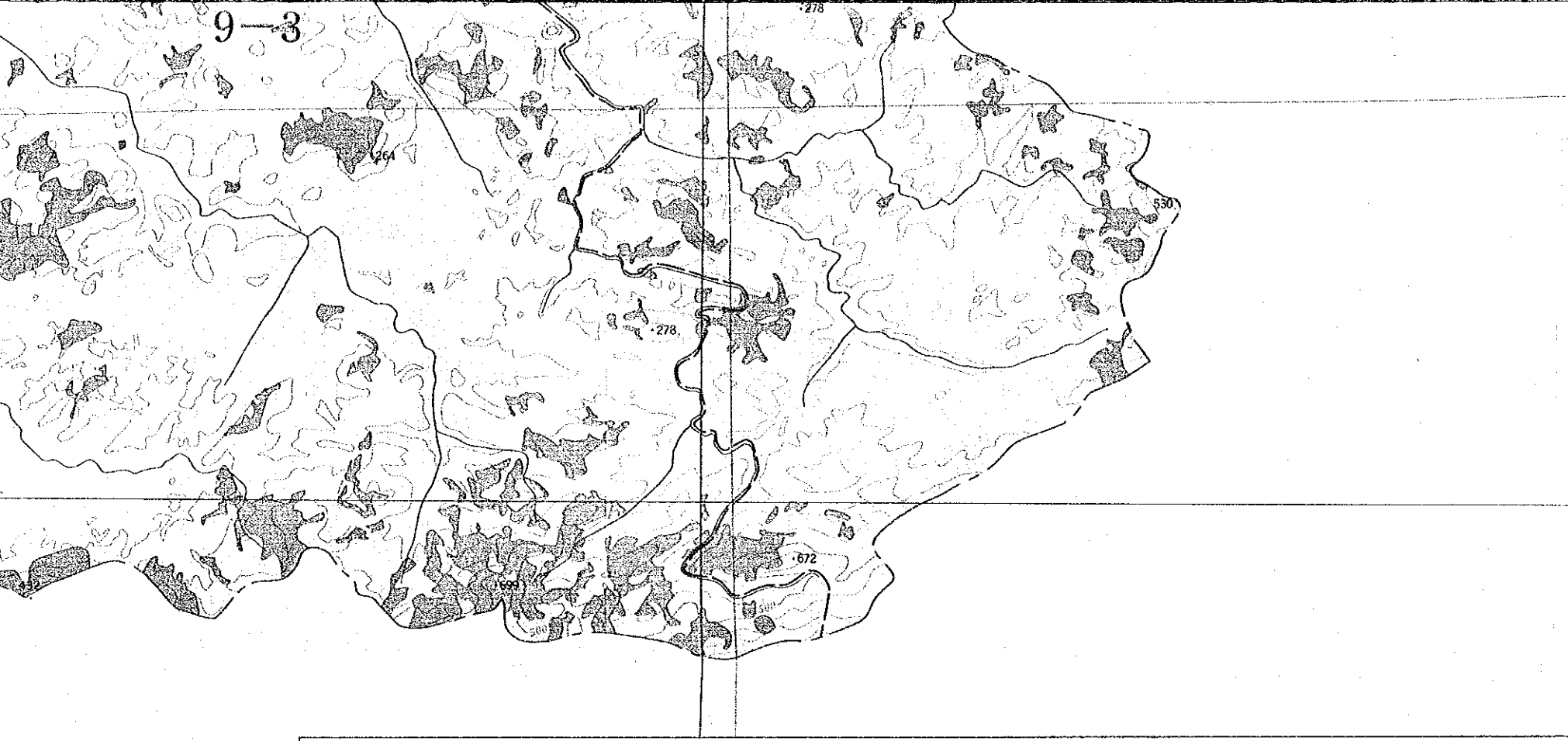
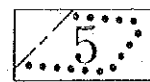
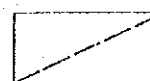
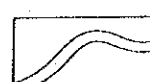

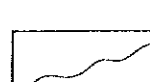

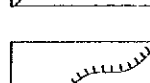
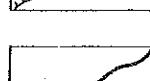
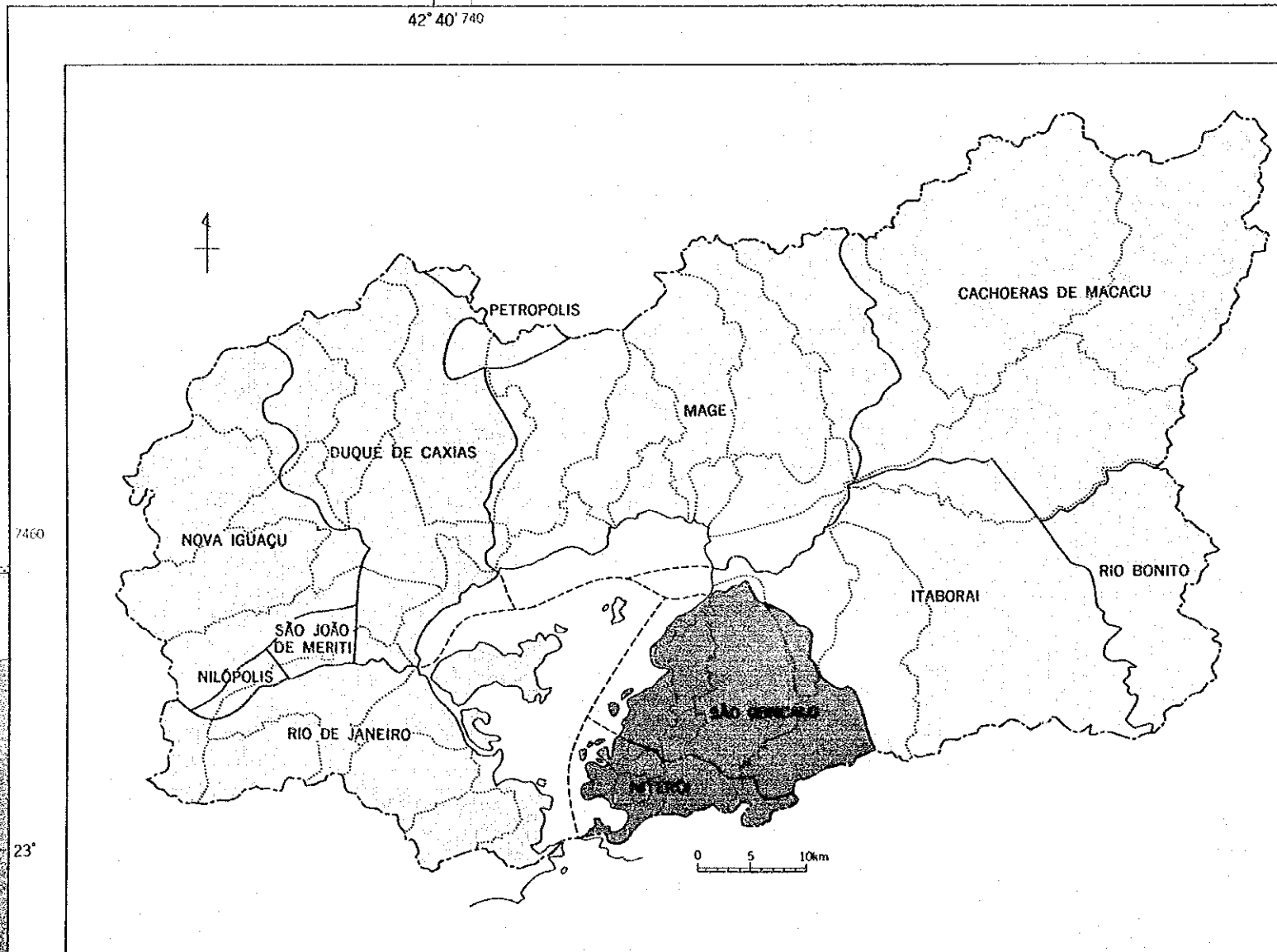


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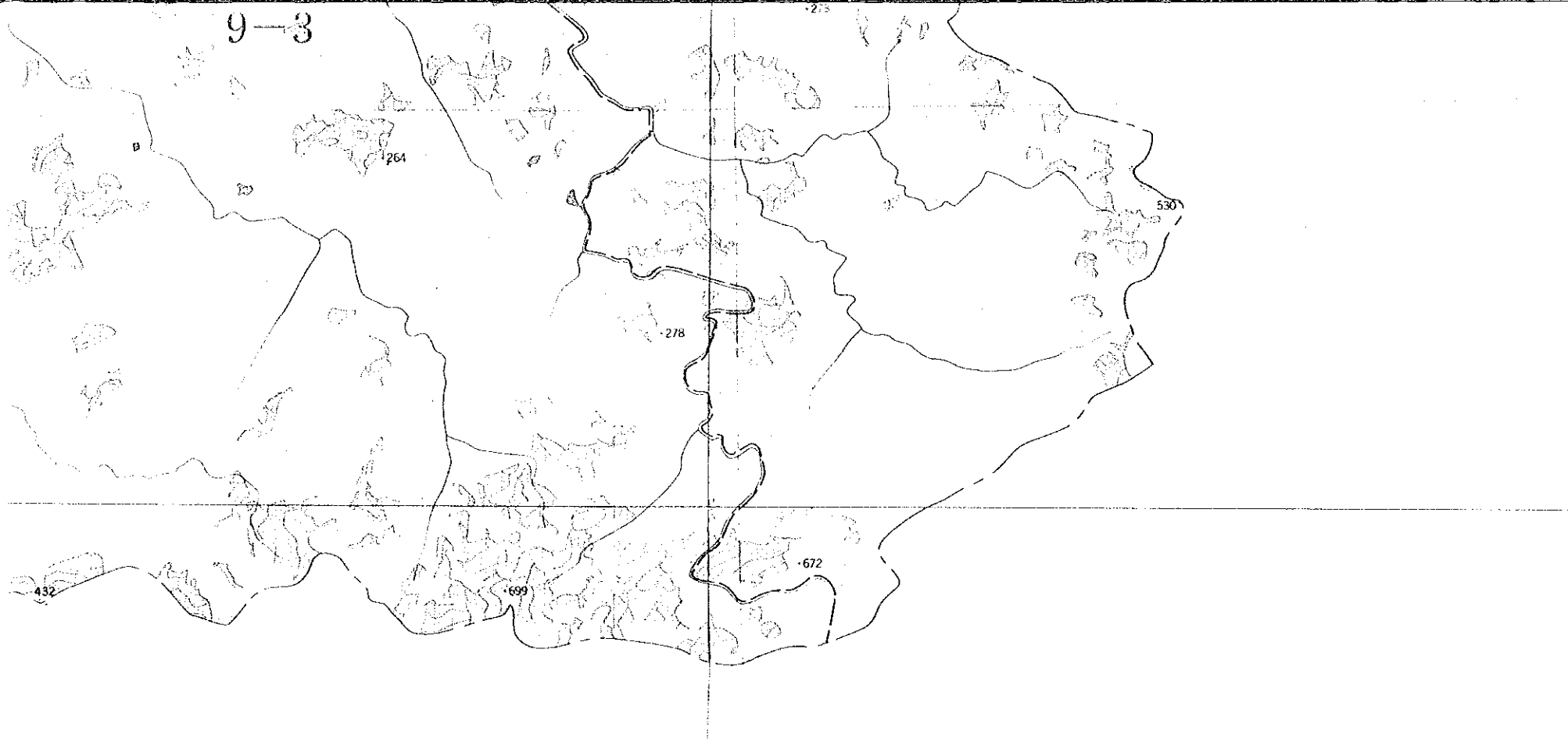



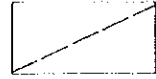
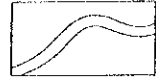

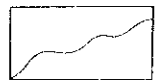
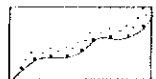
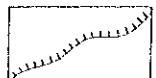

-  Boundary and Number of Sub-basin
Divisa e Numeral de Sub-bacia
-  Administrative Boundary
Divisa Administrativa
-  Main Road
Rodovia Principal
-  Runway in Airport
Pista de Aeroporto
-  Mud Beach
Costa Lodosa
-  Sand Beach
Costa Arenosa
-  Rock Beach
Costa Rochosa
-  Concrete or Stone Piled Revetment
Costa Revestida com Concreto ou Pedra

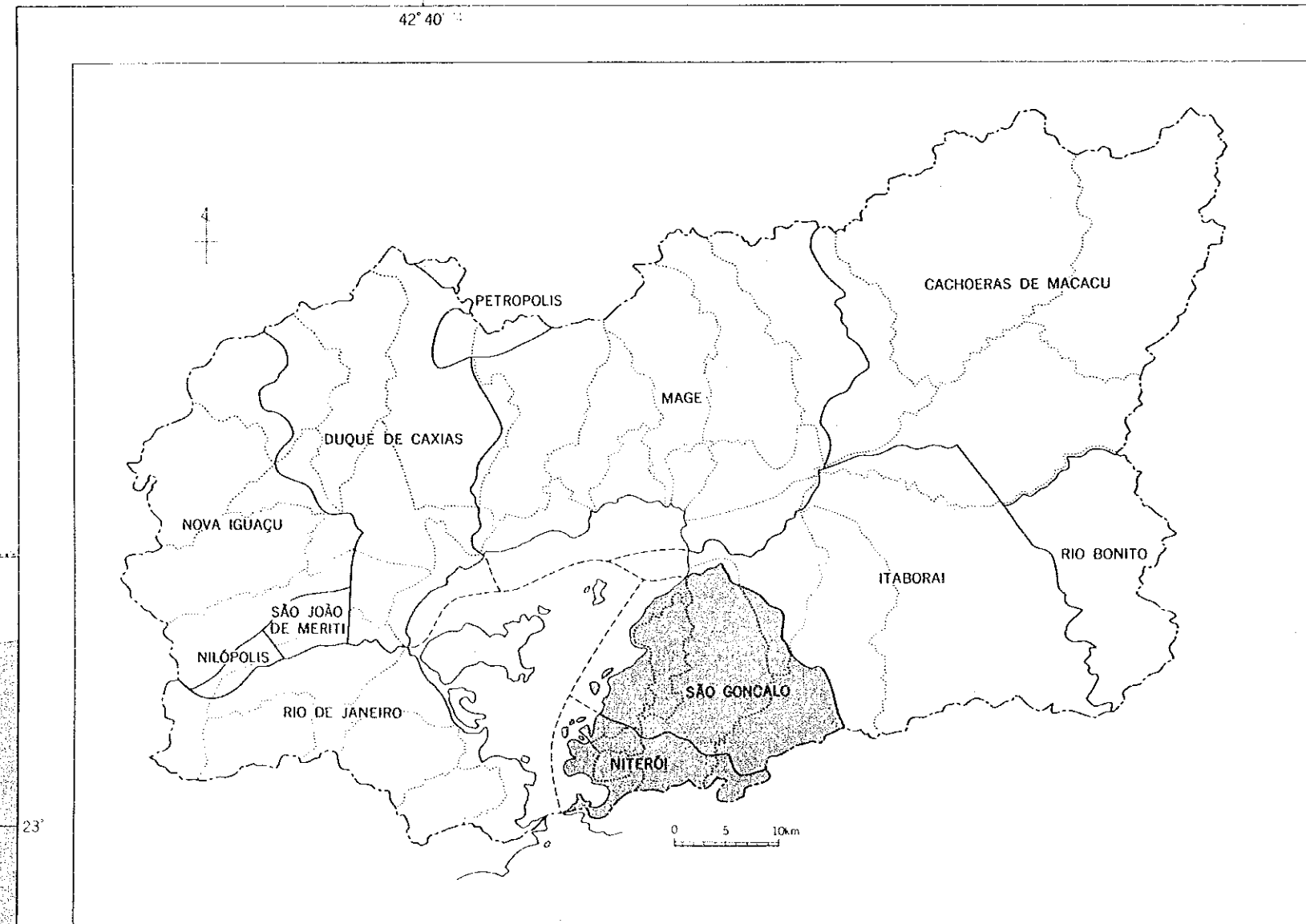


Area and Population of the Municipalities within the Guanabara Bay Basin
 Área e População de Municípios Localizados Dentro da Bacia da Baía de Guanabara

Municipality	Area (km ²)	Population (×10 ³)	Population Density
Western District	1,298.6	5,916.9	4,591
Rio de Janeiro	388.2	3,825.3	9,854
Nova Iguaçu	390.2	888.7	2,278
Duque de Caxias	465.5	665.3	1,429
São João de Meriti	35.4	424.7	11,997
Nilópolis	19.3	157.9	8,181
Eastern District	328.0	1,148.7	3,502
São Gonçalo	245.8	778.8	3,168
Niterói	82.2	369.9	4,500
Northeastern District	2,453.8	483.3	197
Mage	745.8	191.2	256
Itaborai	571.5	161.4	282
Cachoeras de Macacu	899.5	39.6	44
Rio Bonito	197.0	43.1	219
Petropolis	40.0	48.0	1,200
Total	4,080.4	7,594.0	1,861



-  Boundary and Number of Sub-basin
Divisa e Numeral de Sub-bacia
-  Administrative Boundary
Divisa Administrativa
-  Main Road
Rodovia Principal
-  Runway in Airport
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-  Mud Beach
Costa Lodosa
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Costa Arenosa
-  Rock Beach
Costa Rochosa
-  Concrete or Stone Piled Revetment
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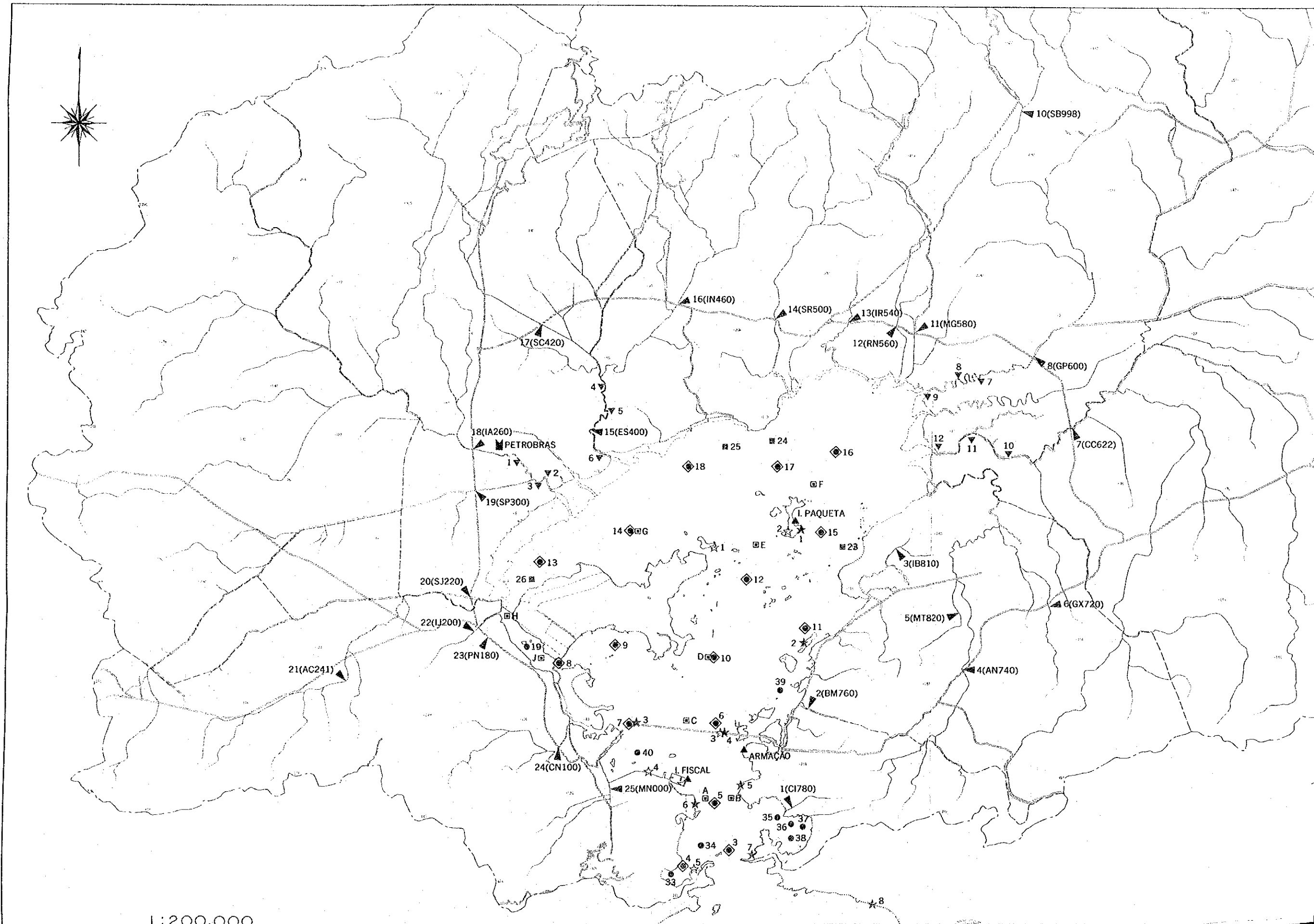


Area and Population of the Municipalities within the Guanabara Bay Basin
Área e População de Municípios Localizados Dentro da Bacia da Baía de Guanabara

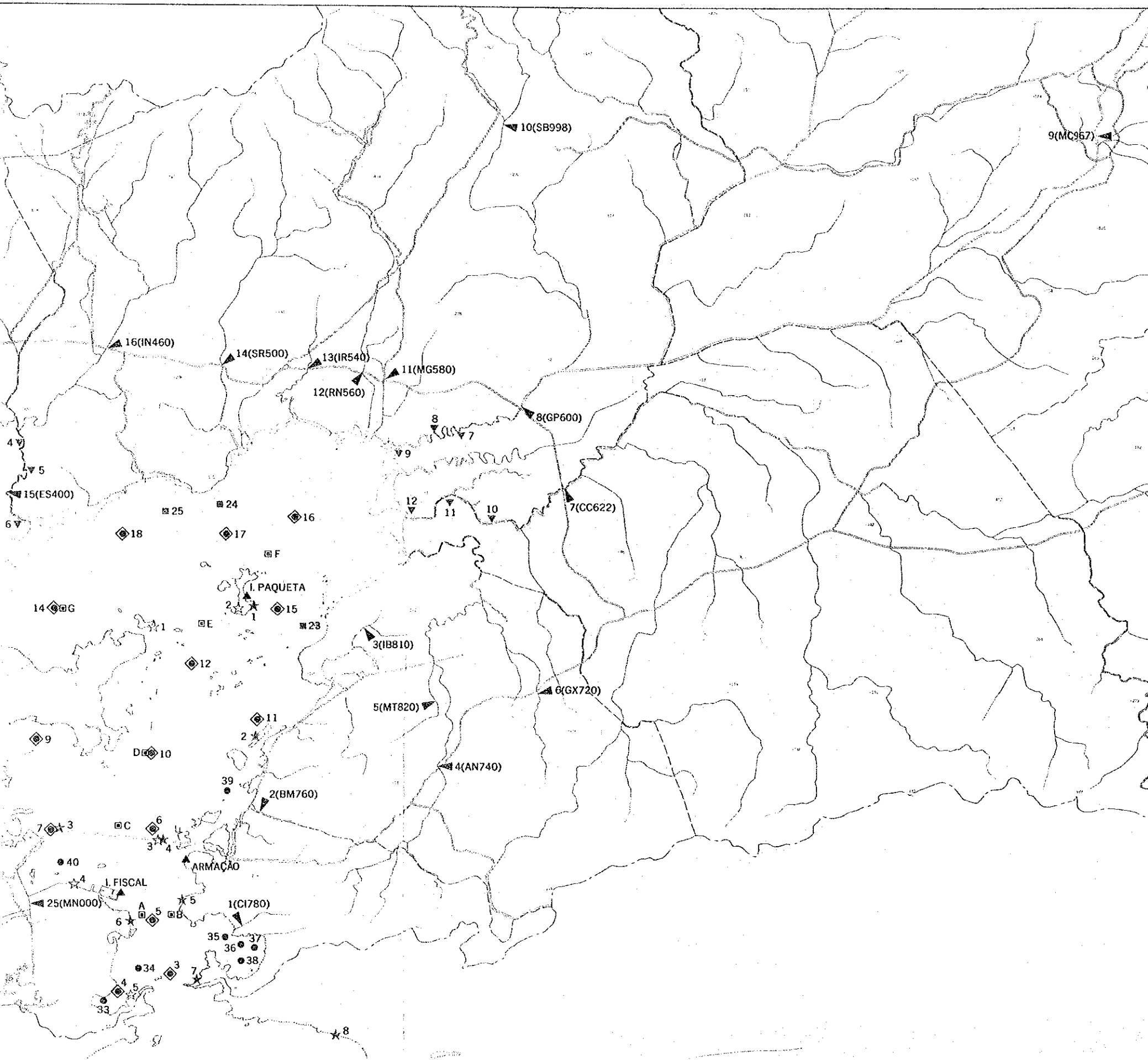
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Observation and Sampling Stations in the Study from 1992 to 1993









Estação de Observação e Amostragem em Estudo de 1992 a 1993



dy from 1992 to 1993
 do de 1992 a 1993

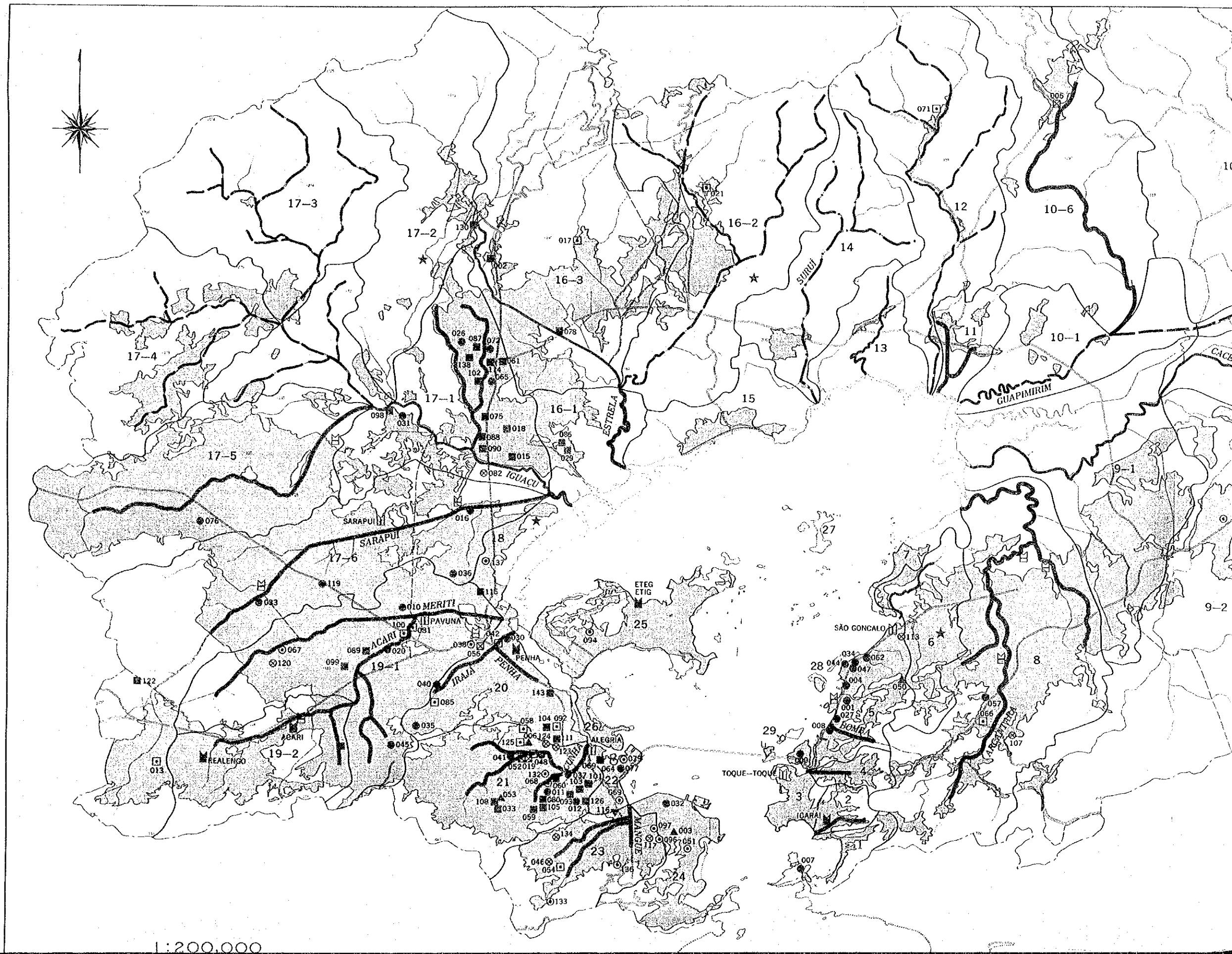


(Legends) (Legenda)

-  Meteorological Observation Station
 Estação Observatória de Meteorologia
-  Observation Station of River Discharge and Water Quality
 Estação Observatória de Fluviometria e Qualidade da Agua
-  Tide Station
 Estação Observatória de Mareia
-  Observation Station of Tidal Current
 Estação Observatória de Corrente Maritma
-  Observation Station of Water Quality
 (Sampling Station of Plankton)
 Estação Observatoria de Qualidade da Agua
 (Ponto de Amostragem de Plancton)
-  Sampling Station of Surface Sediments
 (Sampling Station of Benthos)
 Estação de Amostragem da Camada Superficial de Sedimentos
 (Ponto de Coleta de Bentos)
-  Sampling Station of Columnar Sediments
 Estação de Amostragem da Coluna de Sedimentos
-  Sampling Station of Fouling Organisms (June, 1992)

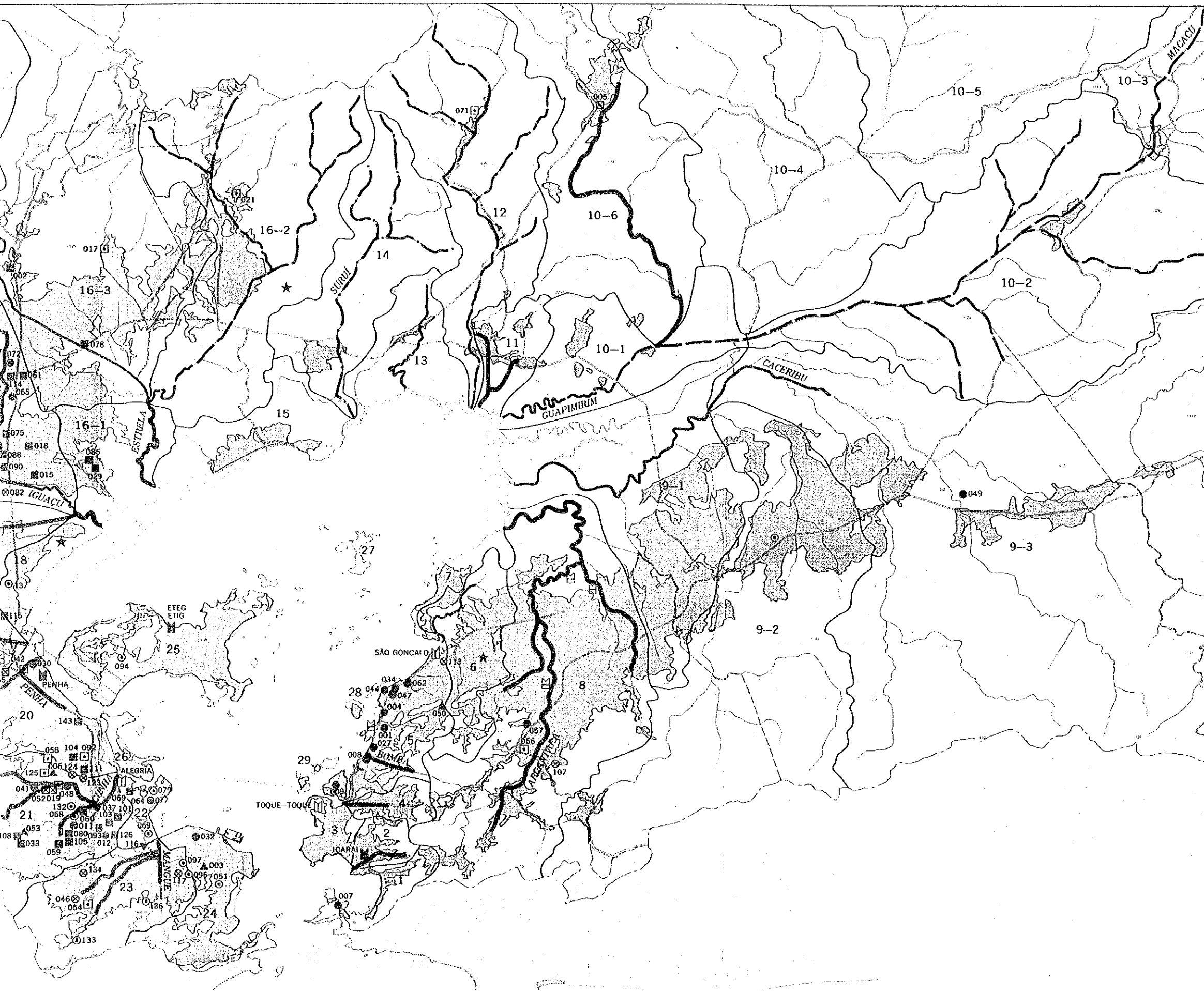
Main Point Pollution Sources and Water Quality Classification of the Rivers
Principais Fontes Poluidoras Pontuais e Classificação da Qualidade da Água dos Rios

nda)
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 Meteorologia
 iver Discharge and Water Quality
 Fluviometria e Qualidade da Agua
 Mareia
 idal Current
 Corrente Marítma
 ater Quality
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 Qualidade da Agua
 de Plankton)
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 da Camada Superficial de Sedimentos
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 mnar Sediments
 da Coluna de Sedimentos
 ing Organisms (June, 1992)
 Organismos Invertebrados (Junho, 1992)



Quality Classification of the Rivers

Classificação da Qualidade da Água dos Rios



(Legends) (Legenda)

Industrial Pollution Source
Fonte de Poluição Industrial

- Food
Alimento
- ▲ Beverage
Bebida
- ⊠ Paper
Papel
- Chemicals
Química
- ▼ Plastics
Plástico
- ⊗ Pharmaceutical
Farmacêutico
- Textile
Têxtil
- Mechanicals
Mecânica
- ⊙ Others
Outros

Numerals attached to each symbol show the number in the industrial inventory of FEEMA

Números relacionados a cada símbolo indicam a ordem numérica estabelecida no levantamento industrial da FEEMA

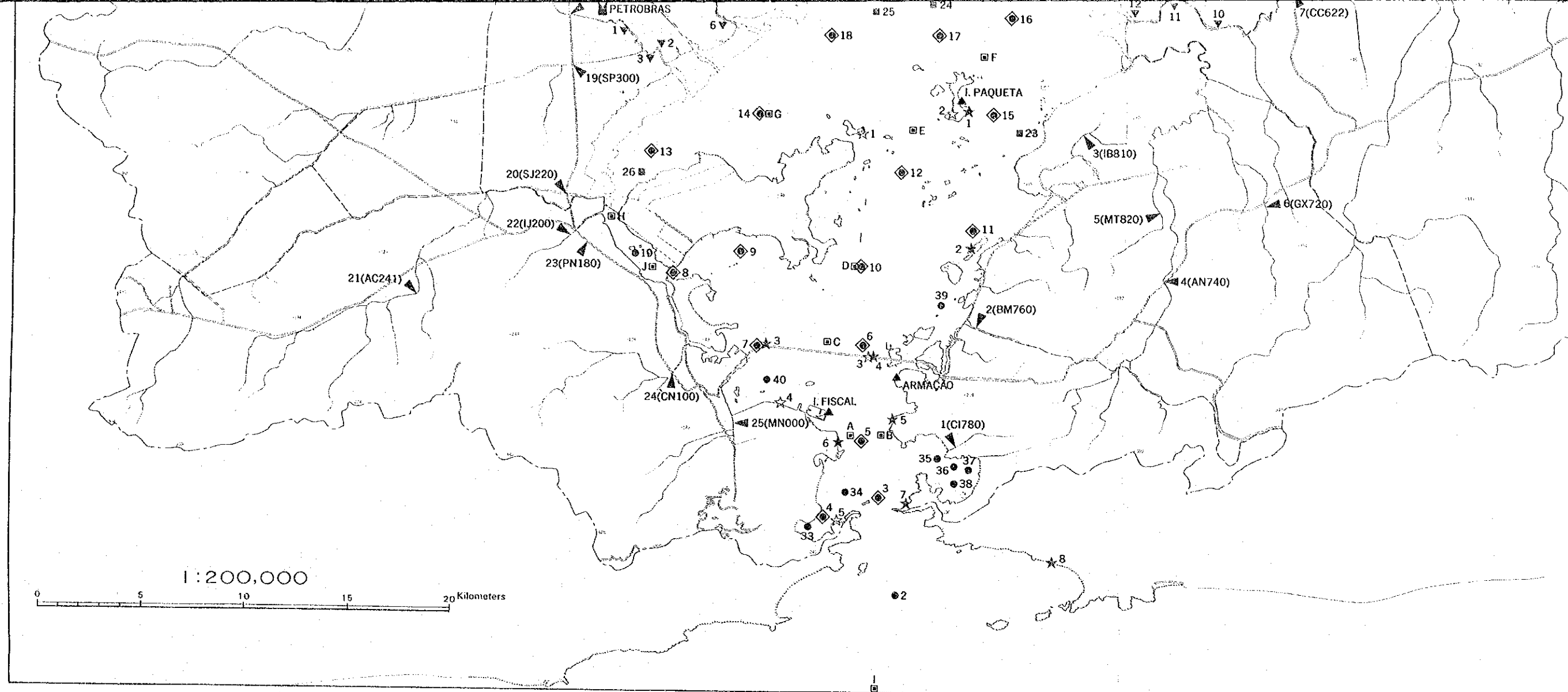
Waste Water Treatment Plant controlled by CEDAE
Estação de Tratamento de Esgotos Residuais Gerenciada pelo CEDAE

- Existing
Existente
- ▨ to be constructed by 2000
a ser construída até o ano 2000
- ▩ to be constructed after 2000
a ser construída depois do ano 2000
- ★ Landfill Site of Solid Wastes
Área de Aterro de Lixo

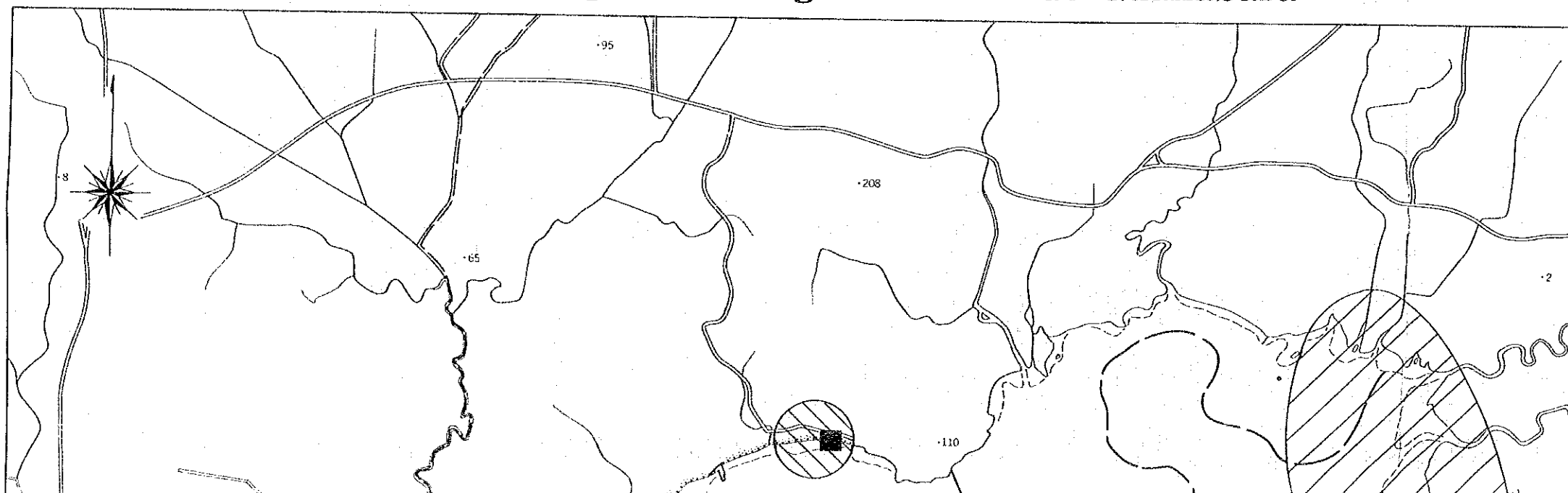
Urban Area
Área Urbana

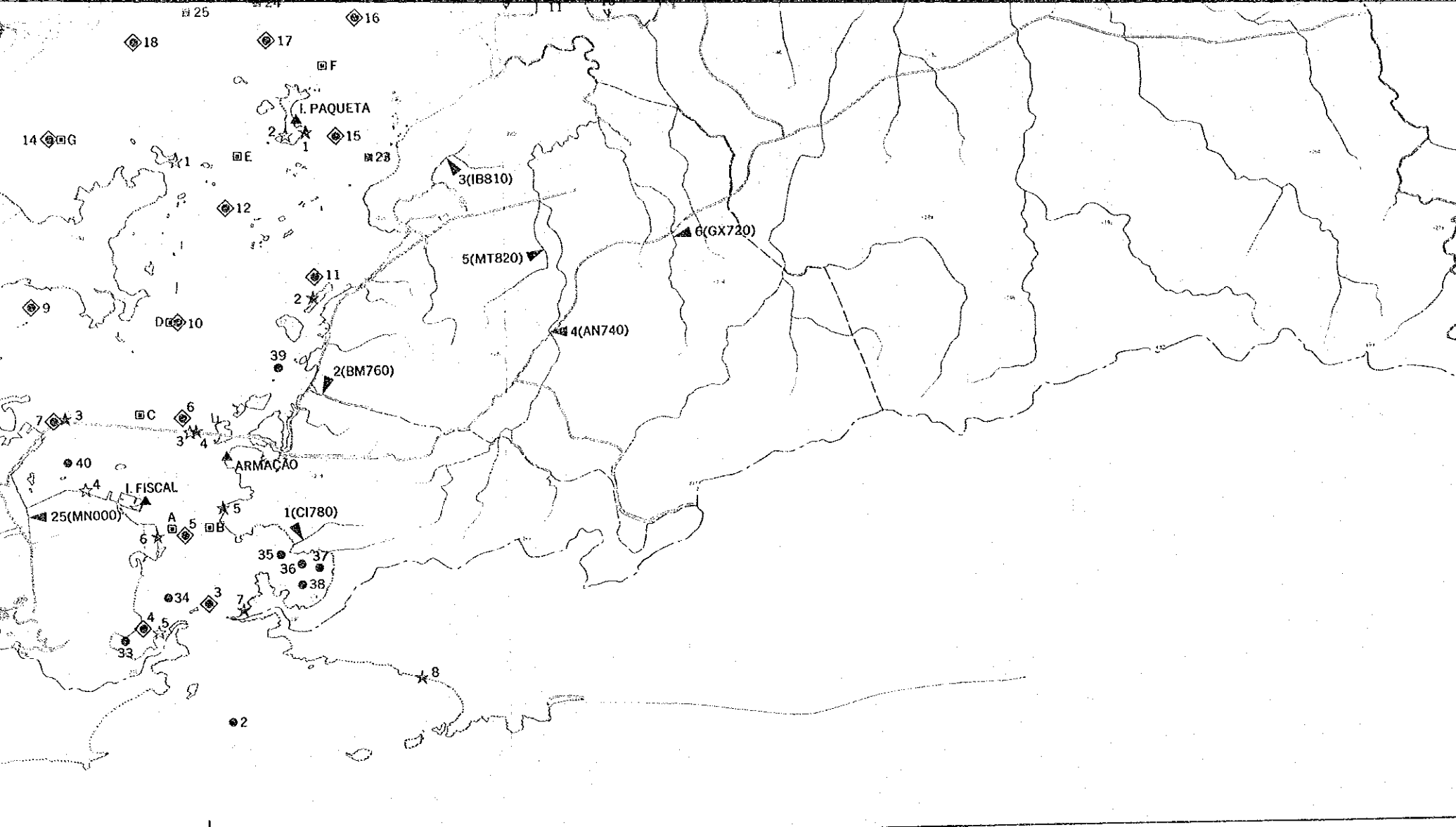
Water Quality Classification of the Rivers
(Mean Value from 1992 to 1993)
Classificação da Qualidade da Água dos Rios
(Valor Médio de 1992 a 1993)

- less than 3 mg/l (Class 1)
menor que 3 mg/l (Classe 1)
- 3~ 5 mg/l (Class 2)



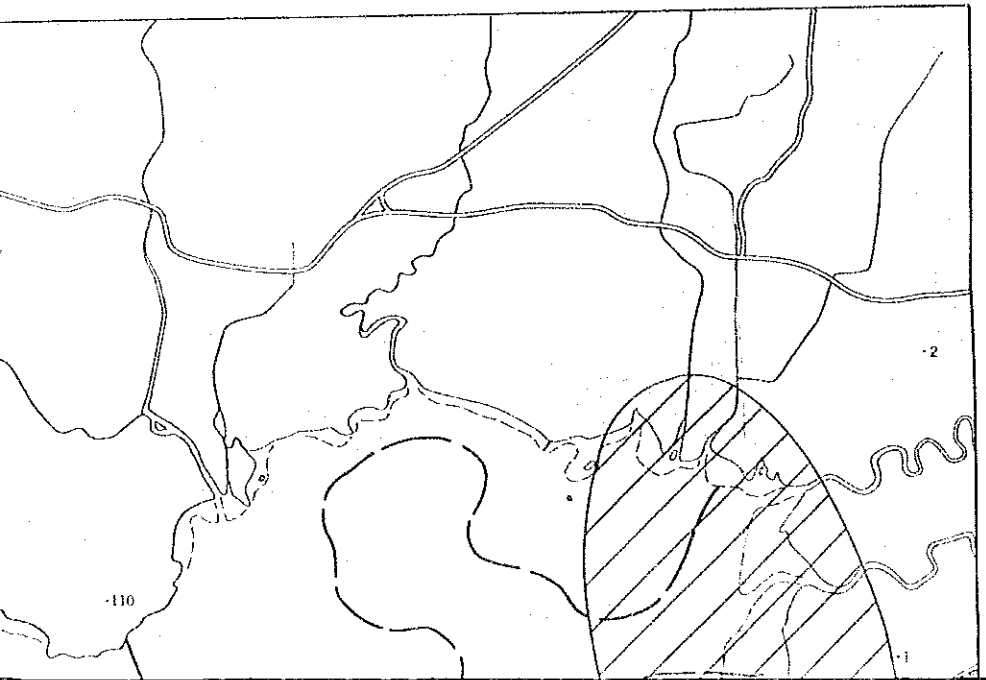
Current Use of Coast and Water Area of the Guanabara Bay
Uso Atual da Costeira e da Espelha da Água da Baía de Guanabara





- (Legends) (Legenda)
- ☒ Meteorological Observation Station
Estação Observatória de Meteorologia
 - ▲ Observation Station of River Discharge and Water Quality
Estação Observatória de Fluiometria e Qualidade da Agua
 - ▲ Tide Station
Estação Observatória de Mareia
 - ☒ Observation Station of Tidal Current
Estação Observatória de Corrente Maritma
 - Observation Station of Water Quality (Sampling Station of Plankton)
Estação Observatoria de Qualidade da Agua (Ponto de Amostragem de Plankton)
 - ◇ Sampling Station of Surface Sediments (Sampling Station of Benthos)
Estação de Amostragem da Camada Superficial de Sedimentos (Ponto de Coleta de Bentos)
 - Sampling Station of Columnar Sediments
Estação de Amostragem da Coluna de Sedimentos
 - ★ Sampling Station of Fouling Organisms (June, 1992)
Estação de Amostragem de Organismos Incrustantes (Junho, 1992)
 - ☆ Sampling Station of Fouling Organisms (November, 1992)
Estação de Amostragem de Organismos Incrustantes (Novembro, 1992)
 - ▼ Survey Point of Mangrove and Salt Marsh
Pontano de Etudo no Manguezal e Pântano Salgado

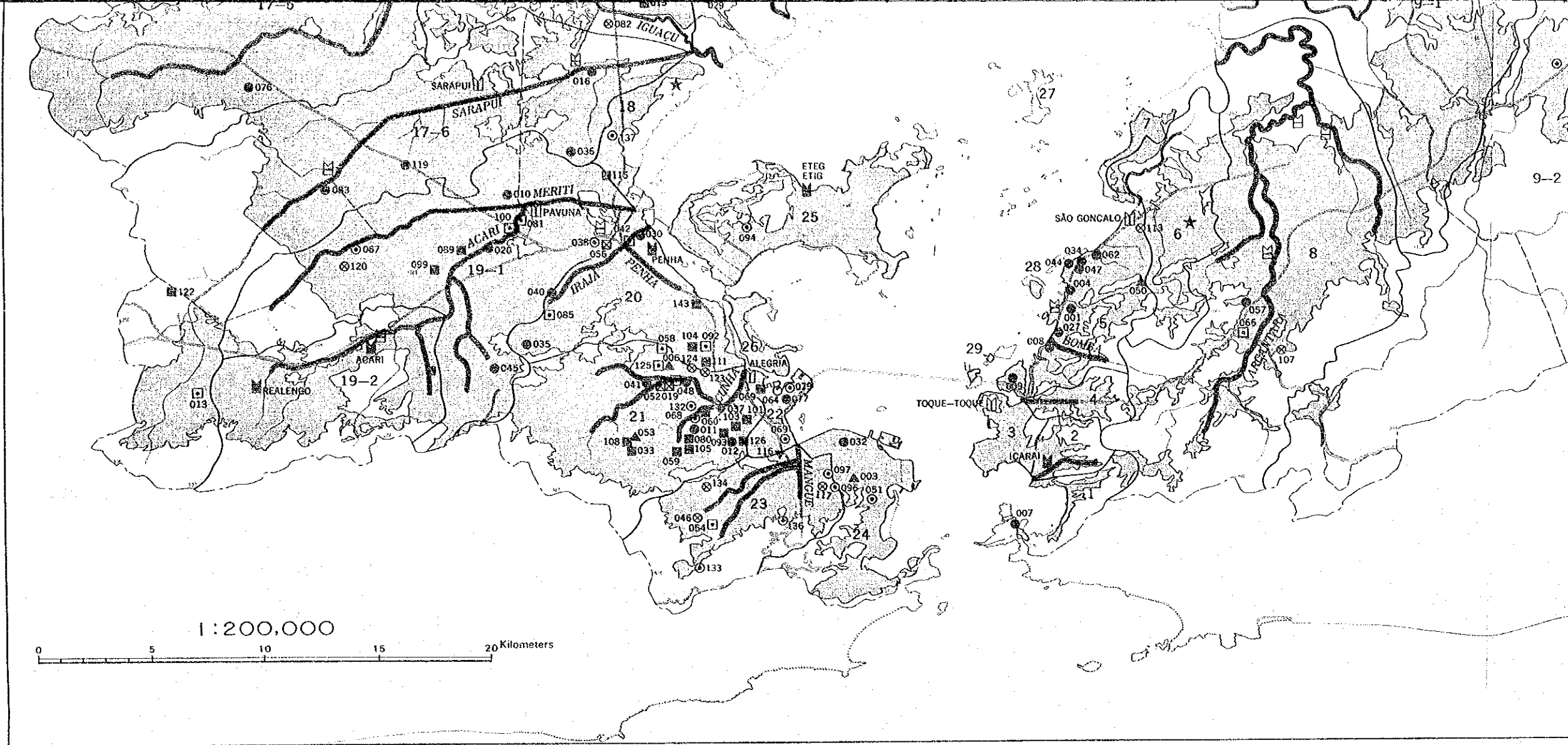
Guanabara Bay
da Baía de Guanabara



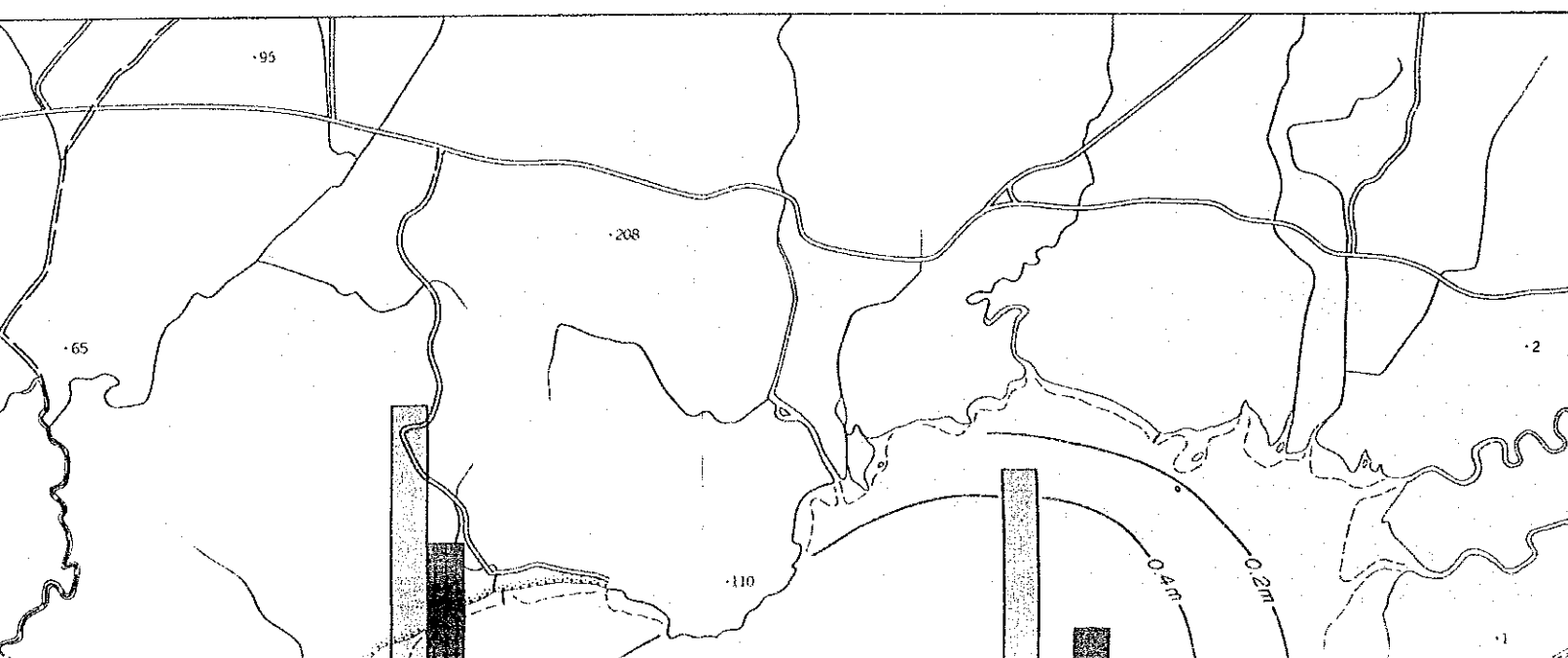
Water Quality in the Bay on Nov. 10, 1992 (Low water time in the
Qualidade da Água da Baía em Nov. 10, 1992 (Na Maré Baixa em



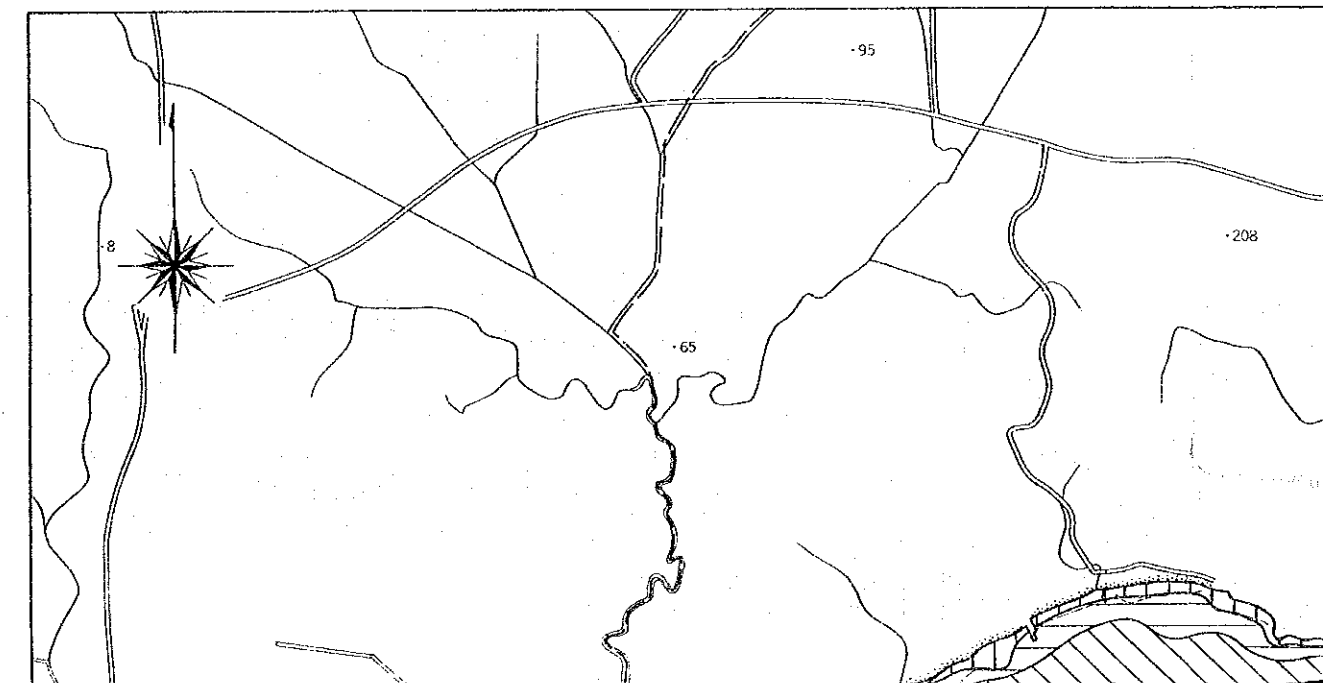
- Station
- teorologia
- Discharge and Water Quality
- viometria e Qualidade da Agua
- area
- Current
- orrente Maritma
- er Quality
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- (Plancton)
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- a Camada Superficial de Sedimentos
-)
- mar Sediments
- a Coluna de Sedimentos
- g Organisms (June, 1992)
- Organismos Incrustantes (Junho, 1992)
- g Organisms (November, 1992)
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- and Salt Marsh
- quezal e Pântano Salgado

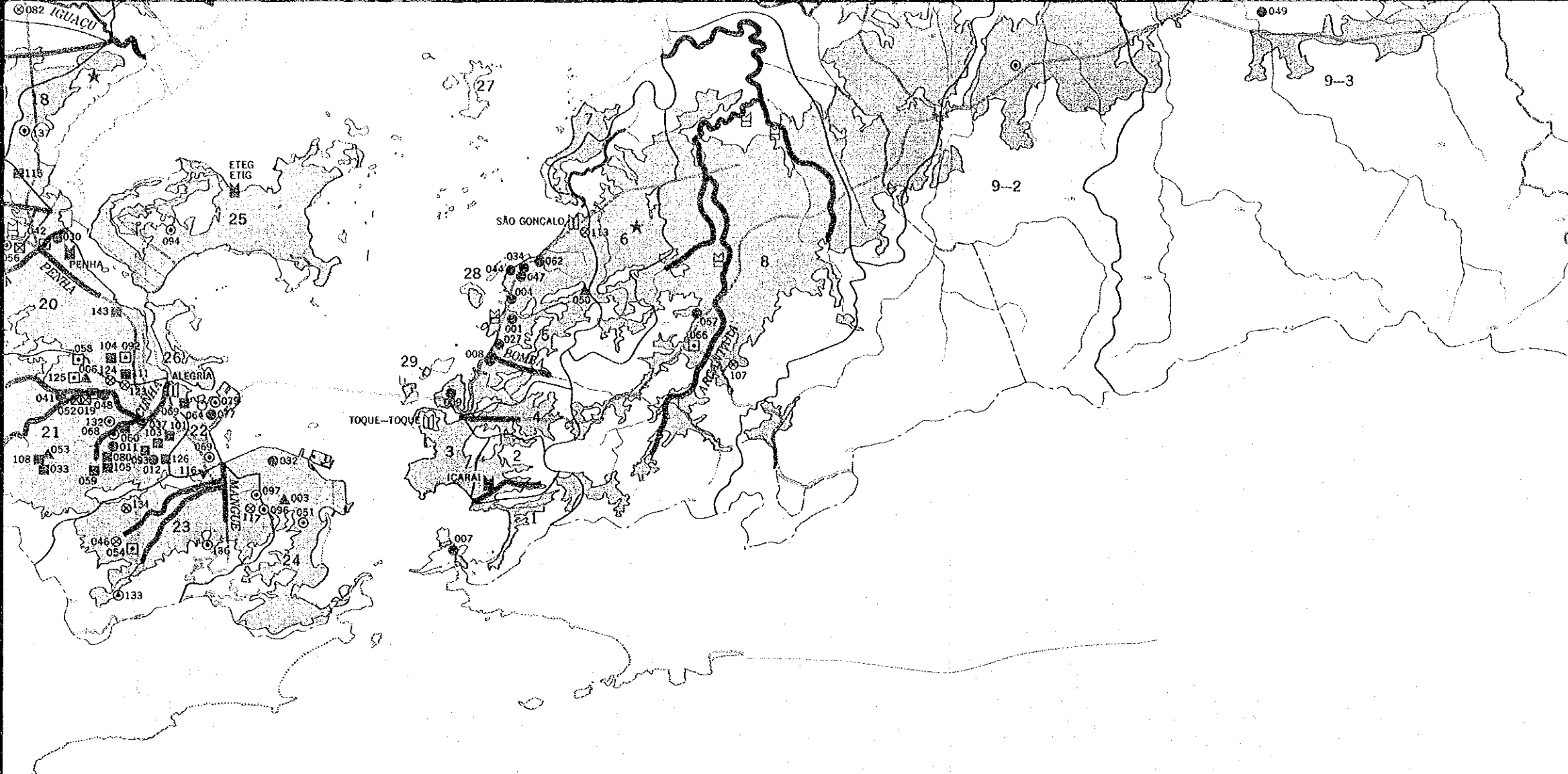


on Nov. 10, 1992 (Low water time in the spring tide period)
 a em Nov. 10, 1992 (Na Maré Baixa em Mare Sizigia)



Bottom Materials and Benthic Organisms of the Baía
 Materiais Bentônicos e Bentos da Baía





Mecânica
 Others
 Outros

Numerals attached to each symbol show the number in the industrial inventory of FEEMA
 Números relacionados a cada símbolo indicam a ordem numérica estabelecida no levantamento industrial da FEEMA

Waste Water Treatment Plant controlled by CEDAE
 Estação de Tratamento de Esgotos Residuárias Gerenciada pelo CEDAE

Existing
 Existente

to be constructed by 2000
 a ser construída até o ano 2000

to be constructed after 2000
 a ser construída depois do ano 2000

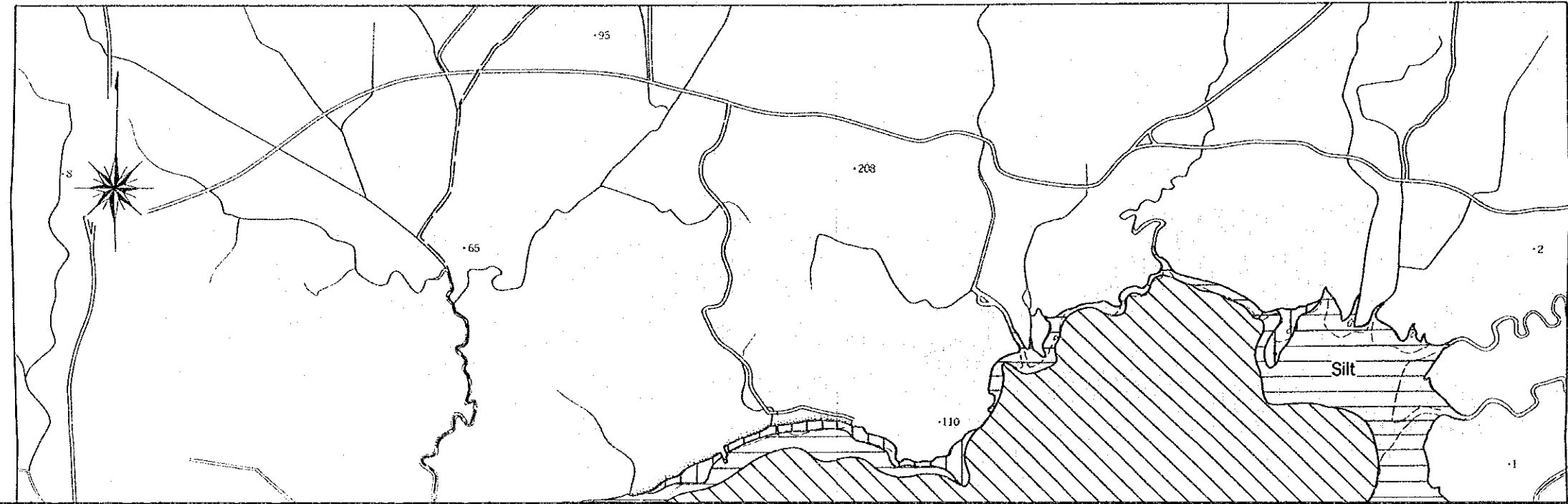
Landfill Site of Solid Wastes
 Área de Aterro de Lixo

Urban Area
 Área Urbana

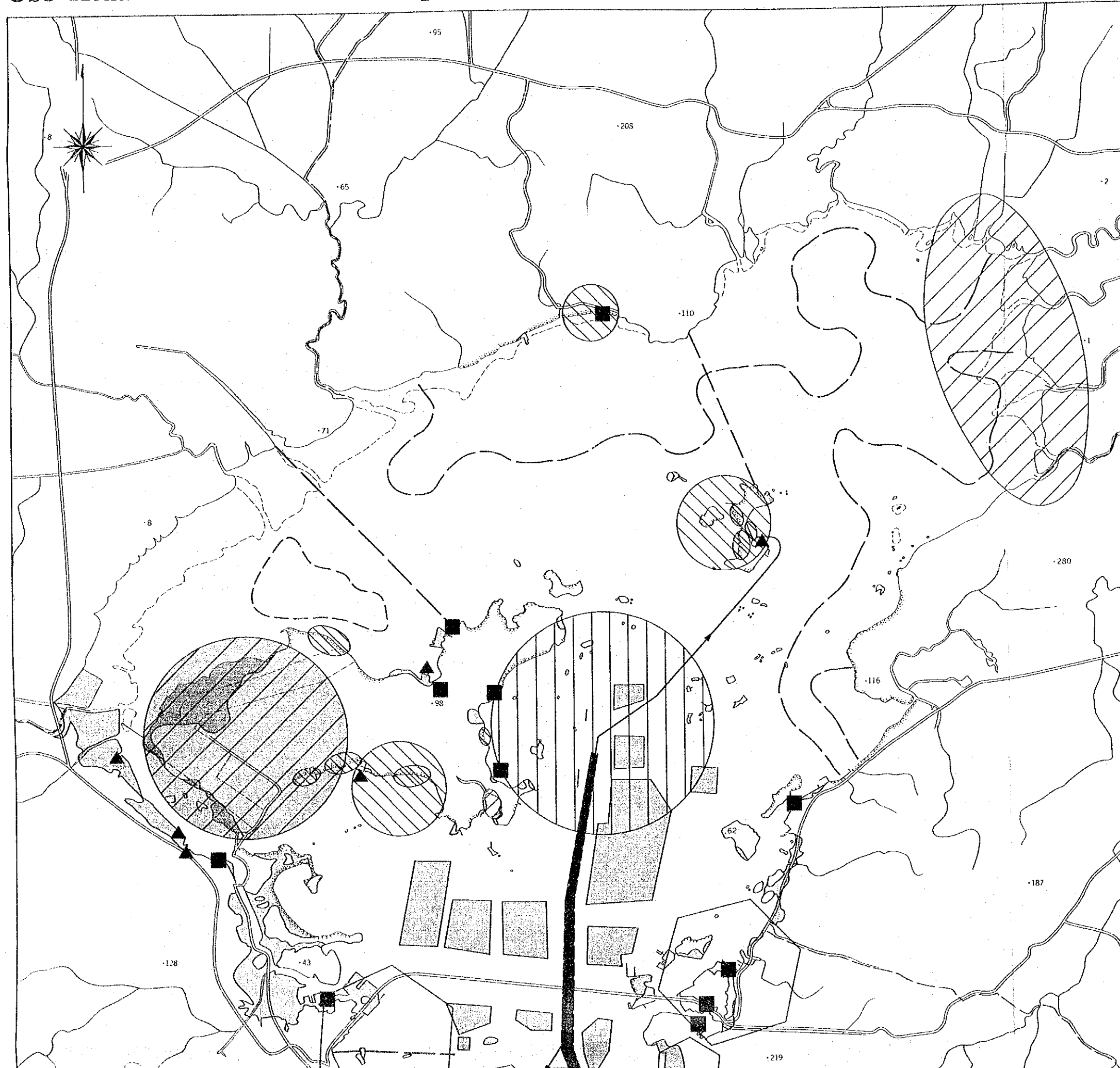
Water Quality Classification of the Rivers
 (Mean Value from 1992 to 1993)
 Classificação da Qualidade da Água dos Rios
 (Valor Médio de 1992 a 1993)

—	less than	3 mg/l (Class 1)
—	menor que	3 mg/l (Classe 1)
- · - · -		3 ~ 5 mg/l (Class 2)
- · - · -		3 ~ 5 mg/l (Classe 2)
— · — · —		5 ~ 10 mg/l (Class 3)
— · — · —		5 ~ 10 mg/l (Classe 3)
— · — · — · — · —		more than 10 mg/l (Class 4)
— · — · — · — · —		maior que 10 mg/l (Classe 4)

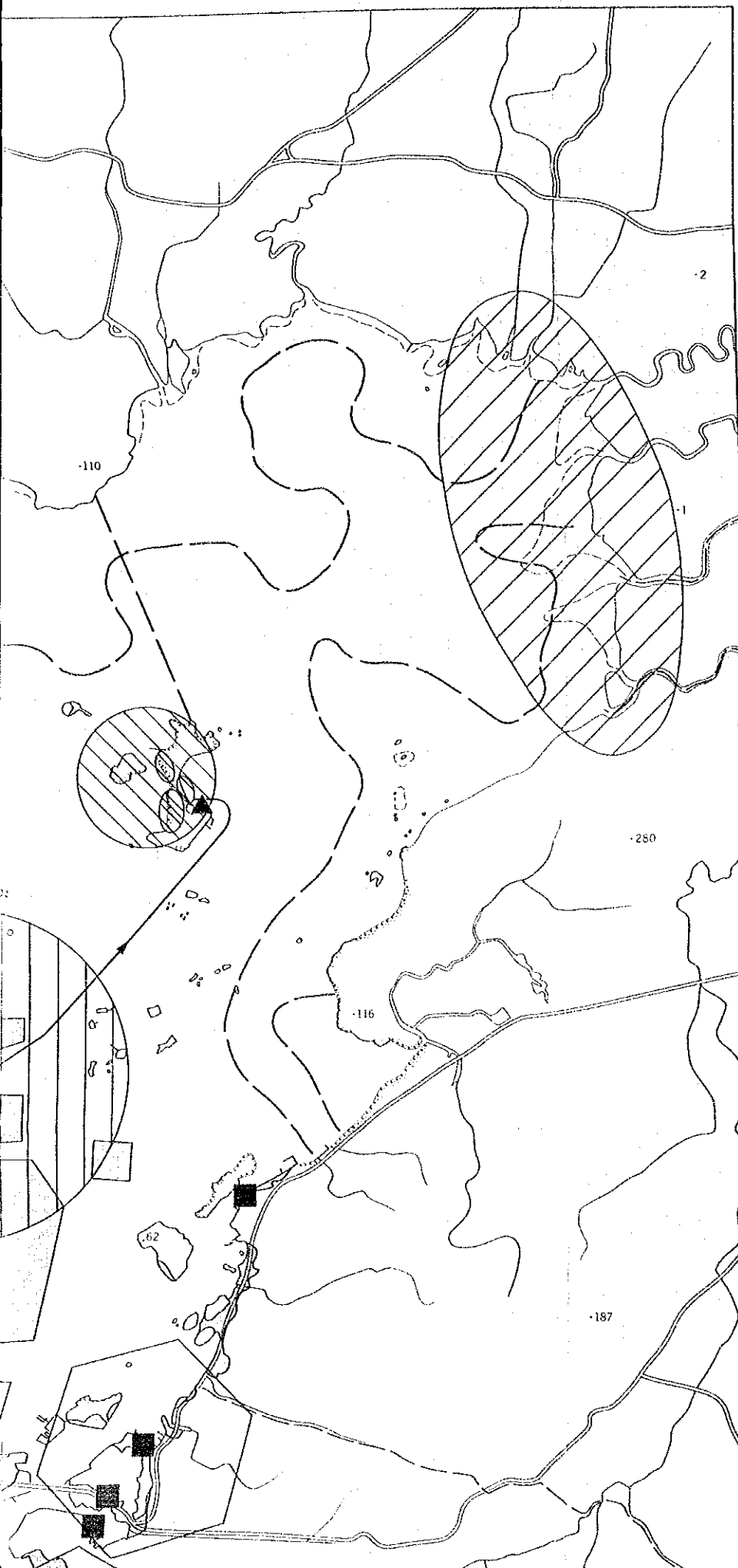
Bottom Materials and Benthic Organisms of the Bay Materiais Bentônicos e Bentos da Baía



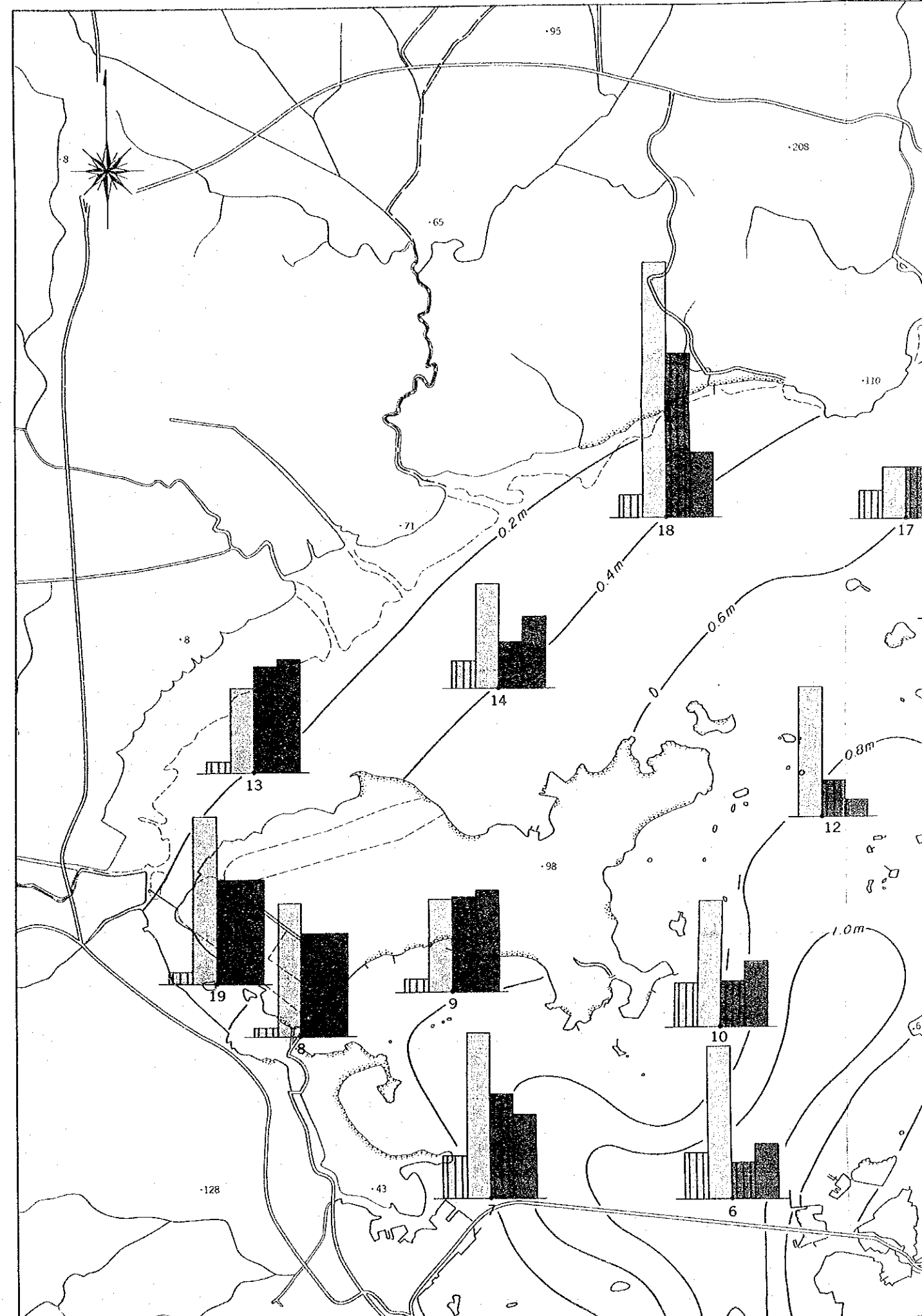
Current Use of Coast and Water Area of the Guanabara Bay
Uso Atual da Costeira e da Espelho da Água da Baía de Guanabara



Guanabara Bay
da Baía de Guanabara



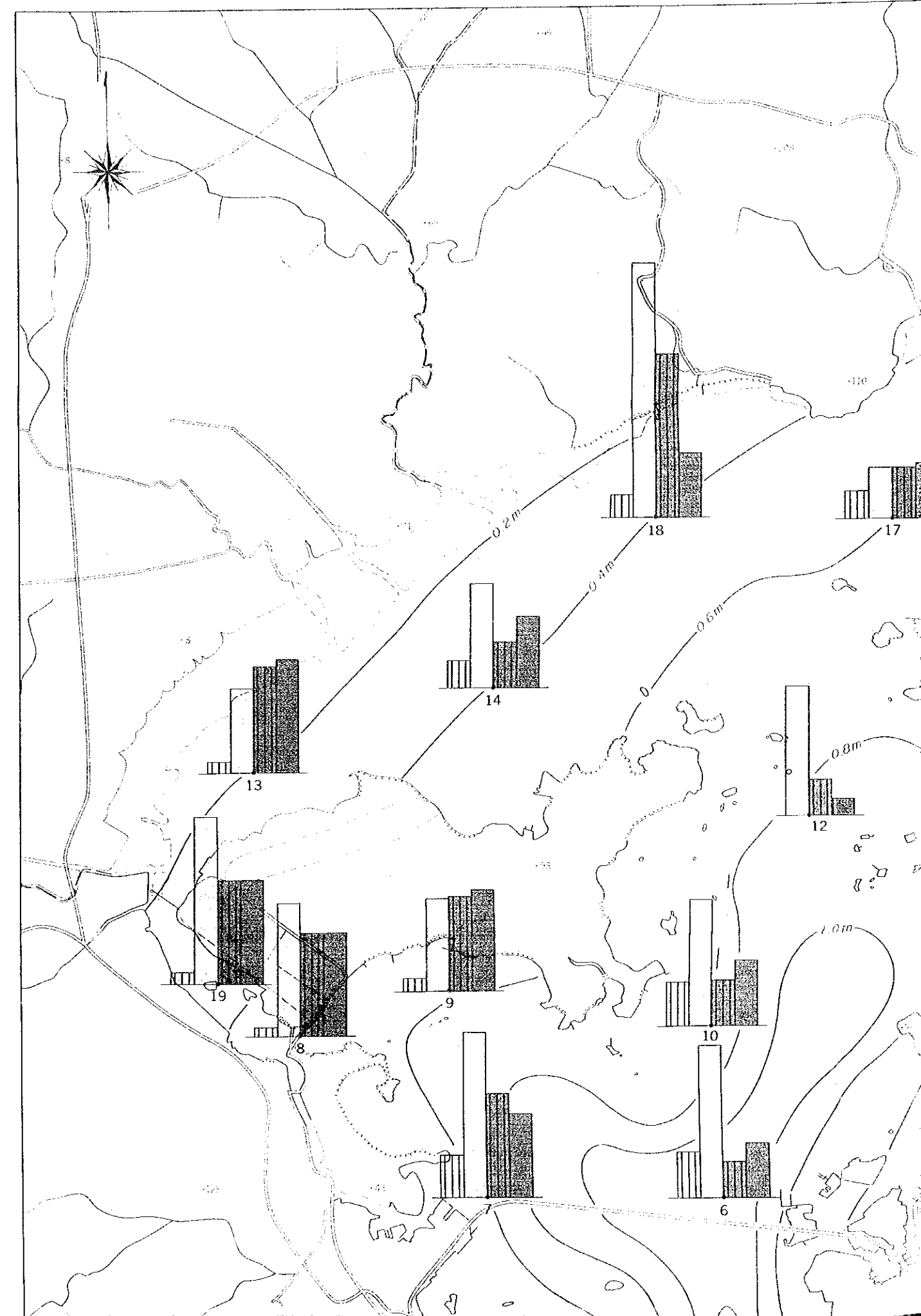
Water Quality in the Bay on Nov. 10, 1992 (Low water time in the
Qualidade da Água da Baía em Nov. 10, 1992 (Na Maré Baixa em M



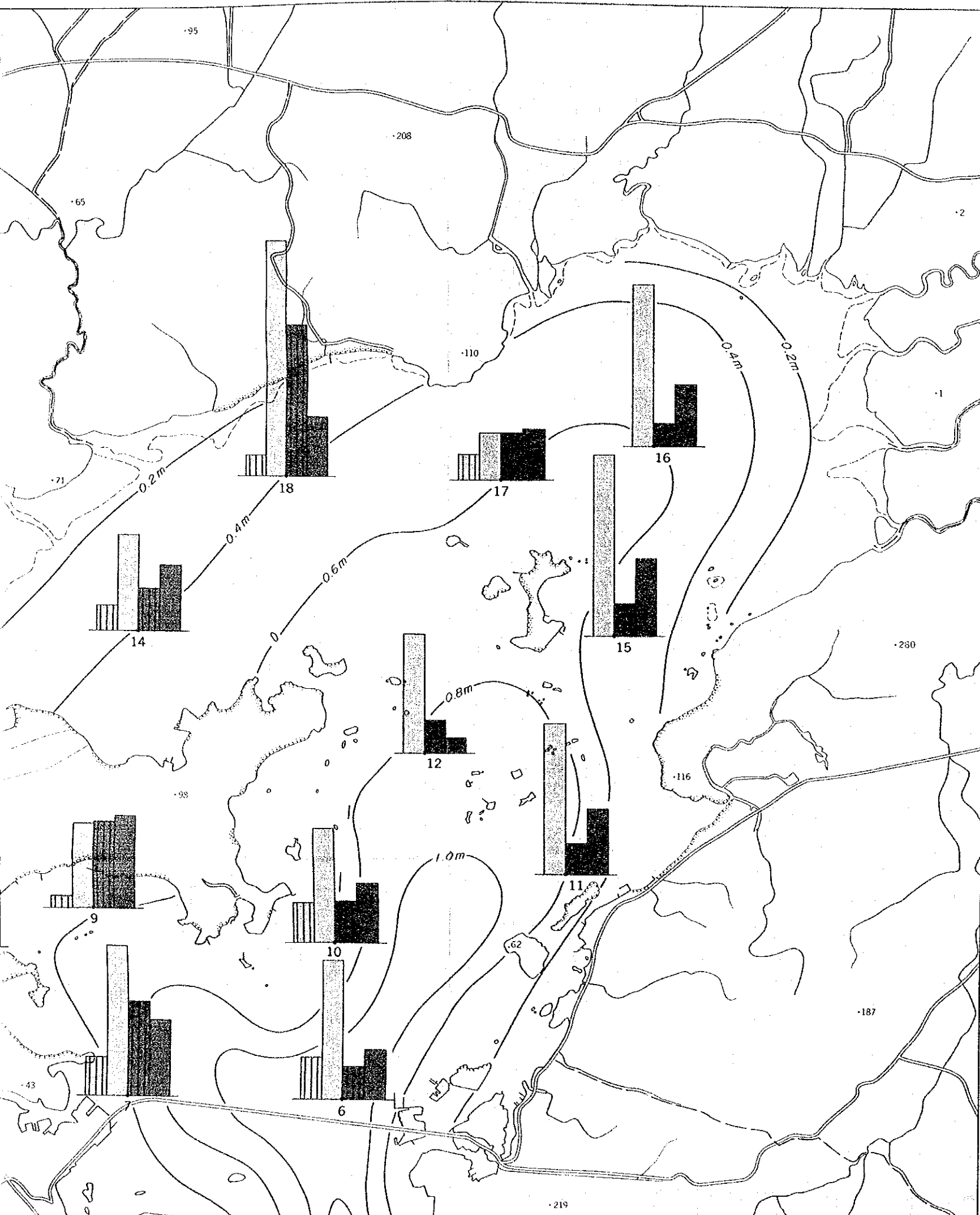
Guanabara Bay
Baía de Guanabara



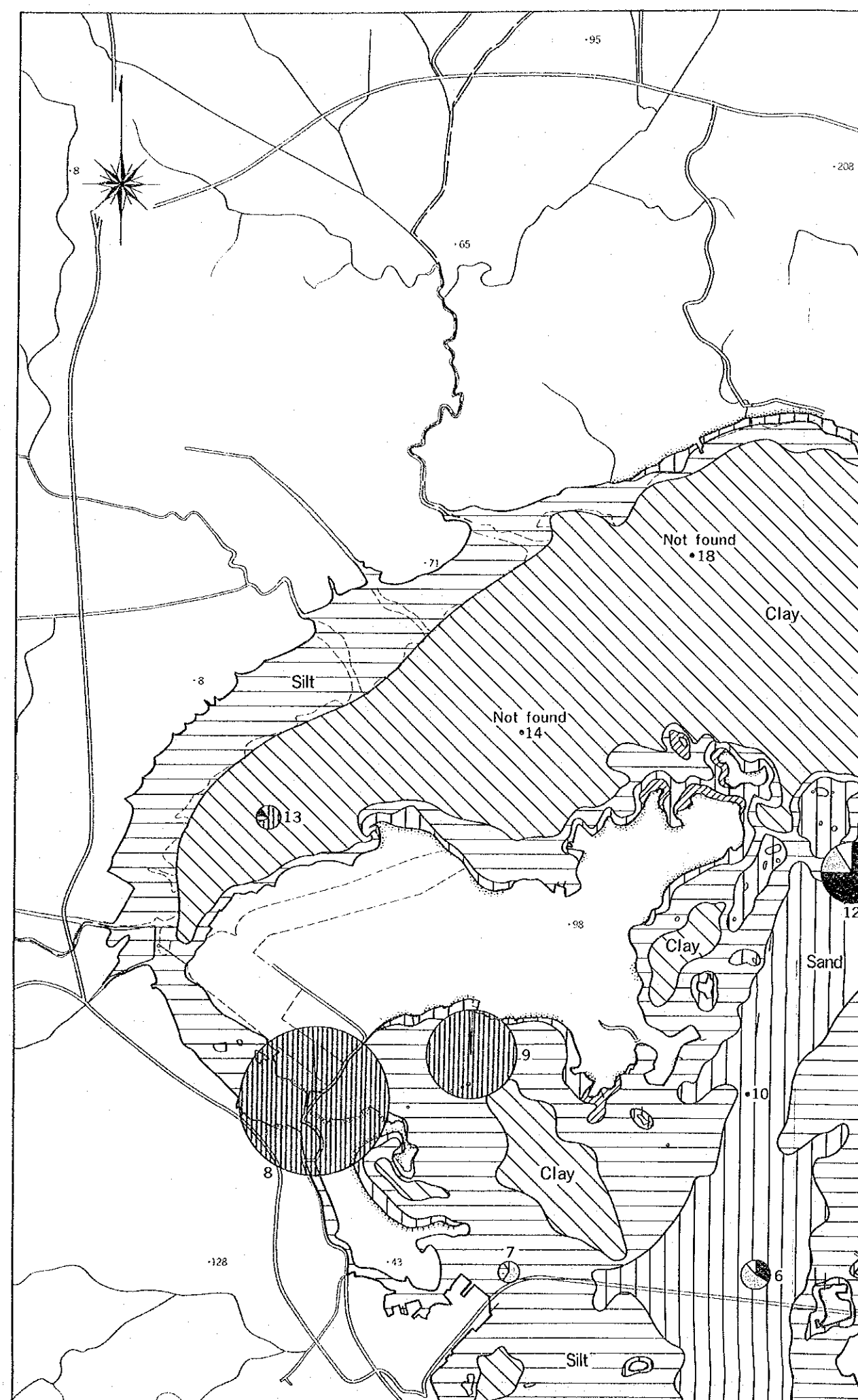
Water Quality in the Bay on Nov. 10, 1992 (Low water time in the s
Qualidade da Água da Baía em Nov. 10, 1992 (Na Maré Baixa em M



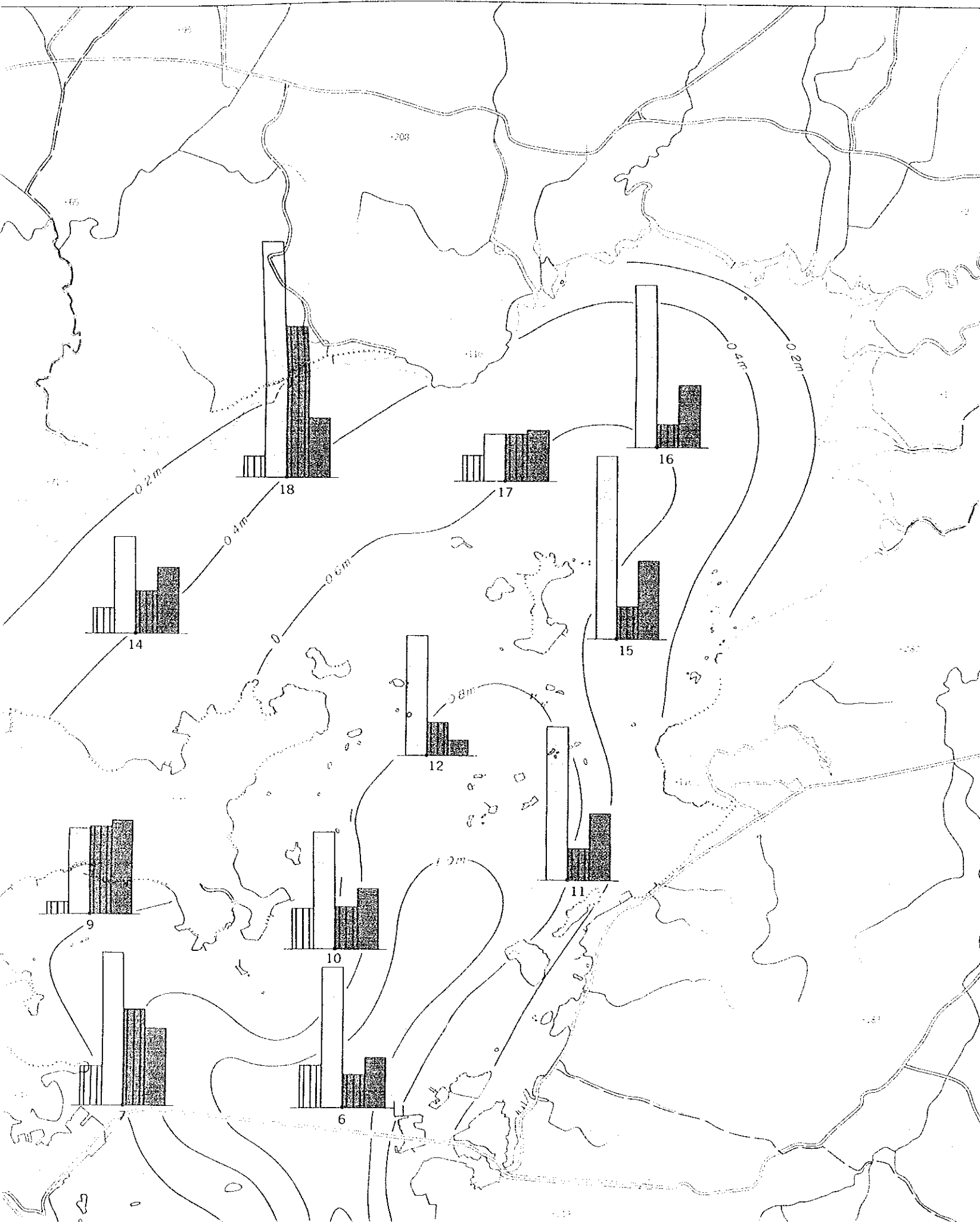
...y on Nov. 10, 1992 (Low water time in the spring tide period)
 Baía em Nov. 10, 1992 (Na Maré Baixa em Mare Sizigia)



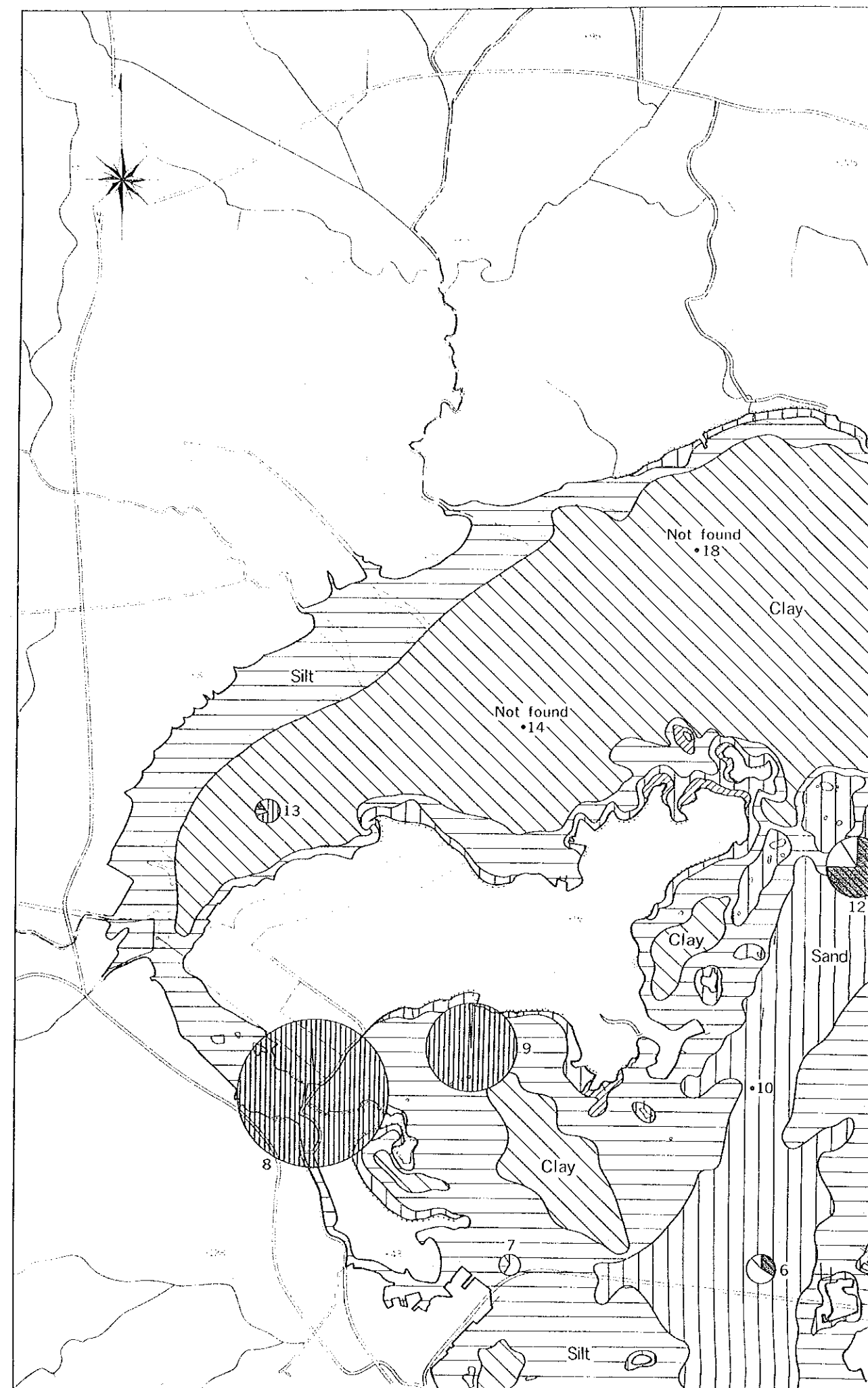
Bottom Materials and Benthic Organisms of the
 Materiais Bentônicos e Bentos da Baía



on Nov. 10, 1992 (Low water time in the spring tide period)
 Baía em Nov. 10, 1992 (Na Maré Baixa em Mare Sizigia)

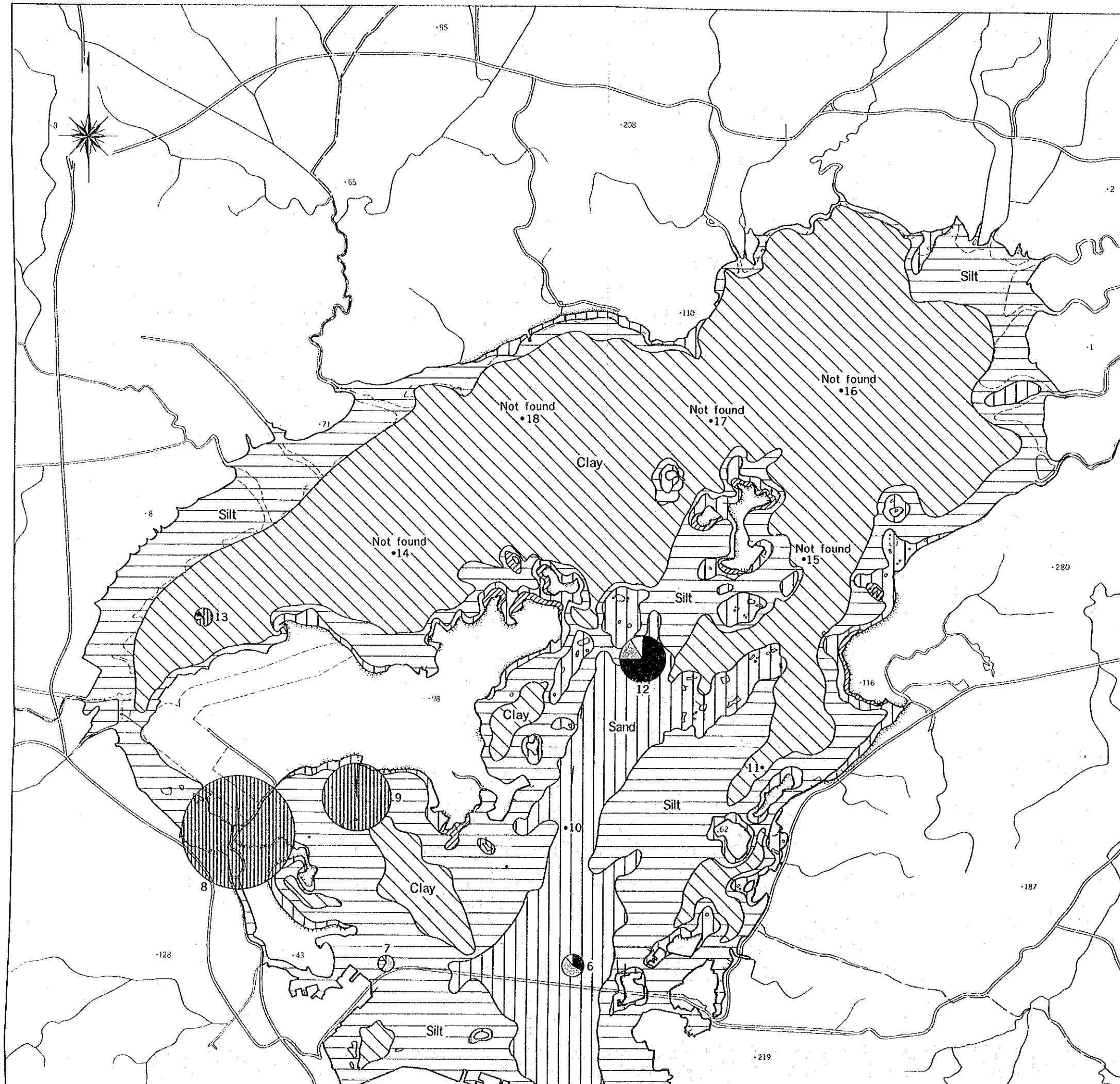


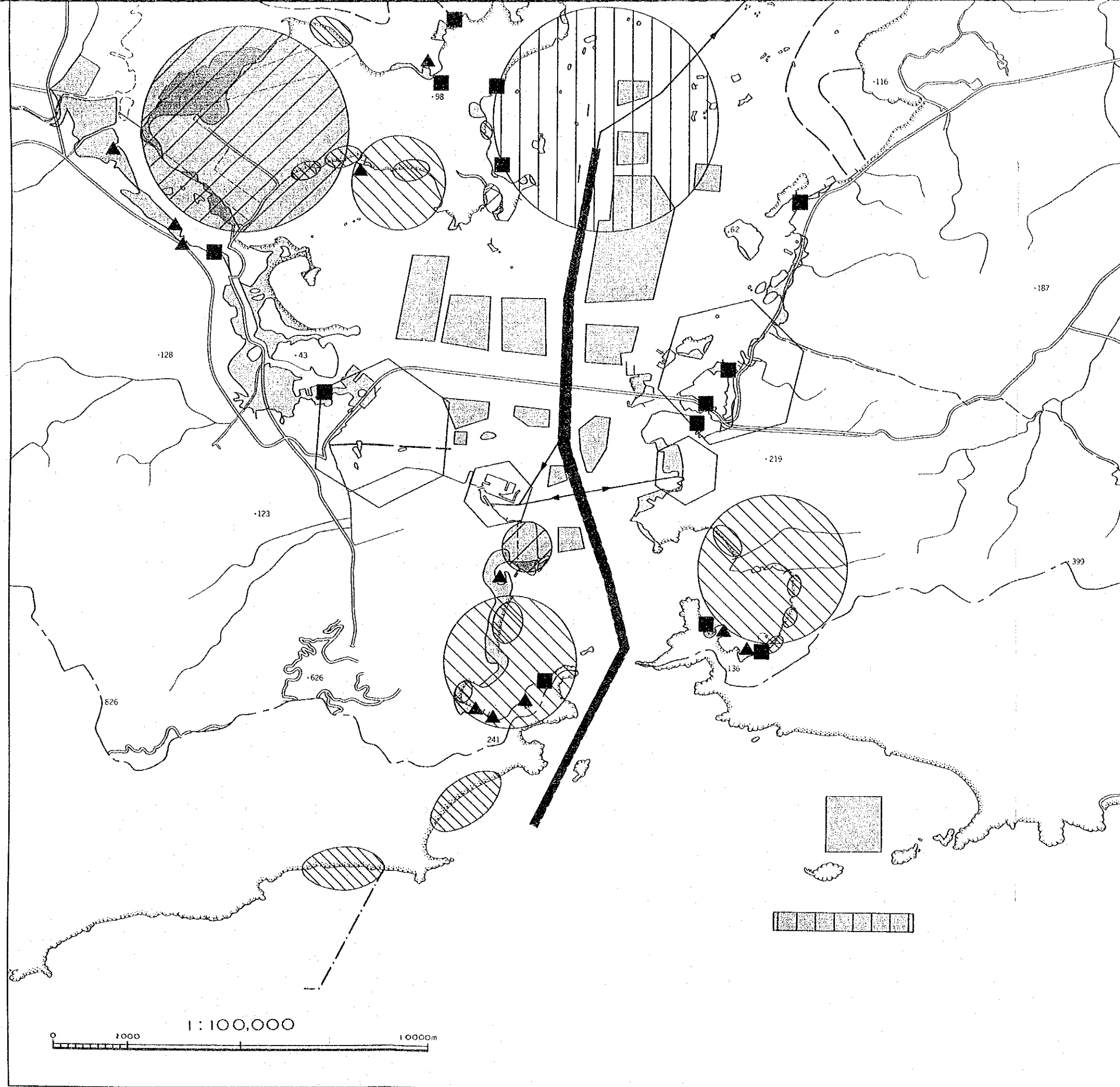
Bottom Materials and Benthic Organisms of the
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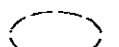




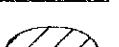

Bottom Materials and Benthic Organisms of the Bay

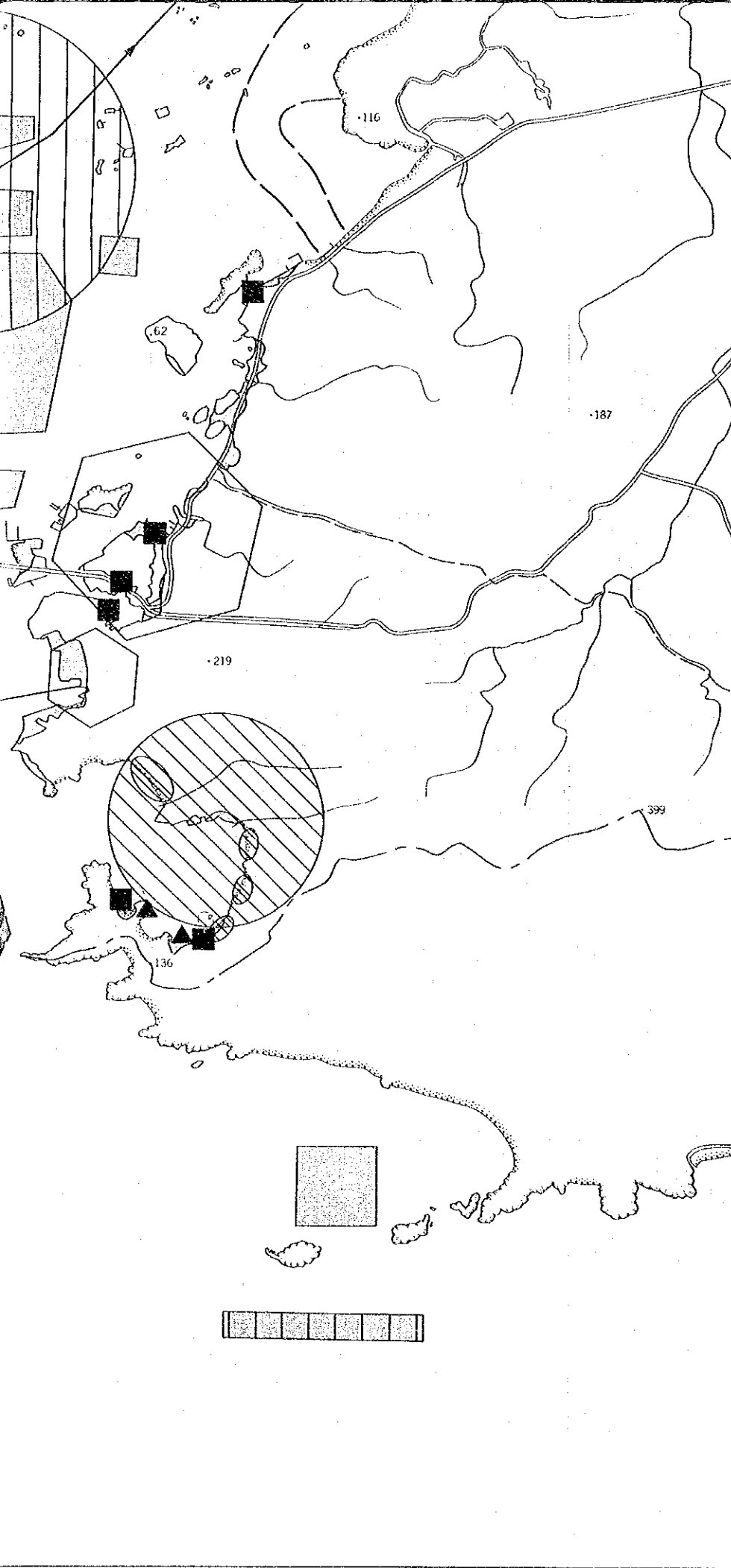
Materiais Bentônicos e Bentos da Baía





















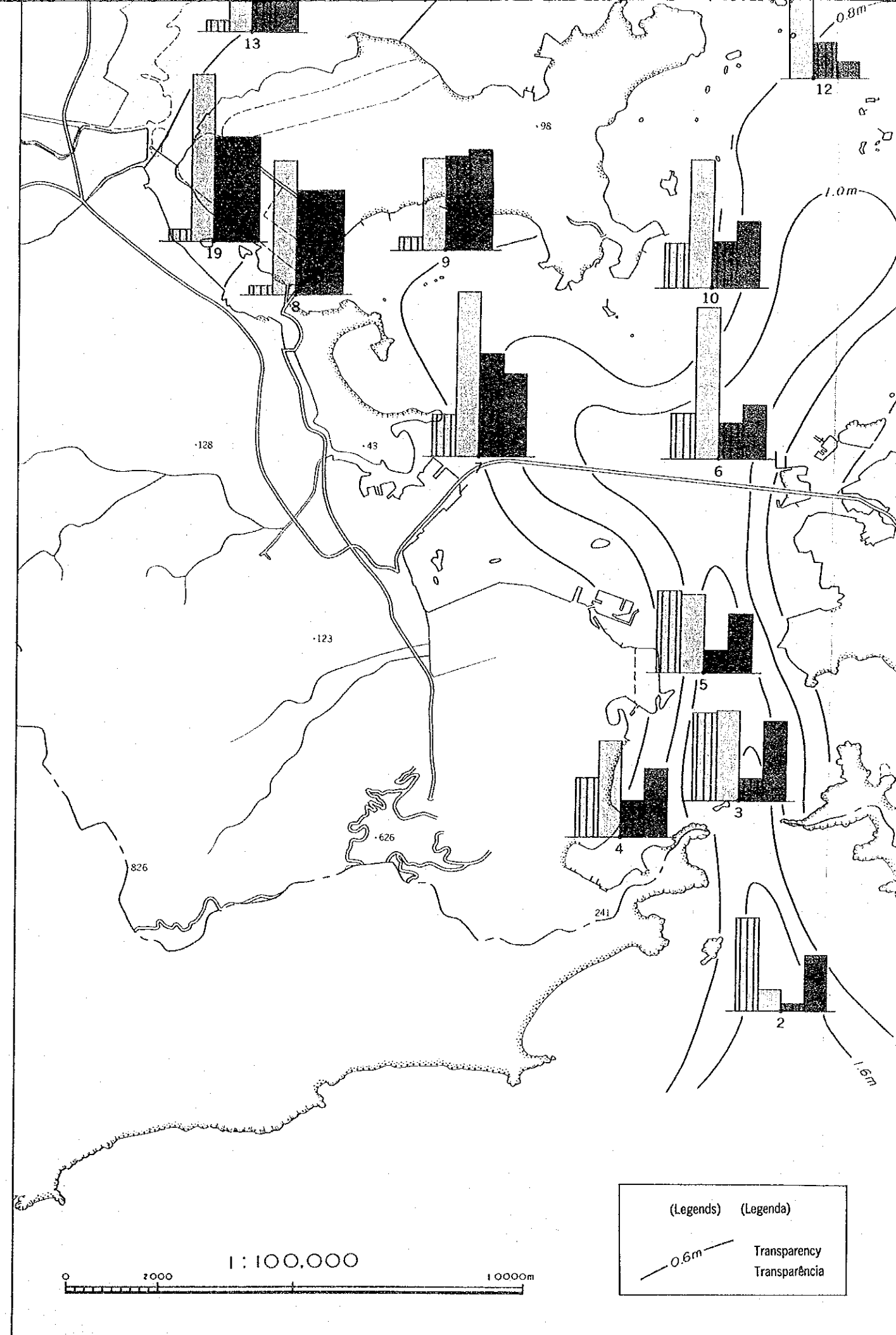
(Legends) (Legenda)

-  Airport Area
Área de Aeroporto
-  Port Facilities Area
Área do Porto Marítimo
-  Anchorage Area
Área de Ancoragem
-  Central Fairway
Canal Central
-  Ferryboat Route
Rota de Ferryboat
-  Fishing Port
Porto de Pesca
-  Yacht Harbor
Porto de Iate
-  Sea Bathing Beach
Praia de Banho
-  Marine Resort Area
Área de Lazer Marítimo
-  Distribution Area of Fishing Fence
Área de Distribuição de Pesca com
-  Oil Facilities Area
Instalação de Refinaria e Depósito
-  Gas Pipe Line
Gasoduto
-  Sewage Pipe Line
Rede Coletora de Esgoto
-  Sludge Disposal Site
Ponto de disposição
-  Mangrove Forest
Floresta de Manguezal
-  Area Reclaimed since 1962
Área Aterrada desde 1962

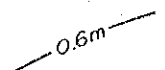


(Legends) (Legenda)

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Área de Aeroporto
-  Port Facilities Area
Área do Porto Marítimo
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Área de Ancoragem
-  Central Fairway
Canal Central
-  Ferryboat Route
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-  Distribution Area of Fishing Fence
Área de Distribuição de Pesca com Armadilhas
-  Oil Facilities Area
Instalação de Refinaria e Depósito de Petróleo
-  Gas Pipe Line
Gasoduto
-  Sewage Pipe Line
Rede Coletora de Esgoto
-  Sludge Disposal Site
Ponto de disposição
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-  Area Reclaimed since 1962
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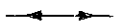








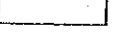


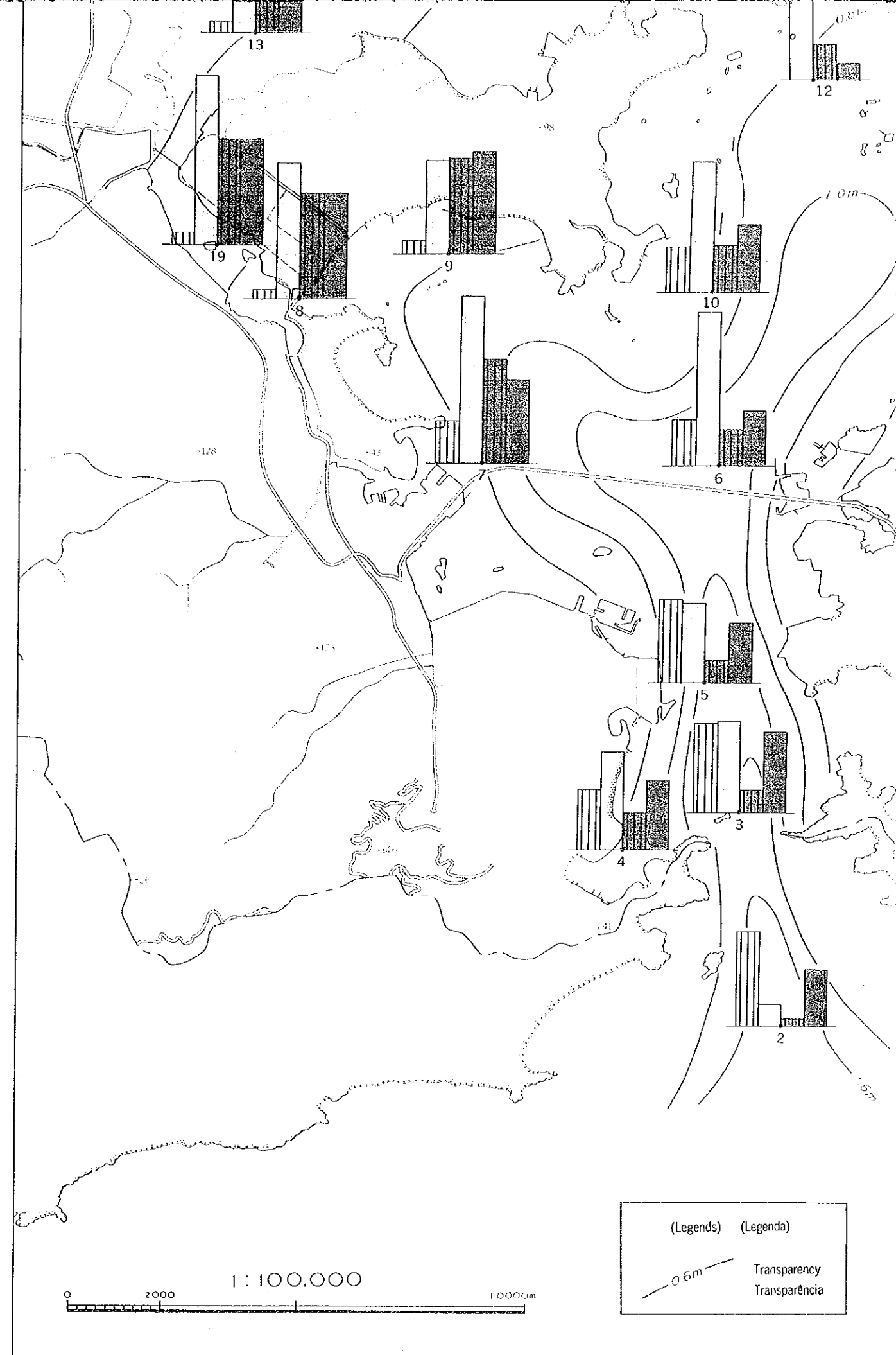
(Legends) (Legenda)

-  0.6m Transparency
Transparência

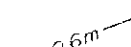


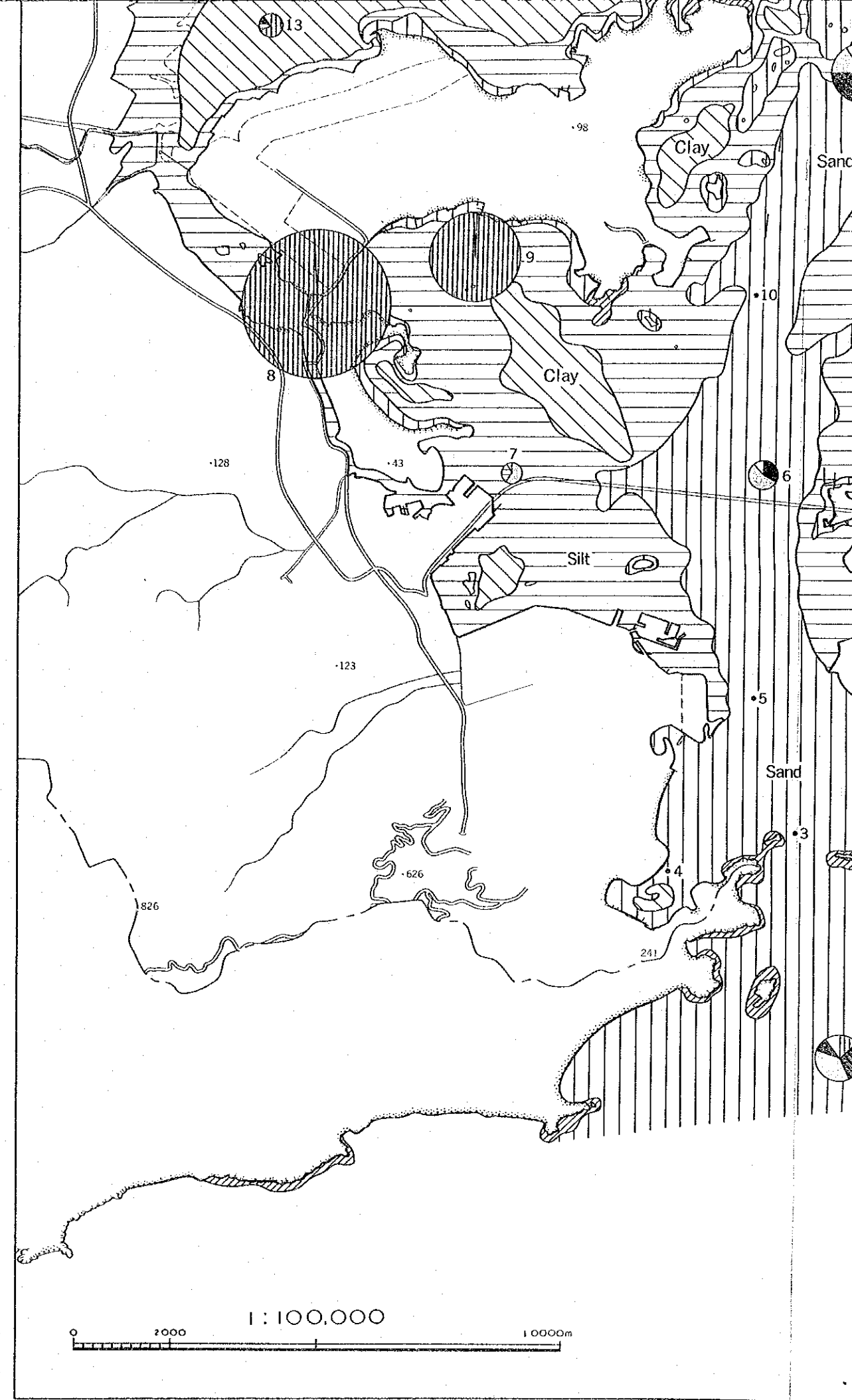
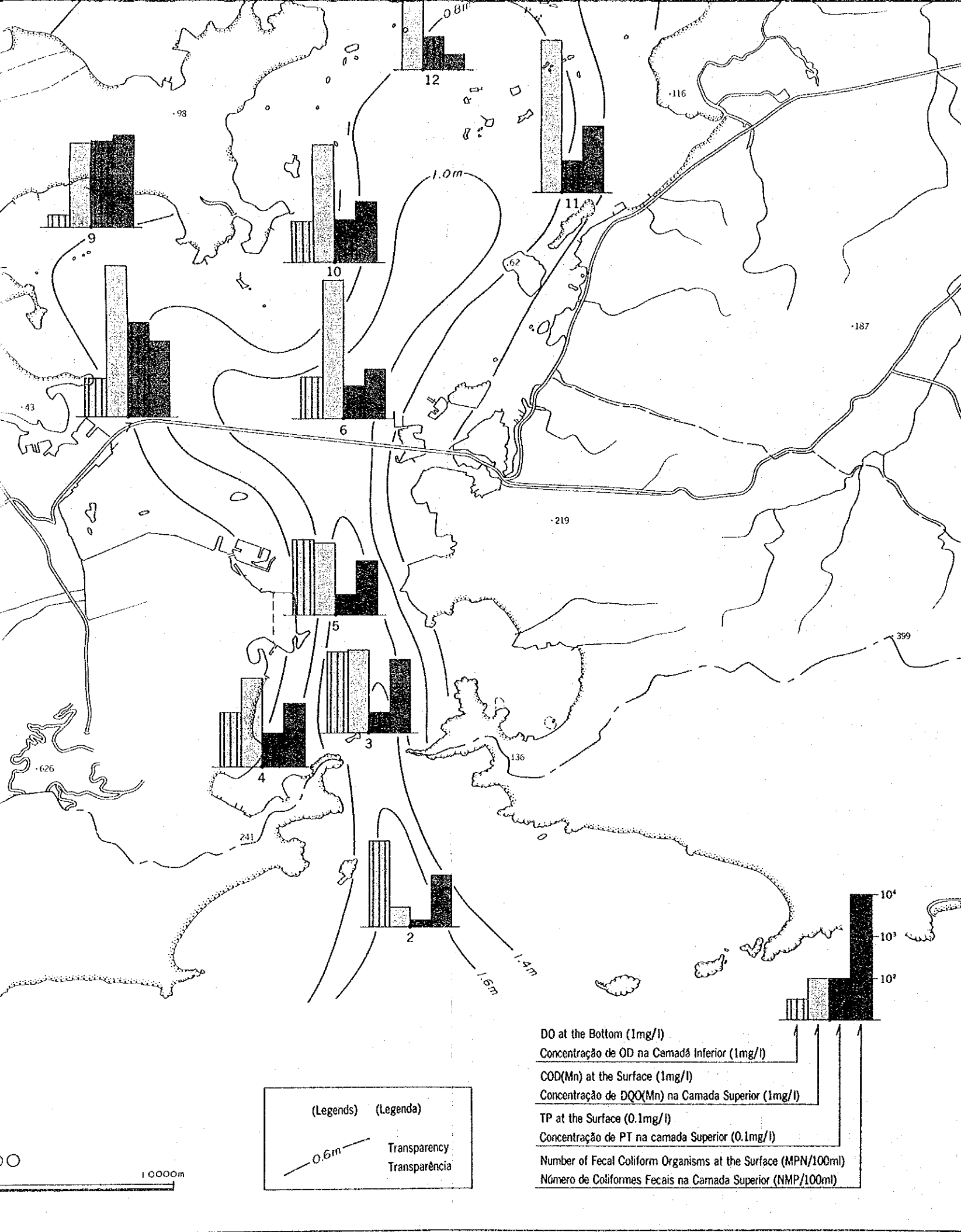
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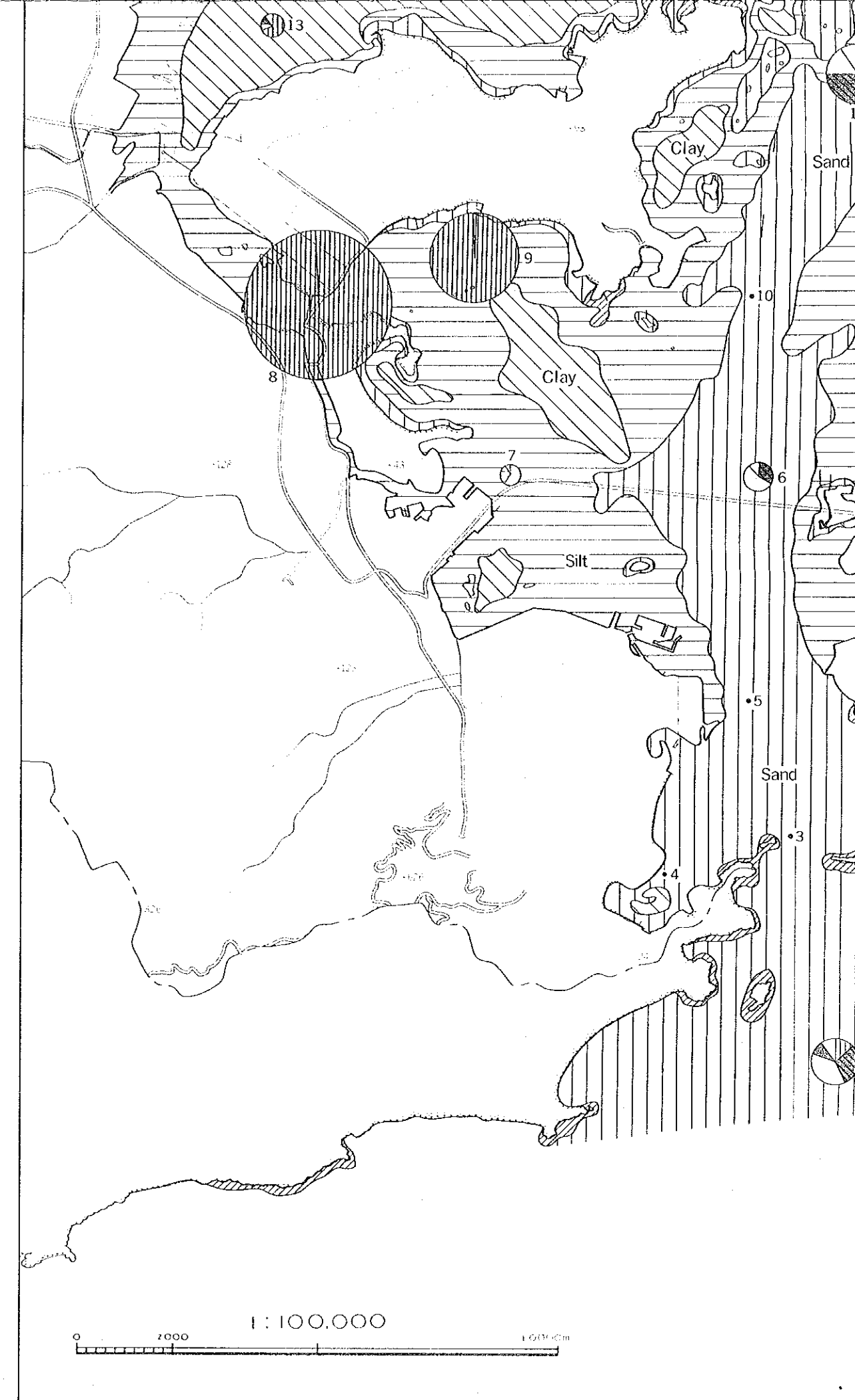
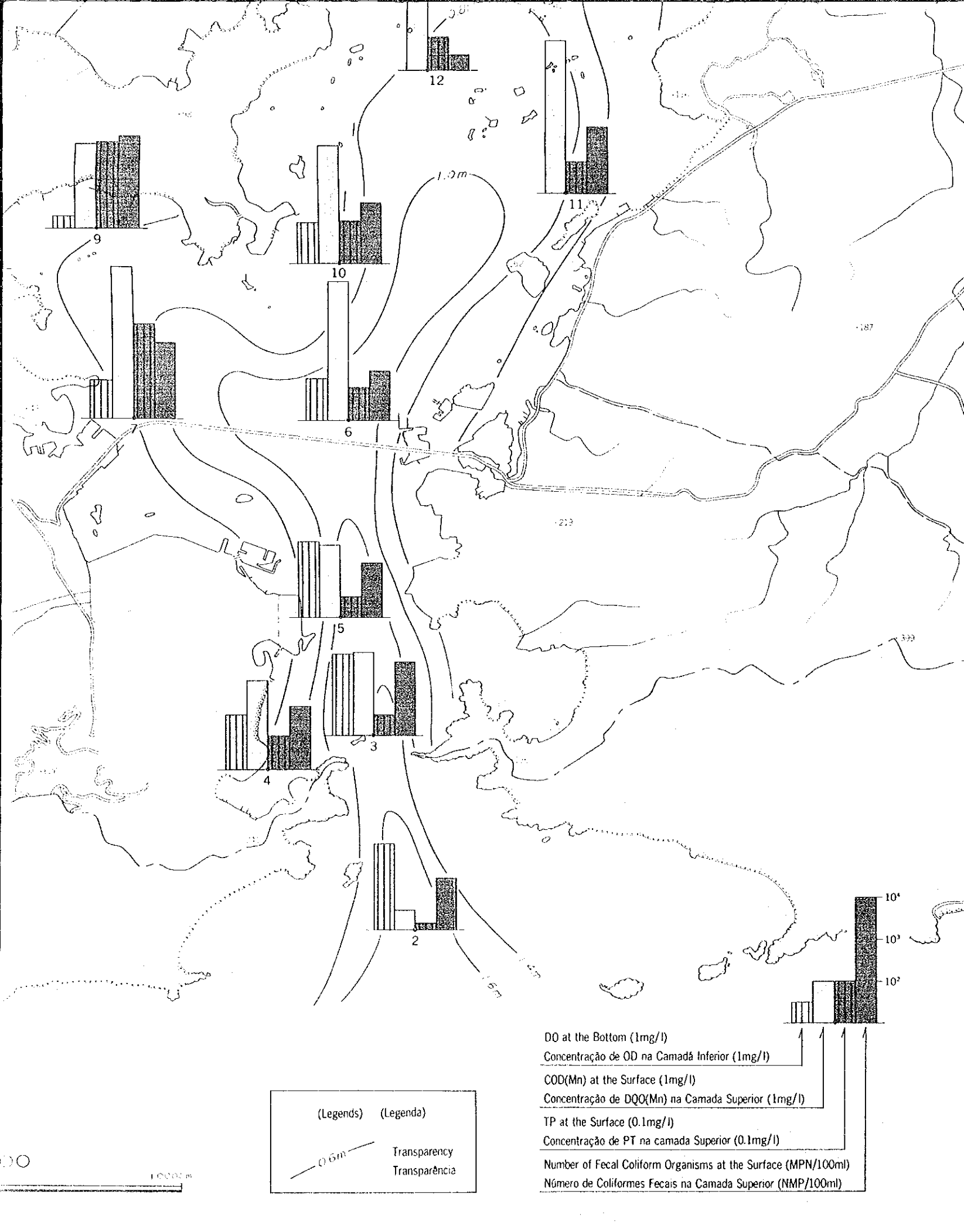
-  Airport Area
Área de Aeroporto
-  Port Facilities Area
Área do Porto Marítimo
-  Anchorage Area
Área de Ancoragem
-  Central Fairway
Canal Central
-  Ferryboat Route
Rota de Ferryboat
-  Fishing Port
Porto de Pesca
-  Yacht Harbor
Porto de Iate
-  Sea Bathing Beach
Praia de Banho
-  Marine Resort Area
Área de Lazer Marítimo
-  Distribution Area of Fishing Fence
Área de Distribuição de Pesca com Armadilhas
-  Oil Facilities Area
Instalação de Refinaria e Depósito de Petróleo
-  Gas Pipe Line
Gasoduto
-  Sewage Pipe Line
Rede Coletora de Esgoto
-  Sludge Disposal Site
Ponto de disposição
-  Mangrove Forest
Floresta de Manguezal
-  Area Reclaimed since 1962
Área Aterrada desde 1962

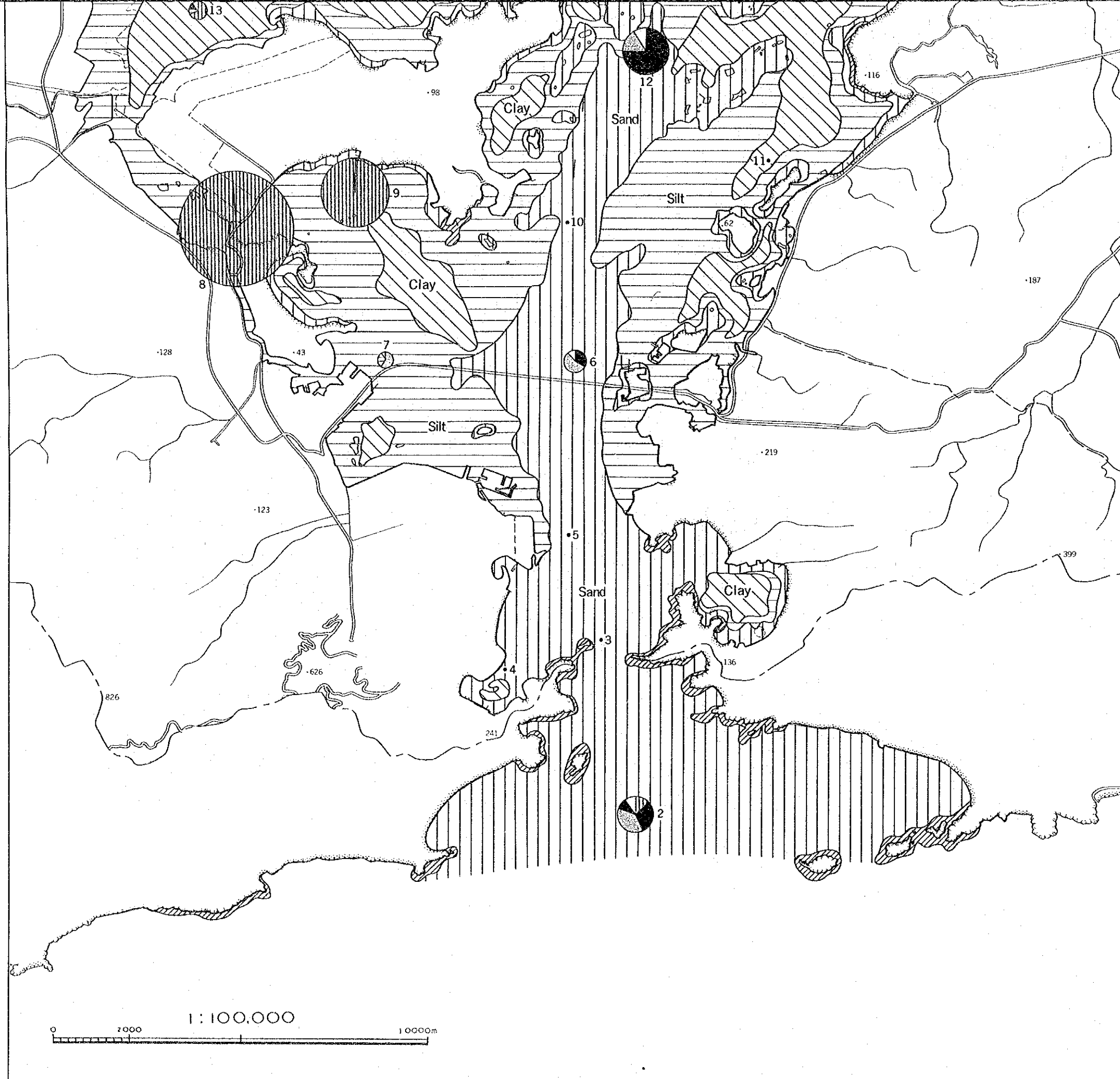


(Legends) (Legenda)

-  Transparency
Transparência


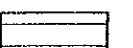
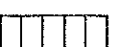





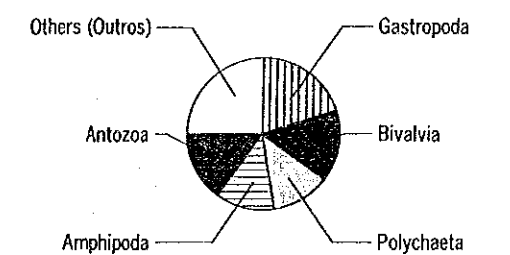


(Legends) (Legenda)

Classification of Bottom Materials
Classificação de Materiais Bentônicos

-  Clay
Argila
-  Silt
Lodo
-  Sand
Areia
-  Rock
Rocha

Numbers and Composition of Benthos
(Collected in October 1992)
Quantidade e Composição de Bentos
(Colletado em Outubro 1992)



Area of a circle is in proportion to the number of benthos
Dimensão do Circulo é Proporcional a Quantidade de Bentos

JICA