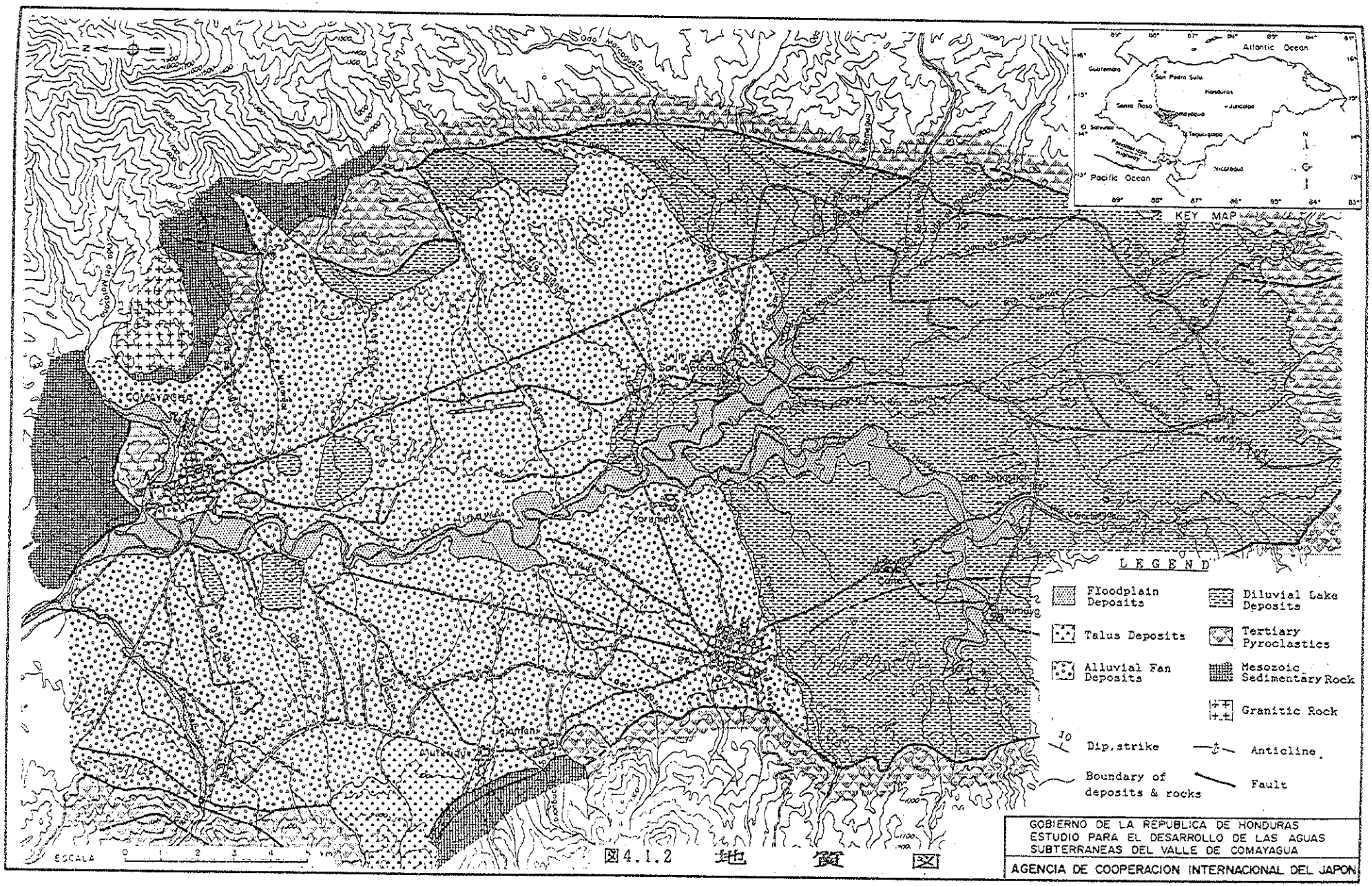

KEY MAP
Atlantic Ocean
Pacific Ocean
Guatemala
San Pedro Sula
Honduras
Santa Rosa
Comayagua
Juticalpa
El Salvador
Tegucigalpa
Nicaragua
Pan-American Highway
LEGEND
Floodplain Deposits
Diluvial Lake Deposits
Talus Deposits
Tertiary Pyroclastics
Alluvial Fan Deposits
Mesozoic Sedimentary Rock
Granitic Rock
Dip, strike
Anticline
Boundary of deposits & rocks
Fault
COMAYAGUA
ESCALA
GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

図4.1.2 地質図

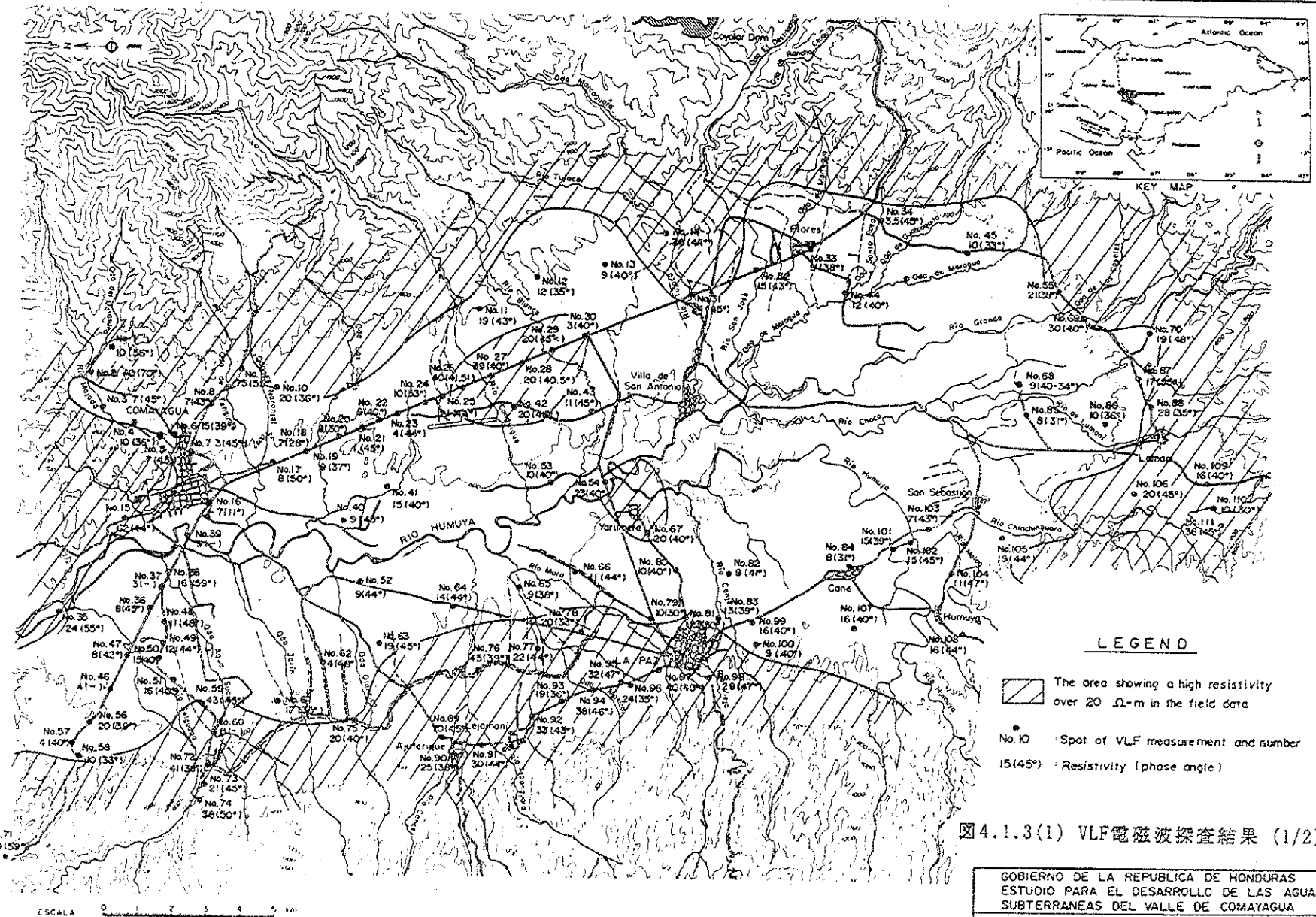


図4.1.3(1) VLF電磁波探査結果 (1/2)

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

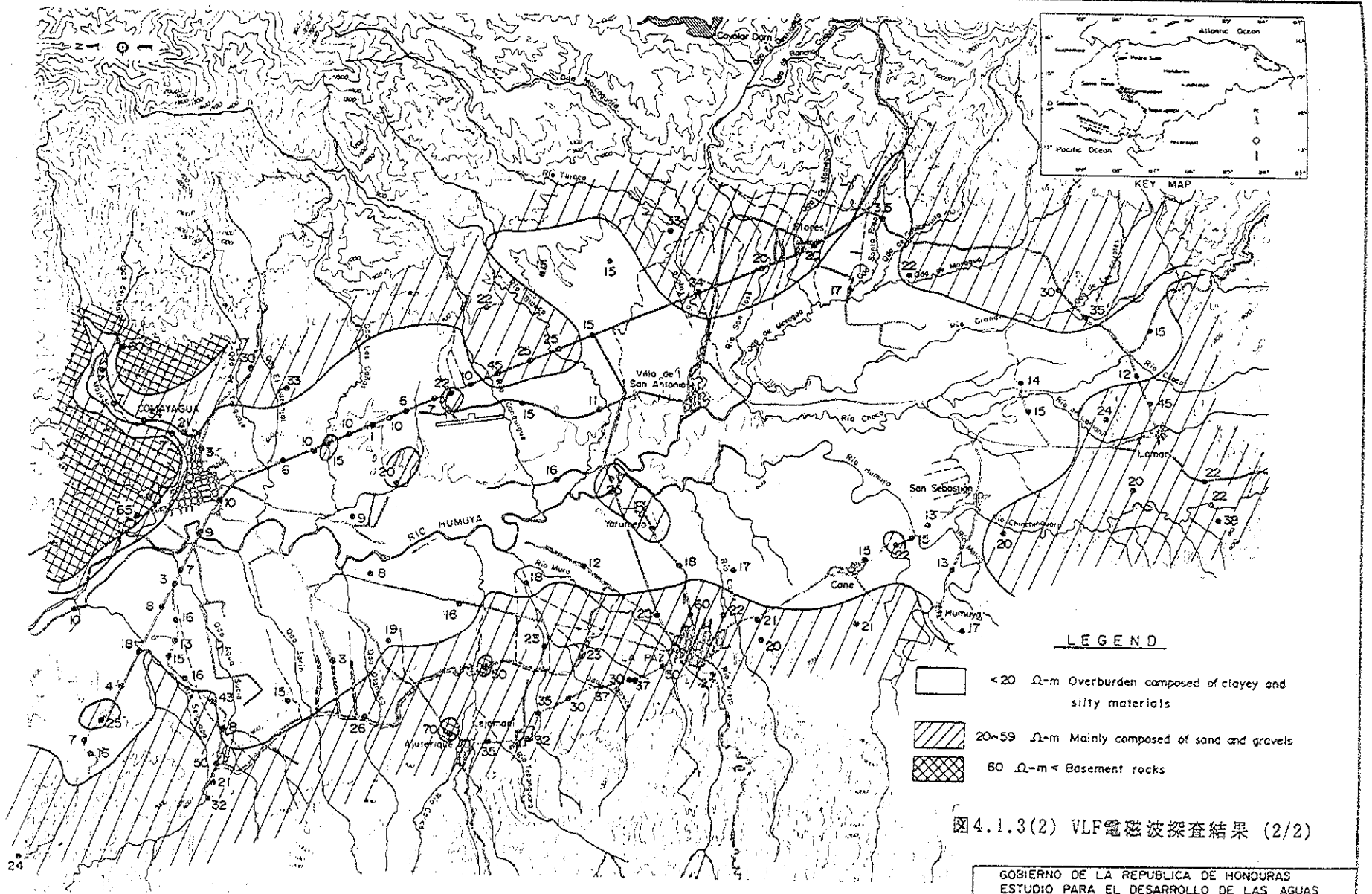


図4.1.3(2) VLF電磁波探査結果 (2/2)

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

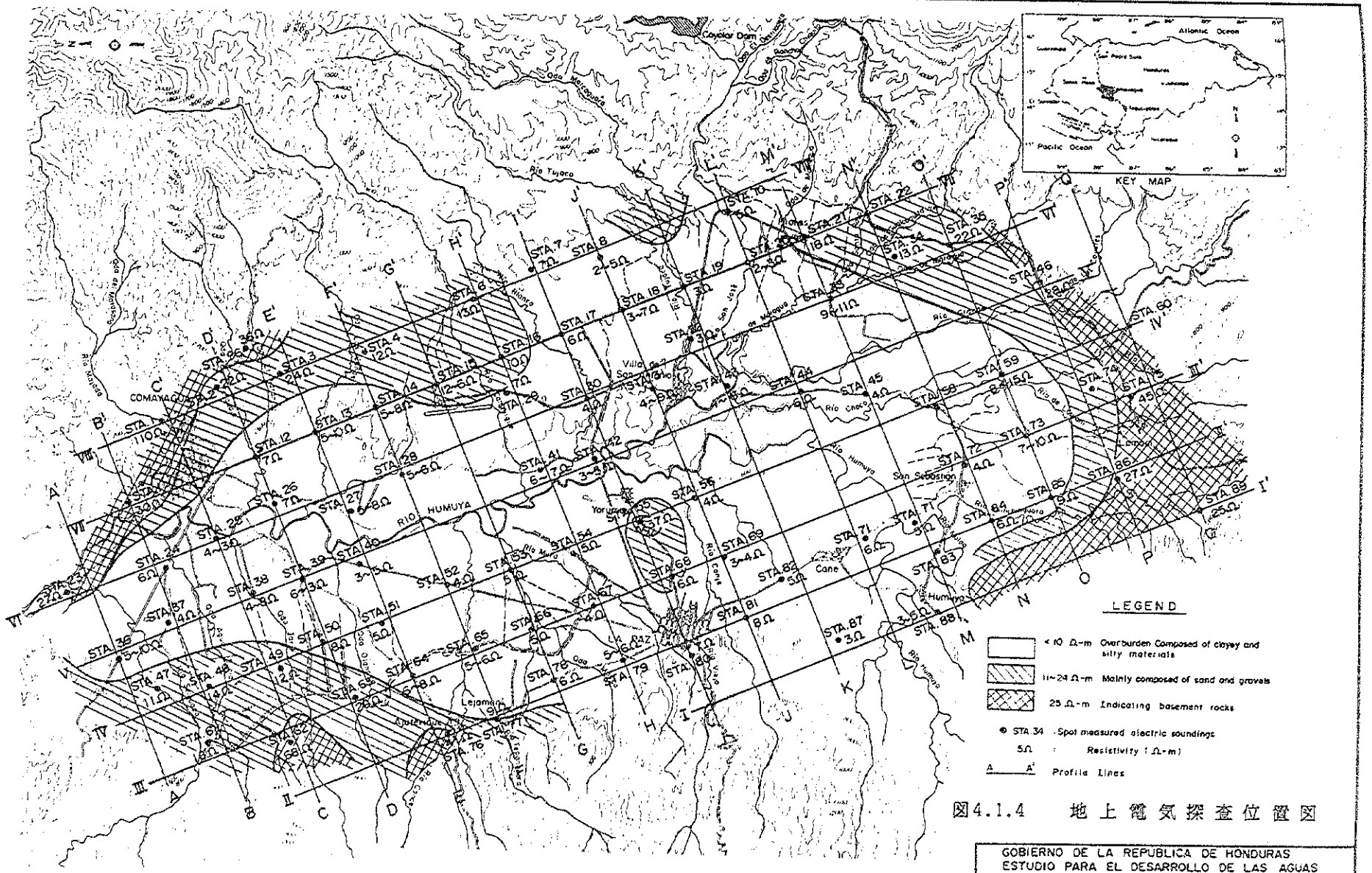
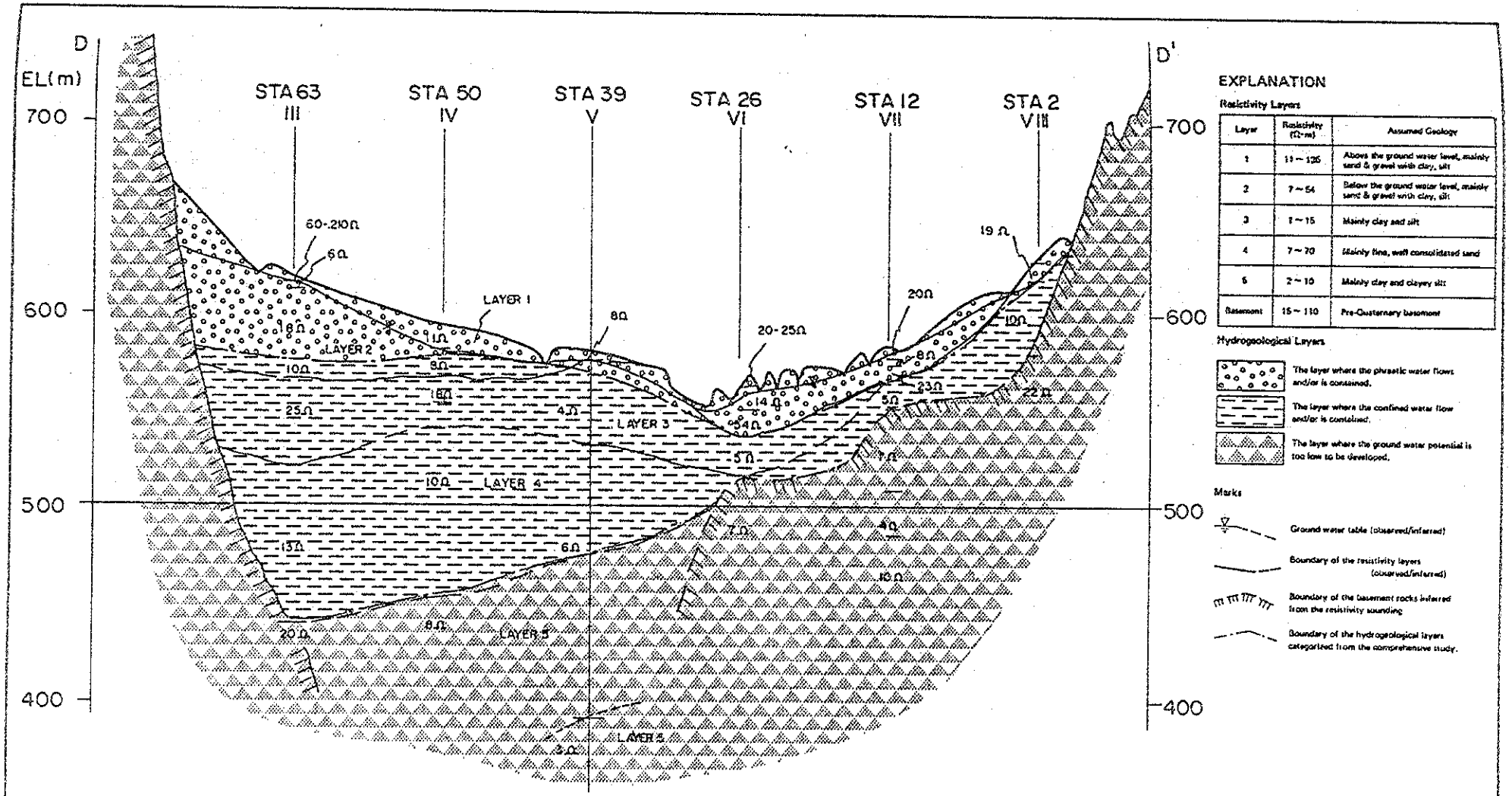


図4.1.4　地上電気探査位置図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON



Layer	Resistivity (Ω-m)	Assumed Geology
1	11 ~ 126	Above the ground water level, mainly sand & gravel with clay, silt
2	7 ~ 54	Below the ground water level, mainly sand & gravel with clay, silt
3	1 ~ 15	Mainly clay and silt
4	7 ~ 70	Mainly fine, well consolidated sand
5	2 ~ 10	Mainly clay and clayey silt
Basement	15 ~ 110	Pre-Quaternary basement

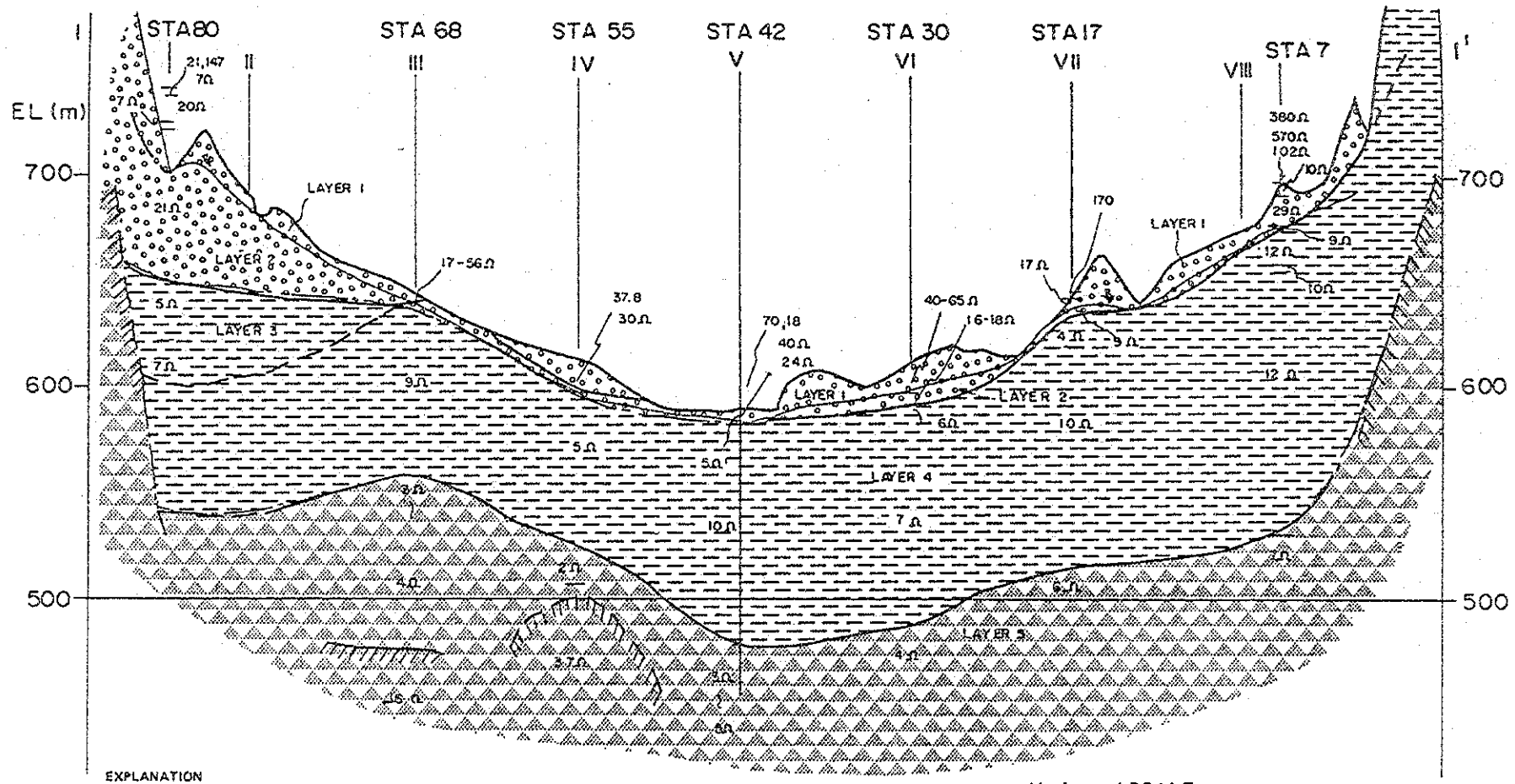
図4.1.5(1) 地 質 断 面 図 (1/4)

Horizontal SCALE

0 5 km

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON



EXPLANATION

Resistivity Layers

Layer	Resistivity (Ω·m)	Assumed Geology
1	11 ~ 126	Above the ground water level, mainly sand & gravel with clay, silt
2	7 ~ 66	Below the ground water level, mainly sand & gravel with clay, silt
3	1 ~ 16	Mainly clay and silt
4	2 ~ 70	Mainly fine, well consolidated sand
5	3 ~ 18	Mainly clay and clayey silt
Basement	15 ~ 110	Pre Quaternary basement

Hydrogeological Layers

The layer where the phreatic water flows and/or is contained.

The layer where the confined water flow and/or is contained.

The layer where the ground water potential is low to be developed.

Marks

Ground water table (observed/inferred)

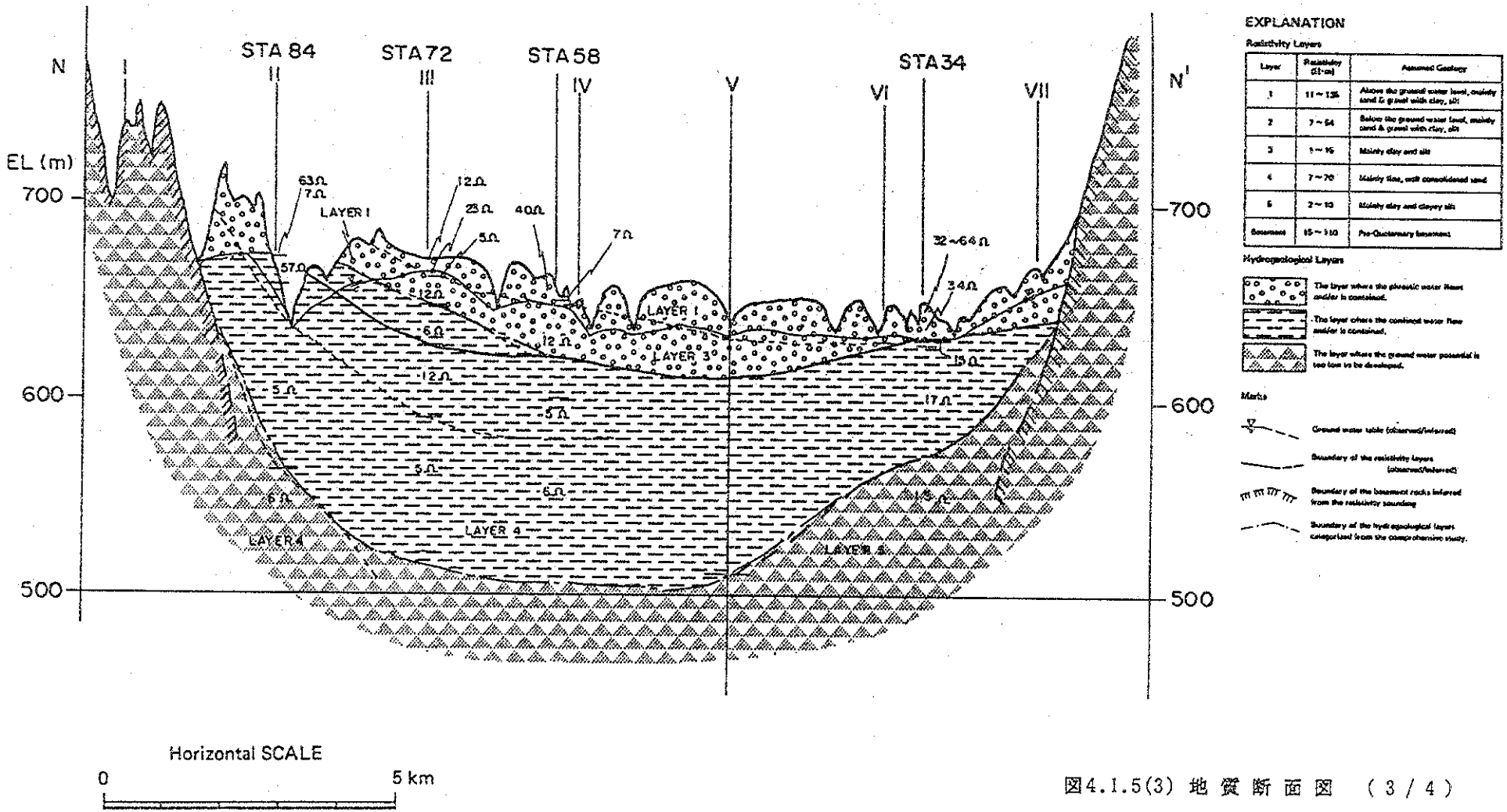
Boundary of the resistivity layers (observed/inferred)

Boundary of the basement rocks inferred from the resistivity sounding

Boundary of the hydrogeological layers categorised from the comprehensive study.

図4.1.5(2) 地質断面図 (2/4)

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON



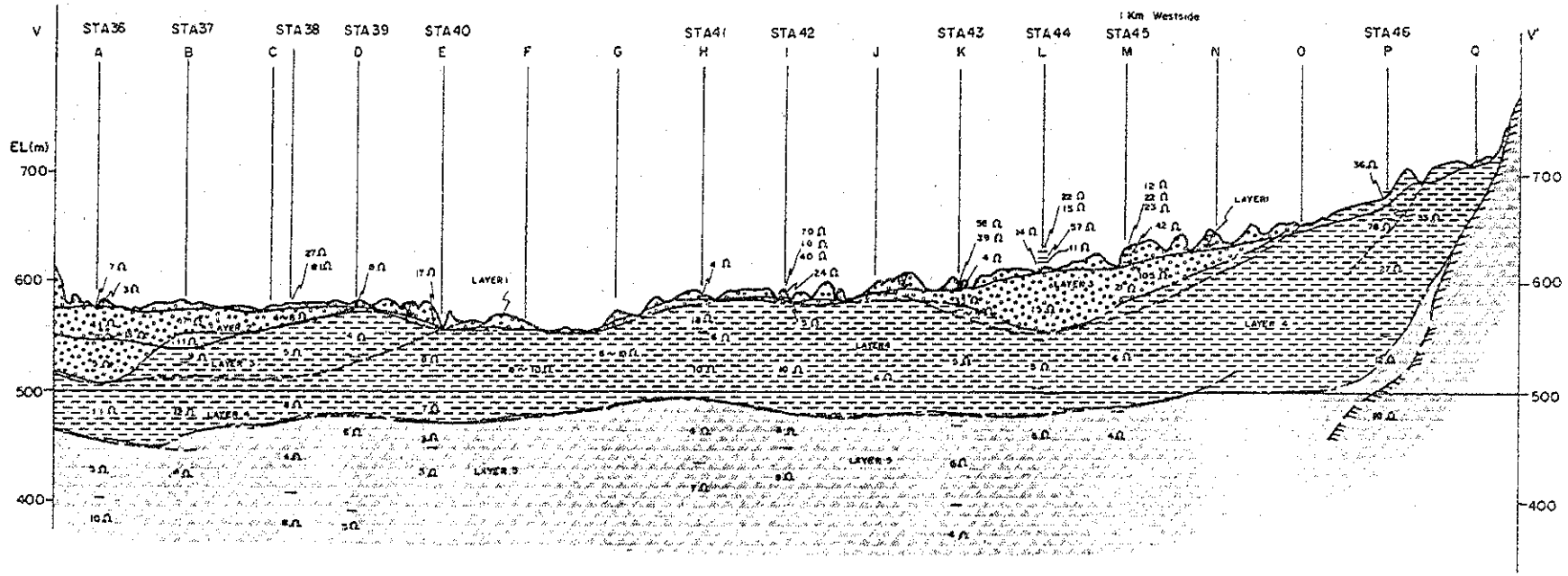
Horizontal SCALE

0 5 km

図4.1.5(3) 地 質 断 面 図 (3 / 4)

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON



Horizontal SCALE

0 5 km

EXPLANATION

Resistivity Layers

Layer	Resistivity (Ω·m)	Assumed Geology
1	11 ~ 135	Above the ground water level, mainly sand & gravel with clay, silt
2	7 ~ 54	Below the ground water level, mainly sand & gravel with clay, silt
3	1 ~ 15	Mainly clay and silt
4	7 ~ 70	Mainly fine, well consolidated sand
5	2 ~ 10	Mostly clay and clayey silt
Basement	15 ~ 110	Pre-Quaternary basement

Hydrogeological Layers

- The layer where the phreatic water flows and/or is contained.
- The layer where the confined water flow and/or is contained.
- The layer where the ground water potential is too low to be developed.

Marks

- Ground water table (observed/inferred)
- Boundary of the resistivity layers (observed/inferred)
- Boundary of the basements rocks inferred from the resistivity sounding
- Boundary of the hydrogeological layers categorized from the comprehensive study.

図4.1.5(4) 地 質 断 面 図 (4 / 4)

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

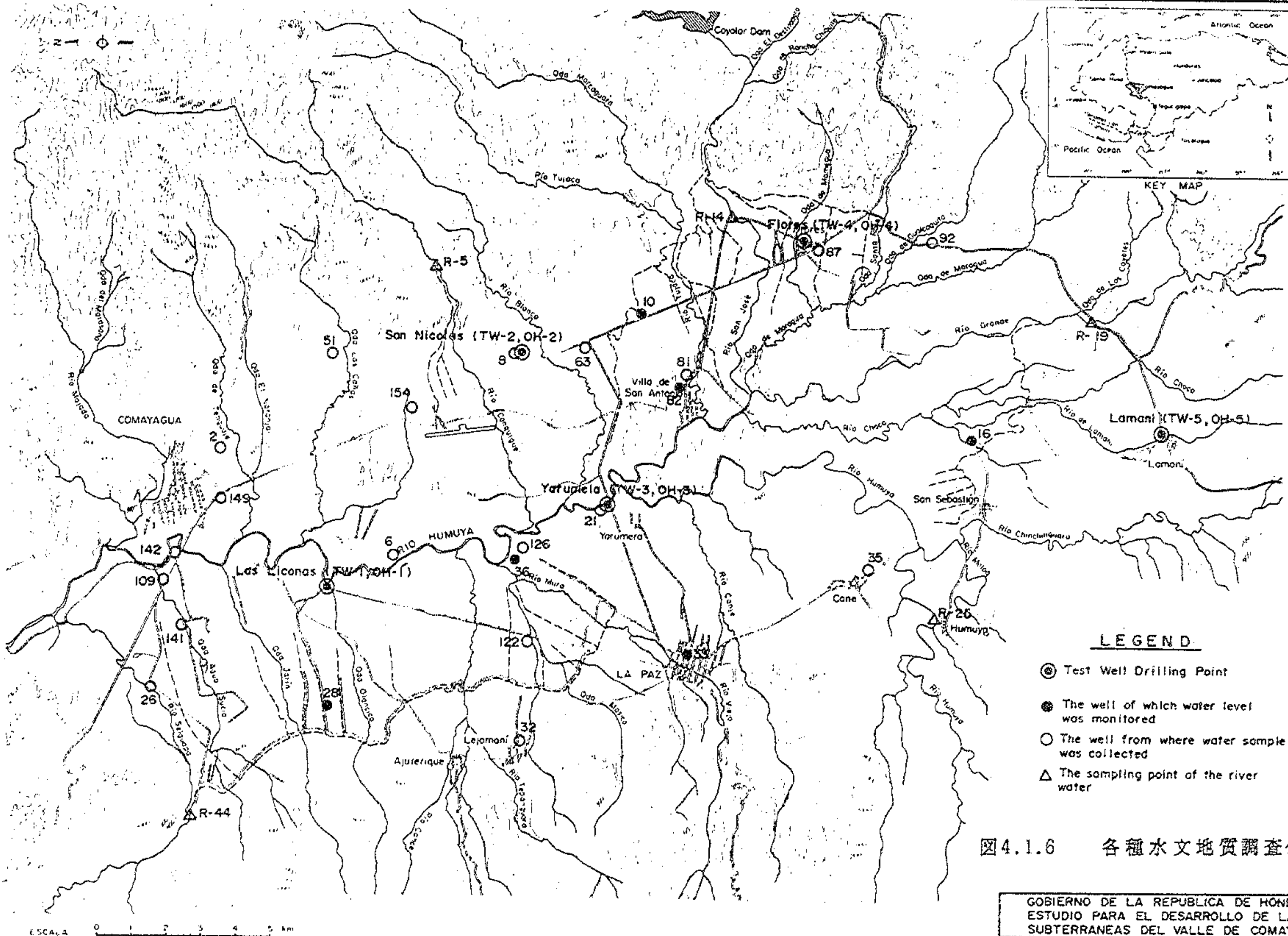


図4.1.6　各種水文地質調査位置図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

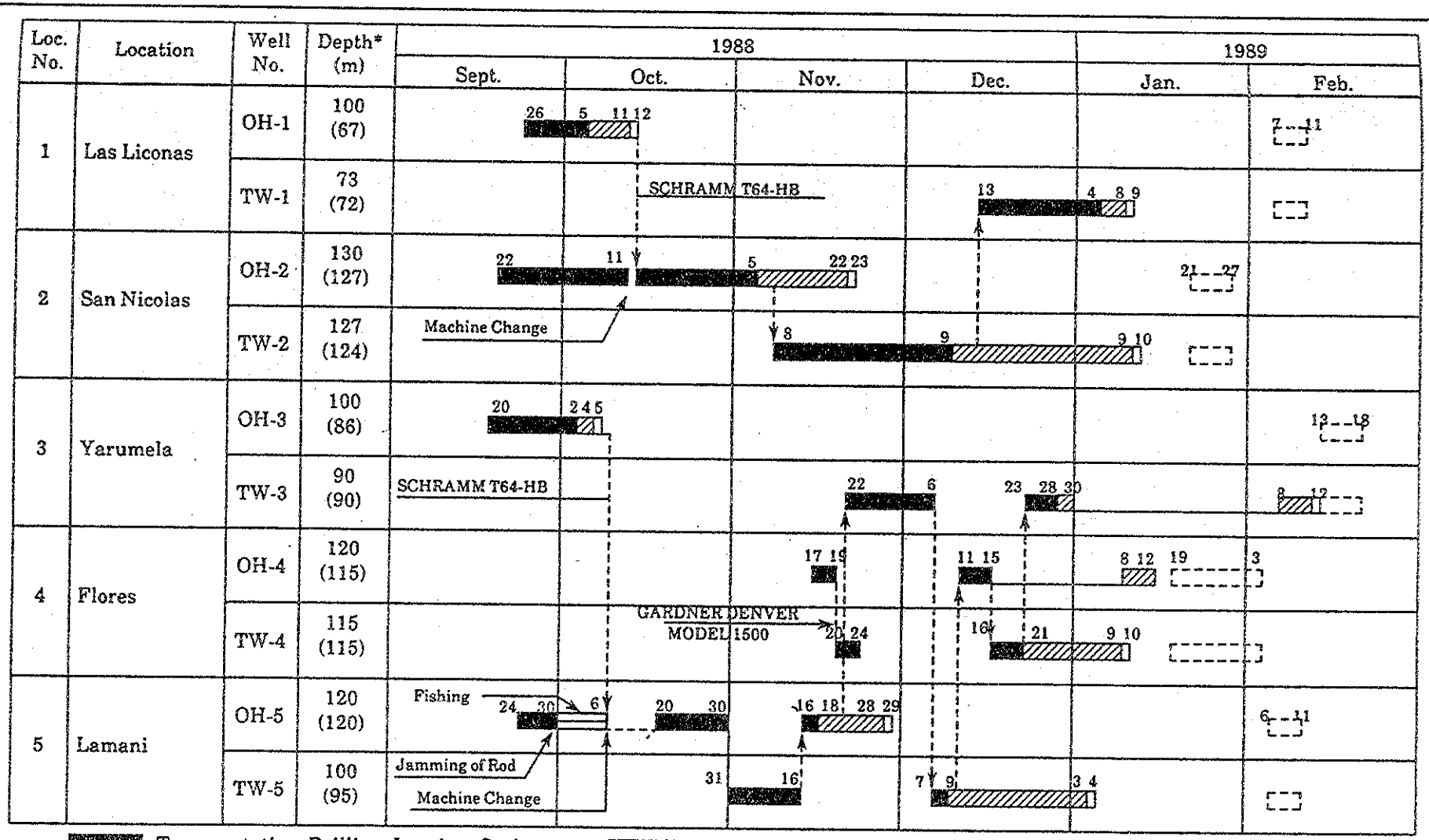
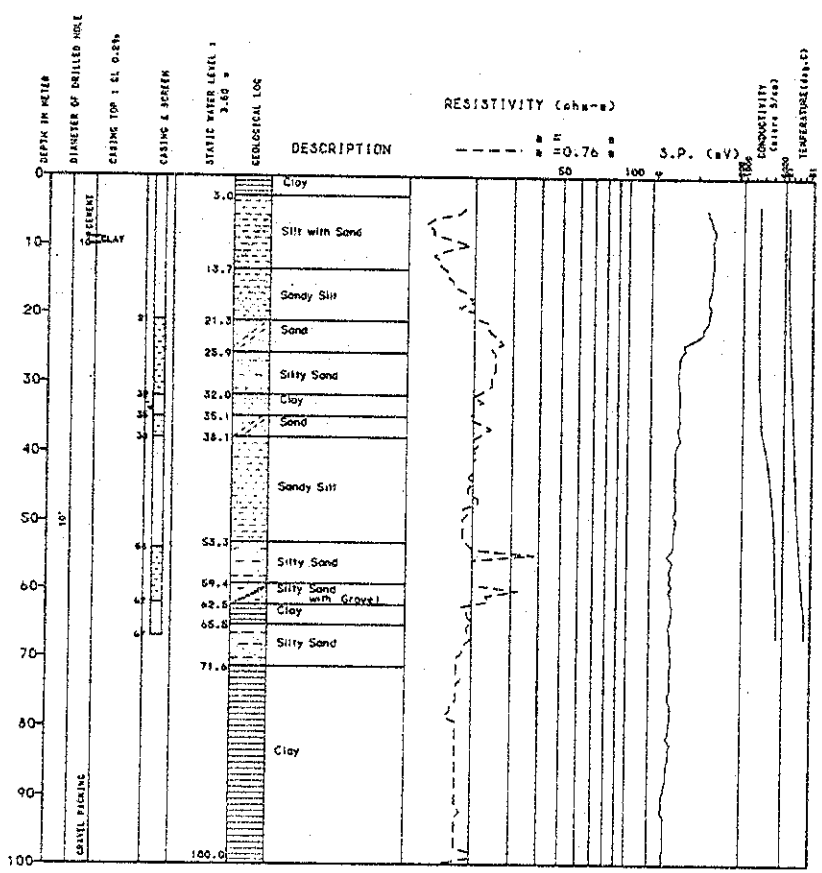
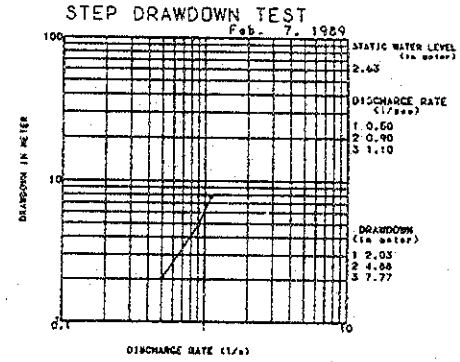
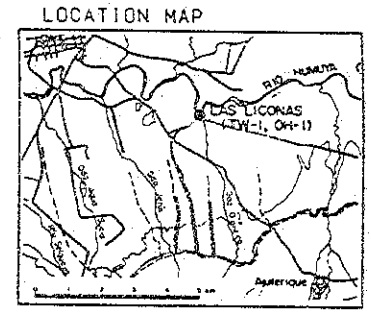


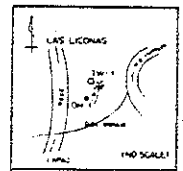
図4.1.7　さく井工事工程図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON



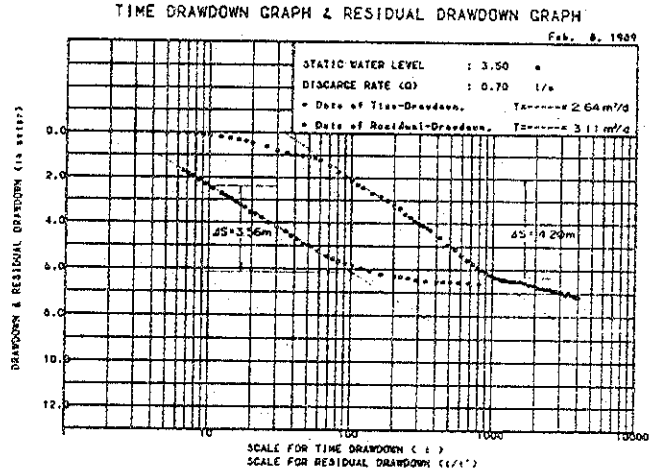






COORDINATION :
X : 428.50
Y : 1593.64

ELEVATION :
560.00 m



WATER QUALITY

IN-SITU TEST	
Temp.(deg.C) :	
EC.(micro S/cm):	
pH:	Eh:
LABORATORY TEST	
T.D.S	
Hardness	
CaCO3	
Ca	Mg
Na	K
Cl	SO4
HCO3	CO3
Fe	Mn

(CONCENTRATIONS ARE EXPRESSED IN mg/l)

LEGEND

Gravel, Sand, Silt, Clay, Silty Sand, Sandy Silt, Sandy Clay, with Gravel, with Sand, with Silt, with Clay

DRILLING STARTED ON Sep. 26, 1988
COMPLETED ON Oct. 12, 1988
DRILLING MACHINE SCHRAMM T64-HB

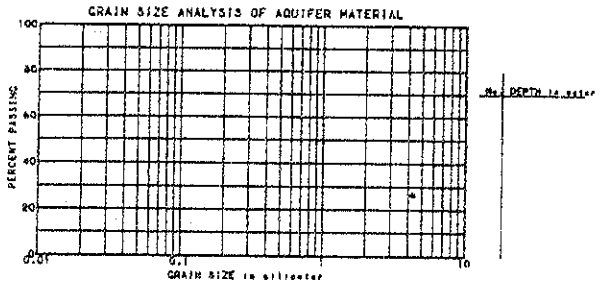
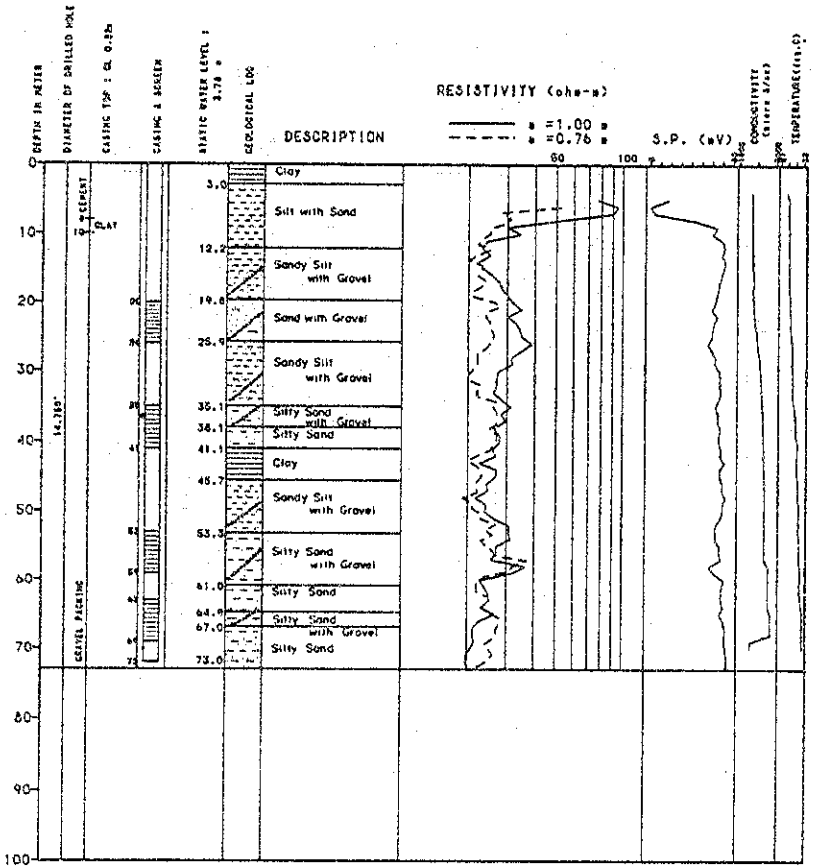
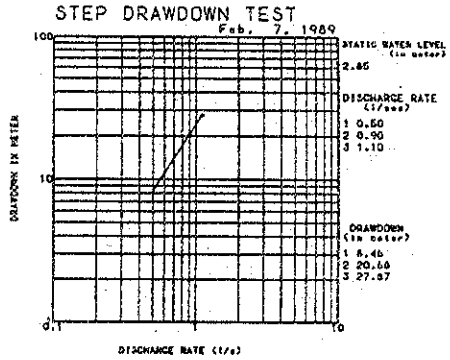
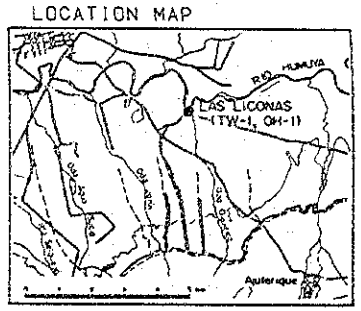


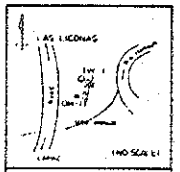
図4.1.8(1) 総合柱状図 (1/10) －ラスリコナス OH-01－

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON



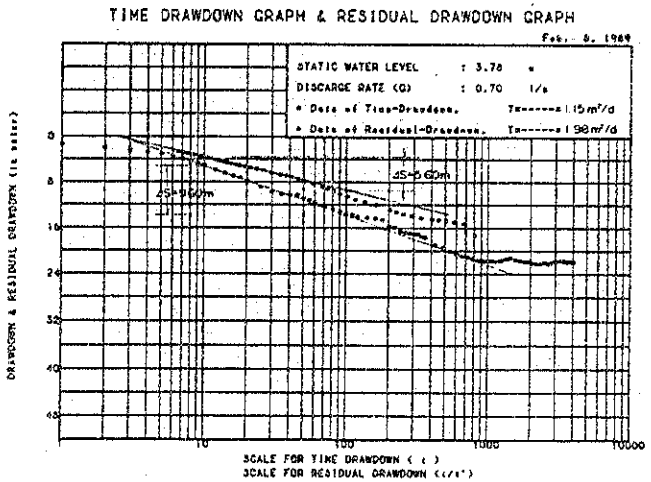






COORDINATION :
X : 426.68
Y : 1593.64

ELEVATION :
660.00 m



WATER QUALITY

IN-SITU TEST	
Temp.(deg.C)	30.5
EC.(micro S/cm)	1900
pH	
Eh	

LABORATORY TEST			
T.D.S			
Hardness			
CaCO3			
Ca	80.0	Mg	16.0
Na	290.0	K	65.0
Cl	89.0	SO4	42.0
HCO3		CO3	
Fe	15.0	Mn	0.0

(CONCENTRATIONS ARE EXPRESSED IN mg/l)

LEGEND

Gravel, Sand, Silt, Clay, Silty Sand, Sandy Silt, Sandy Clay, with Gravel, with Sand, with Silt, with Clay

DRILLING STARTED ON Dec. 13, 1986

COMPLETED ON Jan. 9, 1989

DRILLING MACHINE SCHRAMM T64-KB

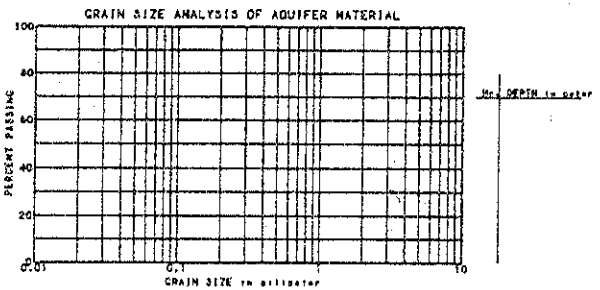
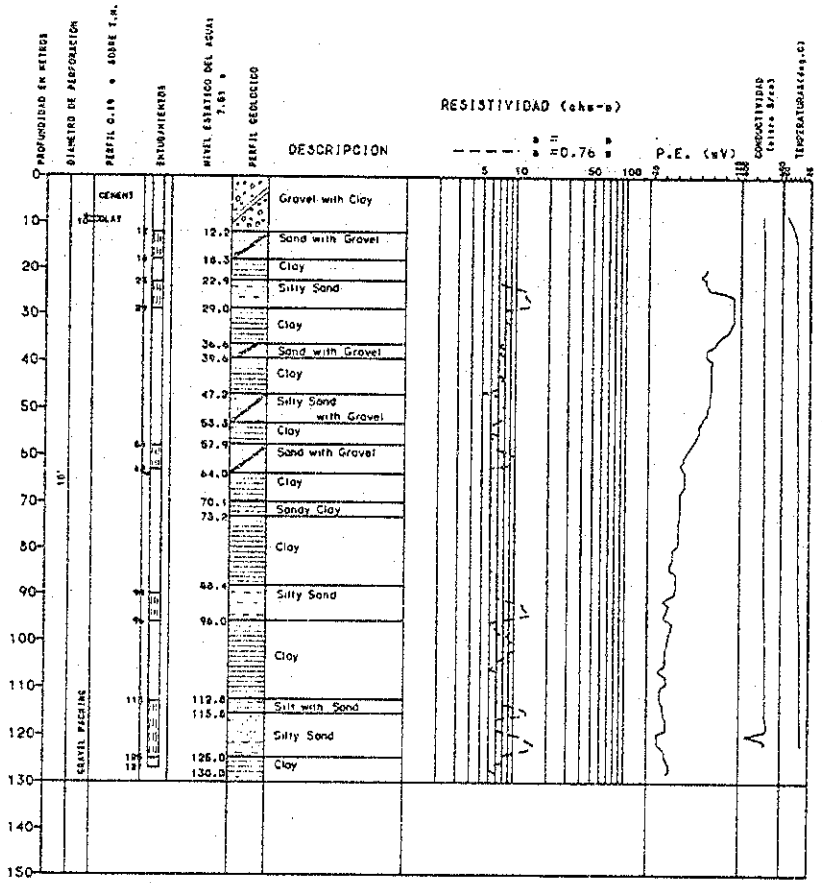
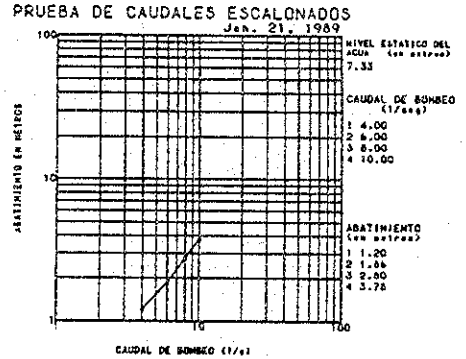


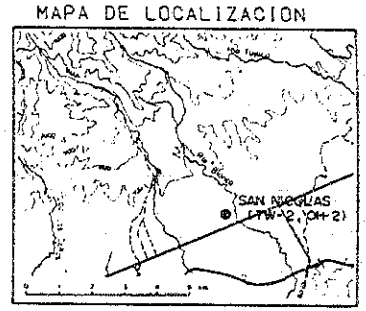
図4.1.8(2) 総合柱状図 (2/10) －ラスリコナス TW-01－

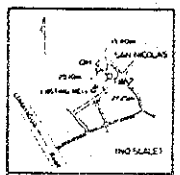
GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

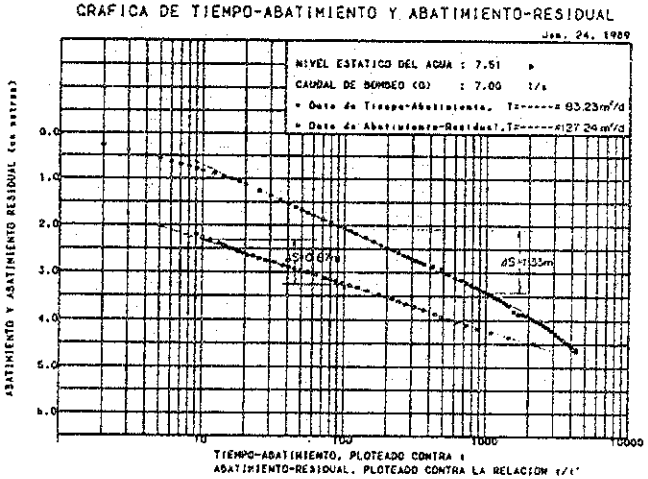








COORDENADAS :
X : 435.59
Y : 1588.16
ELEVACION :
660.00 m

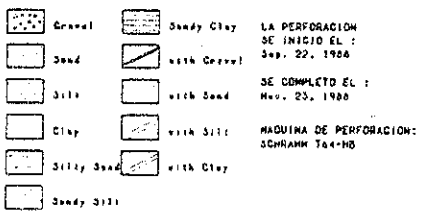


CALIDAD DEL AGUA

ANALISIS EN EL CAMPO	
Temp.(deg.C) :	
EC.(micro S/cm):	
pH:	RpH:
ANALISIS EN LABORATORIO	
T.A.D	
Dureza	
CaCO3	
Ca	Mg
Na	K
Cl	SO4
HCO3	CO3
Fe	Mn

(LAS CONSTITUENTES ESTAN EXPRESADAS EN mg/l.)

LEYENDA



LA PERFORACION SE INICIO EL : Sep. 22, 1988

SE COMPLETO EL : Nov. 23, 1988

MAQUINA DE PERFORACION: SCHRAMM T64-HB

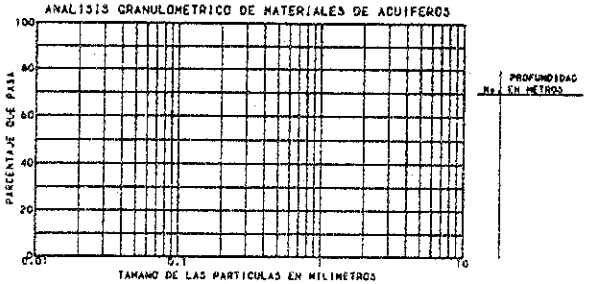
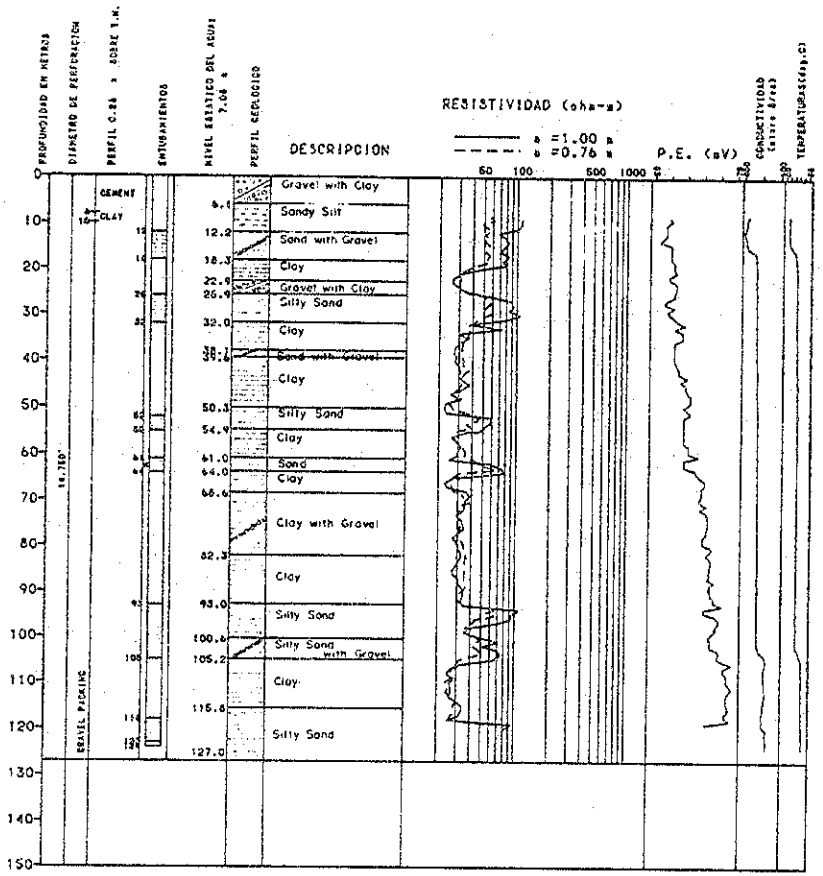
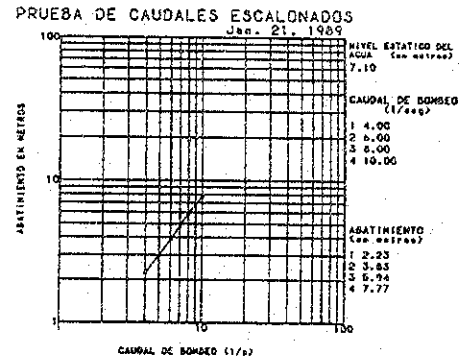


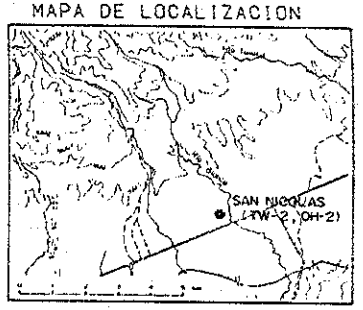
図4.1.8(3) 総合柱状図 (3/10) —サンニコラス OH-02—

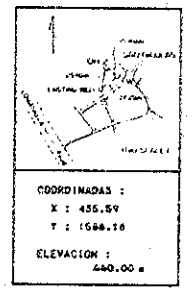
GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

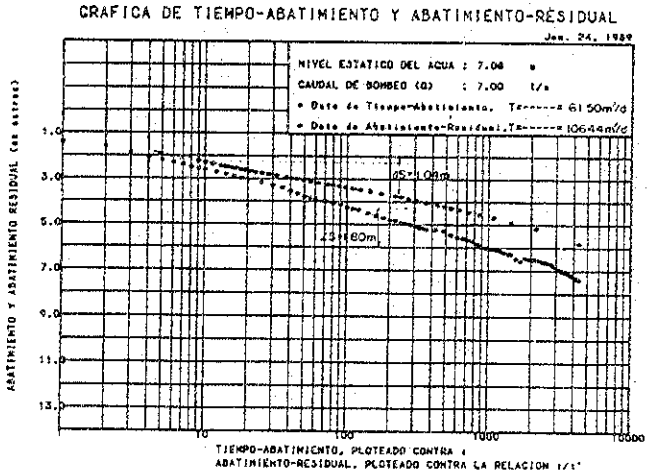
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON







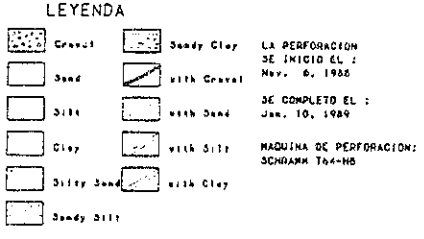




CALIDAD DEL AGUA

ANALISIS EN EL CAMPO			
Temp.(deg.C) : 30.0			
EC.(micro S/cm): 400			
pH:7.80	RpH:		
ANALISIS EN LABORATORIO			
T.S.D			
Dureza			
CaCO3	170.0		
Ca	59.3	Mg	6.1
Na	13.0	K	3.6
Cl	3.3	SO4	20.0
HCO3		CO3	
Fe		Km	

(LAS CONSTITUENTES ESTAN EXPRESADAS EN mg/l.)



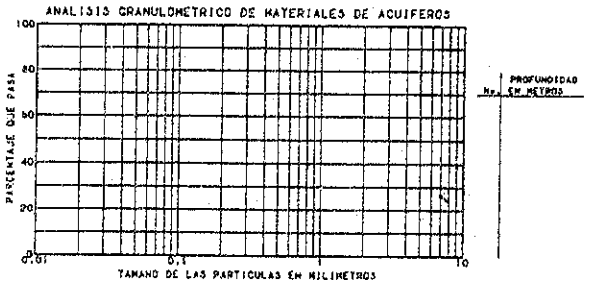
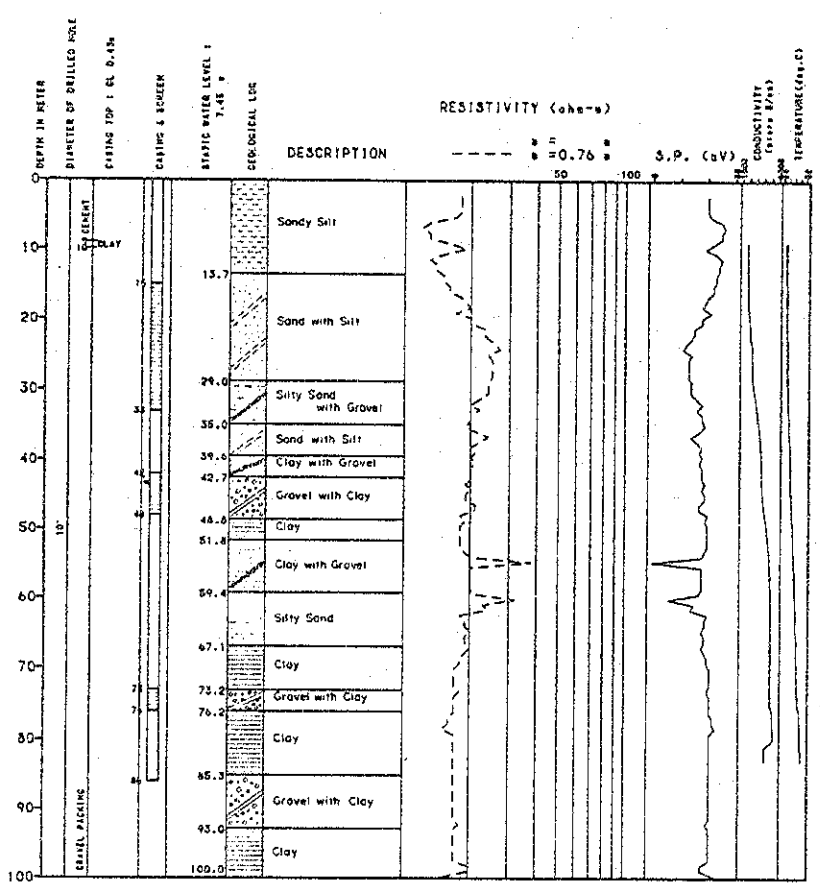
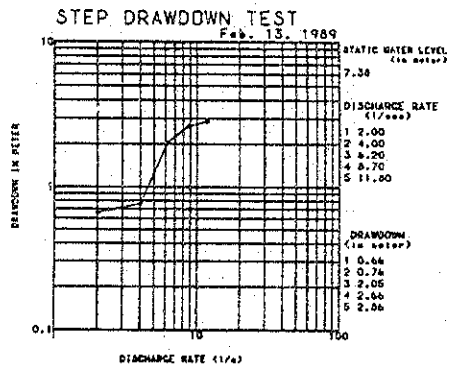
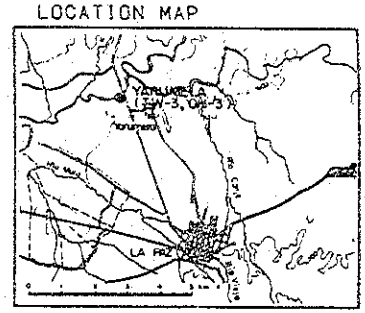


図4.1.8(4) 総合柱状図 (4/10) －サンニコラス TW-02－

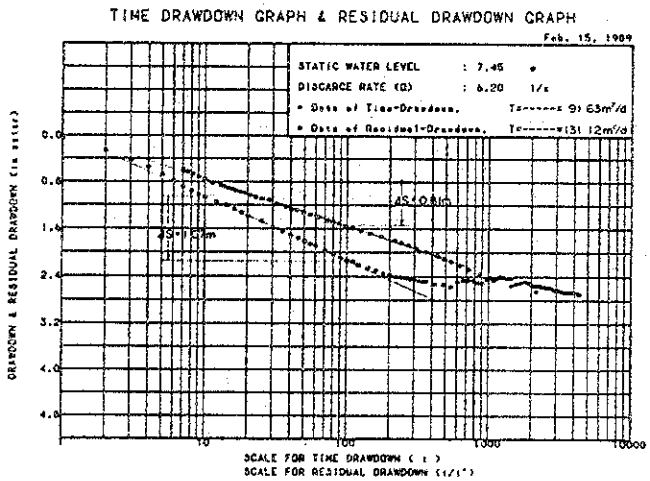
GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON







COORDINATION :
X : 430.94
Y : 1565.56
ELEVATION :
585.00 m



WATER QUALITY

IN-SITU TEST	
Temp.(deg.C) :	
EC.(micro S/cm) :	
pH:	RpM:
LABORATORY TEST	
T.D.S	
Hardness	
CaCO3	
Ca	Mg
Na	K
Cl	SO4
HCO3	CO3
Fe	Mn

(CONCENTRATIONS ARE EXPRESSED IN mg/l)

LEGEND

Gravel, Sand, Silt, Clay, Silty Sand, Sandy Silt, Sandy Clay, with Gravel, with Sand, with Silt, with Clay

DRILLING STARTED ON Sep. 20, 1988
COMPLETED ON Oct. 5, 1988
DRILLING MACHINE SCHRAMM T64-HS

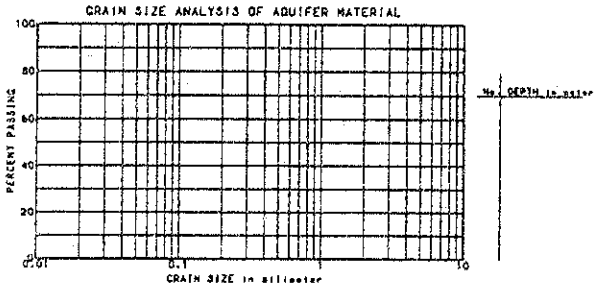
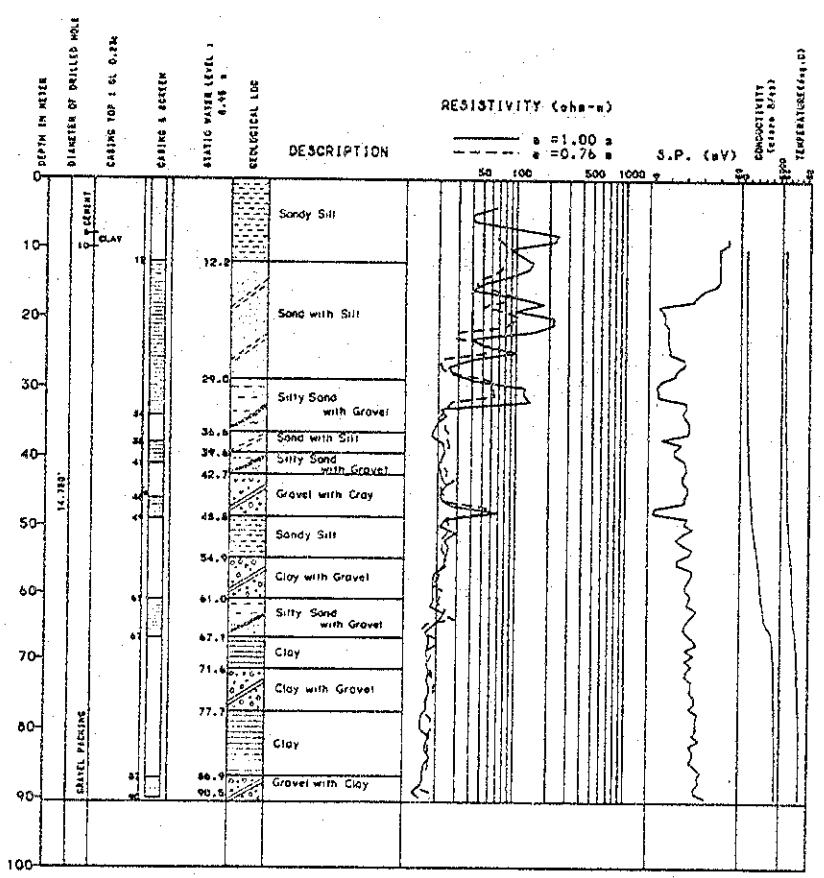
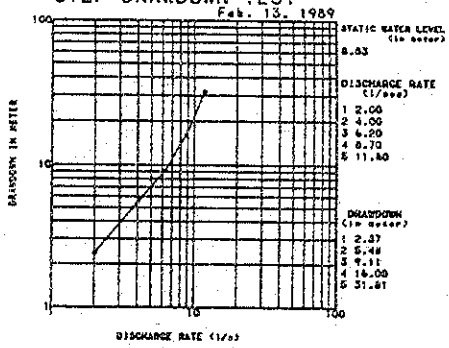
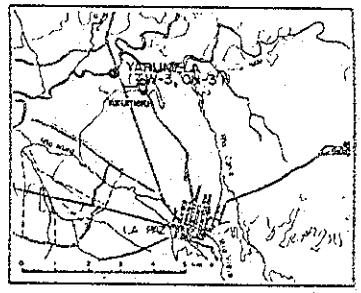


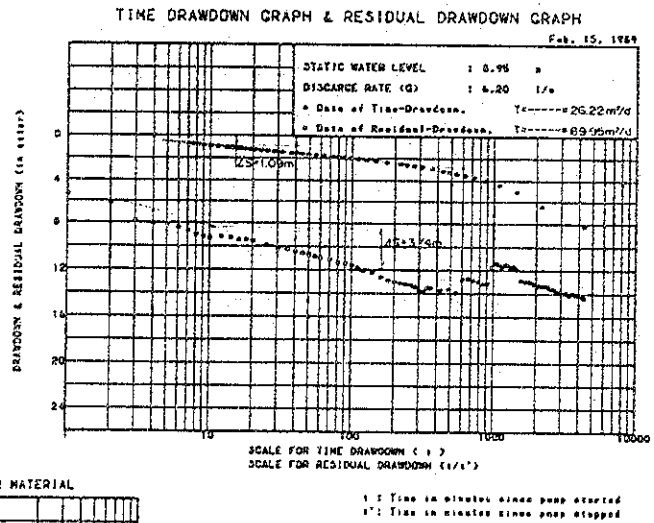
図4.1.8(5) 総合柱状図 (5/10) ―ﾔﾙﾒﾗ OH-03―

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON









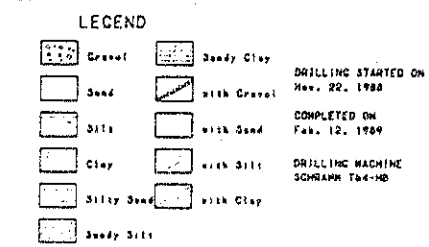
COORDINATION :
X : 430.94
Y : 1585.56
ELEVATION :
586.00 m

WATER QUALITY

IN-SITU TEST

LABORATORY TEST

(CONCENTRATIONS ARE EXPRESSED IN mg/l)



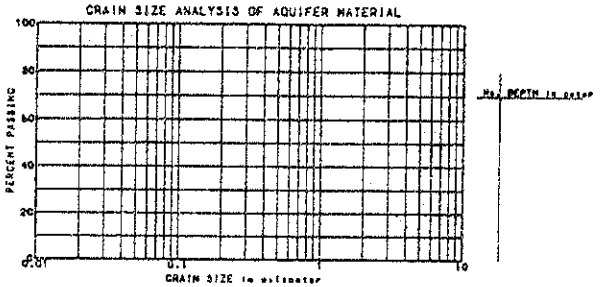
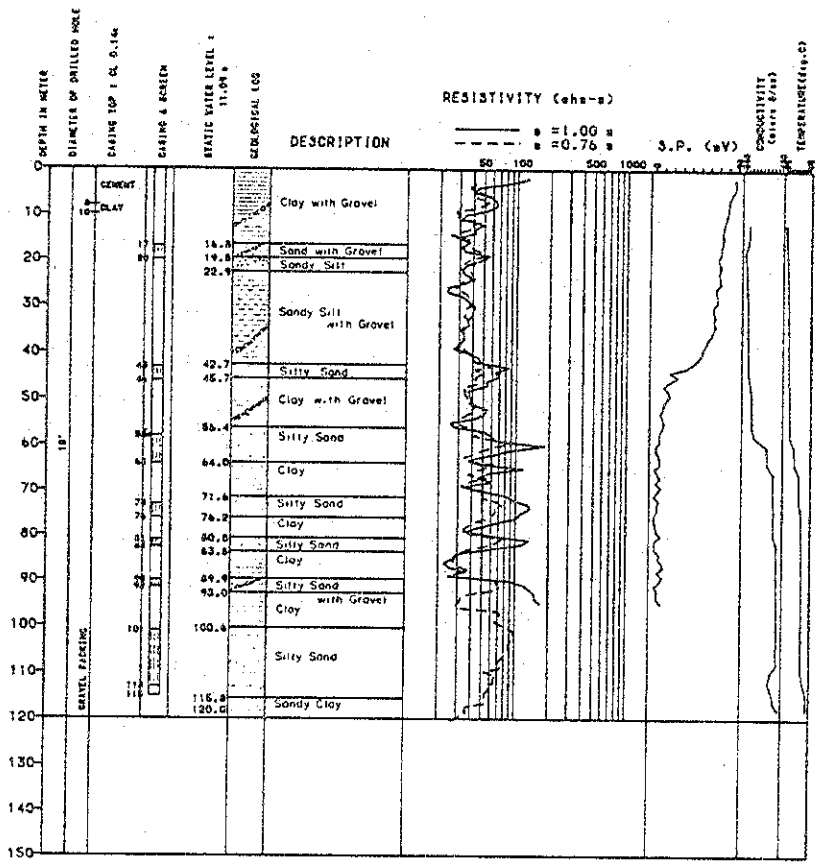
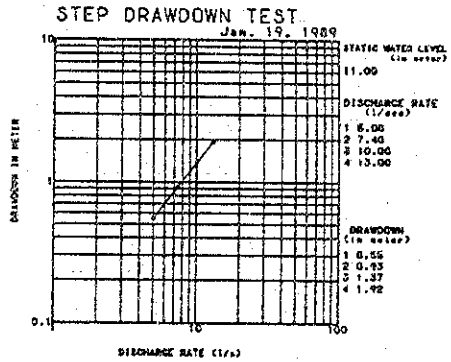


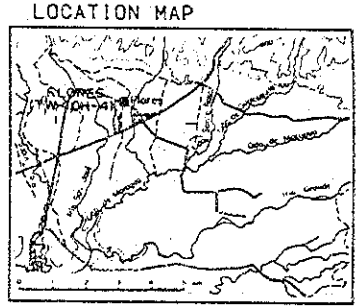
図4.1.8(6) 総合柱状図 (6/10) ーヤルメラ TW-03ー

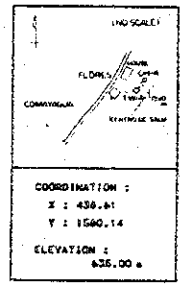
GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

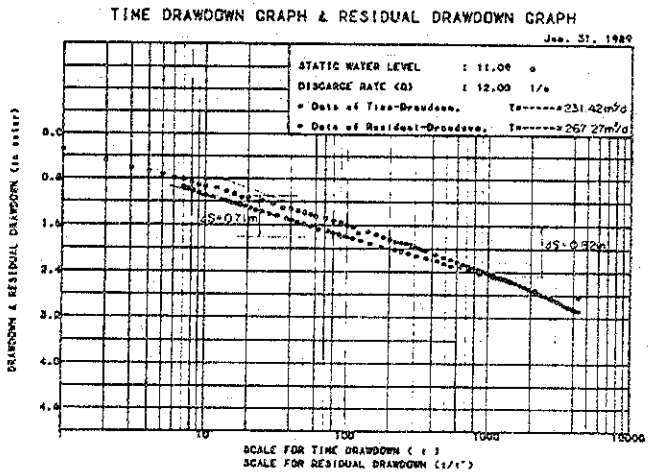
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON











t : Time in minutes since pump started
t' : Time in minutes since pump stopped

WATER QUALITY

IN-SITU TEST	
Temp.(deg.C) :	
EC.(micro℧/cm):	
pH:	Eh(V):
LABORATORY TEST	
T.D.S	
Hardness	
CaCO3	
Ca	Mg
Na	K
Cl	SO4
HCO3	CO3
Fe	Mn

(CONCENTRATIONS ARE EXPRESSED IN mg/l)

LEGEND

Gravel, Sand, Silt, Clay, Silty Sand, Sandy Silt, Sandy Clay, with Gravel, with Sand, with Silt, with Clay

DRILLING STARTED ON Nov. 17, 1988

COMPLETED ON Jan. 13, 1989

DRILLING MACHINE CARDWER DENVER MODEL 1500

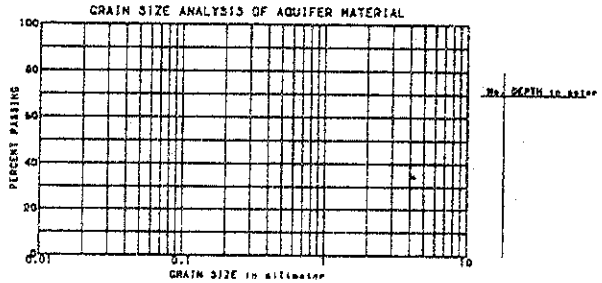


図4.1.8(7) 総合柱状図 (7/10) ―フローレス OH-04―

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

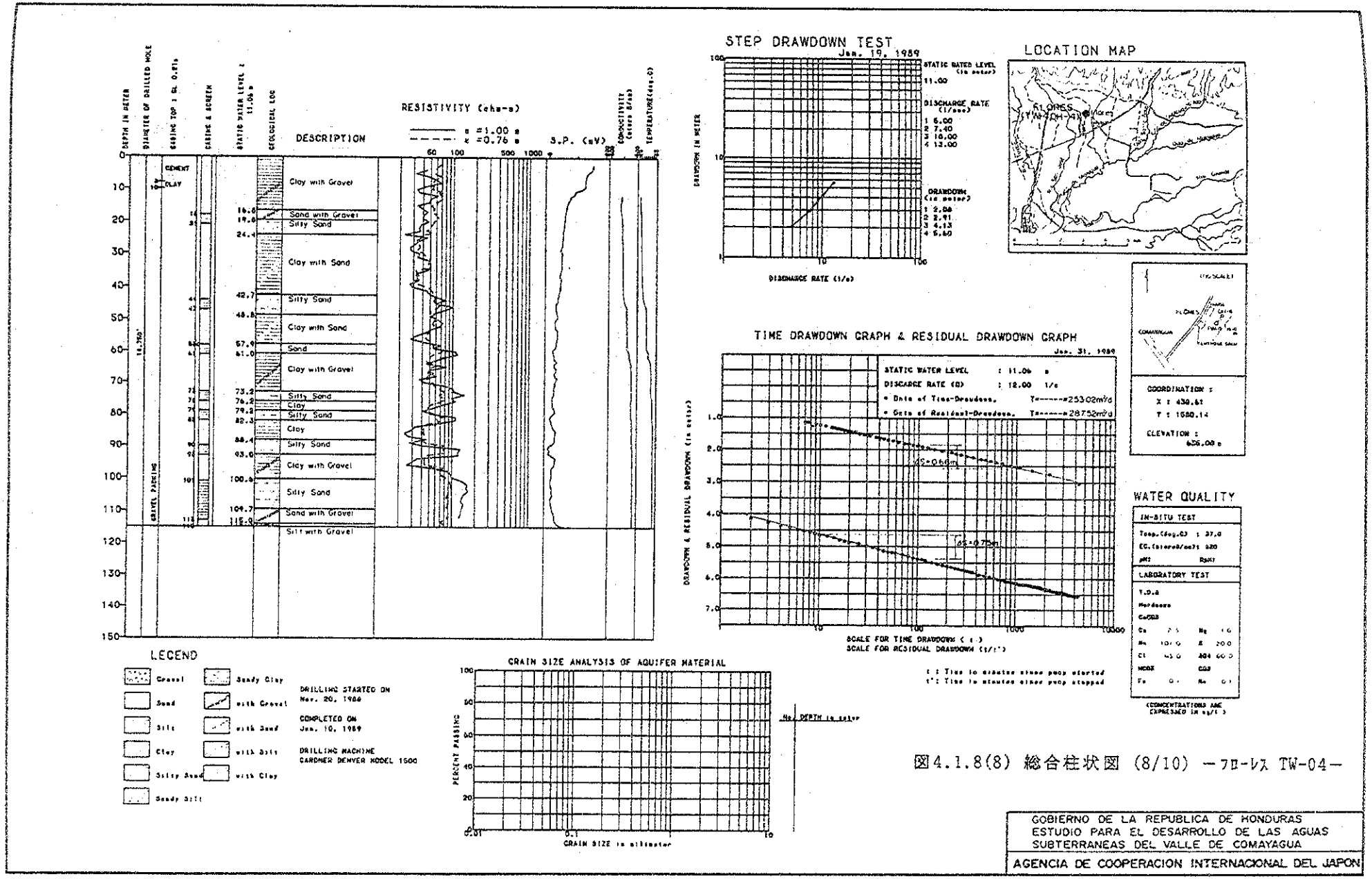


図4.1.8(8) 総合柱状図 (8/10) ーフローレス TW-04ー

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

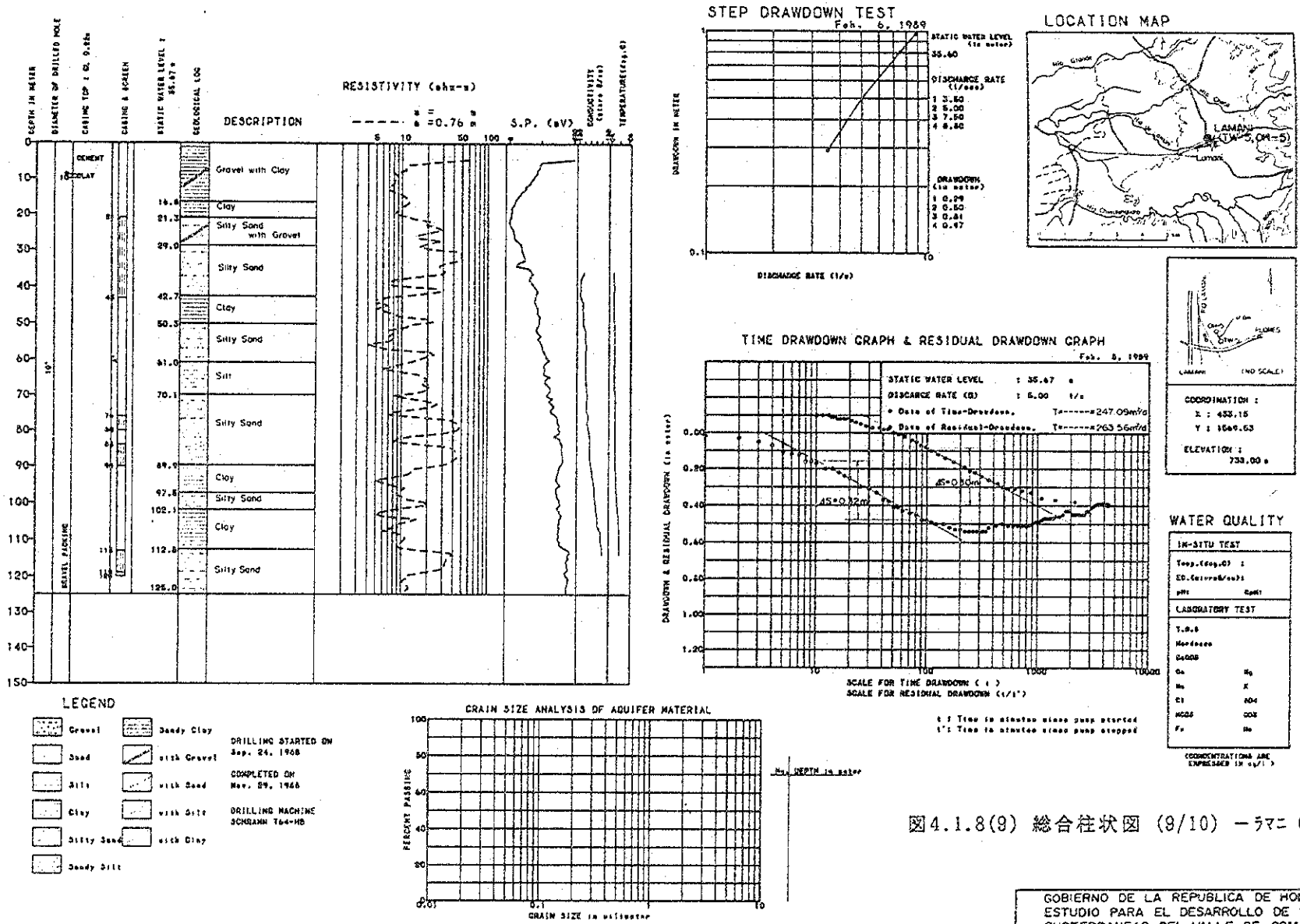


図4.1.8(9) 総合柱状図 (9/10) ーラマニ OH-05ー

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

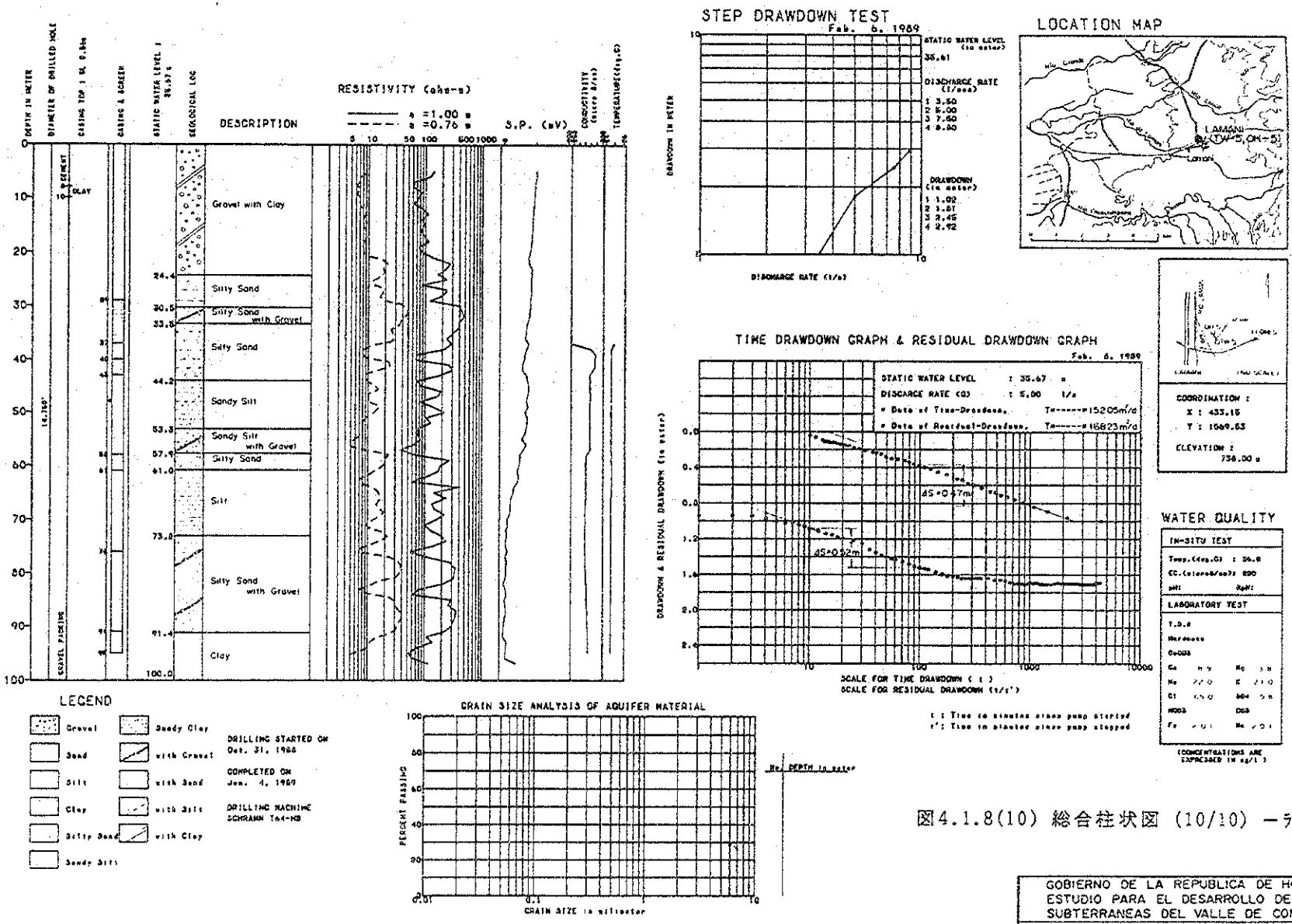


図4.1.8(10) 総合柱状図 (10/10) ーラマニ TW-05ー

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

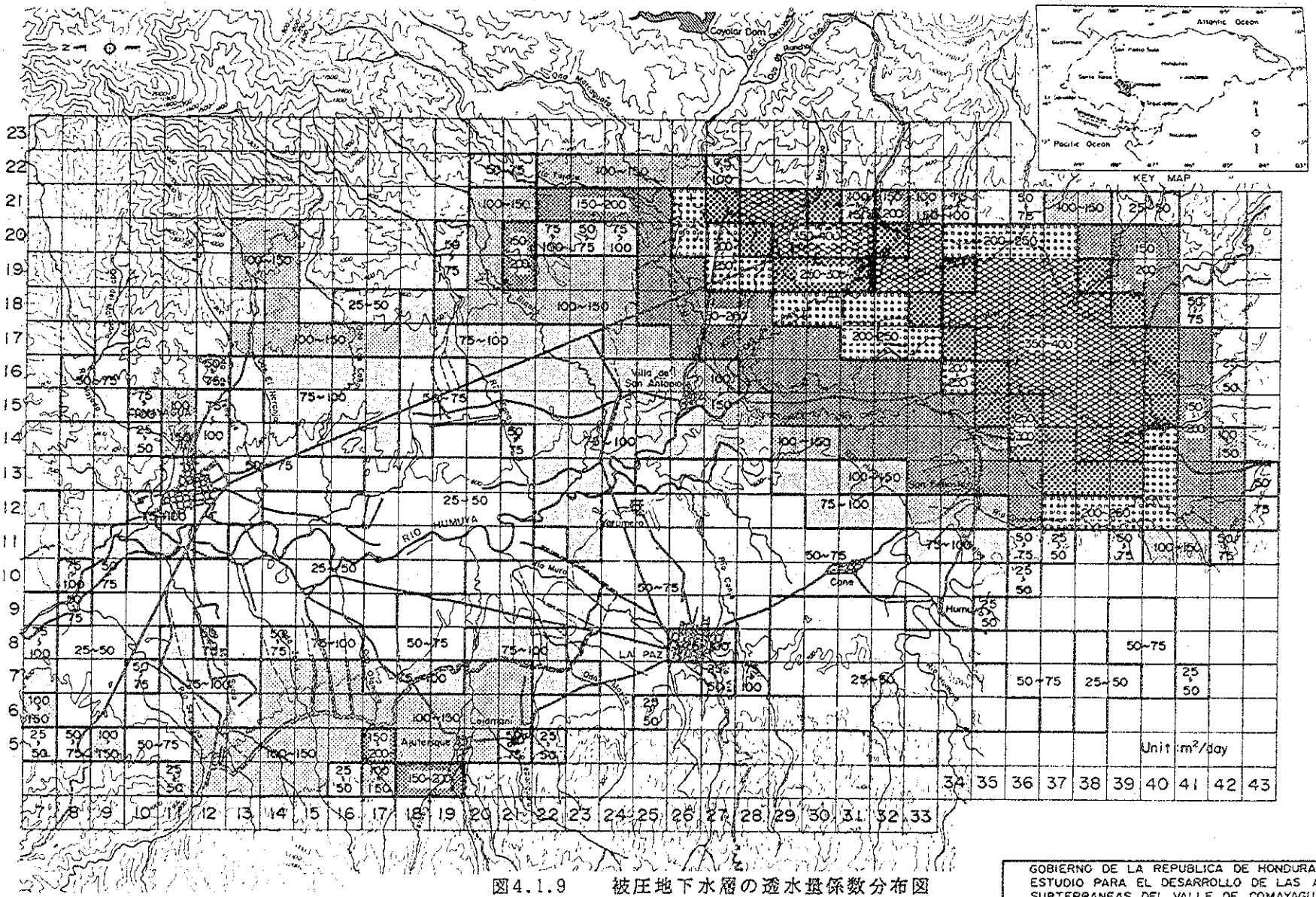


図4.1.9　被圧地下水層の透水係数分布図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

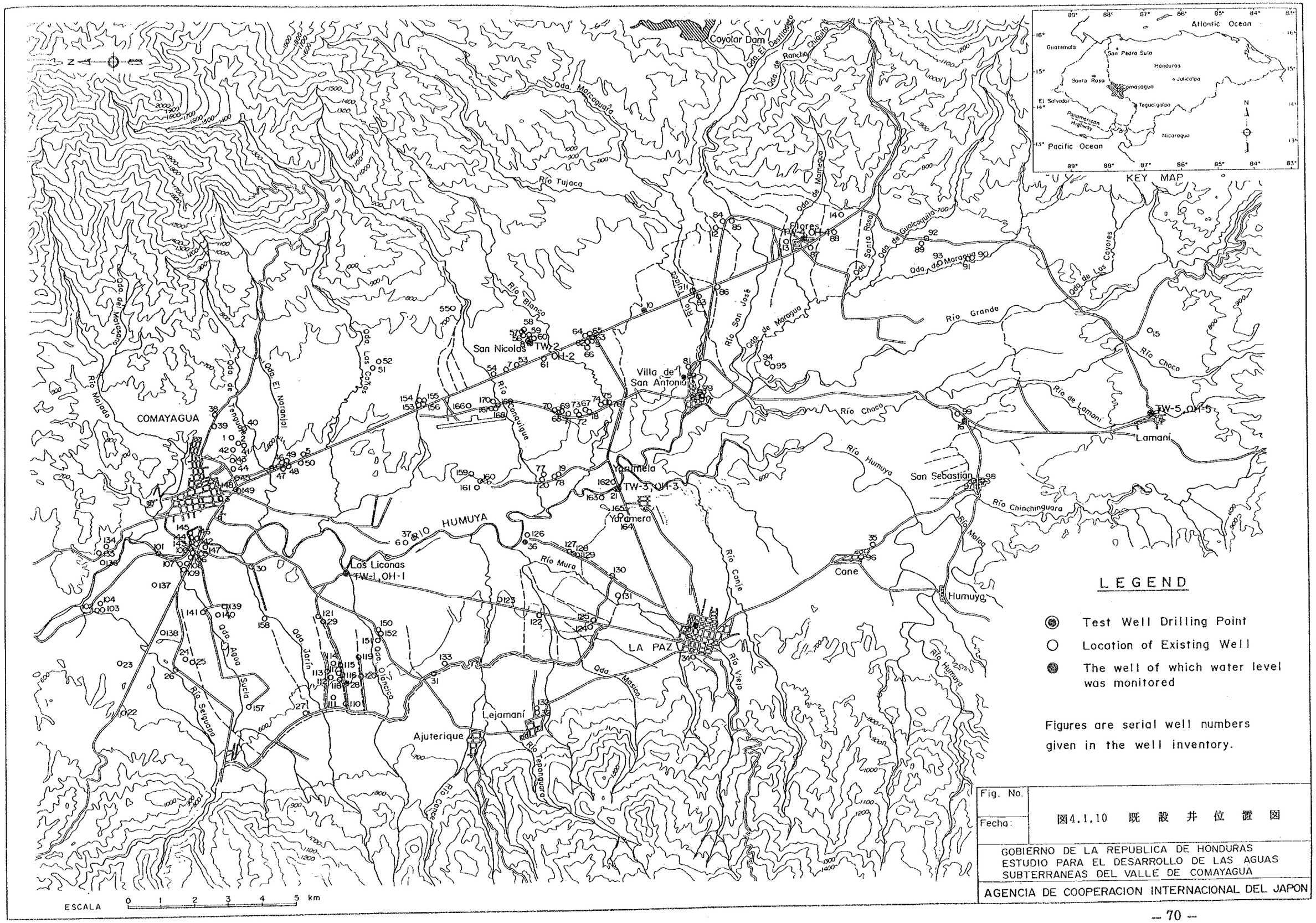


Fig. No.	図4.1.10 既 設 井 位 置 図
Fecha:	

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ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

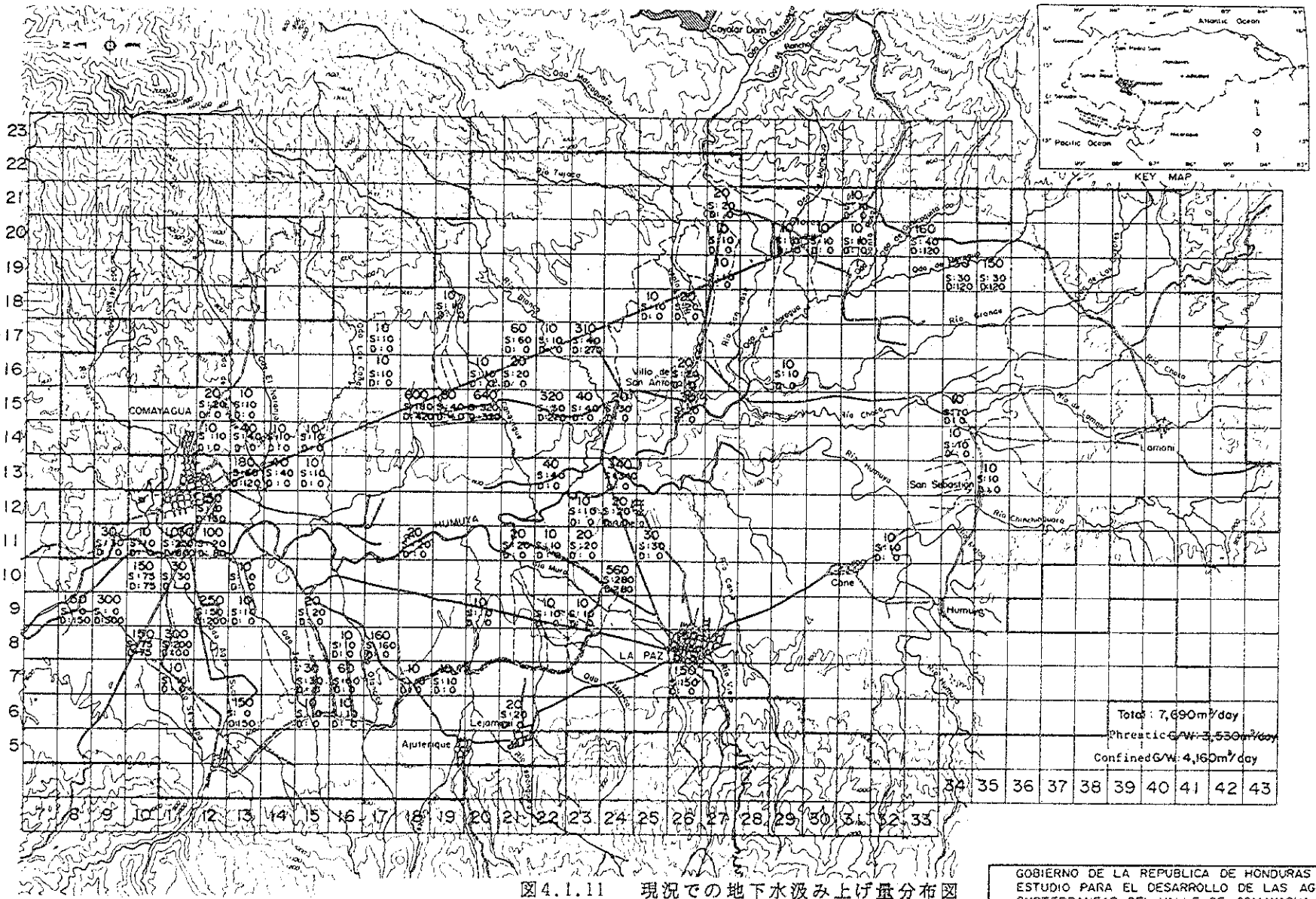

図4.1.11　現況での地下水汲み上げ量分布図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

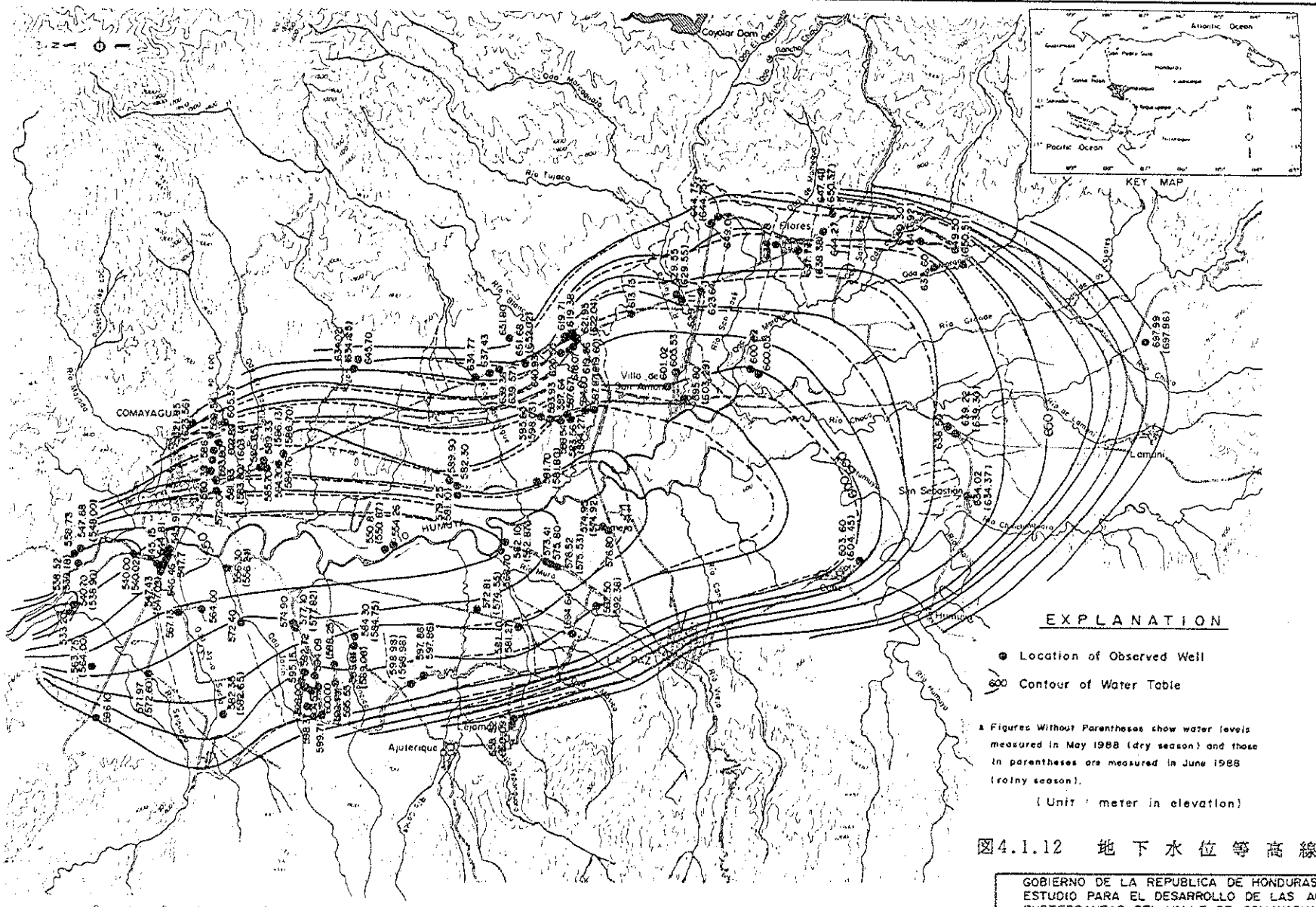

図4.1.12　地下水位等高線図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

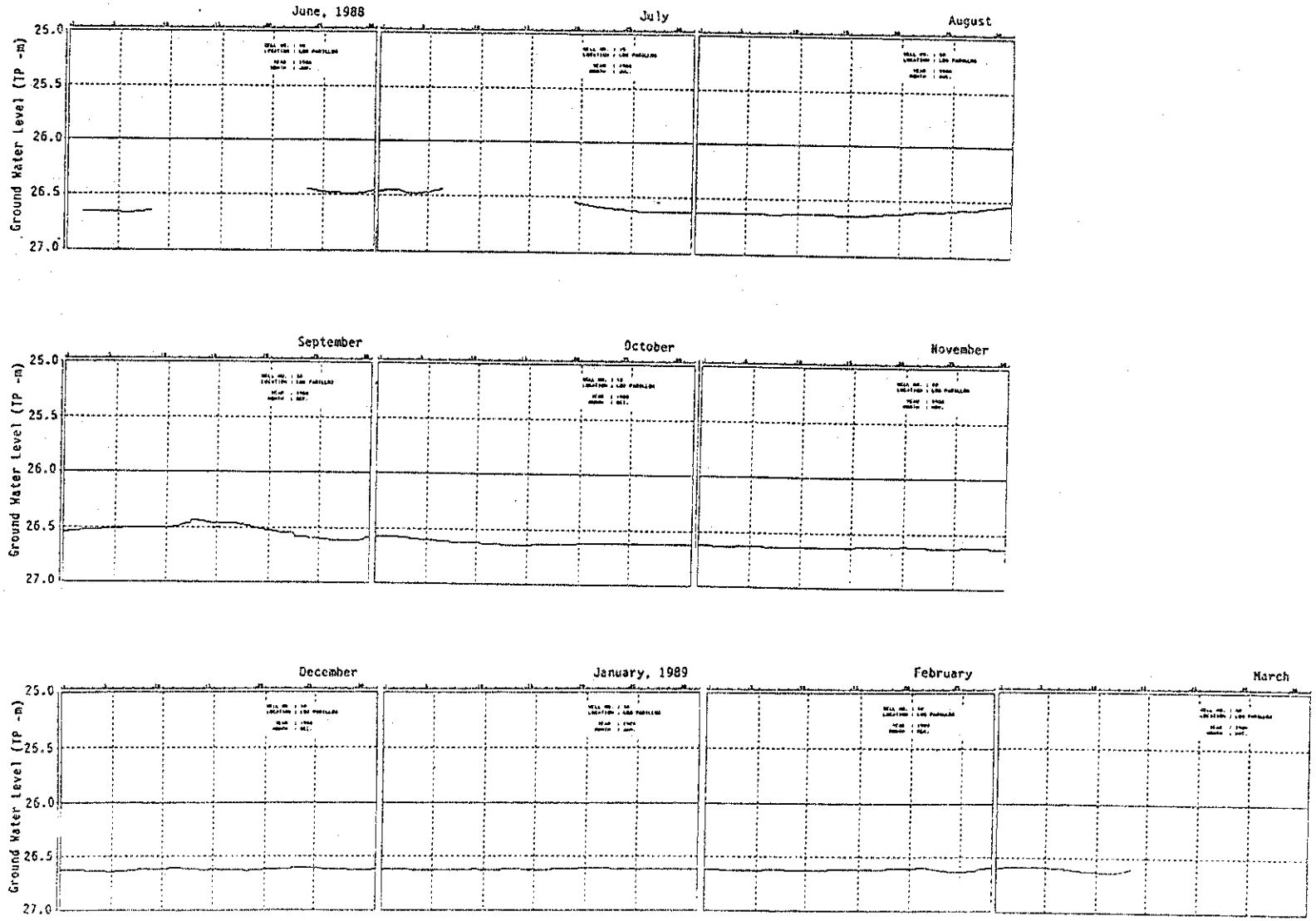

図4.1.13(1)　地下水位変動図 (1/6) ー井戸番号10、ﾛｽﾊﾟﾘｼﾞｮｽー

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

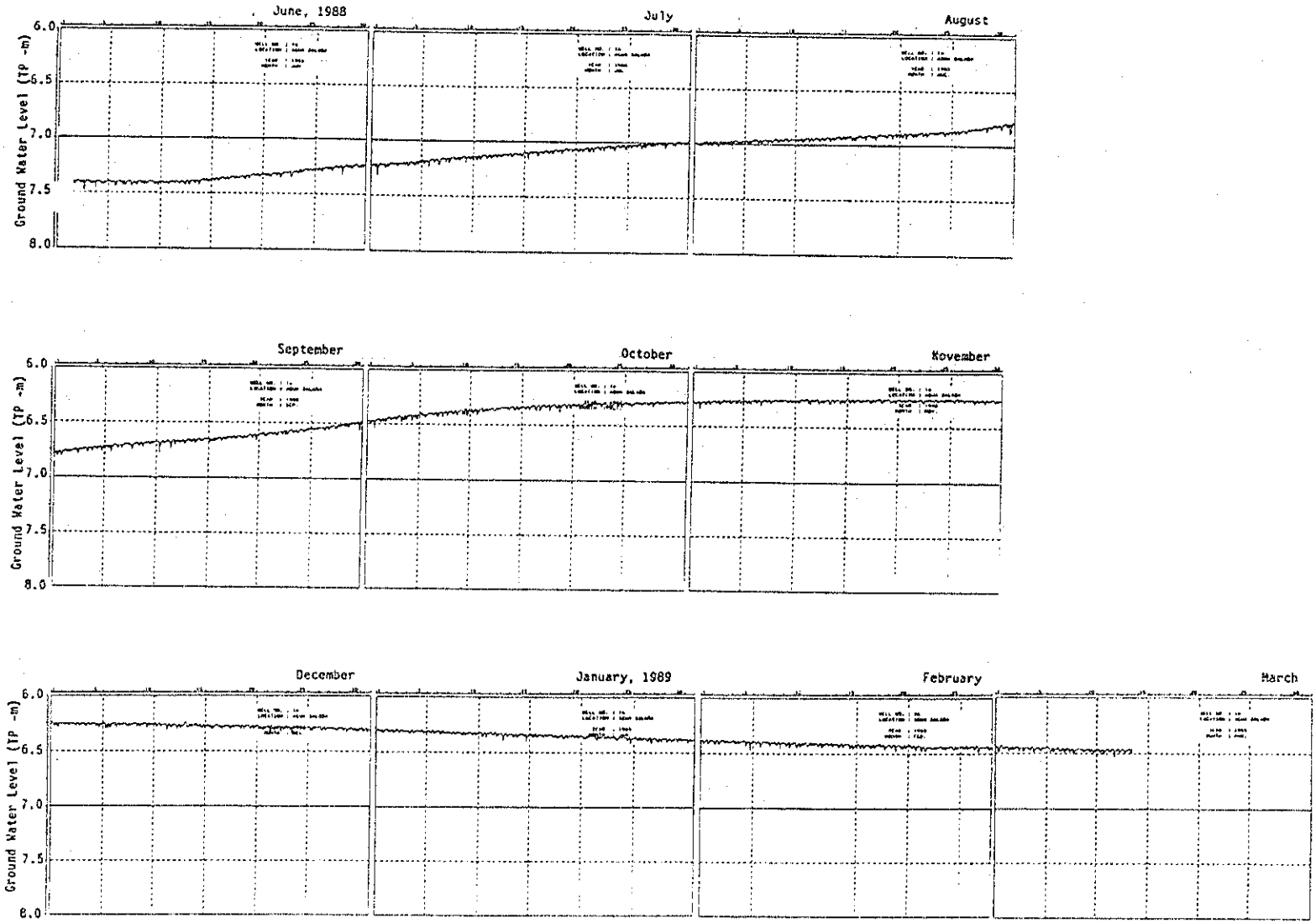

図4.1.13(2)　地下水位変動図 (2/6) －井戸番号16、ｱｸﾞｱｻﾗﾀﾞ－

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

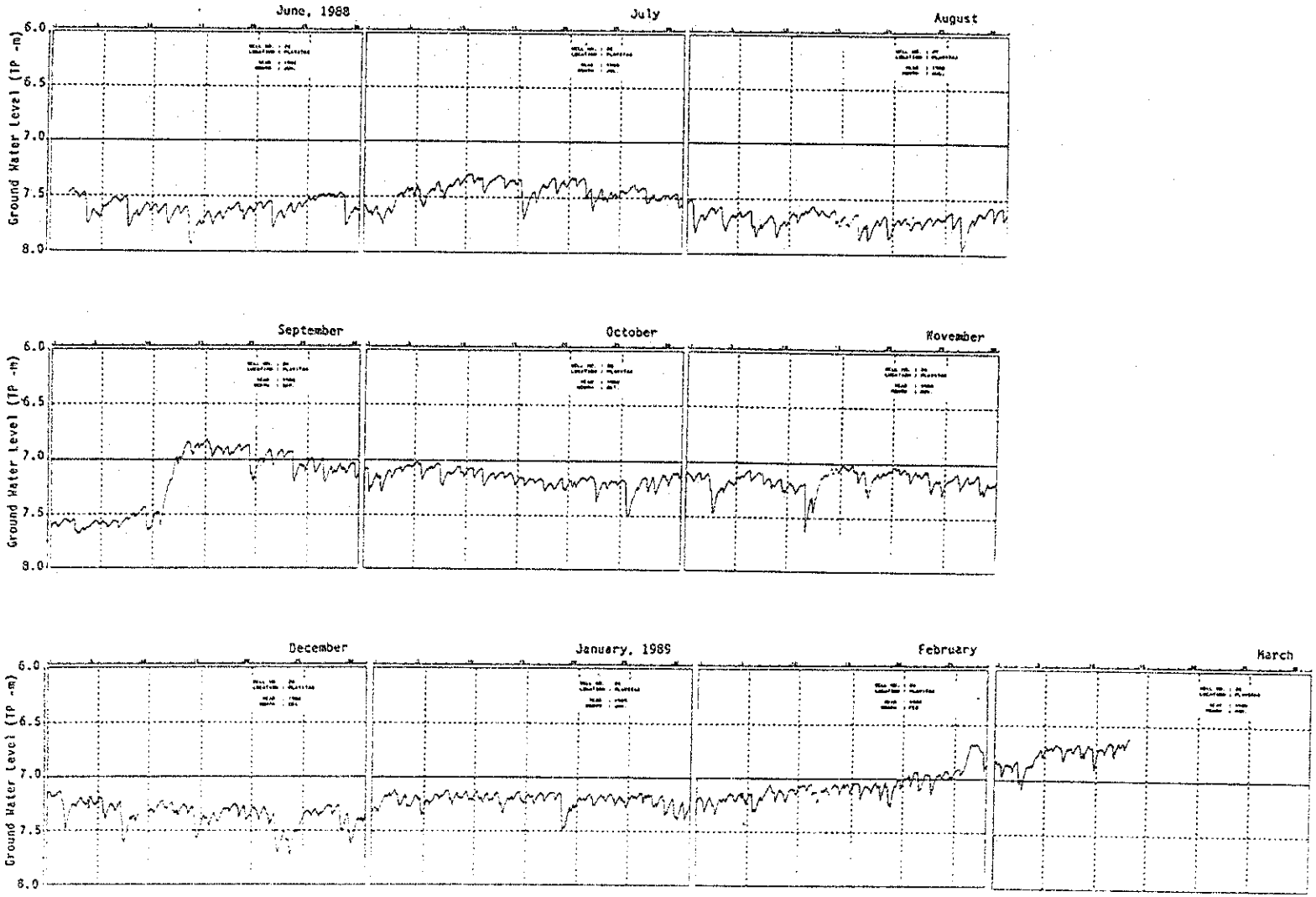

図4.1.13(3) 地下水位変動図 (3/6) ー井戸番号28、ﾌﾟﾚｲｲﾀｽｰ

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

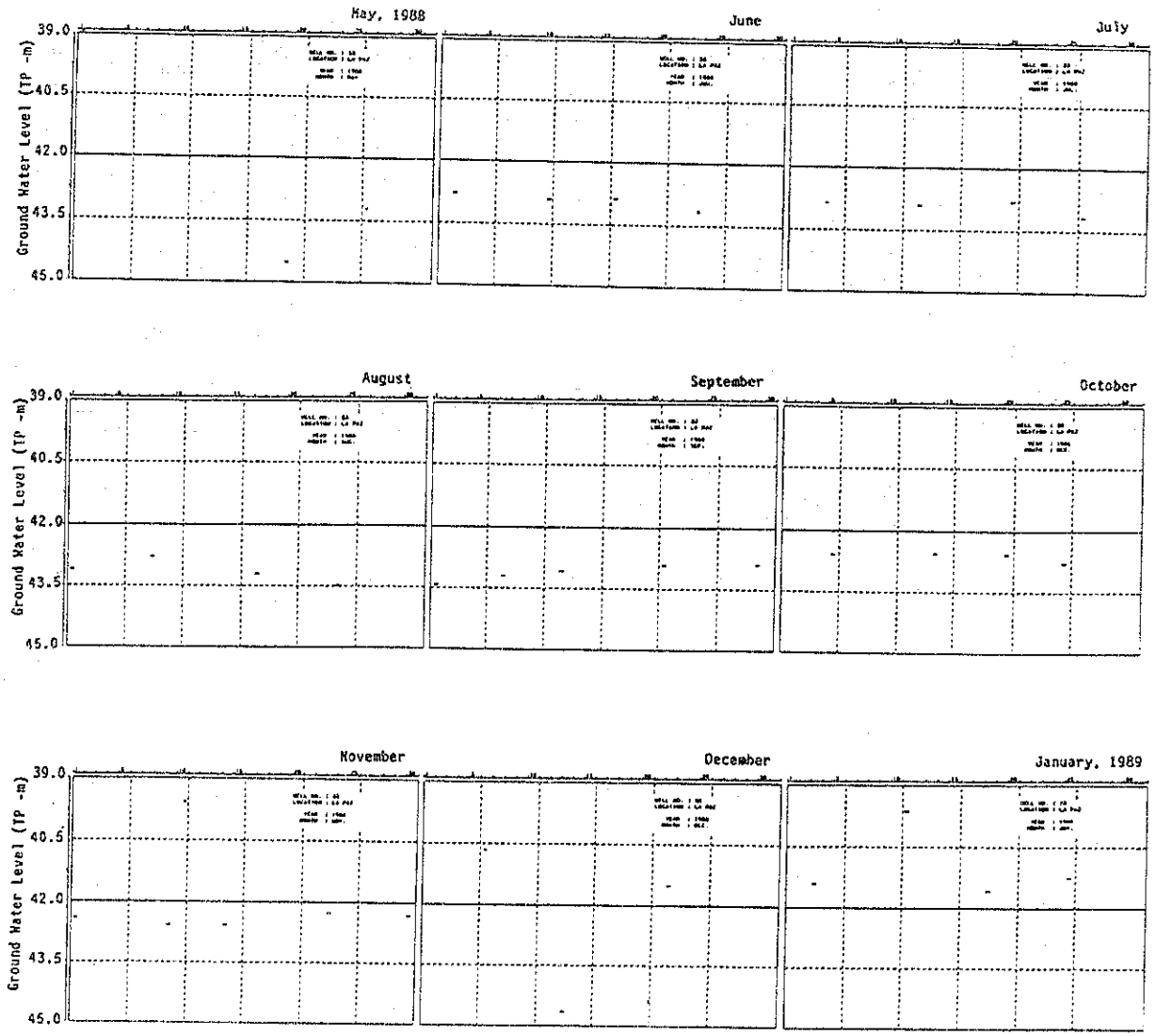

図4.1.13(4)　地下水位変動図 (4/6) ー井戸番号33、ﾗﾊﾟｽー

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

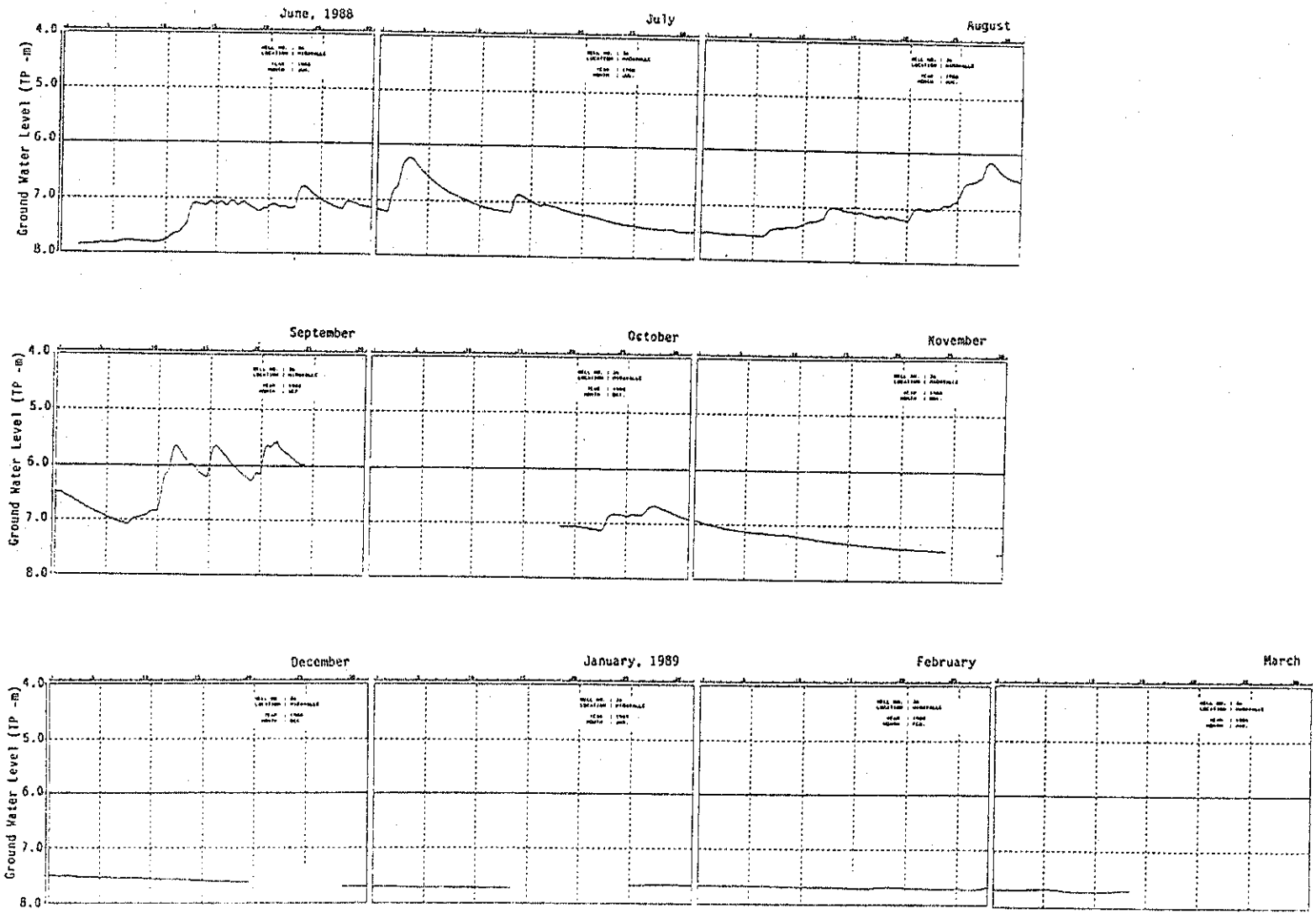

図4.1.13(5) 地下水位変動図 (5/6) ー井戸番号36、ﾐﾗﾊﾞｼﾞｪー

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

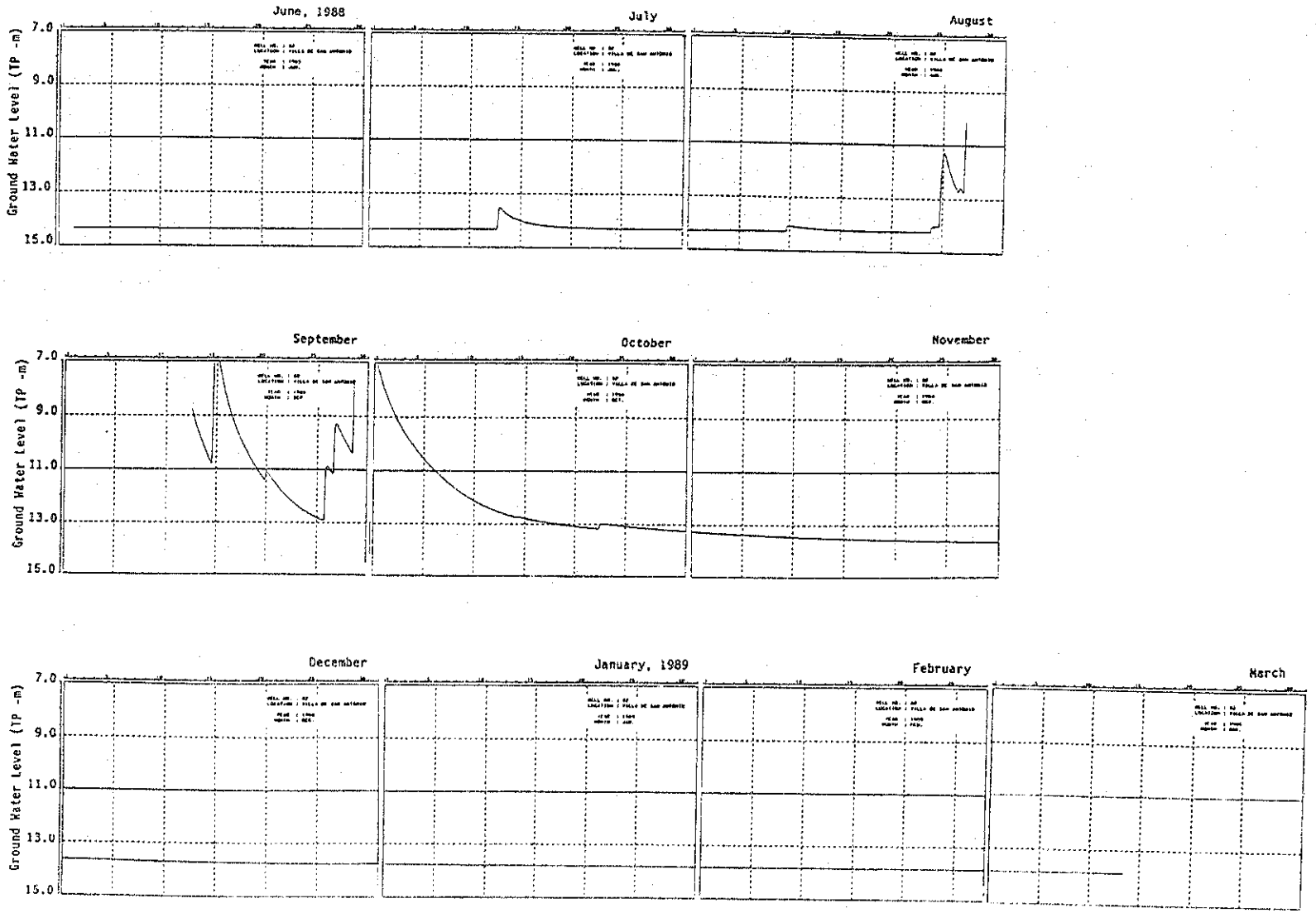

図4.1.13(6)　地下水位変動図 (6/6) ー井戸番号82、ﾋﾞｼﾞｬﾃﾞｻﾝｱﾝﾄﾆｵｰ

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

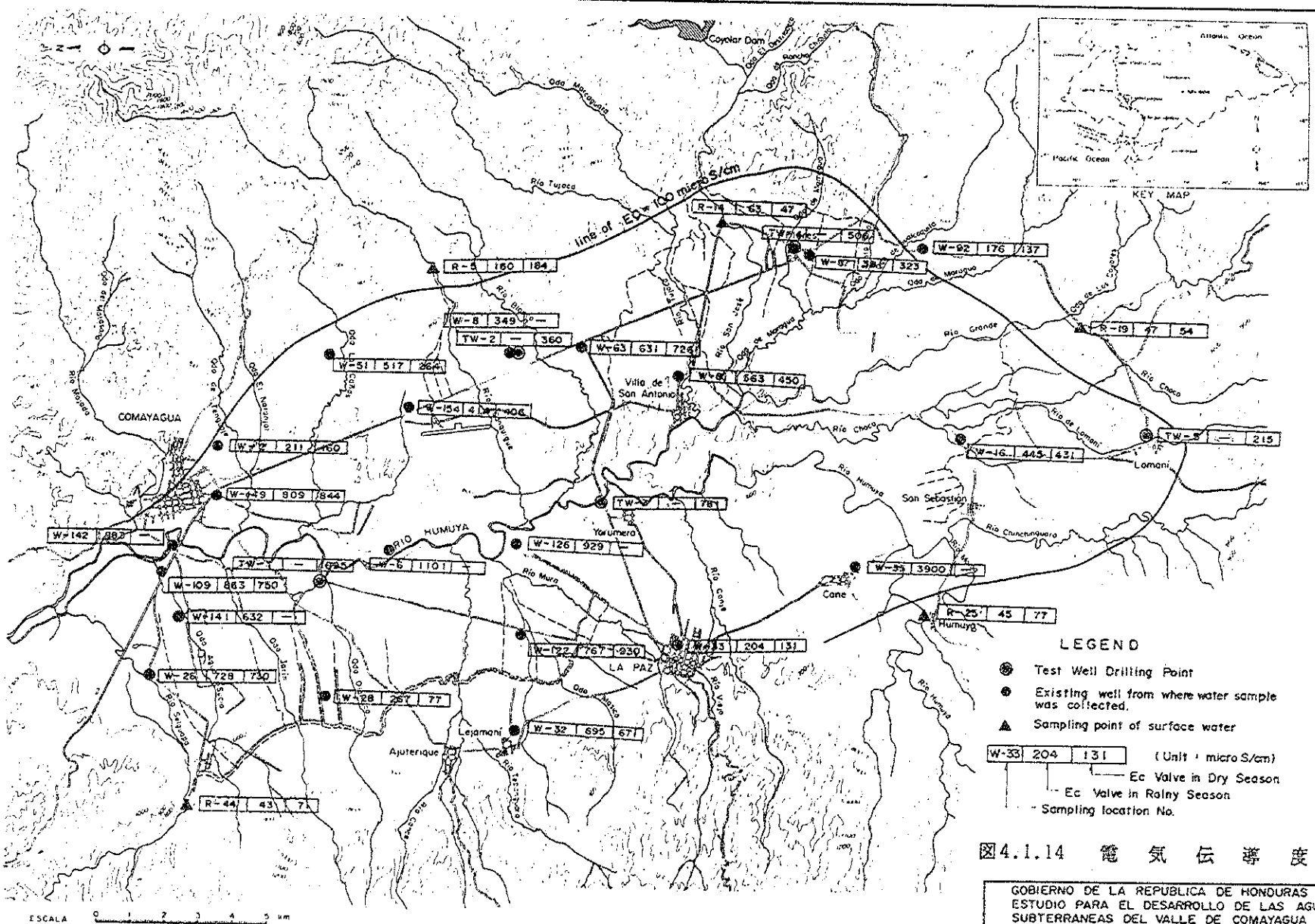

図4.1.14 電 気 伝 導 度 図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

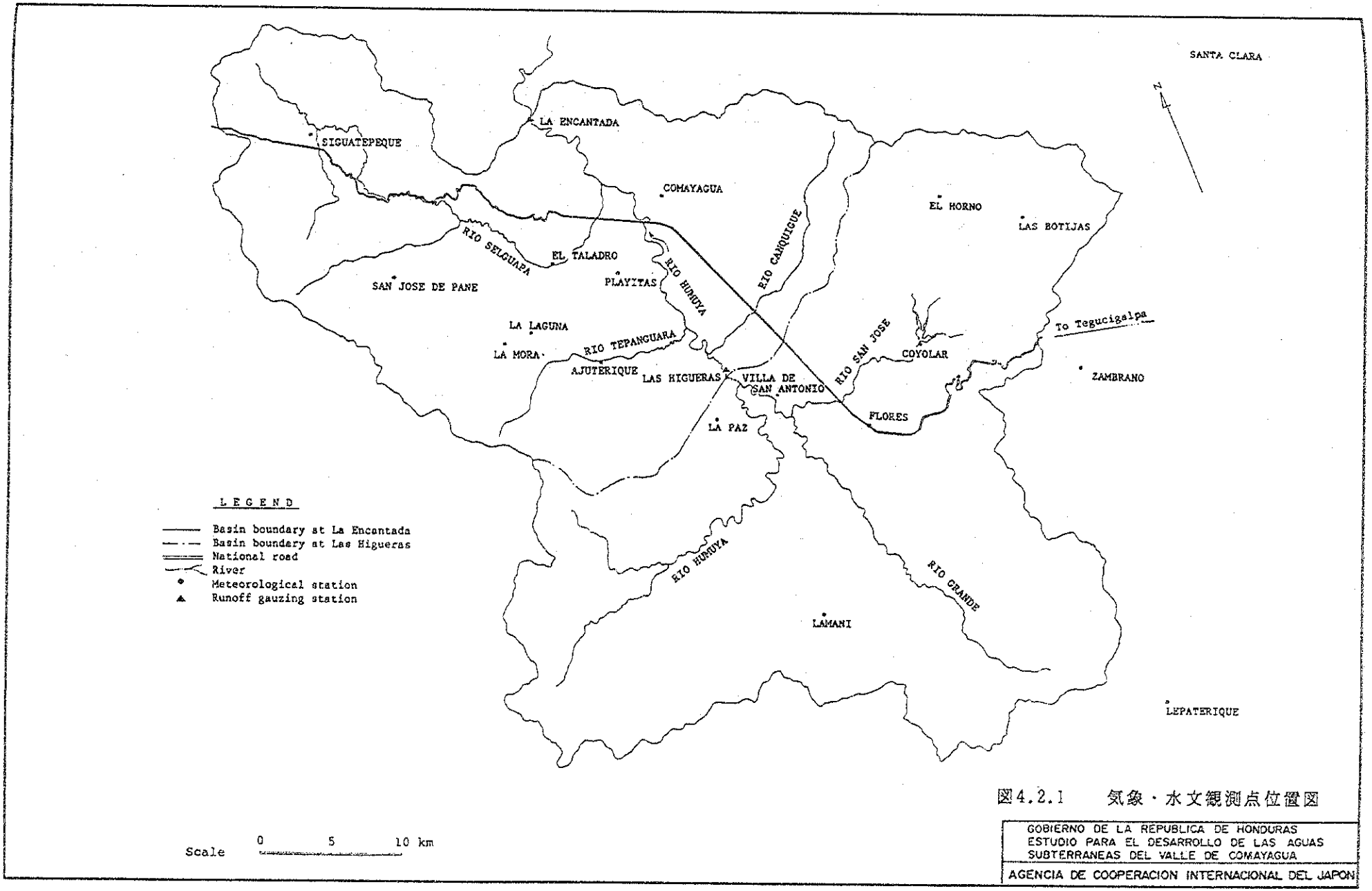

図4.2.1　気象・水文観測点位置図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

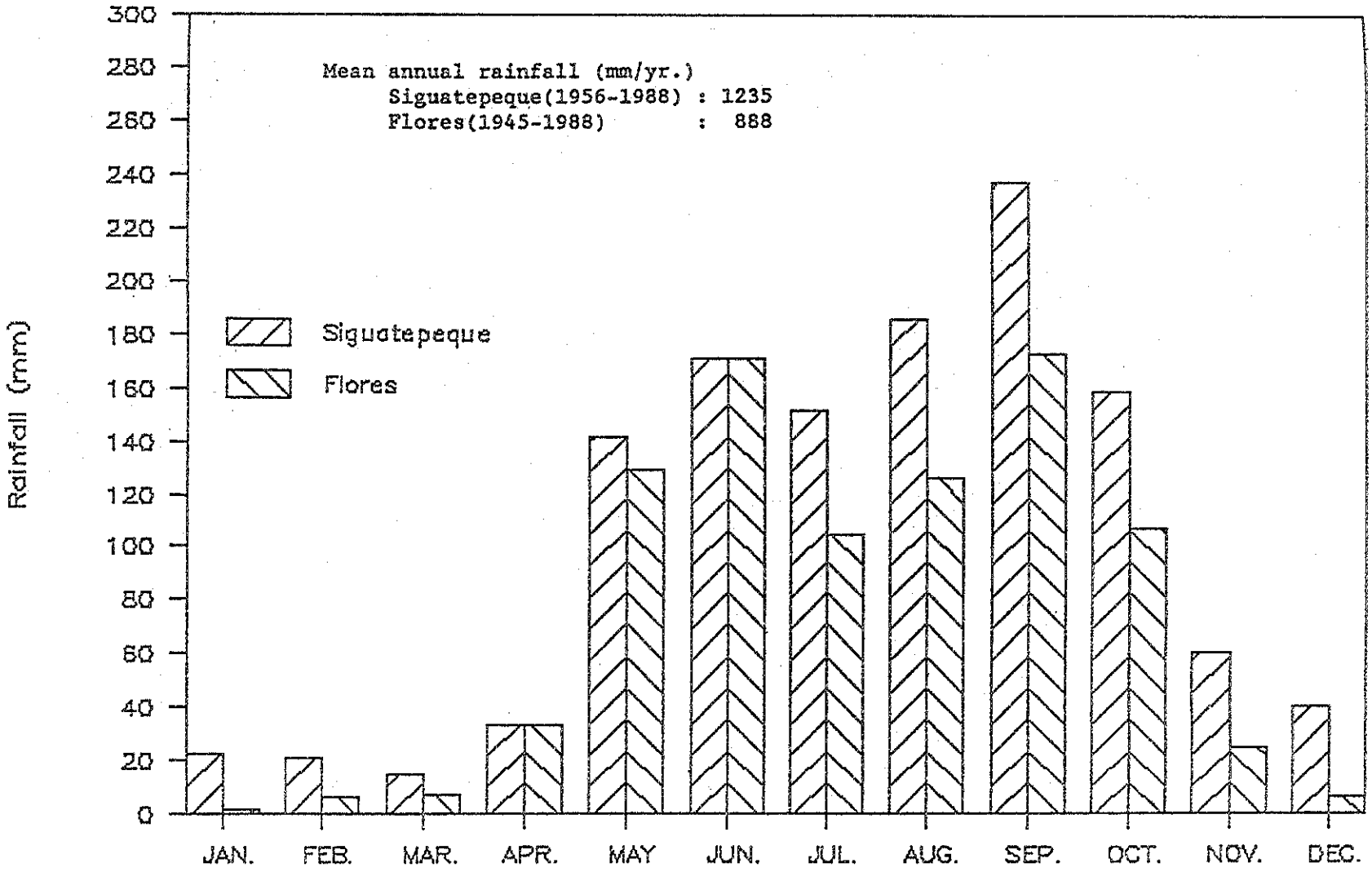

図4.2.2　月　別　降　雨　量　図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

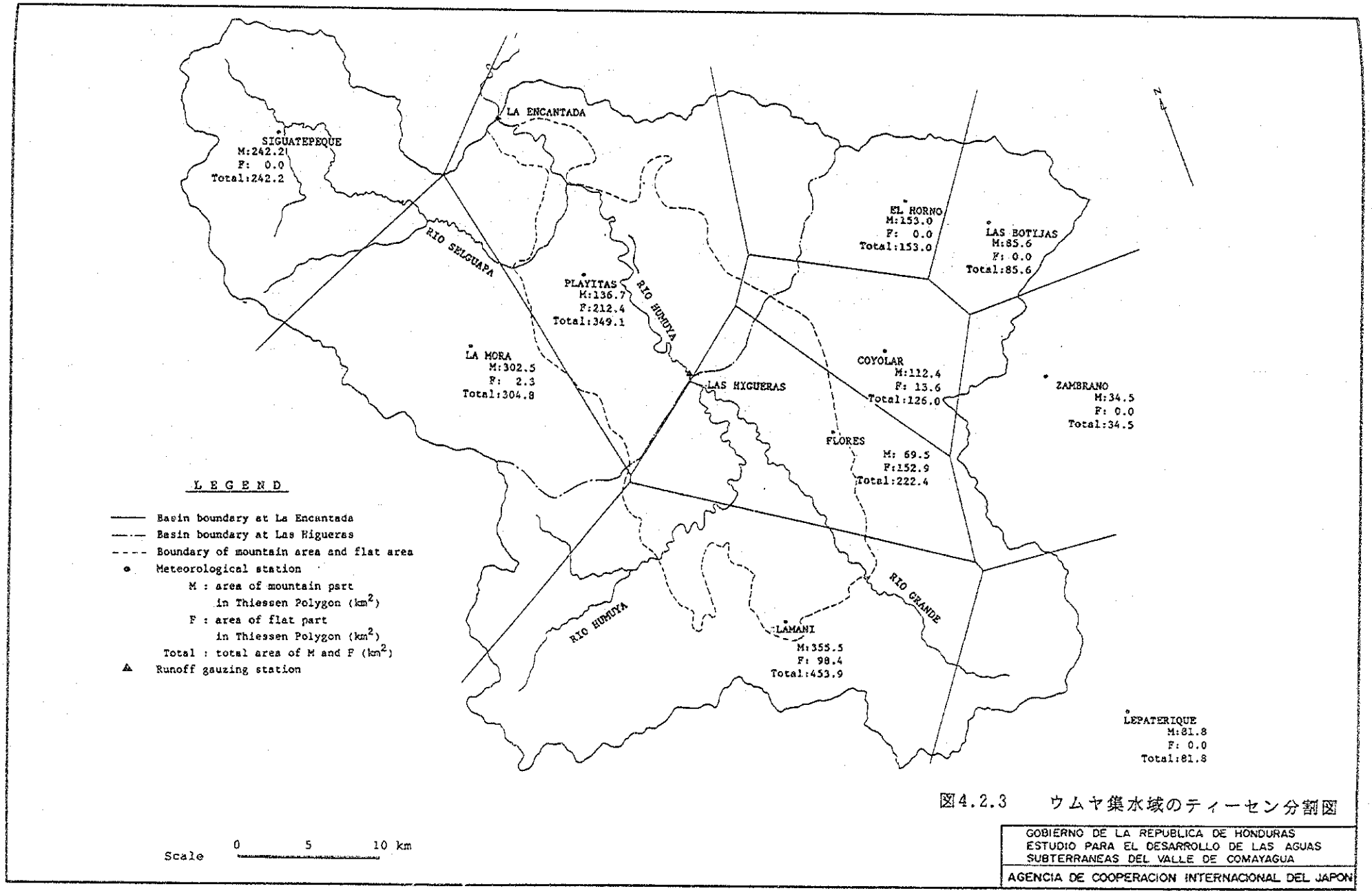

図4.2.3　ウムヤ集水域のティーセン分割図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

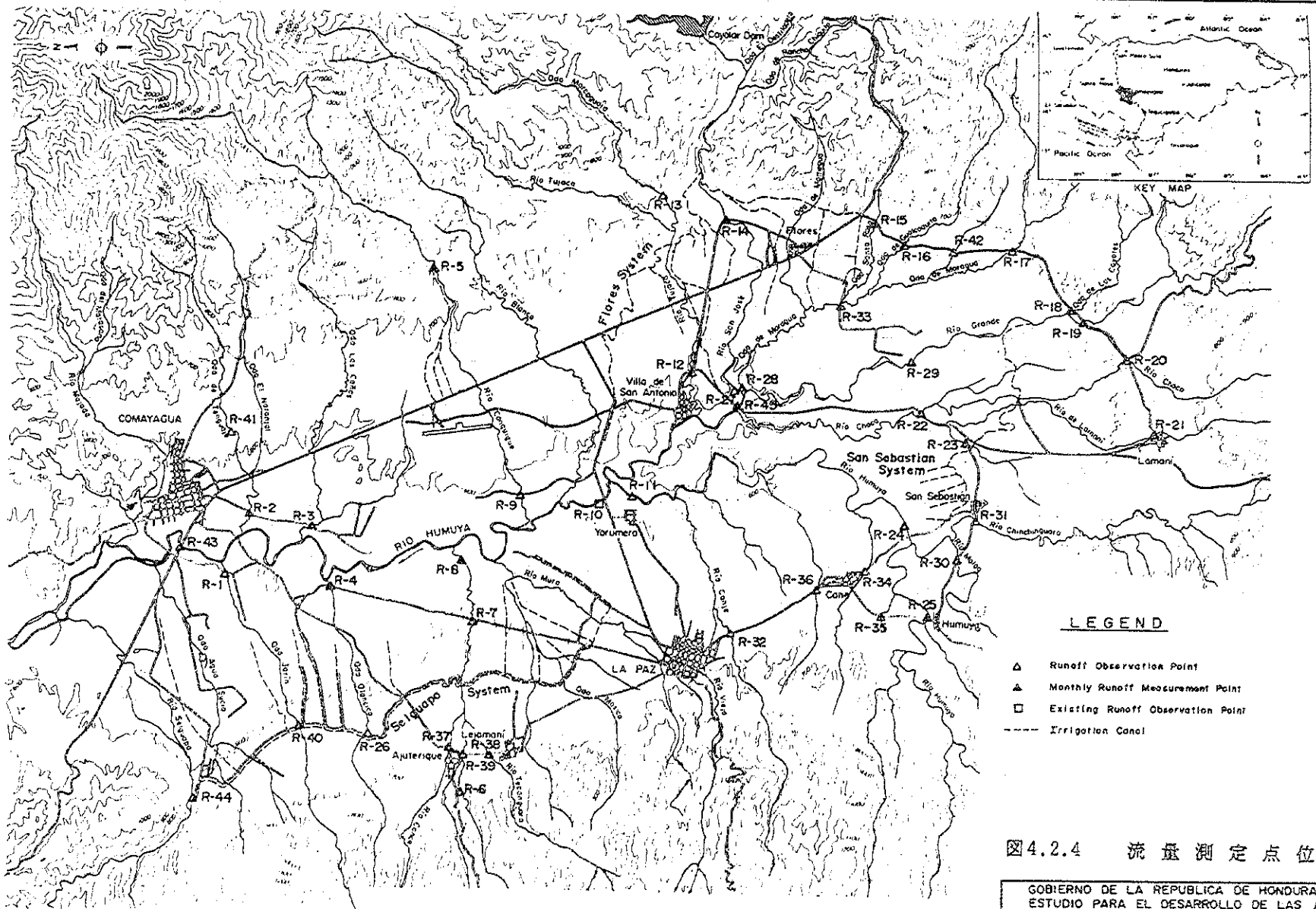

図4.2.4　流量測定点位置図

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA

AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

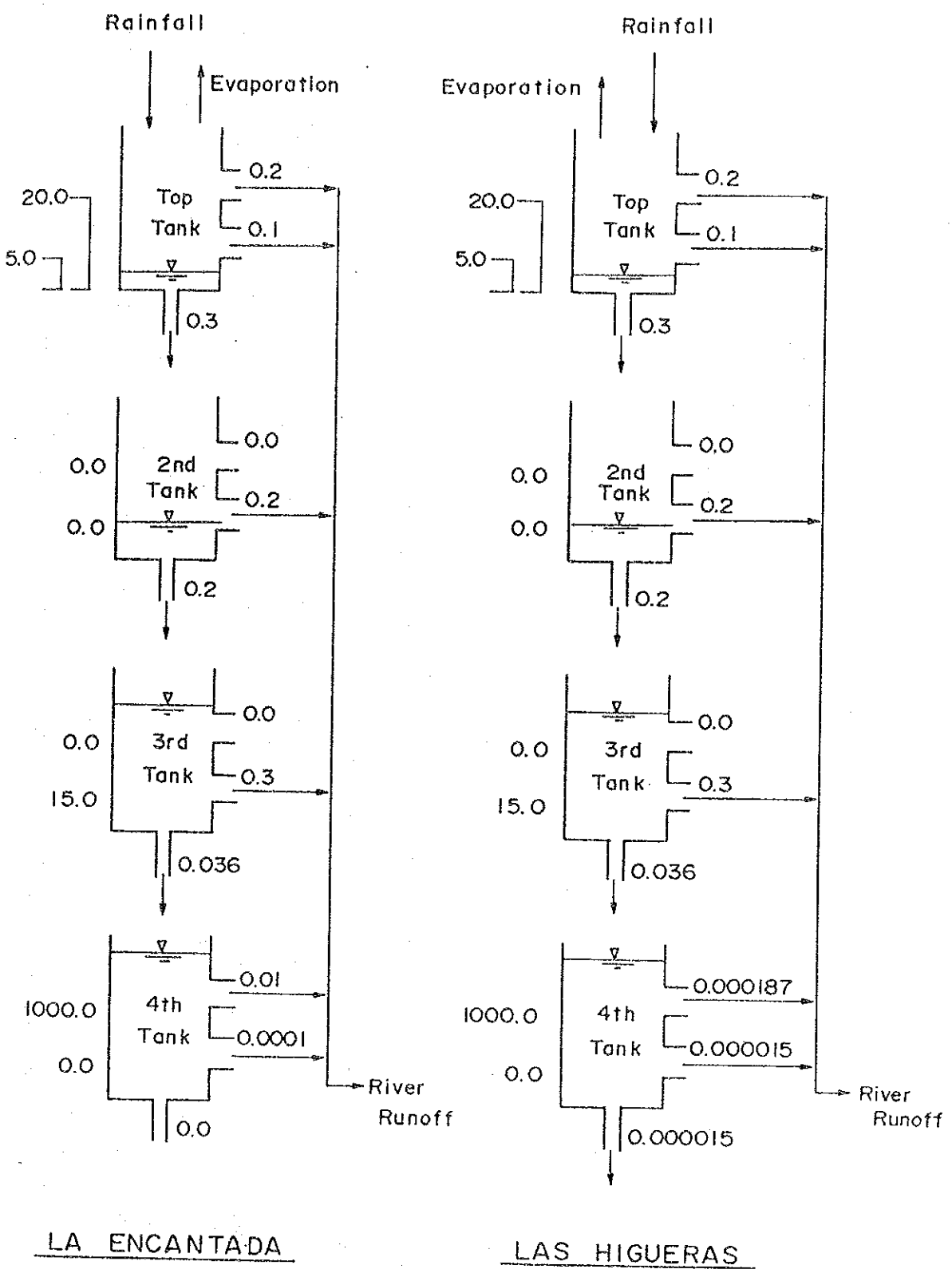

図4.2.5　水収支計算用タンクモデル

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

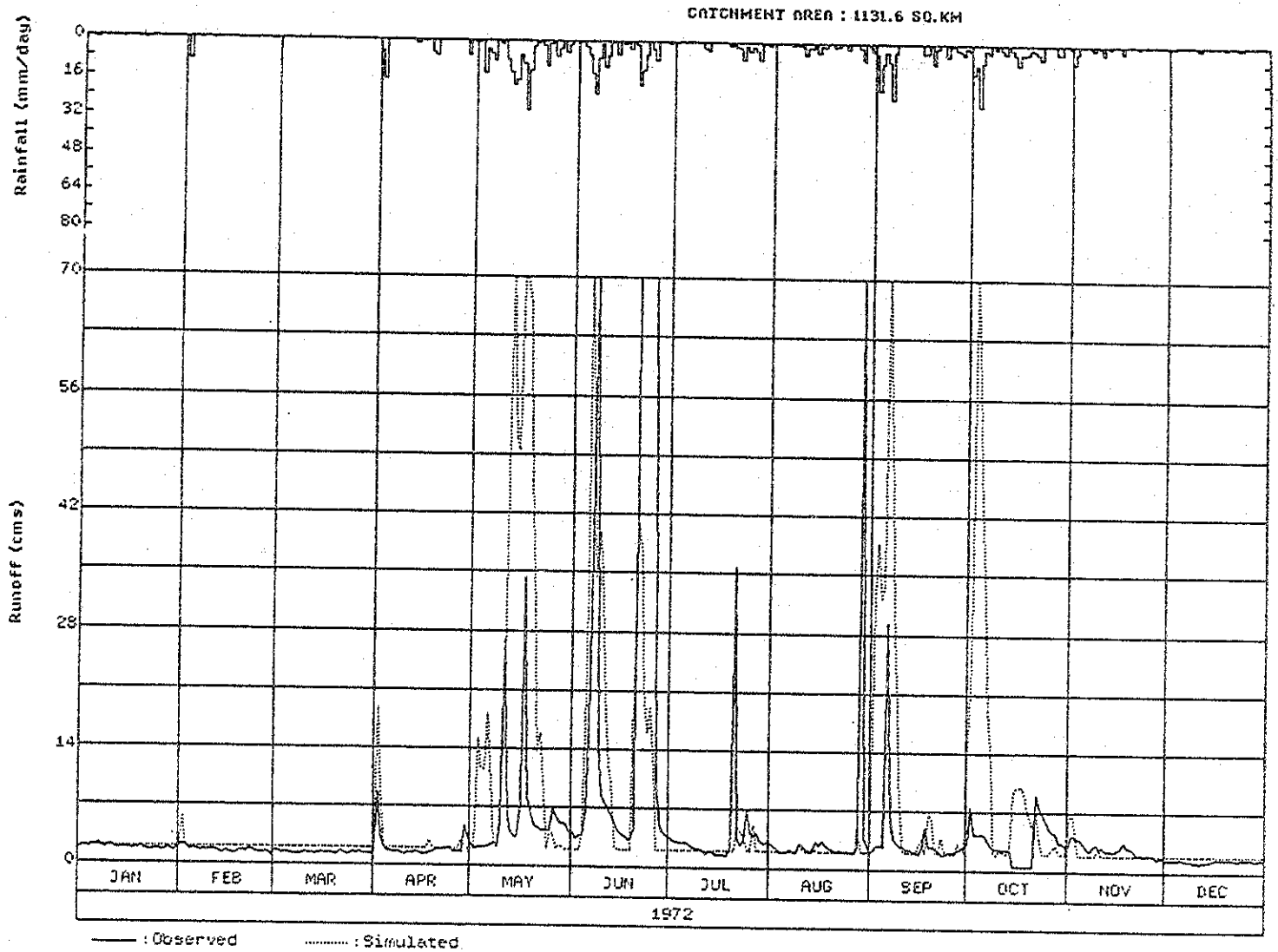

図4.2.6(1) 流出解析結果図 (1/4) －ﾗｽｲｸﾞｴﾗｽﾓﾃﾞﾙ 1972年－

GOBIERNO DE LA REPUBLICA DE HONDURAS
ESTUDIO PARA EL DESARROLLO DE LAS AGUAS SUBTERRANEAS DEL VALLE DE COMAYAGUA
AGENCIA DE COOPERACION INTERNACIONAL DEL JAPON

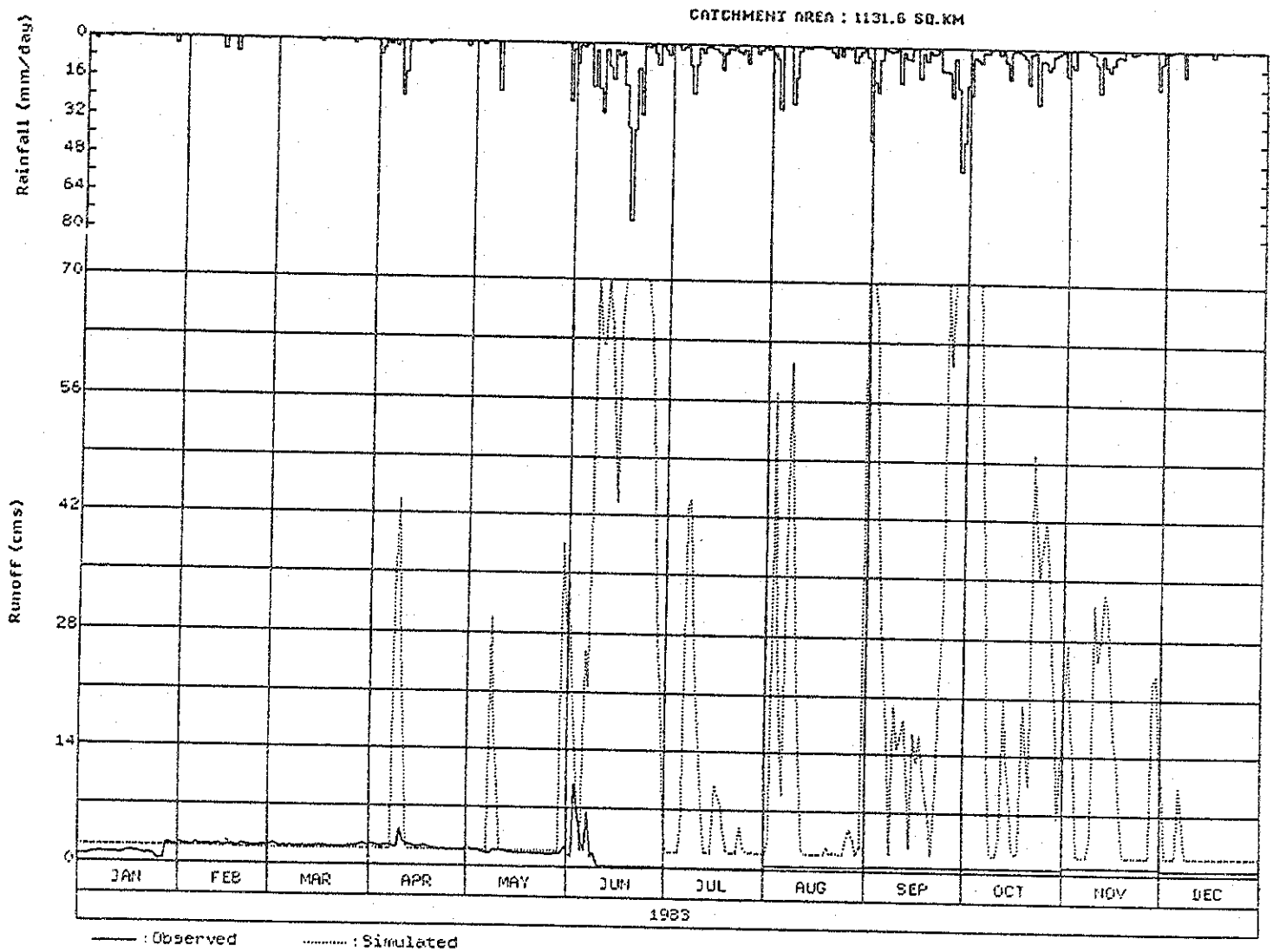

図4.2.6(2)　流出解析結果図 (2/4) －ﾗｽｲｸﾞｴﾗｽﾓﾃﾞﾙ 1983年－

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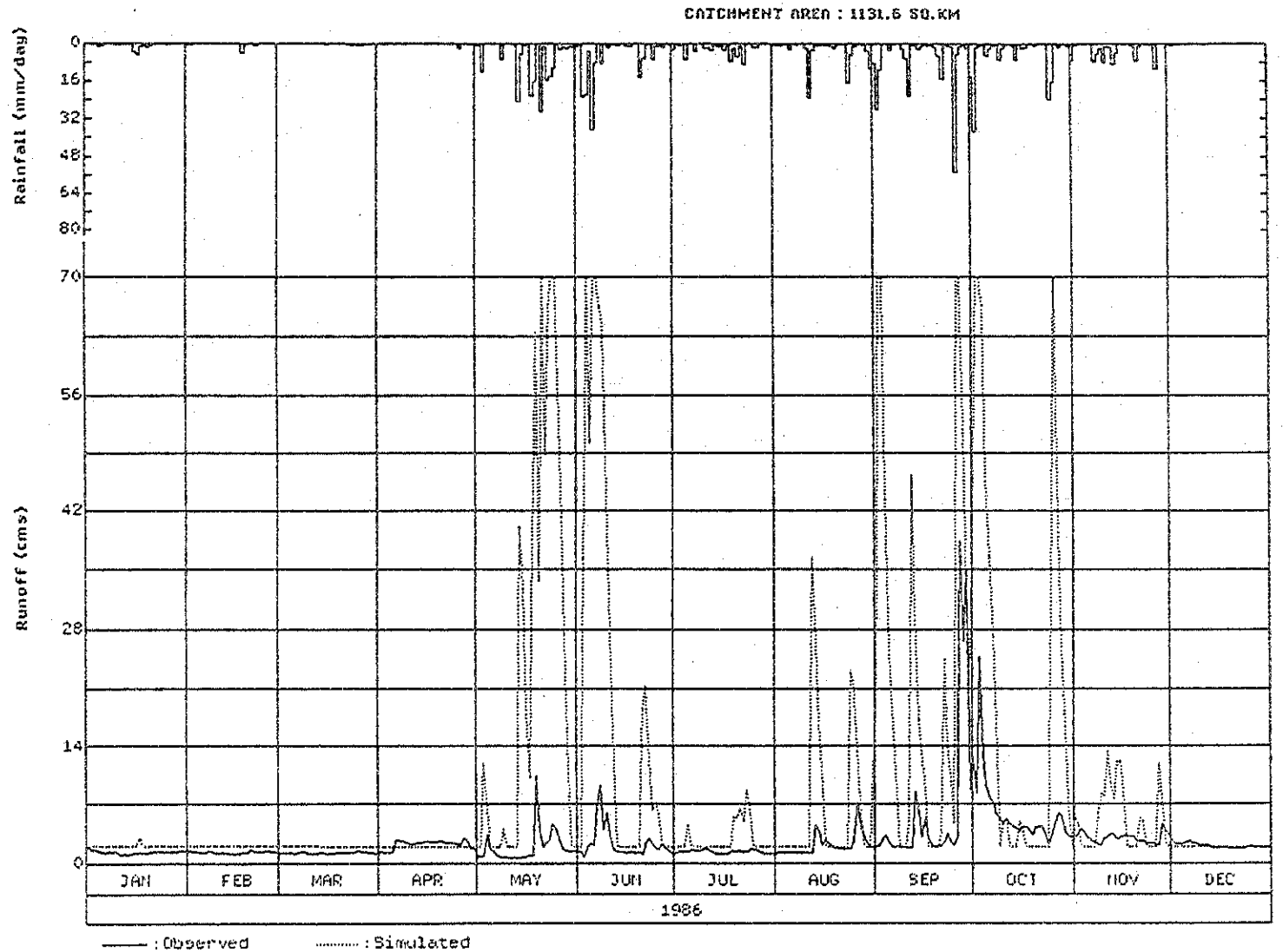

図4.2.6(3)　流出解析結果図 (3/4) －ﾗｽｲｸﾞｴﾗｽﾓﾃﾞﾙ 1986年－

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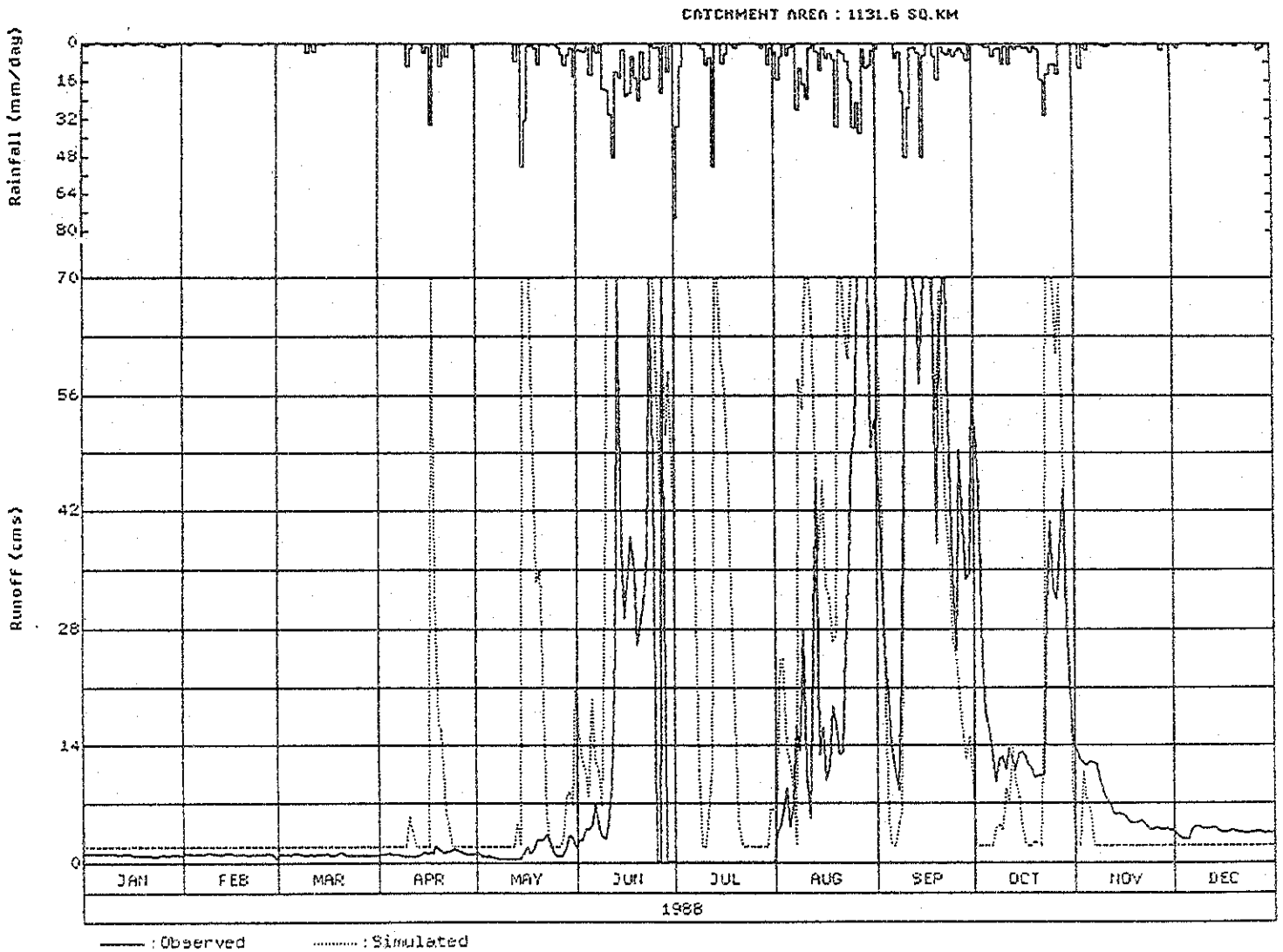

図4.2.6(4)　流出解析結果図 (4/4) ーﾗｽｲｸﾞｴﾗｽﾓﾃﾞﾙ 1988年ー

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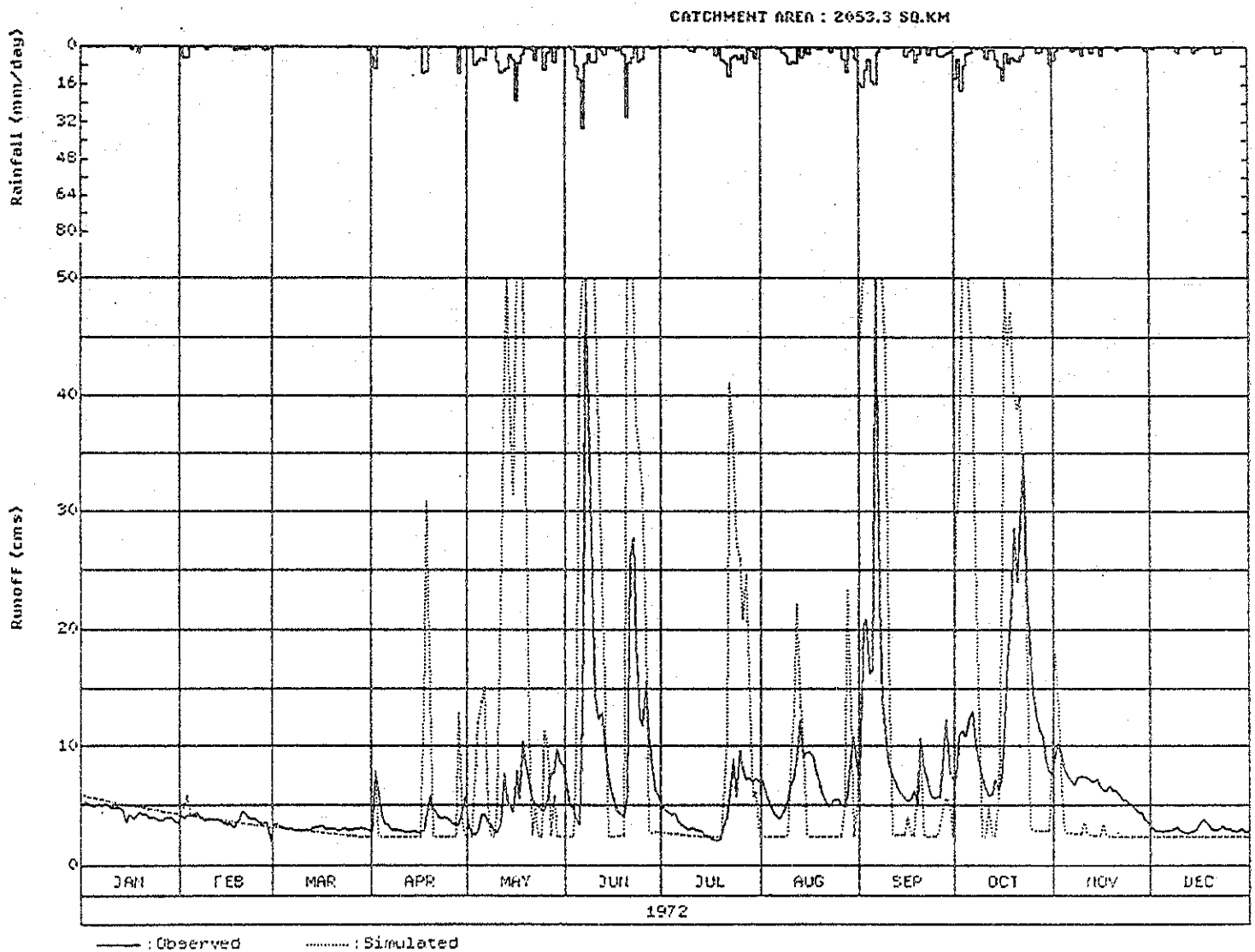

図4.2.7(1)　流出解析結果図 (1/4) －ｴﾝｶﾝﾀｰﾀﾞﾓﾃﾞﾙ 1972年－

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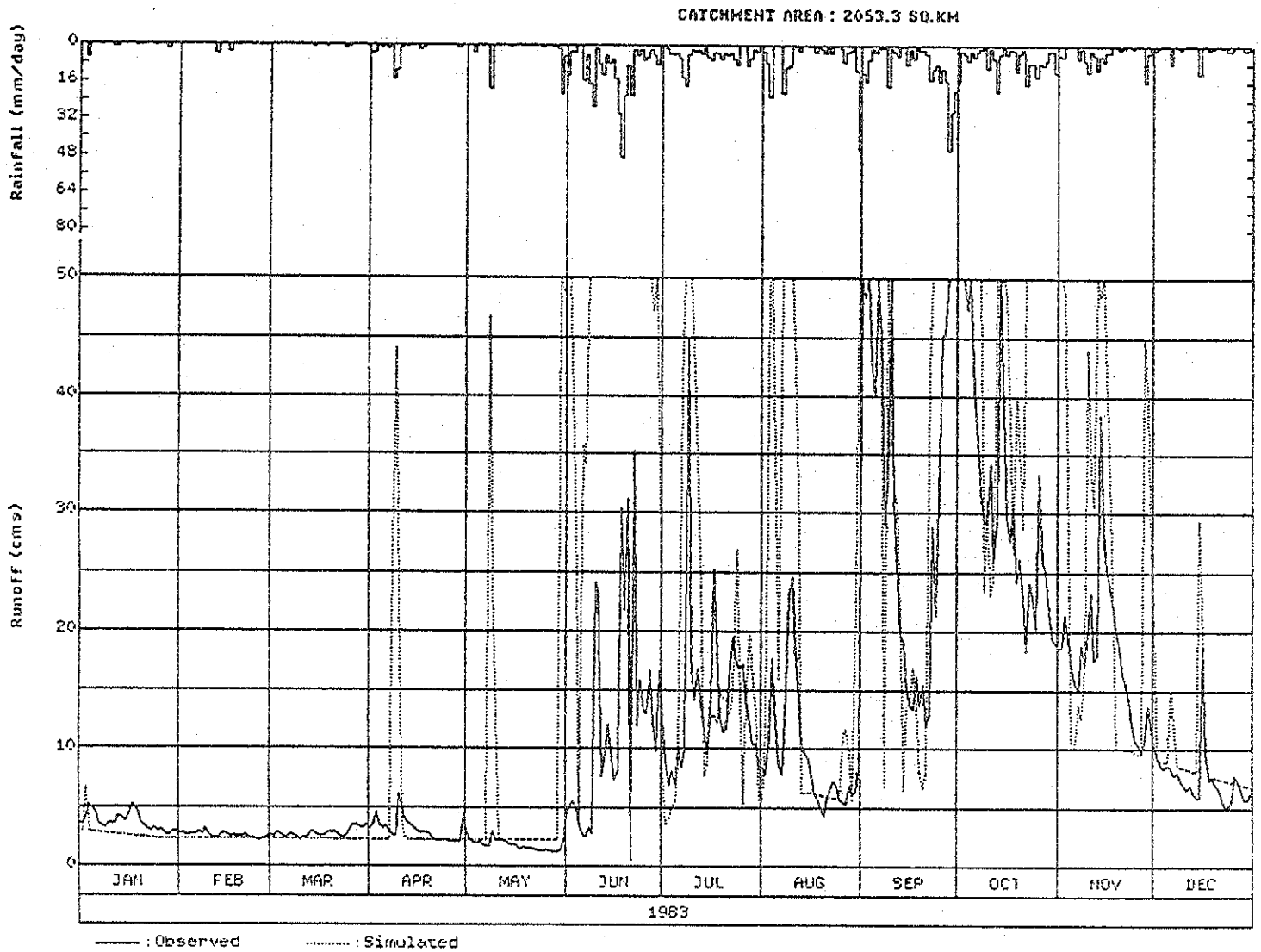

図4.2.7(2)　流出解析結果図 (2/4) －ｴﾝｶﾝﾀｰﾀﾞﾓﾃﾞﾙ 1983年－

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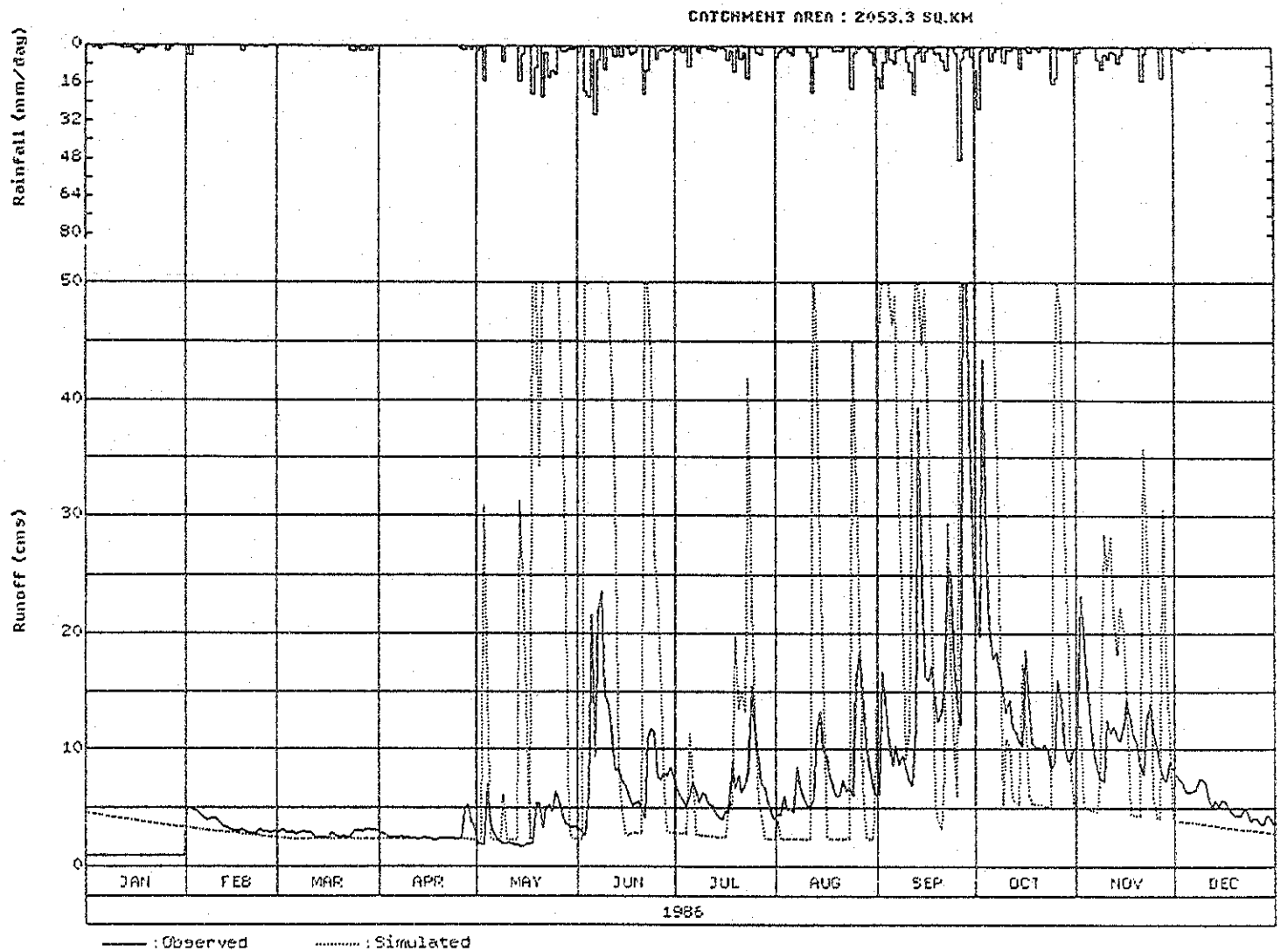

図4.2.7(3)　流出解析結果図 (3/4) －ｴﾝｶﾝﾀｰﾀﾞﾓﾃﾞﾙ 1986年－

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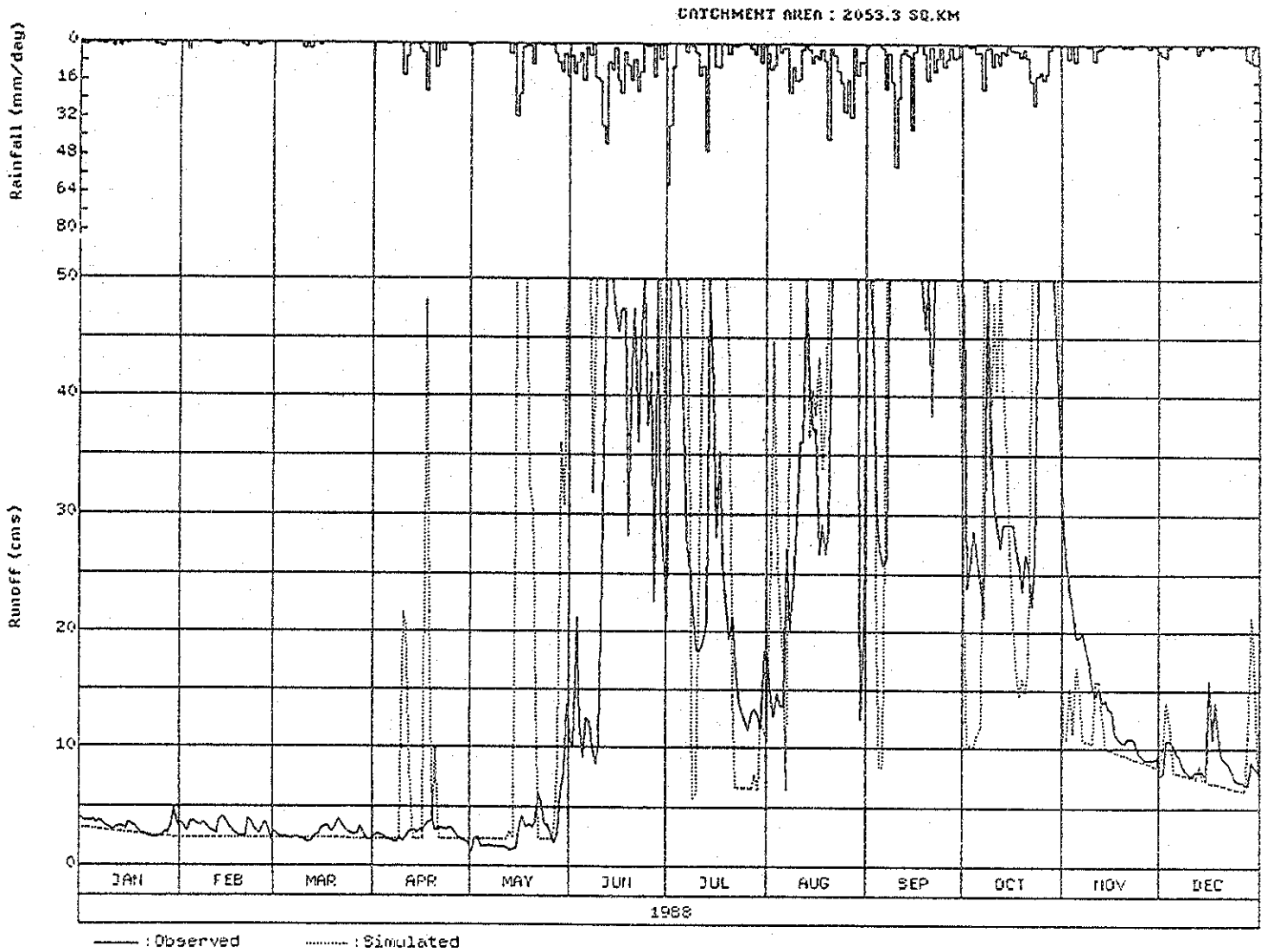

図4.2.7(4)　流出解析結果図 (4/4) －ｴﾝｶﾝﾀｰﾀﾞﾓﾃﾞﾙ 1988年－

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