

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

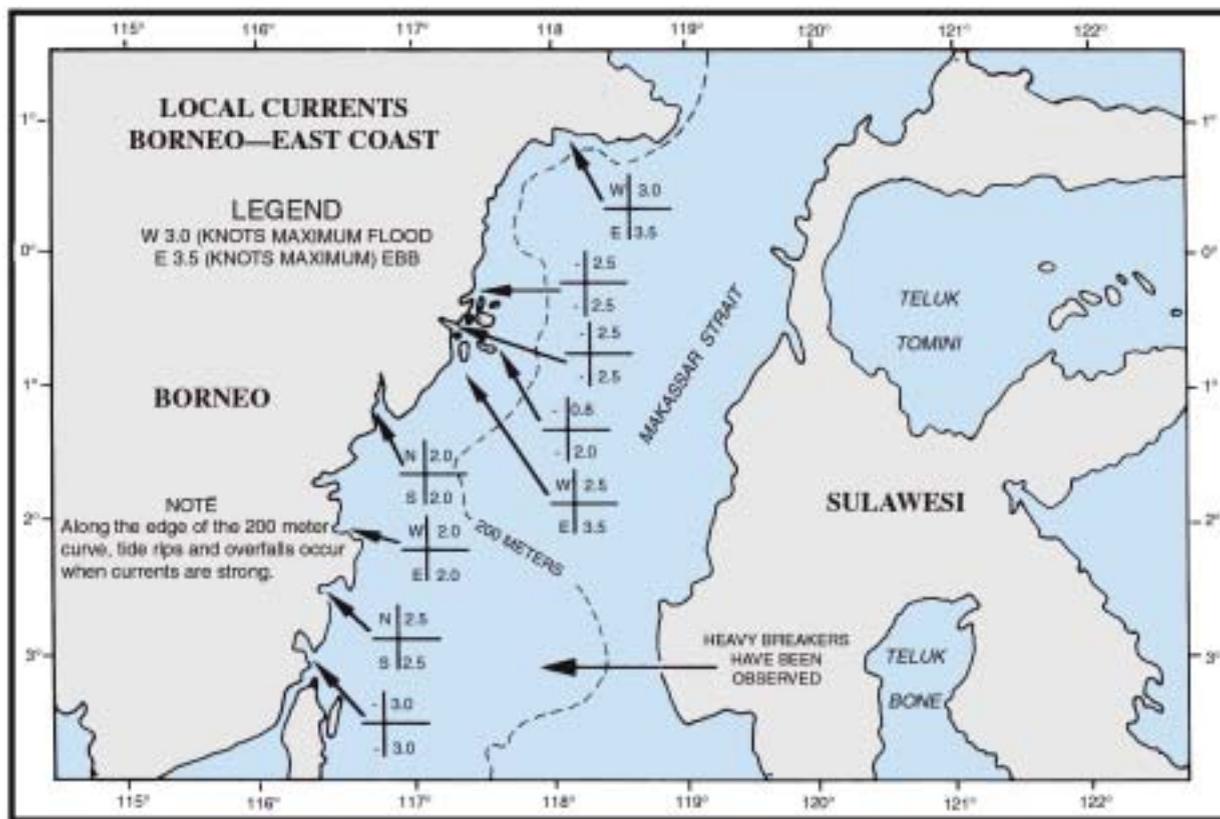
There is less cloudiness in the N than in the S part of the strait, but rain is heavier and more continuous.

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 Sulawean 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 Tanjung Mangkalihat along the Borneo coast with a rate of 0.5 knots. Just outside this current the usual S current may be 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 Tanjung 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 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 Sulawesi.

**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.

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 sandbanks, 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 3.23](#). Pulau Bawean has been previously described in [paragraph 3.59](#). Masalemba-Besar, Masalemba-kecil, and Gosong Gia (Annie Florence Reef) have been previously described in [paragraph 3.63](#).

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.).

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 Penguajan 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 Penguajan. A few 4.6 to 5.5m patches lie W of the outer end of this flat. Berasbasah Banks, consisting of some low, white sandbanks which are not readily seen, lie on the N part of this flat. A light stands about 4.5 miles S of Tanjung Penguajan.

A shoal, with a depth of less than 1.8m, coral and stones, lies about 4.75 miles SE of Tanjung Penguajan.

Anchorage can be taken off the mouth of 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 Penguajan 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. Sungai Kumai, which flows out E of the last-named point, 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 Penguajan.

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 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 Penguajan 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.

Tidal signals are displayed at the landing pier. A red flag indicates flood tide and the "P" flag indicates ebb tide.

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.

**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 sandbank extends 0.75 mile NE. A narrow spit, with a depth of 0.9m, extends 2.75 mile NE of the sandbank. Tanjung Bandaran Light is shown from a 15m high framework tower, 1 mile NE of the point.

**Teluk Sampit** (3°13'S., 113°08'E.), a bay encumbered by mudflats, is entered close E 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.

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.

**Caution.**—The approach to Sungai Sampit is extremely hazardous due to shifting shoals and sandbars 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. The principal pier is 208m long with a least depth of 4m alongside.

Pilotage is not compulsory. Vessels should send their ETA to their agent 10 days, 3 days, 48 hours, and 24 hours prior to arrival.

The following tide signals are displayed from the jetties at Sampit:

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 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 Sebangon** (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 Sungai Kahayan, can be recognized by its high dark trees. Tanjung Tawas and Tanjung Pematang, the W and E entrance points to 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.

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.

**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.

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.

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. 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.

**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 Bandjermasin.

### **Bandjermasin (3°20'S., 114°35'E.)**

[World Port Index No. 51890](#)

**9.11** Bandjermasin, which stands on a marshy island, is one of the most important trading centers in Borneo. The town and surrounding area is subject to frequent flooding.

Bandjermasin is the center of an extensive system of canals and waterways through which a large volume of trade is carried out.

Bandjermasin actually consists of 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 Sungai Martupara enters Sungai Barito.

Modern alongside berthing facilities are provided for all classes of ocean-going vessels capable of crossing the bar.

**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 Bandjermasin 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.



**Bandjermasin Pilot Station**

Vessels up to 5,000 dwt, with a maximum length of 100m 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 Bandjermasin.

Trisakti Wharf, the new port for Bandjermasin, stands on the E bank of the Sungai Barito, 2.25 miles above the entrance of Sungai Martapura. The wharf is 320m long and has a least depth of 9m alongside. An oil jetty 20m long stands N of Trisakti wharf.

There are several piers and wharves at Bandjermasin, 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.

**Aspect.**—Between the entrance to Sungai Barito, to abreast of the entrance to Sungai Martapura, 10 miles upstream, the W bank of the river is low, wooded and marshy, and sparsely inhabited. The E bank is fronted by coconuts, densely populated, and covered with paddy fields.

Tanjung Pulatan Lighthouse, a hut painted with black and white checks, stands on the E bank of Sungai Barito, 4.5 miles N of Tanjung Burung.

Tanjung Telan Lighthouse, 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 Lighthouse.

A prominent customhouse and signal station lie on the S bank of the entrance to Sungai 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

Signals are displayed from the signal station on the S side of the entrance to Sungai Martapura for incoming vessels, from the flagstaff on the downstream end of the Commercial Wharf, and from the flagstaff near the harbor office at Bandjermasin for outgoing vessels, as follows:

Day signal	Night signal	Meaning
One red ball	One red light	Passage prohibited
One white cone	One white light	Passage permitted

Day signal	Night signal	Meaning
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	—	The vessel lying alongside the Commercial Wharf may proceed; passage for other vessels is prohibited

In addition, the International Code Flag Signal "IL" meaning "You must remain where you are," may be displayed from the previously mentioned signal station.

The following signals, displayed by a vessel, will be repeated 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

**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 Lighthouse, bearing about 022°, and when Tanjung Pedadatu 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 Bandjermasin should not attempt to navigate with a flood tide.

Vessels wishing to secure alongside the pier at Bandjermasin 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.

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.

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** (Moreses 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.

**Caution.**—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.

**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.) are 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 Tjongdong 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.

**9.14 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.

**9.15 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.

**9.16 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.

**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, 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 mudbank.

**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.

**9.17 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 lighthouse 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 a range of hills which have been previously described, 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 mudbank. 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.

**9.18 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 sandbanks 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 Kotobaru, 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.

Many islands and dangers exist in the channel of Selat Laut. These are described from S to N.

**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 sandbank, 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.

**9.19 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. 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.

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 mudbank.

**9.20** 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.

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.

**9.21 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.

There is a pier 40m long, with a depth of 5.5m alongside, which is connected to the shore by a bridge 238m long. It is reported that vessels of 5,000 dwt can berth alongside.

North Pulau Laut Coal Terminal, on the NE end of Pulau Laut, extends about 0.6 mile NE from Tanjung Pemancingan and has a berth at its seaward end.

Vessels of 10,000 to 150,000 dwt, with a maximum length of 320m, a maximum beam of 47m, and a maximum draft of 14m, can use the facility.

The controlling depth at the berth and in the turning basin is 18m.

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.

**9.22 Stagen** (Setagen) (3°17'S., 116°09'E.) ([World Port Index No. 51870](#)), situated about 4 miles SW of Kotabaru, is fronted by a pier in bad condition but has been reported to be in operation.

It has a T-head, with depths of 3.7 to 6.1m alongside, with a dolphin off each end. Extreme caution is advised when berthing alongside.

**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.



**North Pulau Laut Coal Terminal**

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 Pemancingan.

Selat Laut is entered through a swept channel at its NE end, the centerline of which is joined by the following positions:

- 8.7 miles, 081° from Tanjung Pemancingan Light
- 1.4 miles, 077° from the same light
- 1.3 miles, 357.5° from the same light
- 1.9 miles, 319.5° from the same light
- 2.7 miles, 243° from Balingkar Light
- 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.

## Makassar Strait—South Entrance

**9.23** 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.

**9.24 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 between 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.

**9.25 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 sandbank 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

**9.26 Tanjung Dewa** (3°08'S., 116°16'E.), the NW entrance point to Selat Laut, is low, coconut covered, and reef fringed. A hill, 74m high, stands close within the point.

Between Tanjung Dewa and Tanjung Aru, about 61 miles NNE, the coast is low, marshy, and for the most part covered with vegetation. Teluk Klumpaung 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 Aru, 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 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.

**9.27 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

**9.28 Teluk Klumpang** (3°05'S., 116°18'E.), entered between Tanjung Dewa and Tanjung Berlarajar 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 Berlarajar. 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 Berlarajar. Some shoal patches with depths of 3.7 to 5m lie on the N side of the channel to the S of these dangers.

**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 Berlarajar and Tanjung Samalantakan, the W entrance point of Teluk Pamukan, 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

**9.29 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-kecil 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 mudbanks 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.

**9.30 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.

## Little Paternoster Islands

**9.31** The Little Paternoster Islands (Kepulauan Balangan) lie between the parallels of 2°00'S, 2°44'S, and between the meridians of 117°00'E, 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 9.27](#). **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

**9.32 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 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.

**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 sandbanks 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 sandbank 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 sandbank and the islet. Reefs and shoal ground extend 5 miles SE from the sandbank. 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

**9.33 Karang Gamelan** (Byron Reef) (2°34'S., 117°48'E.) is about 0.4 mile in diameter. On it is a small sandbank which always dries 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 sandbank, 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 sandbank, 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.

**9.34 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-ketcil, 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.

**9.35 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 sandbank 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 Selolang 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

**9.36 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.

**Sungai Pasir** (1°52'S., 116°26'E.) enters the sea 9.5 miles NNW of Tanjung Giling.

**9.37 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.

Pilotage is compulsory and is available during daylight hours only. The pilot boards at the Entrance Lighted Buoy and should be requested from the harbor master, via the agent, at least 24 hours prior to arrival at the Entrance Lighted Buoy.

**9.38 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 mudbank, 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 mudbanks. 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 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 the Fairway Lighted Buoy. The pilot boards 2 miles S of the 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.

**Caution.**—Offshore oil rig platforms are situated in Sepingan Oil Field, 10.5 miles SE, and in Yakin Oil Field, 2 miles E from Tanjung Jumalai. 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 Jumalai. 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.

**9.39 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 extends 12 miles inland in a N direction to the Sungai Semoi. 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.

**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.

## Balikpapan (1°16'S., 116°49'E.)

[World Port Index No. 51840](#)

**9.40** 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.

**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.

**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 irregular-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.

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, and a flare 1.5 miles NNE. It is reported that the flare is 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.

**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.

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 21.9m. 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.

**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.

**9.41** 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.

**Tanjung 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.) is a small oil refinery settlement that 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.

**9.42 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 of 50,000 to 125,000 dwt.

**Depths—Limitations.**—Vessels up to 150,000 dwt may be accepted on part 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.

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.

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.

There are no pilots, but a mooring master boards at the sea anchorage. 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.

## Sungai Mahakam Delta

**9.43 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.

**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 Samarinda. 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 Pamarung** (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 Pamarung, 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 **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 Pulau Bukuan, landmarks are not easily recognizable in the approaches to the channels.

**Tanjung Pamarung** (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 Pamarung, 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 and the maximum size 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 1°03'S, 117°31'E.

**Caution.**—A lookout for floating logs should be kept in this vicinity.

**9.44 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 Pulau 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 (port hand) 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 leading 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, Muara Pegah, 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 boards all vessels close outside the lighted buoy at the outer entrance of Muara Pegah.

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.

**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.

**9.45 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. 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.

**9.46 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 Bagusani 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 Pamarung. The outer bar has a reported depth of 2.7m and the inner bar, located 3 miles N of Tanjung Pamarung, has a depth of 1.5m, hard sand.

The S part of the Sungai Bagusani 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 Pamarung, 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 Sungai Bagusani 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

**9.47 Tanjung Dewa** (0°37'S., 117°18'E.), a fairly sharp point fronted by a mudbank, 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. 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.

**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.

**9.48 Samarinda** (0°31'S., 117°09'E.) (*World Port Index No. 51820*), the seat of a government administrator, lines both banks of the river for 2.5 miles. The town is 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.

There are three concrete wharves, two of which are 100m long and the third 150m long, with a depth of 7m alongside. Vessels with a maximum length of 156m overall and a draft of 6.8m can use the berth.

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

## Sungai Mahakam Upriver from Samarinda

**9.49** 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 No. 16 lighted beacon, 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.

**Caution.**—Less water than charted is reported 1.25 miles ENE of Santan oil terminal.

**9.50 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 130,000 dwt, with a maximum length of 265m and a maximum draft of 25m.

A loading platform, marked by a light, is situated 1.75 miles WNW of the terminal. Vessels up to 4,700 dwt and an overall length between 60 and 110m are permitted to berth and load propane. The depth alongside this berth is 11.6m.

The ETA should be sent 72 hours, 48 hours, and 24 hours prior to arrival via Balikpapan Radio. Vessels should contact "Santan Control" on VHF channel 16 for mooring or anchoring instructions. There is a depth of 28m in the vicinity of the mooring buoy.

Pilots are not available, but a mooring master will board in the anchorage area to assist with berthing.

Vessel berthing operations at the SBM and platform terminals is restricted to daylight only, but unberthing may be conducted any time.

**9.51 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 Keringdingan. 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.

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 LNG Terminal—Berth No. 3**

**9.52 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.

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 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 1st and 4th pair are painted with red and white bands; those of the 2nd and 3rd 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 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 lighted beacons to the berth bear, as follows:

First pair	284°
Second pair	328°
Third pair	296°

The loading berth, about 200m long, has a charted depths of 10m.

**Pilotage.**—Pilotage is compulsory. Pilot boards at the fairway (safe water) lighted buoy. 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.

**9.53 Tanjung Bara Coal Terminal** (0°32'N., 117°39'E.) 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 to 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.



### Sangata—Marine Export 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 width of 50m can be accommodated. Depth alongside the terminal is 17.25m, and the depths in the channel are 18 to 22m.

Vessels are required to have an underkeel clearance of 0.75m at the berth and 1.25m when sailing.

Two tugs are allocated to assist berthing and sailing of all vessels.

**Caution.**—It has been reported that shallower depths exist between the pilot boarding positions and the coal berth.

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.

**9.54** 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 Miang-kecil.

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.

**9.55 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—Currents.**—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 mudbank, 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 mudbanks can be found in the bay. Pulau Miang-kecil 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; whereas, 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 mudbank 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.

**Aspect.**—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-kecil.

**Directions.**—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.

**9.56 Bnoa 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 Bnoa Baru. The tidal currents between Bnoa Baru and Sampajau attain a rate of 3 to 3.5 knots.

Vessels drawing up to 6.1m can reach Bnoa Baru at all stages of the tide. Depths in the river between Bnoa 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.

**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.

**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

**9.57 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.

Sungai Berau, suitable only for small vessels, discharges through an extensive delta on the N part of this coast.

**Tanjung Redeb** (2°10'N., 117°29'E.), located at the junction of the Sungai Kelai and Sungai Segah, 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 Kaniun-gan, 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.

**9.58 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.

**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 broadtopped 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.

**9.59 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. Southerly winds prevail from July to October, and N winds 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 9.57. 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.

**9.60 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-kecil 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-kecil. 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-kecil. 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.

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.

The limits of the island are not easily defined because of the mangroves on the reef. A large tree stands in the center of the island.

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.

Several detached patches, with depths of 9.1 to 11m, lie in the immediate vicinity of these shoals.

**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.

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**

**9.61** 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.

**9.62** Between **Tanjung Dumarang** (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-ketjil 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-ketjil, 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 Sungai Berau

**9.63 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 sandbank lying at the SE end of the reef above, is overgrown with low trees. Pulau Sambit light structure has been reported to be a good radar target up to 13 miles. Pulau Sambit Light is a 31m high white, metal framework tower with a black top.

**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 sandbank and is marked on its W side by a light. A reef, with a depth of 2.4m, lies close S of this sandbank. 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.

**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.

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.

Tanjung Bolituwatan Light stands on the N extremity of the island.

**9.64 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.

**9.65 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 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.

**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.

**9.66 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 depths 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 Sungai Berau

**9.67 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 9.58](#), 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 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 Sungai Kelai and Sungai Segah (Makam River), 12 miles W of Sokan, and then through 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.

**9.68 Muara Pantai** (1°57'N., 118°00'E.), 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 (safe water) is moored in the outer approaches, 13 miles ESE of the entrance in position 1°56.0'N, 118° 05.5'E.

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 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.

**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.

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.

## Sungai Berau

**9.69 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.

**9.70 Tanjungredeb** (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.

Vessels not going alongside should anchor near the right bank abeam of a mosque in order to leave the channel clear.

**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.

**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, as follows:

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

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.

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.

**Depths—Limitations.**—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 Pandjung by a 5.75 mile wide channel with a 3m patch in its midpart, 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.

## Sungai Kayan

**9.71 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 Sungai Temenggah, and with the Sungai Salimbatu by Sungai Kubil. 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.

Near **Tanjung Selor** (2°50'N., 117°22'E.), 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 Selor by day, and when a vessel is expected, by night.

**Depths—Limitations.**—Vessels of 3.4m draft can reach Tanjung Selor via the Muara Makapan, Sungai Temenggah, and 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.

**9.72 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.

## Sungai Sesayap

**9.73** 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 Sungai Sesayap, N of the NW end of Pulau Bangkadulis-besar.

**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 mudbanks, reefs, and detached dangers lie within the 20m curve.

**9.74 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.

**9.75 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.

The S pier is used by coasting vessels and small craft.

The General Cargo Jetty, standing 4 miles NW of Tanjung Batu, has depths of 7.3m at its head, 4m on its NW side, and 14m on its SW side. Vessels up to 150m long can be accommodated.

The Oil Jetty is 0.4 mile NW of the General Cargo Jetty. It has an alongside depth of 7m. Vessels up to 6,000 dwt, with a maximum length of 130m and a maximum draft of 5.5m, can be accommodated.

There are dolphins off the heads of the general cargo and oil jetties.

An offshore berth for loading oil lies 0.25 mile SW of the head of the oil jetty, and consists of 6 mooring buoys. It is suitable for tankers of up to 55,000 dwt and 230m long, in depths of up to 18.5m.

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 and the harbor pilot is available from 0600 to 1800.

Vessels arriving outside these hours anchor off the berths. Vessels may depart up to 2130. 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

**9.76** 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, and unmooring at 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.

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.

**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.

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.

**9.77 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 mudbank 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.

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 Bukit 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.

**9.78 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-kecil, 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.

**9.79 Sesayap Utara** (3°37'N., 117°24'E.) is divided into two mouths by the Pulau Baru. Muara Sebang, 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-kecil, on the S, and Pulau Mandul, Pulau Tembangan, 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 Tembangan 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 Tembangan.

After it joins the Muara Sebang 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-kecil, 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 Sebang 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 Sebang, 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 Sebang.

When Pulau Tiga is wholly open from Pulau Bangkudulis-kecil, 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.

**9.80 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.

**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 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.