8	32 S	119	14 E	5.57
PULAU BARSU PANDA	8	32 S	119	14 E	5.57
PULAU BASA	4	50 S	121	30 E	8.86
PULAU BATANG	8	25 S	111	45 E	4.44
PULAU BATIK	4	43 N	118	27 E	10.40
PULAU BATOE	7	02 S	120	45 E	6.117
PULAU BATOEATA	6	12 S	122	41 E	8.73
PULAU BATU	7	02 S	120	45 E	6.117
PULAU BATU GARAM	3	22 N	106	20 E	1.46
PULAU BATUDAKA	0	30 S	121	47 E	8.32

	Position °	'	°	'	Sec. Para
PULAU BATUDINDING	2	49 S	107	24 E	2.49
PULAU BAWAL	2	43 S	110	05 E	2.101
PULAU BEDIL	8	24 S	117	04 E	5.38
PULAU BEDUA	0	57 N	107	30 E	1.24
PULAU BELANAK	3	37 N	117	11 E	9.92
PULAU BELANG	8	33 S	116	47 E	5.38
PULAU BELITUNG	2	54 S	107	55 E	2.56
PULAU BELUPUT	3	20 S	108	27 E	2.75
PULAU BENTENAN	0	58 N	124	54 E	8.9
PULAU BENUA	0	57 N	107	27 E	1.23
PULAU BERIKAT	2	28 S	106	58 E	2.39
PULAU BESAR	2	53 S	106	08 E	2.15
PULAU BESAR	8	28 S	122	22 E	6.52
PULAU BESI	1	39 S	109	03 E	2.85
PULAU BILA	5	45 S	112	36 E	3.74
PULAU BILANGBILANGAN	1	34 N	118	57 E	9.69
PULAU BILLEAN	6	37 N	117	46 E	10.70
PULAU BINONGKO	5	56 S	124	00 E	8.69
PULAU BIRAH BIRAHAN	0	41 N	118	28 E	9.64
PULAU BOASALA	8	36 S	119	47 E	6.34
PULAU BOELOENROEE	5	07 S	120	24 E	8.92
PULAU BOETON	5	00 S	122	54 E	8.71
PULAU BOHAYAN	4	48 N	118	19 E	10.41
PULAU BOHAYDULONG	4	36 N	118	47 E	10.32
PULAU BOKKI	1	06 N	121	49 E	7.48
PULAU BONE RATE	7	21 S	121	07 E	6.115
PULAU BUAN	1	29 S	109	03 E	2.98
PULAU BUANING	6	59 N	117	30 E	10.78
PULAU BUAYA BUAYA	1	25 N	118	30 E	9.68
PULAU BUKABUKA	0	45 S	121	45 E	8.34
PULAU BUKULIMAU	2	49 S	108	24 E	2.73
PULAU BULUNRUE	5	07 S	120	24 E	8.92
PULAU BUM BUM	4	28 N	118	41 E	10.31
PULAU BUNGIN	1	02 N	107	31 E	1.21
PULAU BUNGINNJAMPUR	6	36 S	115	30 E	5.67
PULAU BUNGURAN BESAR	3	56 N	108	14 E	1.5
PULAU BURONG	1	38 N	110	48 E	11.14
PULAU BURONG	5	14 N	115	11 E	11.66
PULAU BURUNG	3	42 N	108	02 E	1.8
PULAU BURUNG	8	27 S	117	02 E	5.39
PULAU BUSUNG	3	14 N	106	28 E	1.54
PULAU BUSUNG SERLANG	2	35 S	108	19 E	2.67
PULAU BUTUNG	5	00 S	122	54 E	8.71
PULAU CELAKA	2	52 S	107	01 E	2.45
PULAU CELUKANBAWANG	8	11 S	114	50 E	5.10
PULAU CEMPEDAK	2	38 S	110	07 E	2.101
PULAU CHERMIN	4	56 N	115	01 E	11.77
PULAU CHURMIN	4	56 N	115	01 E	11.77
PULAU DAAT	5	16 N	115	19 E	11.68
PULAU DAHUDAHU	5	13 S	122	05 E	8.83
PULAU DAJANGDAJANGAN	5	24 S	119	11 E	7.10
PULAU DAMBILAH	8	28 S	122	26 E	6.52
PULAU DANA	10	50 S	121	17 E	6.112
PULAU DANA	11	00 S	122	53 E	6.108
PULAU DANAWAN	4	18 N	118	51 E	10.24
PULAU DANGAR BESAR	8	26 S	117	40 E	5.46
PULAU DAPUR	3	08 S	106	31 E	2.16
PULAU DATU	0	08 N	108	36 E	1.73
PULAU DATUK	0	08 N	108	36 E	1.73
PULAU DAYANGDAYANGAN	5	24 S	119	11 E	7.10
PULAU DE HAAN	3	29 S	122	29 E	8.61
PULAU DELI	7	01 S	105	32 E	4.36
PULAU DERAWAN	2	17 N	118	14 E	9.76
PULAU DEWAKANG-CADI	5	30 S	118	28 E	5.68
PULAU DEWAKANG-LOMPO	5	24 S	118	26 E	5.68
PULAU DINAWAN	5	51 N	115	59 E	11.95
PULAU DJAILAMU	6	33 S	118	48 E	5.70
PULAU DOANGDOANGAN-KECIL	5	15 S	117	53 E	5.68
PULAU DOKAN	0	58 S	105	39 E	2.27
PULAU DUA	1	17 S	109	12 E	2.96
PULAU DUA	3	04 N	117	37 E	9.85
PULAU DUA	3	16 S	122	31 E	8.61
PULAU DUA	5	25 S	106	28 E	4.8
PULAU DUA	8	43 S	116	44 E	5.37
PULAU DUMDUM	1	12 N	106	53 E	1.33
PULAU DURAI	3	20 N	106	03 E	1.35
PULAU EGOT	6	18 N	116	18 E	11.107
PULAU ENDE	8	52 S	121	32 E	6.38
PULAU ENOE	5	15 N	115	14 E	11.66
PULAU GADOH	8	35 S	119	48 E	6.34
PULAU GANGGA	1	47 N	125	03 E	8.4
PULAU GAYA	4	37 N	118	45 E	10.32
PULAU GAYA	6	01 N	116	02 E	11.97
PULAU GELAM	2	53 S	110	10 E	2.103
PULAU GELASA	2	25 S	107	04 E	2.39
PULAU GENTING	5	51 S	110	36 E	3.33
PULAU GENTINGUNYUT	3	08 N	106	05 E	1.35
PULAU GERSIK	3	00 S	107	16 E	2.50
PULAU GOAGOA	7	08 S	114	46 E	3.69
PULAU GOSONGMANGKOK	3	20 S	116	25 E	9.18
PULAU GULISAAN	6	09 N	118	03 E	10.66
PULAU GUNDUL	5	47 S	110	35 E	3.33
PULAU GUSUNGAN	4	18 N	118	33 E	10.28
PULAU HAGEDIS	6	12 S	122	41 E	8.73
PULAU HALURA	10	19 S	120	12 E	6.11
PULAU HANTU	1	03 S	109	18 E	2.89
PULAU HIU	5	45 S	105	01 E	4.31
PULAU HIU	5	45 S	105	01 E	4.31
PULAU HIU (HIOE)	5	45 S	105	01 E	4.32
PULAU HOORN	2	50 S	107	29 E	2.61
PULAU IGANGAN	6	40 S	115	38 E	5.66
PULAU IMPUL	3	05 N	105	43 E	1.34
PULAU JACO	8	26 S	127	20 E	6.93
PULAU JAGAUTARA	5	12 S	106	28 E	4.5
PULAU JAGUNG	5	29 S	106	31 E	4.8
PULAU JAILAMU	6	33 S	118	48 E	5.70
PULAU JAMBONGAN	6	41 N	117	27 E	10.71
PULAU JANGKULAN	0	45 N	107	19 E	1.33
PULAU JEMAJA	2	56 N	105	46 E	1.26
PULAU JEMBONGAN	6	41 N	117	27 E	10.74
PULAU JUANTA	1	21 S	109	45 E	2.93
PULAU KABAENA	5	17 S	121	55 E	8.83
PULAU KABALADUA	2	30 S	117	54 E	9.37
PULAU KABUNG	0	50 N	108	47 E	1.73
PULAU KADAPONGAN	4	42 S	115	43 E	9.15
PULAU KADATOEANG	5	33 S	122	30 E	8.79
PULAU KADATUANG	5	33 S	122	30 E	8.79
PULAU KAKABAN	2	09 N	118	32 E	9.73
PULAU KAKABIA	6	54 S	122	13 E	6.113
PULAU KALAMPUNIAN	7	03 N	116	45 E	11.118
PULAU KALAMPUNIAN BESAR	5	45 N	115	40 E	11.92
PULAU KALAMPUNIAN DAMIT	5	46 N	115	41 E	11.92
PULAU KALANGBAHU	3	02 S	107	10 E	2.48
PULAU KALAO	7	18 S	120	56 E	6.115
PULAU KALAOTOA	7	23 S	121	48 E	6.113
PULAU KALEDOAPA	5	32 S	123	46 E	8.68
PULAU KALEDOEPA	5	32 S	123	46 E	8.68
PULAU KALEDUPA	5	32 S	123	46 E	8.68
PULAU KALONG	8	30 S	116	52 E	5.38
PULAU KALUKALUKUANG	5	12 S	117	40 E	5.68
PULAU KAMARIAN-BESAR	2	22 S	117	17 E	9.39
PULAU KAMBANGLAMARI	7	04 S	118	00 E	5.73
PULAU KAMBING	7	18 S	113	13 E	3.46
PULAU KAMBING	8	27 S	118	42 E	5.50
PULAU KANAWA	8	30 S	119	46 E	6.28
PULAU KANDANGBALAK	5	53 S	105	46 E	4.4
PULAU KANGEAN	6	55 S	115	20 E	5.63
PULAU KANIS	2	38 S	108	12 E	2.66
PULAU KANIUNGAN-BESAR	1	07 N	118	51 E	9.68
PULAU KAOENA	7	26 S	122	05 E	6.113
PULAU KAPAL	6	02 S	106	44 E	3.11
PULAU KAPALAI	4	13 N	118	41 E	10.24
PULAU KAPALE	4	35 N	118	55 E	10.35
PULAU KAPOPOSANG	4	42 S	118	57 E	7.16
PULAU KAPOPOSANGBALI	7	30 S	117	11 E	5.75
PULAU KARAJAAN	4	06 S	116	12 E	9.17
PULAU KARANGMAS	7	40 S	114	26 E	3.65
PULAU KARANGRAJA	2	35 S	108	44 E	2.71
PULAU KARANRANG	4	52 S	119	23 E	7.19
PULAU KARIMATA	1	37 S	108	53 E	2.83
PULAU KARIMUNJAWA	5	51 S	110	27 E	3.30
PULAU KAROMPA LOMPO	7	17 S	121	46 E	6.113
PULAU KARUMPUTAN	4	03 S	116	10 E	9.17
PULAU KAUN	8	28 S	117	00 E	5.40
PULAU KAUNA	6	53 S	120	47 E	6.116
PULAU KAUNA	7	26 S	122	05 E	6.113
PULAU KAYUADI	6	48 S	120	48 E	6.116
PULAU KEBATU	3	48 S	108	04 E	2.77
PULAU KELAPA	8	40 S	119	14 E	5.54
PULAU KELAWAR	1	18 S	109	08 E	2.96
PULAU KELEMAR	2	58 S	107	14 E	2.47
PULAU KELMANBANG	2	47 S	107	32 E	2.60
PULAU KELOR	8	33 S	119	49 E	6.33
PULAU KEMBAR	5	44 S	110	11 E	3.31

	Position °	'	°	'	Sec. Para
PULAU KEMUDJAN	5	48 S	110	29 E	3.31
PULAU KEMUJAN	5	48 S	110	29 E	3.31
PULAU KENNEDY	3	21 S	107	42 E	2.79
PULAU KENTI OLE	5	43 S	124	29 E	8.70
PULAU KEPAHIANG	0	38 N	107	01 E	1.31
PULAU KERAMAN	5	14 N	115	08 E	11.64
PULAU KERAMIAN	5	04 S	114	36 E	9.13
PULAU KERANDJI	7	42 S	113	35 E	3.60
PULAU KERISIAN	4	02 S	116	12 E	9.18
PULAU KETAPANG	3	25 S	107	57 E	2.77
PULAU KETAPANG	7	41 S	113	15 E	3.58
PULAU KILUAN	5	47 S	105	06 E	4.32
PULAU KINGARAN	4	57 N	115	01 E	11.76
PULAU KISAR	8	01 S	127	12 E	6.84
PULAU KITANG	4	53 N	115	06 E	11.79
PULAU KOEMBA	8	16 S	124	24 E	6.78
PULAU KOKOILA	3	29 S	122	54 E	8.62
PULAU KOKOTOAN	8	29 S	119	51 E	6.32
PULAU KOMBA	7	48 S	123	35 E	6.54
PULAU KOMODO	8	35 S	119	27 E	5.58
PULAU KONJELAN	8	17 S	111	27 E	4.43
PULAU KONYELAN	8	17 S	111	27 E	4.43
PULAU KOTAK	10	19 S	120	10 E	6.11
PULAU KRA	1	42 N	110	18 E	11.8
PULAU KRAKATAU	6	09 S	105	26 E	4.21
PULAU KRAMAT	1	54 S	124	20 E	8.40
PULAU KRAMAT	8	10 S	114	59 E	5.11
PULAU KRAMIAH	3	15 S	107	45 E	2.79
PULAU KRAWANG	1	44 S	109	20 E	2.83
PULAU KROMO	8	23 S	117	05 E	5.38
PULAU KUDINGARENGKEKE	5	06 S	119	17 E	7.14
PULAU KUEAL	2	59 S	107	08 E	2.47
PULAU KUKUBAN	6	56 N	117	24 E	10.77
PULAU KULAPUAN	4	32 N	118	51 E	10.32
PULAU KUMBA	8	16 S	124	24 E	6.78
PULAU KUMEKE	0	48 N	124	40 E	8.10
PULAU KUNYIT	4	06 S	116	03 E	9.16
PULAU KUPIAH	5	47 S	105	48 E	4.4
PULAU KURICADDI	5	02 S	119	28 E	7.20
PULAU LABENGKE	3	27 S	122	26 E	8.60
PULAU LABUAN	5	20 N	115	13 E	11.61
PULAU LAELAE	5	08 S	119	23 E	7.11
PULAU LAELAE BESAR	5	08 S	119	23 E	7.11
PULAU LAHALURA	10	19 S	120	12 E	6.11
PULAU LAI	10	52 S	123	04 E	6.107
PULAU LAILA	4	56 N	118	14 E	10.49
PULAU LAKATAAN	6	59 N	117	12 E	10.76
PULAU LAKEI	1	45 N	110	30 E	11.7
PULAU LAMBASINA-BESAR	4	05 S	121	21 E	8.88
PULAU LAMBIDAN	5	23 N	115	21 E	11.67
PULAU LAMUDAAN-KETCIL	2	27 S	117	30 E	9.38
PULAU LAMURUANG	7	18 S	118	06 E	5.73
PULAU LANCANG	5	56 S	106	35 E	3.8
PULAU LANDAYANG	6	48 N	117	21 E	10.75
PULAU LANGKOI	8	44 S	119	23 E	5.59
PULAU LANGKUAS	2	32 S	107	37 E	2.57
PULAU LANKAYAN	6	30 N	117	55 E	10.69
PULAU LANYUKANG	4	59 S	119	04 E	7.15
PULAU LAPAN	8	14 S	124	02 E	6.72
PULAU LAPANG	8	14 S	124	02 E	6.73
PULAU LARAPAN	4	34 N	118	36 E	10.38
PULAU LAUT	3	40 S	116	10 E	9.16
PULAU LAUT	4	43 N	107	59 E	1.3
PULAU LAWANG	8	37 S	119	32 E	6.21
PULAU LAYANG	5	47 N	115	53 E	11.95
PULAU LEGOENDI	5	50 S	105	14 E	4.24
PULAU LEGUNDI	5	50 S	105	14 E	4.24
PULAU LEMBEH	1	29 N	125	14 E	8.6
PULAU LEMUKUTAN	0	46 N	108	43 E	1.74
PULAU LEONAN	6	44 N	117	37 E	10.71
PULAU LESAMPOEANG	1	30 S	122	44 E	8.48
PULAU LESAMPUANG	1	30 S	122	44 E	8.48
PULAU LEWUTOKIDI	5	36 S	122	30 E	8.79
PULAU LIANG	8	32 S	117	41 E	5.46
PULAU LIANG MAJA	8	32 S	117	41 E	5.46
PULAU LIAT	2	52 S	107	03 E	2.45
PULAU LIBARAN	6	07 N	118	01 E	10.66
PULAU LIGITAN	4	10 N	118	53 E	10.25
PULAU LILIKANG	6	48 S	119	11 E	5.70
PULAU LIMAU LIMAUAN	6	50 N	116	52 E	10.90
PULAU LINTANG	2	43 N	106	16 E	1.38
PULAU LIRAN	8	00 S	125	45 E	6.83
PULAU LIUKANGLU	5	39 S	120	26 E	7.2
PULAU LUBIDAN	5	23 N	115	21 E	11.67
PULAU LUCIPARA	3	13 S	106	13 E	2.18
PULAU LUMULUMU	2	56 S	117	42 E	9.28
PULAU LUMULUMU	4	59 S	119	13 E	7.15
PULAU LUYUNG	3	11 N	106	22 E	1.58
PULAU LYANG	5	47 N	115	53 E	11.95
PULAU MACAN	1	39 S	109	20 E	2.83
PULAU MADOE	7	30 S	121	46 E	6.113
PULAU MADU	7	30 S	121	46 E	6.113
PULAU MAGANTING	4	49 N	118	17 E	10.42
PULAU MAIGA	4	36 N	118	41 E	10.33
PULAU MAITEM	5	36 S	105	15 E	4.28
PULAU MAJINKIL	4	47 N	118	18 E	10.41
PULAU MALAWALI	7	03 N	117	18 E	10.78
PULAU MALIANGIN KECHIL	7	05 N	117	01 E	10.85
PULAU MALU	2	17 N	108	54 E	1.17
PULAU MAMBURIT	6	51 S	115	13 E	5.63
PULAU MAMUTIK	5	58 N	116	00 E	11.97
PULAU MANDA RIAU DARAT	3	18 N	106	24 E	1.52
PULAU MANDIDARAH	6	56 N	117	20 E	10.76
PULAU MANDIRALLA	6	56 N	117	20 E	10.76
PULAU MANDLIKA	6	23 S	110	55 E	3.28
PULAU MANDUL	3	42 N	117	49 E	10.2
PULAU MANGIATAN	8	33 S	119	41 E	6.28
PULAU MANGKAI	3	05 N	105	36 E	1.34
PULAU MANGKIAN PANDAK	3	12 N	106	21 E	1.60
PULAU MANGKUDU	10	20 S	120	07 E	6.11
PULAU MANGOEDOE	10	20 S	120	07 E	6.11
PULAU MANIANG	4	12 S	121	29 E	8.88
PULAU MANIMBORA	1	28 N	118	32 E	9.68
PULAU MANTABUAN	4	38 N	118	47 E	10.34
PULAU MANTANANI BESAR	6	43 N	116	21 E	11.114
PULAU MANTANANI KECHIL	6	42 N	116	18 E	11.114
PULAU MANTAWATUDAA	0	31 S	123	06 E	8.28
PULAU MANTUKUD	5	50 N	116	01 E	11.96
PULAU MANUEI	3	36 S	123	08 E	8.62
PULAU MANUI	3	36 S	123	08 E	8.62
PULAU MANUKAN	5	59 N	116	00 E	11.97
PULAU MANUKANG	6	56 S	118	52 E	5.71
PULAU MARABATUANG	7	29 S	117	29 E	5.74
PULAU MARANAI	2	38 S	108	30 E	2.70
PULAU MARASENDE	5	07 S	118	09 E	5.68
PULAU MARATUA	2	15 N	118	37 E	9.72
PULAU MASALIMA	5	03 S	117	03 E	9.27
PULAU MASATIGA	0	57 S	109	15 E	2.88
PULAU MASONI	1	45 S	124	10 E	8.41
PULAU MASPARI	3	13 S	106	13 E	2.18
PULAU MASSABANG	3	10 N	106	18 E	1.47
PULAU MATAGATEH	8	34 S	119	12 E	5.54
PULAU MATAK	3	18 N	106	16 E	1.42
PULAU MATAKING	4	34 N	118	57 E	10.35
PULAU MATALANG	6	52 S	118	58 E	5.71
PULAU MATASIRI	4	48 S	115	48 E	9.14
PULAU MAUAN	8	33 S	119	38 E	6.27
PULAU MAYA	1	08 S	109	35 E	2.90
PULAU MEDANG	8	08 S	117	24 E	5.45
PULAU MELAMBIR	2	27 S	117	33 E	9.38
PULAU MEMBATUAAN	6	57 N	117	15 E	10.75
PULAU MEMPERUK	3	04 N	106	21 E	1.49
PULAU MEMPIRAK	2	43 S	108	26 E	2.70
PULAU MENDANAU	2	53 S	107	25 E	2.50
PULAU MENDARIK	1	19 N	107	02 E	1.18
PULAU MENGALUM	6	12 N	115	36 E	11.103
PULAU MENGJATAN	8	33 S	119	41 E	6.28
PULAU MENGKUDU	2	15 S	109	59 E	2.99
PULAU MENTANGOR	1	42 S	109	06 E	2.85
PULAU MEONG	6	51 S	119	00 E	5.71
PULAU MERAK	5	56 S	105	59 E	4.11
PULAU MERAK KECIL	5	56 S	106	00 E	4.11
PULAU MERUNDUNG	2	04 N	109	06 E	1.17
PULAU MIANG-BESAR	0	44 N	118	01 E	9.60
PULAU MIANG-KECIL	0	47 N	118	03 E	9.60
PULAU MIANGKECIL	0	47 N	118	03 E	9.59
PULAU MIDAI	3	00 N	107	47 E	1.11
PULAU MIDDLE SAPONDA	3	59 S	122	46 E	8.63
PULAU MIONGAN	6	43 S	115	39 E	5.66
PULAU MISA	8	32 S	119	45 E	6.28
PULAU MOJO	8	15 S	117	33 E	5.45
PULAU MOLOSSO	0	55 N	123	58 E	7.53
PULAU MONDOLIKO	6	23 S	110	55 E	3.28
PULAU MOPINGULO	0	27 N	122	19 E	8.17

	Position °	'	°	'	Sec. Para
PULAU MOYO	8	15 S	117	33 E	5.45
PULAU MUANG	8	42 S	119	46 E	6.26
PULAU MUARA BESAR	5	00 N	115	07 E	11.73
PULAU MUBUR	3	20 N	106	12 E	1.41
PULAU MULES	8	54 S	120	18 E	6.36
PULAU MUNA	5	00 S	122	30 E	8.80
PULAU MUNDU	5	41 S	105	50 E	4.4
PULAU MURIH	1	54 N	108	39 E	1.17
PULAU NAIN-BESAR	1	47 N	124	47 E	7.56
PULAU NANGKA	2	30 S	108	32 E	2.71
PULAU NATUNA BESAR	3	56 N	108	14 E	1.5
PULAU NDAA	5	39 S	124	03 E	8.70
PULAU NDAO	10	49 S	122	40 E	6.108
PULAU NDIHANG	8	39 S	119	30 E	6.22
PULAU NGALI	8	29 S	117	43 E	5.46
PULAU NGREMBENG	8	19 S	111	44 E	4.44
PULAU NOKO	5	53 S	112	42 E	3.71
PULAU NOSEA	8	52 S	121	32 E	6.38
PULAU NUHABENG	8	07 S	124	37 E	6.82
PULAU NUNSA	2	59 N	106	25 E	1.50
PULAU NUNUKAN TIMUR	4	03 N	117	41 E	10.6
PULAU OMADEL	4	25 N	118	45 E	10.26
PULAU PADABALE	3	01 S	122	20 E	8.59
PULAU PADAMARANG	4	07 S	121	25 E	8.87
PULAU PADAR	8	39 S	119	35 E	6.23
PULAU PADEA KECIL	3	33 S	123	02 E	8.62
PULAU PAGERUNGAN-KECIL	6	57 S	115	52 E	5.64
PULAU PAHIT	3	24 N	106	09 E	1.41
PULAU PALIAT	6	58 S	115	36 E	5.64
PULAU PAMALIKAN	4	45 S	115	52 E	9.15
PULAU PAMANA-BESAR	8	22 S	122	18 E	6.52
PULAU PANABEAN	0	17 N	121	15 E	8.22
PULAU PANAITAN	6	35 S	105	13 E	4.19
PULAU PANDAN	1	34 S	109	10 E	2.85
PULAU PANDAN PANDAN	6	21 N	116	18 E	11.108
PULAU PANDANAN	4	35 N	118	55 E	10.35
PULAU PANDJANG	6	58 S	120	47 E	6.116
PULAU PANDUAN	5	52 N	116	02 E	11.96
PULAU PANEBANGAN	1	13 S	109	15 E	2.95
PULAU PANIKIA	8	35 S	119	45 E	6.29
PULAU PANIKIANG	4	21 S	119	36 E	7.18
PULAU PANJANG	0	02 N	109	13 E	1.75
PULAU PANJANG	2	09 S	106	16 E	2.32
PULAU PANJANG	2	22 N	118	12 E	9.76
PULAU PANJANG	2	45 N	108	55 E	1.14
PULAU PANJANG	4	15 N	108	12 E	1.10
PULAU PANJANG	6	58 S	120	47 E	6.116
PULAU PANJURIT	5	53 S	105	47 E	4.4
PULAU PANJURIT (HOUT ISLAND)	5	53 S	105	47 E	4.22
PULAU PANYANG	1	00 N	107	23 E	1.23
PULAU PAPADO	3	01 S	122	20 E	8.59
PULAU PAPAGARAN BESAR	8	34 S	119	48 E	6.29
PULAU PAPAN	5	15 N	115	16 E	11.68
PULAU PARANG	5	45 S	110	14 E	3.32
PULAU PASARAN	5	28 S	105	16 E	4.27
PULAU PASERAN	8	31 S	116	47 E	5.38
PULAU PASI	6	09 S	120	25 E	7.5
PULAU PASOSO	0	06 N	119	37 E	7.37
PULAU PASUDU	4	55 S	121	57 E	8.84
PULAU PATANUNAM	7	06 N	117	05 E	10.85
PULAU PATJAR	6	40 S	115	38 E	5.66
PULAU PAYANGAN	6	58 S	114	26 E	3.68
PULAU PAYUNG	8	40 S	119	37 E	6.23
PULAU PAYUNG BESAR	5	49 S	106	33 E	3.5
PULAU PEBELOKAN	5	29 S	106	24 E	4.8
PULAU PEJAUL	3	09 N	106	23 E	1.57
PULAU PEKACANG	1	10 S	105	18 E	2.27
PULAU PEKATJANG	1	10 S	105	18 E	2.27
PULAU PELENG	1	20 S	123	10 E	8.44
PULAU PELEPASAN	2	23 S	105	45 E	2.14
PULAU PELOKANG	7	11 S	118	25 E	5.72
PULAU PEMUJA	1	36 S	105	23 E	2.25
PULAU PENDEK	5	13 S	122	44 E	8.77
PULAU PENGANTEN	6	38 S	110	36 E	3.27
PULAU PENGIKI-BESAR	0	15 N	108	03 E	1.32
PULAU PENIKI	5	42 S	106	43 E	3.14
PULAU PENJALIN-BESAR	3	23 N	106	26 E	1.51
PULAU PEPATAN	4	55 N	115	03 E	11.79
PULAU PESEMUT	2	30 S	108	51 E	2.71
PULAU PEUCANG	6	44 S	105	16 E	4.19
PULAU PINAAT	2	25 S	117	35 E	9.38
PULAU PINJANG	5	56 S	106	09 E	4.9

	Position °	'	°	'	Sec. Para
PULAU POEHAWANG	5	41 S	105	13 E	4.29
PULAU POELASI	6	41 S	120	26 E	6.117
PULAU POM POM	4	36 N	118	52 E	10.34
PULAU POONG POONG	2	28 S	117	23 E	9.39
PULAU POPOLE	6	24 S	105	49 E	4.17
PULAU PRENDJONO	8	22 S	111	29 E	4.43
PULAU PUAH	0	30 S	122	34 E	8.29
PULAU PUHAWANG	5	41 S	105	13 E	4.29
PULAU PULASI	6	41 S	120	26 E	6.117
PULAU PUNGU-BESAR	8	31 S	119	48 E	6.29
PULAU PUNJUNG	3	09 N	106	25 E	1.56
PULAU PUNYIT	4	58 N	114	51 E	11.57
PULAU PURA	8	18 S	124	21 E	6.77
PULAU PUTERAN	7	05 S	114	00 E	3.52
PULAU PUTERI	6	04 S	106	51 E	3.14
PULAU RAAS	7	09 S	114	33 E	3.69
PULAU RADEH	8	36 S	119	03 E	5.53
PULAU RAIJUA	10	36 S	121	39 E	6.112
PULAU RAKATA	6	09 S	105	26 E	4.21
PULAU RAKATA (KHAKATAU)	06	09 S	105	26 E	4.2
PULAU RAKI	8	37 S	117	58 E	5.47
PULAU RAKIET	8	37 S	117	58 E	5.47
PULAU RAKIT	5	56 S	108	23 E	3.20
PULAU RAMBUT	5	58 S	106	41 E	3.9
PULAU RETA	8	13 S	124	22 E	6.78
PULAU RETA	8	13 S	124	22 E	6.78
PULAU RIMAUBALAK	5	52 S	105	47 E	4.4
PULAU RINCA	8	43 S	119	41 E	6.24
PULAU RINGGIT	2	57 S	107	31 E	2.62
PULAU ROENDOEMA	5	21 S	124	21 E	8.70
PULAU ROESA	8	23 S	123	49 E	6.71
PULAU ROTAN	3	13 S	108	16 E	2.74
PULAU ROTI	10	45 S	123	09 E	6.106
PULAU RUNDUMA	5	21 S	124	21 E	8.70
PULAU RUSA	8	23 S	123	49 E	6.71
PULAU RUSUKAN BESAR	5	11 N	115	08 E	11.65
PULAU RUSUKAN KECIL	5	12 N	115	09 E	11.64
PULAU SABALANA	6	51 S	119	07 E	5.70
PULAU SABANGKAT	4	34 N	118	40 E	10.33
PULAU SABARU	5	06 S	117	03 E	9.27
PULAU SABARU	6	35 S	118	50 E	5.70
PULAU SABAYUR-BESAR	8	30 S	119	44 E	6.28
PULAU SABAYUR-KECIL	8	31 S	119	42 E	6.28
PULAU SABOJAN	2	21 S	117	19 E	9.39
PULAU SABOLAN-BESAR	8	23 S	119	49 E	6.32
PULAU SABOYAN	2	21 S	117	19 E	9.39
PULAU SABUTAN	4	45 S	119	26 E	7.18
PULAU SABUTANG	4	45 S	119	26 E	7.18
PULAU SADAA	0	26 N	121	31 E	8.20
PULAU SADAPUR	7	46 S	117	13 E	5.76
PULAU SADUJUNG	7	21 S	117	32 E	5.74
PULAU SADULANG	6	58 S	118	49 E	5.71
PULAU SAGO	2	12 S	123	10 E	8.46
PULAU SAGU DAMPAR	3	15 N	106	27 E	1.53
PULAU SAILUS-BESAR	7	28 S	117	26 E	5.75
PULAU SAILUS-KECIL	7	35 S	117	27 E	5.75
PULAU SAKALA	6	57 S	116	15 E	5.65
PULAU SAKAR	4	58 N	118	20 E	10.51
PULAU SAKOALA	4	40 S	119	30 E	7.18
PULAU SALAKAN	4	34 N	118	42 E	10.33
PULAU SALAYAR	6	08 S	120	30 E	7.3
PULAU SALINGSINGAN	2	19 S	117	14 E	9.39
PULAU SALOR	3	54 N	107	55 E	1.9
PULAU SAMAMA	2	08 N	118	20 E	9.75
PULAU SAMARAGO	4	06 N	108	00 E	1.10
PULAU SAMBARGALANG	4	24 S	116	10 E	9.15
PULAU SAMBIT	1	46 N	119	02 E	9.71
PULAU SAMPADI	1	44 N	110	05 E	11.5
PULAU SANANA-BESAR	6	50 S	119	02 E	5.71
PULAU SANANA-KECIL	6	49 S	119	01 E	5.71
PULAU SANDY	1	23 N	125	10 E	8.6
PULAU SANGA	2	14 S	117	08 E	9.39
PULAU SANGAI	2	14 S	117	08 E	9.39
PULAU SANGALAKKI	2	06 N	118	24 E	9.74
PULAU SANGEANG	8	10 S	119	05 E	5.51
PULAU SANGIAN	5	58 S	105	51 E	4.17
PULAU SANGIANG	5	58 S	105	51 E	4.20
PULAU SAPANGAR	6	04 N	116	04 E	11.98
PULAU SAPANJANG	7	10 S	115	50 E	5.65
PULAU SAPANKUR	7	00 S	115	31 E	5.64
PULAU SAPEKAH	8	33 S	119	16 E	5.57
PULAU SAPEKEN	7	00 S	115	42 E	5.64

	Position °	'	°	'	Sec. Para
PULAU SAPIRAK	6	59 N	117	03 E	10.88
PULAU SAPIRI	3	02 S	121	03 E	8.98
PULAU SAPONDA SELATAN	4	02 S	122	46 E	8.63
PULAU SAPONDA UTARA	3	53 S	122	49 E	8.63
PULAU SAPUDI	7	08 S	114	20 E	3.68
PULAU SAPUKA-BESAR	7	04 S	118	11 E	5.72
PULAU SAPUKA-KECIL	7	07 S	118	10 E	5.72
PULAU SARAH	8	23 S	111	40 E	4.43
PULAU SARANGA	4	55 N	118	12 E	10.46
PULAU SARAPPO	4	53 S	119	16 E	7.15
PULAU SAREGE	7	04 S	118	39 E	5.71
PULAU SARINGI	8	26 S	116	59 E	5.38
PULAU SASASAIT	8	45 S	116	43 E	5.37
PULAU SASEEL	7	05 S	115	45 E	5.65
PULAU SATABO	6	58 S	115	42 E	5.64
PULAU SATANG BESAR	1	47 N	110	10 E	11.5
PULAU SATANG KECHIL	1	46 N	110	09 E	11.5
PULAU SATENGAR	7	32 S	117	20 E	5.75
PULAU SATONDA	8	06 S	117	45 E	5.45
PULAU SATUNGGUL	7	32 S	117	53 E	5.74
PULAU SAUBI	7	00 S	115	26 E	5.64
PULAU SAUJUNG	7	21 S	117	32 E	5.74
PULAU SAULAR	6	56 S	115	44 E	5.64
PULAU SAWI	2	23 S	110	04 E	2.100
PULAU SAWU	10	31 S	121	55 E	6.109
PULAU SEBABAHAN	8	24 S	111	42 E	4.44
PULAU SEBANGKATAN	2	13 S	117	25 E	9.37
PULAU SEBATIK	4	10 N	117	47 E	10.13
PULAU SEBESI	5	58 S	105	29 E	4.21
PULAU SEBUKU	3	32 S	116	22 E	9.18
PULAU SEBUKU	5	54 S	105	30 E	4.21
PULAU SEDANAU	3	48 N	108	01 E	1.8
PULAU SEDUA	4	02 N	107	54 E	1.10
PULAU SEGAMAT	5	10 S	106	06 E	4.6
PULAU SEKAPAR	3	09 S	108	14 E	2.74
PULAU SELAI	3	12 N	106	29 E	1.54
PULAU SELANDU	3	04 S	108	15 E	2.73
PULAU SELINTANG	0	57 N	107	29 E	1.24
PULAU SELIU	3	13 S	107	32 E	2.53
PULAU SELOANG	2	27 S	117	40 E	9.38
PULAU SEMANGA-KETCIL	2	25 S	117	24 E	9.38
PULAU SEMAU	10	14 S	123	23 E	6.98
PULAU SEMESA	0	43 N	108	52 E	1.72
PULAU SEMPU	8	27 S	112	42 E	4.46
PULAU SEMUT	3	24 N	106	17 E	1.42
PULAU SENDIRI	0	29 S	122	56 E	8.28
PULAU SENTODO	8	33 S	119	11 E	5.54
PULAU SEPANJANG	7	10 S	115	50 E	5.65
PULAU SERANGAN	8	44 S	115	14 E	5.17
PULAU SERASAN	2	31 N	109	03 E	1.15
PULAU SERAYA-BESAR	8	23 S	119	52 E	6.32
PULAU SERAYA-KECIL	8	24 S	119	52 E	6.32
PULAU SERBETE	8	09 S	123	01 E	6.55
PULAU SERDANG	5	49 S	105	23 E	4.24
PULAU SERTUNG	6	05 S	105	23 E	4.21
PULAU SERUKAT-BESAR	3	11 S	108	07 E	2.74
PULAU SERUTU	1	43 S	108	44 E	2.86
PULAU SETURIAN	2	16 S	117	40 E	9.37
PULAU SI AMIL	4	19 N	118	52 E	10.25
PULAU SIABA-BESAR	8	32 S	119	39 E	6.27
PULAU SIANTAN	3	10 N	106	15 E	1.43
PULAU SIBRONG	2	58 N	105	42 E	1.28
PULAU SIBUAN	4	39 N	118	40 E	10.34
PULAU SIBUNGOR	4	52 N	114	57 E	11.78
PULAU SIKA	8	07 S	124	37 E	6.82
PULAU SILAD	6	39 N	116	34 E	11.112
PULAU SILARANGAN	6	56 S	115	38 E	5.64
PULAU SILAWA	4	33 N	118	33 E	10.38
PULAU SILINGAAN	6	10 N	118	04 E	10.66
PULAU SILUMPAT	4	46 N	118	23 E	10.41
PULAU SILUNGAN	4	19 N	118	27 E	10.28
PULAU SINJATAAN	6	01 N	116	00 E	11.98
PULAU SIOEMPOE	5	40 S	122	30 E	8.79
PULAU SIPADAN	4	07 N	118	38 E	10.26
PULAU SIPINDUNG	6	52 N	117	33 E	10.72
PULAU SIREH	1	14 S	109	12 E	2.96
PULAU SITINJAN	0	22 N	108	45 E	1.74
PULAU SITURI	8	29 S	119	51 E	6.32
PULAU SIUMPU	5	40 S	122	30 E	8.79
PULAU SOANGI	8	34 S	123	14 E	6.60
PULAU SOROABU	6	55 S	119	02 E	5.71
PULAU SUALANG	6	41 S	111	23 E	3.37
PULAU SUANGI	8	34 S	123	14 E	6.60
PULAU SUBI BESAR	2	56 N	108	51 E	1.13
PULAU SUGURA	5	50 N	116	01 E	11.96
PULAU SUKA	1	20 S	109	07 E	2.97
PULAU SUKUR	8	07 S	122	08 E	6.49
PULAU SULUG	5	58 N	116	00 E	11.97
PULAU SUMBA	9	40 S	120	00 E	6.2
PULAU TABAUWAN	4	56 N	118	14 E	10.49
PULAU TABAWAN	4	48 N	118	23 E	10.41
PULAU TABUAN	5	51 S	104	51 E	4.31
PULAU TABUAN	8	03 S	114	28 E	5.5
PULAU TAGABUA	4	46 N	118	14 E	10.45
PULAU TAIMANU	3	19 S	118	51 E	7.27
PULAU TAKATALU	3	04 S	117	42 E	9.28
PULAU TALA	8	45 S	119	26 E	6.19
PULAU TALANG TALANG BESAR	1	55 N	109	47 E	11.2
PULAU TALANG TALANG KECHIL	1	53 N	109	46 E	11.3
PULAU TALATAKAN	0	21 S	122	06 E	8.31
PULAU TALIABOE	1	50 S	124	50 E	8.38
PULAU TAMBAKULU	4	44 S	119	03 E	7.16
PULAU TAMBELAN	1	00 N	107	34 E	1.20
PULAU TAMBISAN	5	28 N	119	07 E	10.57
PULAU TAMBOULIAN	6	58 N	117	28 E	10.78
PULAU TAMENGAN	8	22 S	111	47 E	4.44
PULAU TAMPURANG	5	54 S	105	56 E	4.20
PULAU TANAJAMPEA	7	08 S	120	46 E	6.115
PULAU TANAKEKE	5	30 S	119	17 E	7.10
PULAU TANDJUNGBUAJABUAJA	1	25 N	118	30 E	9.68
PULAU TAOENA	6	53 S	120	47 E	6.116
PULAU TATAGAN	4	36 N	118	43 E	10.33
PULAU TATAGAN TATAGAN	4	40 N	118	33 E	10.40
PULAU TATAWA	8	31 S	119	39 E	6.27
PULAU TEBOLON	8	29 S	119	50 E	6.32
PULAU TEGAL	5	34 S	105	17 E	4.28
PULAU TEGIPIL	6	33 N	117	43 E	10.70
PULAU TELAGA	3	03 N	105	59 E	1.35
PULAU TELAGAPAHAT	2	34 S	108	34 E	2.71
PULAU TELIBANG	3	00 N	106	09 E	1.36
PULAU TELUK RISAN	3	11 N	106	27 E	1.55
PULAU TELUKAYER	0	43 S	109	33 E	1.79
PULAU TEMBAKO	4	54 S	122	03 E	8.82
PULAU TEMIANG	2	56 N	106	08 E	1.37
PULAU TEMPAU	1	51 S	124	00 E	8.43
PULAU TEMPURUNG	5	54 S	105	56 E	4.20
PULAU TEMUKUS	8	10 S	114	59 E	5.11
PULAU TENGA	8	29 S	119	51 E	6.33
PULAU TENGELANGA	1	01 N	120	44 E	7.42
PULAU TERAWANGAN	8	21 S	116	02 E	5.28
PULAU TEREWANGAN	8	21 S	116	02 E	5.28
PULAU TERNATE	8	11 S	124	22 E	6.78
PULAU TERNATE	8	11 S	124	22 E	6.78
PULAU TETAPAAN	1	18 N	124	30 E	7.54
PULAU TIBAKAN	6	56 N	117	28 E	10.77
PULAU TIGA	3	23 S	122	36 E	8.62
PULAU TIGA	5	44 N	115	39 E	11.91
PULAU TIGA	5	49 S	105	33 E	4.24
PULAU TIGA	7	20 N	117	03 E	10.86
PULAU TIGABU	6	53 N	117	28 E	10.77
PULAU TIKUS	2	51 S	107	32 E	2.61
PULAU TIMBA TIMBA	4	33 N	118	55 E	10.35
PULAU TIMBUN MATA	4	39 N	118	25 E	10.38
PULAU TIMPAUS	1	51 S	124	00 E	8.43
PULAU TINGI LANGA	1	01 N	120	44 E	7.42
PULAU TJELUKANDAWANG	8	11 S	114	50 E	5.10
PULAU TJOWO TJOWO	5	48 S	124	20 E	8.70
PULAU TOBINTAH	1	56 S	119	20 E	7.30
PULAU TOBOLON	8	29 S	119	50 E	6.32
PULAU TOGIAN	0	23 S	121	57 E	8.31
PULAU TOGOMOGOLO	3	13 S	122	38 E	8.59
PULAU TOKO TOKO	8	25 S	119	34 E	6.18
PULAU TOKOHBATU	7	13 S	118	01 E	5.73
PULAU TOMEA	5	45 S	123	56 E	8.69
PULAU TREWEG	8	29 S	124	17 E	6.78
PULAU TRISO	1	31 N	110	59 E	11.15
PULAU TUA	10	53 S	123	03 E	6.107
PULAU TUA (PULAU TOEA)	1	45 N	109	16 E	1.67
PULAU TUGUAN	0	35 N	119	48 E	7.39
PULAU TUNDA	5	49 S	106	17 E	3.2
PULAU TUNDU	7	10 S	114	40 E	3.69
PULAU TUNTUNGKALIK	5	48 S	105	05 E	4.31
PULAU UBI-KECIL	6	00 S	106	44 E	3.9
PULAU UDAR BESAR	6	05 N	116	05 E	11.98

	Position °	'	°	'	Sec. Para
PULAU UDAR KECHIL	6	06 N	116	05 E	11.98
PULAU ULABAN	1	24 N	118	32 E	9.68
PULAU ULAR	6	00 S	105	56 E	4.13
PULAU UMBELE	3	04 S	122	30 E	8.58
PULAU UMPANG	3	17 S	107	52 E	2.78
PULAU UNAUNA	0	10 S	121	38 E	8.33
PULAU UNTELUE	8	23 S	121	01 E	6.44
PULAU USU	10	30 S	123	25 E	6.106
PULAU USUKAN	6	25 N	116	20 E	11.109
PULAU VARKENS	6	09 S	120	25 E	7.5
PULAU WALEABAHI	0	15 S	122	18 E	8.30
PULAU WALEAKODI	0	15 S	122	11 E	8.30
PULAU WANGI WANGI	5	18 S	123	34 E	8.68
PULAU WANGIWANGI	5	18 S	123	34 E	8.68
PULAU WATU PENI	8	14 S	123	19 E	6.57
PULAU WATUPENI	8	14 S	123	19 E	6.57
PULAU WETAR	7	49 S	126	14 E	6.84
PULAU WOWONI	4	07 S	123	06 E	8.66
PULAUMERAK	5	56 S	106	00 E	4.13
PULAU-PULAU HANDEULEUM	6	45 S	105	26 E	4.18
PULAU-PULAU PETUDANG	5	35 S	106	36 E	3.13
PULAU-PULAU SERIBU	5	30 S	106	30 E	4.6
PULAU-PULAU TUJU	1	13 S	105	16 E	2.27
PULUA OLUA	0	22 N	120	49 E	8.23
PUNTA HERO	8	20 S	127	11 E	6.91

Q

QUOIN HILL	4	25 N	118	01 E	10.3

R

RABU RABU	2	20 N	118	07 E	9.76
RADJABASA	5	47 S	105	38 E	4.24
RAHA	4	51 S	122	44 E	8.75
RAI PIGA	10	34 S	121	48 E	6.109
RAINBOW REEF	1	42 N	110	18 E	11.9
RAIPIGA	10	34 S	121	48 E	6.109
RAJANG	2	09 N	111	15 E	11.19
RAMBA	2	37 S	104	08 E	2.7
RAMBLER BANKS	4	58 N	115	06 E	11.75
RAMSAY POINT	5	16 N	115	15 E	11.68
RANGET	5	28 S	106	29 E	3.1
RATAI BAAI	5	36 S	105	13 E	4.29
REMBANG ROAD	6	41 S	111	21 E	3.37
RENARD POINT	1	35 N	110	27 E	11.12
RENE SHOAL	5	30 N	119	09 E	10.58
REO LIGHT	8	17 S	120	27 E	6.43
RETA	8	13 S	124	22 E	6.78
RICHARDS REEF	4	44 N	118	43 E	10.34
RICHARDSON POINT	5	15 N	115	10 E	11.66
RIOENG BAY	8	23 S	121	02 E	6.44
RIUNG VILLAGE	8	26 S	121	01 E	6.44
RIZAL SHOAL	6	15 N	115	26 E	11.105
ROACH REEFS	4	10 N	118	18 E	10.18
ROCK	7	04 N	117	07 E	10.87
RODGER ROCK	0	41 N	107	32 E	1.32
ROESA	8	23 S	123	49 E	6.71
ROODE HOEK	4	20 S	122	54 E	8.67
ROTSIGE ISLANDS	8	27 S	116	44 E	5.30
ROYAL CHARLOTTE REEF	6	57 N	113	36 E	11.50
ROYALIST HAVEN	2	30 N	109	01 E	1.16
ROYALIST ROCK	5	43 N	118	40 E	10.60
ROYALIST ROCKS	1	43 N	110	18 E	11.8
ROYDS SHOAL	6	38 N	115	50 E	11.106
RUTH SHOALS	3	44 N	112	55 E	11.32

S

SABOJAN	2	21 S	117	19 E	9.39
SABUTANG	4	45 S	119	26 E	7.18
SADAA	0	26 N	121	31 E	8.20
SADDLE HILL	4	18 N	118	11 E	10.15
SADDLE ISLANDS	4	56 N	118	14 E	10.49
SAGO	2	12 S	123	10 E	8.46
SAINT JOSEPH OIL FIELD	6	38 N	116	09 E	11.106
SAINT JOSEPH ROCK	6	35 N	116	05 E	11.106
SALABANGKA EILANDEN	3	04 S	122	28 E	8.58
SALABANGKA ISLANDS	3	04 S	122	28 E	8.58
SALABANGKA STRAIT	3	04 S	122	20 E	8.58
SALAH KARONTONG	8	40 S	119	46 E	6.26
SALAMADATANG	6	41 S	105	28 E	4.18
SALEH BAAI	8	28 S	117	48 E	5.44
SAMAK	1	30 S	105	55 E	2.26
SAMARANG BANK	5	35 N	114	55 E	11.87
SAMARANG OIL FIELD	5	37 N	114	53 E	11.88
SAMARANG POINT	7	21 N	117	09 E	10.82
SAMARINDA	0	31 S	117	09 E	9.53
SAMATANYIWUTUN	8	34 S	122	57 E	6.63
SAMBAS	1	22 N	109	18 E	1.70
SAMPAGA	2	18 S	119	08 E	7.29
SAMPIT	2	31 S	113	00 E	9.8
SANDAKAN	5	49 N	118	08 E	10.62
SANDY ISLAND	6	49 N	117	37 E	10.71
SANE SANE REEF	6	58 S	120	27 E	6.116
SANGKAPURA ROAD	5	52 S	112	37 E	3.72
SANGKULIRANG	0	59 N	117	58 E	9.62
SANGORA BANKS	3	14 S	111	41 E	9.5
SANTAN OIL TERMINAL	0	06 N	117	32 E	9.55
SANTIGI REEF	8	32 S	116	02 E	5.25
SANUR	8	40 S	115	15 E	5.16
SANUR ROAD	8	40 S	115	16 E	5.16
SAPAGAR BANK	3	08 S	111	46 E	9.5
SAPANGAR BAY	6	05 N	116	07 E	11.99
SAPEKAH	8	33 S	119	16 E	5.57
SAPPA DJAMBI BANK	3	59 S	122	41 E	8.63
SAPPA JAMBA	3	59 S	122	41 E	8.63
SAPUDU	8	36 S	118	12 E	5.48
SARACEN BANK	6	10 N	115	22 E	11.104
SARIKEI	2	08 N	111	32 E	11.23
SATONG	8	52 S	117	46 E	5.62
SAWU	10	31 S	121	55 E	6.109
SCHAARVOGEL ISLANDS	3	17 S	108	25 E	2.75
SCOUT PATCHES	4	56 N	114	38 E	11.59
SCOUT ROCK	4	56 N	114	39 E	11.59
SEBA	10	29 S	121	51 E	6.110
SEBOE	9	03 S	117	20 E	5.62
SEBULU	0	17 S	116	59 E	9.54
SEBUYAU VILLAGE	1	31 N	110	55 E	11.14
SEDARI REEF	5	54 S	107	25 E	3.16
SEDGEMAN ROCKS	6	43 N	117	44 E	10.70
SEGARA ANAK	8	36 S	114	13 E	4.48
SEKUNCI	7	51 S	117	12 E	5.77
SEKUNTJI	7	51 S	117	12 E	5.77
SELAKA BANK	3	10 S	110	54 E	9.4
SELAT ALOR	8	20 S	123	50 E	6.71
SELAT BADUNG	8	40 S	115	22 E	5.20
SELAT BALI	8	15 S	114	26 E	5.1
SELAT BANGGI SELATAN	7	07 N	117	10 E	10.87
SELAT BANGKA	1	45 N	125	05 E	8.3
SELAT BOLENG	8	17 S	123	21 E	6.58
SELAT BUTUNG	5	00 S	122	45 E	8.74
SELAT CAPALULU	1	50 S	125	19 E	8.42
SELAT KAPAS	1	19 N	120	48 E	7.44
SELAT LAMAKERA	8	28 S	123	12 E	6.59
SELAT LAUT	3	40 S	115	58 E	9.20
SELAT LEGUNDI	5	50 S	105	12 E	4.24
SELAT LEMBEH	1	28 N	125	12 E	8.6
SELAT LINTAH	8	37 S	119	35 E	6.20
SELAT LOMBOK	8	35 S	115	45 E	5.20
SELAT MASIRIR	5	35 S	122	33 E	8.79
SELAT MENDANAU	2	55 S	107	30 E	2.60
SELAT MOLO	8	37 S	119	49 E	6.31
SELAT MUNA	5	15 S	122	08 E	8.84
SELAT PANTAR	8	20 S	124	20 E	6.77
SELAT POLEANG	4	58 S	121	57 E	8.84
SELAT SALABANGKA	3	04 S	122	20 E	8.58
SELAT SAPE	8	39 S	119	18 E	5.56
SELAT SELAYAR	5	42 S	120	30 E	8.74
SELAT SEMAU	10	16 S	123	27 E	6.100
SELAT SUNGIAN	8	19 S	116	42 E	5.29
SELAT TANAKEKE	5	30 S	119	21 E	7.9
SELAT TIWORO	4	33 S	122	30 E	8.81
SELAT WALEA	0	25 S	122	25 E	8.29
SELAT WOWONI	4	06 S	122	54 E	8.66
SEMANJUNG BLAMBANGAN	8	45 S	114	25 E	5.1
SEMARANG	6	57 S	110	25 E	3.26
SEMATAN	1	49 N	109	47 E	11.3
SEMBODJALAMA	1	02 S	117	07 E	9.46
SEMPORNA	4	29 N	118	37 E	10.30
SENIPAH OIL TERMINAL	1	03 S	117	13 E	9.47

	Position °	'	°	'	Sec. Para
SENTODO	8	33 S	119	11 E	5.54
SENTRY BANK	5	42 N	119	19 E	10.58
SEPTEMBER REEF	2	17 S	116	49 E	9.30
SERAJA MOUNTAINS	8	23 S	115	40 E	5.9
SERDANG REEF	3	24 S	122	32 E	8.61
SERIA OIL TERMINAL	4	37 N	114	19 E	11.54
SESAYAP SELATAN	3	29 N	117	20 E	9.89
SESAYAP TENGAH	3	30 N	117	31 E	9.90
SESAYAP UTARA	3	37 N	117	24 E	9.91
SETAGEN	3	17 S	116	09 E	9.25
SEVERN SHOAL	1	37 S	106	31 E	2.30
SIBAUNG ISLAND	6	18 N	118	00 E	10.67
SIBBALDS BANK	5	45 S	117	05 E	5.67
SIBU	2	17 N	111	49 E	11.24
SIBUKO BAY	4	00 N	118	20 E	10.2
SIBUKO BAY TANKER TERMINAL	3	51 N	118	06 E	10.5
SIKA	8	07 S	124	37 E	6.82
SIKA BESAR	8	45 S	122	12 E	6.40
SIKLAPA	8	22 S	111	44 E	4.43
SIKORONG REEF	4	41 N	119	05 E	10.36
SILAM HARBOR	4	57 N	118	14 E	10.47
SILAPAG PASSAGE	4	20 N	118	41 E	10.27
SIMEDANG	3	19 S	107	12 E	2.41
SIMUNJAN	1	24 N	110	45 E	11.14
SINDJAI	5	05 S	120	12 E	8.92
SINDJAI	5	08 S	120	15 E	8.93
SINJAI	5	08 S	120	15 E	8.93
SIPU BAY	9	48 S	119	40 E	6.13
SIRUMPA	7	25 S	113	04 E	3.46
SITEO	0	15 N	120	11 E	8.25
SIWA OIL FIELD	4	18 N	113	48 E	11.42
SIWA SHOAL	4	16 N	113	49 E	11.40
SJAHBANDAR BANK	5	05 S	106	00 E	4.3
SKY ROCK	6	54 N	117	25 E	10.77
SLANGENBERG	5	29 S	120	10 E	7.6
SOAI SOAIUM BAY	4	58 N	118	14 E	10.50
SOANGI	8	34 S	123	14 E	6.60
SOEMBAWA	8	30 S	117	26 E	5.43
SOKAN	2	11 N	117	41 E	9.77
SOKKAN	2	11 N	117	41 E	9.77
SOPHIA LOUISA ROCK	8	56 S	116	00 E	5.33
SORO GO	8	36 S	119	28 E	6.22
SORO LIA	8	35 S	119	31 E	6.22
SORO MASANGGA	8	36 S	119	28 E	6.22
SORONG JUKUNG	8	21 S	116	09 E	5.28
SOUTH BANK	3	26 S	122	30 E	8.61
SOUTH CHANNEL DANGERS	7	06 N	117	11 E	10.79
SOUTH FURIOUS OIL FIELD	6	47 N	116	14 E	11.115
SOUTH FURIOUS SHOALS	6	47 N	116	12 E	11.115
SOUTH HAYCOCK	2	17 N	108	54 E	1.17
SOUTH HILL ROCK	5	59 N	115	52 E	11.97
SOUTH HINDER	3	18 S	122	30 E	8.61
SOUTH LUCONIA SHOALS	5	04 N	112	38 E	11.47
SOUTH NARROWS	5	21 S	122	39 E	8.77
SOUTH REEF	3	46 S	122	31 E	8.61
SOUTH SAPONDA	4	02 S	122	46 E	8.63
SOUTHEAST BANGGI DANGERS	7	07 N	117	24 E	10.85
SOUTHWEST SNKN, BARRIER SHL.	6	17 N	115	48 E	11.106
SRI BLITONG	2	39 S	107	33 E	2.58
SRI MANGGAR	2	37 S	107	34 E	2.58
SRIBLITONG	2	39 S	107	33 E	2.58
SRIMANGGAR	2	37 S	107	34 E	2.58
STAGEN	3	17 S	116	09 E	9.25
STARING BAY	4	05 S	122	44 E	8.65
STIGANT REEF	5	02 N	112	29 E	11.47
STONE POINT	4	04 N	117	55 E	10.13
STRAAT BADOENG	8	40 S	115	22 E	5.20
STRAAT BATAGAU	3	22 N	117	31 E	9.89
STRAAT LEGOENDI	5	50 S	105	12 E	4.24
STRAAT LOMBOK	8	35 S	115	45 E	5.20
STRAAT SALAJAR	5	42 S	120	30 E	8.74
STRAAT SAPE	8	39 S	119	18 E	5.56
STRAGGLER ISLAND	7	05 N	117	29 E	10.79
STROOMKLIP	5	55 S	105	49 E	4.20
STRUISVOGEL KLIPPER	5	53 S	106	28 E	3.6
SUGARLOAF MOUNTAIN	1	51 N	117	45 E	9.66
SUKA LATING	0	19 S	109	35 E	1.77
SULORO	8	39 S	127	01 E	6.93
SUMATRA SHOAL	8	07 S	125	57 E	6.85
SUMBAWA BESAR	8	30 S	117	26 E	5.43
SUMENEP	7	00 S	113	52 E	3.53
SUNDA SPIT	4	59 N	115	11 E	11.73
SUNDAY BANK	5	49 N	119	09 E	10.58
SUNGAI BALUNG	4	18 N	118	10 E	10.20
SUNGAI BARITO	3	32 S	114	30 E	9.10
SUNGAI BAYOLI	1	53 S	121	21 E	8.53
SUNGAI BELAIT	4	35 N	114	11 E	11.53
SUNGAI BERAU	2	10 N	117	42 E	9.79
SUNGAI KAHAYAN	3	30 S	114	04 E	9.10
SUNGAI KALUMPANG	4	20 N	118	20 E	10.20
SUNGAI KAMBU	8	23 S	118	19 E	5.49
SUNGAI KANDANG KARBAU	1	46 S	109	56 E	2.94
SUNGAI KAPUAS	0	19 S	109	35 E	1.77
SUNGAI KEPUAS-KECIL	0	03 N	109	11 E	1.75
SUNGAI KINABATANGAN	5	39 N	118	37 E	10.60
SUNGAI KINARUT	5	50 N	116	00 E	11.95
SUNGAI KLIAS	5	17 N	115	22 E	11.85
SUNGAI LASOLO	3	34 S	122	14 E	8.60
SUNGAI LIAT	1	51 S	106	06 E	2.34
SUNGAI LINGGANG	3	02 S	108	12 E	2.73
SUNGAI MAHAKAM	0	35 S	117	17 E	9.48
SUNGAI MAKAM	2	09 N	117	30 E	9.80
SUNGAI MENGGATAL	6	04 N	116	07 E	11.99
SUNGAI PADANGTIKAR	0	37 S	109	12 E	1.79
SUNGAI PALEMBANG	2	18 S	104	55 E	2.8
SUNGAI PANDARUAN	4	49 N	115	02 E	11.80
SUNGAI PASIR	1	52 S	116	26 E	9.41
SUNGAI PEMBUANG	3	26 S	112	34 E	9.6
SUNGAI RAMBUNGAN	1	42 N	110	08 E	11.6
SUNGAI ROMO	8	27 S	118	43 E	5.50
SUNGAI SAMBAS-BESAR	1	11 N	108	57 E	1.68
SUNGAI SAMBAS-KECIL	1	18 N	109	10 E	1.69
SUNGAI SAMPADI	1	41 N	109	58 E	11.5
SUNGAI SANGA SANGA	0	34 S	117	16 E	9.52
SUNGAI SARAWAK	1	43 N	110	17 E	11.7
SUNGAI SEBUKU	4	04 N	117	29 E	10.5
SUNGAI SEGAH	2	09 N	117	30 E	9.80
SUNGAI SEMBAKUNG	3	44 N	117	48 E	9.92
SUNGAI SERUDONG	4	13 N	117	36 E	10.7
SUNGAI SESAYAP	3	36 N	117	14 E	9.92
SUNGAI SIBU LAUT	1	42 N	110	12 E	11.6
SUNGAI SIMANDALAN	4	16 N	117	39 E	10.10
SUNGAI SUKADANA	1	14 S	109	57 E	2.92
SUNGAI TELADAN	3	27 N	117	20 E	9.89
SUNGAI TELAGA	6	50 N	117	02 E	10.88
SUNGAI TEMBURONG ENTRANCE	4	49 N	115	03 E	11.79
SUNGAI TUTONG	4	47 N	114	36 E	11.55
SUNGAI WOTOE	2	38 S	120	48 E	8.97
SUNGAI WOTU	2	38 S	120	48 E	8.97
SUNGAIMARIAM	0	35 S	117	18 E	9.52
SUNGIAN STRAIT	8	19 S	116	42 E	5.29
SUNKEN BARRIER SHOALS	6	25 N	115	53 E	11.105
SURABAYA	7	12 S	112	44 E	3.48
SVERRE REEF	6	02 S	110	21 E	3.33
SWALLOW REEF	7	24 N	113	49 E	11.50
SWIRL PATCH	4	12 N	117	57 E	10.14

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	Position °	'	°	'	Sec. Para
TADAH TADA	2	08 S	105	26 E	2.4
TAGANAK ISLAND	6	05 N	118	19 E	10.65
TAGANAK PATCHES	6	06 N	118	15 E	10.65
TAHARAN COAL TERMINAL	5	29 S	105	13 E	4.25
TAKA BAKANG	4	58 S	118	32 E	7.13
TAKA BAKOE	5	08 S	119	21 E	7.11
TAKA BAKU	5	08 S	119	21 E	7.11
TAKA BASSI	7	31 S	121	13 E	6.114
TAKA BOEBOEJANG	5	11 S	119	22 E	7.11
TAKA BOLOH	5	48 S	120	13 E	7.2
TAKA BUBUYANG	5	11 S	119	22 E	7.11
TAKA BULANGO	4	22 S	119	12 E	7.17
TAKA GOSSEYA	5	23 S	118	59 E	7.10
TAKA KAPALLE	7	07 S	120	25 E	6.115
TAKA LAMBAENA	7	16 S	121	40 E	6.113
TAKA LANGARA	3	59 S	122	59 E	8.66
TAKA LANGGARA	3	59 S	122	59 E	8.66
TAKA LINCANG	1	25 N	118	42 E	9.69
TAKA LINTJANG	1	25 N	118	42 E	9.69
TAKA LOEWARA	5	37 S	119	23 E	7.8
TAKA LUWARA	5	37 S	119	23 E	7.8
TAKA PATAPA	5	29 S	119	06 E	7.10
TAKA REWATAYA	6	05 S	118	54 E	5.69
TAKA SANGALAN	1	19 N	118	46 E	9.69

	Position °	'	°	'	Sec. Para
TAKA TENGAH TENGAH	4	50 S	119	08 E	7.16
TAKAL MENGAL	5	05 N	115	32 E	11.84
TAKAT BESAR	5	04 N	115	30 E	11.84
TAKAT LUDIN	5	04 N	115	31 E	11.84
TAKAT PATOKANAN	6	51 S	115	14 E	5.63
TAKAU OIL FIELD	4	25 N	113	43 E	11.42
TAKU REWATAYA	6	05 S	118	54 E	5.70
TALANTAM SHOAL	5	42 N	119	28 E	10.59
TALONAN	9	06 S	117	02 E	5.62
TALUK APAR LIGHTED BEACON	2	03 S	116	33 E	9.41
TALUK PARAJA	6	41 S	105	28 E	4.18
TAMBAKAN	7	13 S	113	20 E	3.55
TAMBUNAN SINGKALA	8	33 S	119	36 E	6.21
TAMPANG BAAI	5	52 S	104	43 E	4.33
TAMPURANG	5	54 S	105	56 E	4.20
TANA DJAMPEA	7	08 S	120	46 E	6.115
TANDJOENG MANIMBAJA	0	00 N	119	36 E	7.36
TANGJUNG LAMARU	1	11 S	117	00 E	9.46
TANGJUNG MANGGAR	1	11 S	117	00 E	9.46
TANGUSU BAY	5	27 N	119	03 E	10.57
TANJONG AGAS	4	15 N	117	39 E	10.9
TANJONG ARU	5	57 N	116	02 E	11.96
TANJONG BANGAU	6	57 N	116	42 E	11.117
TANJONG BARAM	4	36 N	113	58 E	11.44
TANJONG BATU	1	38 N	110	28 E	11.12
TANJONG BATU	3	12 N	113	02 E	11.30
TANJONG BATU	4	06 N	113	48 E	11.36
TANJONG BATU BATU	5	11 N	115	34 E	11.85
TANJONG BENDERA	5	16 N	115	15 E	11.68
TANJONG BREGUM	3	38 N	113	22 E	11.38
TANJONG BULI GANTUNGAN	6	44 N	117	23 E	10.75
TANJONG BULIJONG	6	03 N	116	01 E	11.98
TANJONG DALIT	6	10 N	116	08 E	11.102
TANJONG DANDULIT	6	47 N	116	38 E	11.116
TANJONG DATU	2	05 N	109	39 E	1.64
TANJONG DUDAR	6	37 N	116	33 E	11.112
TANJONG DUMPIL	5	54 N	116	02 E	11.95
TANJONG EMBANG	1	38 N	110	31 E	11.12
TANJONG GANDA	6	47 N	116	38 E	11.116
TANJONG INDAI	6	14 N	116	11 E	11.102
TANJONG INULU	5	24 S	122	28 E	8.80
TANJONG JERIJEH	2	09 N	110	11 E	11.18
TANJONG KAITAN	6	07 N	116	05 E	11.102
TANJONG KIDURONG	3	16 N	113	03 E	11.34
TANJONG KINDANA	4	55 N	115	01 E	11.76
TANJONG KLIAS	5	18 N	115	21 E	11.67
TANJONG KOMBONGO	6	18 N	116	16 E	11.102
TANJONG KUBONG	5	24 N	115	15 E	11.61
TANJONG LABIAN	5	09 N	119	13 E	10.55
TANJONG LAYANG LAYANGAN	5	21 N	115	12 E	11.61
TANJONG LIPAT	6	00 N	116	05 E	11.100
TANJONG LITA	6	02 N	116	06 E	11.100
TANJONG LOBANG	4	22 N	113	57 E	11.40
TANJONG LOKPADANG	6	32 N	116	30 E	11.111
TANJONG LUMBA LUMBA	4	53 N	115	06 E	11.79
TANJONG MANGALONG	5	01 N	115	28 E	11.83
TANJONG MANI	2	09 N	111	21 E	11.20
TANJONG MARINTAMAN	5	04 N	115	32 E	11.83
TANJONG MUARA TEBAS	1	39 N	110	30 E	11.10
TANJONG NARUNTONG	7	01 N	117	09 E	10.80
TANJONG NIUG	6	15 N	117	43 E	10.64
TANJONG PALOH	1	47 N	111	06 E	11.17
TANJONG PANGALAT	5	47 N	115	58 E	11.95
TANJONG PAYONG	3	44 N	113	25 E	11.38
TANJONG PELOMPONG	5	02 N	115	07 E	11.71
TANJONG PEREPAT	4	58 N	115	12 E	11.81
TANJONG PERUNJUK	6	20 N	116	19 E	11.106
TANJONG PO	1	44 N	110	31 E	11.8
TANJONG PUNEI	5	15 N	115	10 E	11.61
TANJONG RANCHA RANCHA	5	15 N	115	14 E	11.66
TANJONG RENARD	1	35 N	110	27 E	11.12
TANJONG SAIMA	4	11 N	117	53 E	10.13
TANJONG SAKAT	5	23 N	115	22 E	11.67
TANJONG SAMARANG	7	21 N	117	09 E	10.82
TANJONG SEBUBAL	2	07 N	111	19 E	11.20
TANJONG SELABAT	1	40 N	110	29 E	11.10
TANJONG SEMASTRA	4	55 N	115	01 E	11.76
TANJONG SEMPANG MANGAYAU	7	02 N	116	45 E	10.92
TANJONG SINDIAN	6	00 N	116	04 E	11.100
TANJONG SIPANG	1	48 N	110	20 E	11.7
TANJONG SIRIK	2	47 N	111	19 E	11.25
TANJONG SUNDA	4	58 N	115	12 E	11.81
TANJONG TAMBULURAN	6	52 N	116	38 E	11.116
TANJONG TAMPENAN BALE	5	03 S	122	45 E	8.77
TANJONG TARAS	5	17 N	115	16 E	11.67
TANJONG TEMBUNGO	6	17 N	116	14 E	11.102
TANJONG TIMBUN MATA	4	35 N	118	33 E	10.39
TANJONG TOBU-TOBU	4	51 N	115	01 E	11.79
TANJONG TORONG GUSU	6	15 N	116	13 E	11.102
TANJONG TORONG SEMBURONG	6	19 N	116	17 E	11.102
TANJONG TOULAK	5	25 N	115	23 E	11.86
TANJONG TRUSAN	4	58 N	115	11 E	11.72
TANJUNG AGAR AGAR	8	13 S	116	20 E	5.29
TANJUNG AHUS	3	48 N	117	50 E	9.92
TANJUNG AIMAU	10	26 S	121	52 E	6.111
TANJUNG ALANGALANG	5	52 S	112	37 E	3.71
TANJUNG ALANGALANG	6	39 S	105	22 E	4.18
TANJUNG AMAT	8	58 S	116	43 E	5.36
TANJUNG ANA-BURAKAWUTUN	8	24 S	123	14 E	6.59
TANJUNG ANAU	0	34 S	123	03 E	8.28
TANJUNG APATANA	6	30 S	120	29 E	6.114
TANJUNG API	0	48 S	121	39 E	8.35
TANJUNG API	1	57 N	109	20 E	1.67
TANJUNG ARANG	3	28 N	117	52 E	9.88
TANJUNG ARTWOLI	8	08 S	124	29 E	6.78
TANJUNG ARU	2	10 S	116	35 E	9.41
TANJUNG ARUS	1	20 N	120	49 E	7.45
TANJUNG ATU	9	38 S	120	16 E	6.5
TANJUNG AWARAWAR	6	46 S	111	57 E	3.38
TANJUNG BACHATANWUTUN	8	13 S	123	36 E	6.69
TANJUNG BADAK	5	37 S	104	49 E	4.32
TANJUNG BAGIMPOEANG	0	20 N	119	51 E	7.38
TANJUNG BAGIMPUANG	0	20 N	119	51 E	7.38
TANJUNG BAJA	3	08 S	122	25 E	8.59
TANJUNG BAKAI	3	17 S	113	21 E	9.8
TANJUNG BAKALINGA	1	09 S	123	12 E	8.49
TANJUNG BALI	10	28 S	122	00 E	6.111
TANJUNG BANDARAN	3	08 S	113	02 E	9.7
TANJUNG BANSERING	8	04 S	114	26 E	5.5
TANJUNG BANTENAN	8	47 S	114	32 E	4.49
TANJUNG BAO BELEWANG	8	17 S	123	52 E	6.68
TANJUNG BARA COAL TERMINAL	0	32 N	117	39 E	9.58
TANJUNG BARU	8	53 S	118	10 E	5.62
TANJUNG BARU BARU KOMA	5	25 S	122	36 E	8.77
TANJUNG BARUTU	5	22 S	122	38 E	8.77
TANJUNG BARUYA	6	06 S	120	26 E	7.4
TANJUNG BATOE GENDANG	8	50 S	115	50 E	5.33
TANJUNG BATOE KOEPING	8	28 S	117	23 E	5.42
TANJUNG BATOE PAJOENG	8	14 S	122	44 E	6.53
TANJUNG BATOE POETIH	10	13 S	124	05 E	6.97
TANJUNG BATOE POETIH	8	21 S	118	44 E	5.49
TANJUNG BATOELOENIK	5	51 S	104	43 E	4.33
TANJUNG BATU	0	53 N	123	43 E	7.52
TANJUNG BATU	2	18 N	118	05 E	9.81
TANJUNG BATU	2	22 S	105	48 E	2.11
TANJUNG BATU	2	36 S	108	03 E	2.66
TANJUNG BATU	8	05 S	115	16 E	5.14
TANJUNG BATU GENDANG	8	50 S	115	50 E	5.33
TANJUNG BATU HITAM	0	40 S	122	43 E	8.33
TANJUNG BATU KALLONG	6	16 S	120	27 E	7.5
TANJUNG BATU KUPING	8	28 S	117	23 E	5.42
TANJUNG BATU MERAH	8	17 S	123	50 E	6.68
TANJUNG BATU MERAH	9	52 S	124	45 E	6.96
TANJUNG BATU PUTIH	1	11 S	122	55 E	8.49
TANJUNG BATU PUTIH	7	13 S	113	09 E	3.45
TANJUNG BATU SAWANG	6	52 S	112	17 E	3.39
TANJUNG BATUANGAS	1	30 N	125	15 E	8.3
TANJUNG BATUATA	9	37 S	120	29 E	6.7
TANJUNG BATUATU	9	37 S	120	29 E	6.5
TANJUNG BATUBELAT	0	49 N	108	51 E	1.71
TANJUNG BATUBOGA	8	26 S	121	57 E	6.48
TANJUNG BATUHITAM	3	15 S	108	04 E	2.77
TANJUNG BATUISI	10	37 S	123	25 E	6.106
TANJUNG BATUMANUK	8	26 S	122	02 E	6.49
TANJUNG BATUPUTIH	10	13 S	124	05 E	6.97
TANJUNG BATUPUTIH	8	21 S	118	44 E	5.49
TANJUNG BAWANG	1	47 S	109	55 E	2.94
TANJUNG BAYA	3	08 S	122	25 E	8.59
TANJUNG BAYOR	0	44 S	117	37 E	9.49
TANJUNG BEA	1	58 S	121	38 E	8.53
TANJUNG BEACO	8	57 S	126	28 E	6.94
TANJUNG BEASO	8	57 S	126	28 E	6.94
TANJUNG BEBERA	8	43 S	115	52 E	5.22
TANJUNG BEDAK	8	06 S	114	29 E	5.9

	Position °	'	°	'	Sec. Para
TANJUNG BEDAUN	2	35 S	105	53 E	2.12
TANJUNG BEDULAN	7	42 S	113	29 E	3.60
TANJUNG BELITUNG	3	52 N	108	01 E	1.9
TANJUNG BELITUNG	3	53 N	108	01 E	1.8
TANJUNG BELKODI	8	17 S	123	47 E	6.68
TANJUNG BELOPPO	8	34 S	123	21 E	6.64
TANJUNG BELUSUN	8	40 S	116	45 E	5.37
TANJUNG BENDA	6	37 S	111	30 E	3.38
TANJUNG BENETE	8	53 S	116	44 E	5.36
TANJUNG BENGKUANG	2	11 S	110	05 E	2.99
TANJUNG BENOA	8	45 S	115	13 E	5.19
TANJUNG BERANI	2	04 S	105	07 E	2.3
TANJUNG BERI	8	14 S	116	28 E	5.29
TANJUNG BERIKAT	2	34 S	106	51 E	2.40
TANJUNG BERTUMPA	0	57 N	107	33 E	1.20
TANJUNG BERU	8	49 S	116	47 E	5.36
TANJUNG BESAR	0	58 N	122	56 E	7.50
TANJUNG BESEK	7	44 S	108	47 E	4.38
TANJUNG BESI	8	14 S	120	25 E	6.43
TANJUNG BETONG	6	24 S	110	55 E	3.28
TANJUNG BETUNG	5	34 S	104	33 E	4.32
TANJUNG BIASPUTIH	8	30 S	115	37 E	5.14
TANJUNG BIAT	1	56 S	105	09 E	2.23
TANJUNG BIGONO	8	26 S	126	22 E	6.90
TANJUNG BILA	1	10 N	108	55 E	1.71
TANJUNG BINGA	2	36 S	107	38 E	2.57
TANJUNG BIRI	8	46 S	116	46 E	5.37
TANJUNG BLENDERAN	6	24 S	110	55 E	3.28
TANJUNG BOBOS	6	11 S	107	49 E	3.16
TANJUNG BODA	8	33 S	124	04 E	6.76
TANJUNG BOEA	3	03 S	120	15 E	8.97
TANJUNG BOEDING	2	36 S	108	03 E	2.66
TANJUNG BOEKOE	3	30 S	119	12 E	7.26
TANJUNG BOENGIKALO	4	51 S	121	41 E	8.86
TANJUNG BOGOANG	0	43 N	120	03 E	7.39
TANJUNG BOGOWUTUN	8	17 S	123	33 E	6.70
TANJUNG BOKABAK	0	55 N	123	27 E	7.52
TANJUNG BONDE	8	21 S	116	43 E	5.29
TANJUNG BORONG	2	56 S	107	32 E	2.63
TANJUNG BOTA AMIN	8	33 S	124	07 E	6.76
TANJUNG BOTAAMIN	8	33 S	124	07 E	6.76
TANJUNG BOTOE	8	39 S	119	11 E	5.55
TANJUNG BOTOK	1	03 S	123	20 E	8.51
TANJUNG BRENTI	8	09 S	117	44 E	5.46
TANJUNG BUA	3	03 S	120	15 E	8.97
TANJUNG BUBUAYANG	4	23 S	105	51 E	2.21
TANJUNG BUGBUG	8	31 S	115	35 E	5.15
TANJUNG BUGEL	6	25 S	111	03 E	3.34
TANJUNG BUKU	3	30 S	119	12 E	7.26
TANJUNG BULOOLIHO	0	28 N	122	08 E	8.18
TANJUNG BULUBULU	2	48 S	120	59 E	8.97
TANJUNG BULUPANDAN	6	54 S	112	51 E	3.49
TANJUNG BUNGA	2	08 S	106	11 E	2.30
TANJUNG BUNGALUN	0	38 N	117	43 E	9.59
TANJUNG BUNGKULAN	8	03 S	115	11 E	5.9
TANJUNG BUNGKULAN	8	58 S	116	23 E	5.32
TANJUNG BUNGKUNLAN	8	03 S	115	11 E	5.13
TANJUNG BUNUTAN	8	44 S	116	02 E	5.23
TANJUNG CAMARA	6	36 S	105	37 E	4.17
TANJUNG CANDIBAN	7	53 S	114	28 E	5.5
TANJUNG CANGKUANG	6	51 S	105	16 E	4.35
TANJUNG CAPBELANDA	0	58 S	109	30 E	2.90
TANJUNG CAPIL	8	38 S	114	13 E	4.47
TANJUNG CELONG	6	55 S	109	56 E	3.22
TANJUNG CEMARA	8	44 S	116	03 E	5.23
TANJUNG CHATER	8	20 S	127	00 E	6.91
TANJUNG CIKONENG	6	04 S	105	53 E	4.16
TANJUNG CIMANGGU	7	44 S	108	40 E	4.38
TANJUNG CINA	5	47 S	112	35 E	3.73
TANJUNG CINA	5	56 S	104	44 E	4.31
TANJUNG CINOKA	1	41 S	119	17 E	7.30
TANJUNG COTEK	7	45 S	114	19 E	3.64
TANJUNG DAMARI	1	41 S	121	56 E	8.52
TANJUNG DAMPELAS	0	13 N	119	46 E	7.38
TANJUNG DARAT	8	30 S	122	29 E	6.51
TANJUNG DATA	8	28 S	115	38 E	5.14
TANJUNG DEBI	8	27 S	124	02 E	6.76
TANJUNG DELAKI	8	33 S	124	04 E	6.76
TANJUNG DEWA	0	37 S	117	18 E	9.52
TANJUNG DEWA	3	08 S	116	16 E	9.22
TANJUNG DJAMBELO	8	20 S	115	40 E	5.14
TANJUNG DJELENGNJA	8	51 S	116	46 E	5.36
TANJUNG DJENEMEDJAI	3	15 S	120	25 E	8.97
TANJUNG DJOELI	8	15 S	118	28 E	5.49
TANJUNG DOLA	8	12 S	124	15 E	6.75
TANJUNG DONDO	1	00 N	120	17 E	7.40
TANJUNG DONGKALA	2	18 S	121	49 E	8.54
TANJUNG DORO	8	53 S	118	29 E	5.61
TANJUNG DUMARING	1	38 N	118	10 E	9.70
TANJUNG FANOT	10	11 S	123	32 E	6.101
TANJUNG FATOE SOE	8	52 S	125	00 E	6.104
TANJUNG FATOEKOEMBOE	1	47 S	125	19 E	8.38
TANJUNG FATU BERO	8	41 S	125	06 E	6.104
TANJUNG FATU CAMA	8	32 S	125	36 E	6.89
TANJUNG FATU LANA	8	29 S	125	51 E	6.89
TANJUNG FATU SUE	8	52 S	125	00 E	6.104
TANJUNG FATUKUMBU	1	47 S	125	19 E	8.38
TANJUNG FLESKO	0	28 N	124	30 E	8.12
TANJUNG GAANG	5	51 S	112	34 E	3.73
TANJUNG GAGAR	8	50 S	115	13 E	5.19
TANJUNG GALI	8	34 S	116	40 E	5.30
TANJUNG GANGSA	2	26 S	110	09 E	2.99
TANJUNG GELEKO	8	21 S	123	27 E	6.58
TANJUNG GELING	8	23 S	115	16 E	5.16
TANJUNG GENTING	1	42 S	105	19 E	2.24
TANJUNG GERINTING	7	42 S	113	29 E	3.60
TANJUNG GILI	5	48 S	112	34 E	3.73
TANJUNG GIRING GIRING	1	11 N	118	46 E	9.68
TANJUNG GONDOL	8	09 S	114	43 E	5.10
TANJUNG GORAM	4	52 S	123	12 E	8.72
TANJUNG GORNEA	4	51 S	122	50 E	8.75
TANJUNG GRASAK	1	30 S	105	55 E	2.26
TANJUNG GRESAK	8	43 S	116	02 E	5.22
TANJUNG GRINTING	7	42 S	113	29 E	3.60
TANJUNG GUHAKOLAK	6	50 S	105	15 E	4.34
TANJUNG GULAH	8	06 S	115	20 E	5.13
TANJUNG GUMUK	9	30 S	123	48 E	6.100
TANJUNG GUNUNG	6	53 S	109	48 E	3.24
TANJUNG GUNUNGDALAM	5	44 S	104	39 E	4.33
TANJUNG HAAI	4	54 S	122	46 E	8.76
TANJUNG HERO	8	20 S	127	11 E	6.91
TANJUNG HOREGALA	8	15 S	123	34 E	6.69
TANJUNG HOREGALAWUTUN	8	15 S	123	34 E	6.69
TANJUNG IBOES	8	22 S	115	42 E	5.14
TANJUNG IBUL	2	29 N	109	01 E	1.16
TANJUNG IBUS	8	22 S	115	42 E	5.14
TANJUNG IKANGKUTONG	8	27 S	123	57 E	6.76
TANJUNG JALONO	8	18 S	124	24 E	6.78
TANJUNG JAMBELO	8	20 S	115	40 E	5.14
TANJUNG JANDIBAN	7	53 S	114	28 E	5.5
TANJUNG JELENGNYA	8	51 S	116	46 E	5.36
TANJUNG JENE	3	15 S	120	25 E	8.97
TANJUNG JULI	8	15 S	118	28 E	5.49
TANJUNG KAIT	6	01 S	106	32 E	3.2
TANJUNG KAJANGAN	8	30 S	116	41 E	5.30
TANJUNG KAJOEANGIN	3	36 S	119	29 E	7.25
TANJUNG KAJU BELE	8	53 S	116	06 E	5.32
TANJUNG KAJUANGINGGE	3	36 S	119	29 E	7.25
TANJUNG KALASEI	1	27 N	124	44 E	7.54
TANJUNG KALIKAWUTUN	8	26 S	122	59 E	6.62
TANJUNG KANANGJAJAR	6	41 S	105	11 E	4.19
TANJUNG KANDI	1	19 N	121	28 E	7.46
TANJUNG KANJAI	1	06 N	121	56 E	7.48
TANJUNG KANO	1	16 N	121	22 E	7.46
TANJUNG KAPO	5	56 S	106	07 E	4.9
TANJUNG KARANG	0	38 S	119	44 E	7.32
TANJUNG KARANGBATA	7	46 S	109	24 E	4.39
TANJUNG KARANGBURUNG	6	41 S	105	11 E	4.19
TANJUNG KARANGWUTUN	8	08 S	122	58 E	6.41
TANJUNG KARAT KOEIP	8	25 S	124	20 E	6.79
TANJUNG KARATKUIP	8	25 S	124	20 E	6.79
TANJUNG KARENDI	9	22 S	119	25 E	6.3
TANJUNG KAROSSO	9	33 S	118	56 E	6.3
TANJUNG KARTERBILEH	8	28 S	121	37 E	6.47
TANJUNG KASIKEBO	4	42 S	119	31 E	7.20
TANJUNG KASSIKKEBOK	4	42 S	119	31 E	7.20
TANJUNG KATOEPA	8	08 S	118	09 E	5.49
TANJUNG KATUPA	8	08 S	118	09 E	5.49
TANJUNG KECINAN	8	34 S	116	03 E	5.27
TANJUNG KEKOH	1	07 N	120	47 E	7.43
TANJUNG KELAPA	5	50 S	105	36 E	4.22
TANJUNG KELIAN	2	05 S	105	08 E	2.3
TANJUNG KEMBANI	1	36 S	122	53 E	8.47
TANJUNG KENAM	4	40 S	105	55 E	4.3

	Position °	'	°	'	Sec. Para
TANJUNG KEPALA	2	53 S	110	14 E	2.101
TANJUNG KERITAMESE	8	52 S	119	55 E	6.36
TANJUNG KESSI	8	34 S	118	12 E	5.48
TANJUNG KETAH	7	43 S	113	42 E	3.61
TANJUNG KETJINAN	8	34 S	116	03 E	5.27
TANJUNG KIBINGI	8	23 S	123	48 E	6.71
TANJUNG KIWI	3	39 S	116	00 E	9.23
TANJUNG KLUANG	1	18 S	109	30 E	2.91
TANJUNG KOKOE	5	30 S	121	57 E	8.83
TANJUNG KOKU	5	30 S	121	57 E	8.83
TANJUNG KOMIWUTUN	8	26 S	123	41 E	6.67
TANJUNG KONA	1	56 S	125	01 E	8.40
TANJUNG KONGA	8	33 S	123	18 E	6.64
TANJUNG KOPONDEI	8	04 S	122	52 E	6.53
TANJUNG KOROWELANG	6	51 S	110	12 E	3.24
TANJUNG KOYAN	2	57 S	105	58 E	2.17
TANJUNG KRAMBITAN	8	40 S	115	34 E	5.20
TANJUNG KRANGBOTO	7	46 S	109	24 E	4.41
TANJUNG KRAWANG	5	56 S	107	00 E	3.4
TANJUNG KRUPIT	2	35 S	108	01 E	2.65
TANJUNG KUANGWAHE	8	45 S	116	32 E	5.34
TANJUNG KURUNGBAJA	8	15 S	120	36 E	6.43
TANJUNG LABEA	0	09 S	119	48 E	7.35
TANJUNG LABOE	5	22 S	120	25 E	8.91
TANJUNG LABU	2	56 S	106	55 E	2.44
TANJUNG LABU	2	58 S	106	20 E	2.15
TANJUNG LABU	5	22 S	120	25 E	8.91
TANJUNG LABU BERU	8	31 S	116	49 E	5.37
TANJUNG LADONGI	3	55 S	121	15 E	8.90
TANJUNG LAINPANGI	1	10 N	124	20 E	7.54
TANJUNG LAISOEMBOE	8	19 S	125	08 E	6.80
TANJUNG LAJAR	6	45 S	105	13 E	4.19
TANJUNG LALAK	3	59 S	116	12 E	9.16
TANJUNG LALEREH	2	00 S	119	12 E	7.29
TANJUNG LALETE	9	12 S	125	42 E	6.95
TANJUNG LAMANUK	8	30 S	123	00 E	6.63
TANJUNG LAMBO	8	26 S	121	22 E	6.45
TANJUNG LANGKA	2	28 S	106	27 E	2.30
TANJUNG LANGUNDU	8	49 S	118	59 E	5.61
TANJUNG LANKA	2	28 S	106	27 E	2.30
TANJUNG LAPA	6	59 S	114	07 E	3.50
TANJUNG LAPAROENO	10	00 S	119	57 E	6.12
TANJUNG LAQUEBADA	8	32 S	125	34 E	6.88
TANJUNG LASO	5	37 S	120	29 E	7.6
TANJUNG LASSA	5	37 S	120	29 E	7.6
TANJUNG LAUNDI	9	28 S	120	12 E	6.5
TANJUNG LAURAN	3	44 S	116	01 E	9.19
TANJUNG LAWAWOLO	8	37 S	122	53 E	6.63
TANJUNG LAWITU	10	10 S	120	05 E	6.12
TANJUNG LAYAR	4	05 S	116	05 E	9.17
TANJUNG LAYAR	5	52 S	112	41 E	3.71
TANJUNG LAYAR	6	45 S	105	13 E	4.19
TANJUNG LEIBORA	4	59 S	122	46 E	8.77
TANJUNG LELAN	2	49 N	105	44 E	1.28
TANJUNG LELARI	2	49 S	105	57 E	2.12
TANJUNG LELENDO	10	14 S	123	29 E	6.100
TANJUNG LELINDO	10	14 S	123	29 E	6.100
TANJUNG LEMO	1	24 S	121	02 E	8.36
TANJUNG LENENG	6	01 S	105	57 E	4.16
TANJUNG LERANG	8	37 S	122	47 E	6.40
TANJUNG LEREH	2	00 S	119	12 E	7.29
TANJUNG LERUNG	0	21 S	117	33 E	9.49
TANJUNG LESUNG	6	29 S	105	39 E	4.17
TANJUNG LEUR	8	15 S	123	55 E	6.68
TANJUNG LEWITU	10	10 S	120	05 E	6.12
TANJUNG LEWOWUTUN	8	32 S	123	28 E	6.65
TANJUNG LIAKOKOLI	10	37 S	123	25 E	6.106
TANJUNG LIANGMAH	8	31 S	123	13 E	6.60
TANJUNG LIANGMEAH	8	31 S	123	13 E	6.60
TANJUNG LIANWUTUN	8	32 S	122	58 E	6.63
TANJUNG LIE GETA	10	33 S	121	59 E	6.111
TANJUNG LIKIEWATANG	8	10 S	124	40 E	6.82
TANJUNG LIKUWATANG	8	10 S	124	40 E	6.82
TANJUNG LIMAUBUNGKUK	2	20 S	105	13 E	2.10
TANJUNG LIMONG	8	27 S	117	24 E	5.43
TANJUNG LINGKOBOE	2	03 S	121	32 E	8.54
TANJUNG LINGKOBU	2	03 S	121	32 E	8.54
TANJUNG LIRANG	8	37 S	122	47 E	6.40
TANJUNG LISOMU	8	19 S	125	08 E	6.80
TANJUNG LOJAR	4	05 S	116	05 E	9.17
TANJUNG LOKAN	8	27 S	115	39 E	5.14
TANJUNG LOKOLOKO	3	44 S	120	26 E	8.95

	Position °	'	°	'	Sec. Para
TANJUNG LONSIO	0	39 S	123	25 E	8.28
TANJUNG LORE	8	41 S	127	01 E	6.93
TANJUNG LOSONI	2	40 S	122	02 E	8.56
TANJUNG LUMUT	3	49 S	105	57 E	2.19
TANJUNG MAGINA	5	04 S	121	58 E	8.84
TANJUNG MAKAR	10	55 S	122	58 E	6.107
TANJUNG MALANGGU	10	07 S	120	01 E	6.12
TANJUNG MALATE	5	17 S	121	48 E	8.83
TANJUNG MALI	10	22 S	123	36 E	6.97
TANJUNG MALOH	8	55 S	116	44 E	5.36
TANJUNG MAMBA	9	45 S	119	11 E	6.15
TANJUNG MAMBANG	9	45 S	119	11 E	6.15
TANJUNG MAMOEAN	2	35 S	119	00 E	7.29
TANJUNG MAMUAN	2	35 S	119	00 E	7.29
TANJUNG MANAMONI	8	09 S	125	06 E	6.81
TANJUNG MANDOLANG	1	27 N	124	44 E	7.54
TANJUNG MANDU	1	46 S	116	27 E	9.42
TANJUNG MANEMARA	9	12 S	125	42 E	6.95
TANJUNG MANGKALIHAT	1	01 N	119	00 E	9.65
TANJUNG MANGKIT	0	55 N	124	47 E	8.9
TANJUNG MANGKUN	9	01 S	116	44 E	5.36
TANJUNG MANIMBAYA	0	00 N	119	36 E	7.36
TANJUNG MANTOK	1	19 N	121	05 E	7.46
TANJUNG MANULALUK	10	52 S	123	01 E	6.107
TANJUNG MARANGKAYU	0	13 S	117	26 E	9.54
TANJUNG MARESEH	8	52 S	116	09 E	5.32
TANJUNG MARGET	8	28 S	124	25 E	6.79
TANJUNG MARGETA	8	28 S	124	25 E	6.79
TANJUNG MARIKASOE	1	40 S	124	24 E	8.40
TANJUNG MATANGDU	8	17 S	123	01 E	6.41
TANJUNG MATARI	8	08 S	124	29 E	6.78
TANJUNG MATOMPO	8	22 S	118	19 E	5.49
TANJUNG MAU DUKI	8	32 S	125	32 E	6.86
TANJUNG MELANGU	10	07 S	120	01 E	6.12
TANJUNG MEMANDJING	1	39 S	119	17 E	7.31
TANJUNG MEMANJING	1	39 S	119	17 E	7.31
TANJUNG MENAHAKEH	1	30 S	122	23 E	8.52
TANJUNG MENANGIS	8	24 S	117	26 E	5.43
TANJUNG MENTIGI	5	43 S	112	41 E	3.70
TANJUNG MENU	9	52 S	124	45 E	6.96
TANJUNG MEPE	10	39 S	123	25 E	6.106
TANJUNG MERAH	1	24 N	125	07 E	8.8
TANJUNG MERANGA	10	36 S	121	33 E	6.112
TANJUNG MESERA	10	34 S	121	41 E	6.109
TANJUNG METI BOOT	9	09 S	125	49 E	6.95
TANJUNG METIBOT	9	09 S	125	49 E	6.95
TANJUNG MINGGA	3	03 N	105	44 E	1.26
TANJUNG MIPAH	8	26 S	116	02 E	5.28
TANJUNG MITAWUTUN	8	26 S	123	19 E	6.60
TANJUNG MOANG	8	18 S	124	10 E	6.74
TANJUNG MODUNG	6	55 S	112	49 E	3.40
TANJUNG MONEH	9	06 S	117	02 E	5.62
TANJUNG MOTONG	8	26 S	123	10 E	6.59
TANJUNG MOTTONG	8	26 S	123	10 E	6.59
TANJUNG MUARA BERAU	0	35 S	117	17 E	9.52
TANJUNG MUNA	8	11 S	124	19 E	6.75
TANJUNG MUNU	8	16 S	123	26 E	6.69
TANJUNG MUNUWUTUN	8	16 S	123	26 E	6.69
TANJUNG NABOTTIEBITTE	5	03 S	122	23 E	8.82
TANJUNG NANGA AMBA	9	21 S	119	18 E	6.3
TANJUNG NANGA LEBANG	8	24 S	123	42 E	6.67
TANJUNG NANGU WARA	10	14 S	120	41 E	6.9
TANJUNG NAROE	8	19 S	119	00 E	5.51
TANJUNG NARU	8	19 S	119	00 E	5.51
TANJUNG NBAI	8	30 S	121	18 E	6.45
TANJUNG NDOLOEDEOE	1	54 S	125	19 E	8.39
TANJUNG NDOLUDEU	1	54 S	125	19 E	8.39
TANJUNG NEDERBURGH	2	55 S	122	19 E	8.58
TANJUNG NGAMBER	8	15 S	111	06 E	4.42
TANJUNG NGAROE ROEHOE	9	28 S	120	12 E	6.5
TANJUNG NGARU MANGEH	10	15 S	120	37 E	6.9
TANJUNG NGIS	8	10 S	115	27 E	5.13
TANJUNG NGOENDJOE	10	19 S	120	27 E	6.10
TANJUNG NGUNGU WAWI	9	55 S	119	47 E	6.13
TANJUNG NGUNJU	10	19 S	120	27 E	6.10
TANJUNG NIOEWOEDOE	10	27 S	122	00 E	6.111
TANJUNG NIPANIPA	3	54 S	122	40 E	8.63
TANJUNG NIUWUDU	10	27 S	122	00 E	6.111
TANJUNG NONGUWAWI	9	55 S	119	47 E	6.13
TANJUNG NUBI	8	33 S	123	18 E	6.64
TANJUNG OENDOE	10	05 S	120	51 E	6.8
TANJUNG OENGGAE	10	36 S	123	12 E	6.109

	Position °	'	°	'	Sec. Para
TANJUNG OGOGILI	0	48 N	120	30 E	7.41
TANJUNG OISINA	10	21 S	123	27 E	6.97
TANJUNG ONEMATOEBOE	1	57 S	121	33 E	8.53
TANJUNG ONEMATUBU	1	57 S	121	33 E	8.53
TANJUNG ONGKONA	3	05 S	118	47 E	7.28
TANJUNG PABUWAHAN	8	20 S	114	31 E	5.8
TANJUNG PADELEGAN	7	15 S	113	32 E	3.53
TANJUNG PAGARANTIMUN	2	15 S	110	04 E	2.99
TANJUNG PAGER	0	49 N	118	23 E	9.63
TANJUNG PAKANGSIPONGE	4	14 S	119	36 E	7.21
TANJUNG PAKEM	8	14 S	114	23 E	5.2
TANJUNG PAKOELAK	10	02 S	123	35 E	6.101
TANJUNG PAKULAR	10	02 S	123	35 E	6.101
TANJUNG PALAGAN	6	40 S	105	34 E	4.17
TANJUNG PAN GORAWUTUN	8	30 S	123	35 E	6.66
TANJUNG PANDA	8	09 S	117	40 E	5.46
TANJUNG PANDANAN	8	43 S	115	51 E	5.22
TANJUNG PANGALUANG	0	57 N	120	39 E	7.42
TANJUNG PANGGA	8	55 S	116	00 E	5.33
TANJUNG PANGKALASEANG	0	42 S	123	27 E	8.50
TANJUNG PANJANG	0	24 N	121	48 E	8.20
TANJUNG PANTO	6	51 S	105	54 E	4.35
TANJUNG PANURUKAN	8	05 S	115	07 E	5.11
TANJUNG PAPAK	8	19 S	116	11 E	5.28
TANJUNG PARAKAN	1	12 N	108	59 E	1.69
TANJUNG PARAKAWUTUN	8	15 S	123	39 E	6.70
TANJUNG PARANGGAWU	8	30 S	118	07 E	5.48
TANJUNG PARAPARANGATAN	0	55 S	117	20 E	9.48
TANJUNG PARIMBALA	8	39 S	125	07 E	6.104
TANJUNG PAROPA	8	18 S	118	39 E	5.49
TANJUNG PASANGKAYU	1	10 S	119	20 E	7.31
TANJUNG PASIA MANUK	9	39 S	120	19 E	6.7
TANJUNG PASIR	6	01 S	106	41 E	3.2
TANJUNG PASIR	8	06 S	114	26 E	5.8
TANJUNG PASSANGKAJOE	1	10 S	119	20 E	7.31
TANJUNG PAU	8	11 S	123	46 E	6.70
TANJUNG PAUGORA	8	30 S	123	35 E	6.66
TANJUNG PAYUNG	4	00 N	107	58 E	1.9
TANJUNG PECARON	7	41 S	113	52 E	3.61
TANJUNG PECENAN	7	36 S	114	02 E	3.64
TANJUNG PEKAT	8	40 S	118	11 E	5.48
TANJUNG PELINDU	8	24 S	113	24 E	4.46
TANJUNG PEMALI	1	17 S	123	34 E	8.44
TANJUNG PEMARUNG	0	53 S	117	26 E	9.48
TANJUNG PENET	5	15 S	105	52 E	4.3
TANJUNG PENGAMBENGAN	8	24 S	114	35 E	5.8
TANJUNG PERANU	8	37 S	115	19 E	5.20
TANJUNG PERAPPAT	8	22 S	117	06 E	5.39
TANJUNG PERUPU	1	47 N	118	04 E	9.77
TANJUNG PETA BARI	8	18 S	120	12 E	6.42
TANJUNG PETANG	3	37 S	116	58 E	9.22
TANJUNG PETAWANG	9	48 S	120	38 E	6.7
TANJUNG PIAKOKOLI	10	39 S	123	25 E	6.106
TANJUNG PIAN PADANG	3	40 N	108	18 E	1.5
TANJUNG PIANPADANG	3	40 N	108	18 E	1.5
TANJUNG PIATU	5	53 S	106	04 E	4.10
TANJUNG PIOEN	8	20 S	118	16 E	5.49
TANJUNG PIUN	8	20 S	118	16 E	5.49
TANJUNG POEKOEATOE	10	26 S	123	22 E	6.106
TANJUNG POELEH	10	50 S	123	13 E	6.107
TANJUNG POGONG	8	37 S	122	20 E	6.50
TANJUNG PONGGUL	1	37 S	106	03 E	2.28
TANJUNG PONTANG	5	56 S	106	16 E	3.2
TANJUNG PREPE	8	27 S	116	43 E	5.30
TANJUNG PRIOK	6	06 S	106	53 E	3.15
TANJUNG PROPA	8	18 S	118	23 E	5.49
TANJUNG PUJUT	5	52 S	106	02 E	4.10
TANJUNG PUKUATU	10	26 S	123	22 E	6.106
TANJUNG PULAKI	8	07 S	114	35 E	5.10
TANJUNG PULISAN	1	41 N	125	10 E	8.4
TANJUNG PURWO	8	44 S	114	20 E	4.48
TANJUNG PUTING	3	31 S	111	46 E	9.5
TANJUNG PUTRI	2	55 S	111	23 E	9.4
TANJUNG PUTUS	0	17 S	109	05 E	1.77
TANJUNG RANGASA	3	35 S	118	56 E	7.27
TANJUNG RATA	5	57 S	104	35 E	4.33
TANJUNG RATA	8	42 S	119	11 E	5.55
TANJUNG RATUWOLU	9	21 S	119	51 E	6.4
TANJUNG RAYA	2	08 S	105	40 E	2.5
TANJUNG RINGGIT	8	52 S	116	36 E	5.31
TANJUNG RORO AI	8	48 S	126	37 E	6.94
TANJUNG RUA	9	48 S	119	28 E	6.15
TANJUNG RUSA	3	10 S	107	50 E	2.79
TANJUNG RUWANA	0	35 S	117	17 E	9.50
TANJUNG SAGUWUTUN	8	14 S	123	13 E	6.56
TANJUNG SALABANGKA	3	03 S	122	17 E	8.58
TANJUNG SALANGKETO	4	50 S	120	23 E	8.93
TANJUNG SALIMBURUNG	0	43 N	124	38 E	8.11
TANJUNG SALIPOLO	3	43 S	119	26 E	7.24
TANJUNG SALOKA	8	35 S	119	22 E	5.59
TANJUNG SAMAK	1	30 S	105	55 E	2.26
TANJUNG SAMAK	2	53 S	108	17 E	2.68
TANJUNG SAMATANYI	8	34 S	122	57 E	6.63
TANJUNG SAMATANYIWUTUN	8	34 S	122	57 E	6.63
TANJUNG SAMBAR	3	00 S	110	19 E	9.2
TANJUNG SANEH	8	05 S	115	16 E	5.14
TANJUNG SANGANYIWUTUN	8	14 S	123	09 E	6.56
TANJUNG SANGEANG	8	10 S	115	00 E	5.11
TANJUNG SANGULA	8	55 S	116	26 E	5.31
TANJUNG SANTIGI	0	23 N	120	54 E	8.23
TANJUNG SANTIGI	8	30 S	116	02 E	5.27
TANJUNG SARA	8	54 S	116	04 E	5.32
TANJUNG SARANGLAYANG	3	05 S	106	29 E	2.16
TANJUNG SARI	8	32 S	115	31 E	5.15
TANJUNG SAROKAJA	8	22 S	117	10 E	5.41
TANJUNG SASAR	9	17 S	119	56 E	6.4
TANJUNG SAUKEMEH	8	53 S	120	47 E	6.37
TANJUNG SAUSU	0	59 S	120	30 E	8.25
TANJUNG SAWA	3	45 S	122	27 E	8.61
TANJUNG SAWAH	3	45 S	122	27 E	8.61
TANJUNG SEBU	9	03 S	117	20 E	5.62
TANJUNG SEDANO	7	50 S	114	28 E	3.65
TANJUNG SEDIHANG	8	49 S	115	35 E	5.21
TANJUNG SEKAMPUNG	5	35 S	105	49 E	4.3
TANJUNG SEKOL	3	38 N	108	10 E	1.6
TANJUNG SEKOPONG	4	56 S	105	54 E	4.3
TANJUNG SELATAN	4	10 S	114	39 E	9.12
TANJUNG SELOKAN	2	23 S	105	37 E	2.10
TANJUNG SELOR	2	50 N	117	22 E	9.84
TANJUNG SEMAMBUNG	7	11 S	112	40 E	3.43
TANJUNG SEMBULUGAN	8	27 S	114	23 E	5.2
TANJUNG SEMBULUNGAN	8	27 S	114	23 E	5.2
TANJUNG SEMPINIT	0	24 N	121	04 E	8.15
TANJUNG SENDANG	8	08 S	114	39 E	5.10
TANJUNG SENE	0	02 S	120	05 E	8.25
TANJUNG SENTIGI	8	22 S	116	43 E	5.29
TANJUNG SENUBING	3	58 N	108	24 E	1.5
TANJUNG SERAH	2	23 S	104	44 E	2.7
TANJUNG SERANGAN	8	43 S	115	16 E	5.16
TANJUNG SERBETE	8	19 S	123	01 E	6.55
TANJUNG SERDANG	3	29 S	116	02 E	9.23
TANJUNG SERDANG	4	27 S	105	54 E	4.3
TANJUNG SETRA	8	34 S	115	27 E	5.16
TANJUNG SEVIVARA	8	23 S	127	18 E	6.86
TANJUNG SIANTU	2	32 S	107	49 E	2.65
TANJUNG SIKA	8	08 S	124	36 E	6.82
TANJUNG SIRAH	8	22 S	116	06 E	5.27
TANJUNG SIRRAH	8	22 S	116	06 E	5.27
TANJUNG SISI	0	31 S	117	35 E	9.49
TANJUNG SIWA	3	41 S	120	26 E	8.96
TANJUNG SLOKAH	8	43 S	114	36 E	5.2
TANJUNG SODONG	6	52 S	105	32 E	4.35
TANJUNG SODONG	7	44 S	108	59 E	4.40
TANJUNG SOELORO	8	41 S	127	01 E	6.93
TANJUNG SOJANG	8	27 S	123	55 E	6.73
TANJUNG SOYANG	8	27 S	123	55 E	6.73
TANJUNG STEILE	4	14 S	122	55 E	8.67
TANJUNG SUAI	9	21 S	125	16 E	6.95
TANJUNG SUBA	8	33 S	123	13 E	6.60
TANJUNG SUBANG	8	29 S	125	59 E	6.89
TANJUNG SUBAO	8	29 S	125	59 E	6.89
TANJUNG SUMA	9	26 S	119	02 E	6.3
TANJUNG SUMBERTBOTO	7	47 S	114	26 E	3.65
TANJUNG SUMUR BATU	5	50 S	105	47 E	4.4
TANJUNG TA ATU	9	47 S	119	36 E	6.14
TANJUNG TAAL	8	40 S	115	27 E	5.21
TANJUNG TABAKO	3	25 S	120	52 E	8.90
TANJUNG TADA	2	08 S	105	26 E	2.4
TANJUNG TAFARA	9	25 S	125	12 E	6.95
TANJUNG TAI MANUK	9	37 S	120	15 E	6.5
TANJUNG TAJU	7	43 S	113	09 E	3.57
TANJUNG TALABU	0	46 S	123	27 E	8.50
TANJUNG TALONAN	9	06 S	117	02 E	5.62
TANJUNG TAMBAHAGUNG	7	27 S	112	50 E	3.46

	Position °	'	°	'	Sec. Para
TANJUNG TAMBARANA	1	11 S	120	35 E	8.37
TANJUNG TAMBIKIL	5	31 S	105	16 E	4.27
TANJUNG TAMBOO	0	27 N	121	58 E	8.19
TANJUNG TAMPA	8	55 S	116	12 E	5.32
TANJUNG TAMPUNABALE	5	03 S	122	45 E	8.77
TANJUNG TANAH	6	29 S	108	33 E	3.21
TANJUNG TANJUNGAN	8	38 S	115	06 E	5.6
TANJUNG TANO	8	31 S	116	49 E	5.37
TANJUNG TAPA	2	41 S	105	47 E	2.11
TANJUNG TAPAULAMA	3	11 S	122	29 E	8.59
TANJUNG TAPOAOELOENO	3	11 S	122	29 E	8.59
TANJUNG TEBUR	2	31 N	108	59 E	1.16
TANJUNG TEDONG	2	22 S	105	48 E	2.11
TANJUNG TEKURENAN	8	11 S	115	29 E	5.14
TANJUNG TEPOX	3	08 S	108	12 E	2.73
TANJUNG TERANJUN	0	43 N	108	52 E	1.72
TANJUNG TERAPA	9	21 S	119	38 E	6.4
TANJUNG TERELENG	6	51 S	105	25 E	4.35
TANJUNG TIBI	3	29 N	117	37 E	9.90
TANJUNG TIDUNG SALANG	4	05 N	117	28 E	10.7
TANJUNG TIKUS	5	48 S	105	13 E	4.30
TANJUNG TIMBANGONGOT	0	55 S	117	15 E	9.48
TANJUNG TINGGI	6	50 S	115	13 E	5.63
TANJUNG TIPPOELOEWE	4	29 S	120	23 E	8.94
TANJUNG TIPPULUWE	4	29 S	120	23 E	8.94
TANJUNG TITIR	8	36 S	122	13 E	6.50
TANJUNG TIWORO	4	45 S	122	23 E	8.81
TANJUNG TJAMARA	6	36 S	105	37 E	4.17
TANJUNG TJANDIBAN	7	53 S	114	28 E	5.5
TANJUNG TJANKOEANG	6	51 S	105	16 E	4.35
TANJUNG TJELONG	6	55 S	109	56 E	3.22
TANJUNG TJEMARA	8	44 S	116	03 E	5.23
TANJUNG TJENOKI	1	41 S	119	17 E	7.30
TANJUNG TJIKONENG	6	04 S	105	53 E	4.16
TANJUNG TJIMANGGU	7	44 S	108	40 E	4.38
TANJUNG TJINA	5	47 S	112	35 E	3.73
TANJUNG TJOTEK	7	45 S	114	19 E	3.64
TANJUNG TOBI	8	30 S	123	04 E	6.59
TANJUNG TOBIKUMONG	8	18 S	124	24 E	6.78
TANJUNG TOKABENE	1	29 N	124	50 E	7.55
TANJUNG TOLOSIADJE	0	28 N	121	26 E	8.20
TANJUNG TOLOSIAJE	0	28 N	121	26 E	8.20
TANJUNG TOLU	0	22 N	124	13 E	8.13
TANJUNG TOMARA	5	08 S	123	02 E	8.72
TANJUNG TOMBULILATU	0	18 N	123	20 E	8.13
TANJUNG TONGA	10	47 S	122	49 E	6.108
TANJUNG TONGGA	10	47 S	122	49 E	6.108
TANJUNG TONRANGANG	4	03 S	119	37 E	7.22
TANJUNG TORIENG	8	25 S	121	09 E	6.45
TANJUNG TORO PEMALI	4	03 S	122	50 E	8.67
TANJUNG TROENA	8	20 S	115	38 E	5.14
TANJUNG TRUNA	8	20 S	115	38 E	5.14
TANJUNG TUA	5	55 S	105	43 E	4.4
TANJUNG TUAK	8	18 S	123	21 E	6.58
TANJUNG TUAK	8	38 S	122	43 E	6.40
TANJUNG TUAK	9	43 S	120	36 E	6.7
TANJUNG TUING	1	37 S	106	03 E	2.28
TANJUNG TULADENGG	0	25 N	121	09 E	8.21
TANJUNG TUNTUNGKALIK	5	48 S	105	05 E	4.30
TANJUNG TUWAK	8	18 S	123	21 E	6.58
TANJUNG TUWESI	6	25 S	110	51 E	3.28
TANJUNG UDANG	8	20 S	123	01 E	6.55
TANJUNG UHO	8	13 S	123	42 E	6.70
TANJUNG ULAR	1	58 S	105	07 E	2.3
TANJUNG ULOIMI	10	20 S	123	24 E	6.98
TANJUNG UNDU	10	05 S	120	51 E	6.8
TANJUNG UNGGAE	10	36 S	123	12 E	6.109
TANJUNG UPEOH	10	14 S	123	19 E	6.99
TANJUNG WAI AU	8	15 S	123	25 E	6.69
TANJUNG WAIBUKU	9	40 S	119	02 E	6.15
TANJUNG WAIKRONG	8	28 S	123	17 E	6.60
TANJUNG WAINDE	9	21 S	119	51 E	6.4
TANJUNG WAISELAI	9	37 S	119	00 E	6.15
TANJUNG WAIWEWANG	8	22 S	123	23 E	6.58
TANJUNG WAIWOWANG	8	22 S	123	23 E	6.58
TANJUNG WAJAU	8	15 S	123	25 E	6.58
TANJUNG WAMBA	8	31 S	119	03 E	5.52
TANJUNG WANDA	9	21 S	119	38 E	6.4
TANJUNG WANGI	8	07 S	114	24 E	5.4
TANJUNG WARA DJANGGA	9	55 S	120	45 E	6.8
TANJUNG WARADJANGGA	10	14 S	120	41 E	6.9
TANJUNG WARANGAN	7	39 S	113	01 E	3.57
TANJUNG WARANGWUTUN	8	24 S	123	10 E	6.61
TANJUNG WARUMANGGIT	10	15 S	120	37 E	6.9
TANJUNG WATOEMBOLO	9	46 S	119	20 E	6.15
TANJUNG WATU PERONO	10	15 S	120	31 E	6.10
TANJUNG WATU WULAN	8	24 S	122	36 E	6.52
TANJUNG WATUBOLO	9	46 S	119	20 E	6.15
TANJUNG WATUMANUK	8	14 S	123	31 E	6.69
TANJUNG WATUPARONU	10	15 S	120	31 E	6.10
TANJUNG WATUPARUNU	10	00 S	119	57 E	6.12
TANJUNG WATUPAYUNG	8	14 S	122	44 E	6.53
TANJUNG WATUWOKO	8	23 S	123	17 E	6.58
TANJUNG WE TOH	9	38 S	124	53 E	6.95
TANJUNG WETOH	9	38 S	124	53 E	6.95
TANJUNG WOLO WUTUN	8	35 S	123	24 E	6.65
TANJUNG WONTO	8	20 S	118	41 E	5.49
TANJUNG WOTANG	8	25 S	123	00 E	6.61
TANJUNG WOWOBATOE	4	02 S	122	40 E	8.65
TANJUNG WOWOBATU	4	02 S	122	40 E	8.65
TANJUNG WUIMAHI	10	38 S	121	31 E	6.112
TANJUNG WURGOBIN	8	16 S	123	20 E	6.57
TANJUNGKAIT	3	14 S	106	05 E	2.17
TANJUNGKAROSSO	9	34 S	118	55 E	6.15
TANJUNGMUNA	8	11 S	124	19 E	6.78
TANJUNGPANDAN	2	45 S	107	38 E	2.59
TANJUNGPERAK	7	12 S	112	44 E	3.48
TANJUNGREDEB	2	10 N	117	29 E	9.80
TANJUNGWAPUE	8	17 S	123	50 E	6.68
TANJUNGWARUMANGGIT	10	15 S	120	37 E	6.9
TANJUNGWATUPARONU	10	15 S	120	31 E	6.9
TANJUNGWATUWOKA	8	23 S	123	17 E	6.61
TANO BOTU	8	39 S	119	11 E	5.55
TANO GADU	8	36 S	119	07 E	5.53
TANO GERANTAH	9	05 S	117	09 E	5.35
TANO JAMPA	8	45 S	118	59 E	5.60
TANO MABALA	8	33 S	119	10 E	5.52
TANO MALOK	8	55 S	116	44 E	5.36
TANO SIDO	8	47 S	118	58 E	5.60
TANO WADUDALI	8	35 S	119	11 E	5.54
TANUNG BAKUNG	8	49 S	115	35 E	5.21
TAOENA	6	53 S	120	47 E	6.116
TAPOK TEPOX	3	08 S	108	12 E	2.73
TARAKAN	3	17 N	117	36 E	9.87
TARATA BAAI	8	28 S	117	42 E	5.46
TAREMBU	5	56 S	105	59 E	4.12
TAREMPAH	3	13 N	106	13 E	1.44
TAWAU	4	15 N	117	53 E	10.15
TEBIAN BESAR	2	30 N	108	57 E	1.15
TEGAL	6	51 S	109	08 E	3.24
TELOK BAROE	8	52 S	118	04 E	5.62
TELOK KAMAROE	5	11 S	123	04 E	8.72
TELOK KORO	4	50 S	123	09 E	8.72
TELOK SERABANG	1	59 N	109	39 E	11.2
TELUK ADANG	1	43 S	116	28 E	9.43
TELUK AGAL	6	49 N	116	39 E	11.116
TELUK AIMERE	8	52 S	120	50 E	6.37
TELUK AIRHITAM	2	55 S	110	30 E	9.3
TELUK AMBONG	6	20 N	116	18 E	11.106
TELUK APAR	2	04 S	116	28 E	9.41
TELUK AWANG	8	57 S	116	26 E	5.32
TELUK AYER BINI	3	06 N	106	15 E	1.43
TELUK BADJO	8	25 S	117	05 E	5.39
TELUK BAJO	8	25 S	117	05 E	5.39
TELUK BAKONG	0	50 N	118	40 E	9.63
TELUK BALIKPAPAN	1	20 S	116	49 E	9.44
TELUK BALOK	3	14 S	107	53 E	2.78
TELUK BANGKO LUA	8	40 S	118	12 E	5.48
TELUK BANTEN	5	58 S	106	11 E	4.9
TELUK BELANTUNG	5	42 S	105	33 E	4.25
TELUK BENLELANG	8	10 S	124	38 E	6.82
TELUK BLANG MERANG	8	20 S	124	07 E	6.74
TELUK BLONGAS	8	53 S	116	02 E	5.33
TELUK BONE	4	00 S	120	45 E	8.85
TELUK BUNGIN	8	29 S	117	00 E	5.39
TELUK CEMPI	8	46 S	118	21 E	5.61
TELUK CIASEM	6	12 S	107	40 E	3.18
TELUK CILAUTEUREUN	7	40 S	107	41 E	4.37
TELUK CILETUH	7	11 S	106	26 E	4.36
TELUK DALUM	8	22 S	117	08 E	5.41
TELUK DAMPAR	8	17 S	113	05 E	4.46
TELUK DAMU	8	22 S	120	59 E	6.44
TELUK DOMISIL	0	51 N	123	45 E	7.53
TELUK DONDO	0	54 N	120	30 E	7.41

	Position °	'	°	'	Sec. Para
TELUK DONDO	8	29 S	121	53 E	6.48
TELUK ENDE	8	50 S	121	31 E	6.38
TELUK GEMEK (TELUK POPOH)	8	17 S	111	47 E	4.45
TELUK GILI LAWA	8	28 S	119	31 E	6.17
TELUK GILIMANUK	8	09 S	114	26 E	5.8
TELUK GOLOK	0	49 N	117	54 E	9.60
TELUK GORONTALO	0	30 N	123	03 E	8.16
TELUK GRAJAGAN	8	40 S	114	15 E	4.48
TELUK IPI	8	52 S	121	41 E	6.39
TELUK JEBUNG	2	57 N	105	50 E	1.27
TELUK KAKADU	9	56 S	119	57 E	6.13
TELUK KALABAHI	8	15 S	124	29 E	6.77
TELUK KALBANO	10	02 S	124	33 E	6.96
TELUK KEBOLA	8	15 S	124	28 E	6.78
TELUK KEMBA	5	15 S	122	37 E	8.77
TELUK KEMPANG	8	34 S	118	14 E	5.48
TELUK KENDARI	3	58 S	122	35 E	8.64
TELUK KERTASARI	8	45 S	116	46 E	5.37
TELUK KILOEAN	5	46 S	105	06 E	4.32
TELUK KILUAN	5	46 S	105	06 E	4.32
TELUK KLUMPANG	3	05 S	116	18 E	9.31
TELUK KUMAI	3	00 S	111	43 E	9.5
TELUK KUPANG	10	06 S	123	40 E	6.101
TELUK LABU BERU	8	32 S	116	51 E	5.39
TELUK LADA	6	28 S	105	44 E	4.17
TELUK LAMAR	9	03 S	117	13 E	5.62
TELUK LAMPUI	9	03 S	117	13 E	5.62
TELUK LASIPU	9	48 S	119	40 E	6.13
TELUK LASONGKO	5	23 S	122	31 E	8.80
TELUK LEBALEBA	8	20 S	123	25 E	6.58
TELUK LELAMU	4	39 S	123	12 E	8.71
TELUK LEVILIA	8	22 S	120	10 E	6.42
TELUK LIMBA	0	29 N	122	31 E	8.15
TELUK LINGGEH	8	16 S	120	34 E	6.43
TELUK LOMBOK	0	23 N	117	35 E	9.57
TELUK LOMBOK	8	30 S	116	40 E	5.30
TELUK MALIKABA	9	58 S	119	57 E	6.12
TELUK MAMUJU	2	36 S	118	54 E	7.28
TELUK MANDAR	3	37 S	119	16 E	7.25
TELUK MAUMERE	8	35 S	122	18 E	6.50
TELUK MAUSAMBI	8	29 S	121	48 E	6.47
TELUK MBULI	8	50 S	121	53 E	6.39
TELUK MEKONGGA	4	08 S	121	30 E	8.87
TELUK MENUMBAR	0	49 N	118	27 E	9.63
TELUK MOTI TOI	8	19 S	118	16 E	5.49
TELUK MOTITOI	8	19 S	118	16 E	5.49
TELUK NALANDI	5	40 S	122	45 E	8.73
TELUK NAMBO	5	25 S	122	34 E	8.81
TELUK NANGALILI	8	48 S	120	09 E	6.37
TELUK NANGAMESI	9	37 S	120	20 E	6.5
TELUK NANGARUJENG	8	30 S	121	41 E	6.47
TELUK NURI	0	56 S	109	30 E	2.88
TELUK PACITAN	8	15 S	111	05 E	4.42
TELUK PADANG	8	32 S	115	31 E	5.15
TELUK PAGA	8	45 S	122	07 E	6.40
TELUK PAGUJAMAN	0	29 N	122	40 E	8.17
TELUK PALOPO	2	59 S	120	13 E	8.97
TELUK PALU	0	45 S	119	49 E	7.32
TELUK PAMUKAN	2	35 S	116	28 E	9.33
TELUK PANGGUI	8	17 S	111	27 E	4.42
TELUK PANGGUL	8	17 S	111	26 E	4.42
TELUK PARIA	4	48 S	121	38 E	8.86
TELUK PASARWADJO	5	28 S	122	53 E	8.73
TELUK PATJITAN	8	15 S	111	05 E	4.42
TELUK PEDADA	5	45 S	105	13 E	4.30
TELUK PEGAMETAN	8	07 S	114	36 E	5.10
TELUK PENYU	7	45 S	109	04 E	4.39
TELUK PEPELA	10	35 S	123	25 E	6.106
TELUK PEPER	5	48 S	105	13 E	4.30
TELUK PERING	2	40 S	108	09 E	2.66
TELUK PEUCANG	6	42 S	105	18 E	4.19
TELUK PISING	5	05 S	121	56 E	8.83
TELUK PRAYA	8	25 S	117	35 E	5.46
TELUK RANGKO	8	27 S	119	55 E	6.42
TELUK RATAI	5	36 S	105	13 E	4.29
TELUK REO	8	16 S	120	30 E	6.43
TELUK RIUNG	8	23 S	121	02 E	6.44
TELUK SALEH	8	28 S	117	48 E	5.44
TELUK SALEH	8	34 S	117	54 E	5.35
TELUK SAMPIT	3	13 S	113	08 E	9.7
TELUK SANGGAR	8	19 S	118	19 E	5.49
TELUK SANGKULIRANG	0	49 N	118	07 E	9.61
TELUK SAPE	8	33 S	119	02 E	5.53
TELUK SAWAR	8	5 S	116	01 E	5.33
TELUK SEBANGAN	3	18 S	113	30 E	9.9
TELUK SEGORO WEDI	8	21 S	111	44 E	4.44
TELUK SEMRAWANG	8	17 S	111	51 E	4.46
TELUK SENDIKARI	9	47 S	119	37 E	6.14
TELUK SEPI	8	52 S	116	03 E	5.33
TELUK SIBUKO	4	00 N	118	20 E	10.1
TELUK SINDEH	8	34 S	121	31 E	6.46
TELUK SLAWI	8	36 S	119	31 E	6.22
TELUK SULEMAN	1	10 N	118	46 E	9.67
TELUK SUMBANG	1	05 N	118	51 E	9.67
TELUK SUMBAWA	8	27 S	117	23 E	5.42
TELUK SUMBRENG	8	20 S	111	33 E	4.43
TELUK TALIWANG	8	48 S	116	47 E	5.37
TELUK TALLABASSI	5	15 S	122	04 E	8.83
TELUK TALONAN	9	07 S	117	02 E	5.35
TELUK TAMBELAN	0	59 N	107	33 E	1.20
TELUK TAMPAKURA	3	12 S	122	27 E	8.60
TELUK TAMPANG	5	52 S	104	43 E	4.33
TELUK TARATA	8	28 S	117	42 E	5.46
TELUK TERANG	8	24 S	120	07 E	6.42
TELUK TIRO	8	52 S	118	04 E	5.62
TELUK TJIASEM	7	11 S	106	26 E	4.36
TELUK TJILAUTEUREUN	7	40 S	107	41 E	4.37
TELUK TODO	8	34 S	121	26 E	6.46
TELUK TOLITOLI	1	03 N	120	48 E	7.43
TELUK TOLO	2	20 S	122	30 E	8.50
TELUK TOTOK	0	52 N	124	43 E	8.10
TELUK TRIMA	8	08 S	114	32 E	5.10
TELUK UMBAR	5	43 S	104	58 E	4.32
TELUK USU	2	40 S	121	02 E	8.97
TELUK USUKAN	6	22 N	116	20 E	11.110
TELUK WAIKELO	9	22 S	119	14 E	6.3
TELUK WAIPRUNG	8	21 S	122	46 E	6.53
TELUK WAMBOLOLI	5	23 S	122	23 E	8.80
TELUK WAWORADA	8	46 S	118	58 E	5.60
TELUK WAWOSUNGU	4	05 S	122	44 E	8.65
TELUK WERA	8	18 S	118	56 E	5.51
TELUK WOIMENDA	3	51 S	121	14 E	8.90
TELUKAN TUBAU	3	35 N	113	19 E	11.38
TELUKBETUNG	5	27 S	105	16 E	4.27
TEMBAGA REEFS	7	07 S	114	09 E	3.67
TEMBOBOR	8	22 S	116	07 E	5.28
TEMBUNGO OIL FIELD	6	37 N	115	47 E	11.106
TEMUKUS	8	11 S	114	59 E	5.11
TENAU	10	12 S	123	32 E	6.101
TENGAH BAY	6	20 N	116	19 E	11.108
TENGOR ANCHORAGE	5	40 S	104	54 E	4.32
TERAMPA	3	13 N	106	13 E	1.44
TERNATE	8	11 S	124	22 E	6.78
TERUMBU BELASU	4	59 N	118	21 E	10.51
TERUMBU GOSA	5	53 S	105	55 E	4.20
TERUMBU MANGGAR	2	55 S	108	56 E	2.81
TERUMBU MOHAMMED BASIR	5	58 S	105	23 E	4.21
TERUMBU SALAK	1	42 N	110	18 E	11.9
TERUMBU SERDANG	5	53 S	105	42 E	4.22
TERUMBU SUBIS	3	32 N	113	15 E	11.37
THE BROTHERS	4	24 S	116	10 E	9.15
THETIS REEF	3	15 N	106	21 E	1.59
THREE HILLS	4	57 S	122	45 E	8.78
TIANJAR ROAD	8	12 S	115	30 E	5.14
TIGA CHANNEL	5	41 N	115	34 E	11.92
TIGA SHOALS	5	46 N	115	40 E	11.92
TIJANTI	5	48 S	105	35 E	4.24
TILAMUTA	0	30 N	122	20 E	8.17
TIMAU	3	18 N	107	33 E	1.12
TIMUR BESAR	5	27 S	106	34 E	3.13
TINAMANDUKAN	5	38 N	116	02 E	11.93
TINSON REEFS	5	52 N	116	01 E	11.96
TIORO STRAIT	4	33 S	122	30 E	8.81
TJANDIBAN	7	53 S	114	28 E	5.5
TJANDIKESUMA	8	19 S	114	31 E	5.8
TJAPALOELOE STRAIT	1	50 S	125	19 E	8.42
TJAREME	6	54 S	108	24 E	3.16
TJELONG	6	55 S	109	56 E	3.22
TJEMPI BAAI	8	46 S	118	21 E	5.61
TJIENDEH BAY	8	34 S	121	31 E	6.46
TJILAUTEUREUN	7	40 S	107	41 E	4.37
TJIMANGGU	7	44 S	108	40 E	4.38
TJIMIRING	7	47 S	109	02 E	4.38
TJINA	5	47 S	112	35 E	3.73

	Position °	'	°	'	Sec. Para
TJIREBON	6	43 S	108	34 E	3.23
TOBOALI	3	01 S	106	27 E	2.16
TOEKANG BESI ISLANDS	5	30 S	123	40 E	8.68
TOGOMOGOLO	3	13 S	122	38 E	8.59
TOHOR JANTAN	5	49 S	106	49 E	3.14
TOKONG BORO	4	04 N	107	26 E	1.10
TOKONG BURUNG	4	25 N	107	41 E	1.4
TOKONG DAHAN	2	49 N	106	10 E	1.39
TOKONG KEMUDI	0	56 N	106	44 E	1.33
TOKONG MALANGBIRU	2	18 N	105	36 E	1.40
TOKONG MENGIRANG	0	51 N	107	37 E	1.24
TOKONG PERANGIN	1	47 S	109	15 E	2.83
TOKONGPERANGIN	1	47 S	109	15 E	2.83
TOMINI	0	30 N	120	33 E	8.24
TONGARA	5	55 S	106	32 E	3.8
TORO AMARAU	8	46 S	119	44 E	6.25
TORO ATUOTO	8	53 S	120	47 E	6.37
TORO BATUPUTIH	8	32 S	119	51 E	6.33
TORO BERU	8	26 S	119	26 E	5.58
TORO DORO	8	53 S	118	29 E	5.61
TORO GADU	8	36 S	119	07 E	5.53
TORO HUU	8	47 S	118	24 E	5.61
TORO KERITA	8	52 S	119	55 E	6.36
TORO KUNING	8	36 S	119	35 E	6.21
TORO LANGOEDOE	8	49 S	118	59 E	5.61
TORO LETUHOH	8	37 S	119	23 E	5.59
TORO LOMO	8	50 S	120	19 E	6.37
TORO MABALANG	8	33 S	119	10 E	5.52
TORO NAGA NURI	8	33 S	119	02 E	5.52
TORO NGGIKOK	8	36 S	119	37 E	6.24
TORO NTA ULAH	8	48 S	119	41 E	6.25
TORO PADANG	8	20 S	120	59 E	6.43
TORO PANGKAJARAT	8	46 S	118	55 E	5.60
TORO PONTIANAH	8	23 S	120	02 E	6.42
TORO RATA	8	45 S	119	09 E	5.55
TORO ROTO	8	20 S	120	48 E	6.43
TORO SIDO	8	47 S	118	58 E	5.60
TORO TAA	8	48 S	119	37 E	6.25
TORO TJARMI	8	21 S	120	07 E	6.42
TORO WADOE DALI	8	35 S	119	11 E	5.54
TORO WAIRII	8	40 S	119	48 E	6.35
TORO WAITIMBANG	8	39 S	119	48 E	6.26
TORO WATU IPU	8	50 S	120	37 E	6.37
TORO WATURAMBA	8	26 S	119	52 E	6.32
TOTOPELE LIGHT	4	32 S	120	28 E	8.94
TPORO JAMPANG	8	45 S	118	59 E	5.60
TREACHER	4	20 N	118	33 E	10.29
TREE ROCK	6	57 N	117	15 E	10.75
TREWEG	8	29 S	124	17 E	6.78
TRIDENT SHOAL	5	14 N	115	14 E	11.66
TRIPP REEF	5	29 N	112	30 E	11.48
TRUMBU KOLIOT	5	55 S	105	49 E	4.20
TRUSAN MERLIN	4	16 N	117	33 E	10.10
TRUSAN SIGALONG	4	34 N	118	31 E	10.38
TRUSAN TANDO BULONG	4	20 N	118	33 E	10.29
TUBAN	6	54 S	112	04 E	3.39
TUDJU EILANDAN	1	13 S	105	16 E	2.27
TUING	1	37 S	106	03 E	2.28
TUJAU TUTUN	7	32 S	126	38 E	6.84
TUKOH LEHOK GEBAH	8	34 S	119	23 E	5.59
TUKOH MAPINKA	8	33 S	119	15 E	5.57
TUNGAI SULAMAN	6	15 N	116	13 E	11.102
TURNER PATCH	4	56 N	118	35 E	10.54
TURTLE ROCK	6	12 N	118	03 E	10.66
TWO BROTHERS	4	08 S	122	53 E	8.67
TWO FATHOM ROCK	5	06 N	114	58 E	11.60

U

	Position °	'	°	'	Sec. Para
UDANG MARINE TERMINAL	4	02 N	106	30 E	1.61
UJONG SAPOH	5	00 N	115	08 E	11.73
UJUNG	8	28 S	115	38 E	5.14
UJUNG APATANA	6	30 S	120	29 E	6.114
UJUNG BATAKARANG	2	05 S	104	53 E	2.3
UJUNG BREBES	6	46 S	109	01 E	3.23
UJUNG CUKUCAPAH	5	46 S	105	12 E	4.30
UJUNG CUKUREDAK	5	56 S	104	44 E	4.33
UJUNG CURAM	4	14 S	122	55 E	8.67
UJUNG CURAM	5	50 S	105	47 E	4.4
UJUNG DODAIJA	6	16 S	120	27 E	7.5
UJUNG GENTENG	7	23 S	106	24 E	4.37
UJUNG INDRAMAYU	6	14 S	108	18 E	3.20
UJUNG KANGGALAN	5	48 S	105	48 E	4.2
UJUNG KARANGTARADJE	6	57 S	106	14 E	4.36
UJUNG KARANGTARAJE	6	57 S	106	14 E	4.36
UJUNG MADASARI	7	47 S	108	30 E	4.37
UJUNG MERAH	4	20 S	122	54 E	8.67
UJUNG PANDANG	5	08 S	119	24 E	5.77
UJUNG PANGKAH	6	51 S	112	33 E	3.39
UJUNG PANRENG	4	21 S	119	37 E	7.19
UJUNG PARAPA	5	25 S	119	22 E	7.8
UJUNG PEMALANG	6	48 S	109	32 E	3.24
UJUNG PEPE	5	37 S	119	28 E	7.8
UJUNG PIRING	6	30 S	110	40 E	3.28
UJUNG PIRING	7	02 S	112	41 E	3.44
UJUNG SIKLAPA	8	22 S	111	44 E	4.43
UJUNG SIKLOPO	8	22 S	111	44 E	4.43
UJUNG SININI	7	00 S	106	21 E	4.35
UJUNG SININI	7	00 S	106	21 E	4.35
UJUNGPANDANG	5	08 S	119	24 E	7.12
UMPOHL SHOALS	6	34 N	116	29 E	11.112
UNARANG ROCK	4	00 N	118	04 E	10.8
UNDAUNTED ROCK	5	14 N	115	08 E	11.64
UNION BANK	3	02 S	118	20 E	9.36
URSULA SHOALS	3	58 N	113	32 E	11.33
USU	10	30 S	123	25 E	6.106
UTALEUMBU	9	35 S	120	14 E	6.5

V

	Position °	'	°	'	Sec. Para
VARKENS	6	09 S	120	25 E	7.5
VERNON BANK	5	46 N	115	03 E	11.89
VESUVIUS REEF	2	06 S	122	53 E	8.46
VICTORIA	5	17 N	115	14 E	11.69
VICTORIA PATCHES	4	55 N	114	39 E	11.59
VILA SALAZAR	8	27 S	126	30 E	6.90

W

	Position °	'	°	'	Sec. Para
WAI SEPUTIH	4	41 S	105	53 E	4.3
WAINGAPU	9	38 S	120	16 E	6.6
WAINGAPU ROAD	9	38 S	120	15 E	6.5
WAITEBA ONE	8	37 S	123	38 E	6.67
WALLACE BAY	4	15 N	117	39 E	10.11
WALSH BANK	3	02 N	106	18 E	1.48
WALTON REEF	4	42 N	118	21 E	10.42
WAMBOLOLI BAY	5	23 S	122	23 E	8.80
WANI	0	41 S	119	50 E	7.34
WARREN REEF	2	33 S	108	39 E	2.71
WATU PENI	8	14 S	123	19 E	6.57
WATU SIPU	9	51 S	119	42 E	6.13
WAWORADA BAAI	8	46 S	118	58 E	5.60
WEBB SHOAL	4	24 N	118	52 E	10.26
WEBSPER PATCH	4	56 N	118	34 E	10.54
WELSTEAD SHOAL	0	33 N	107	53 E	1.32
WELVISCH	6	05 S	120	20 E	7.5
WEST BANK	4	00 S	122	52 E	8.66
WEST EILAND	5	29 S	106	24 E	4.8
WEST HYDROGRAFF	1	56 S	106	25 E	2.33
WEST LUTONG OIL FIELD	4	30 N	113	54 E	11.43
WEST TWEELING	4	13 S	122	55 E	8.67
WESTON	5	13 N	115	36 E	11.85
WETAR STRAIT	8	14 S	126	16 E	6.85
WHALE REEF	6	05 S	120	20 E	7.5
WHITE ROCK	3	15 S	107	28 E	2.53
WHITE ROCKS	6	42 N	116	36 E	11.113
WHITE ROCKS BAY	6	43 N	116	38 E	11.113
WHITE ROCKS REEF	6	44 N	116	36 E	11.113
WICKS ROCK	4	15 N	117	52 E	10.15
WIDURI MARINE TERMINAL	4	41 S	106	39 E	2.22
WILHELMINA REEF	8	33 S	116	04 E	5.25
WILSON SHOAL	3	47 N	113	04 E	11.32
WINCHESTER SHOALS	5	42 N	115	21 E	11.90
WINSOR ROCK	5	53 S	105	55 E	4.20
WINSORKLIP	5	53 S	105	55 E	4.20
WISER BAY	3	35 N	113	19 E	11.38
WOLLOWA BAY	5	28 S	122	53 E	8.73
WONG SANDS	2	06 N	111	11 E	11.19
WOODHALL REEFS	4	58 N	118	15 E	10.48
WOWONI	4	07 S	123	06 E	8.66
WOWONI STRAIT	4	06 S	122	54 E	8.66

	Position °	'	°	'	Sec. Para
WUREH	8	18 S	123	02 E	6.55
WURI	8	18 S	123	02 E	6.55
Y					
YACO	8	25 S	127	20 E	6.93
YAMSECIE REEF	1	24 S	108	51 E	2.84
Z					
ZAND BAAI	7	11 S	106	26 E	4.36
ZEEKLIP	5	58 S	105	23 E	4.21
ZELDA OIL FIELD	5	11 S	106	23 E	2.22
ZUIDWACHTER	0	06 N	119	37 E	7.37
ZWAANTJES REEF	7	28 S	113	07 E	3.66