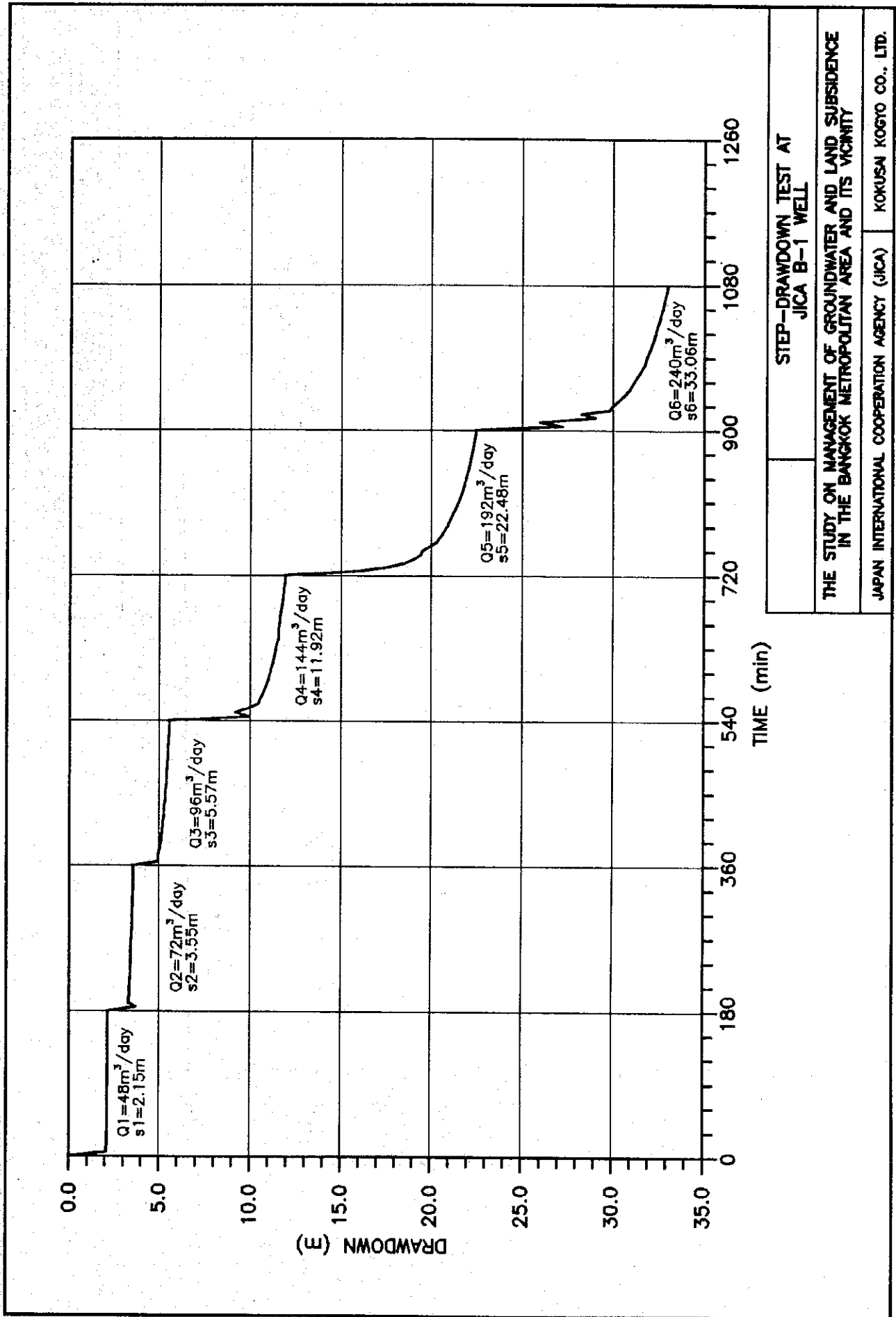


B. PUMPING TESTS

B.2 Pumping tests results of Site-B

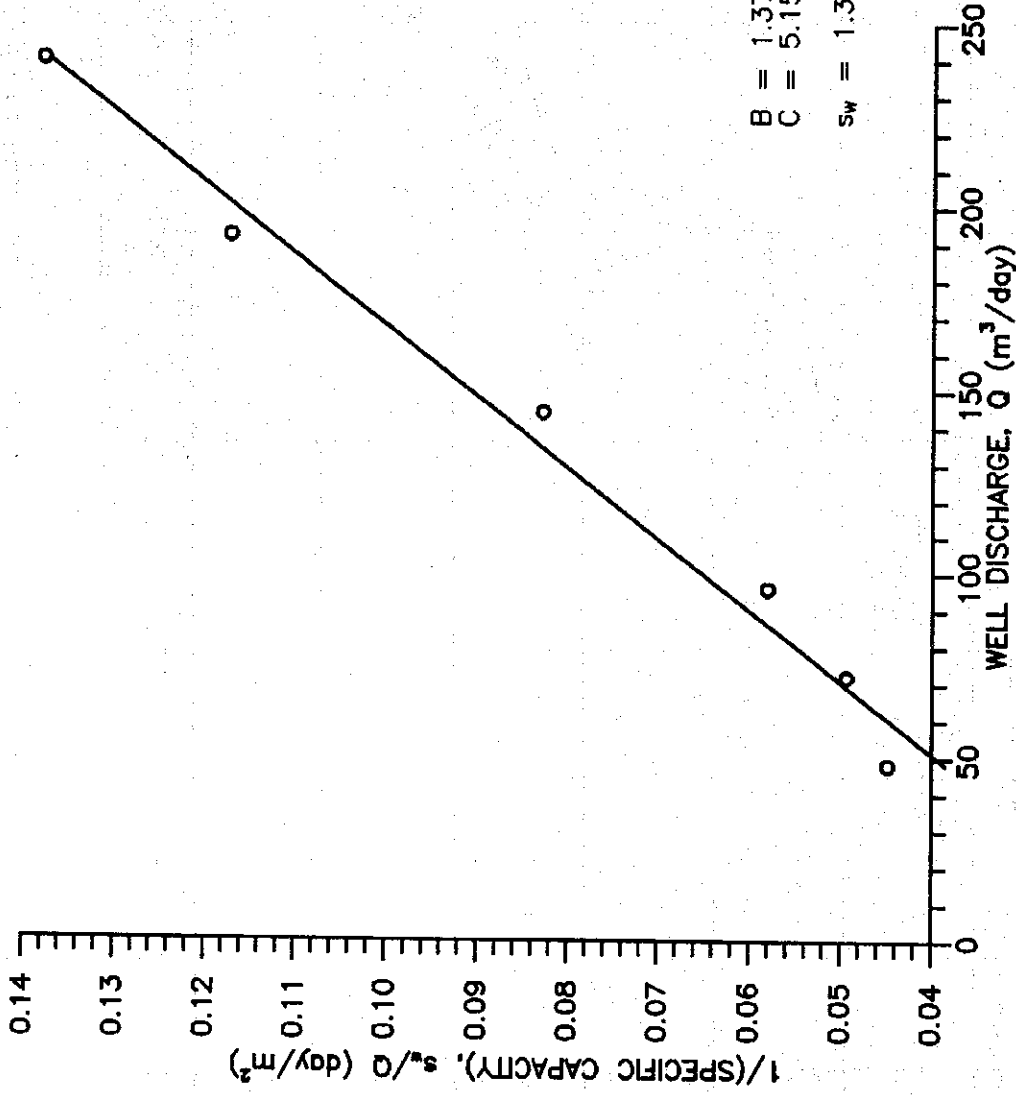


STEP-DRAWDOWN TEST AT
JICA B-1 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOKUSAI KOGYO CO., LTD.

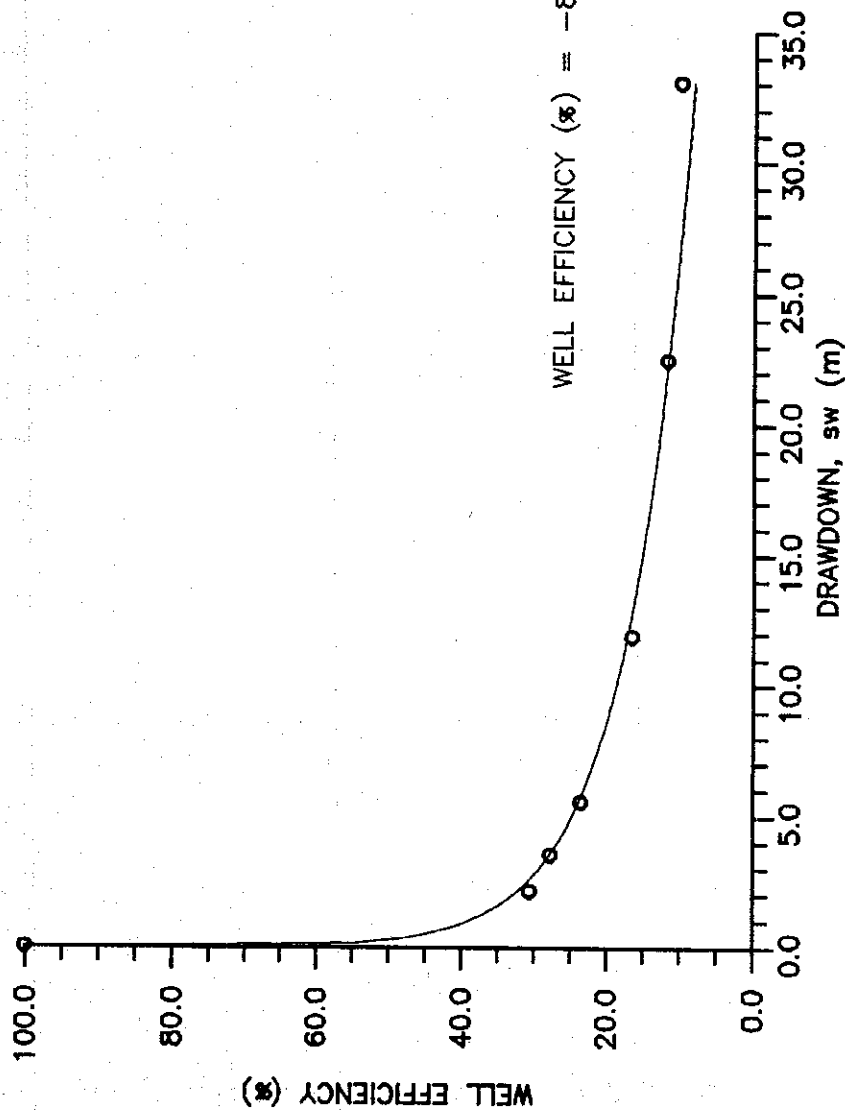


$$B = 1.37E-02 \left(\frac{\text{day}}{\text{m}^2} \right)$$

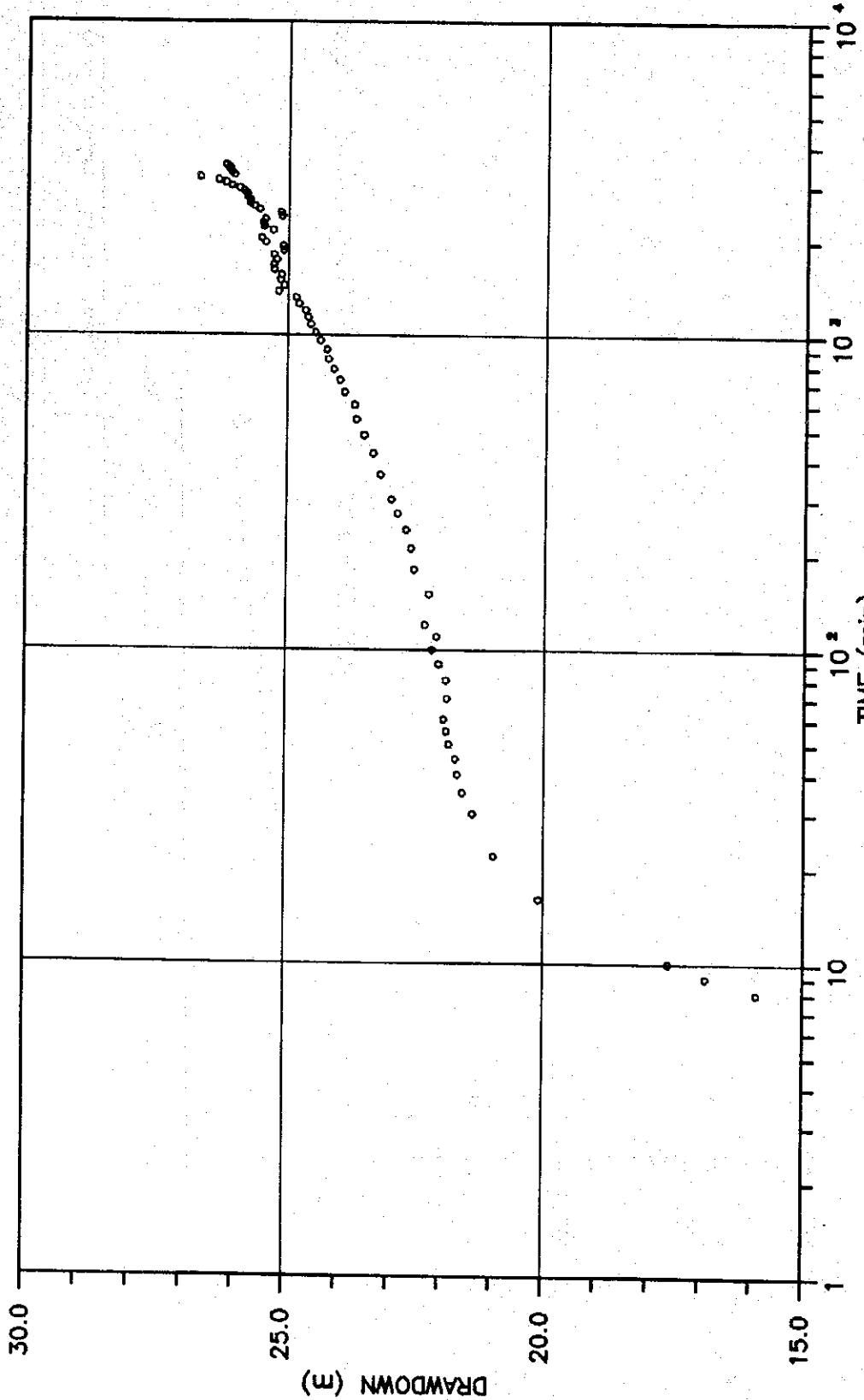
$$C = 5.15E-04 \left(\frac{\text{day}^2}{\text{m}^3} \right)$$

$$s_w = 1.37E-02 \times Q + 5.15E-04 \times Q^2$$

	DETERMINATION OF B AND C FROM STEP-DRAWDOWN TEST (JICA B-1 WELL)
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	KOKUSAI KOGYO CO., LTD.



VARIATION OF WELL EFFICIENCY WITH DRAWDOWN (JICA B-1 WELL)
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



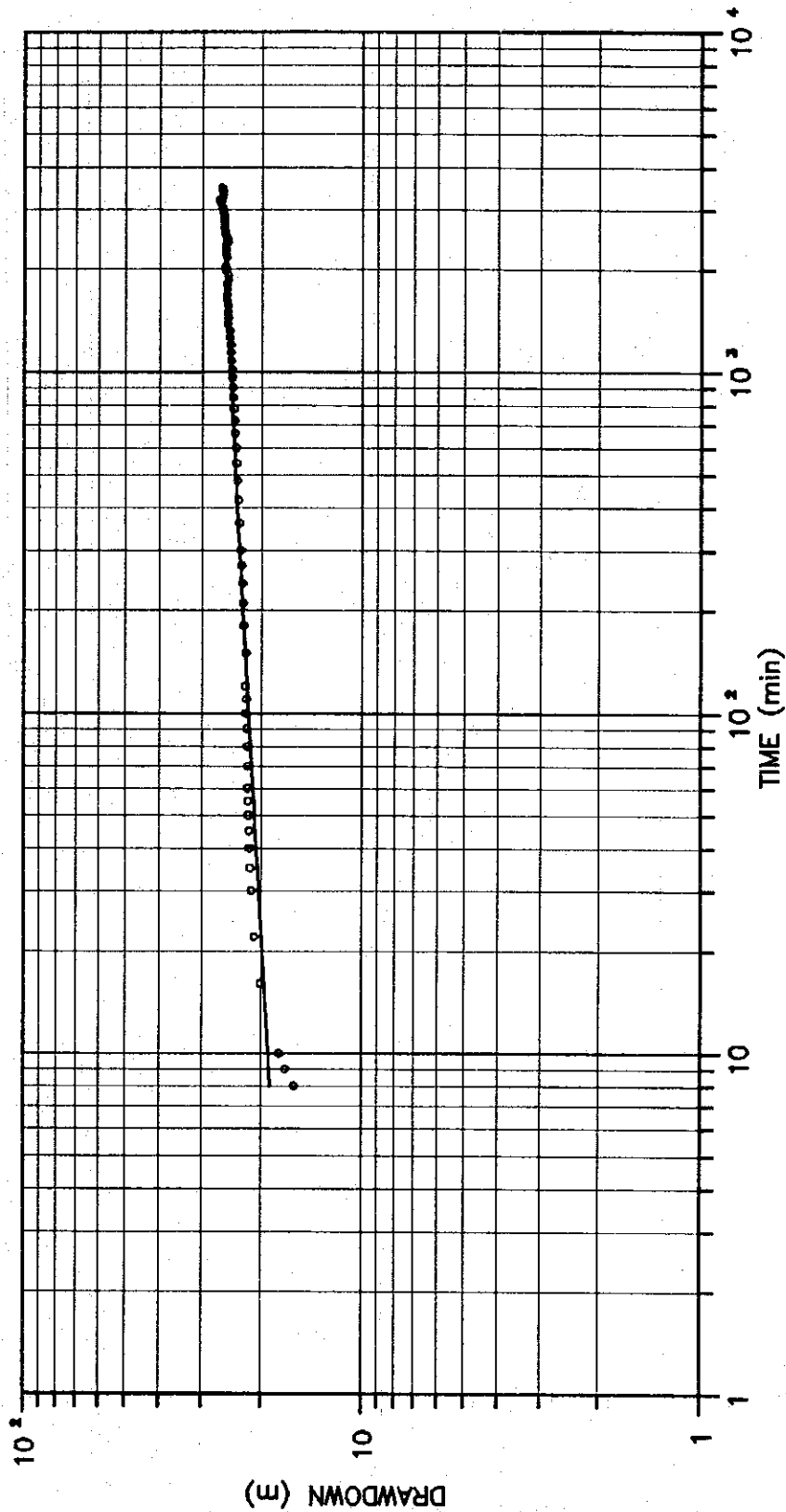
LOCATION : SITE-B (AIT)
 UTM GRID : 746568
 WELL DEPTH : 272.00m
 SCREEN DEPTH : 263.18-271.495m
 SCREEN LENGTH : 8.315m

DATE : 20-22 FEB. 1993
 DISCHARGE : 144.0 m³/day
 (100 l/min)
 STATIC W.L. : 35.05 m
 WELL RADIUS : 0.1016m

CONTINUOUS PUMPING TEST
 AT JICA B-1 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



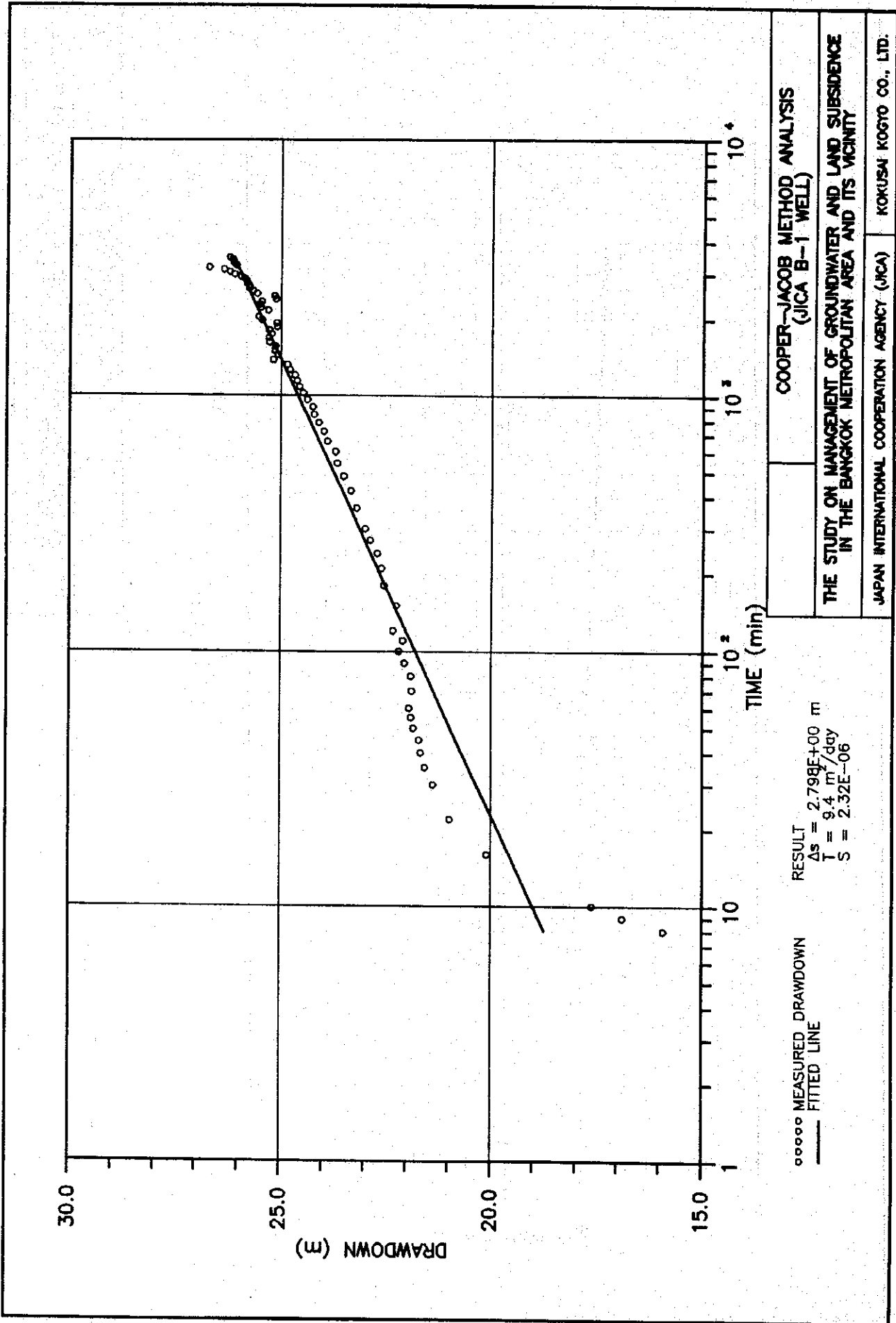
— COMPUTED DRAWDOWN
 ○○○○ MEASURED DRAWDOWN

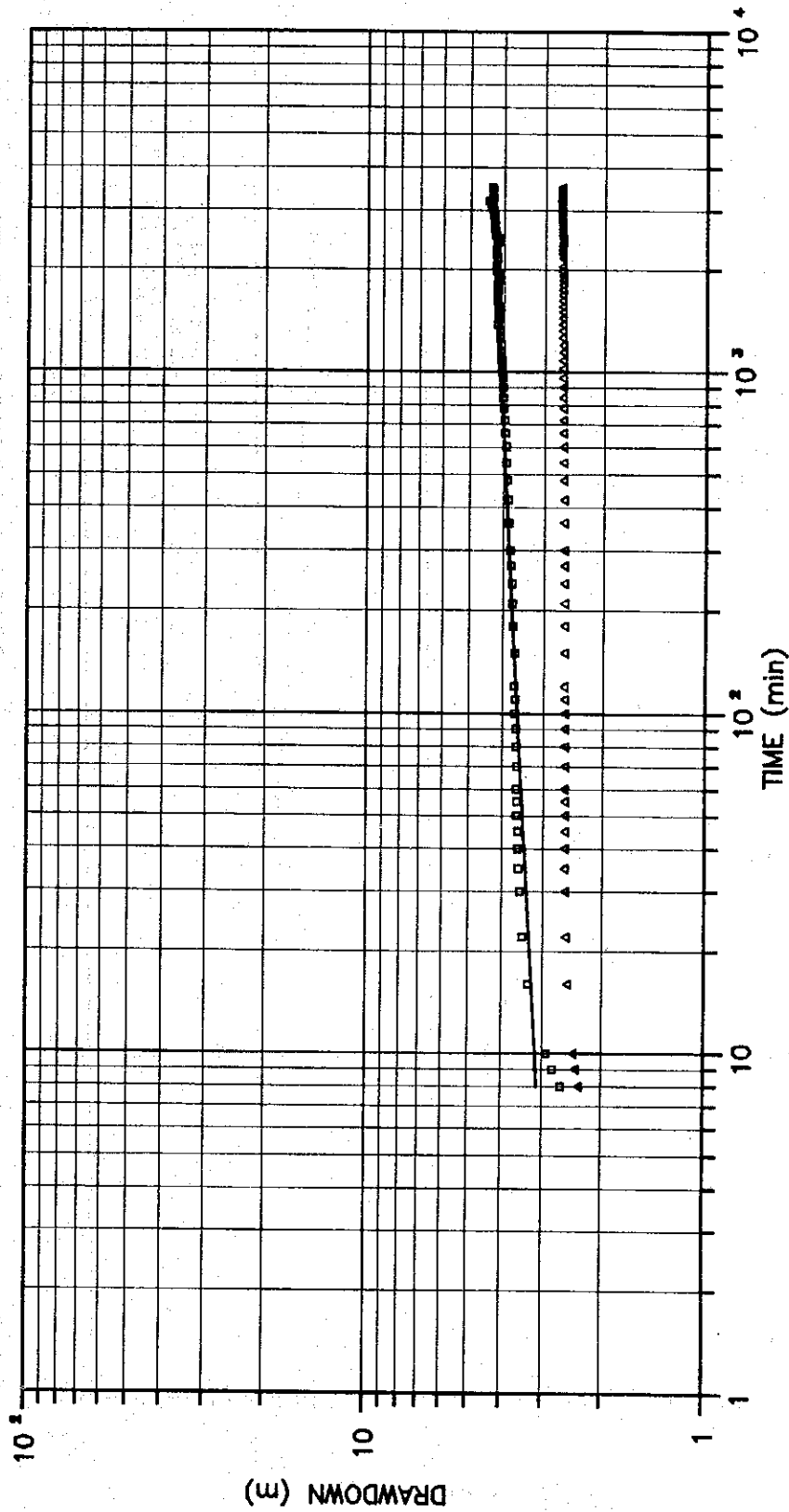
RESULT
 $T = 9.4 \text{ m}^2/\text{day}$
 $S = 2.32E-06$
 $SD = 5.65E-01 \text{ m}$

THEIR TYPE-CURVE MATCHING
 (JICA B-1 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

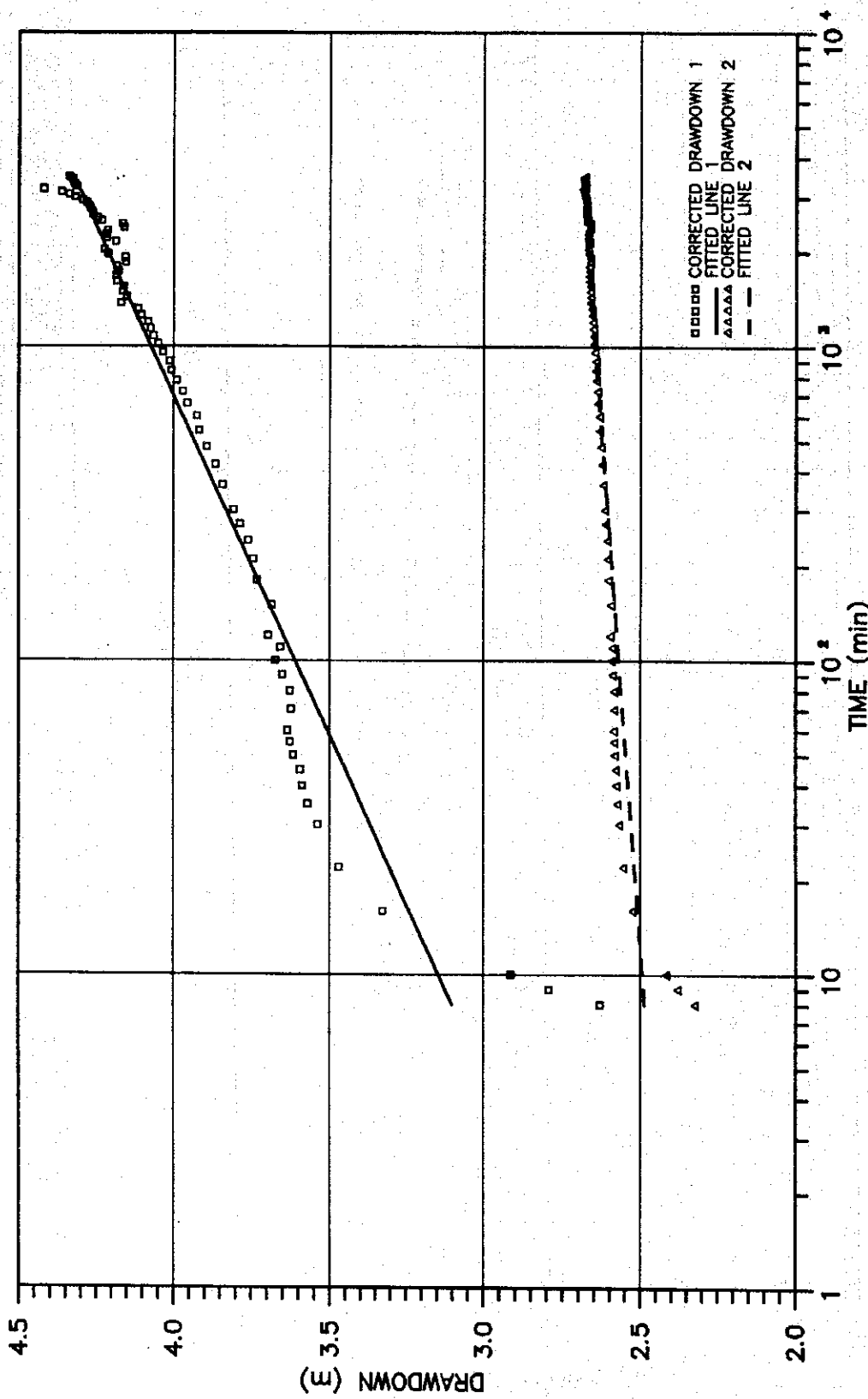




RESULT
 CORRECTED DRAWDOWN 1
 $T = 57.0 \text{ m/day}$
 $S = 1.40E-05$
 $SD = 9.36E-02 \text{ m}$
 CORRECTED DRAWDOWN 2
 Auto-matching is
 not applicable
 due to small u.

□□□□ CORRECTED DRAWDOWN 1
 ——— COMPUTED DRAWDOWN 1
 ▲▲▲▲ CORRECTED DRAWDOWN 2

	THIS TYPE-CURVE MATCHING USING CORRECTED DRAWDOWN (JICA B-1 WELL)
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	KOKUSAI KOSYO CO., LTD.



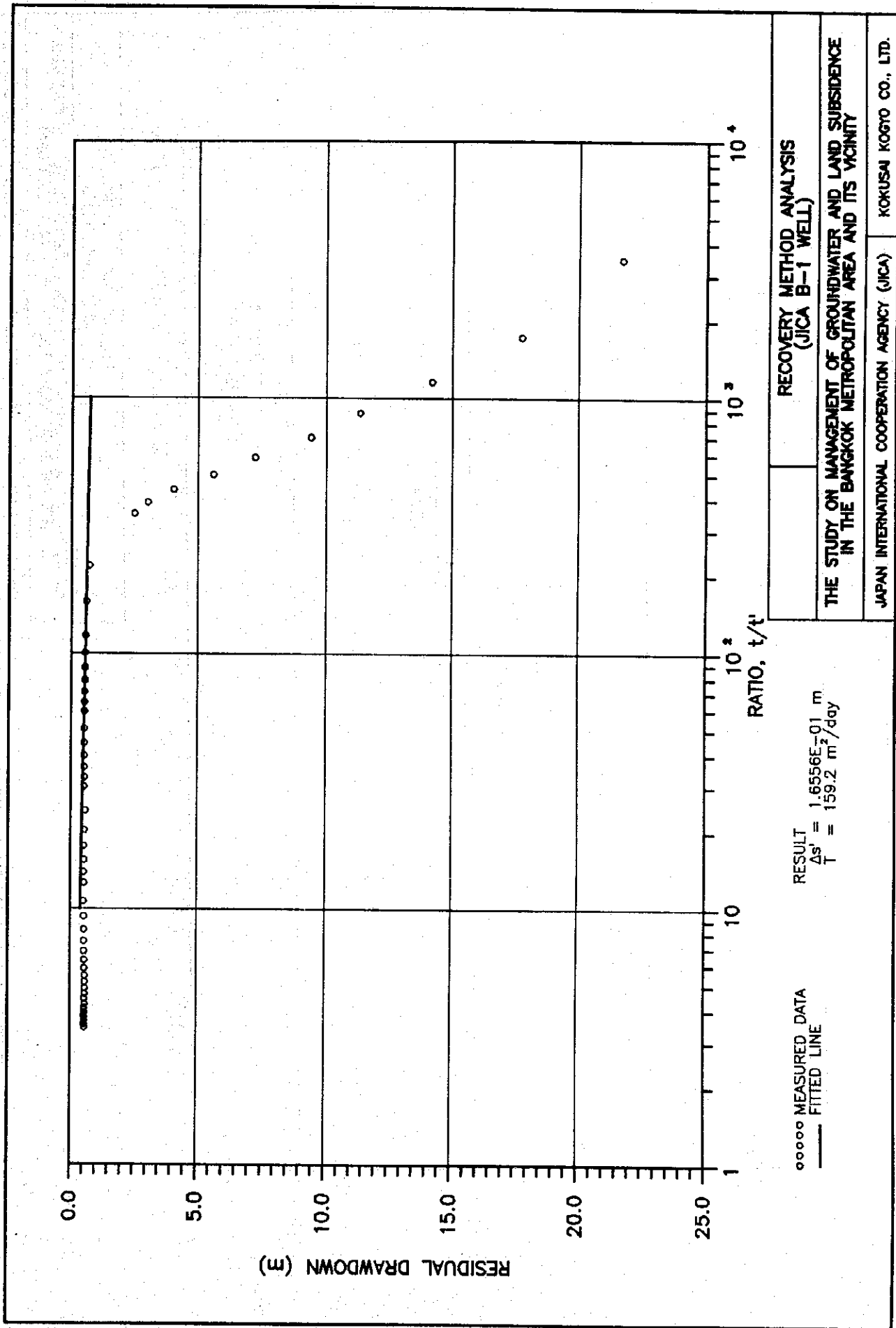
RESULT
 CORRECTED DRAWDOWN 1
 $\Delta s = 4.633E-01$ m
 $T = 56.9$ m²/day
 $S = 1.40E-05$

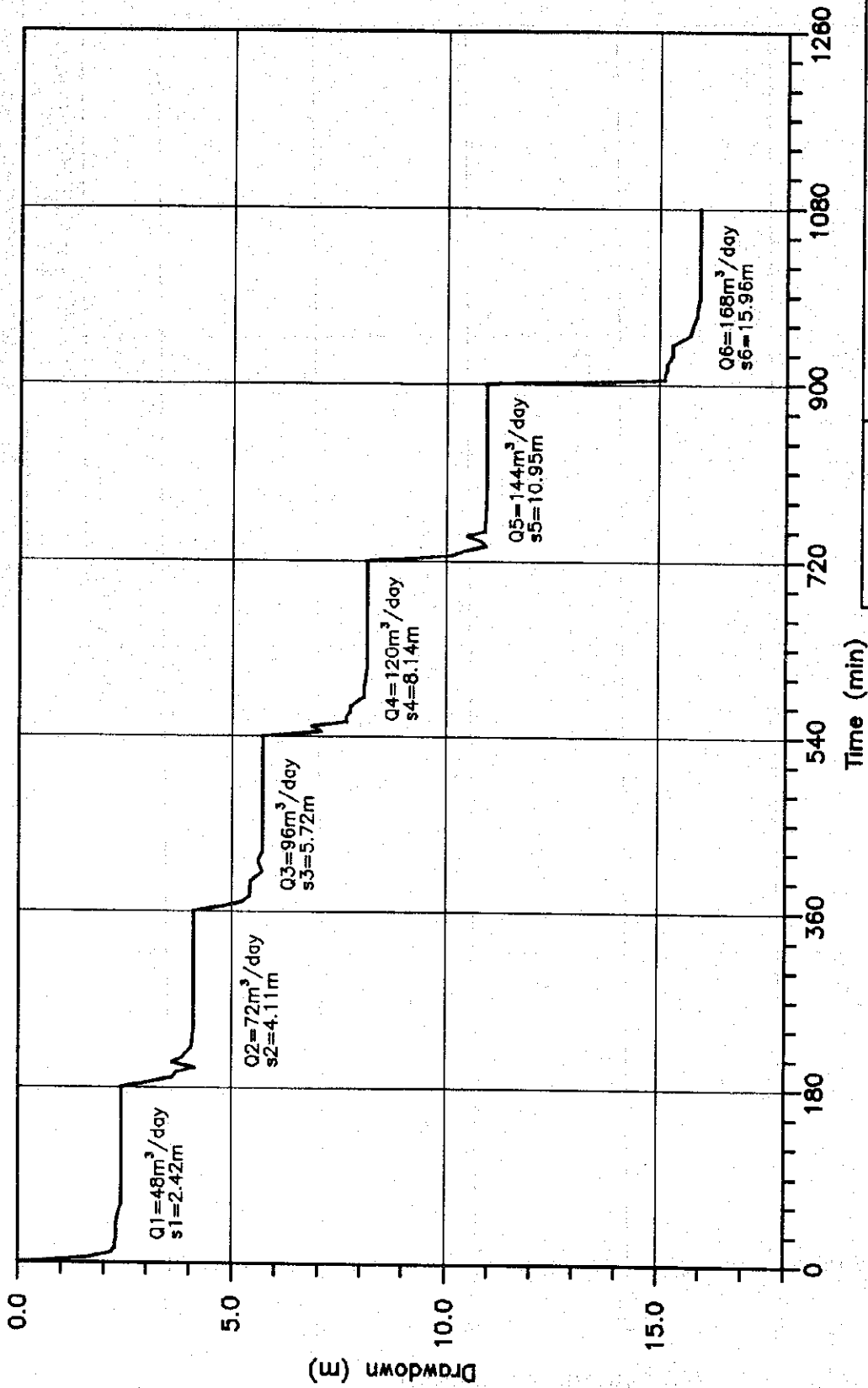
CORRECTED DRAWDOWN 2
 $\Delta s = 7.806E-02$ m
 $T = 337.7$ m²/day
 $S = 6.01E-30$

COOPER-JACOB METHOD ANALYSIS USING
 CORRECTED DRAWDOWN (JICA B-1 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

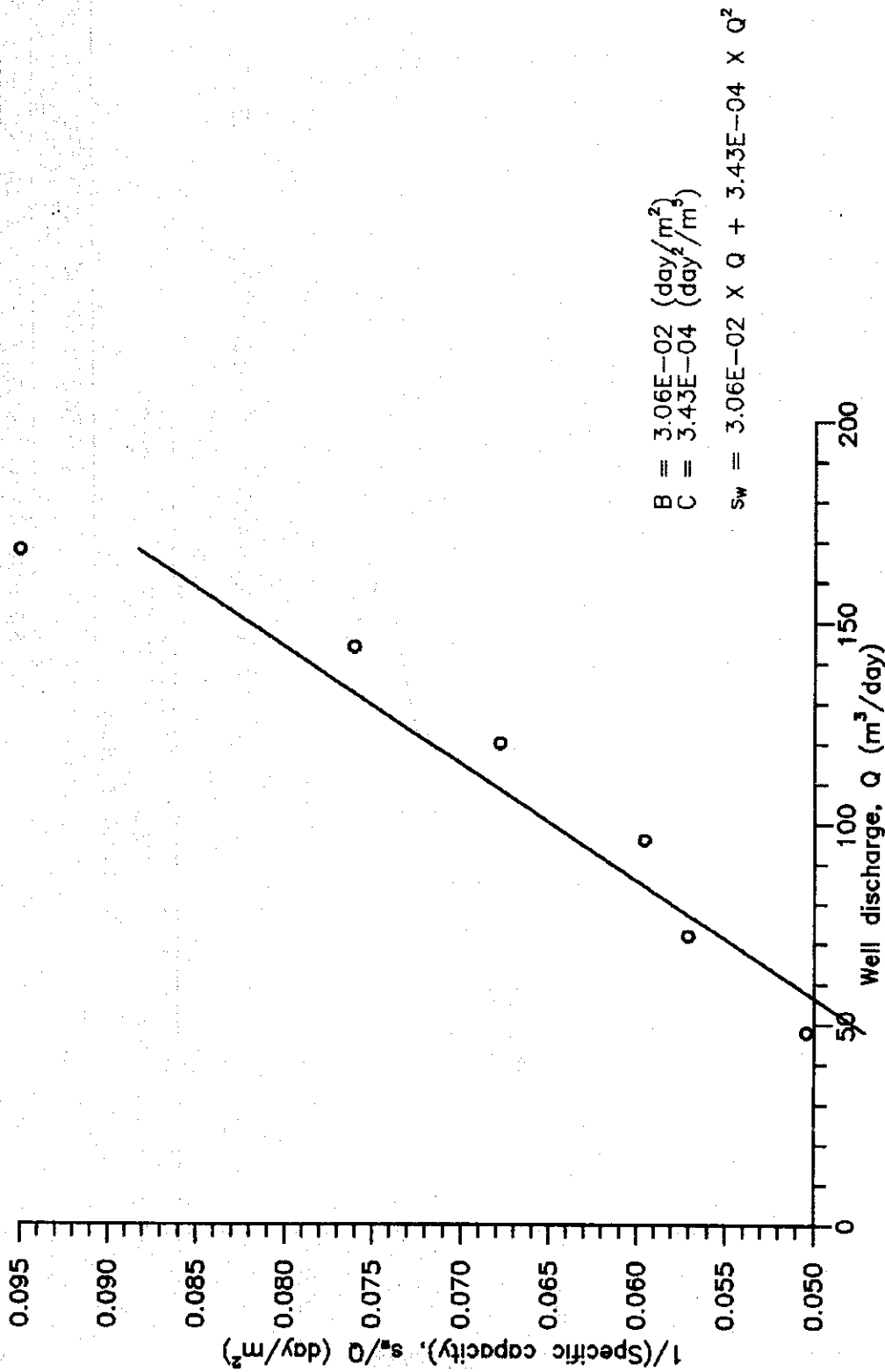




STEP-DRAWDOWN TEST AT
JICA B-2 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

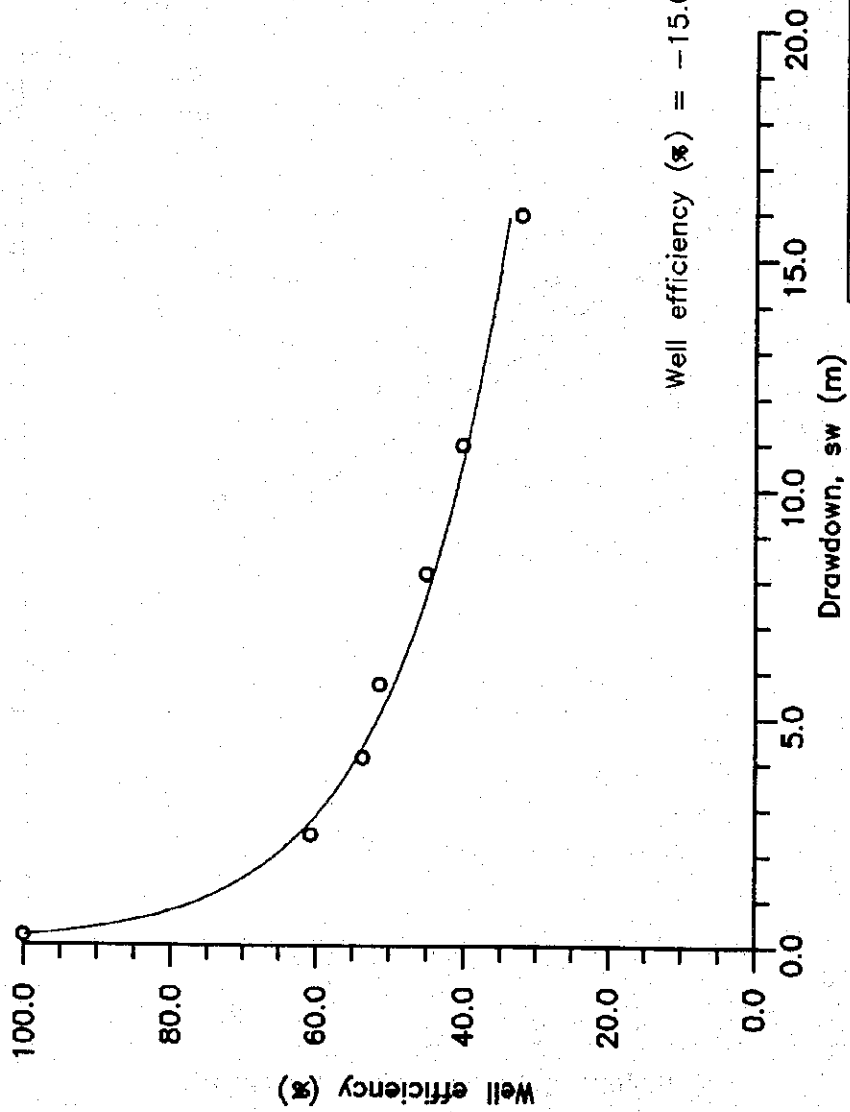
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



**DETERMINATION OF B AND C FROM
 STEP-DRAWDOWN TEST (JICA B-2 WELL)**

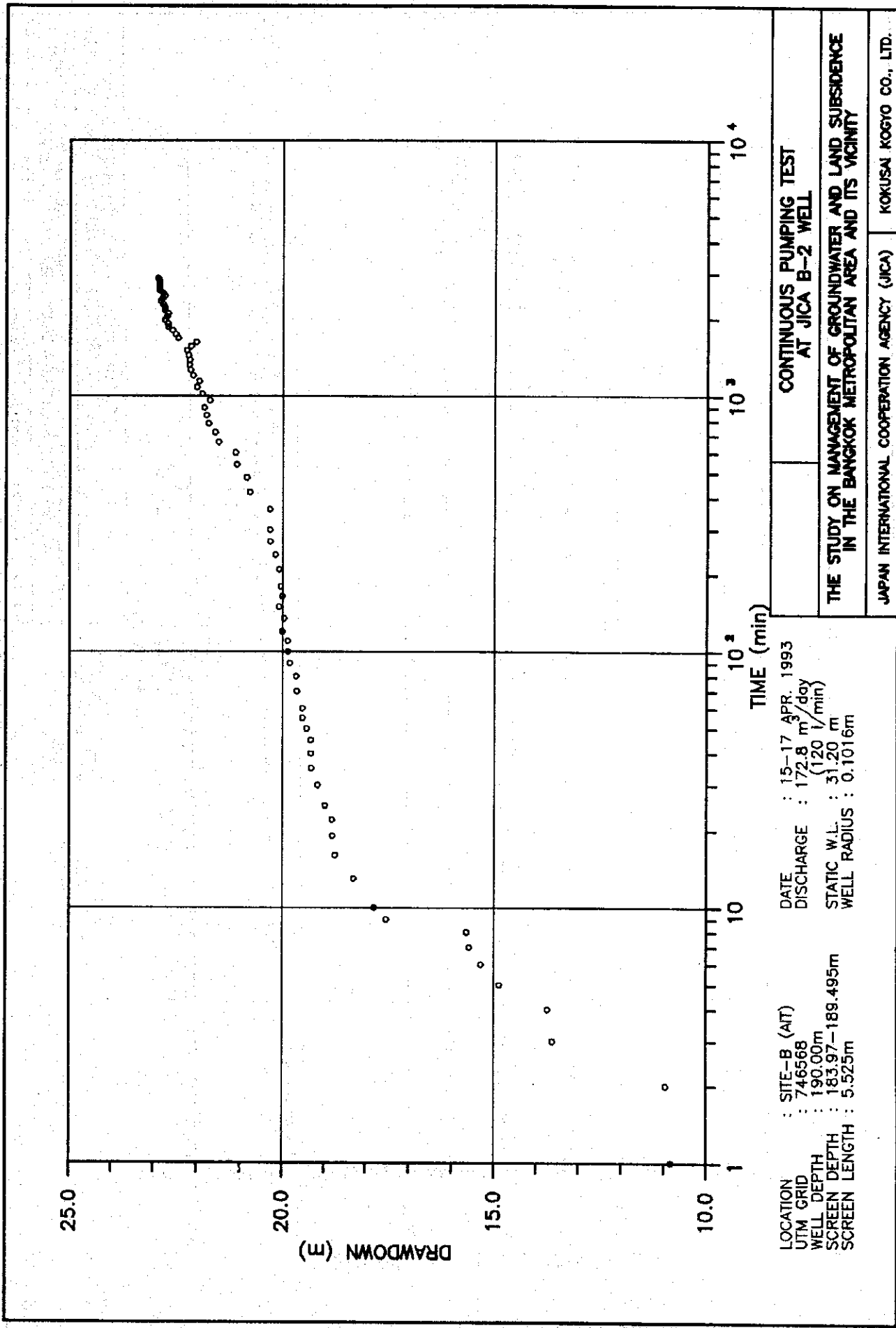
**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



$$\text{Well efficiency (\%)} = -15.0466 \times \text{LN}(\text{sw}) + 75.5787$$

	VARIATION OF WELL EFFICIENCY WITH DRAWDOWN (JICA B-2 WELL)
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	KOKUSAI KOGYO CO., LTD.

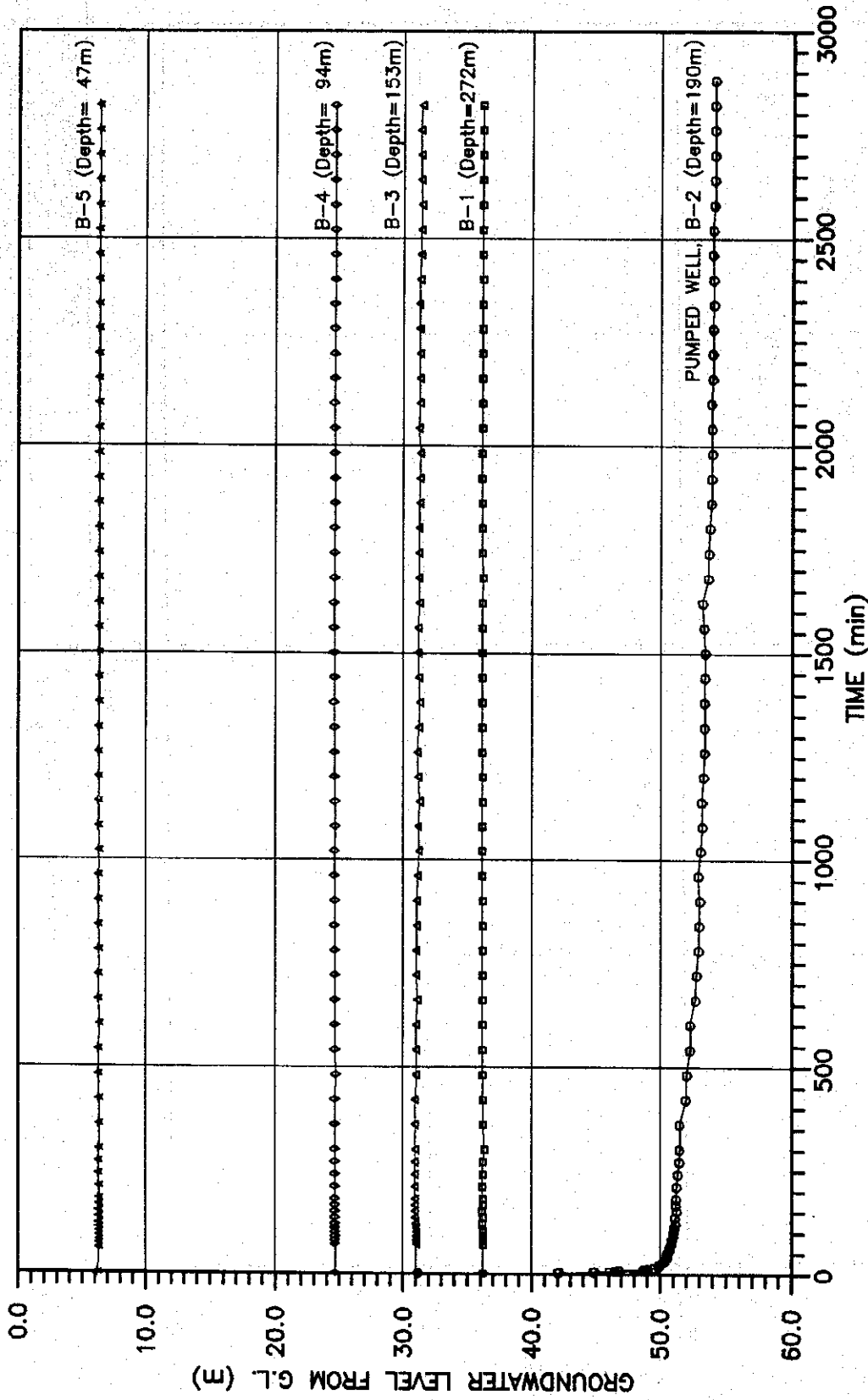


LOCATION : SITE-B (AIT)
 UTM GRID : 746568
 WELL DEPTH : 190.00m
 SCREEN DEPTH : 183.97-189.495m
 SCREEN LENGTH : 5.525m
 DATE : 15-17 APR. 1993
 DISCHARGE : 172.8 m³/day
 (120 l/min)
 STATIC W.L. : 31.20 m
 WELL RADIUS : 0.1016m

CONTINUOUS PUMPING TEST
AT JICA B-2 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.

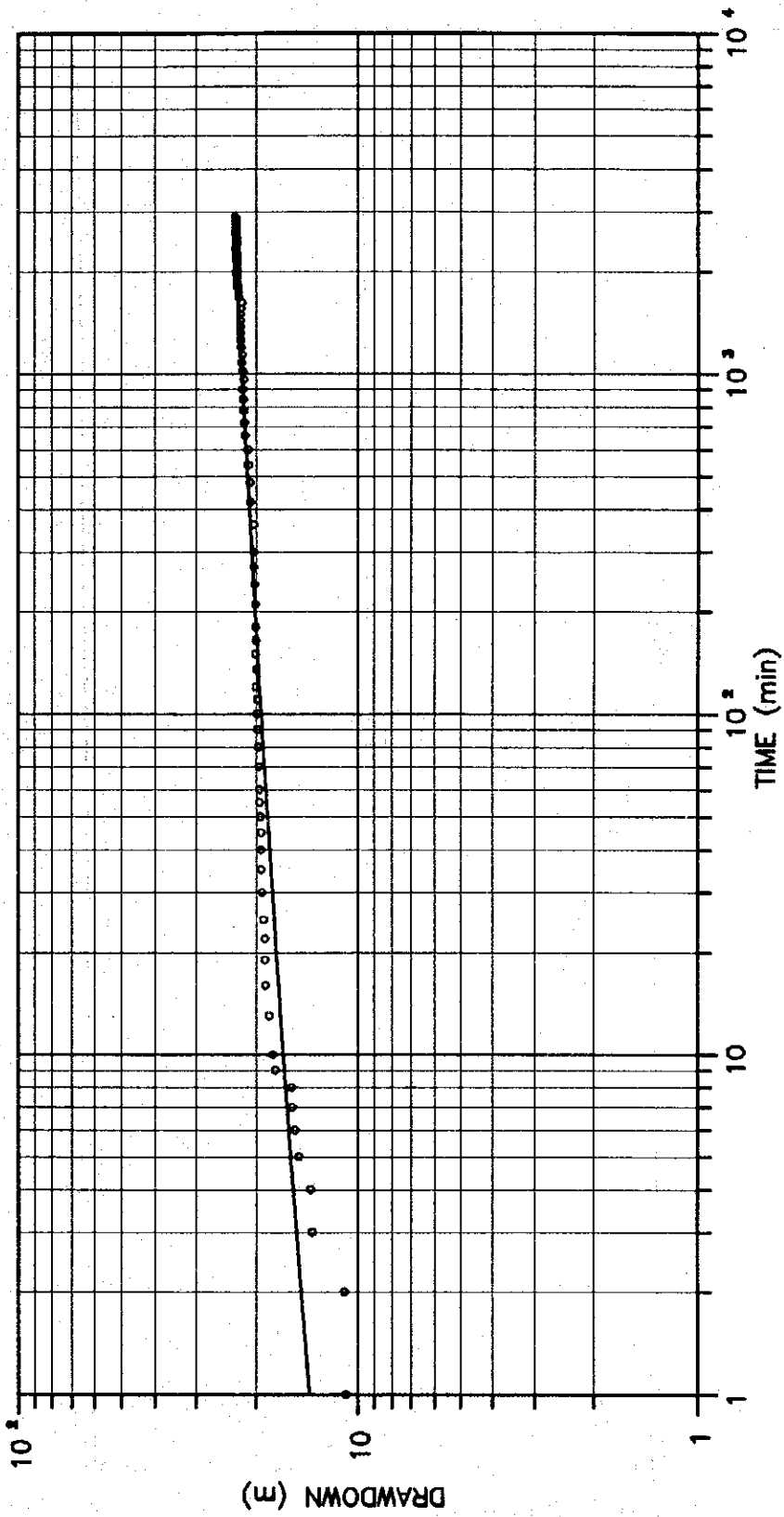


DATE : 15-17 APR. 1993
 PUMPED WELL : JICA B-2 WELL
 DISCHARGE : 172.8 m³/day
 (120 l/min)

GROUNDWATER LEVEL CHANGES DURING
 CONTINUOUS PUMPING TEST AT JICA B-2 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



RESULT
 $T = 11.6 \text{ m}^2/\text{day}$
 $S = 1.42E-05$
 $SD = 8.44E-01 \text{ m}$

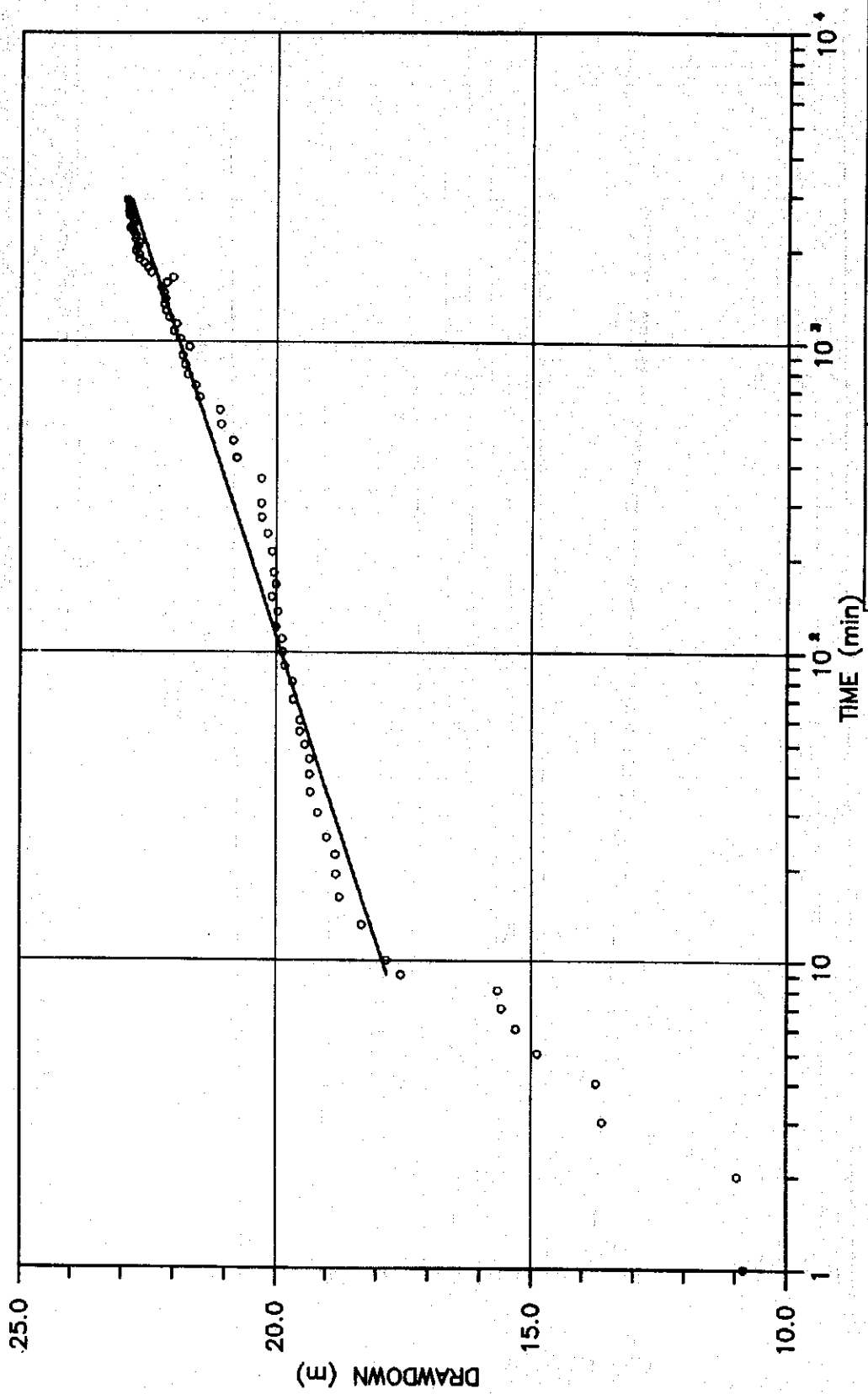
— COMPUTED DRAWDOWN
 ○○○○ MEASURED DRAWDOWN

THEIR TYPE-CURVE MATCHING
 (JICA B-2 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOKUSAI KOGYO CO., LTD.

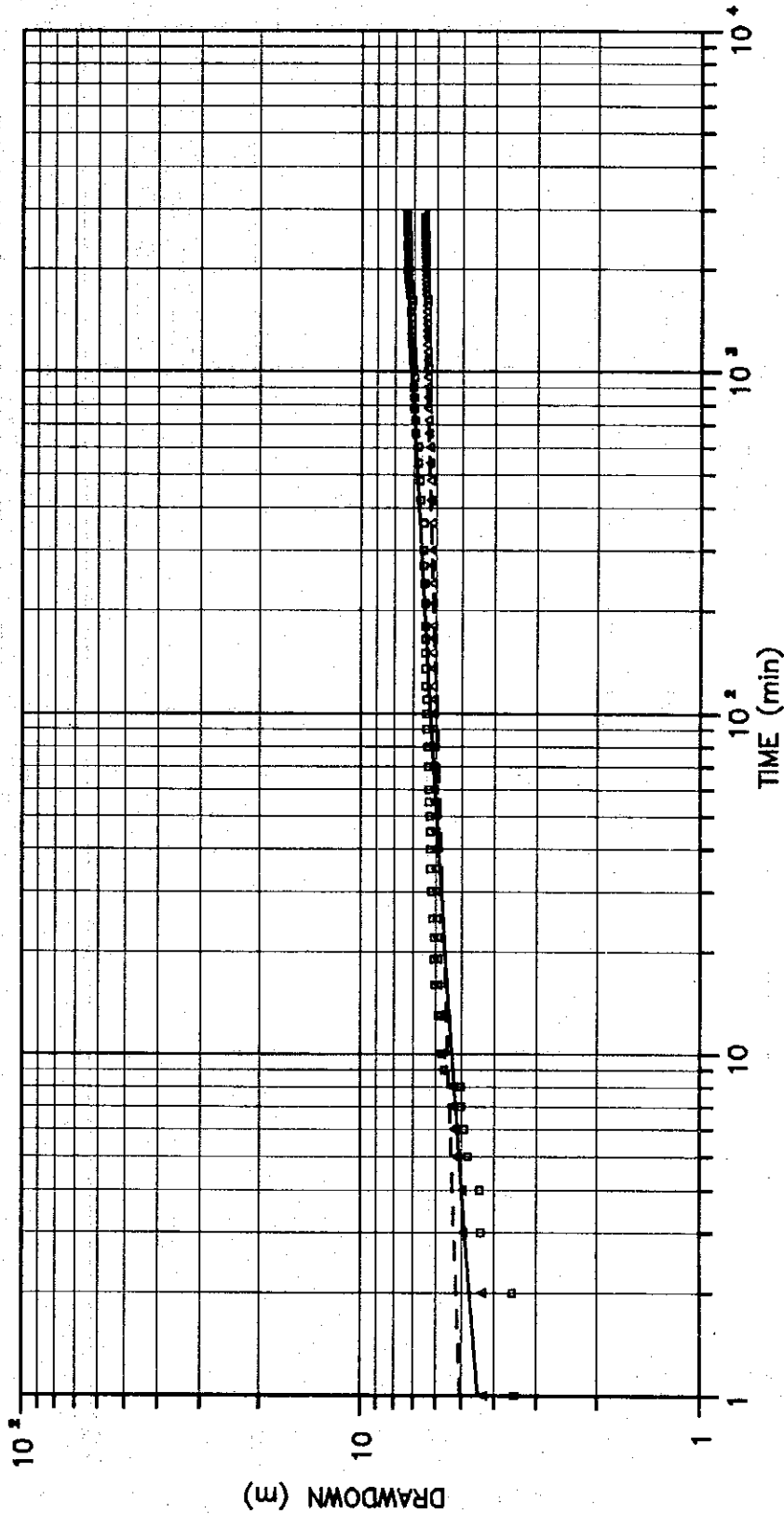


RESULT
 $\Delta s = 2.005E+00$ m
 $T = 15.8$ m²/day
 $S = 2.88E-08$

COOPER-JACOB METHOD ANALYSIS
 (JICA B-2 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



RESULT
 CORRECTED DRAWDOWN 1
 $T = 36.2 \text{ m}^2/\text{day}$
 $S = 4.42E-05$
 $SD = 2.72E-01 \text{ m}$
 CORRECTED DRAWDOWN 2
 $T = 69.9 \text{ m}^2/\text{day}$
 $S = 7.86E-11$
 $SD = 1.83E-01 \text{ m}$

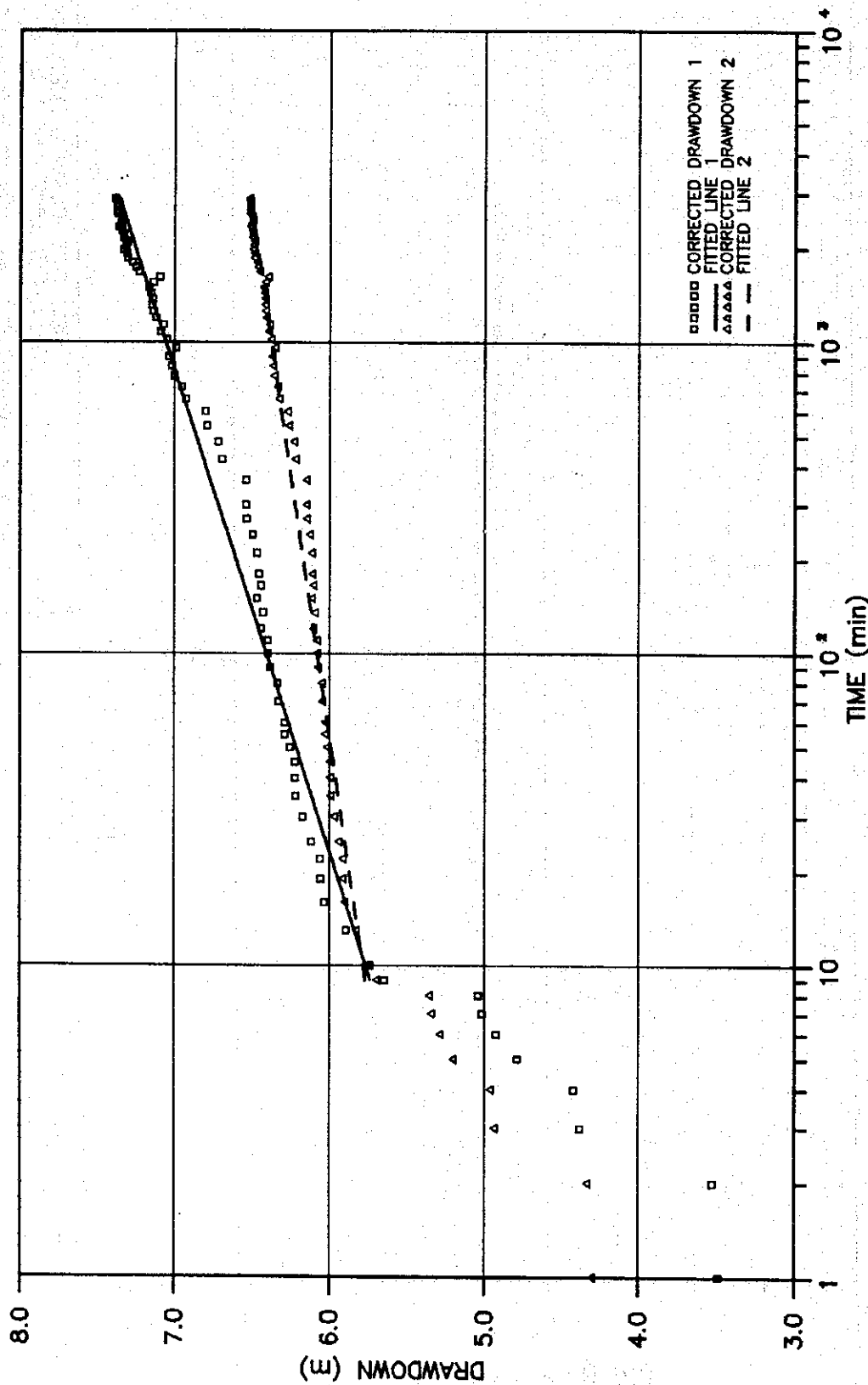
□ □ □ □ CORRECTED DRAWDOWN 1
 ——— COMPUTED DRAWDOWN 1
 ▲ ▲ ▲ ▲ CORRECTED DRAWDOWN 2
 - - - COMPUTED DRAWDOWN 2

THEIR TYPE-CURVE MATCHING USING
 CORRECTED DRAWDOWN (JICA B-2 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOKUSAI KOGYO CO., LTD.



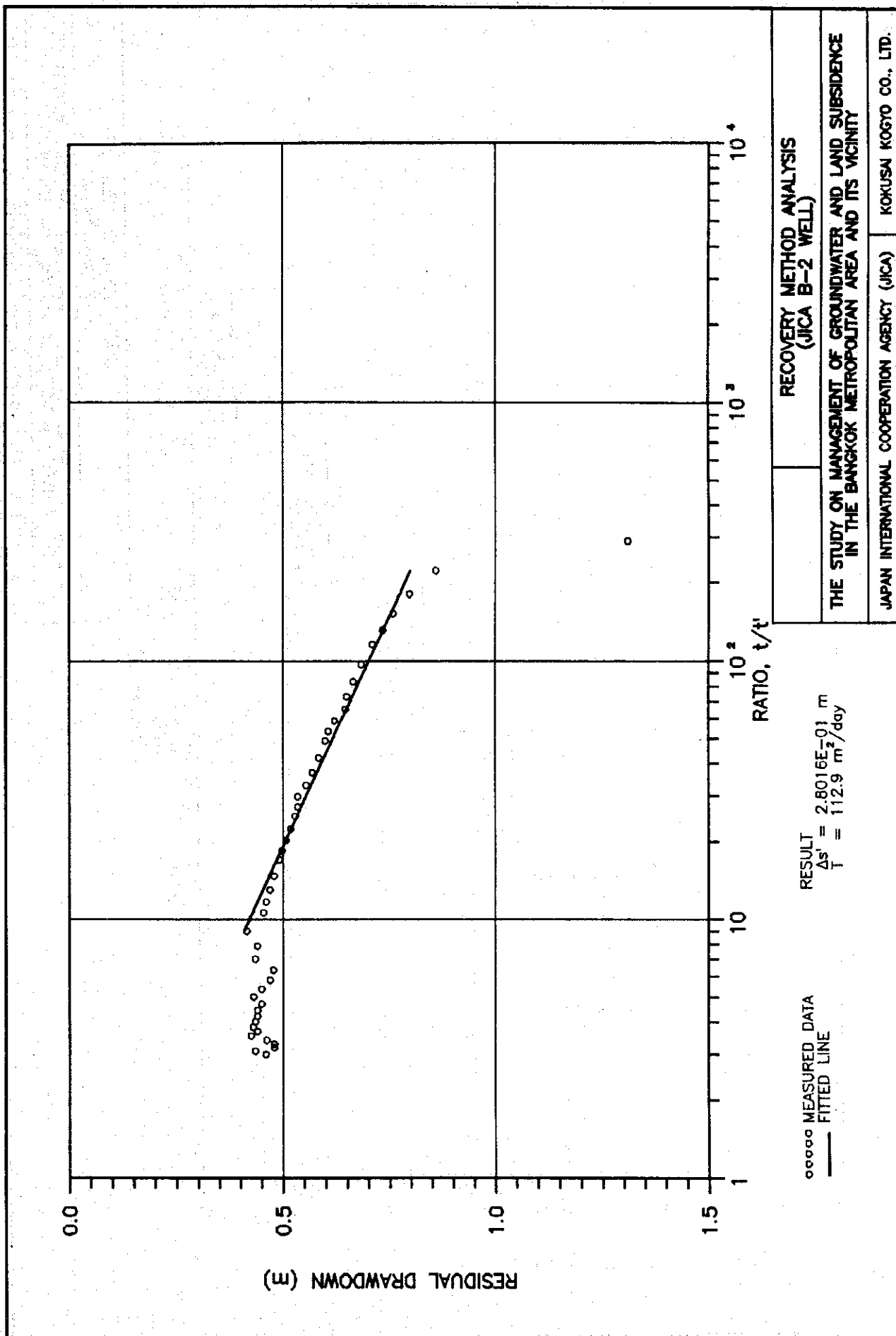
RESULT
 CORRECTED DRAWDOWN 1
 $\Delta s = 6.458E-01$ m
 $T = 49.0$ m/day
 $S = 8.92E-08$

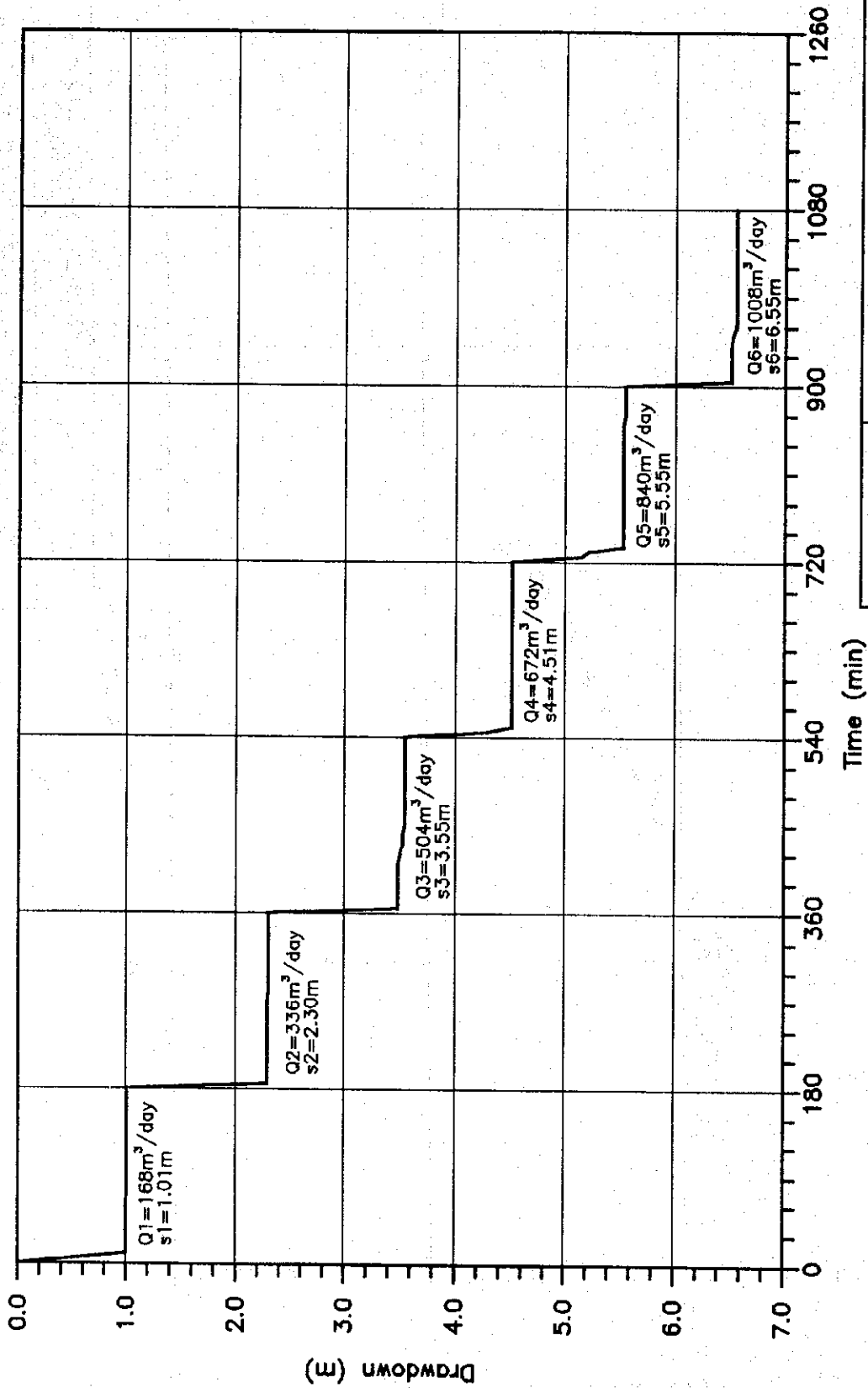
CORRECTED DRAWDOWN 2
 $\Delta s = 2.995E-01$ m
 $T = 105.6$ m/day
 $S = 8.13E-18$

COOPER-JACOB METHOD ANALYSIS USING
 CORRECTED DRAWDOWN (JICA B-2 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



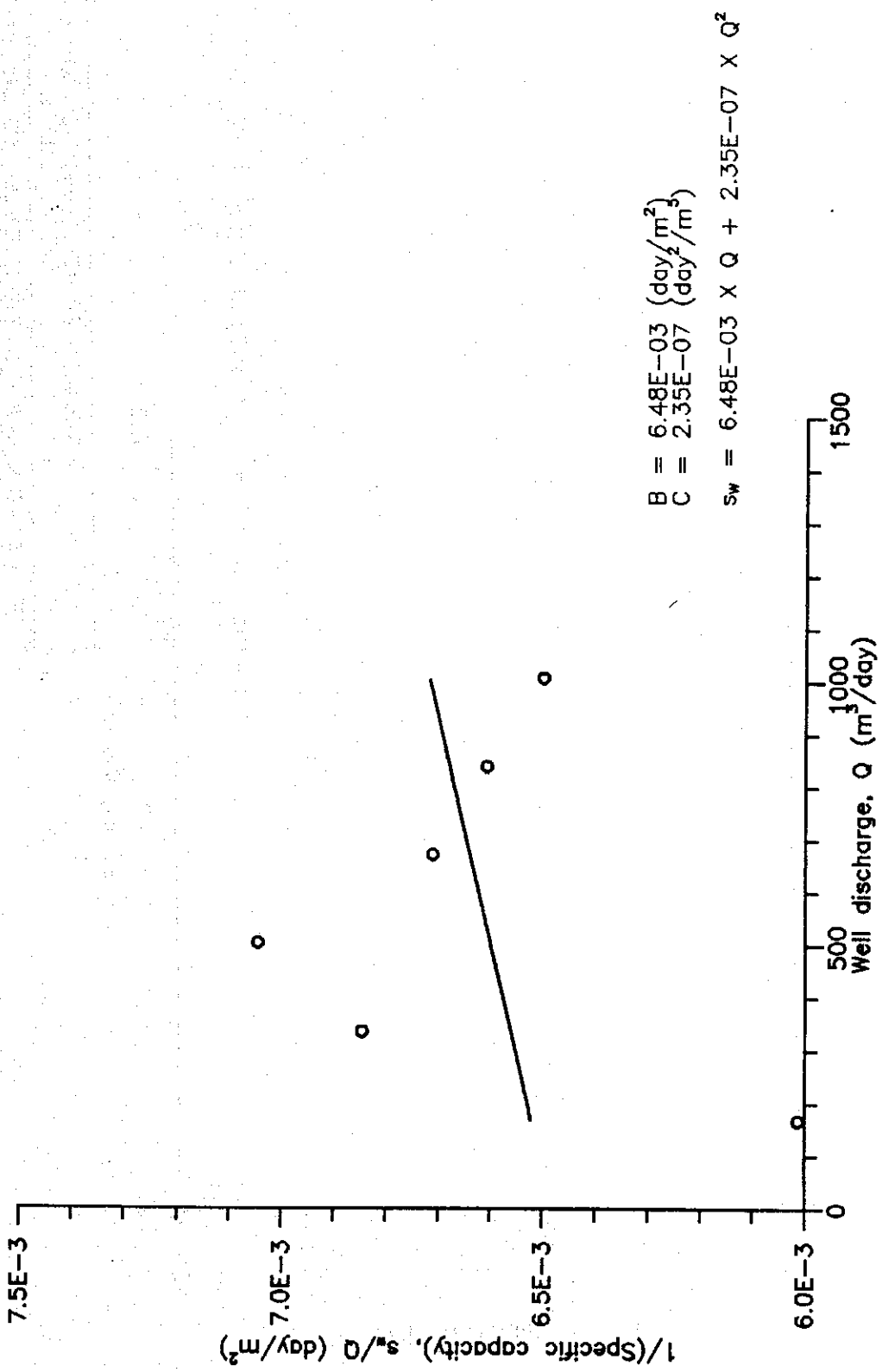


STEP-DRAWDOWN TEST AT
JICA B-3 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOKUSAI KOGYO CO., LTD.

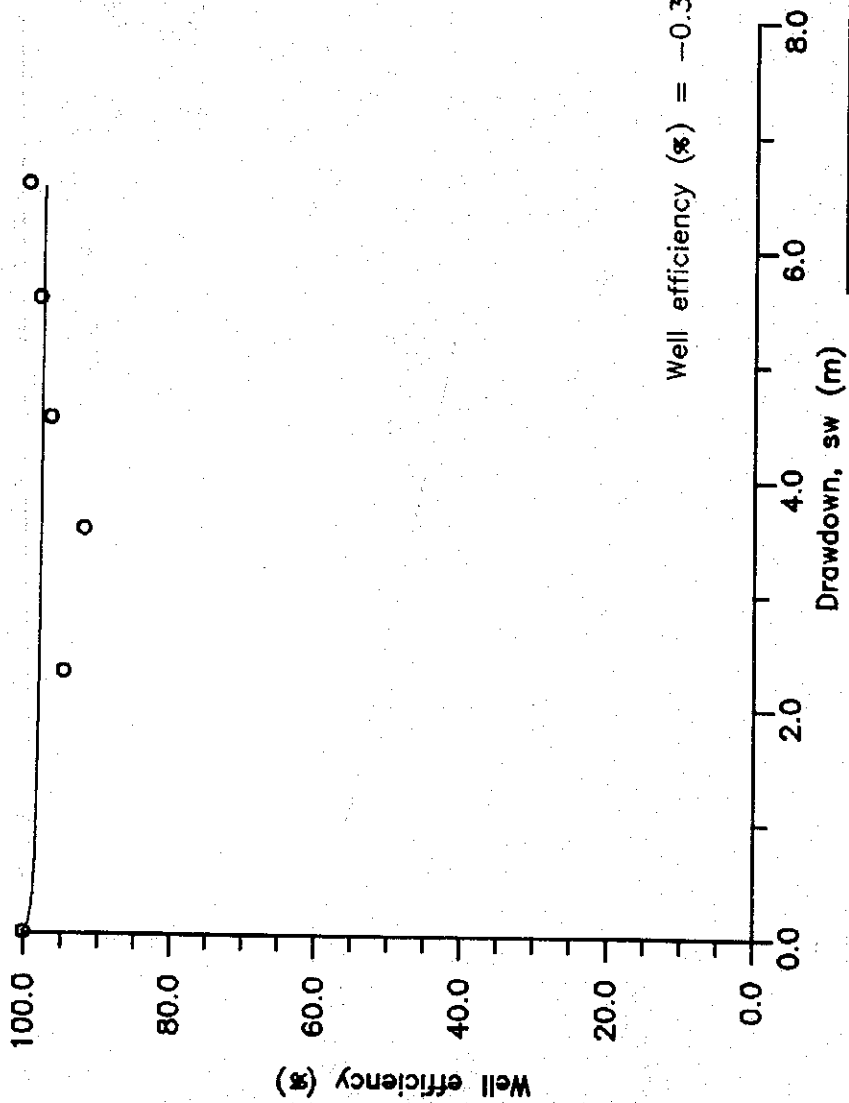


$$B = 6.48E-03 \left(\frac{\text{day}}{\text{m}^2} \right)$$

$$C = 2.35E-07 \left(\frac{\text{day}^2}{\text{m}^3} \right)$$

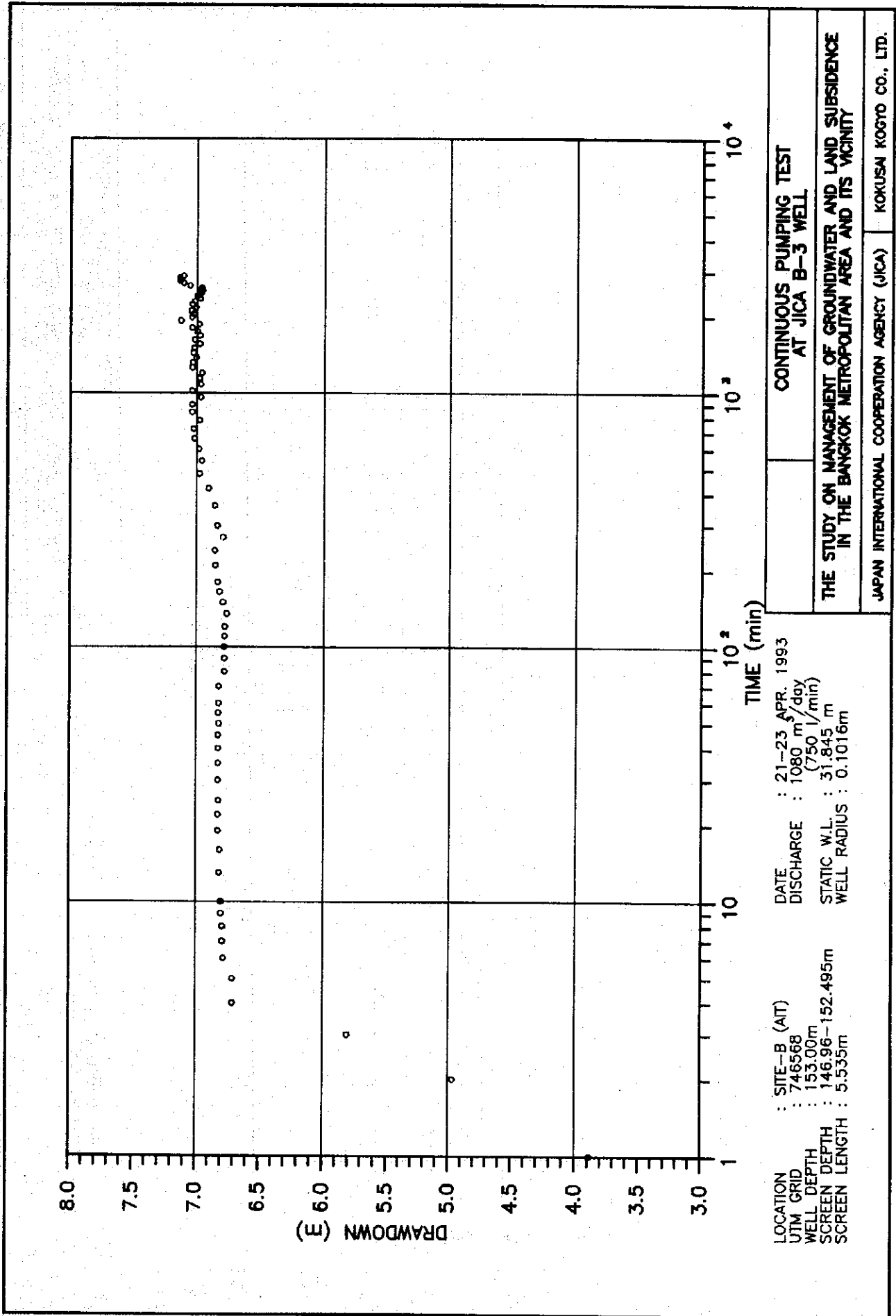
$$s_w = 6.48E-03 \times Q + 2.35E-07 \times Q^2$$

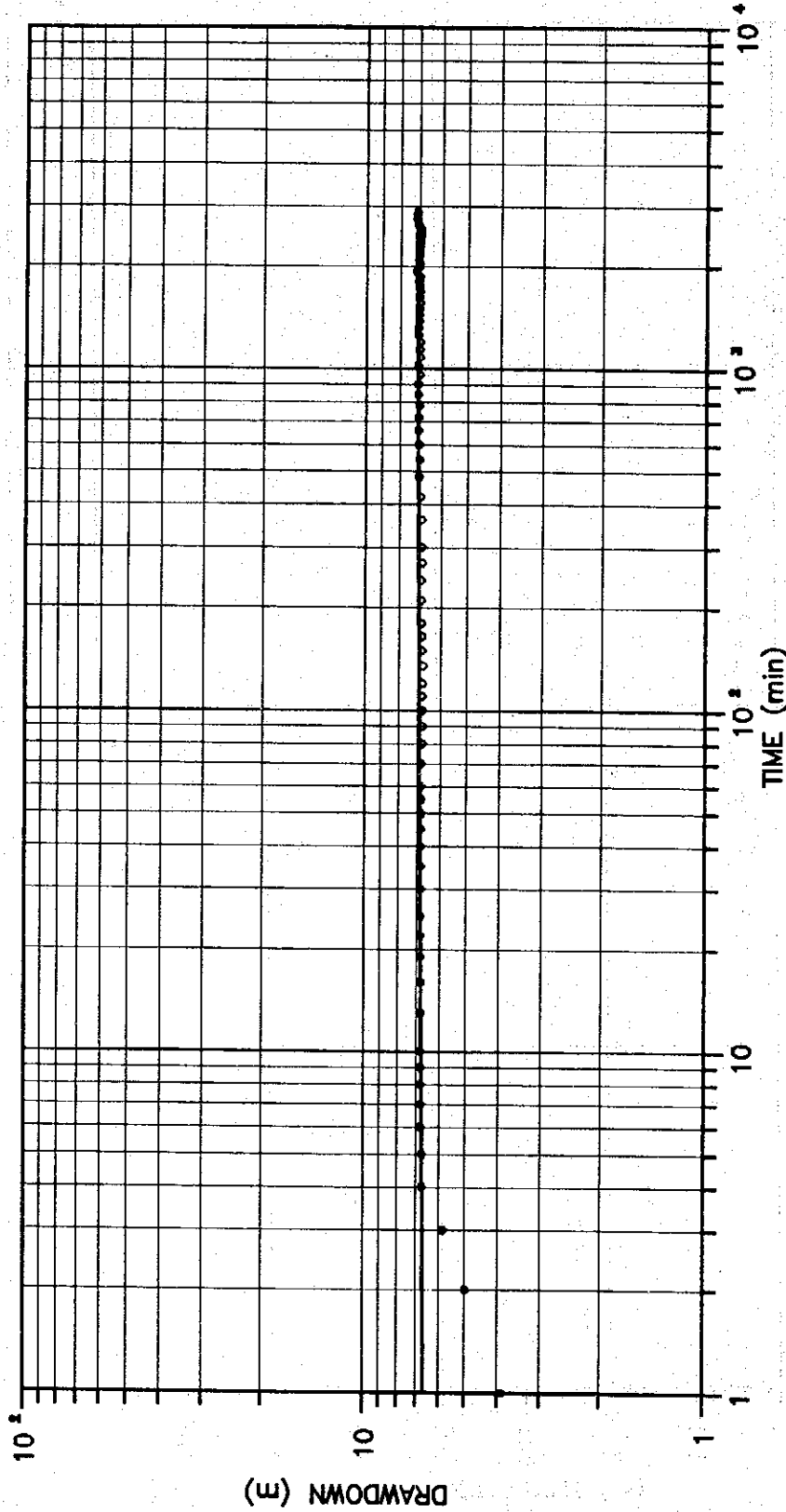
DETERMINATION OF B AND C FROM STEP-DRAWDOWN TEST (JICA B-3 WELL)	
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	KOKUSA KOGYO CO., LTD.



Well efficiency (%) = $-0.396565 \times \text{LN}(\text{sw}) + 98.3482$

VARIATION OF WELL EFFICIENCY WITH DRAWDOWN (JICA B-3 WELL)
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.





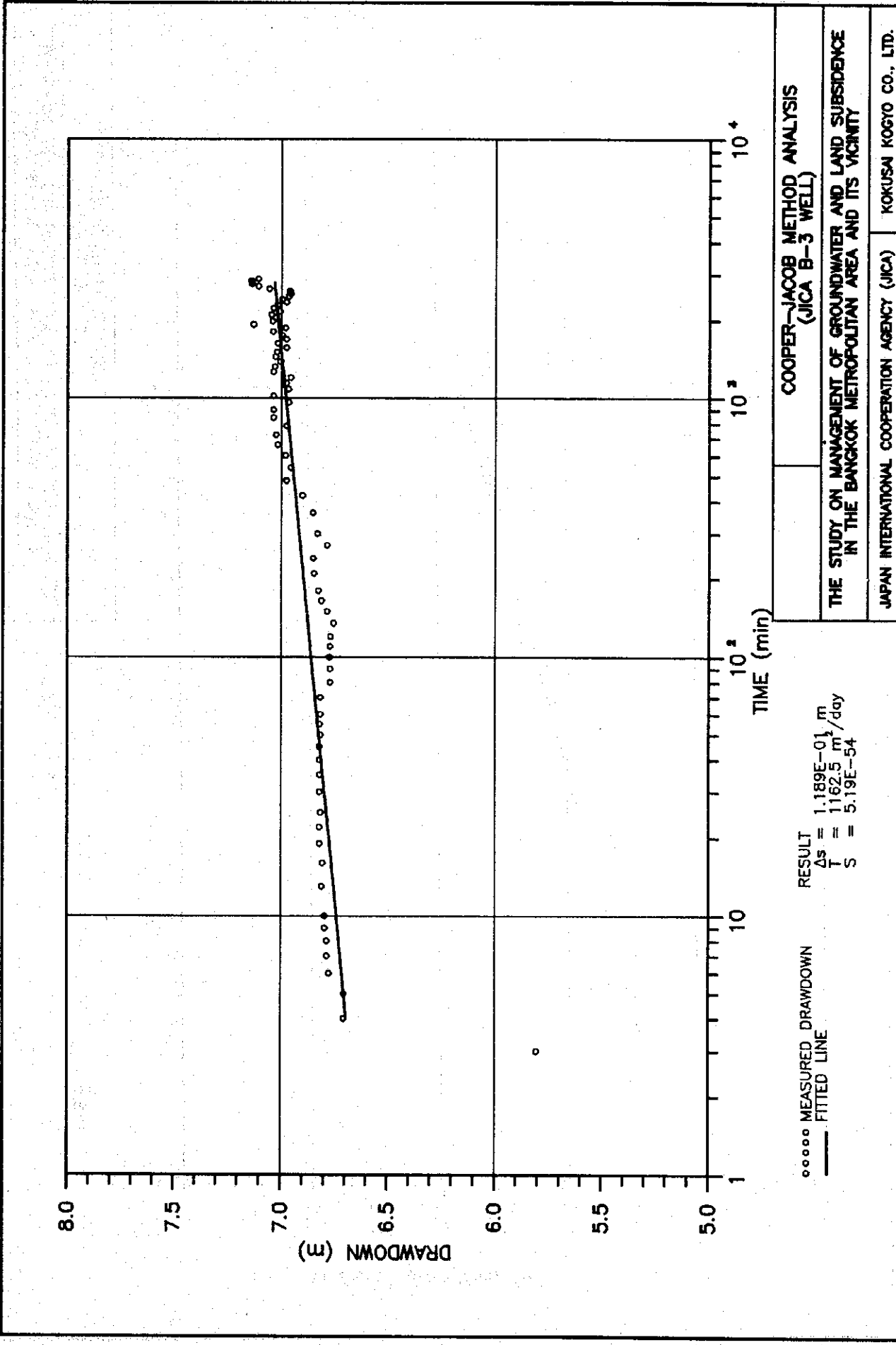
——— COMPUTED DRAWDOWN
 ○○○○○ MEASURED DRAWDOWN

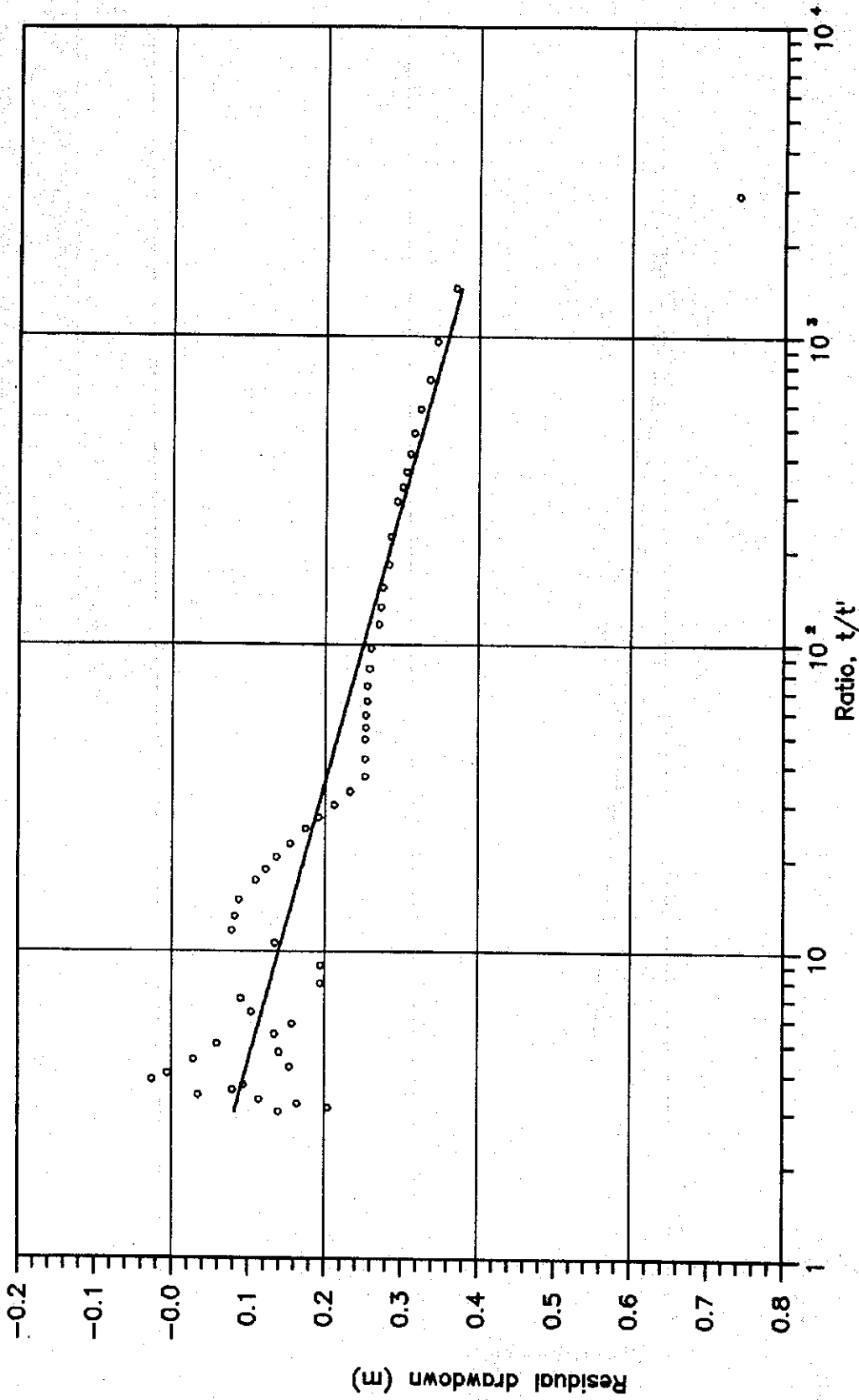
THIS TYPE-CURVE MATCHING
(JICA B-3 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

RESULT
 $T = 1329.6 \text{ m}^2/\text{day}$
 $S = 7.18\text{E}-43$
 $SD = 3.62\text{E}-01 \text{ m}$





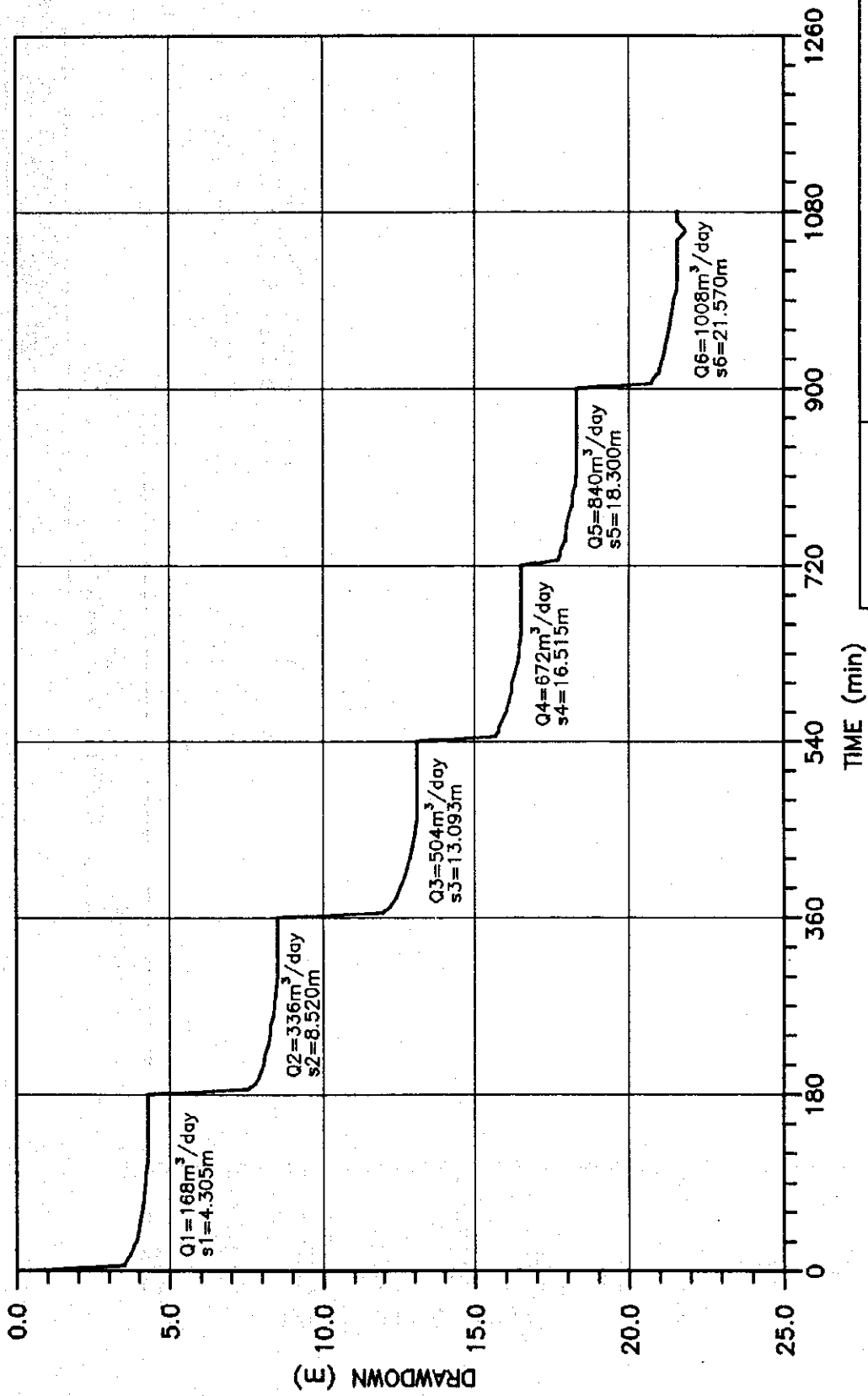
RECOVERY METHOD ANALYSIS
 (JICA B-3 WELL)

RESULT
 $\Delta s'_T = 1.098E-01 \text{ m}$
 $T = 1800.8 \text{ m}^2/\text{day}$

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

○○○○○ MEASURED DATA
 ——— FITTED LINE

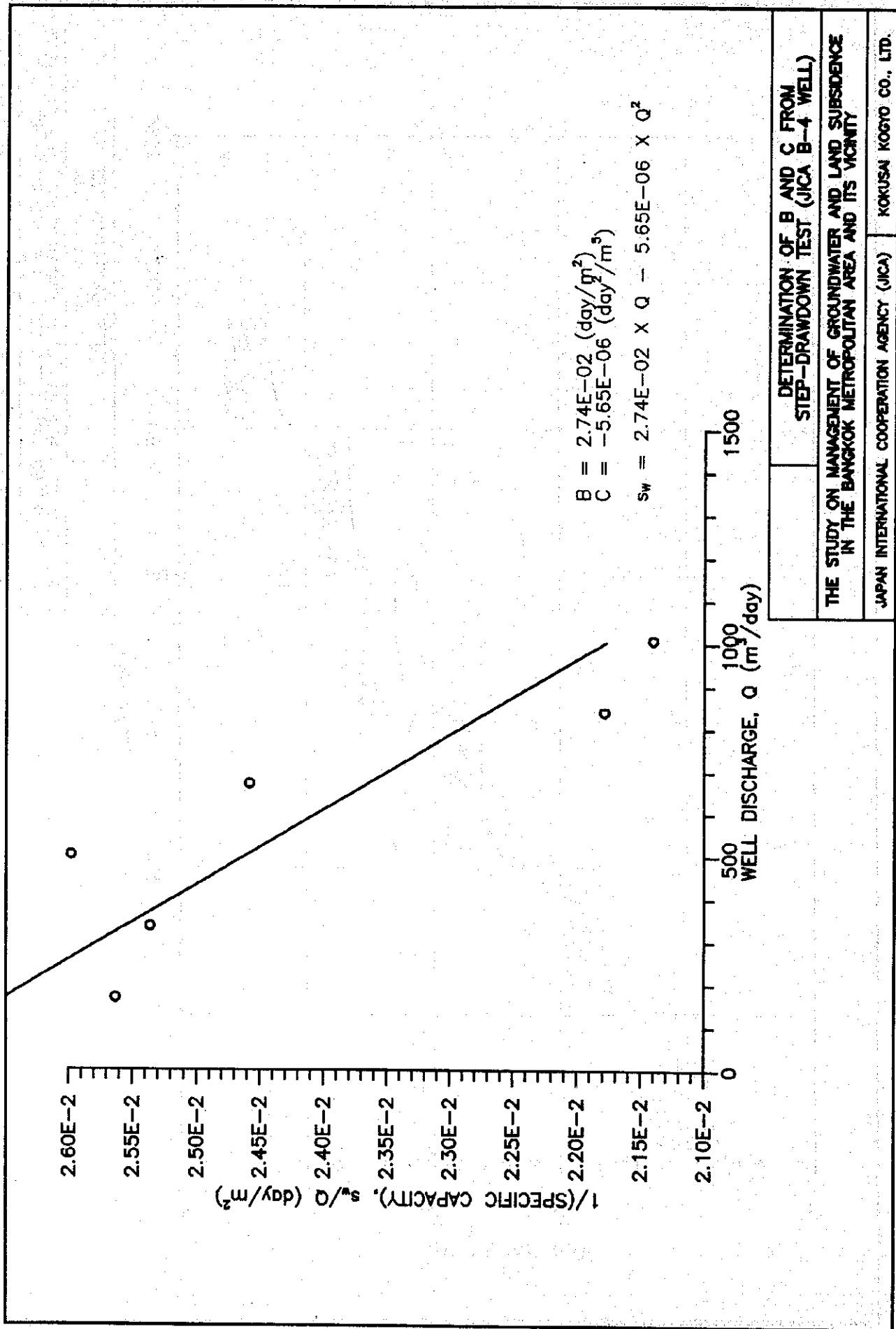


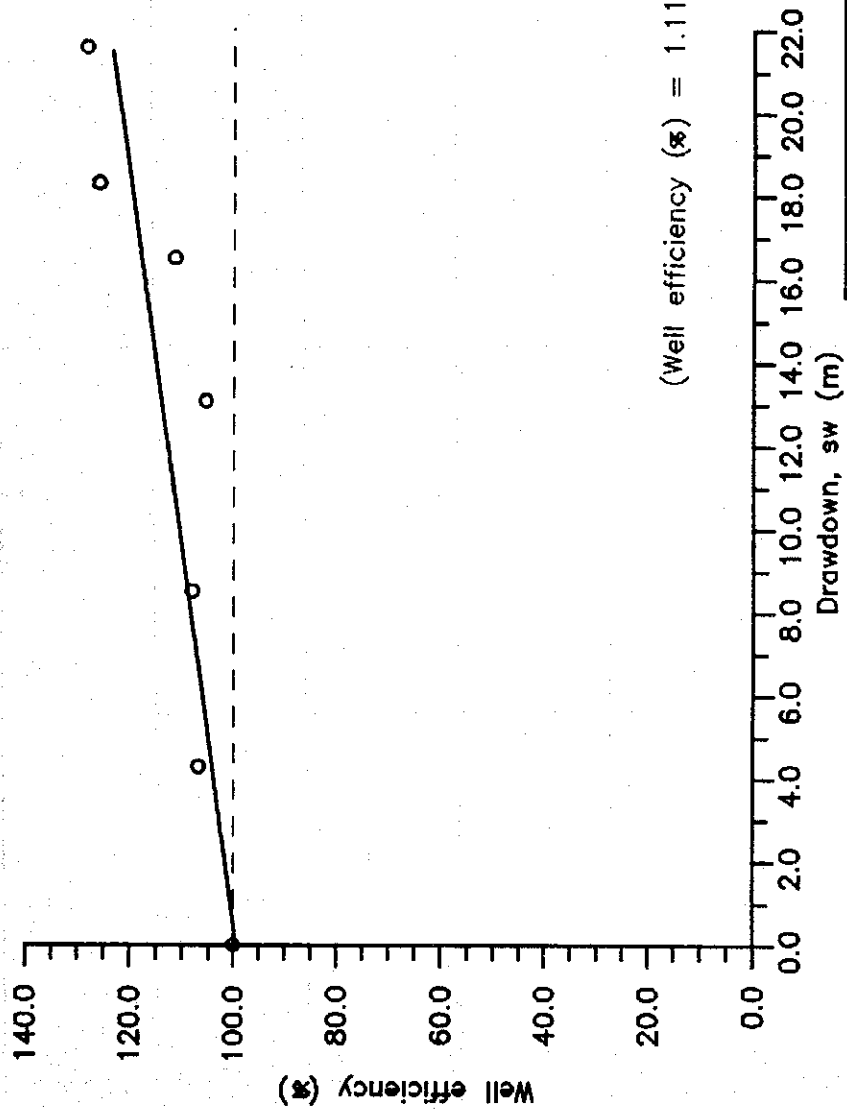
STEP-DRAWDOWN TEST AT
JICA B-4 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

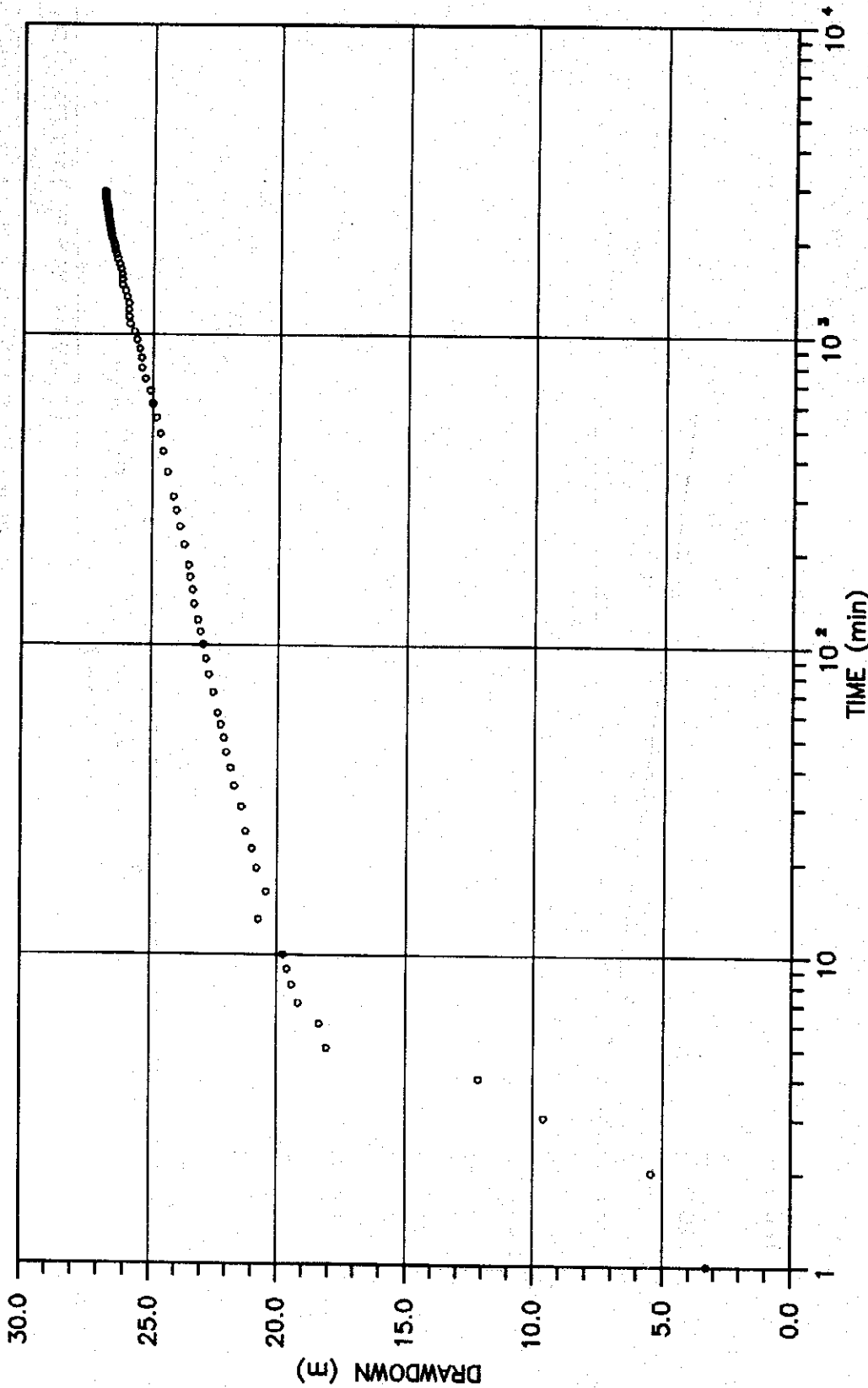
KOKUSAI KOGYO CO., LTD.





(Well efficiency (%)) = 1.11075 X sw + 99.43

	VARIATION OF WELL EFFICIENCY WITH DRAWDOWN (JICA B-4 WELL)
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.	



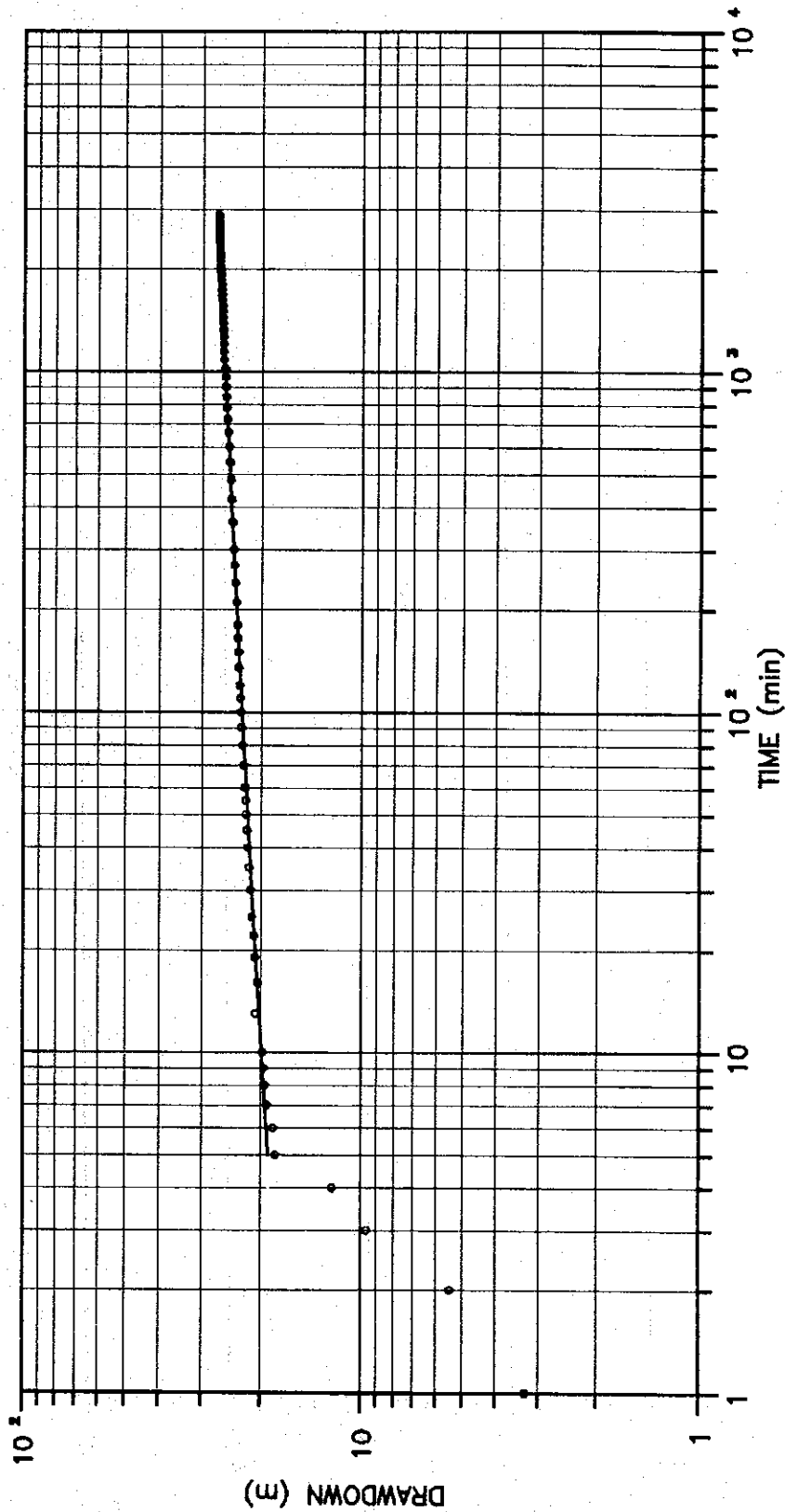
LOCATION : SITE-B (AT)
 UTM GRID : 746568
 WELL DEPTH : 94.00m
 SCREEN DEPTH : 87.96-93.495m
 SCREEN LENGTH : 5.535m

DATE : 05-07 MAY, 1993
 DISCHARGE : 1080 m³/day
 (750 l/min)
 STATIC W.L. : 24.980 m
 WELL RADIUS : 0.1016m

CONTINUOUS PUMPING TEST
 AT JICA B-4 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



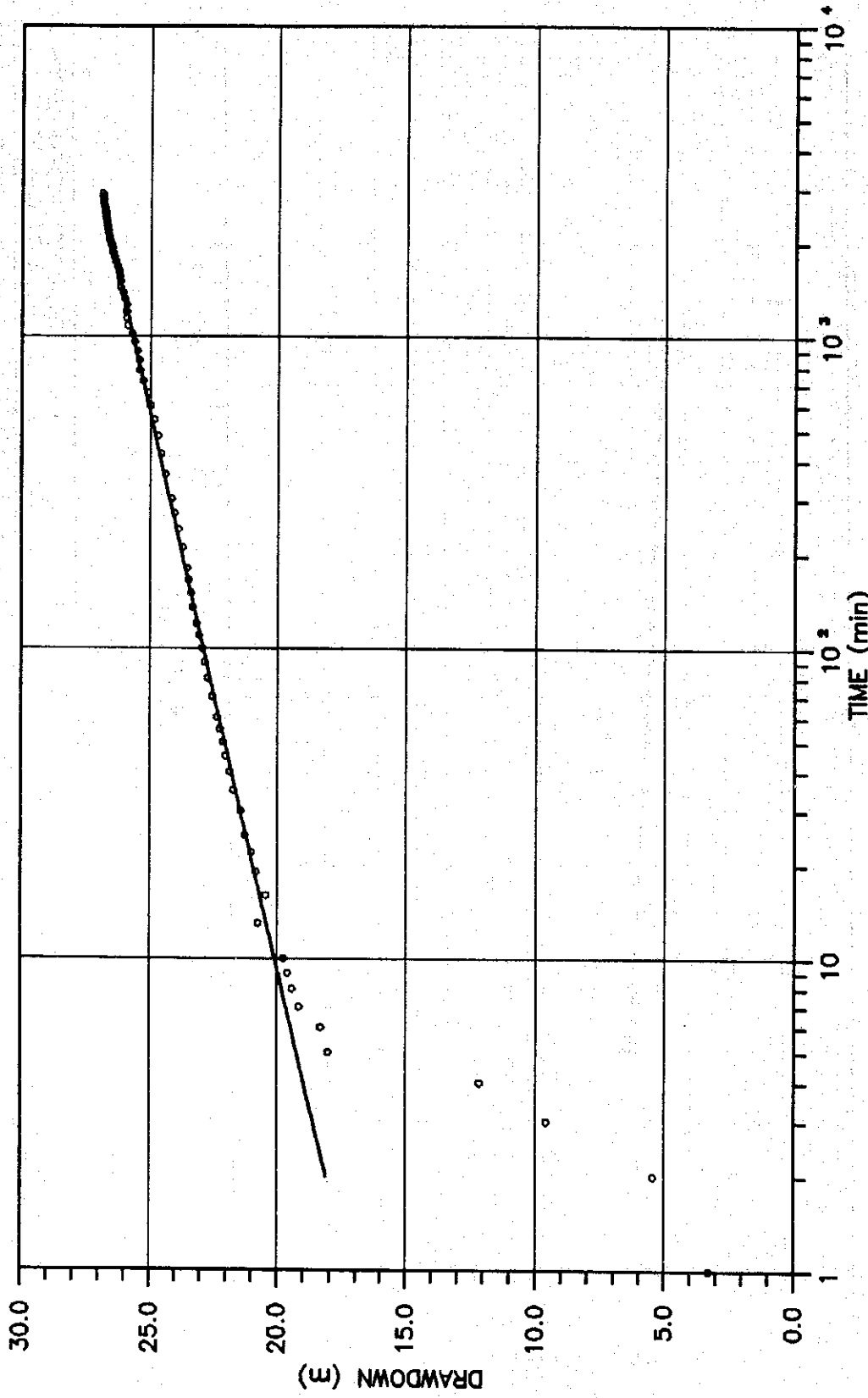
RESULT
 $T = 67.6 \text{ m}^2/\text{day}$
 $S = 1.69E-05$
 $SD = 1.94E-01 \text{ m}$

— COMPUTED DRAWDOWN
 ○○○○ MEASURED DRAWDOWN

THEIS TYPE-CURVE MATCHING
 (JICA B-4 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



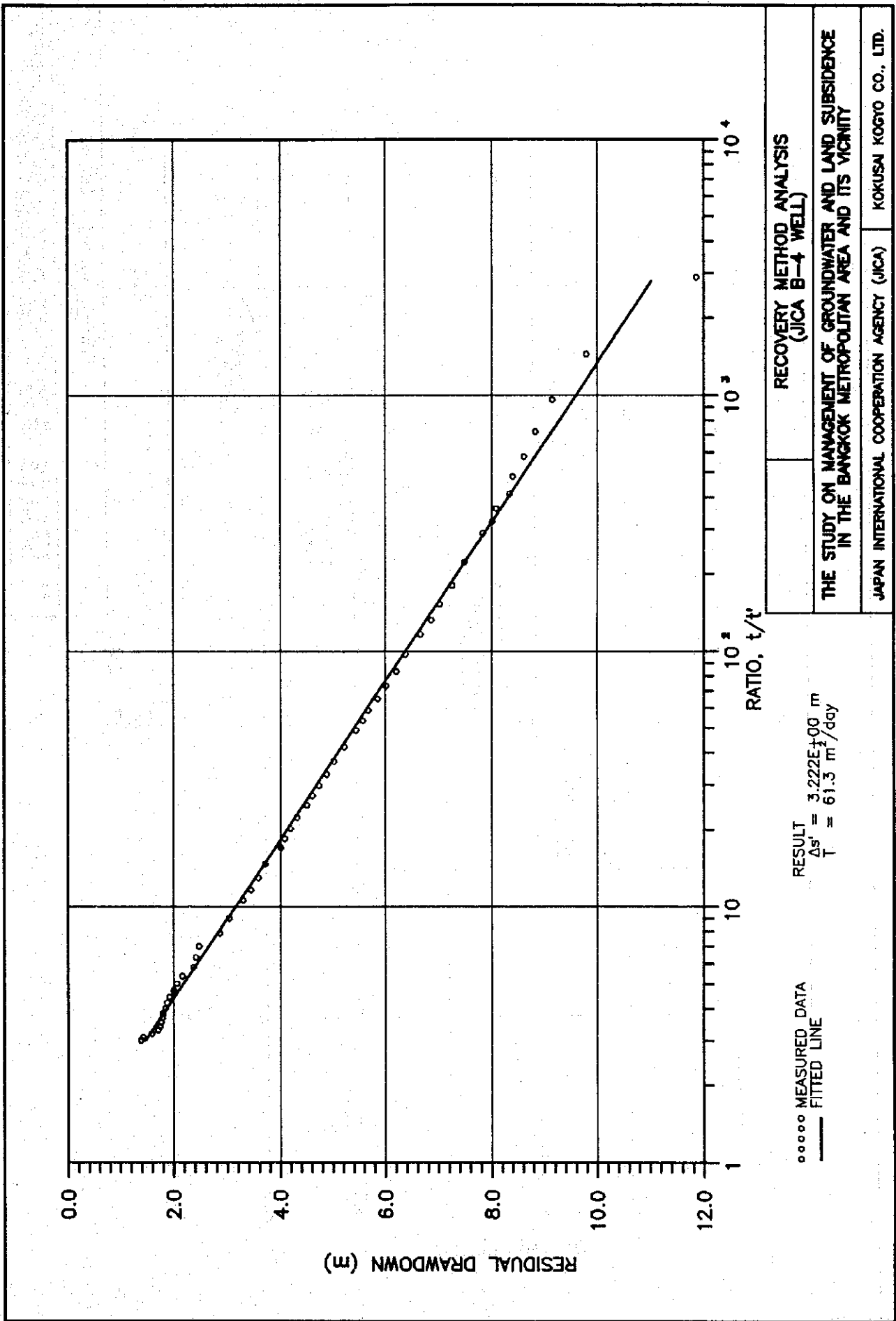
○○○○ MEASURED DRAWDOWN
 ——— FITTED LINE

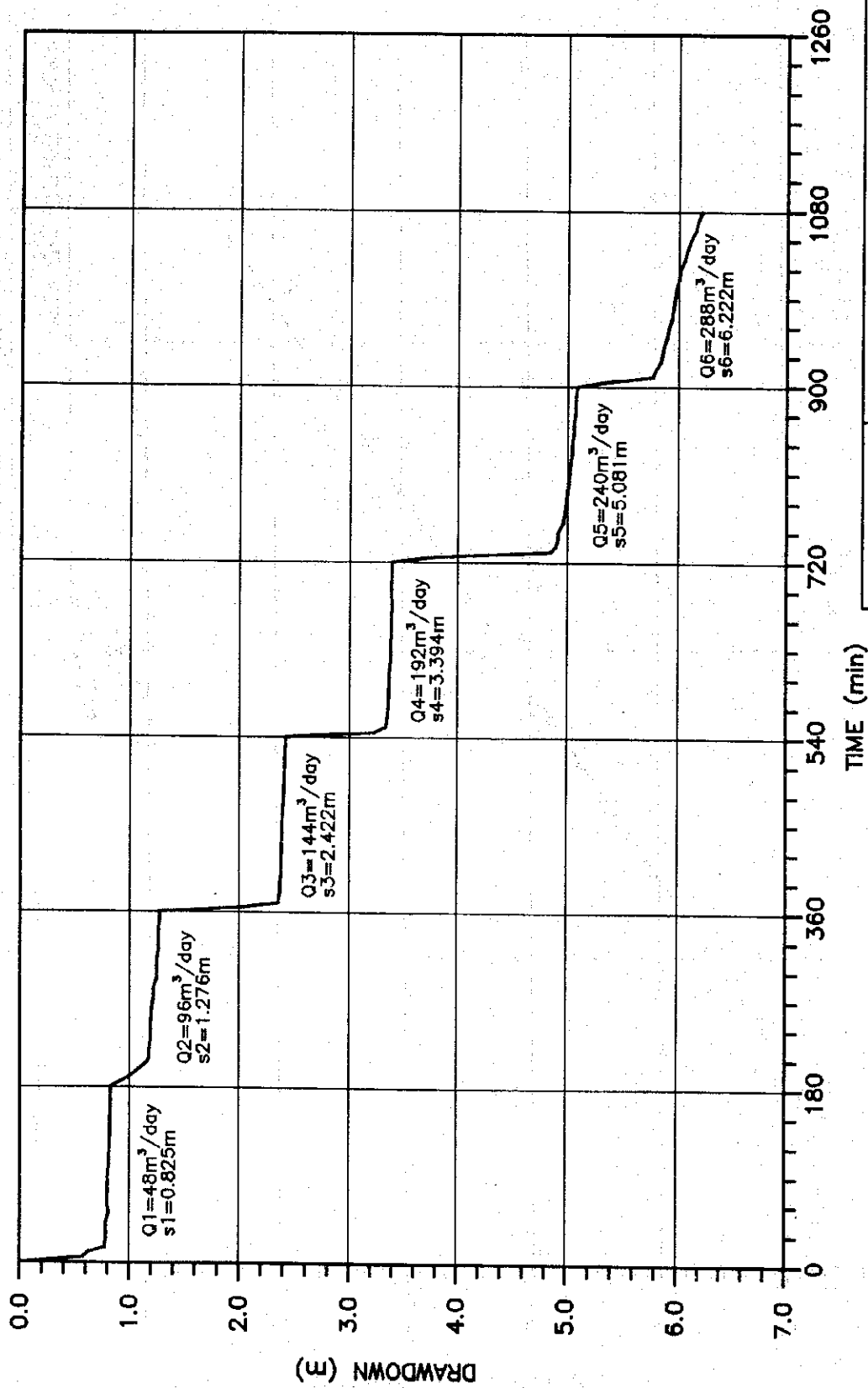
RESULT
 $\Delta s = 2.807E+00$ m
 $T = 70.4$ m/day
 $S = 7.51E-06$

COOPER-JACOB METHOD ANALYSIS
(WELL B-4)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

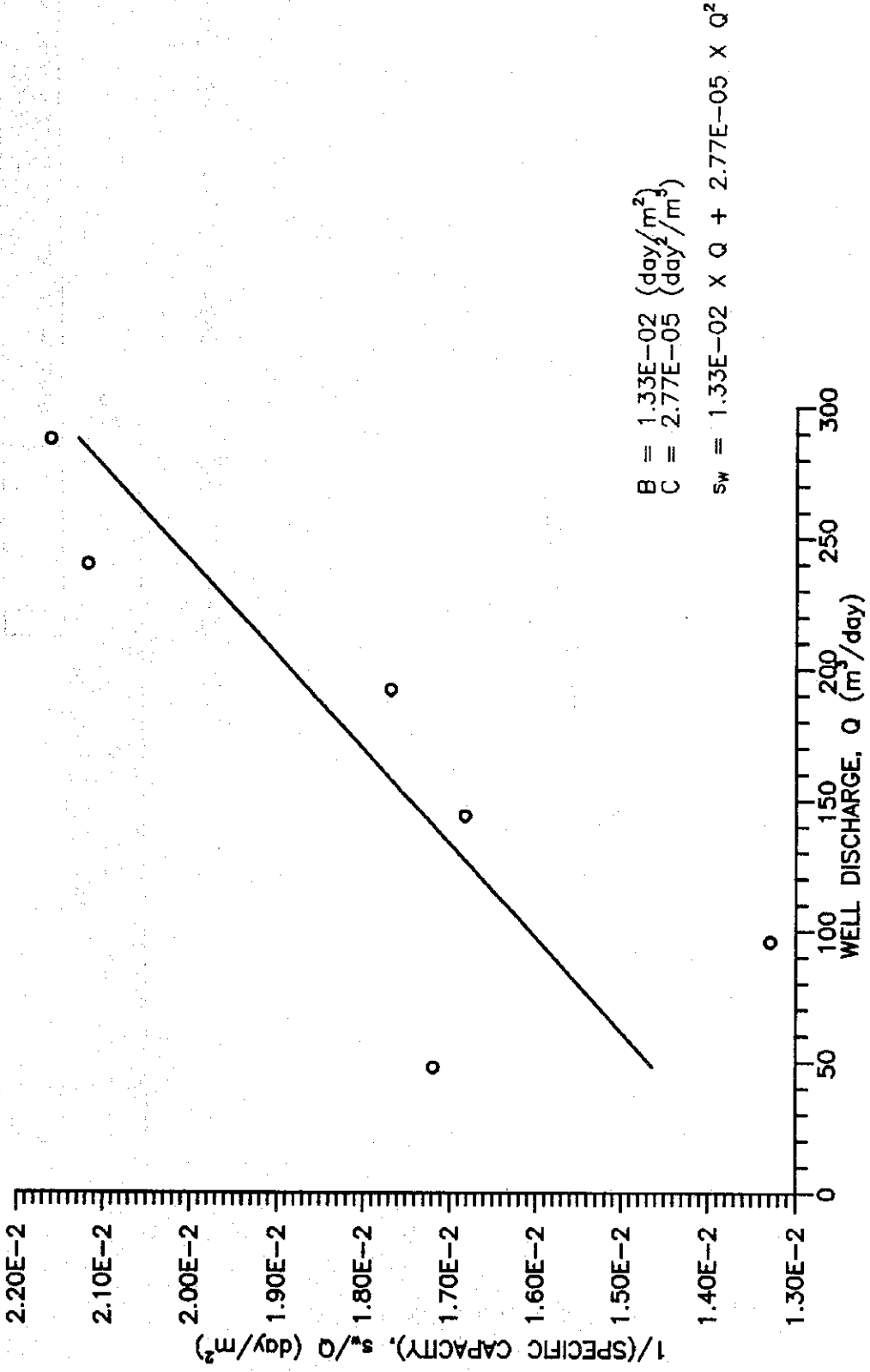




STEP-DRAWDOWN TEST AT
JICA B-5 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

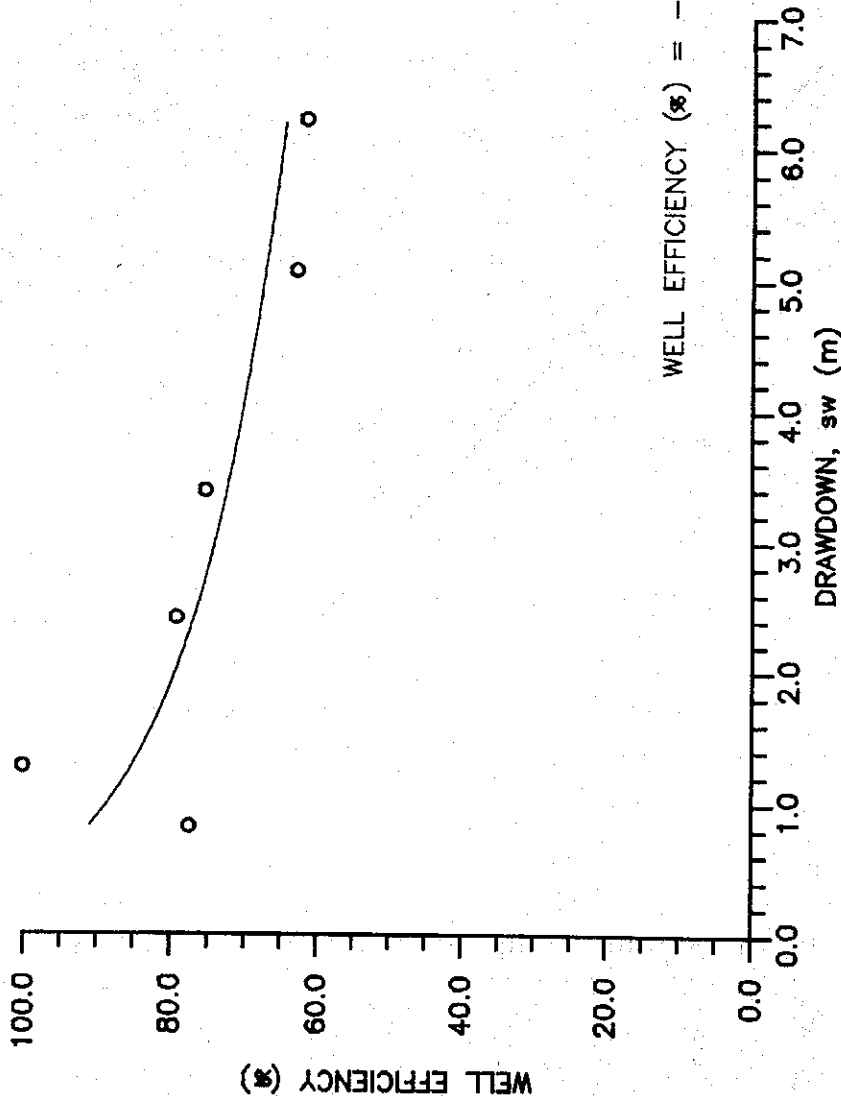
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



DETERMINATION OF B AND C FROM
 STEP-DRAWDOWN TEST (JICA B-5 WELL)

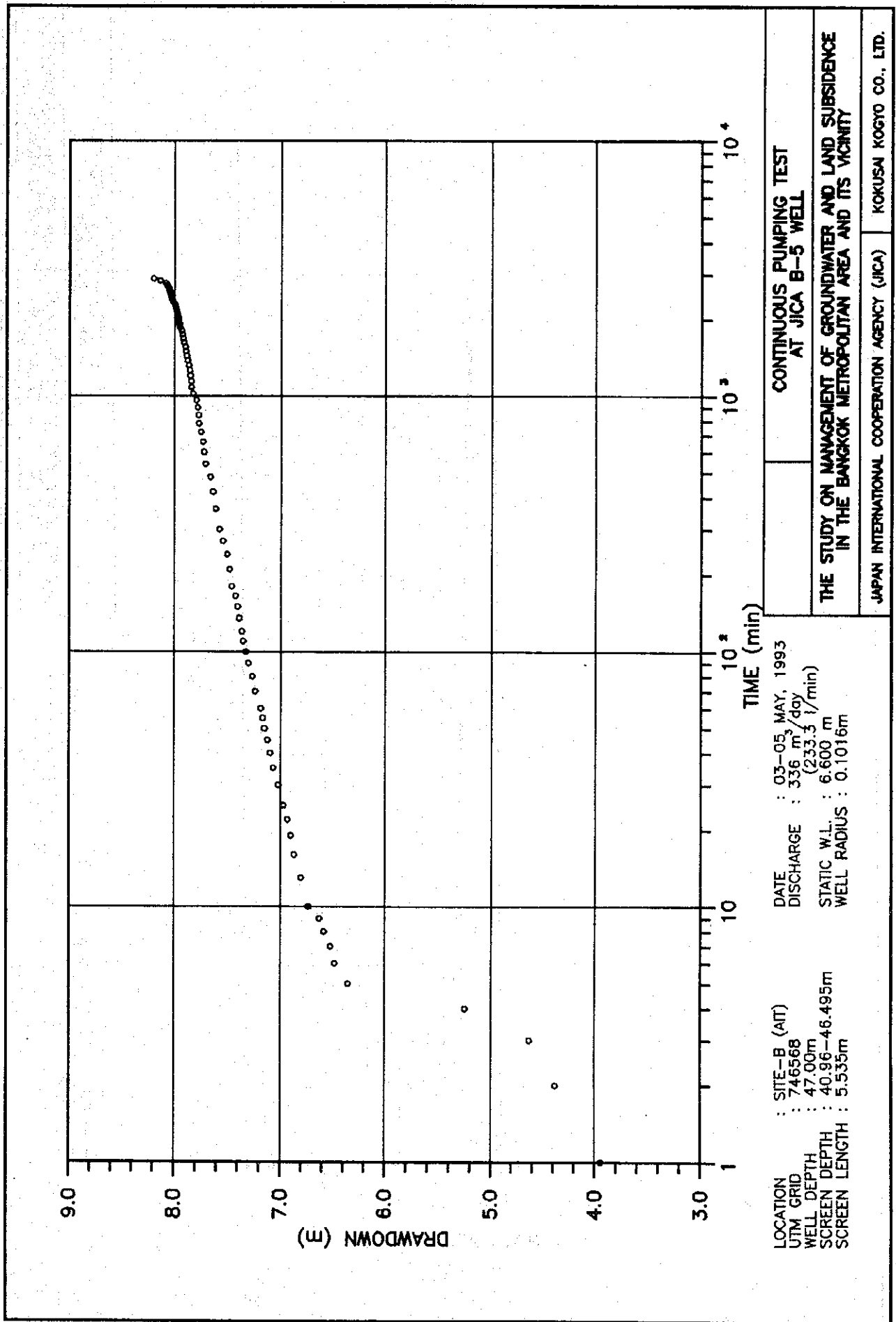
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



WELL EFFICIENCY (%) = -13.0494 X LN(sw) + 88.2284

VARIATION OF WELL EFFICIENCY WITH DRAWDOWN (JICA B-5 WELL)
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



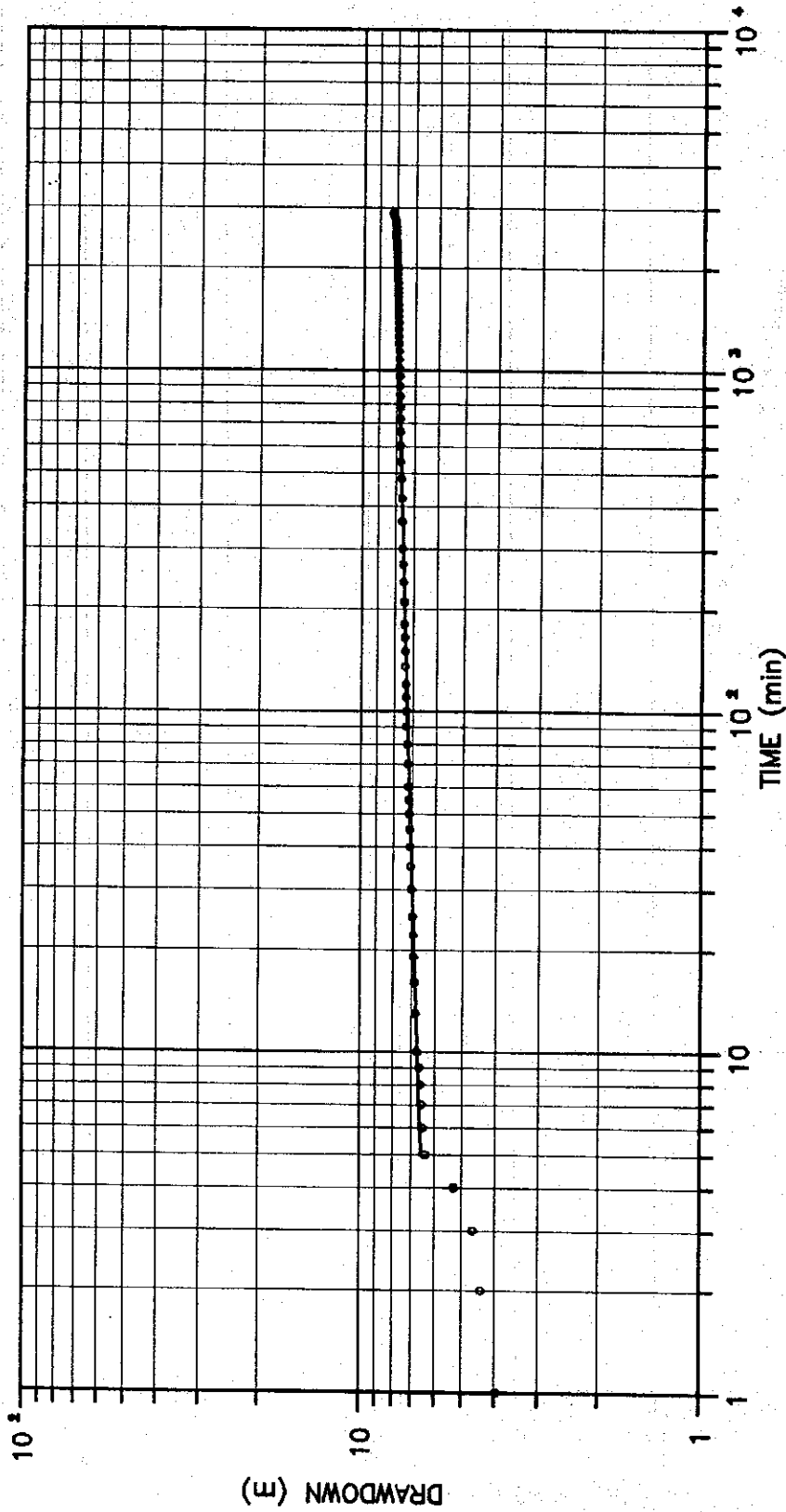
LOCATION : SITE-B (AIT)
 UTM GRID : 746568
 WELL DEPTH : 47.00m
 SCREEN DEPTH : 40.96-46.495m
 SCREEN LENGTH : 5.535m

DATE : 03-05 MAY, 1993
 DISCHARGE : 336 m³/day
 (233.3 l/min)
 STATIC W.L. : 6.600 m
 WELL RADIUS : 0.1016m

CONTINUOUS PUMPING TEST
 AT JICA B-5 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



THEIS TYPE-CURVE MATCHING
(JICA B-5 WELL)

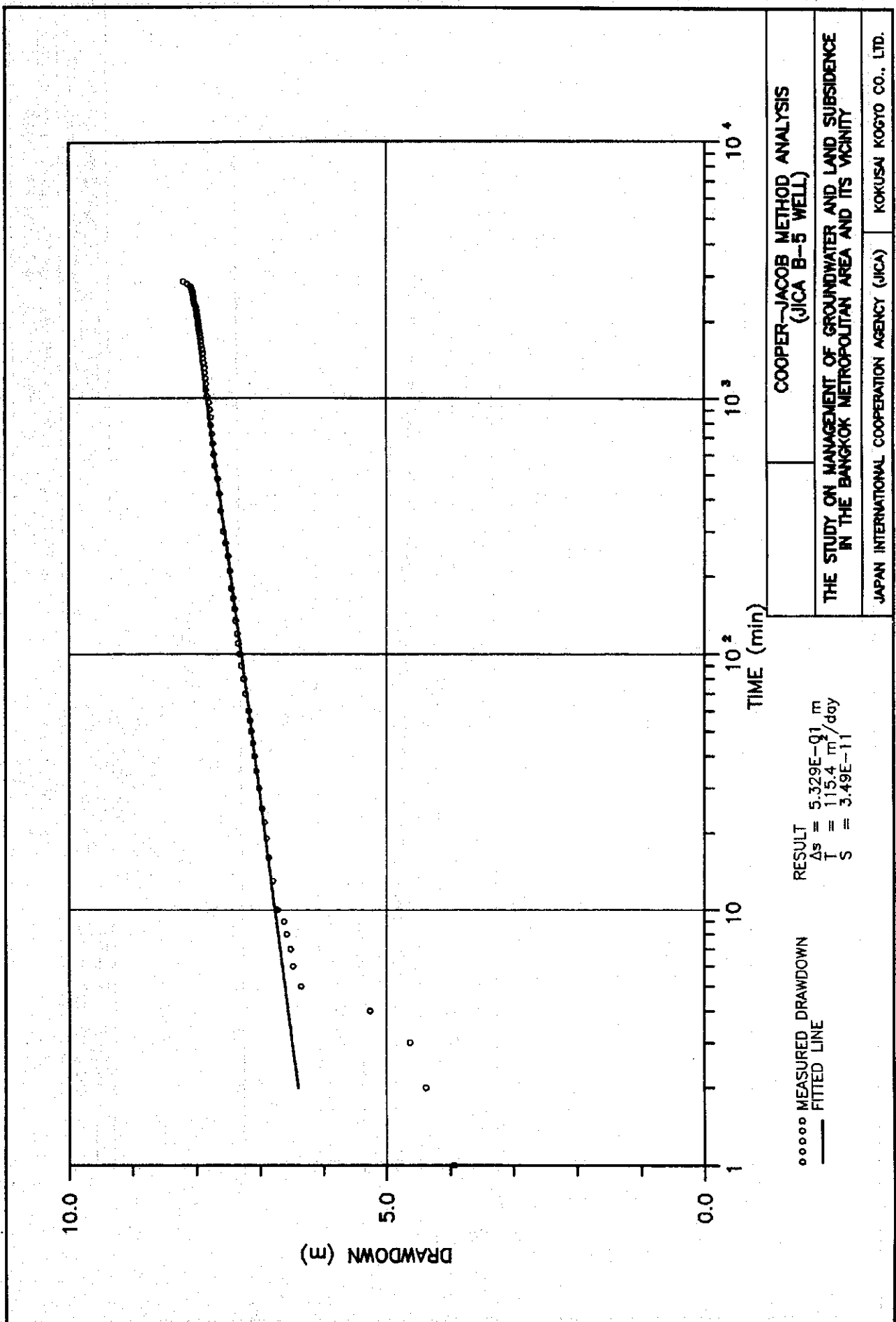
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

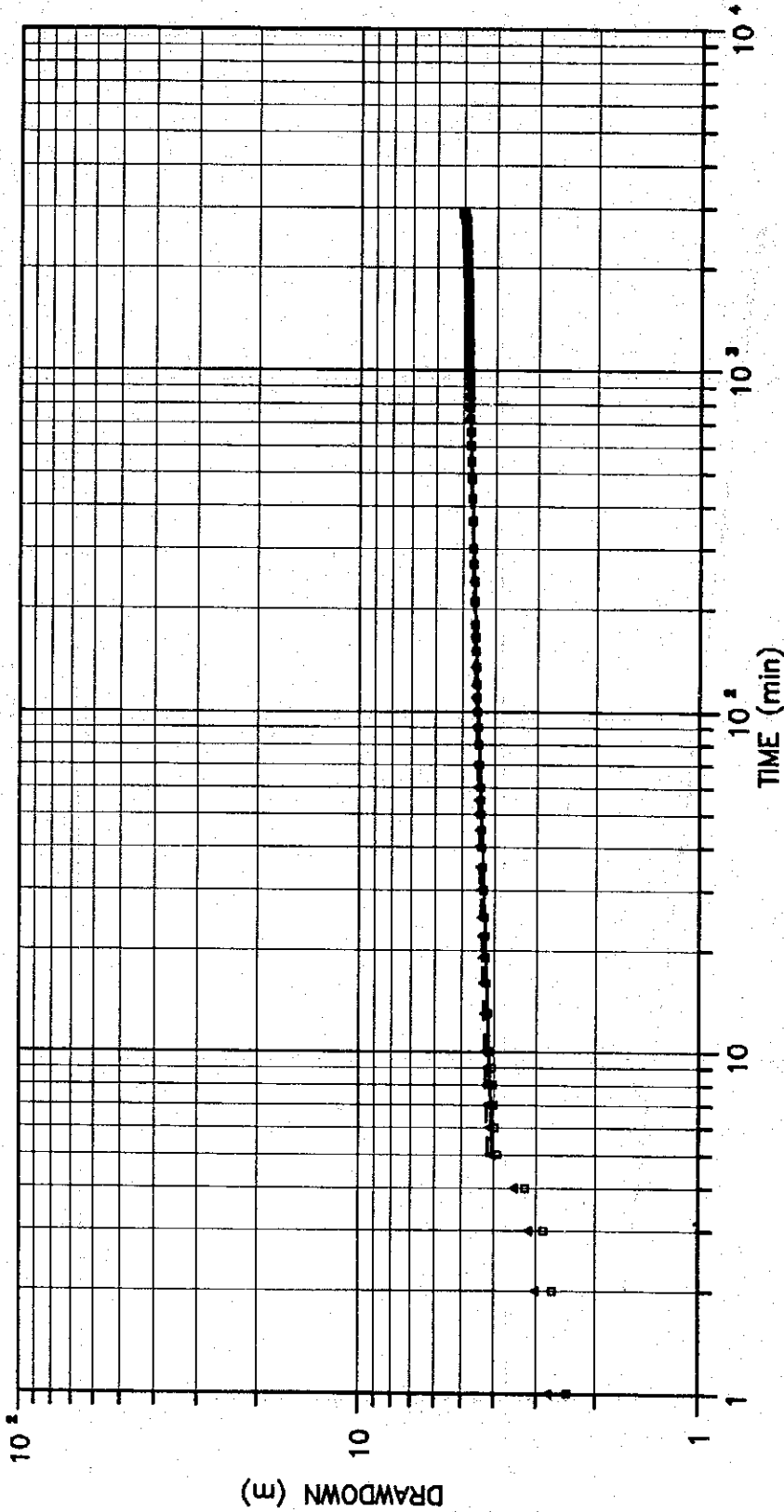
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOKUSAI KOGYO CO., LTD.

RESULT
 $T = 111.0 \text{ m}^2/\text{day}$
 $S = 1.31E-10$
 $SD = 4.56E-02 \text{ m}$

— COMPUTED DRAWDOWN
 ○○○○ MEASURED DRAWDOWN





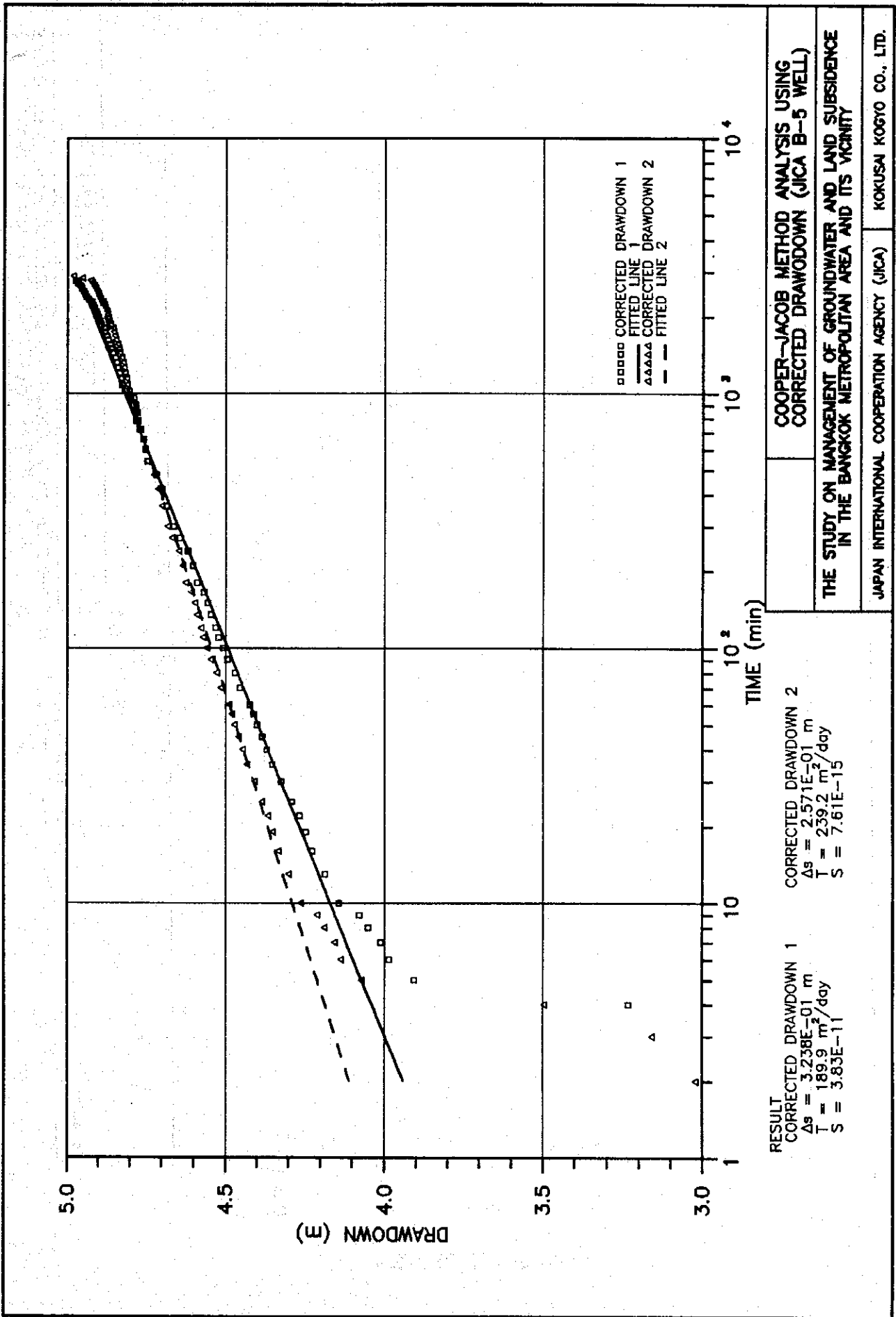
RESULT
 CORRECTED DRAWDOWN 1
 $T = 180.3 \text{ m}^2/\text{day}$
 $S = 2.12E-10$
 $SD = 2.80E-02 \text{ m}$
 CORRECTED DRAWDOWN 2
 $T = 226.0 \text{ m}^2/\text{day}$
 $S = 7.98E-14$
 $SD = 2.36E-02 \text{ m}$

□□□□ CORRECTED DRAWDOWN 1
 ——— COMPUTED DRAWDOWN 1
 ▲▲▲▲ CORRECTED DRAWDOWN 2
 - - - COMPUTED DRAWDOWN 2

THESE TYPE--CURVE MATCHING USING
 CORRECTED DRAWDOWN (JICA B-5 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

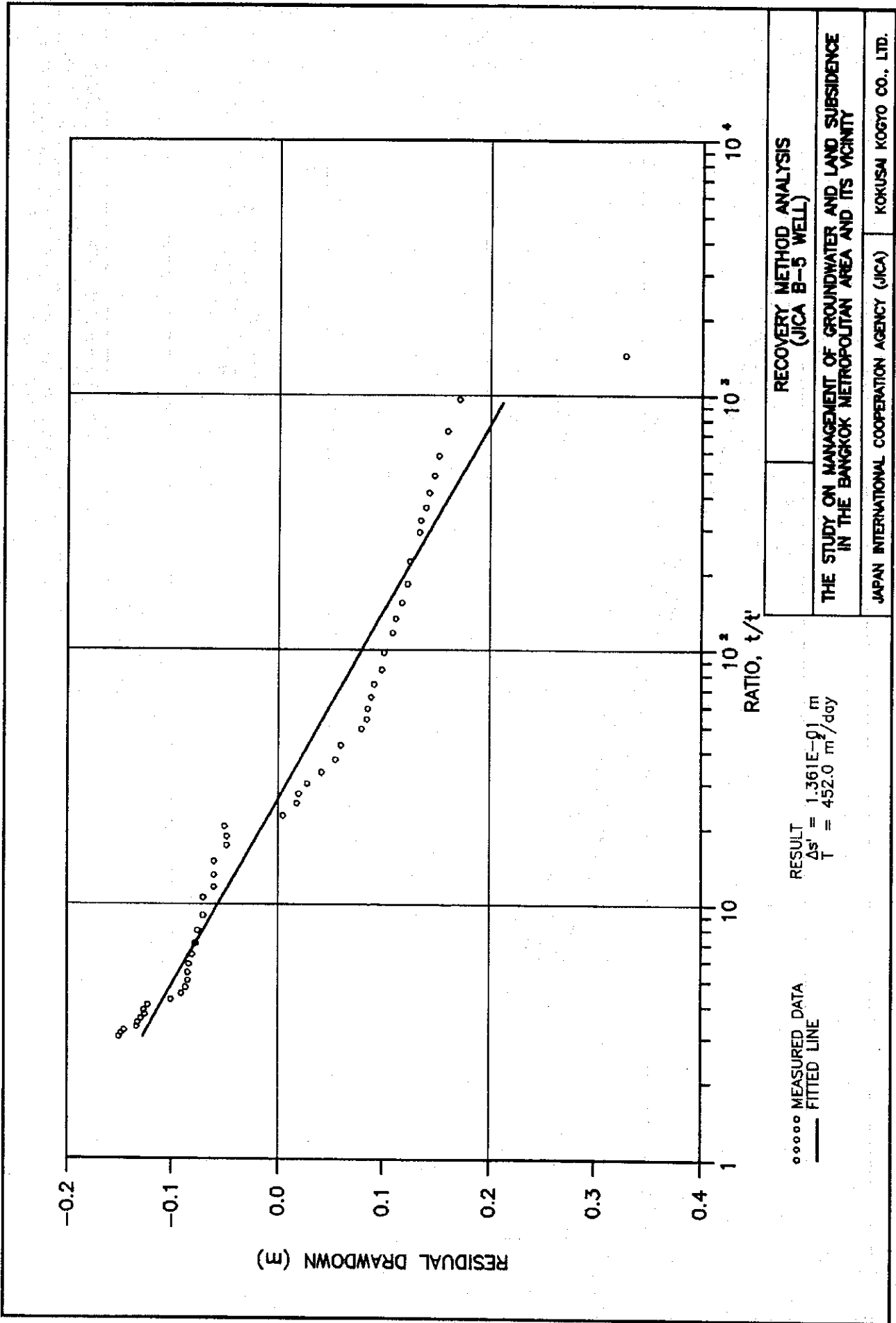
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



COOPER-JACOB METHOD ANALYSIS USING
 CORRECTED DRAWDOWN (JICA B-5 WELL)

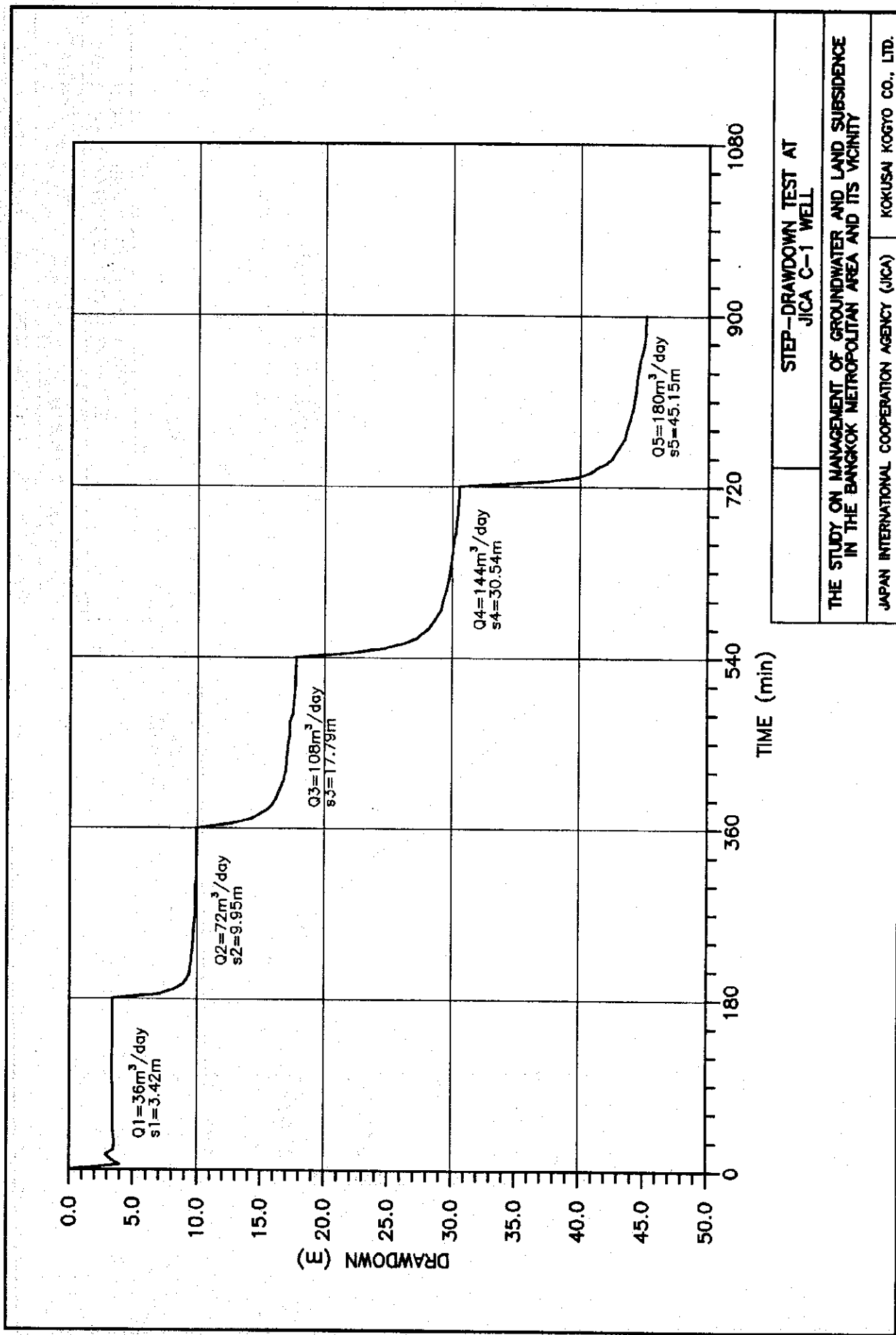
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



B. PUMPING TESTS

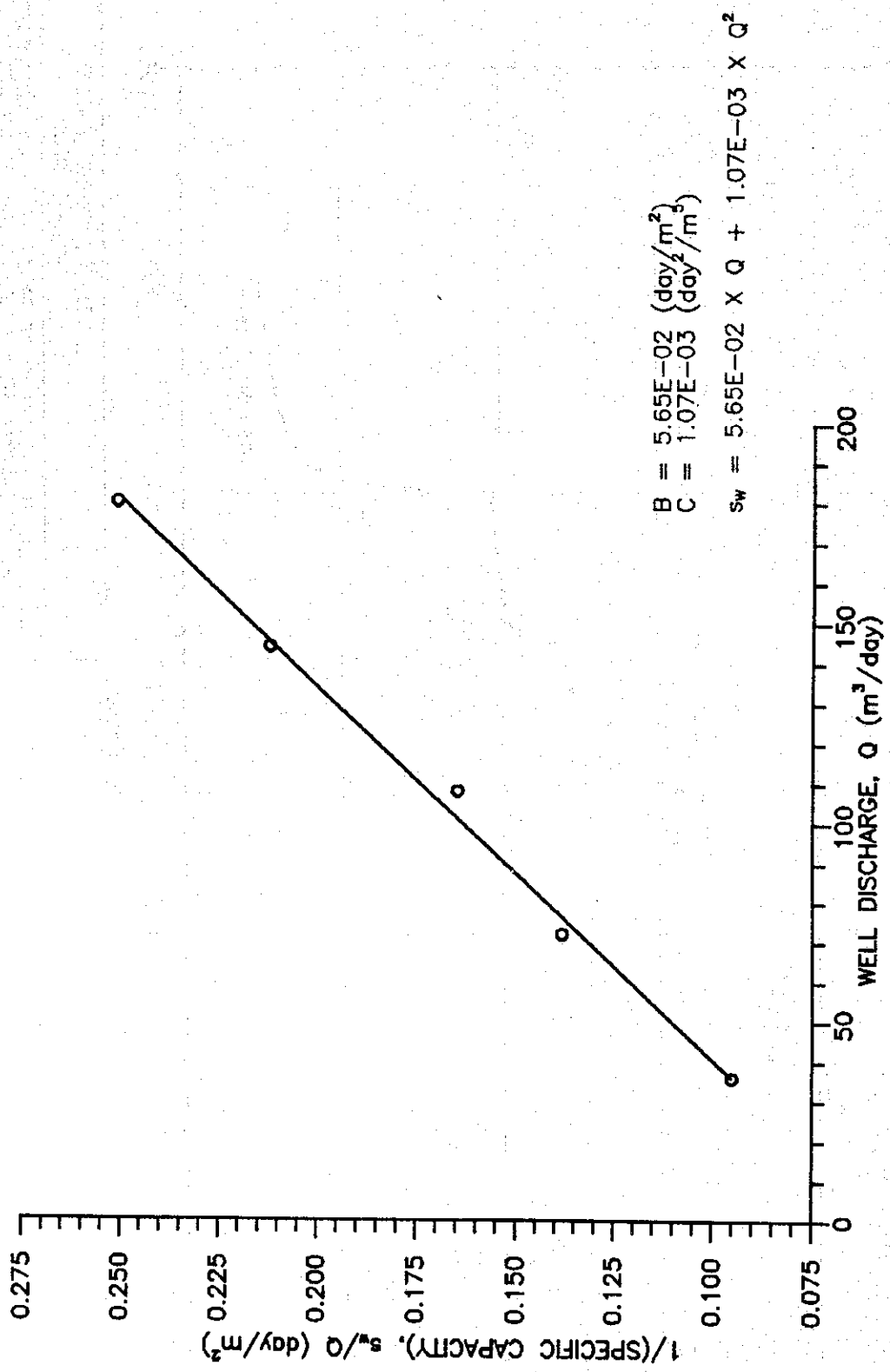
B.3 Pumping tests results of Site-C



STEP-DRAWDOWN TEST AT
JICA C-1 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.

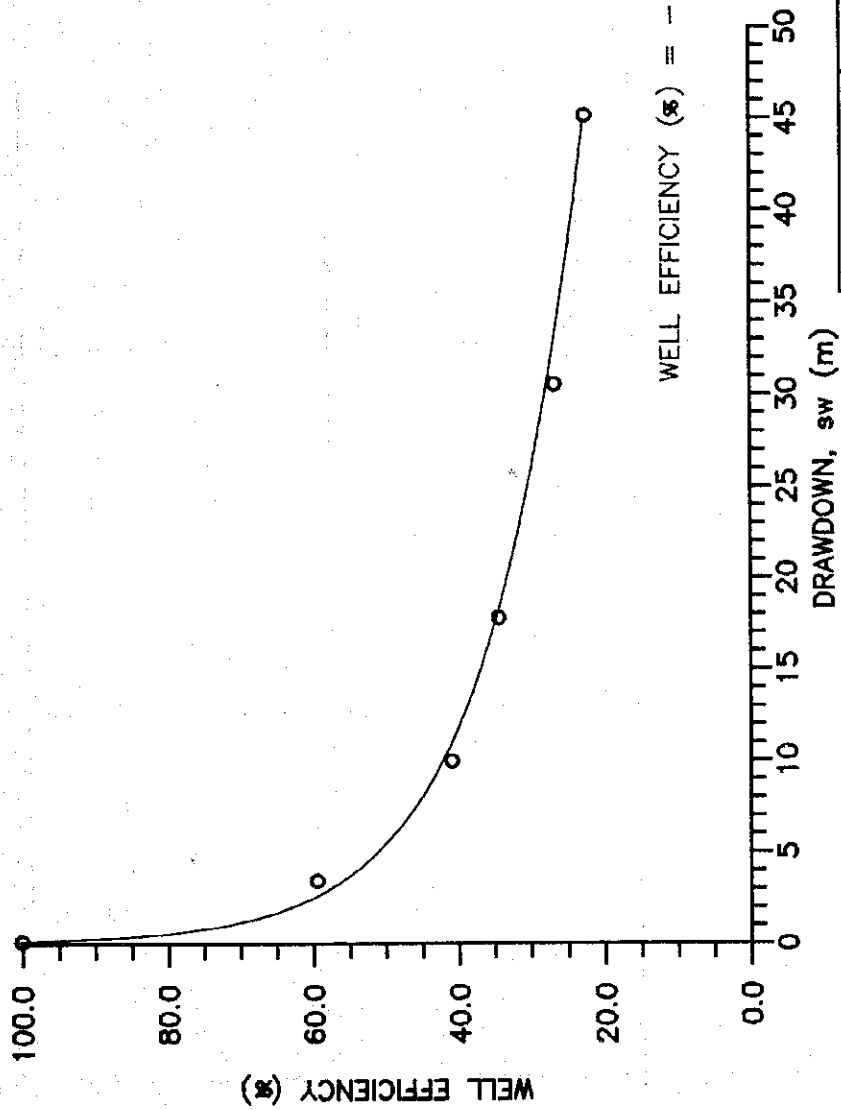


$$B = 5.65E-02 \left(\frac{\text{day}}{\text{m}^2} \right)$$

$$C = 1.07E-03 \left(\frac{\text{day}^2}{\text{m}^3} \right)$$

$$s_w = 5.65E-02 \times Q + 1.07E-03 \times Q^2$$

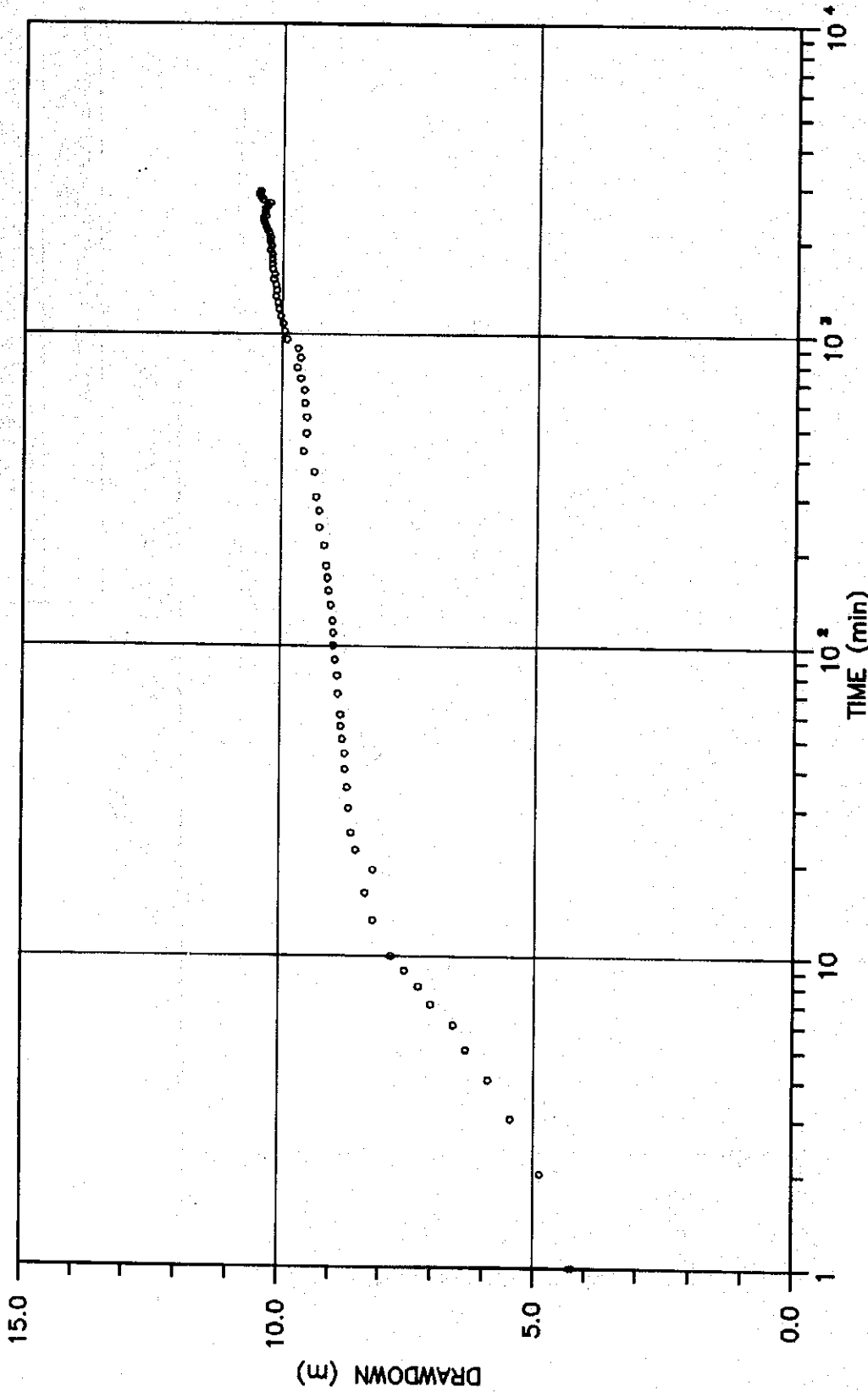
DETERMINATION OF B AND C FROM STEP-DRAWDOWN TEST (JICA C-1 WELL)	
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	KOKUSAI KOGYO CO., LTD.



VARIATION OF WELL EFFICIENCY WITH DRAWDOWN
(JICA C-1 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



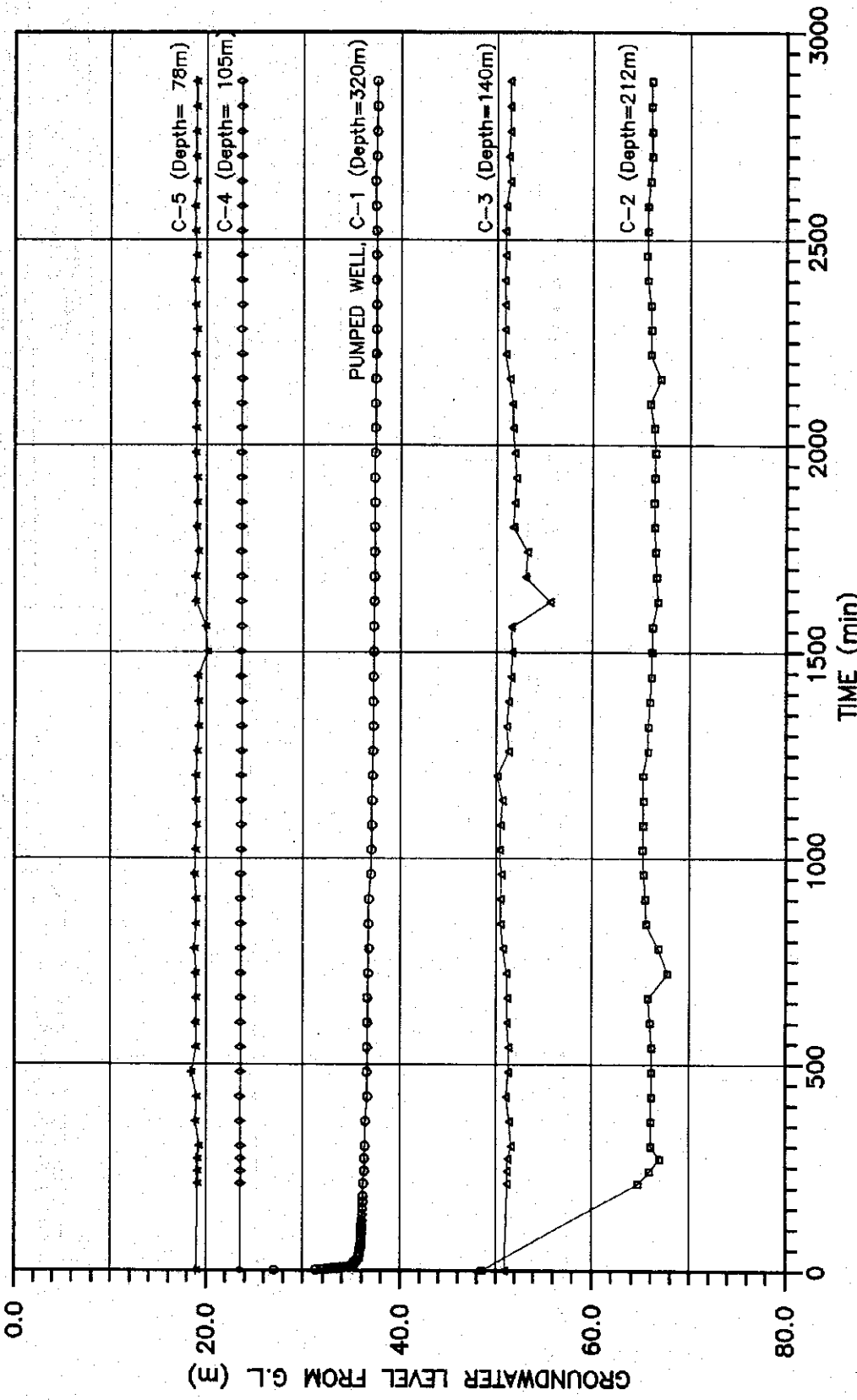
LOCATION : SITE-C (SAMUT SAKHON) DATE : 21-23 APR. 1993
 UTM GRID : 381007 DISCHARGE : 108.0 m³/day
 WELL DEPTH : 320.00m (75 l/min)
 SCREEN DEPTH : 311.19-319.495m STATIC W.L. : 27.10 m
 SCREEN LENGTH : 8.305m WELL RADIUS : 0.1016m

CONTINUOUS PUMPING TEST
AT JICA C-1 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

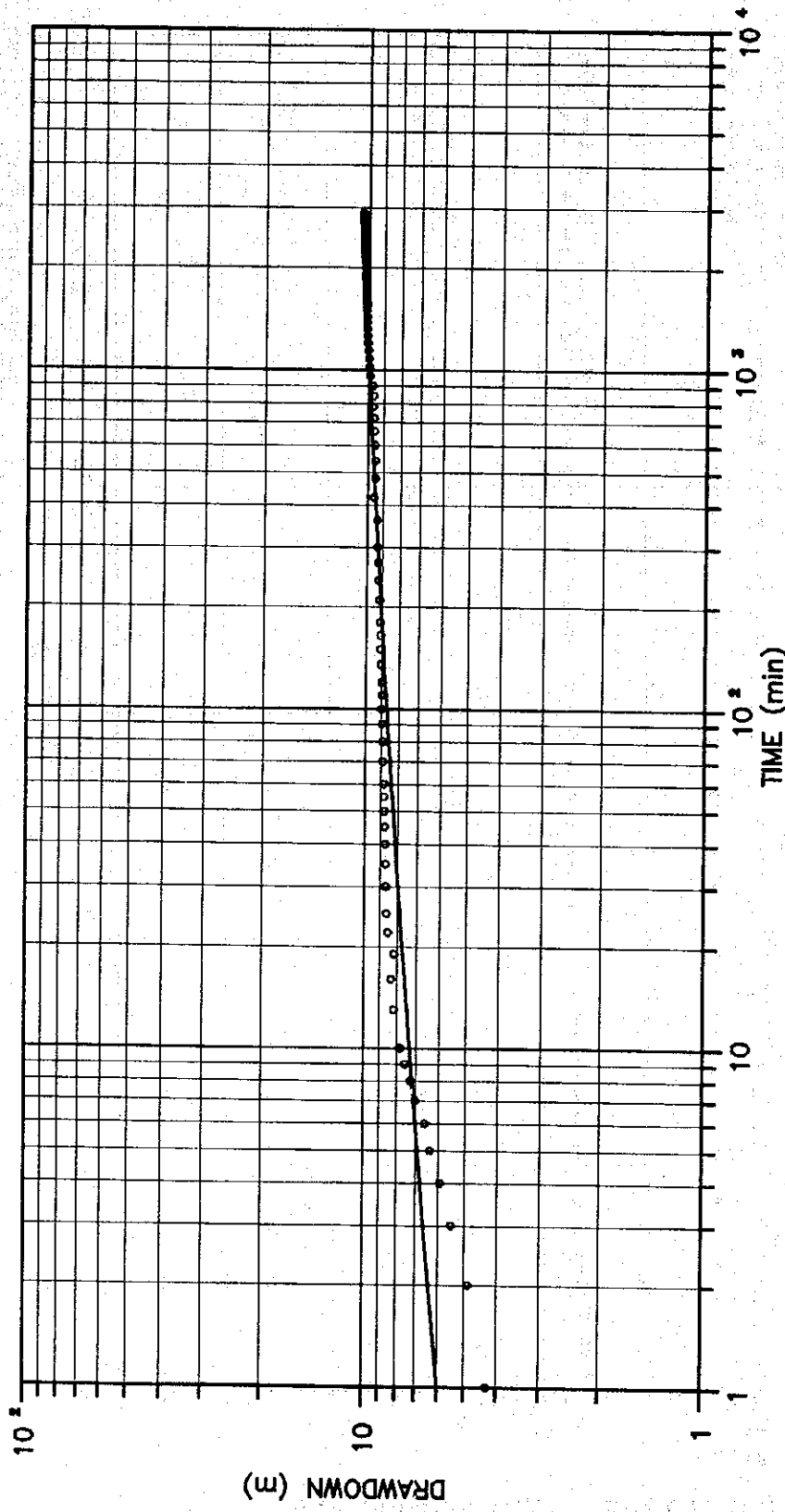
KOKUSAI KOGYO CO., LTD.



DATE : 21-23 APR. 1993
 PUMPED WELL : JICA C-1 WELL
 DISCHARGE : 108.0 m³/day
 (75 l/min)

GROUNDWATER LEVEL CHANGES DURING
 CONTINUOUS PUMPING TEST AT JICA C-1 WELL
 THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



— COMPUTED DRAWDOWN
 ○○○○ MEASURED DRAWDOWN

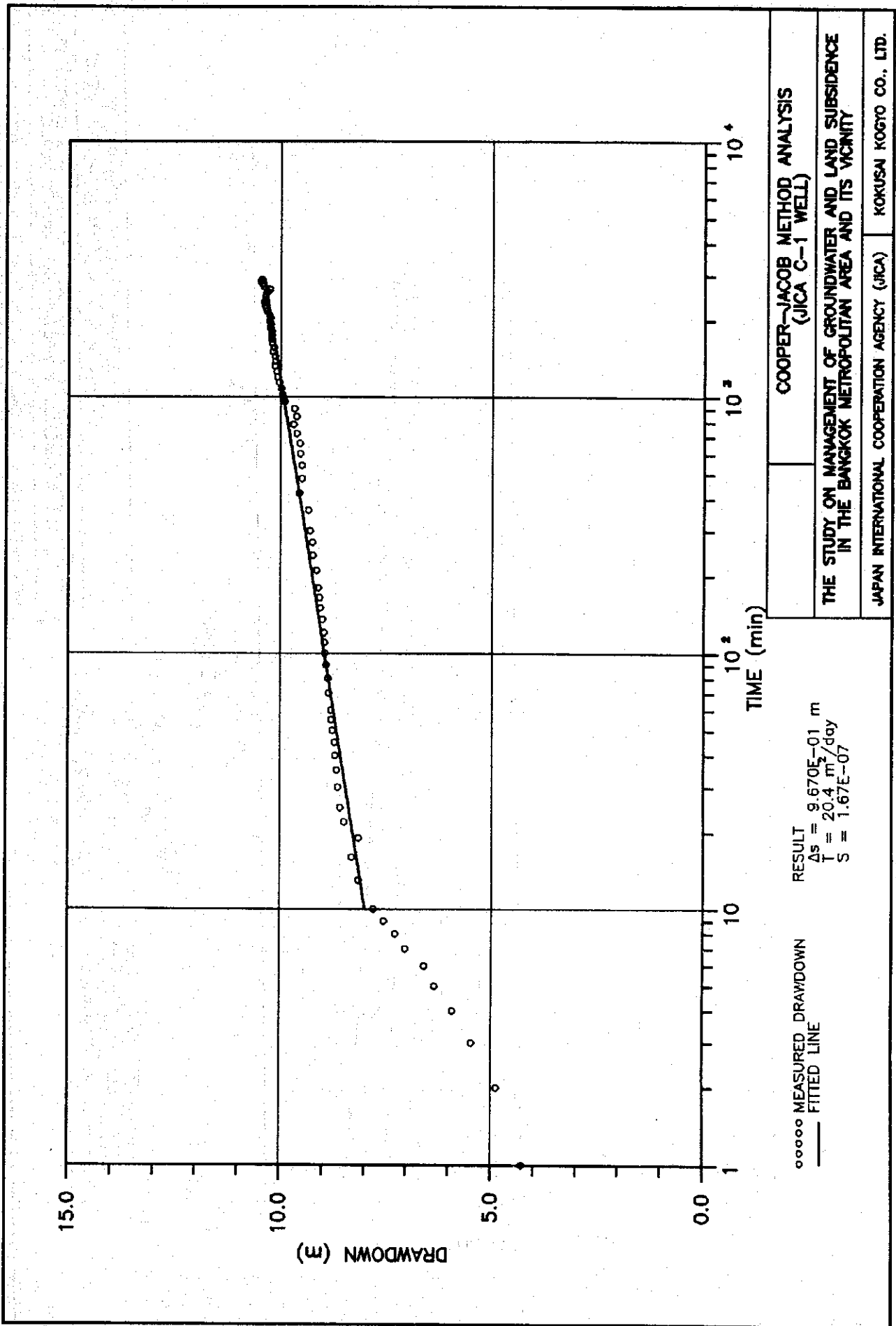
RESULT
 $T = 14.8 \text{ m}^2/\text{day}$
 $S = 7.76E-05$
 $SD = 4.22E-01 \text{ m}$

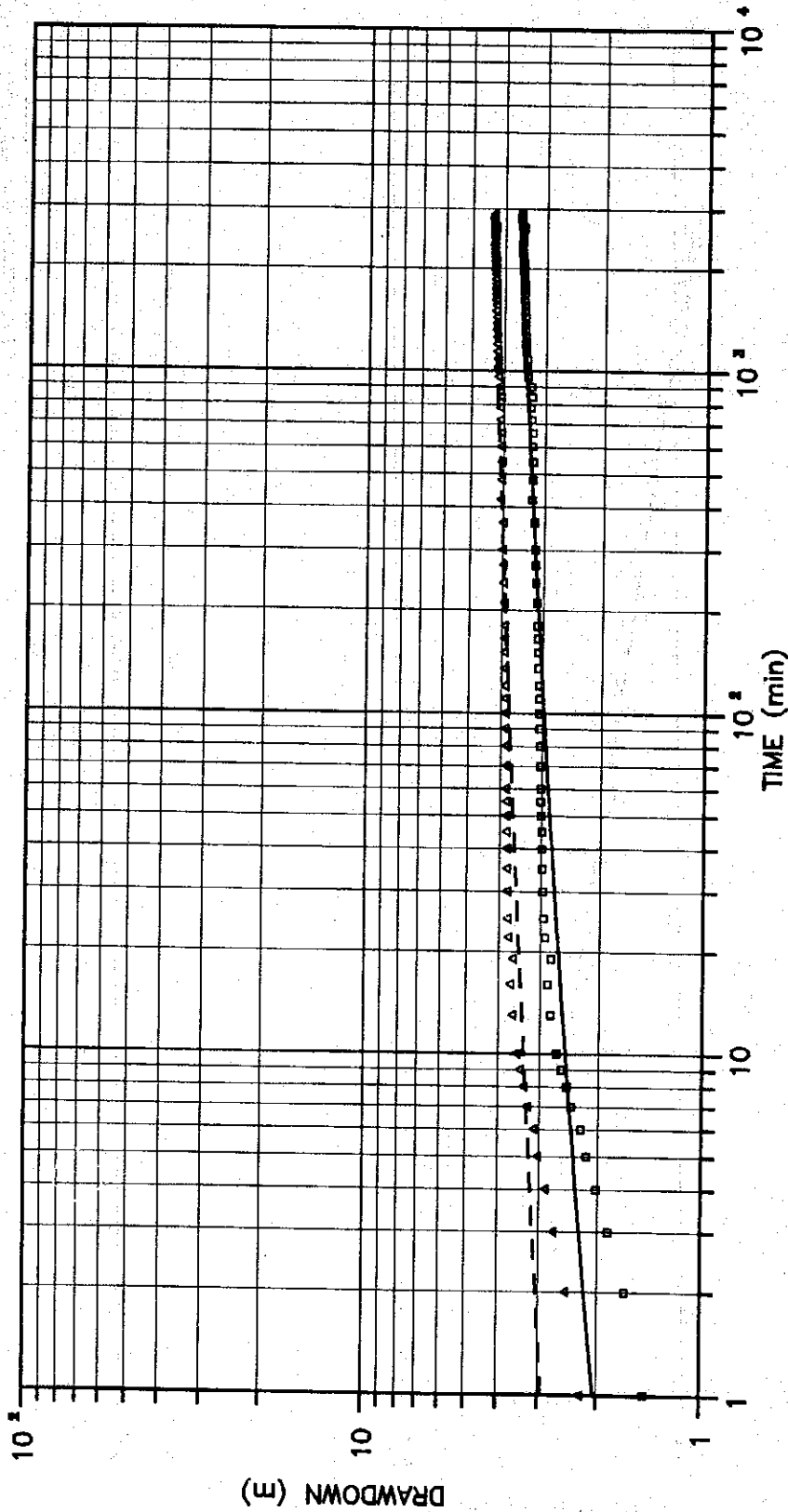
THEIR TYPE-CURVE MATCHING
 (JICA C-1 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOKUSAI KOGYO CO., LTD.



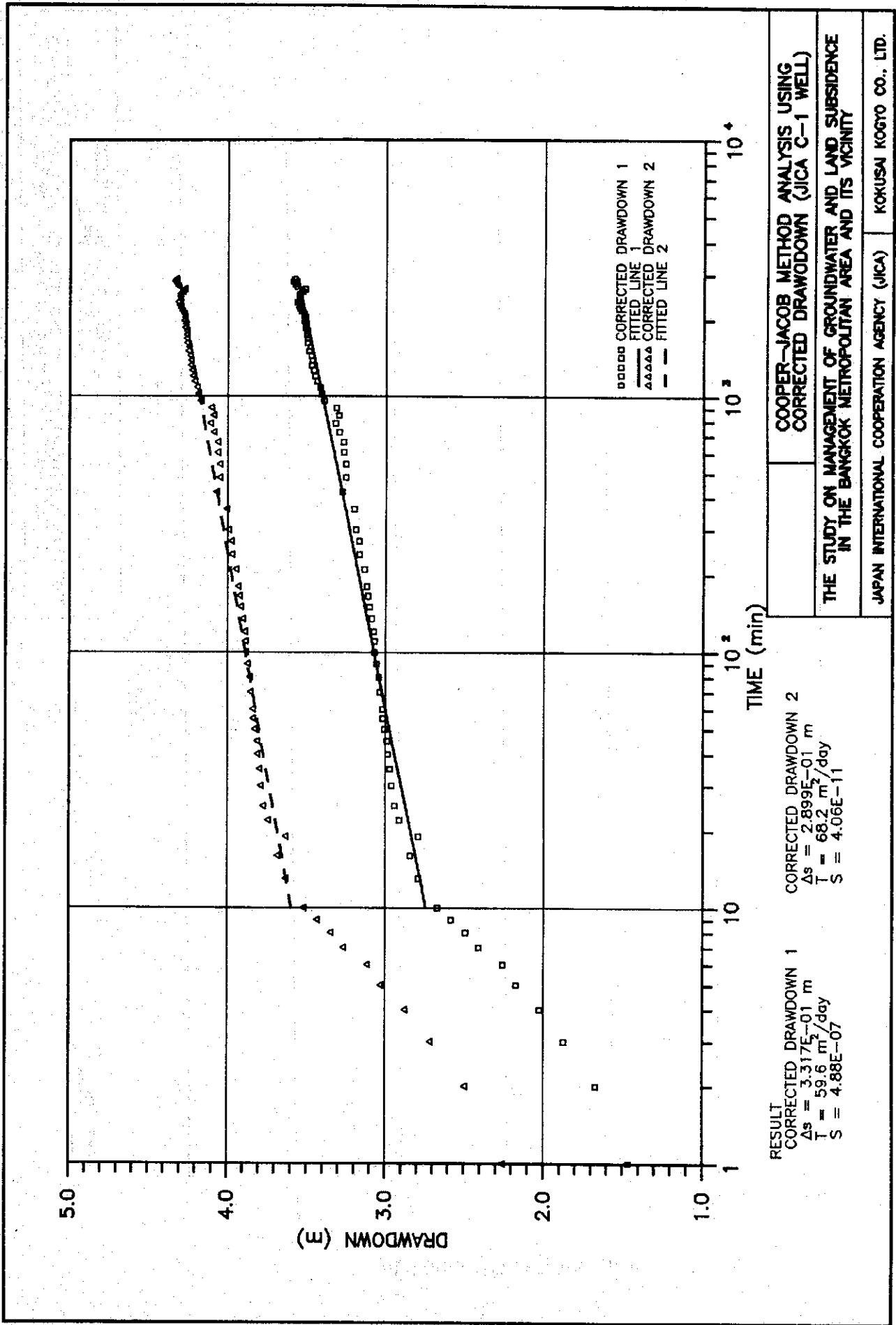


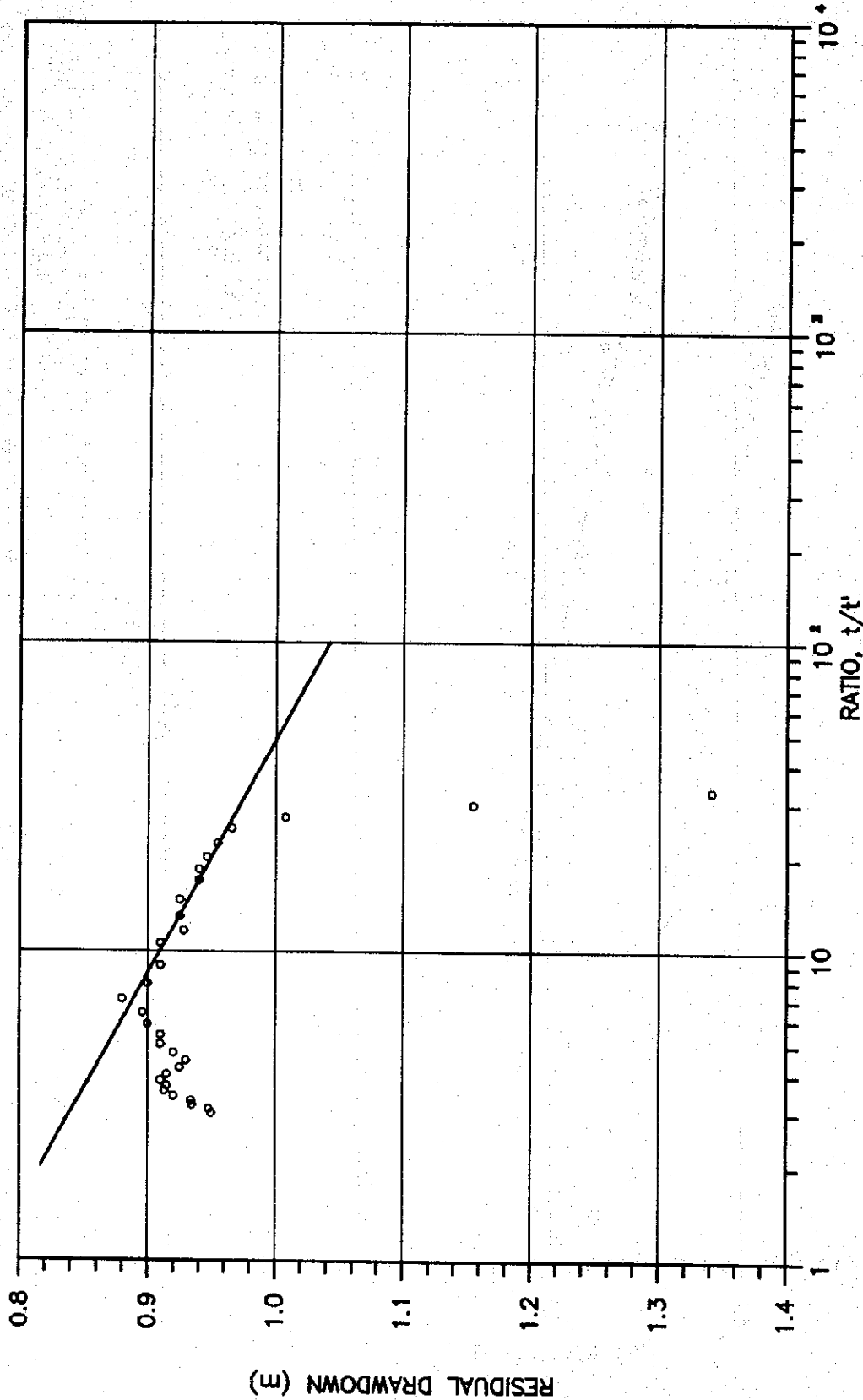
□□□□ CORRECTED DRAWDOWN 1
 ———— COMPUTED DRAWDOWN 1
 ▲▲▲▲ CORRECTED DRAWDOWN 2
 - - - - COMPUTED DRAWDOWN 2

RESULT
 CORRECTED DRAWDOWN 1
 $T = 43.1 \text{ m}^2/\text{day}$
 $S = 2.26\text{E}-04$
 $SD = 1.45\text{E}-01 \text{ m}$
 CORRECTED DRAWDOWN 2
 $T = 46.7 \text{ m}^2/\text{day}$
 $S = 9.03\text{E}-07$
 $SD = 1.55\text{E}-01 \text{ m}$

THEIR TYPE-CURVE MATCHING USING
 CORRECTED DRAWDOWN (JICA C-1 WELL)
 THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.





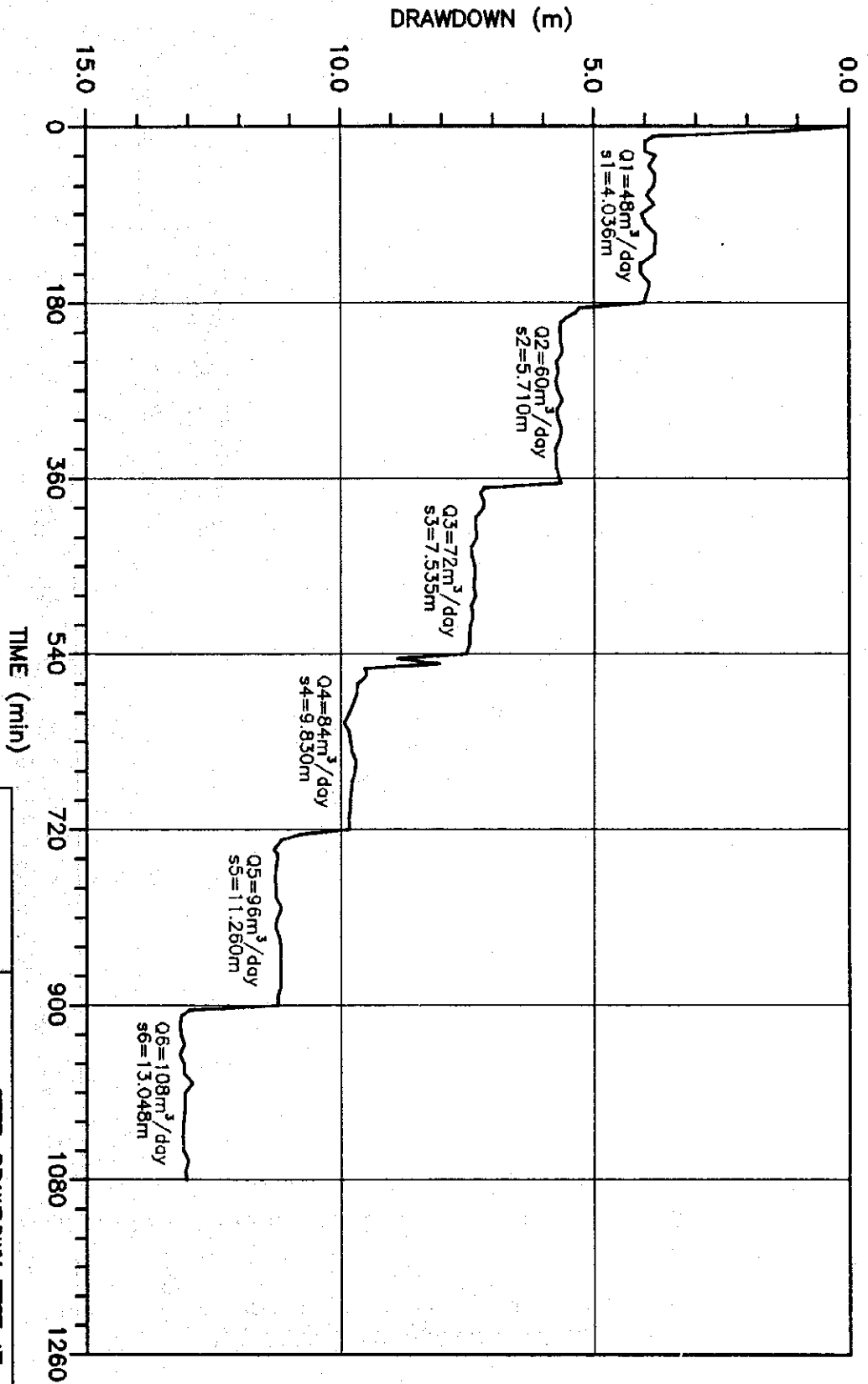
○○○○○ MEASURED DATA
 ——— FITTED LINE

RESULT
 $\Delta s'_T = 1.328E-01$ m
 $= 148.9$ m/day

RECOVERY METHOD ANALYSIS
(JICA C-1 WELL)

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.

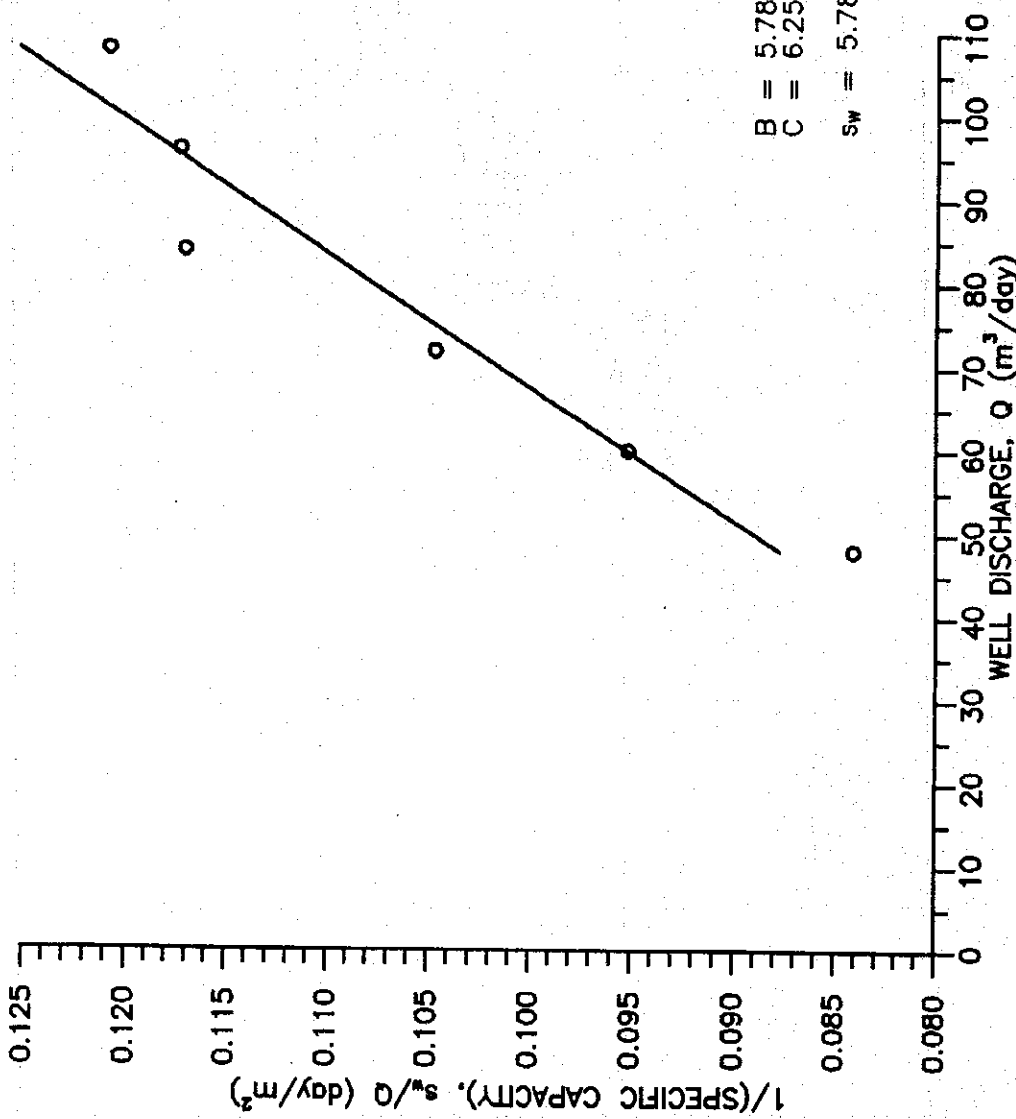


STEP-DRAWDOWN TEST AT
JICA C-2 WELL

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOKUSAI KOGYO CO., LTD.

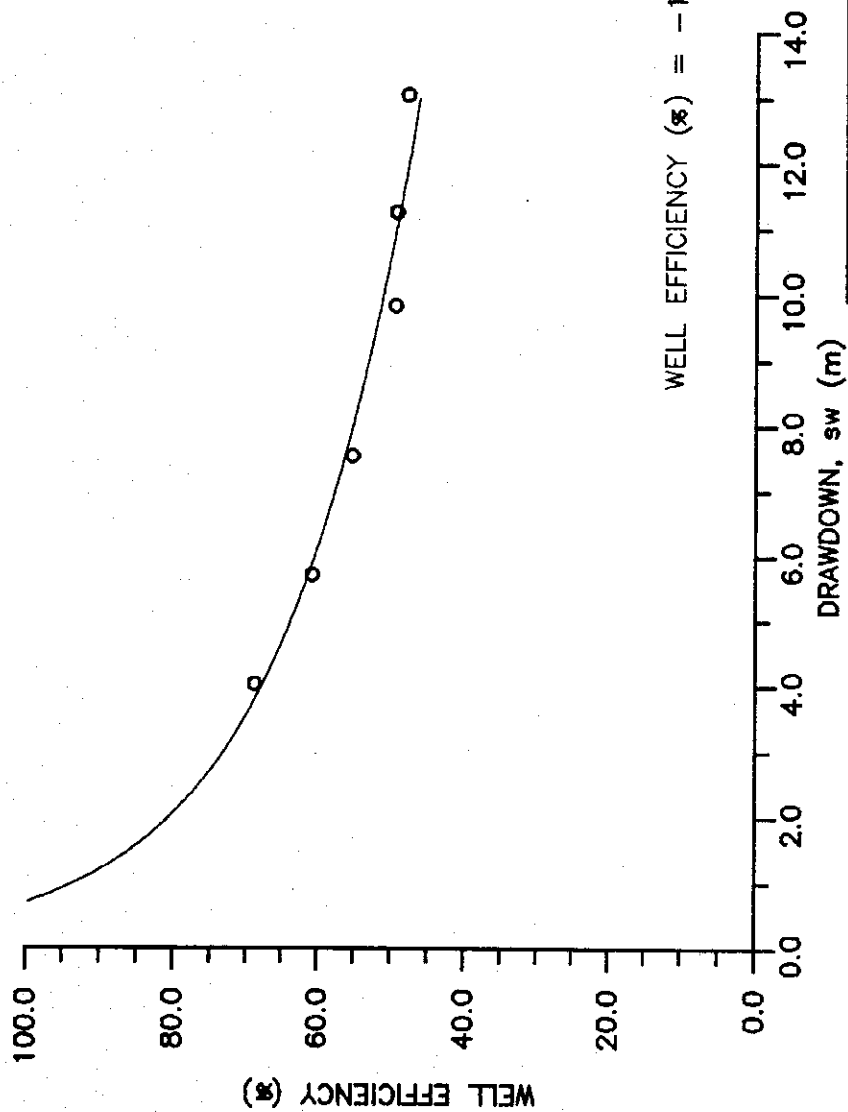


$$B = 5.78E-02 \left(\frac{\text{day}}{\text{m}^2} \right)$$

$$C = 6.25E-04 \left(\frac{\text{day}^2}{\text{m}^3} \right)$$

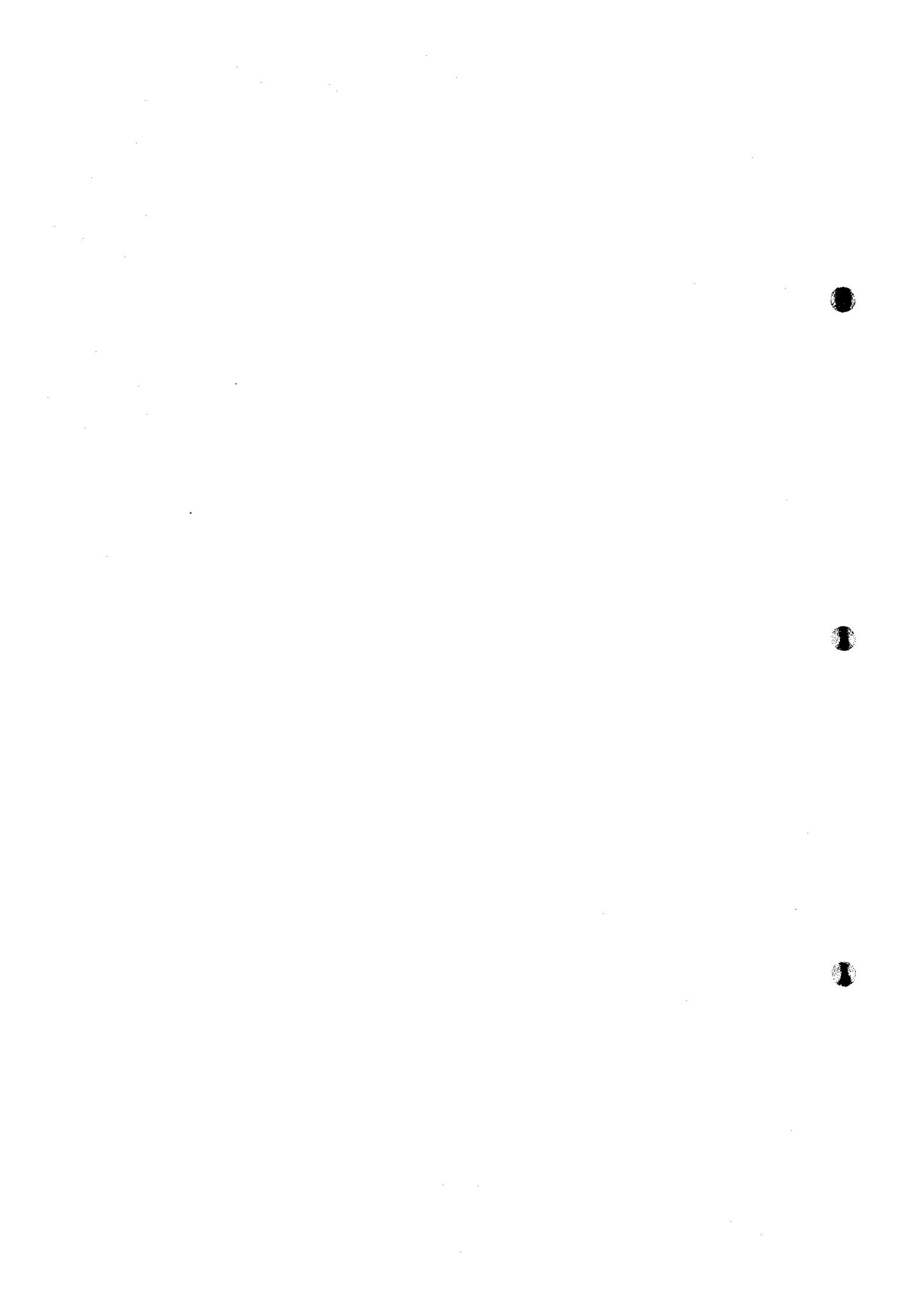
$$s_w = 5.78E-02 \times Q + 6.25E-04 \times Q^2$$

DETERMINATION OF B AND C FROM STEP-DRAWDOWN TEST (JICA C-2 WELL)	
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	KOKUSAI KOGYO CO., LTD.

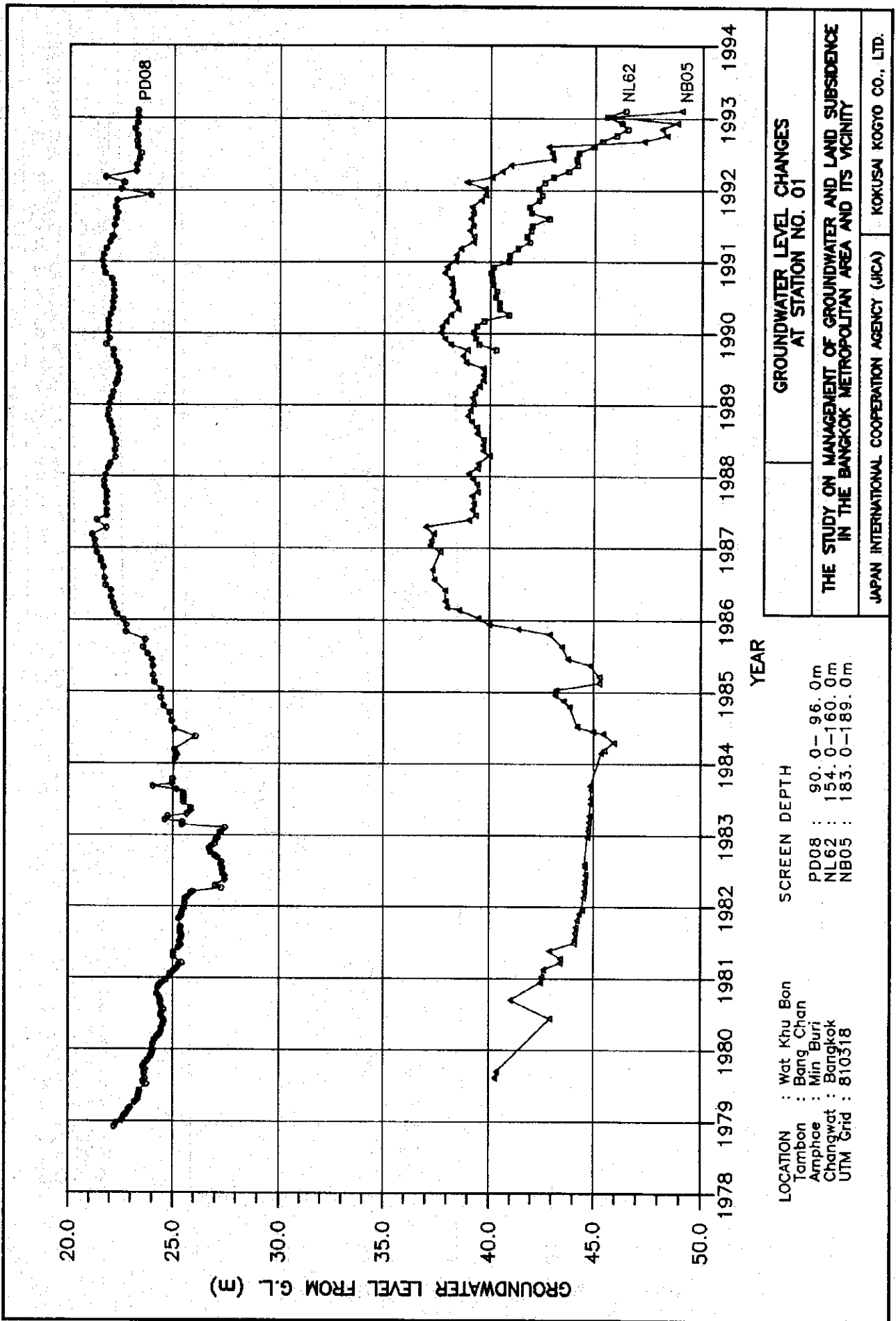


$$\text{WELL EFFICIENCY (\%)} = -18.2509 \times \text{LN}(\text{sw}) + 93.0203$$

	VARIATION OF WELL EFFICIENCY WITH DRAWDOWN (JICA C-2 WELL)
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	KOKUSAI KOGYO CO., LTD.



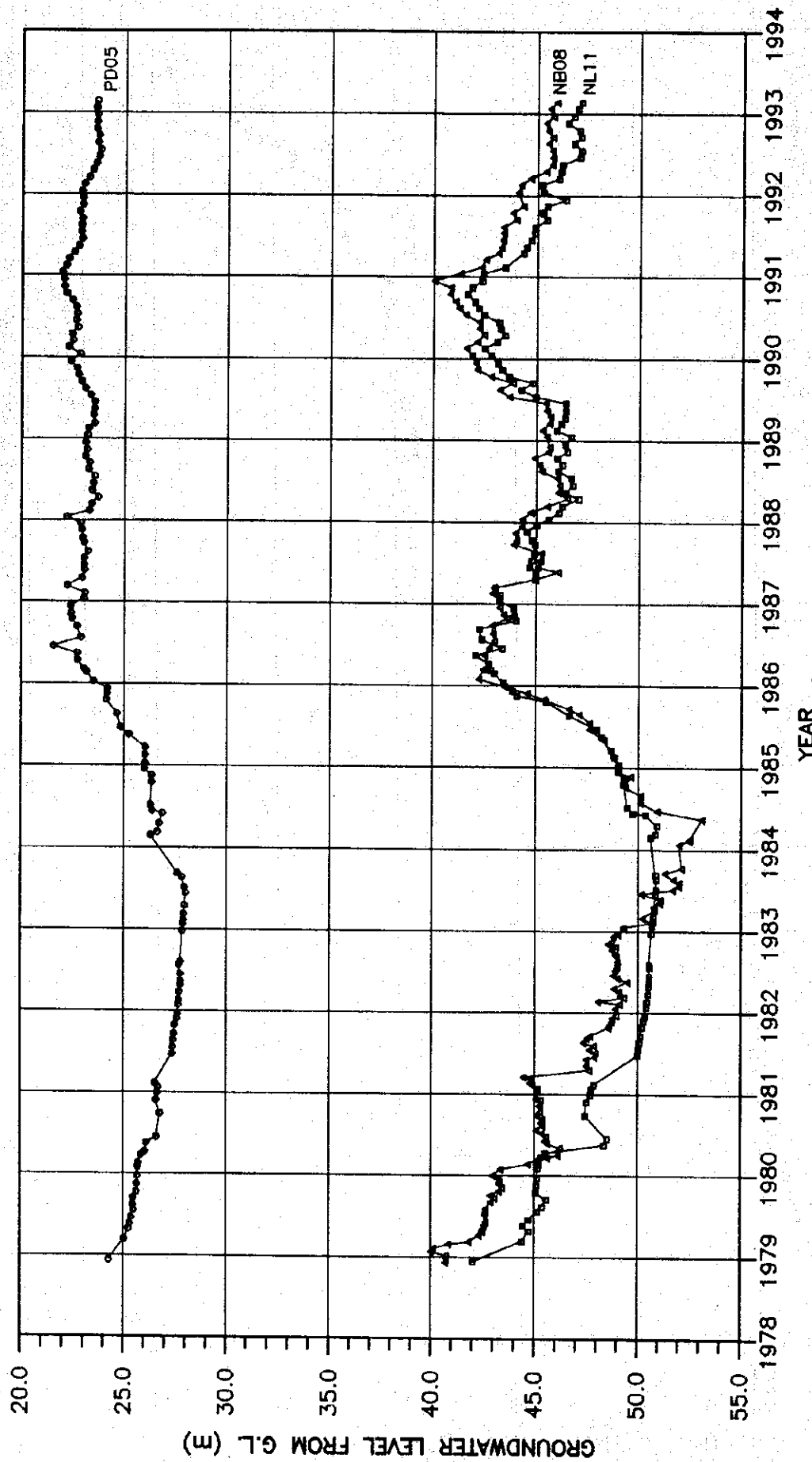
C. GROUNDWATER LEVEL



GROUNDWATER LEVEL CHANGES AT STATION NO. 01
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY
 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOSYO CO., LTD.

LOCATION : Wat Khu Bon
 Tambon : Bang Chan
 Amphoe : Min Buri
 Changwat : Bangkok
 UTM Grid : 810318

SCREEN DEPTH
 PD08 : 90.0 - 96.0m
 NL62 : 154.0 - 160.0m
 NB05 : 183.0 - 189.0m

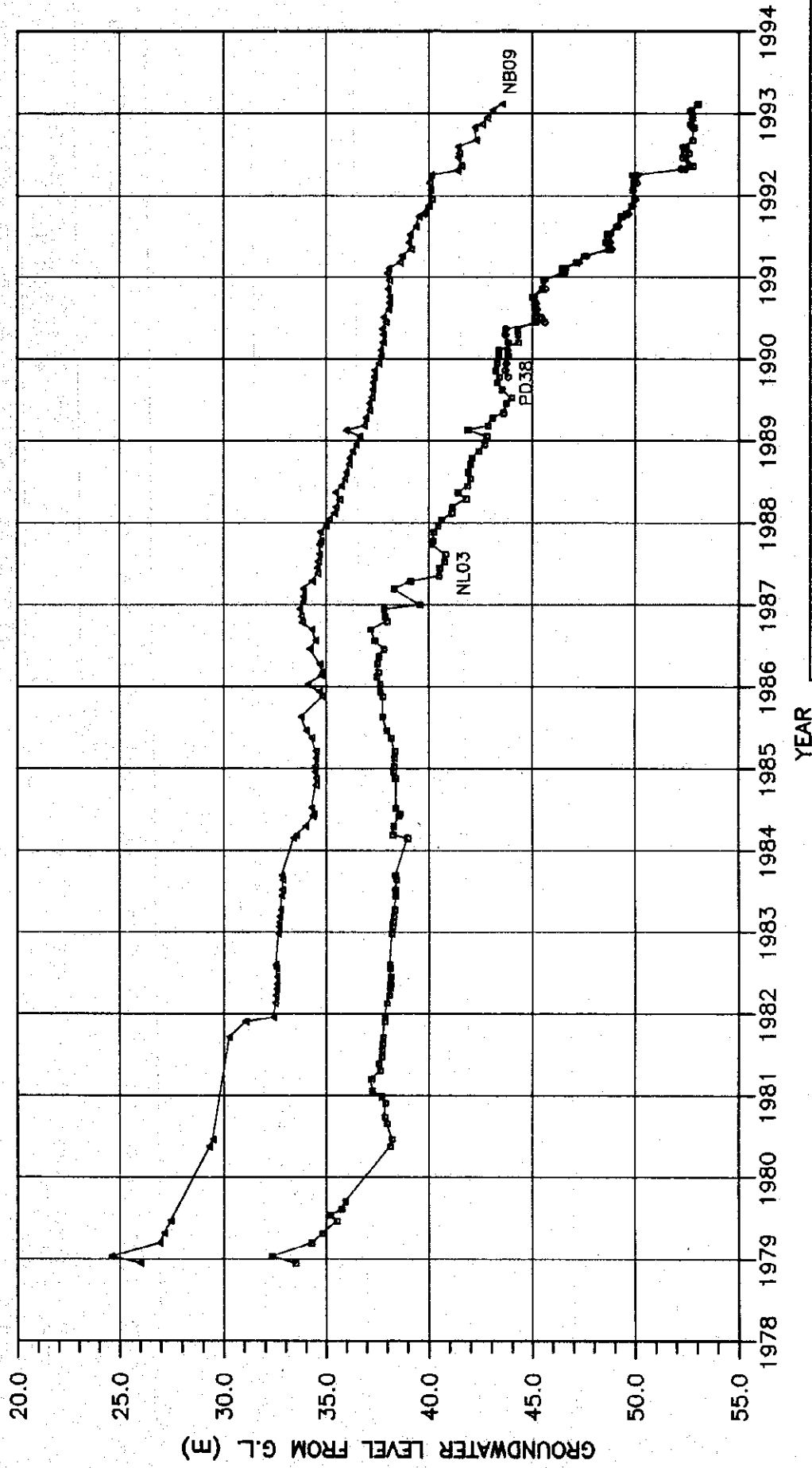


**GROUNDWATER LEVEL CHANGES
AT STATION No. 02**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Bangkok Golf Course SCREEN DEPTH
 Tambon : Hua Mak PD05 : 91.5 - 97.5m
 Amphoe : Bang Kapi NL11 : 129.0 - 135.0m
 Changwat : Bangkok NB08 : 180.0 - 186.0m
 UTM Grid : 801199



**GROUNDWATER LEVEL CHANGES
AT STATION No. 03**

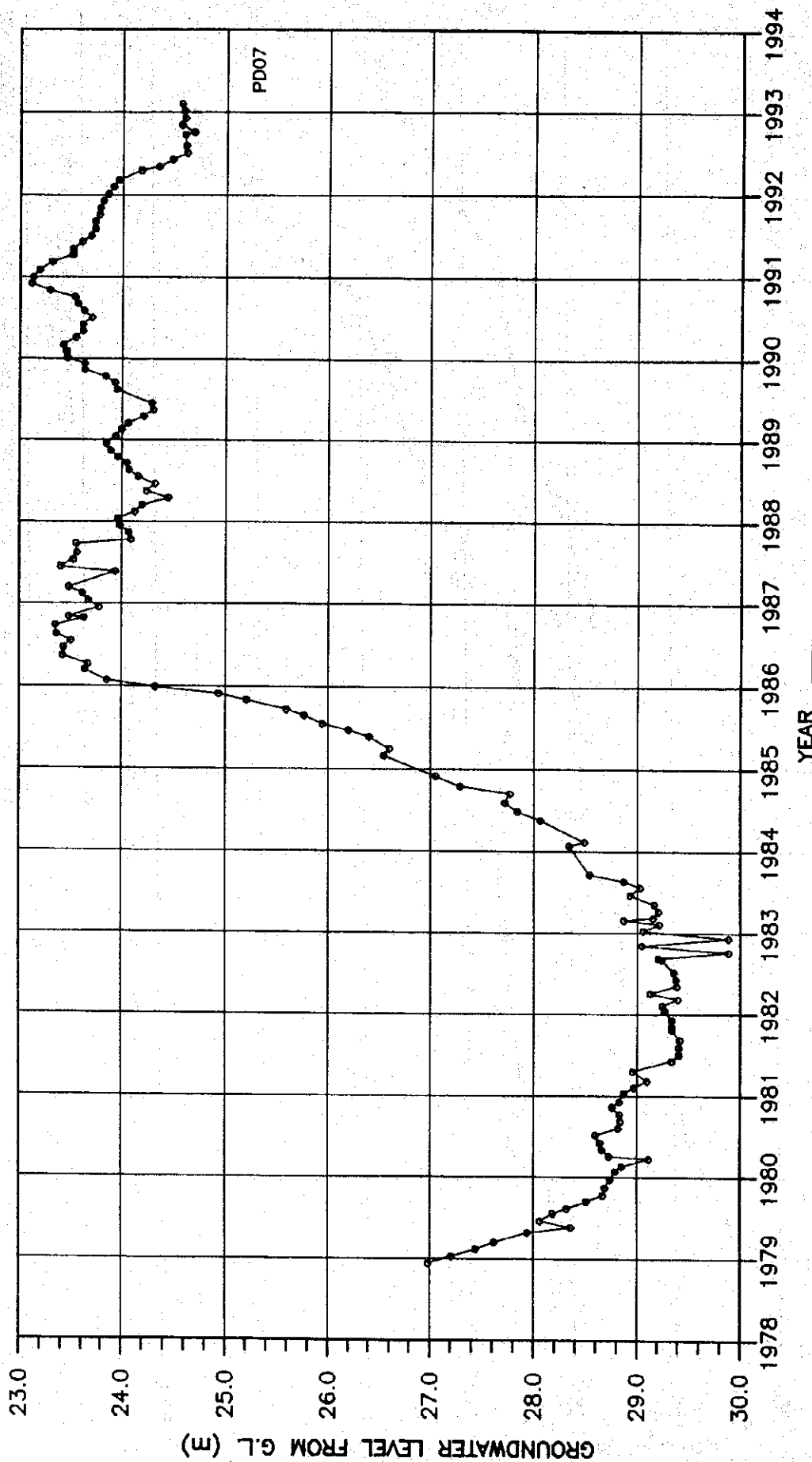
**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Hua Khu Wanaram
 Tambon : Sisa Chorakhe Noi
 Amphoe : Bang Phli
 Changwat : Samut Prakan
 UTM Grid : 936156

SCREEN DEPTH

PD38 : 103.0-109.0m
 NL03 : 144.0-150.0m
 NB09 : 186.3-192.3m

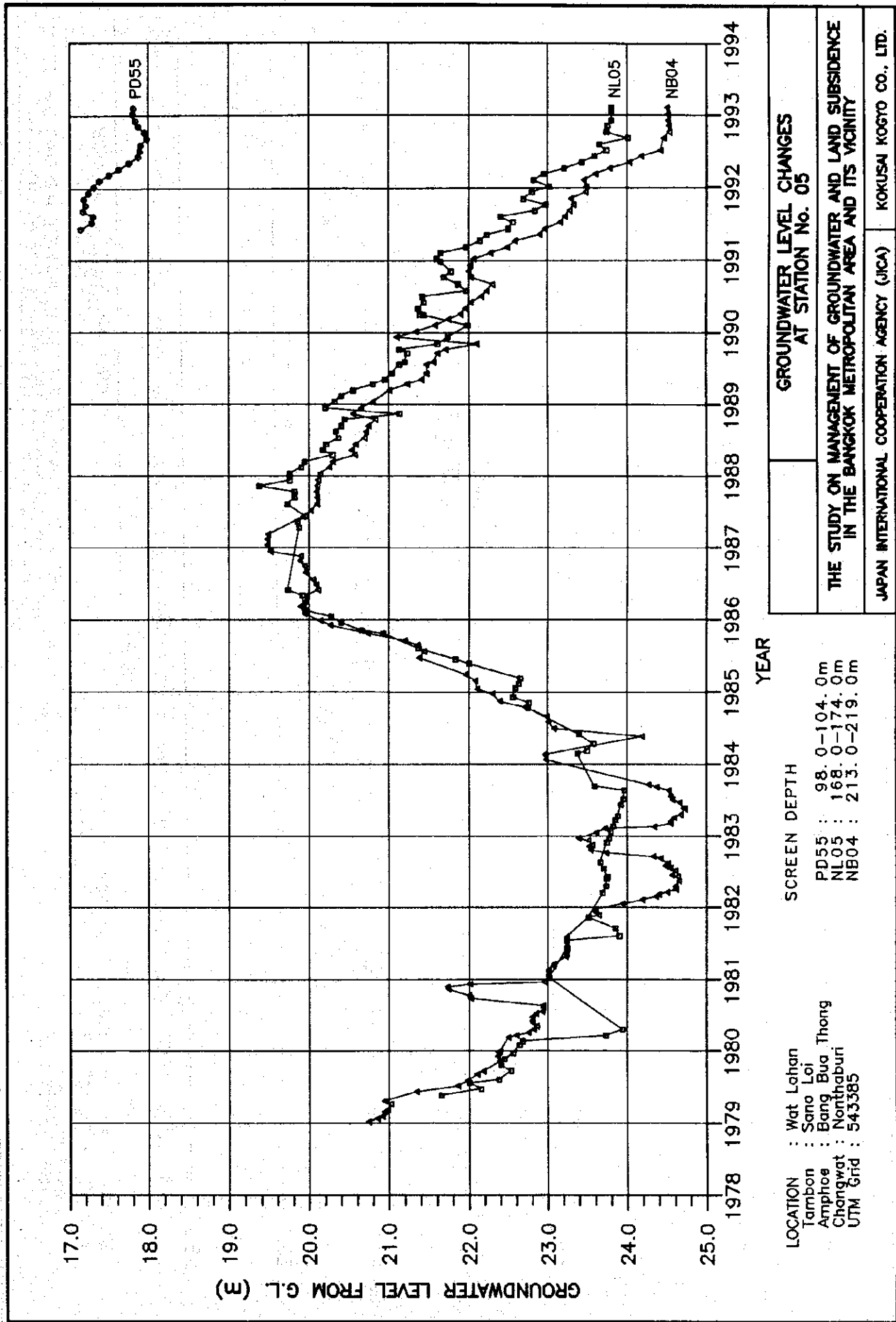


**GROUNDWATER LEVEL CHANGES
AT STATION No. 04**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Phibun Uppatham School SCREEN DEPTH : PD07 : 92.1 - 98.1 m
 Tambon : Lat Phrao
 Amphoe : Bang Kapi
 Changwat : Bangkok
 UTM Grid : 721255



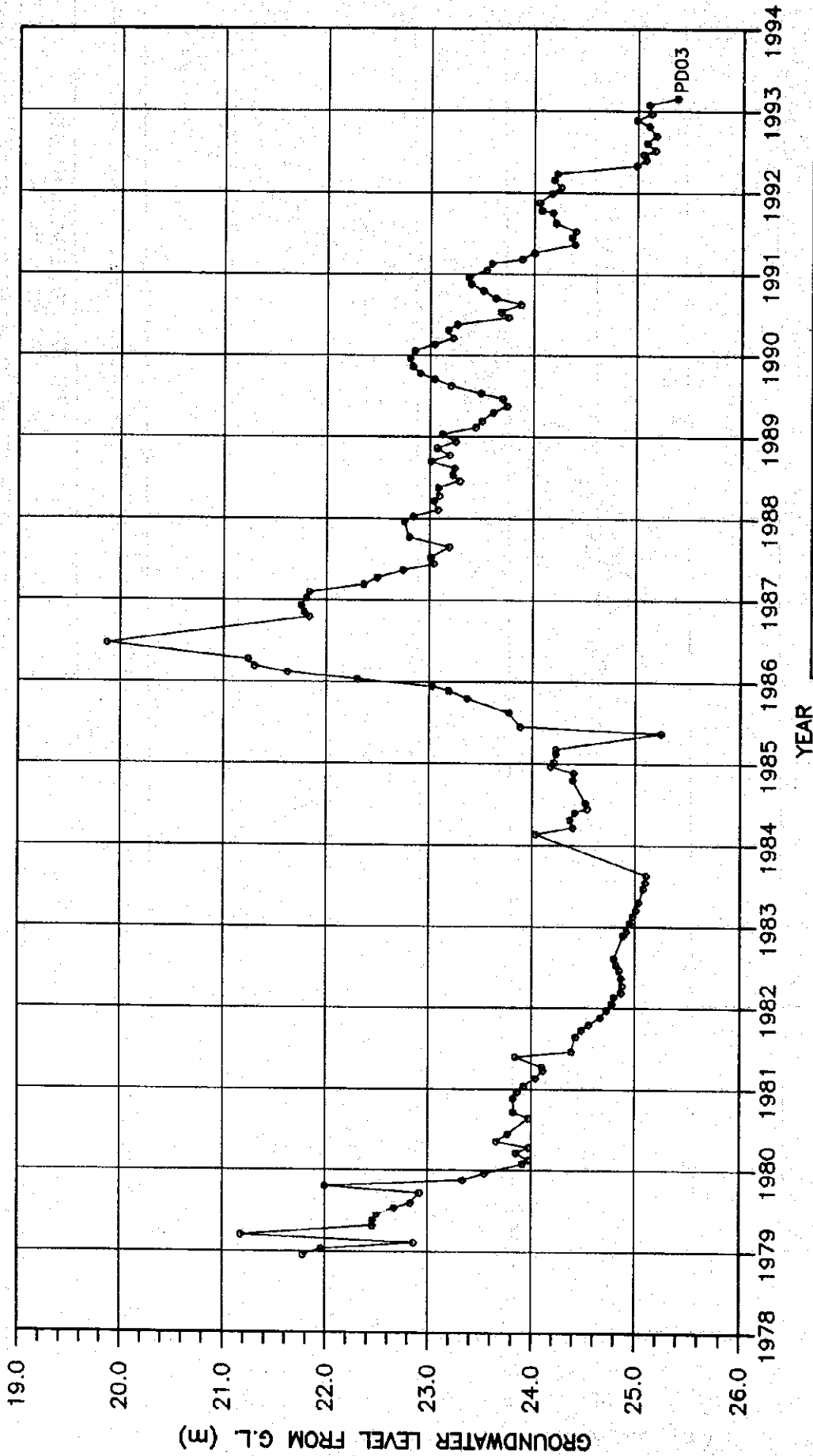
GROUNDWATER LEVEL CHANGES
AT STATION No. 05

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

SCREEN DEPTH
 PD55 : 98.0-104.0m
 NL05 : 168.0-174.0m
 NB04 : 213.0-219.0m

LOCATION : Wat Lahan
 Tambon : Sano Loi
 Amphos : Bang Bua Thong
 Chongwat : Nonthaburi
 UTM Grid : 543385



**GROUNDWATER LEVEL CHANGES
AT STATION No. 06**

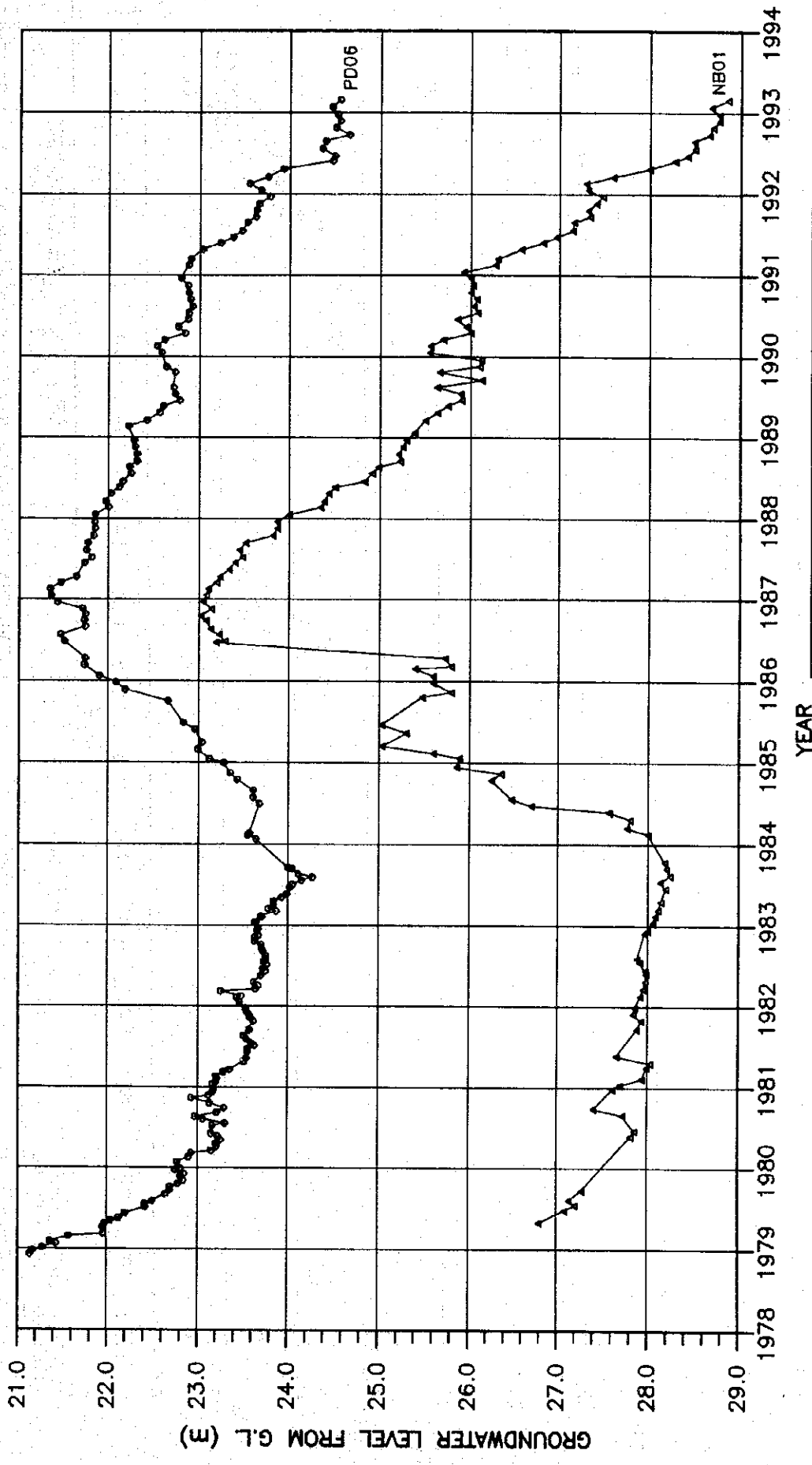
**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Khlong Salut
 Tambon : Bang Phli Yai
 Amphoe : Bang Phli
 Changwat : Samut Prakan
 UTM Grid : 838092

SCREEN DEPTH
 PD03 : 79.5 - 85.5 m

YEAR



**GROUNDWATER LEVEL CHANGES
AT STATION No. 07**

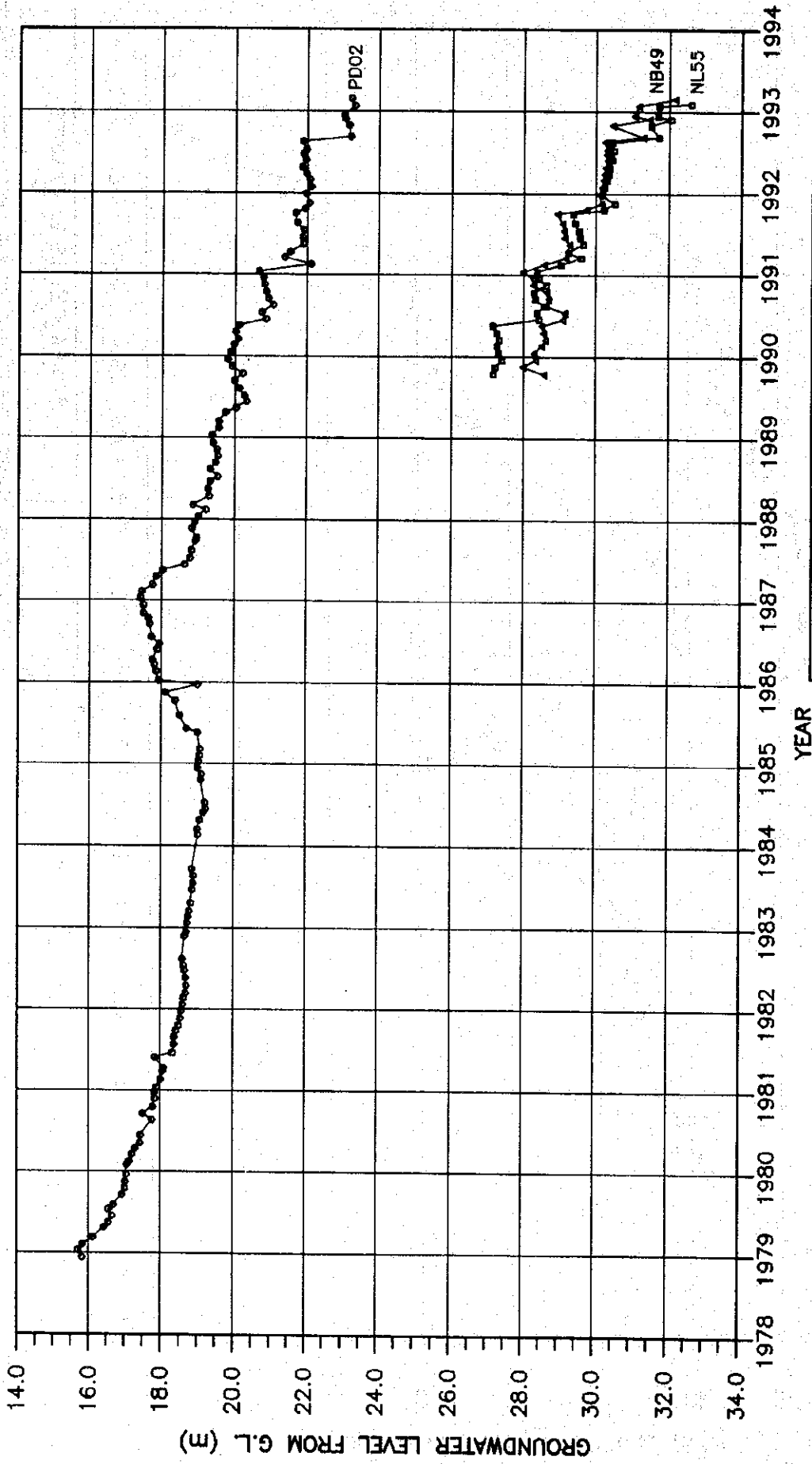
**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDIENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Chan Predittharam
 Tambon : Bang Duan
 Amphoe : Phasi Charoen
 Changwat : Bangkok
 UTM Grid : 562168

SCREEN DEPTH
 PD06 : 88.6 - 94.6m
 NB01 : 192.6 - 198.6m

YEAR



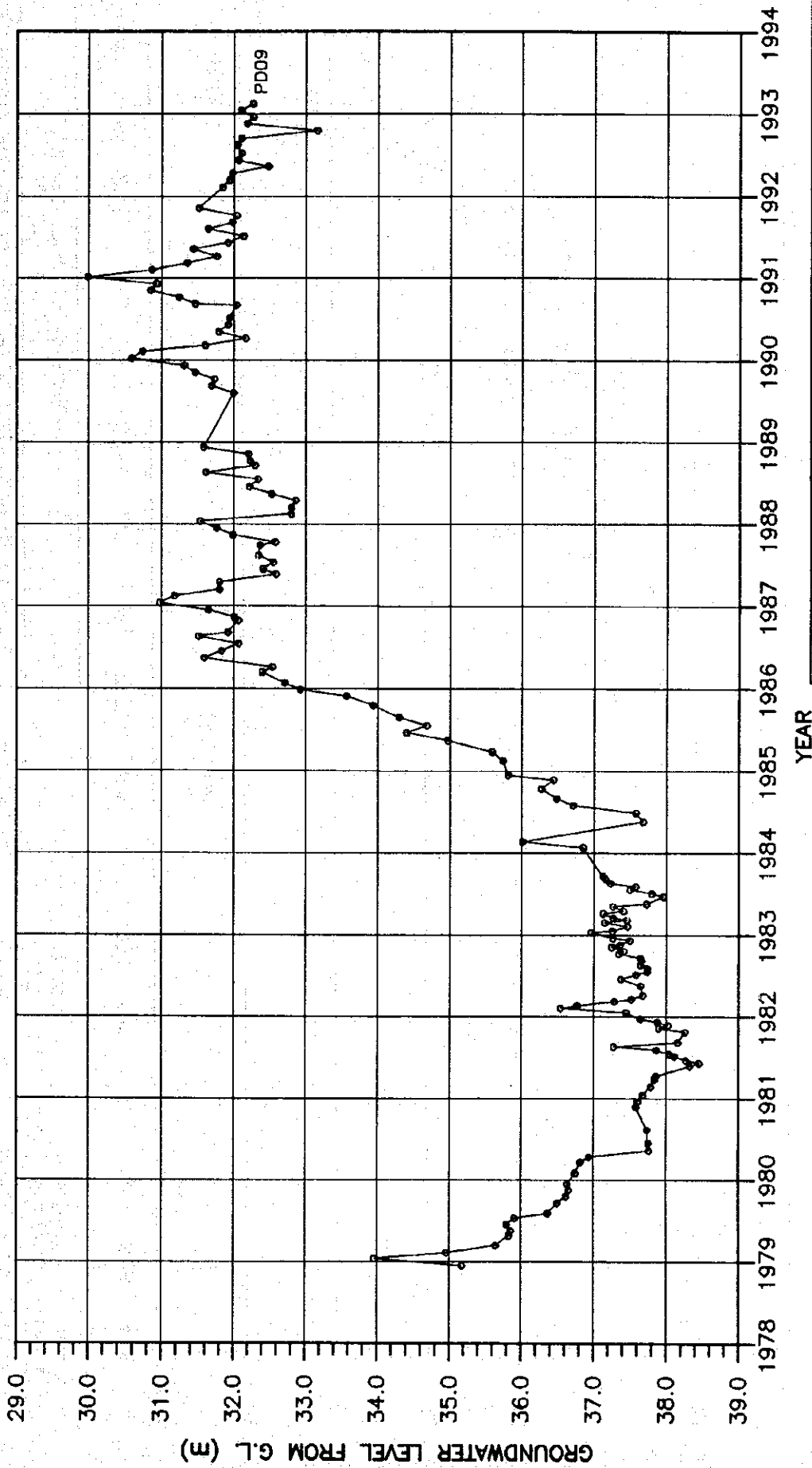
LOCATION : Wat Tamru
 Tambon : Bang Pu Mai
 Amphoe : Muang Samut Prakan
 Changwat : Samut Prakan
 UTM Grid : 825947

SCREEN DEPTH
 PD02 : 87.1 - 93.1 m
 NL55 : 151.0 - 157.0 m
 NB49 : 196.0 - 202.0 m

GROUNDWATER LEVEL CHANGES
 AT STATION No. 08

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



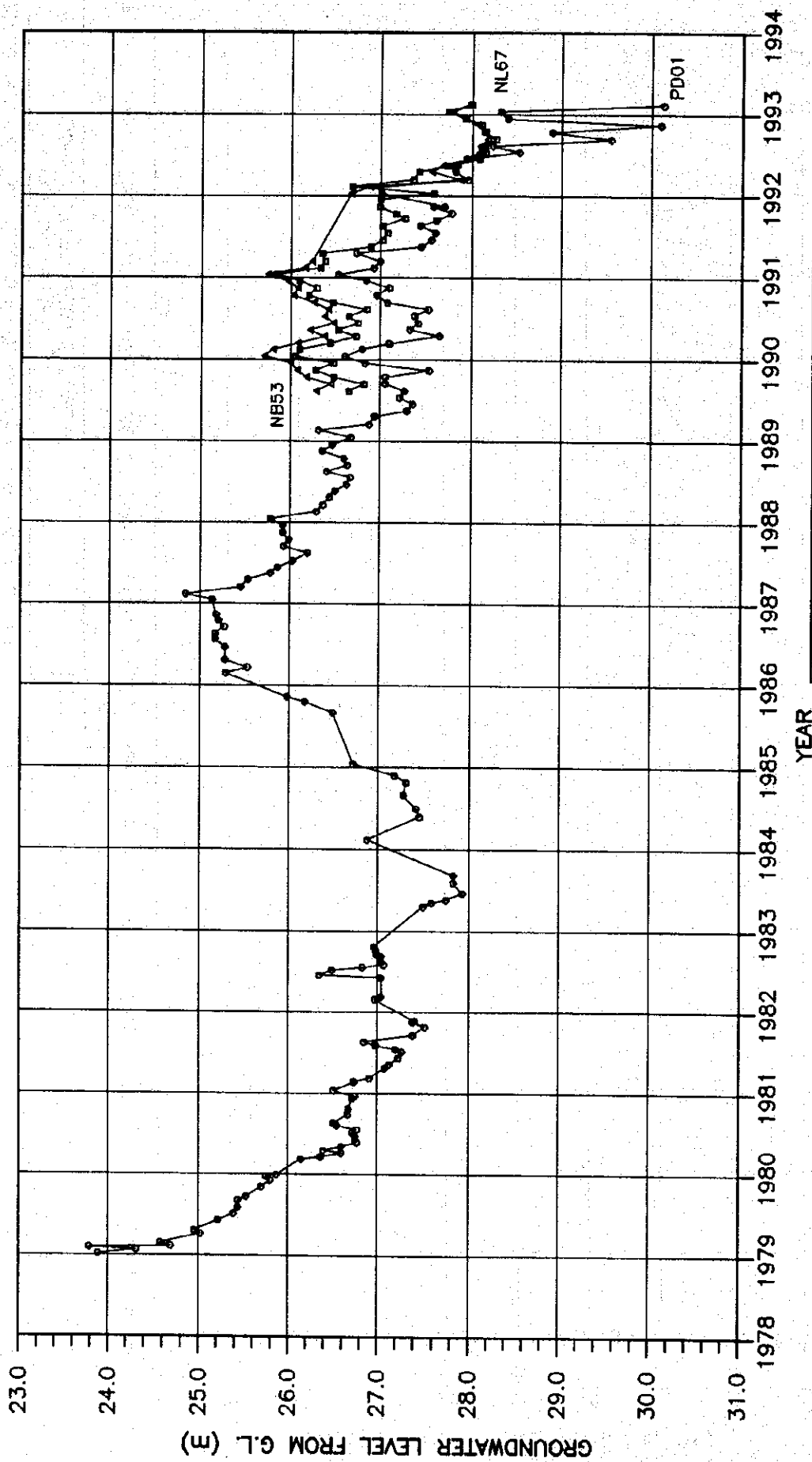
**GROUNDWATER LEVEL CHANGES
AT STATION No. 09**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Dan Samrong
 Tambon : Samrong Nua
 Amphoe : Muang Samut Prakan
 Changwat : Samut Prakan
 UTM Grid : 733090

SCREEN DEPTH
 PD09 : 96.0-102.0m



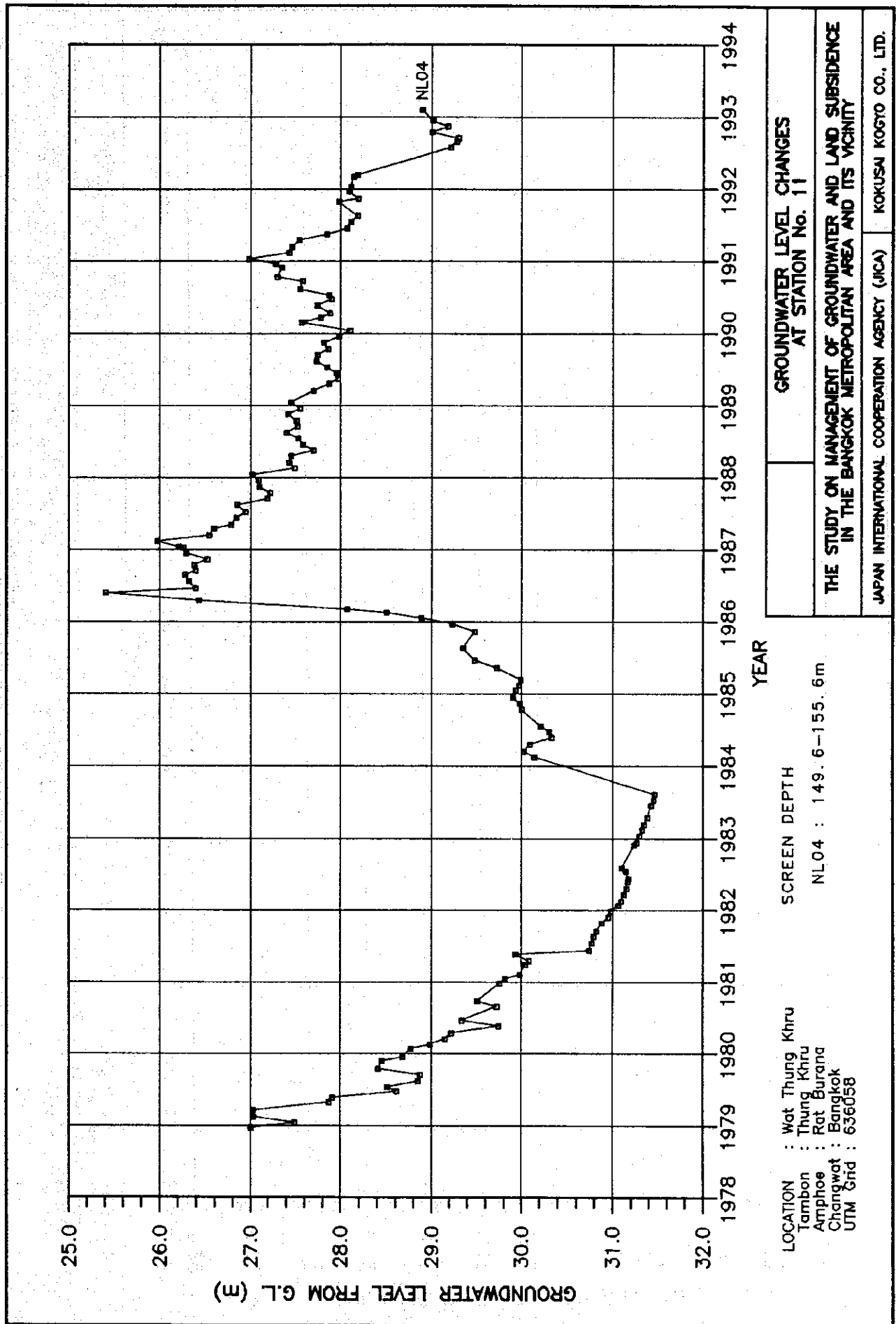
**GROUNDWATER LEVEL CHANGES
AT STATION No. 10**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Khu Sang
 Tambon : Nai Khlong Bang Pla Kot
 Amphoe : Phra Samut Chediak
 Changwat : Samut Prakan
 UTM Grid : 660007

SCREEN DEPTH
 PD01 : 97.7-103.7m
 NL55 : 130.0-136.0m
 NB49 : 178.0-184.0m



LOCATION : Wat Thung Khru
 Tambon : Thung Khru
 Amphoe : Rat Burana
 Changwat : Bangkok
 UTM Grid : 656058

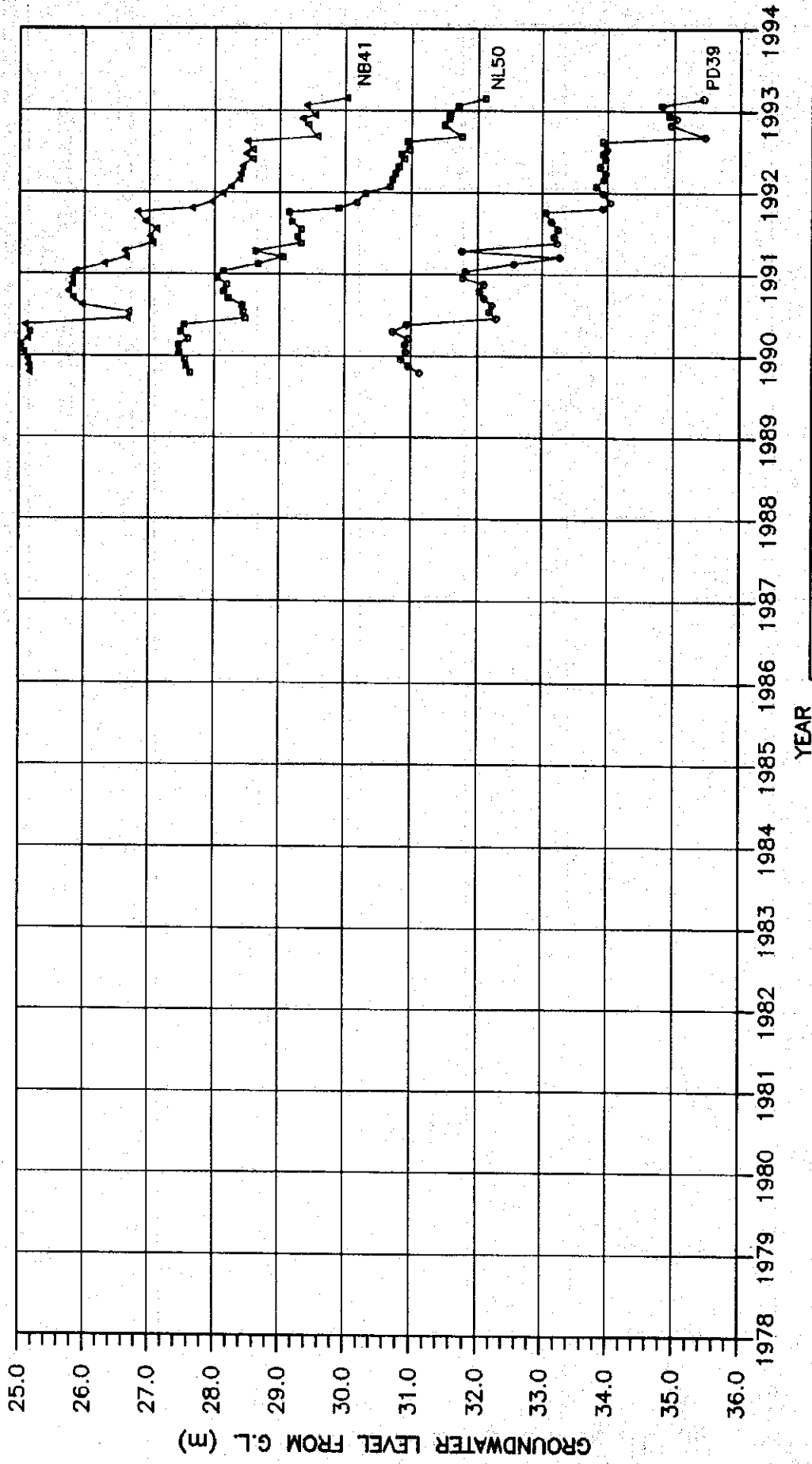
SCREEN DEPTH
 NL04 : 149.6-155.6m.

YEAR

GROUNDWATER LEVEL CHANGES
 AT STATION No. 11

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



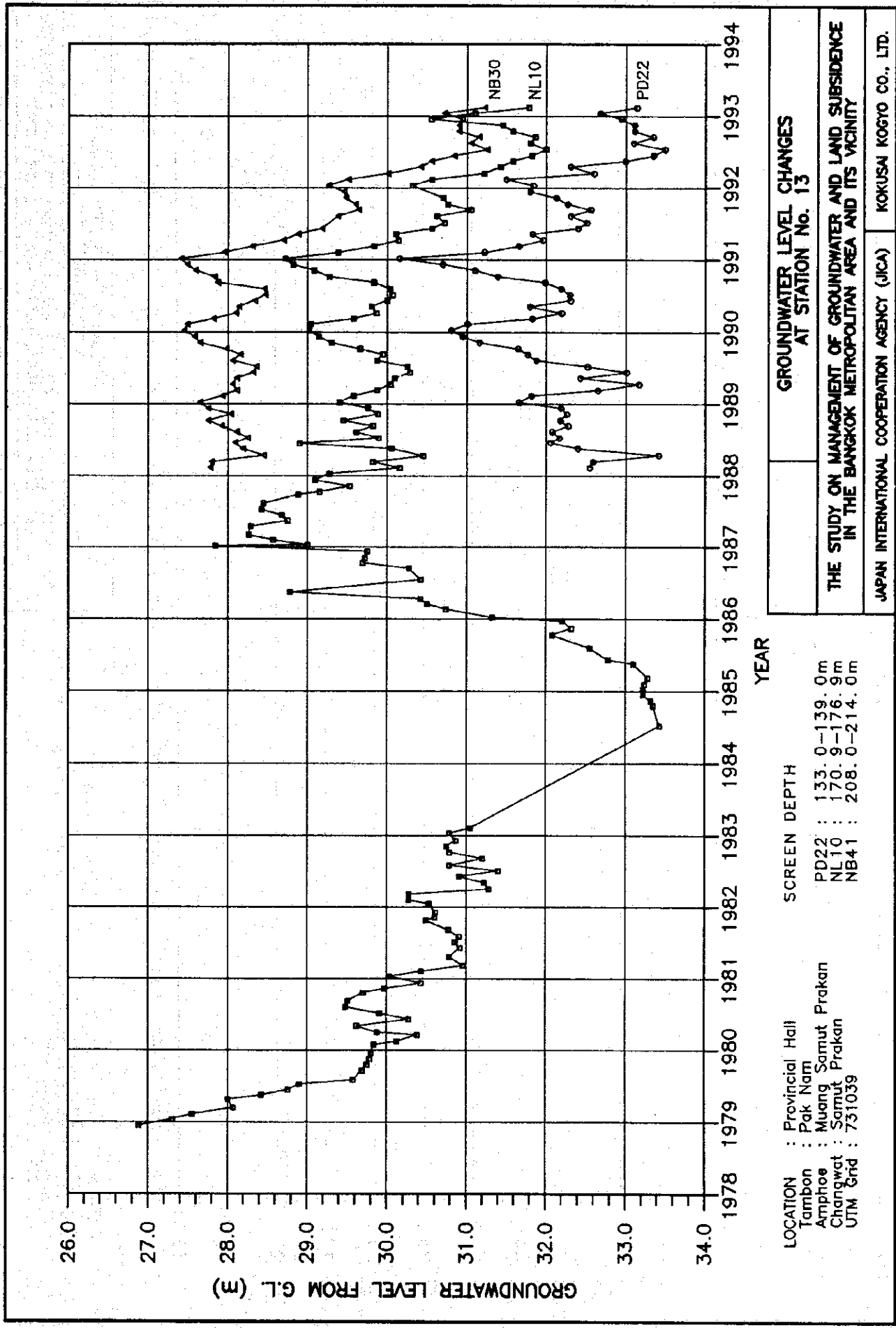
**GROUNDWATER LEVEL CHANGES
AT STATION No. 12**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Phraek Sa
 Tambon : Phraek Sa
 Amphoe : Muang Samut Prakan
 Changwat : Samut Prakan
 UTM Grid : 777007

SCREEN DEPTH
 PD39 : 126.0-132.0m
 NL50 : 168.0-174.0m
 NB41 : 212.0-218.0m



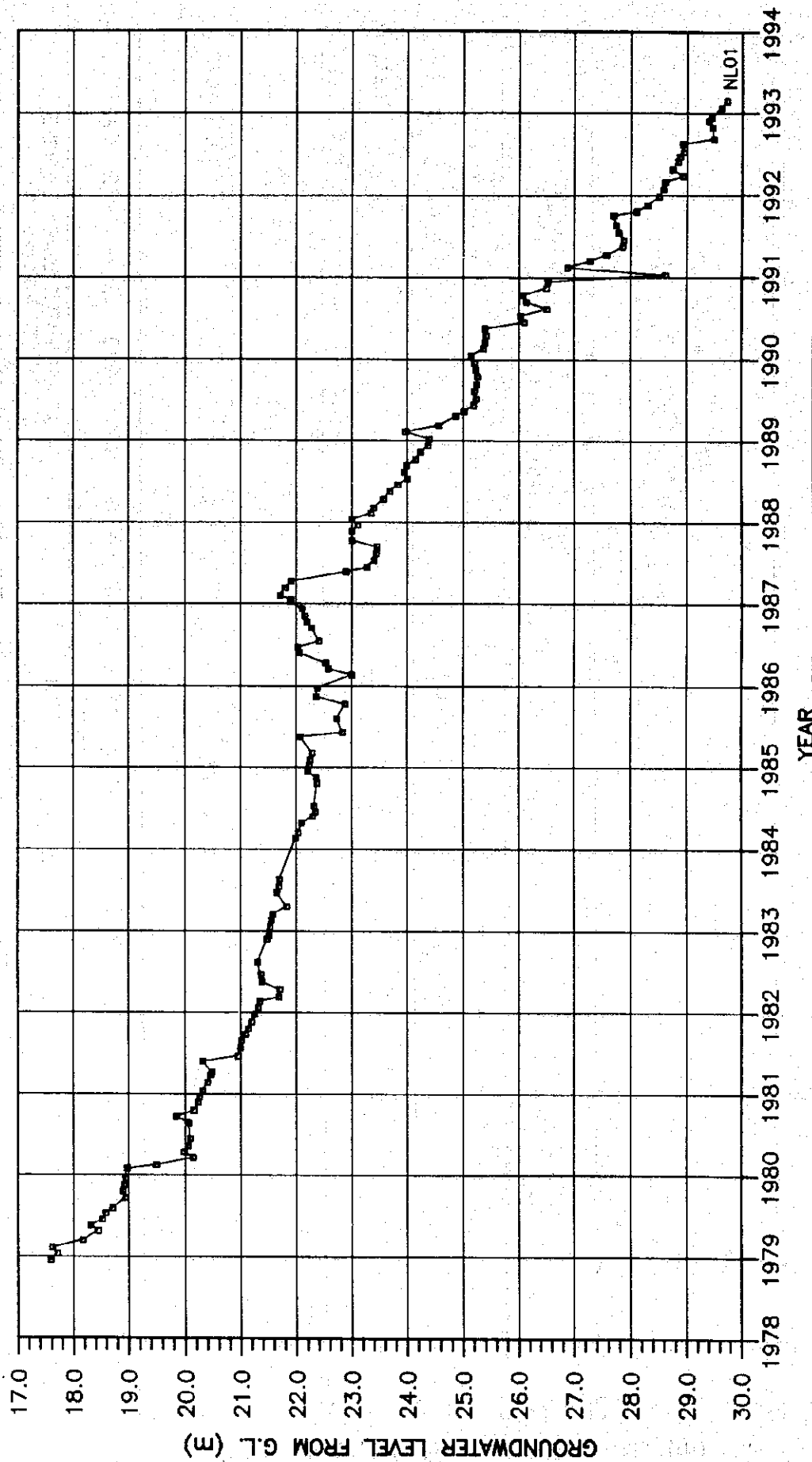
GROUNDWATER LEVEL CHANGES AT STATION No. 13

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOSYO CO., LTD.

LOCATION : Provincial Hall
 Tambon : Pak Nam
 Amphoe : Muang Samut Prakan
 Changwat : Samut Prakan
 UTM Grid : 731039

SCREEN DEPTH
 PD22 : 133.0-139.0m
 NL10 : 170.9-176.9m
 NB41 : 208.0-214.0m



**GROUNDWATER LEVEL CHANGES
AT STATION No. 14**

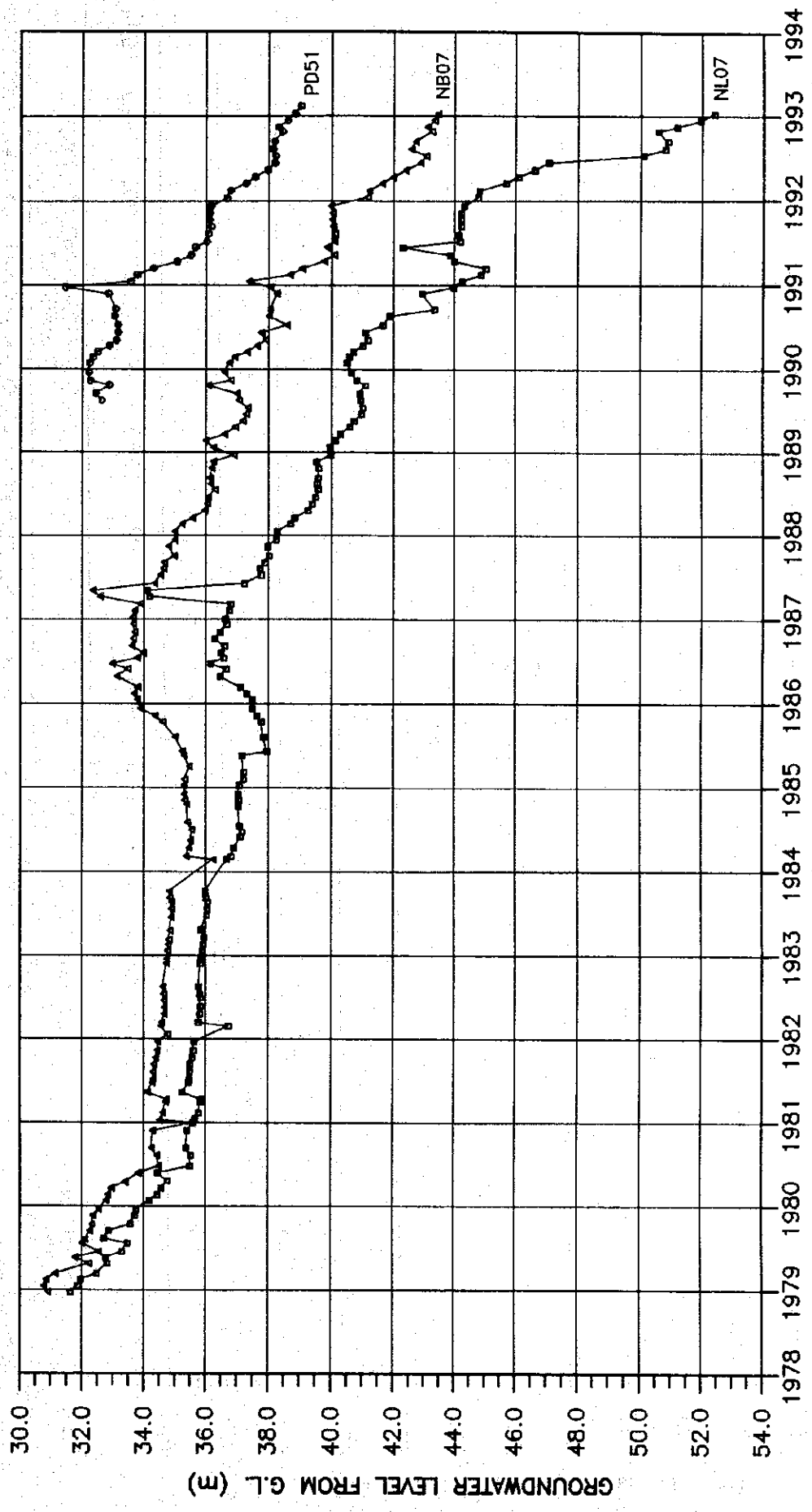
**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Aeronautical Station
 Tambon : Bang Pu Mai
 Amphoe : Muang Samut Prakan
 Changwat : Samut Prakan
 UTM Grid : 906949

SCREEN DEPTH
 NL01 : 140.0-146.0m

YEAR



YEAR

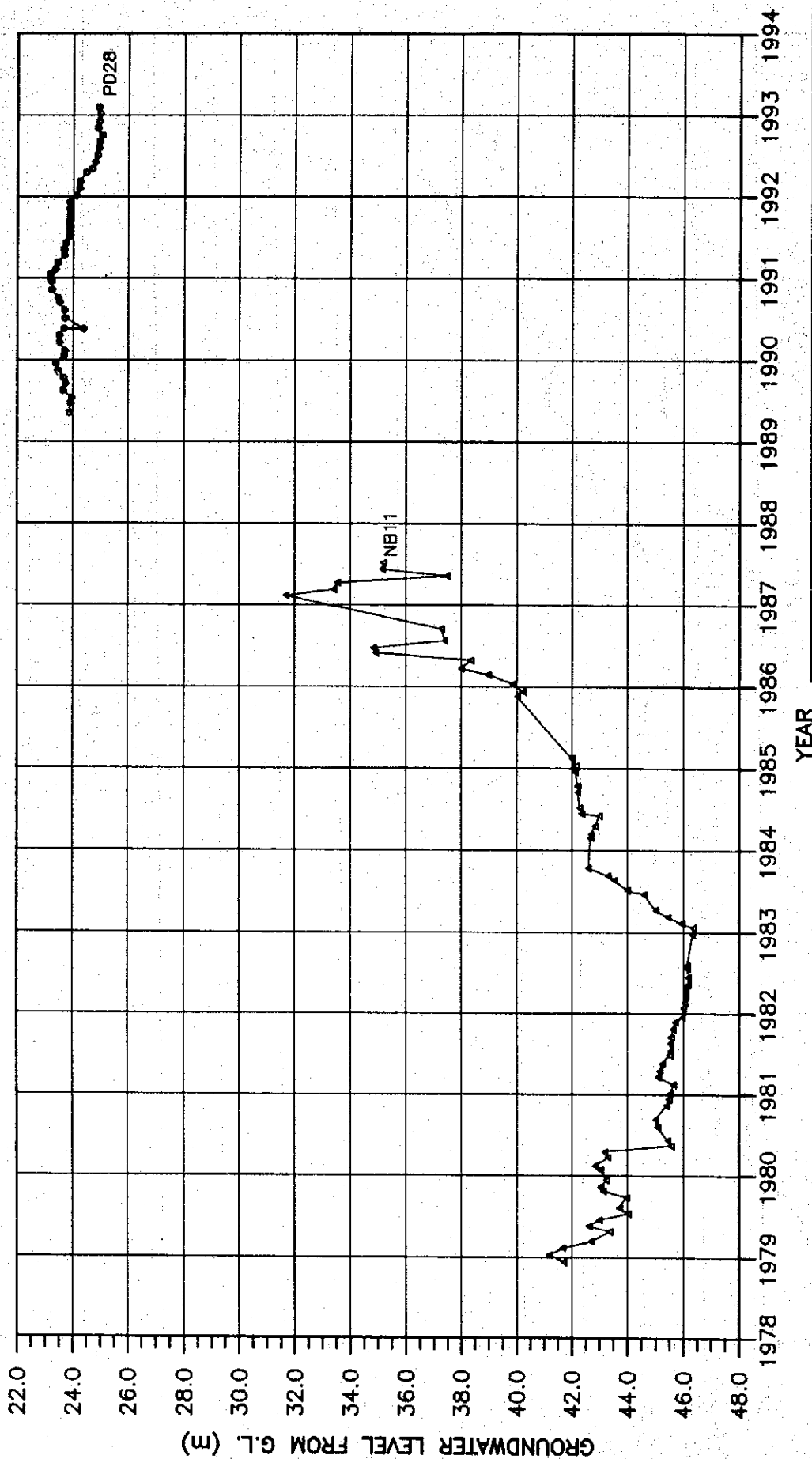
GROUNDWATER LEVEL CHANGES
AT STATION No. 16

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOSYO CO., LTD.

LOCATION : Wat Nang Khan Chantri
 Tambon : Bung Khiam Phrai
 Amphoe : Lam Luk Ka
 Changwat : Pathum Thani
 UTM Grid : 891407

SCREEN DEPTH
 PD51 : 109.0-115.0m
 NL07 : 140.5-146.5m
 NB07 : 171.0-177.0m



YEAR

LOCATION : Wat Bang Bua
 Tambon : Anusawari
 Amphoe : Bang Khen
 Changwat : Bangkok
 UTM Grid : 719319

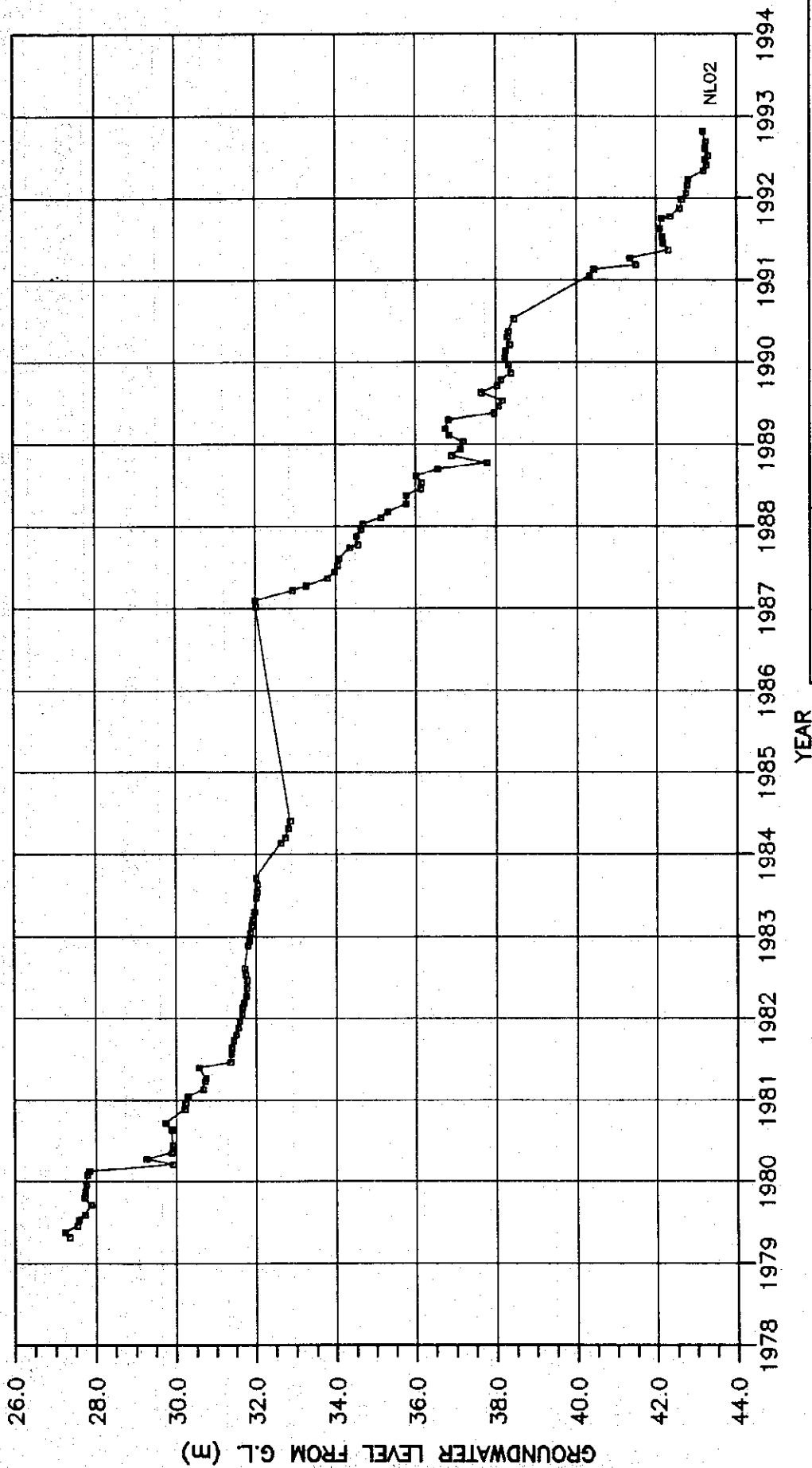
SCREEN DEPTH

PD28 : 94.0-100.0m
 NB11 : 186.2-192.2m

GROUNDWATER LEVEL CHANGES
 AT STATION No. 17

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



YEAR

**GROUNDWATER LEVEL CHANGES
AT STATION No. 18**

LOCATION : Phun Charoen School
 Tambon : Bang Chalong
 Amphoe : Bang Phli
 Changwat : Samut Prakan
 UTM Grid : 888056

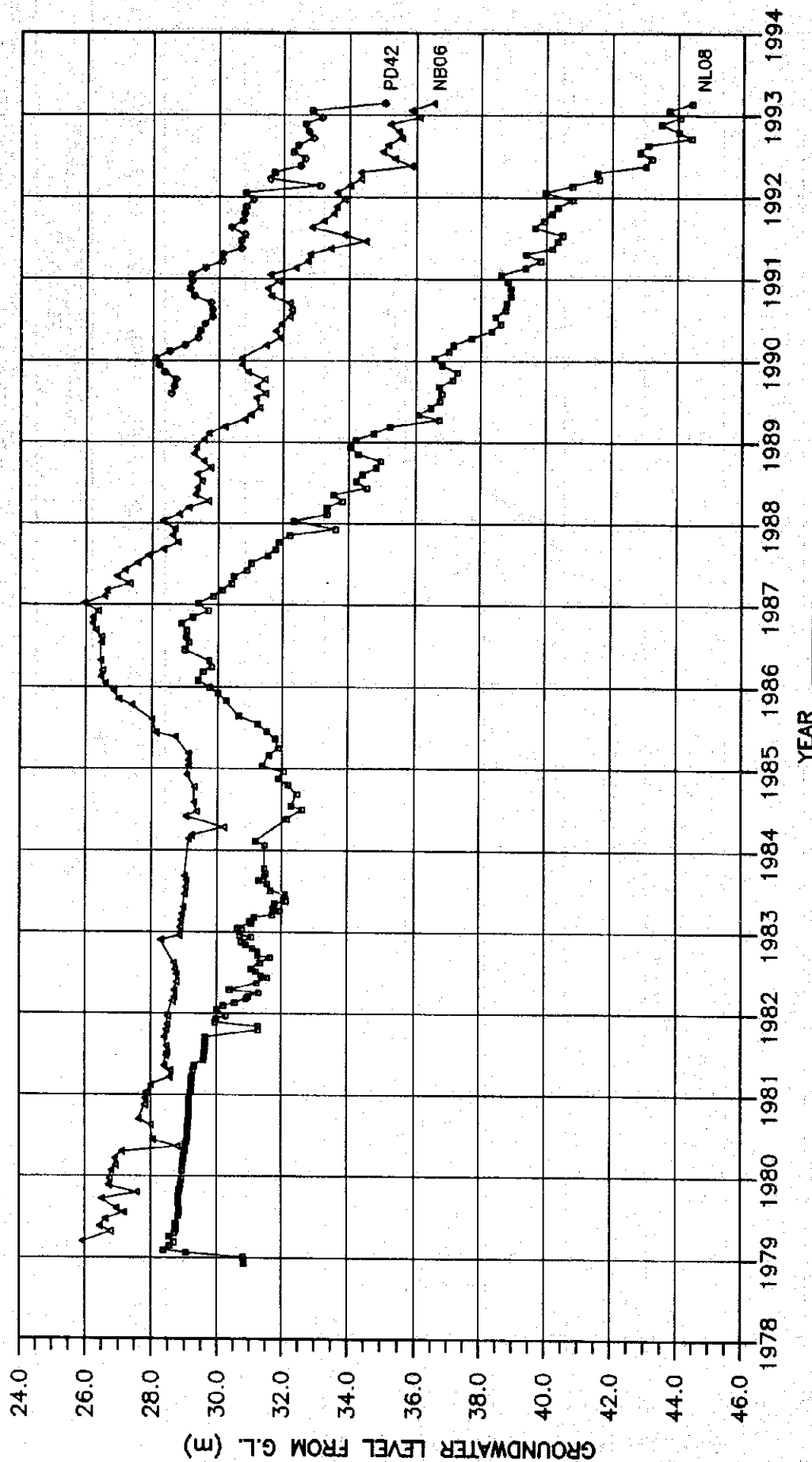
SCREEN DEPTH

NL02 : 140.0-146.0m

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOKUSAI KOGYO CO., LTD.



YEAR

LOCATION : Wat Kia Cha-um
 Tambon : Khlong Song
 Amphoe : Khlong Luang
 Changwat : Pathum Thani
 UTM Grd : 778520

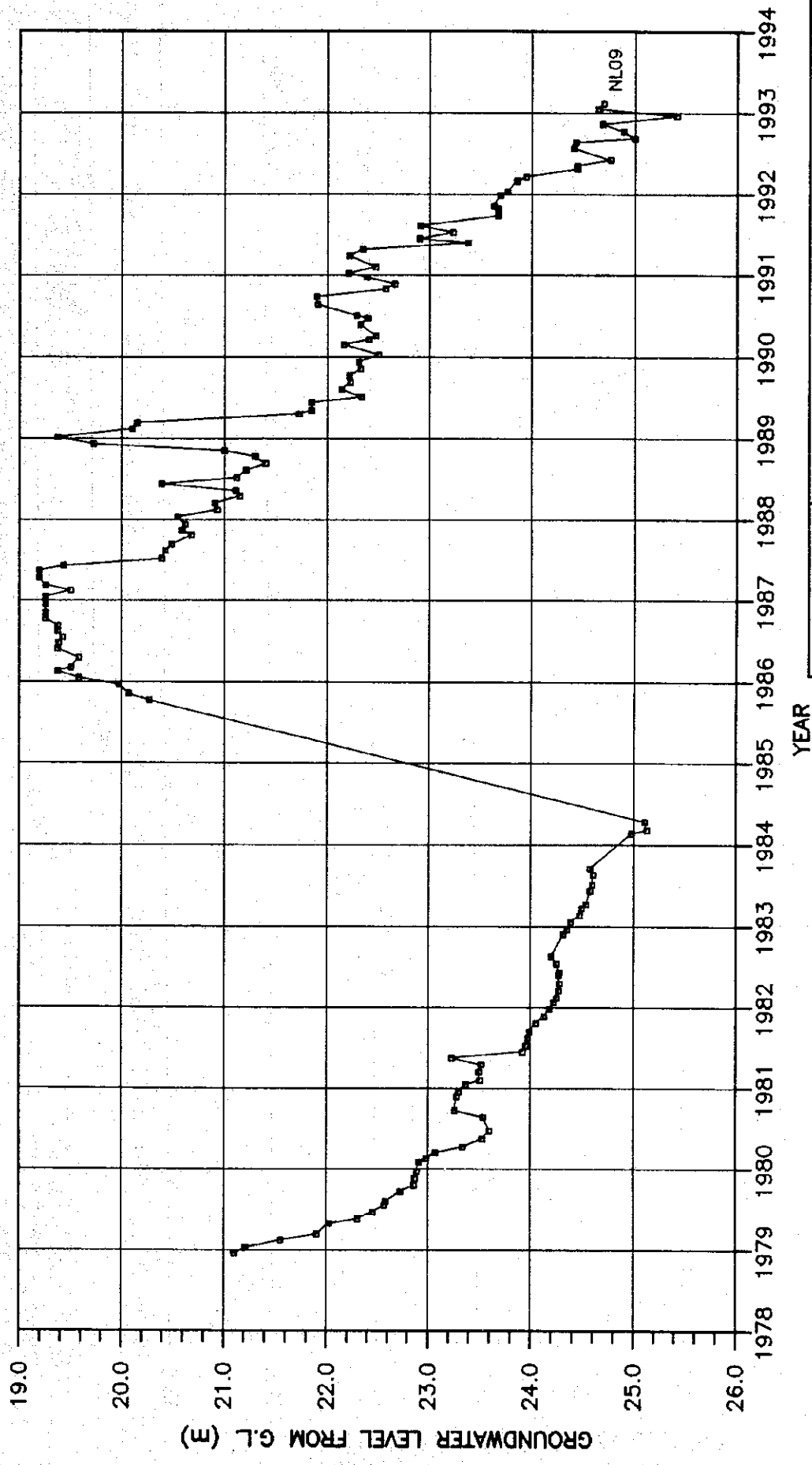
SCREEN DEPTH

PD42 : 107.0-113.0m
 NL08 : 122.3-128.3m
 NB06 : 186.2-192.2m

GROUNDWATER LEVEL CHANGES
 AT STATION No. 19

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



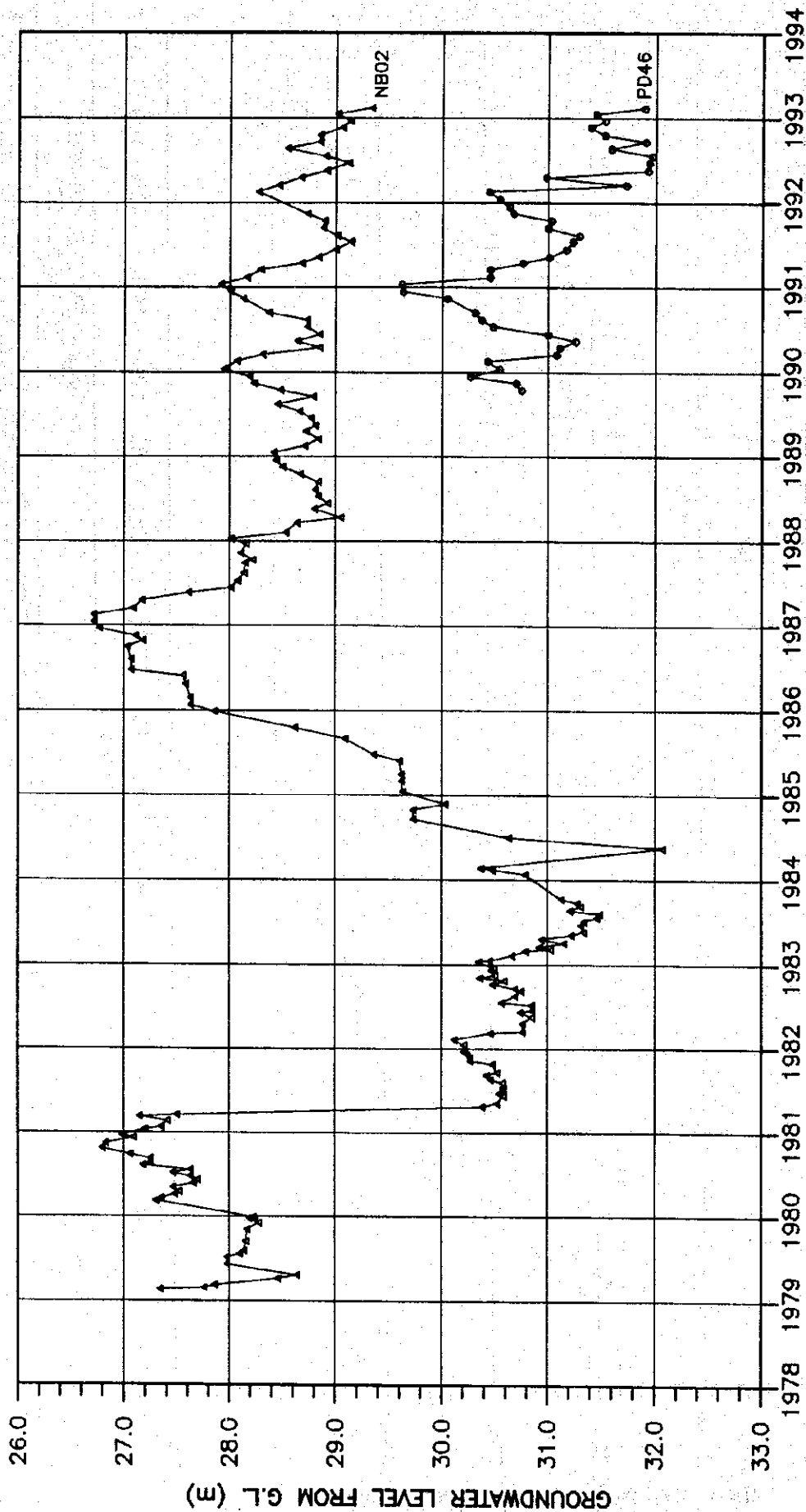
**GROUNDWATER LEVEL CHANGES
AT STATION No. 20**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Pa Klang Thung
 Tambon : Bang Khaeng
 Amphoe : Muang Pathum Thani
 Changwat : Pathum Thani
 UTM Grid : 657433

SCREEN DEPTH
 NL09 : 134.3-140.3m



YEAR

LOCATION : Wat Bang Ya Phraek
 Tambon : Bang Ya Phraek
 Amphoe : Phra Pradaeng
 Changwat : Samut Sakhon
 UTM Grid : 673085

SCREEN DEPTH

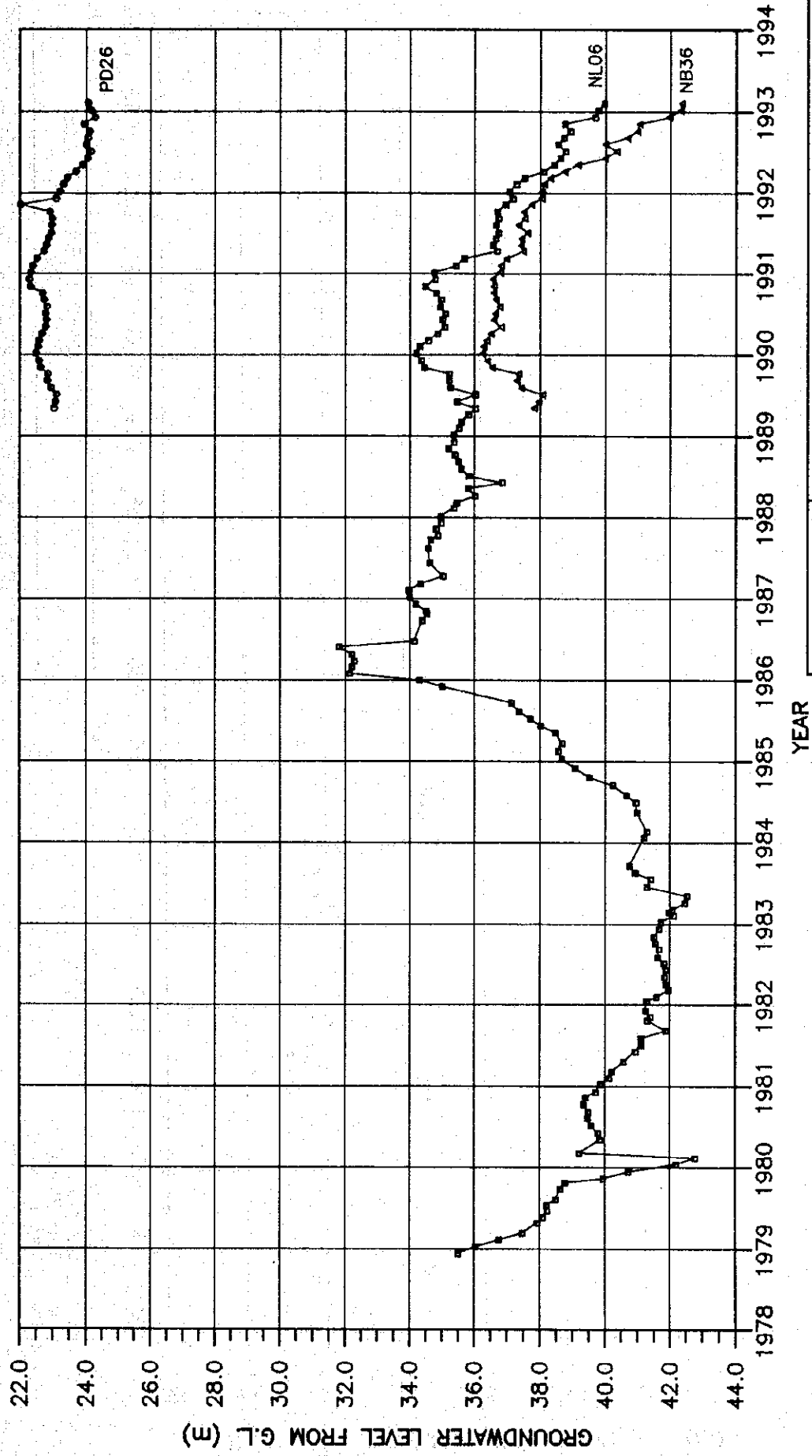
PD46 : 107.0-113.0m
 NB02 : 177.0-183.0m

GROUNDWATER LEVEL CHANGES
 AT STATION No. 21

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOKUSAI KOGYO CO., LTD.



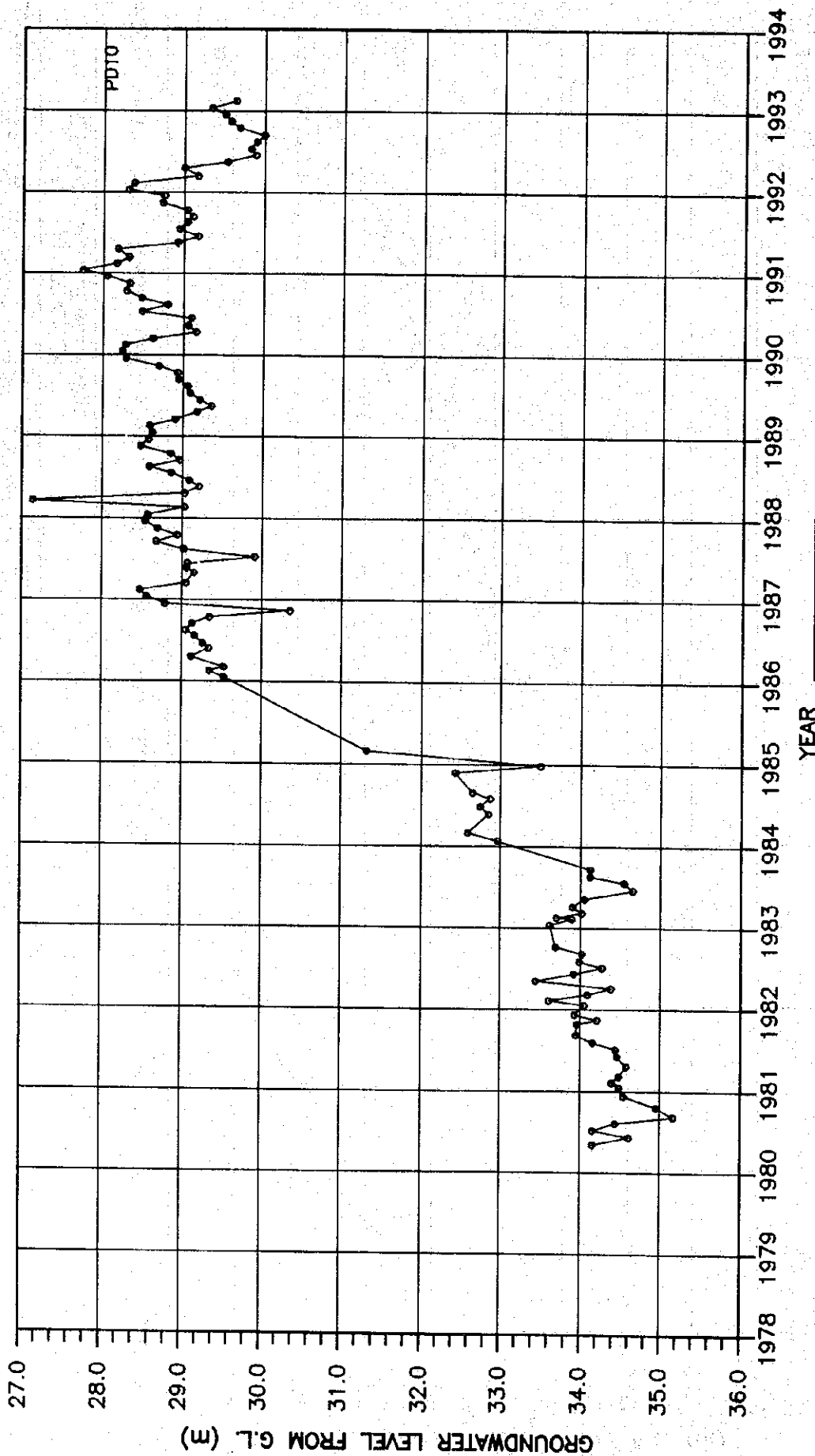
**GROUNDWATER LEVEL CHANGES
AT STATION No. 22**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Siri Phong Thammimit
 Tambon : Tha Raeng
 Amphoe : Bang Khen
 Changwat : Bangkok
 UTM Grid : 777328

SCREEN DEPTH
 PD26 : 91.0 - 97.0m
 NL06 : 125.2 - 131.2m
 NB36 : 220.0 - 226.0m



LOCATION : Wat Ruak
 Tambon : Bang Phuang
 Amphoe : Phra Pradaeng
 Changwat : Samut Prakan
 UTM Grid : 643112

SCREEN DEPTH

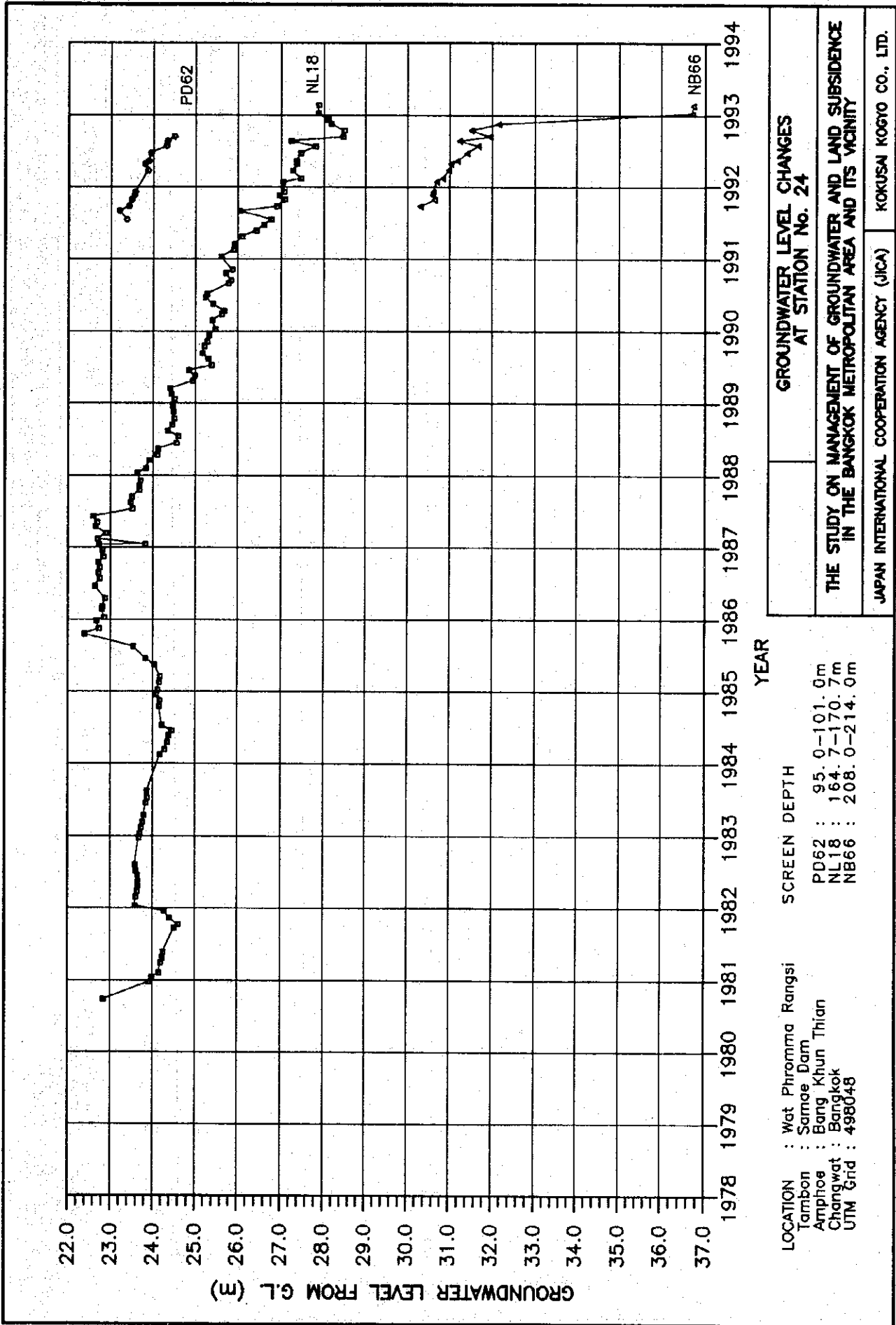
PD10 : 82.6 - 88.6m

**GROUNDWATER LEVEL CHANGES
 AT STATION No. 23**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

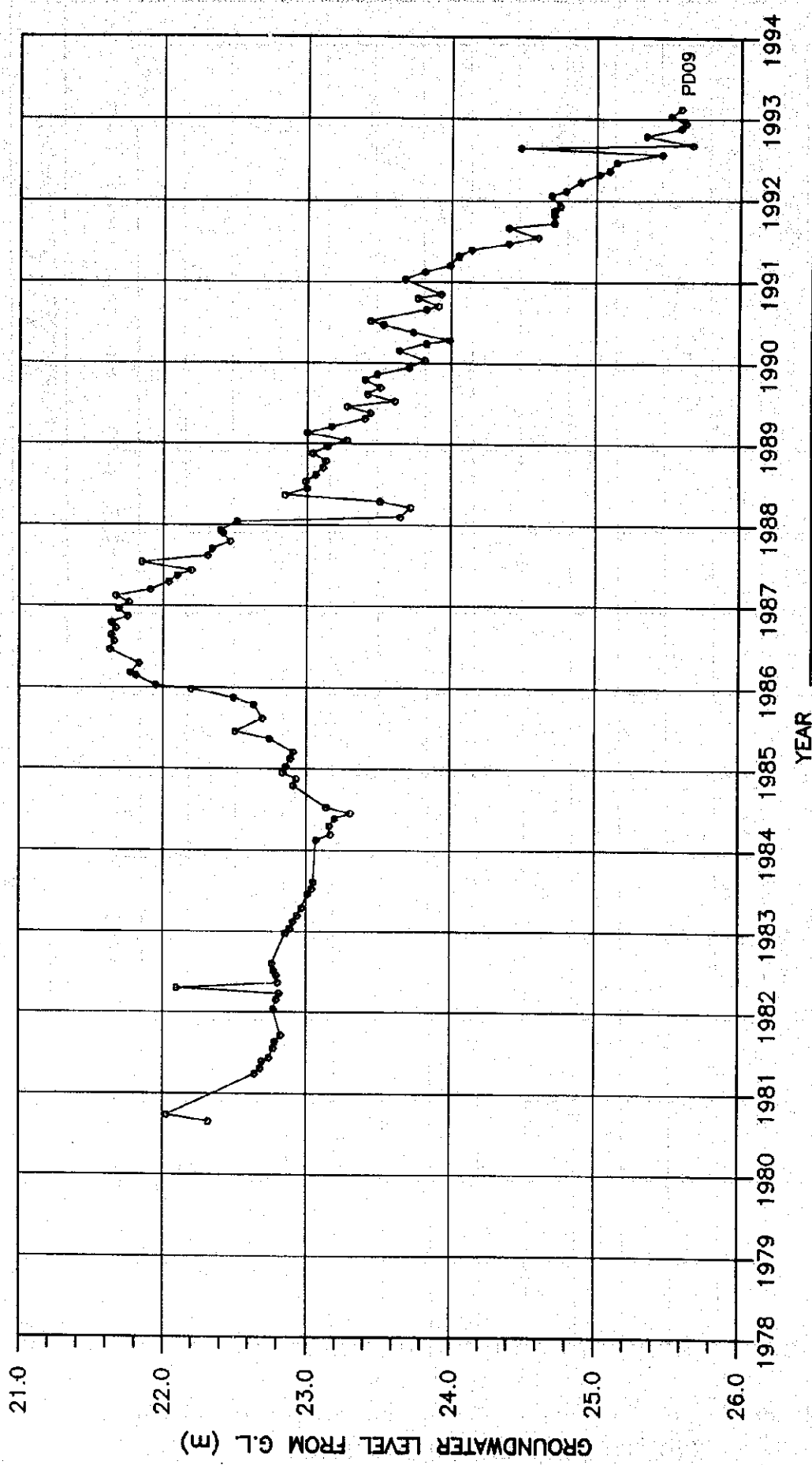
KOKUSAI KOGYO CO., LTD.



LOCATION : Wat Phromma Rangsi
 Tambon : Samsoe Darn
 Amphoe : Bang Khun Thian
 Changwat : Bangkok
 UTM Grid : 498048

SCREEN DEPTH
 PD62 : 95.0-101.0m
 NL18 : 164.7-170.7m
 NB66 : 208.0-214.0m

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



YEAR

LOCATION : Wat Sakae Ngarn
 Tambon : Samee Dam
 Amphoe : Bang Khun Thian
 Changwat : Bangkok
 UTM Grid : 539072

SCREEN DEPTH

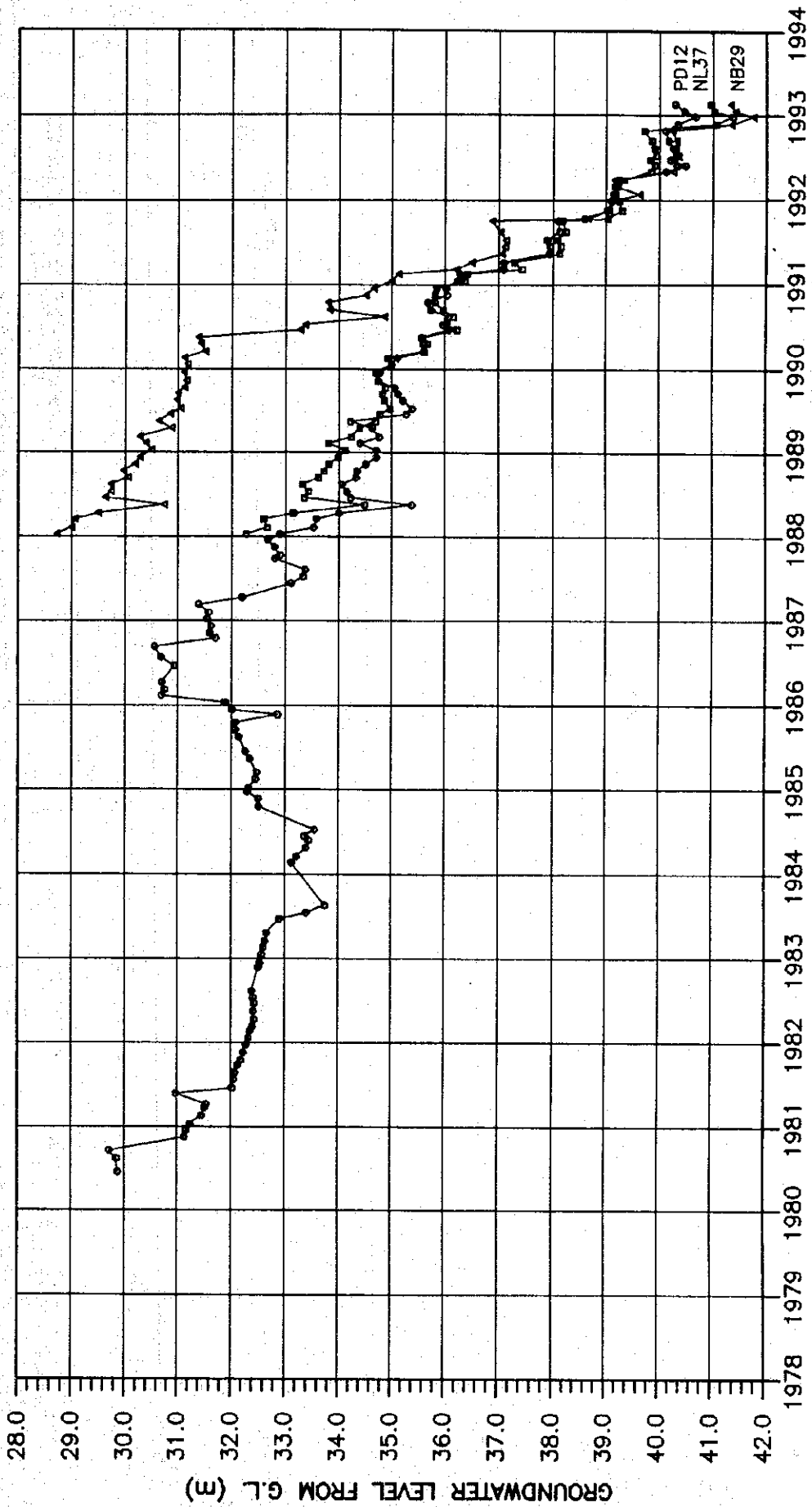
PD09 : 103.8-109.8m

GROUNDWATER LEVEL CHANGES
 AT STATION No. 25

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOKUSAI KOGYO CO., LTD.



YEAR

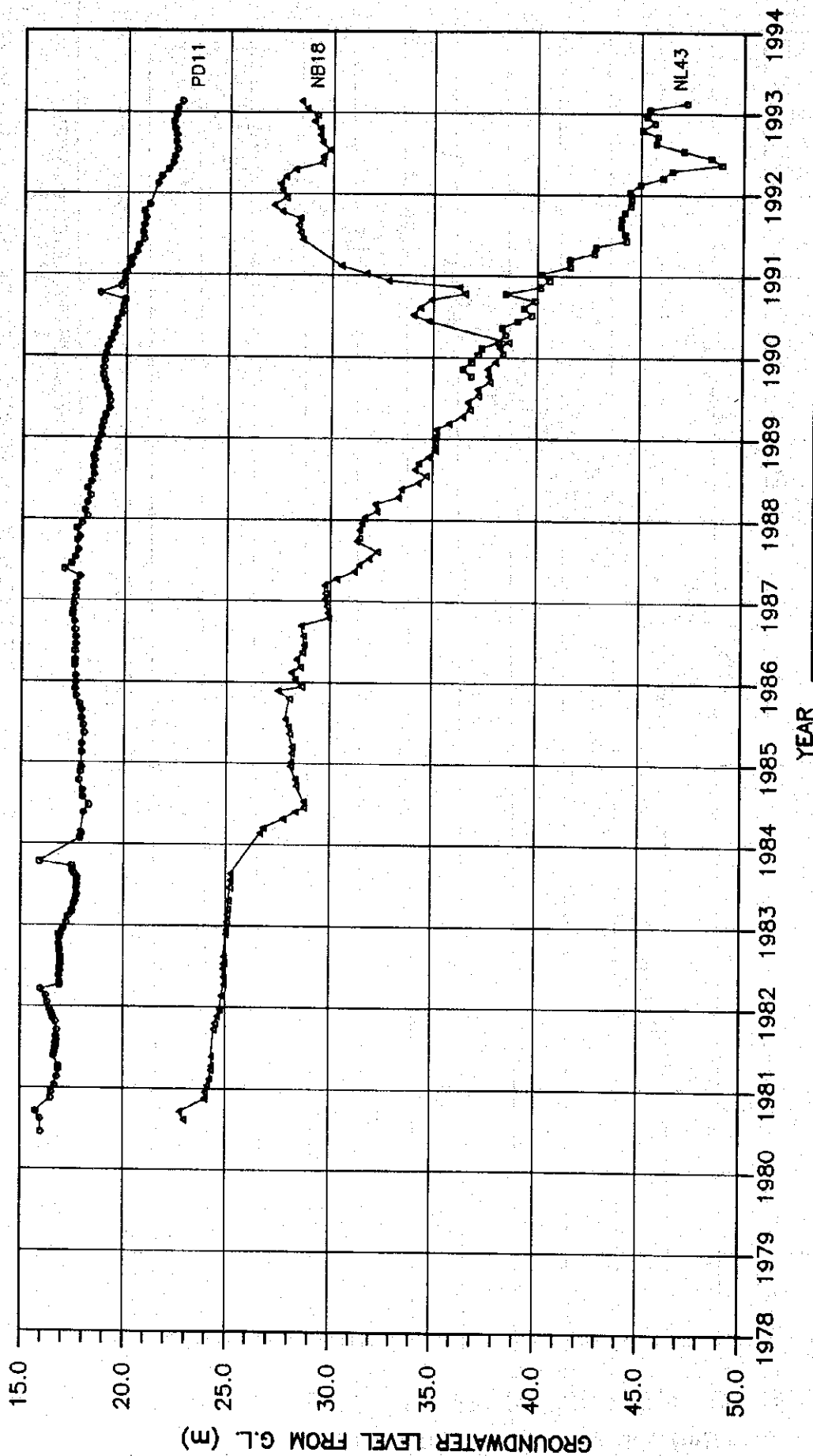
GROUNDWATER LEVEL CHANGES
AT STATION No. 26

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Bang Phli Yai Klang
 Tambon : Bang Phli Yai
 Amphoe : Bang Phli
 Changwat : Samut Prakan
 UTM Grid : 847047

SCREEN DEPTH
 PD12 : 106.8-112.8m
 NL37 : 154.0-160.0m
 NB29 : 202.0-208.0m



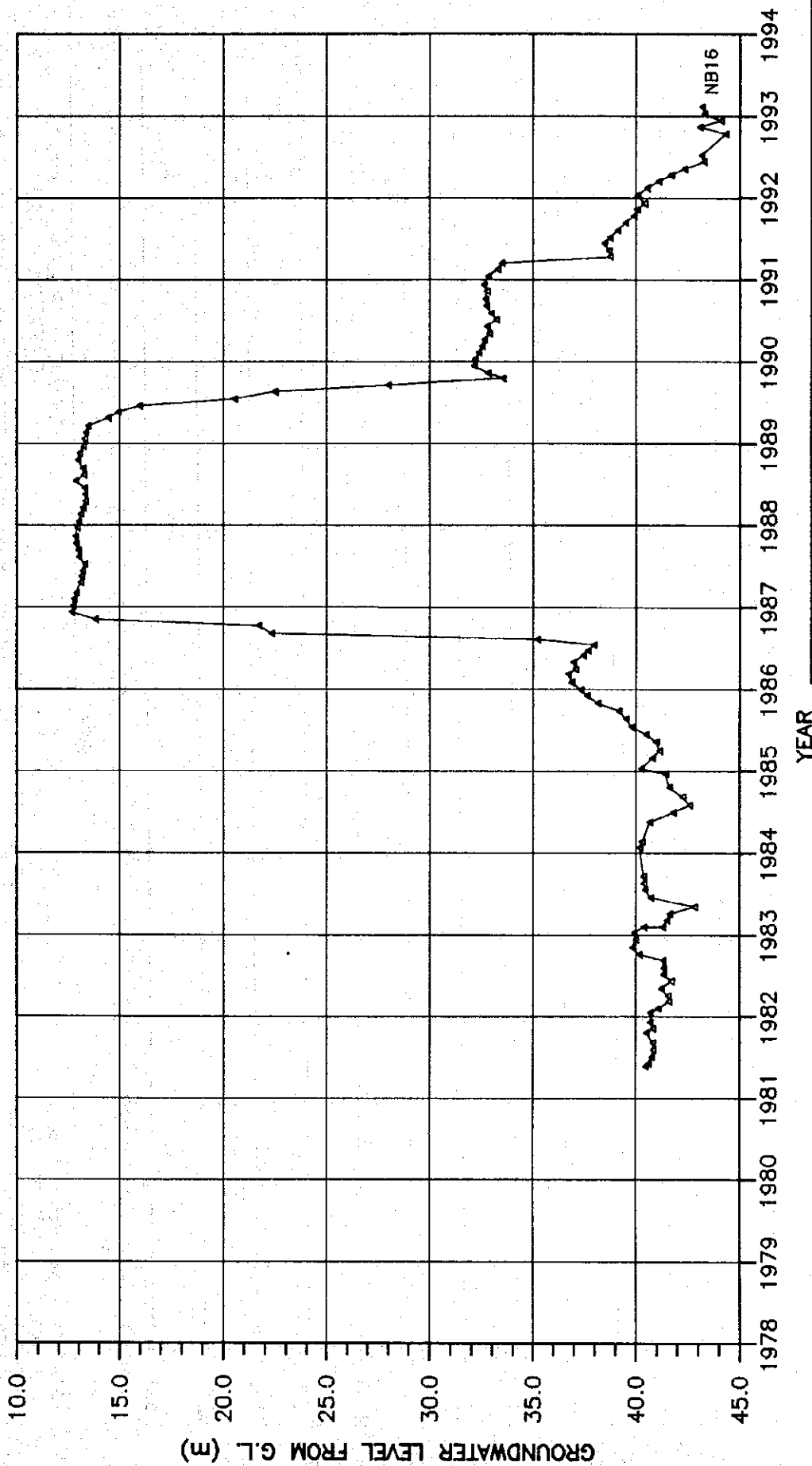
**GROUNDWATER LEVEL CHANGES
AT STATION No. 27**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Mangkhan Nimit
 Tambon : Bang Sao Theng
 Amphoe : Bang Phli
 Changwat : Samut Prakan
 UTM Grid : 938029

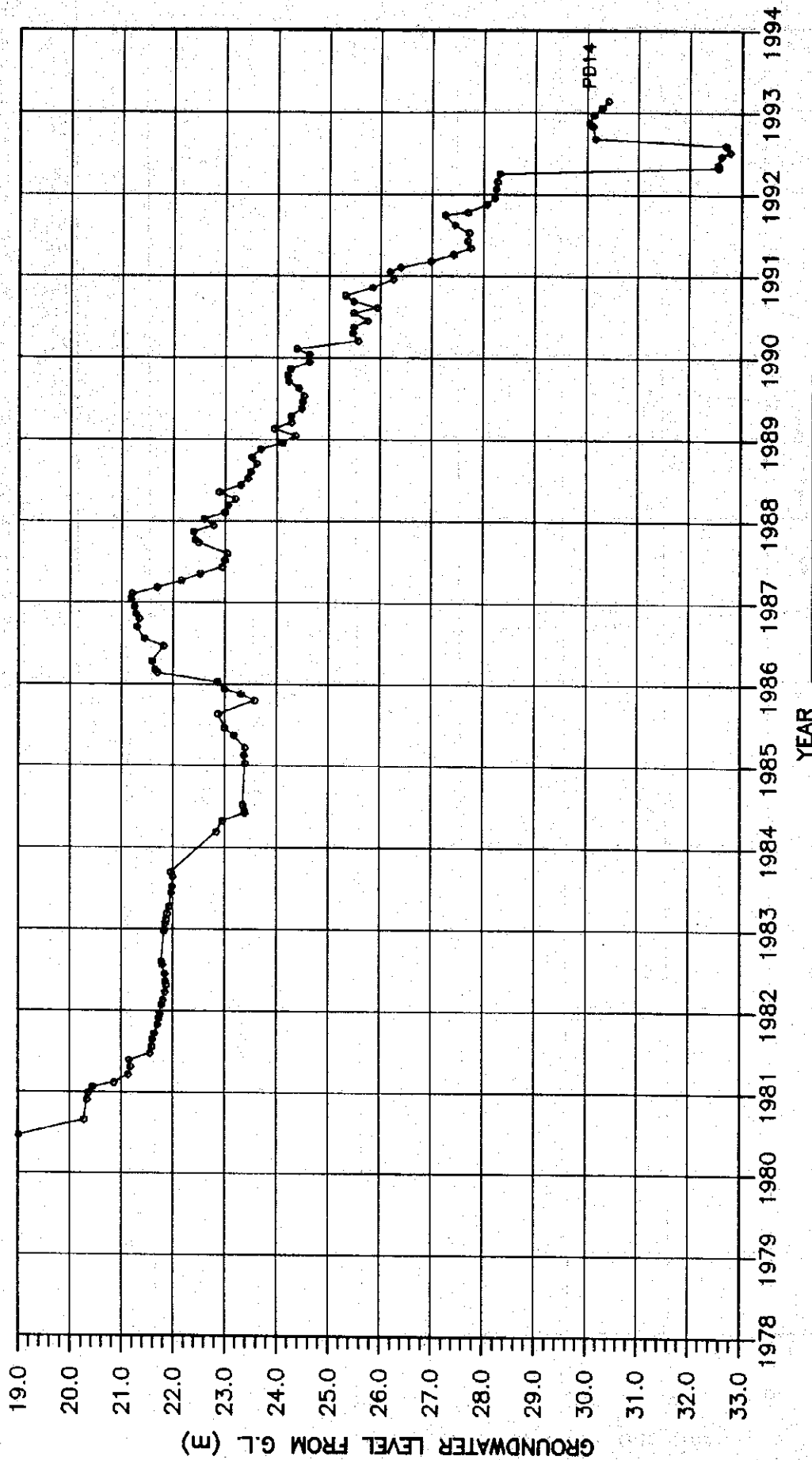
SCREEN DEPTH
 PD11 : 70.3 - 76.3m
 NL37 : 151.0 - 157.0m
 NB29 : 180.0 - 186.0m



GROUNDWATER LEVEL CHANGES AT STATION No. 28
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY
 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) · KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Sai Mai
 Tambon : Khu Khot
 Amphoe : Lum Luk Ka
 Changwat : Pathum Thani
 UTM Grid : 796405

SCREEN DEPTH : NB16 : 195.0-201.0m



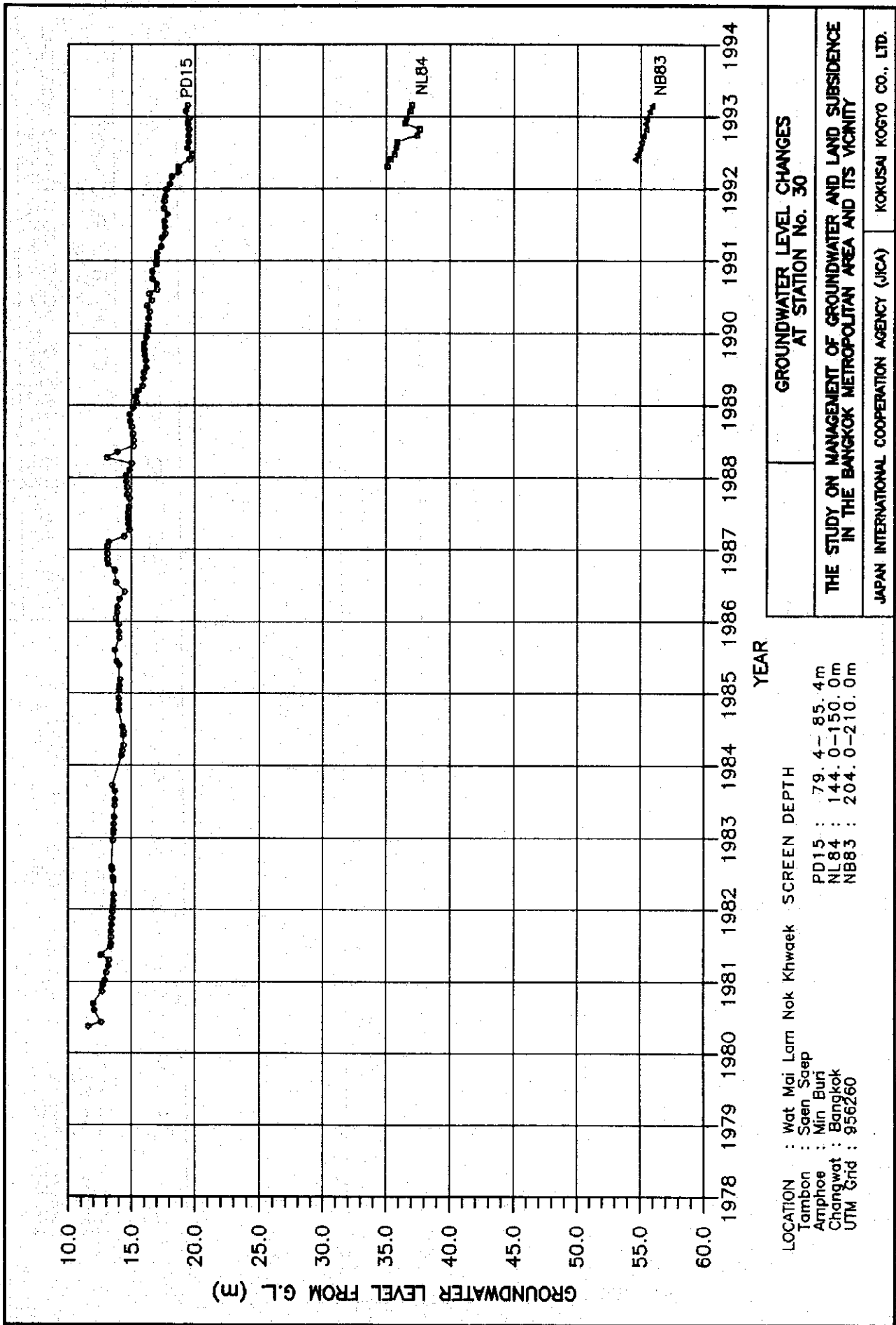
**GROUNDWATER LEVEL CHANGES
AT STATION No. 29**

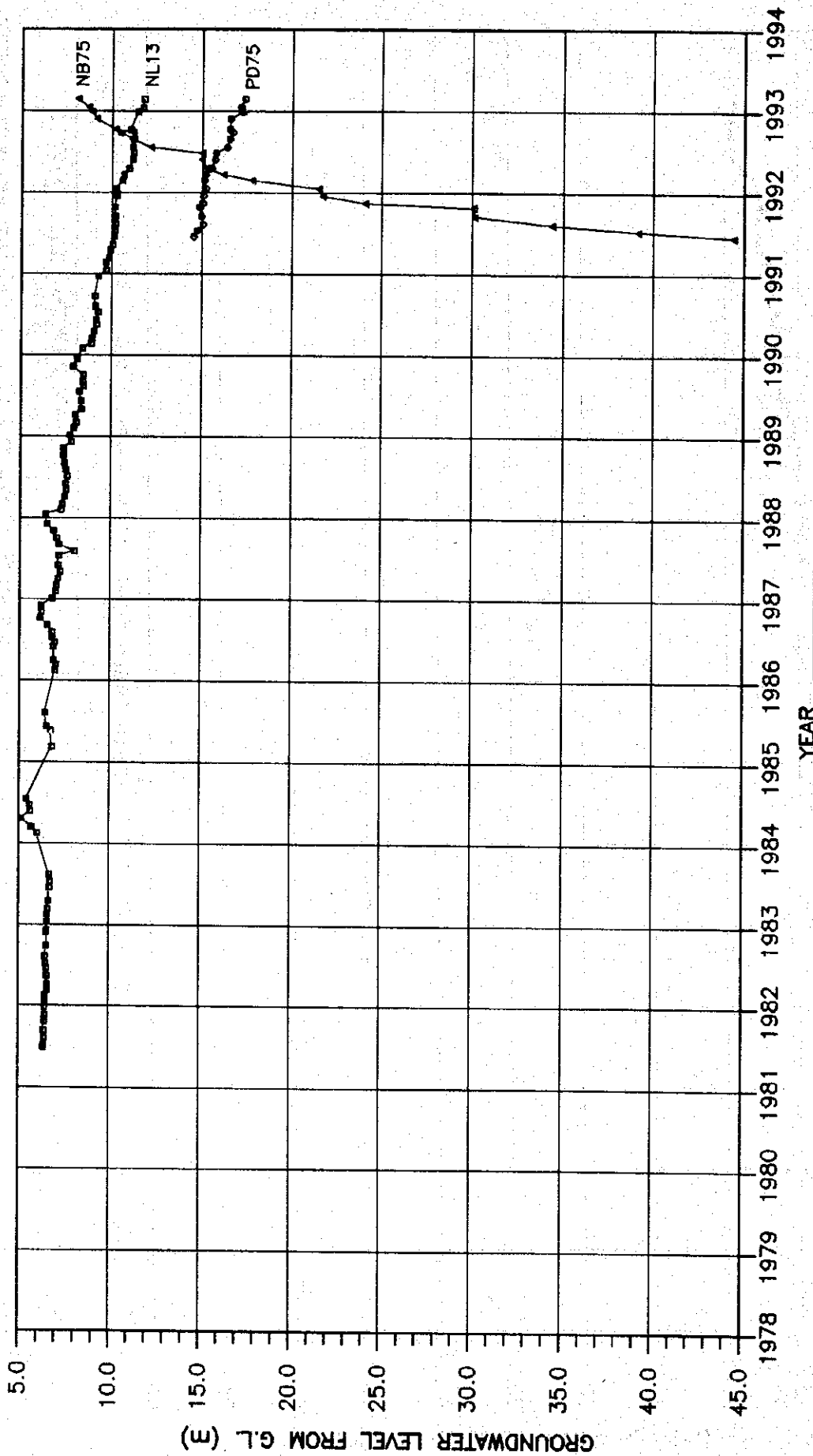
**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Ratcha Kosa
 Tambon : Khun Thong
 Amphoe : Lat Krabang
 Changwat : Bangkok
 UTM Grid : 005150

SCREEN DEPTH : PD14 : 91.0 - 97.0m





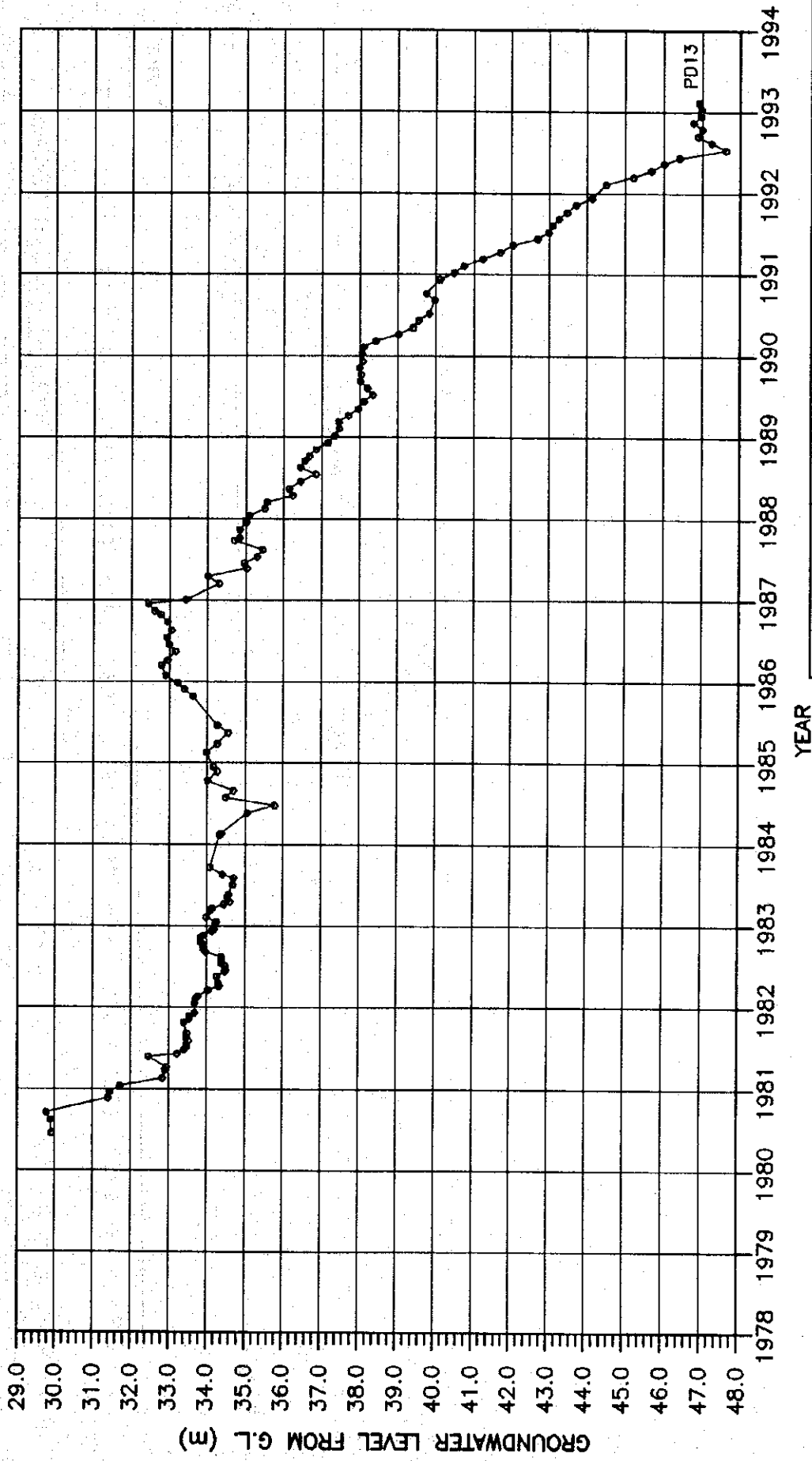
GROUNDWATER LEVEL CHANGES
AT STATION No. 31

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Lat Sai
 Tambon : Lam Sai
 Amphoe : Wang Noi
 Changwat : Phra Nakhon Si Ayutthaya
 UTM Grid : 819714

SCREEN DEPTH
 PD75 : 110.0-116.0m
 NL13 : 155.0-161.0m
 NB75 : 220.0-226.0m



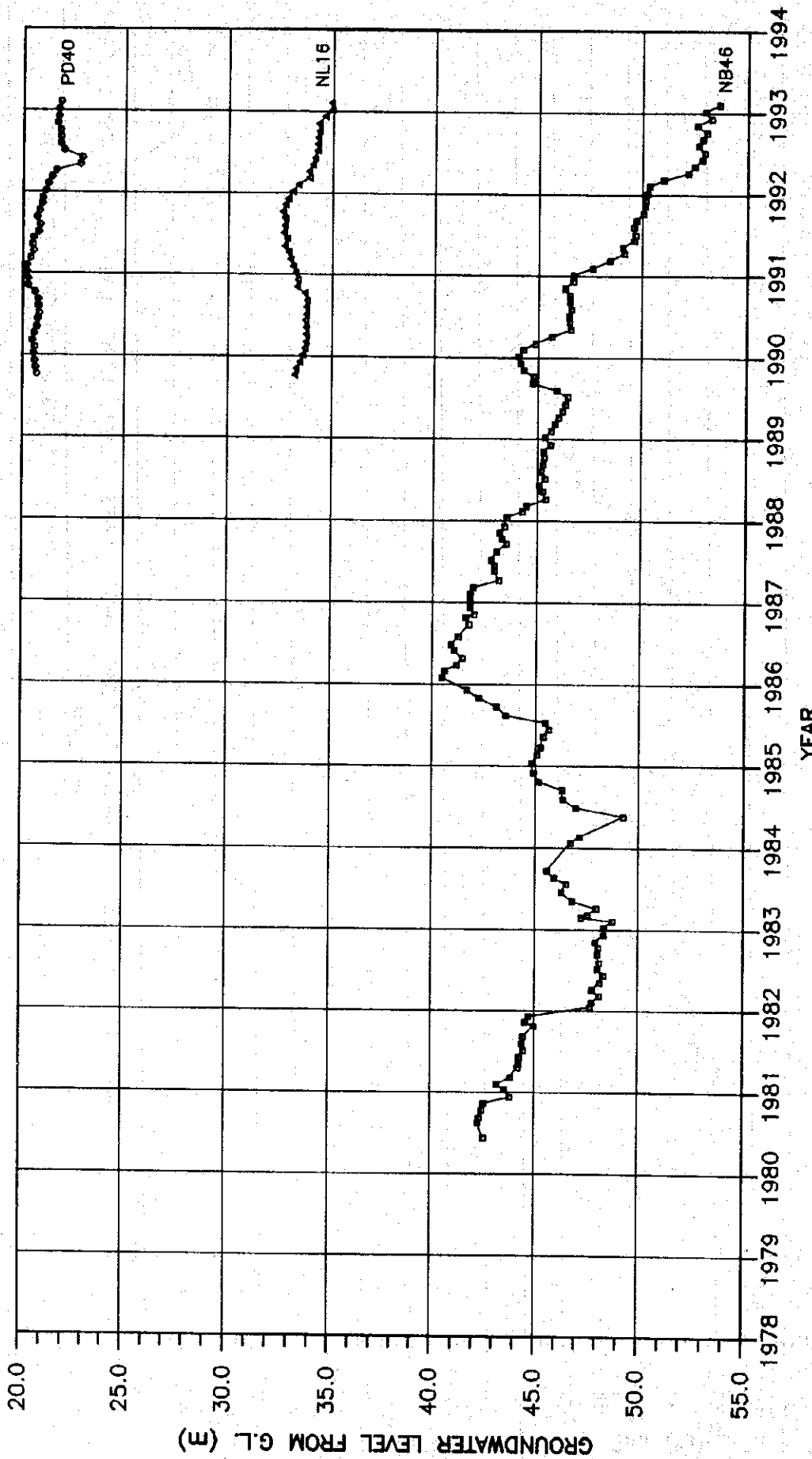
**GROUNDWATER LEVEL CHANGES
AT STATION No. 32**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Si Wari Nai
 Tambon : Sisa Chorakhe Yai
 Amphoe : Bang Phli
 Changwat : Samut Prakan
 UTM Grid : 950116

SCREEN DEPTH
 PD13 : 110.0-116.0 m



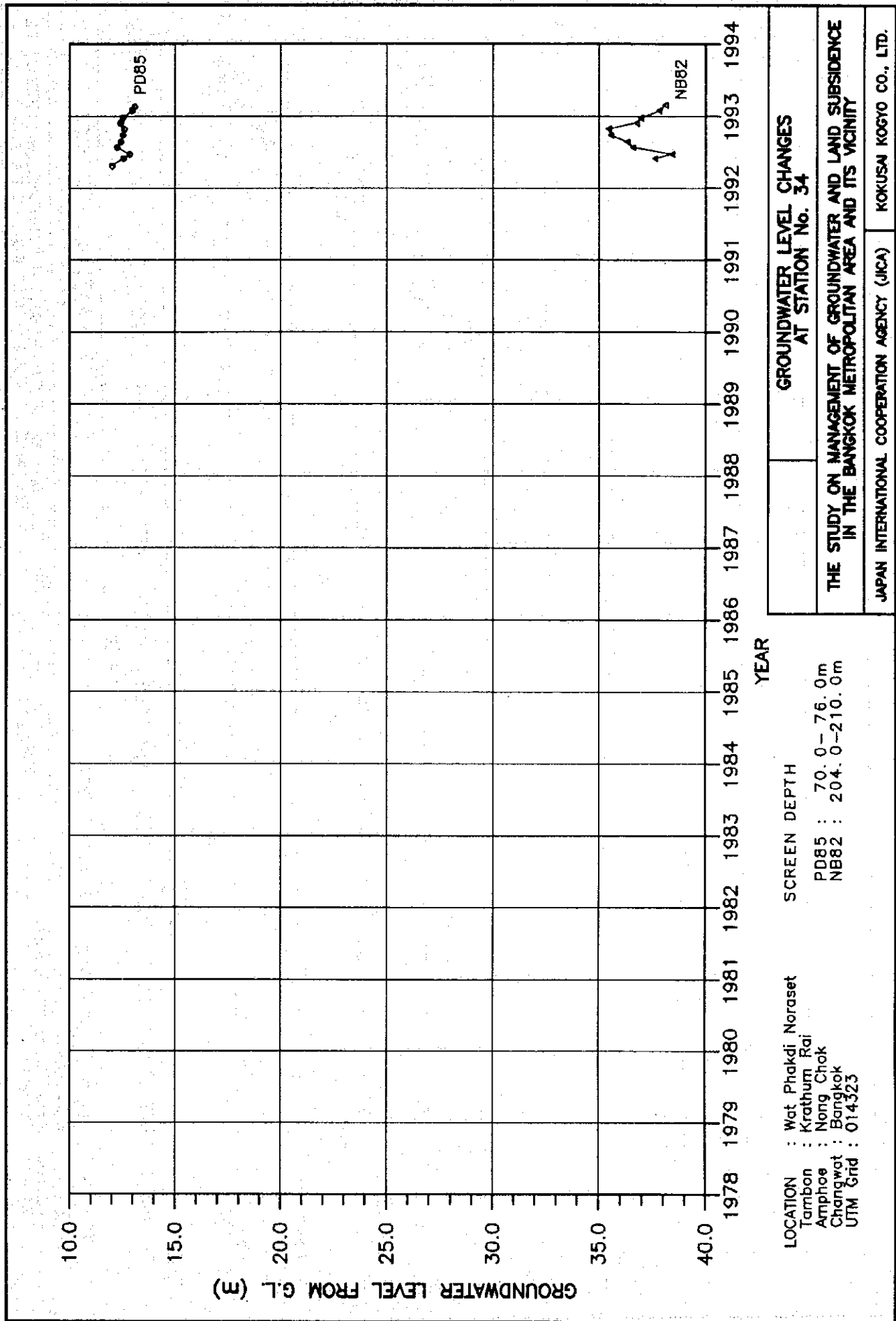
LOCATION : Wat Saen Suk
 Tambon : Min Buri
 Amphoe : Min Buri
 Changwat : Bangkok
 UTM Grid : 887280

SCREEN DEPTH
 PD40 : 67.0 - 73.0m
 NL16 : 131.1 - 137.1m
 NB46 : 208.0 - 214.0m

GROUNDWATER LEVEL CHANGES
 AT STATION No. 33

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



LOCATION : Wat Phakdi Noraset
 Tambon : Krathum Rai
 Amphoe : Nong Chok
 Changwat : Bangkok
 UTM Grid : 014323

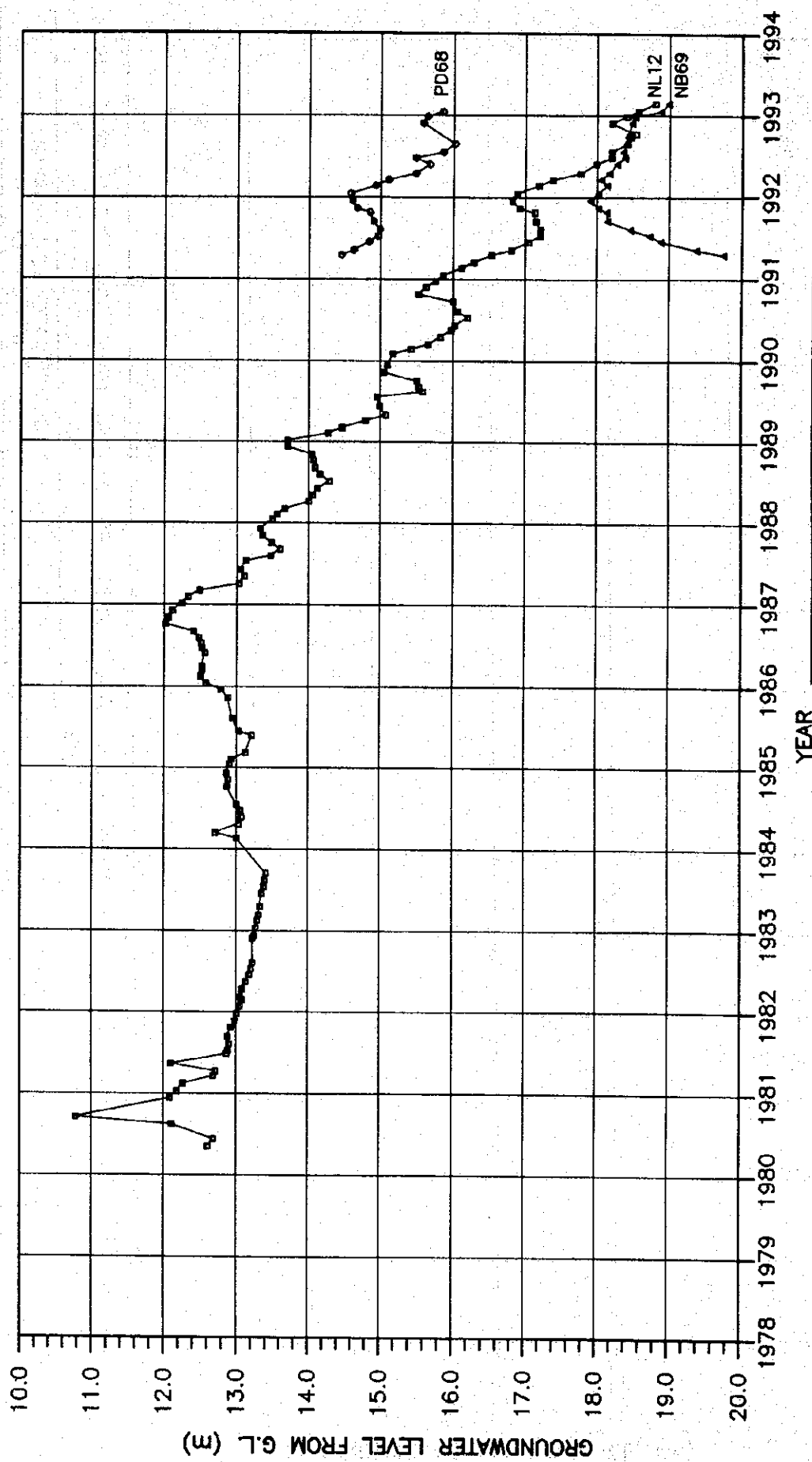
SCREEN DEPTH

PD85 : 70.0-76.0m
 NB82 : 204.0-210.0m

GROUNDWATER LEVEL CHANGES
AT STATION No. 34

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



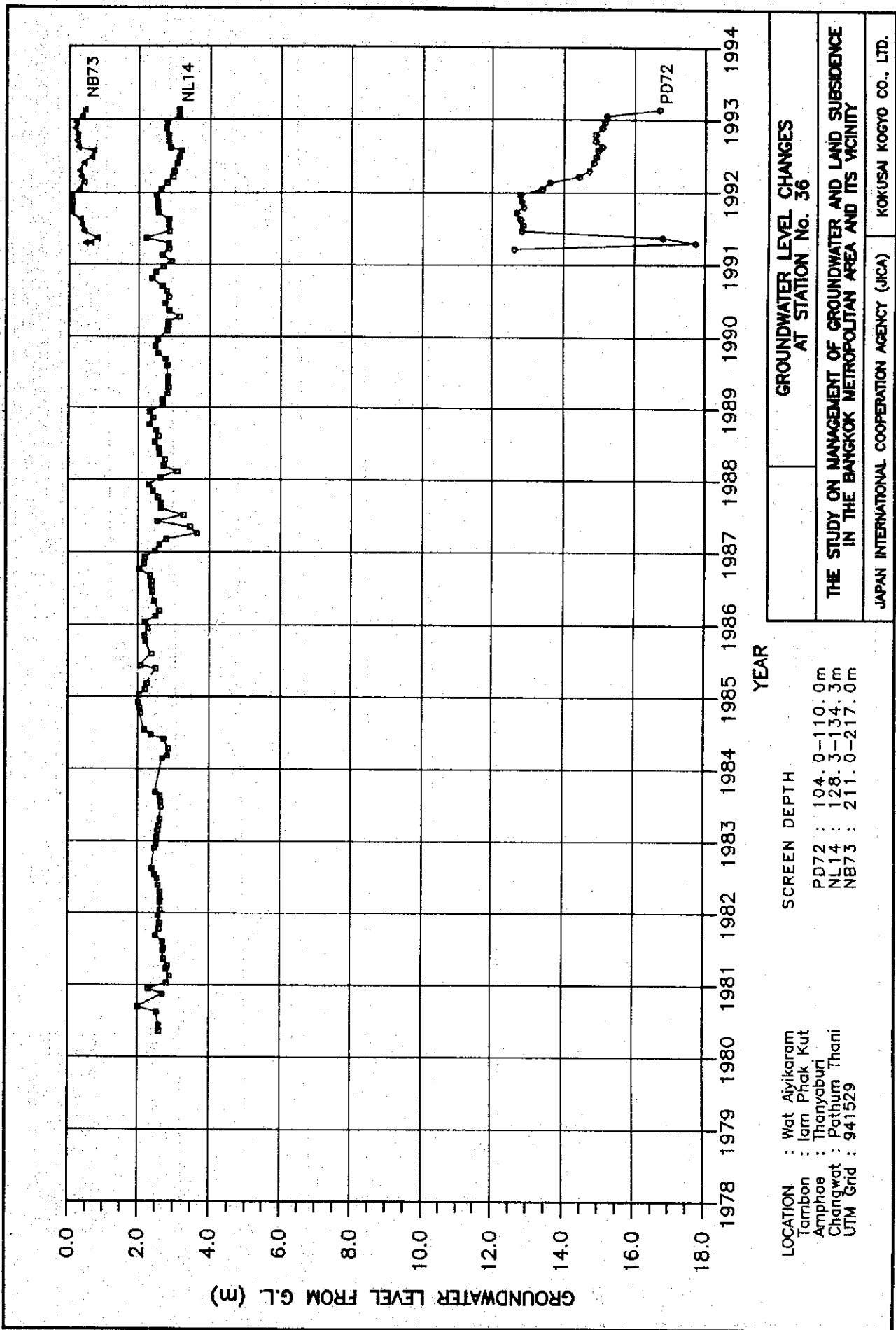
GROUNDWATER LEVEL CHANGES
AT STATION No. 35

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Bot Samphon Chai
 Tambon : Ratcha Khram
 Amphoe : Bang Sai
 Changwat : Phra Nakhon Si Ayutthaya
 UTM Gnd : 652696

SCREEN DEPTH
 PD68 : 89.0-95.0m
 NL12 : 143.0-149.0m
 NB69 : 217.0-223.0m



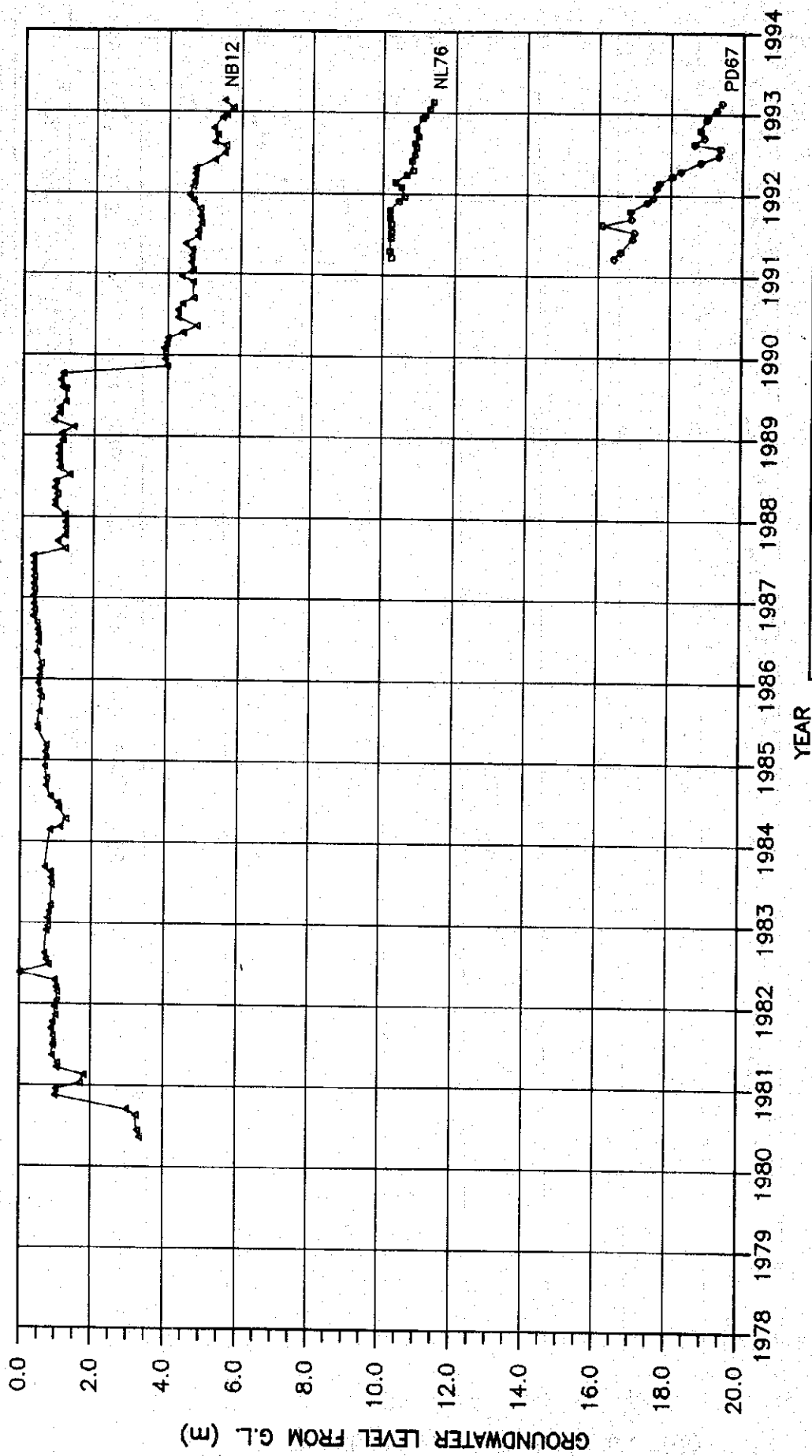
LOCATION : Wat Aiyikaram
 Tambon : Iam Phak Kut
 Amphoe : Thanyaburi
 Changwat : Pathum Thani
 UTM Grid : 941529

SCREEN DEPTH
 PD72 : 104.0-110.0m
 NL14 : 128.3-134.3m
 NB73 : 211.0-217.0m

GROUNDWATER LEVEL CHANGES
 AT STATION No. 36

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



YEAR

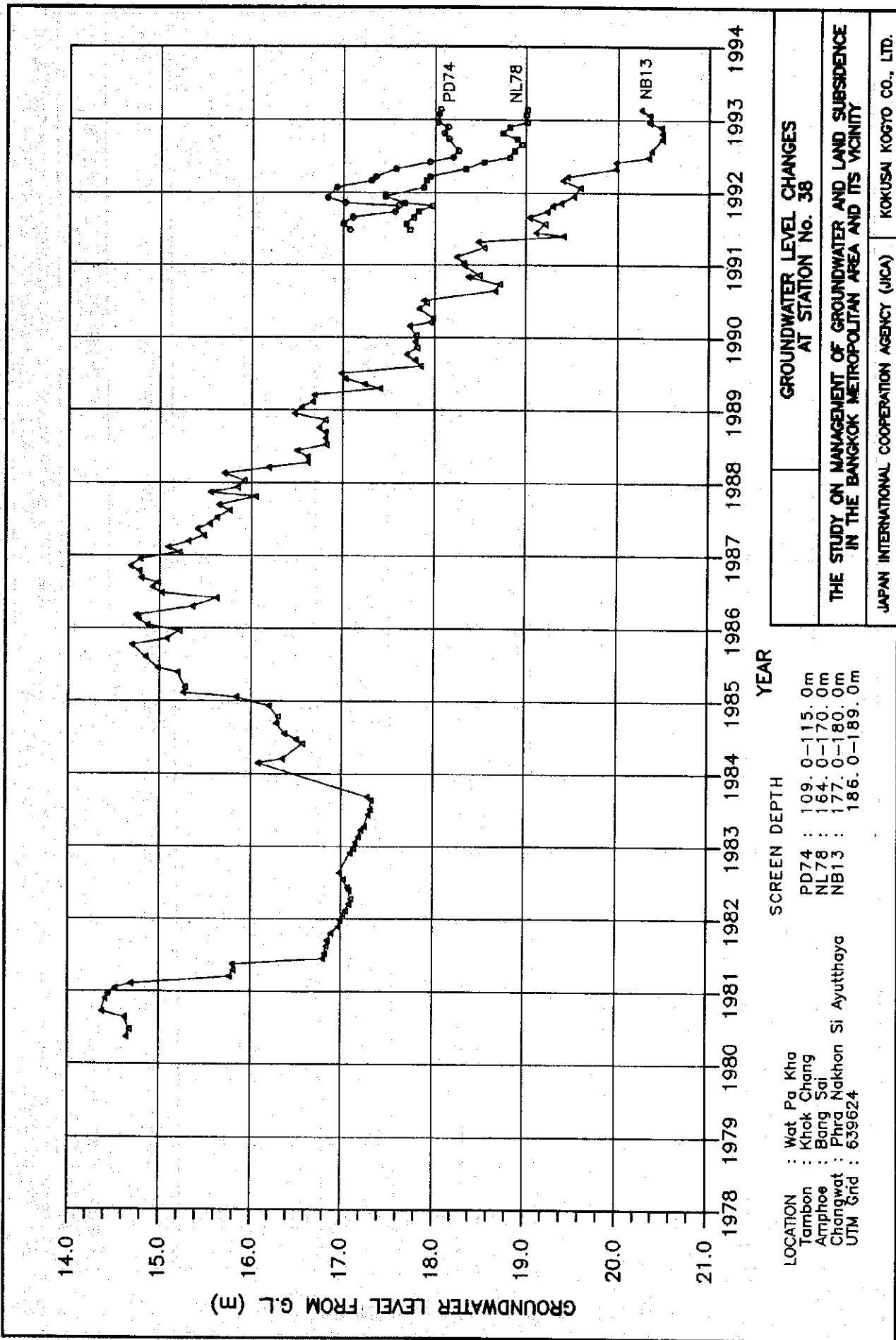
LOCATION : Wat Phalahan
 Tambon : Khlong Hok
 Amphoe : Khlong Luang
 Changwat : Pathum Thani
 UTM Gnd : 872606

SCREEN DEPTH
 PD67 : 89.0-95.0m
 NL76 : 147.0-153.0m
 NB12 : 180.0-186.0m

GROUNDWATER LEVEL CHANGES
 AT STATION No. 37

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



**GROUNDWATER LEVEL CHANGES
AT STATION No. 38**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

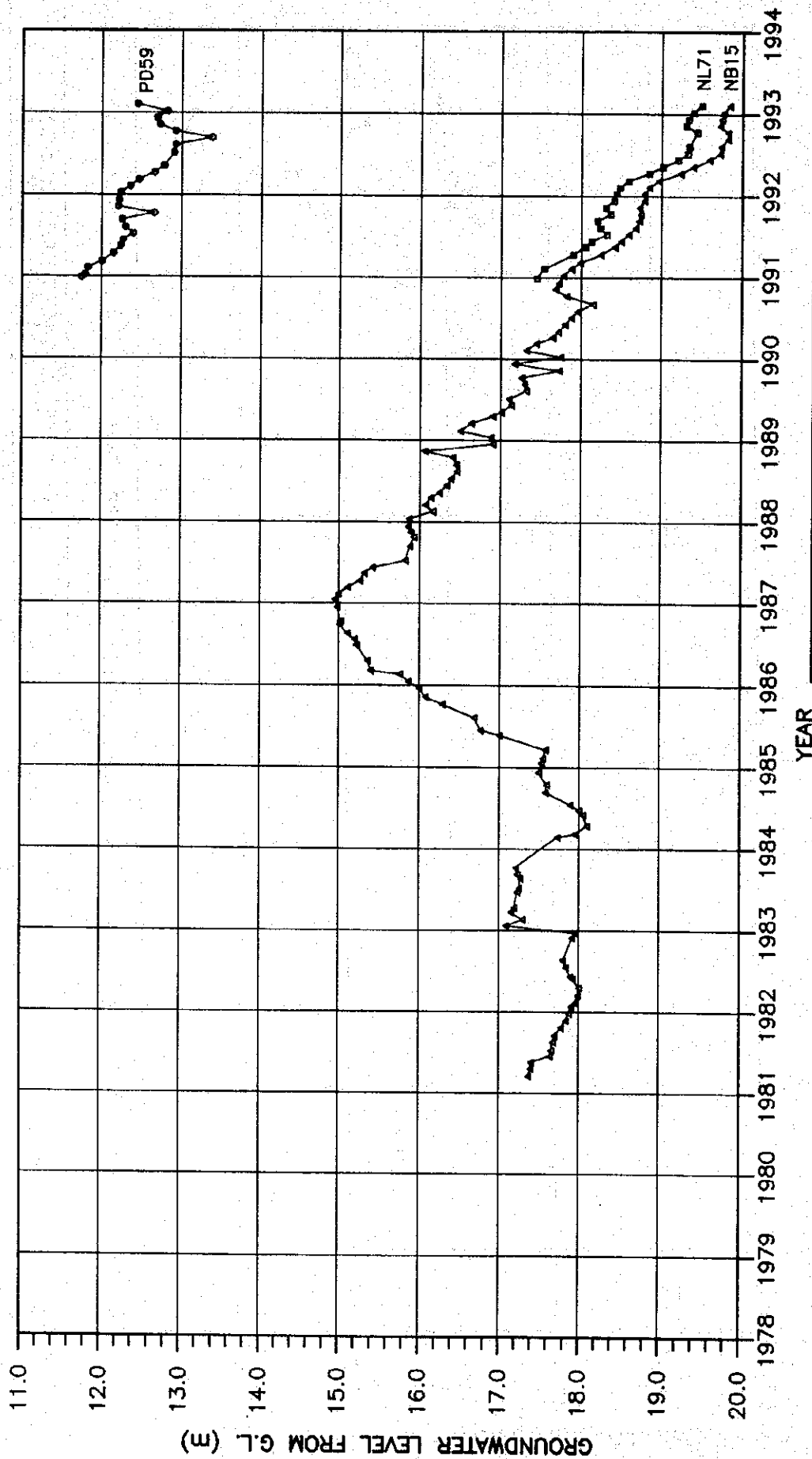
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Pa Kha
 Tambon : Khok Chang
 Amphoe : Bang Sai
 Changwat : Phra Nakhon Si Ayutthaya
 UTM Grid : 639624

SCREEN DEPTH

PD74 : 109.0-115.0m
 NL78 : 164.0-170.0m
 NB13 : 177.0-180.0m
 186.0-189.0m

YEAR



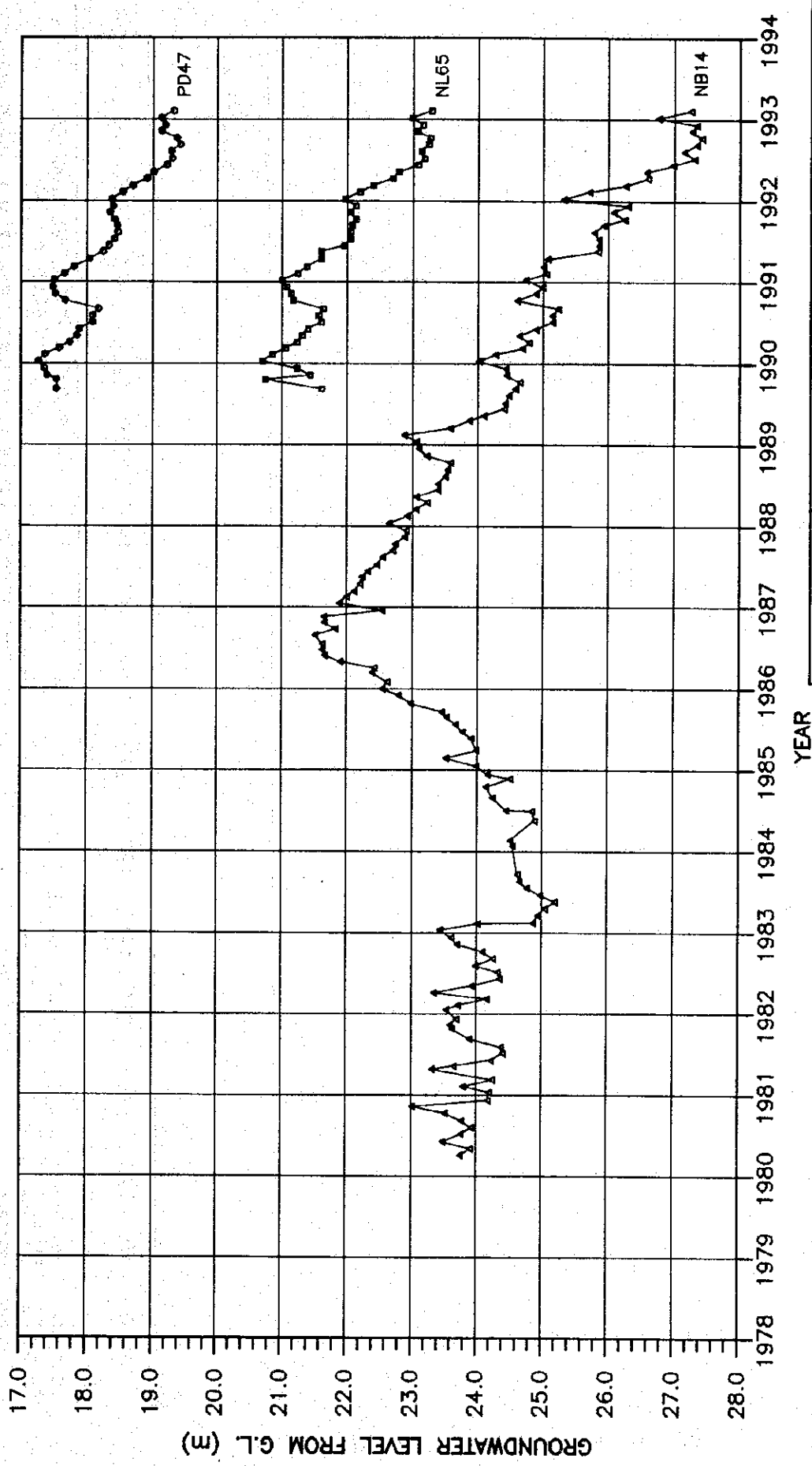
**GROUNDWATER LEVEL CHANGES
AT STATION No. 39**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

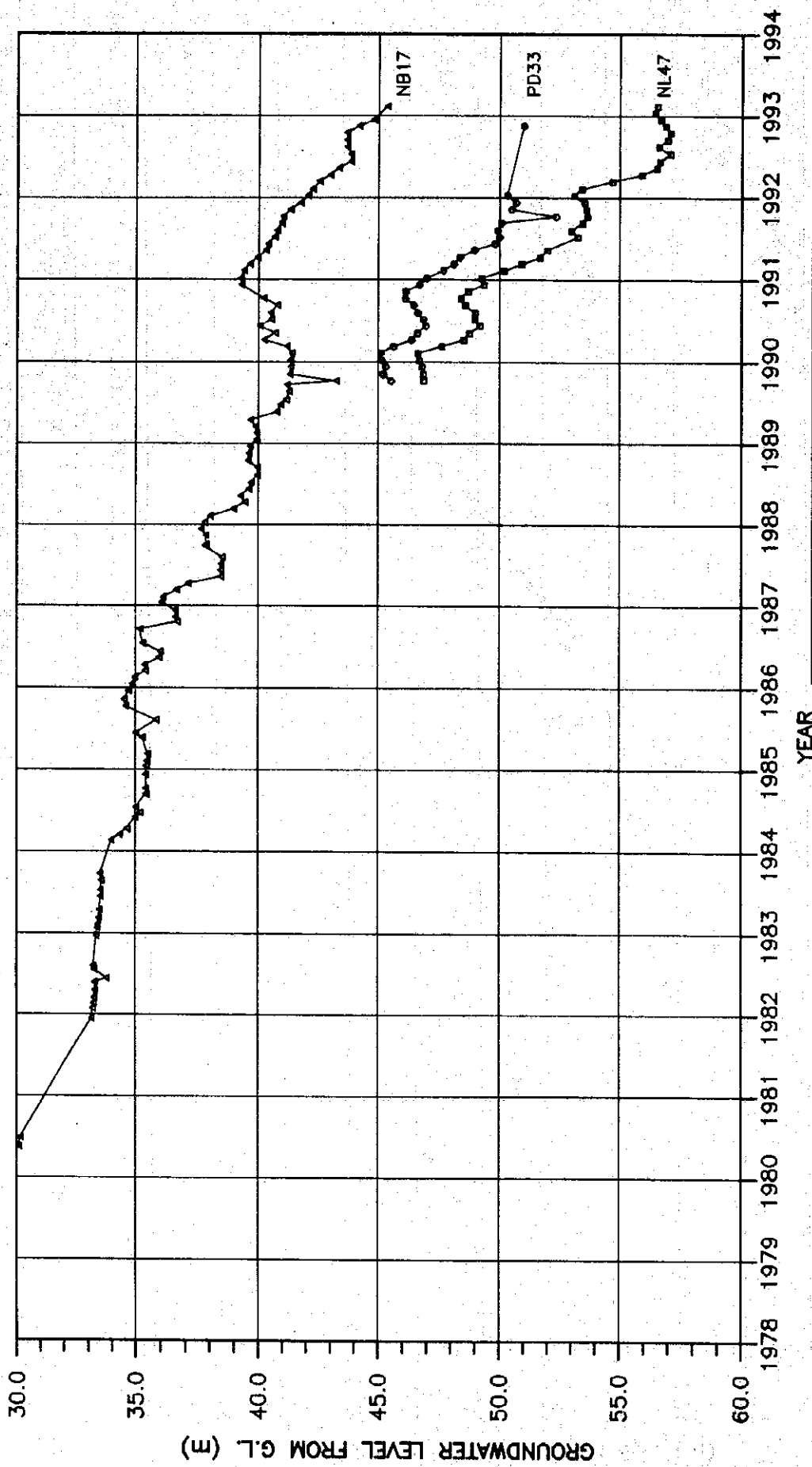
LOCATION : Wat Bug Kaeo Keson
 Tambon : Rahaeng
 Amphoe : Lat Lum Kaeo
 Changwat : Pathum Thani
 UTM Grid : 538525

SCREEN DEPTH
 PD59 : 84.0 - 90.0m
 NL71 : 139.0 - 145.0m
 NB15 : 180.0 - 186.0m



GROUNDWATER LEVEL CHANGES AT STATION No. 40	
THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	KOKUSAI KOGYO CO., LTD.

<p>LOCATION : Provincial Hall Tambon : Bang Prok Amphoe : Muang Pathum Thani Changwat : Pathum Thani UTM Grid : 659503</p>	<p>SCREEN DEPTH</p> <p>PD47 : 98.0-104.0m NL65 : 143.0-149.0m NB14 : 198.3-204.5m</p>
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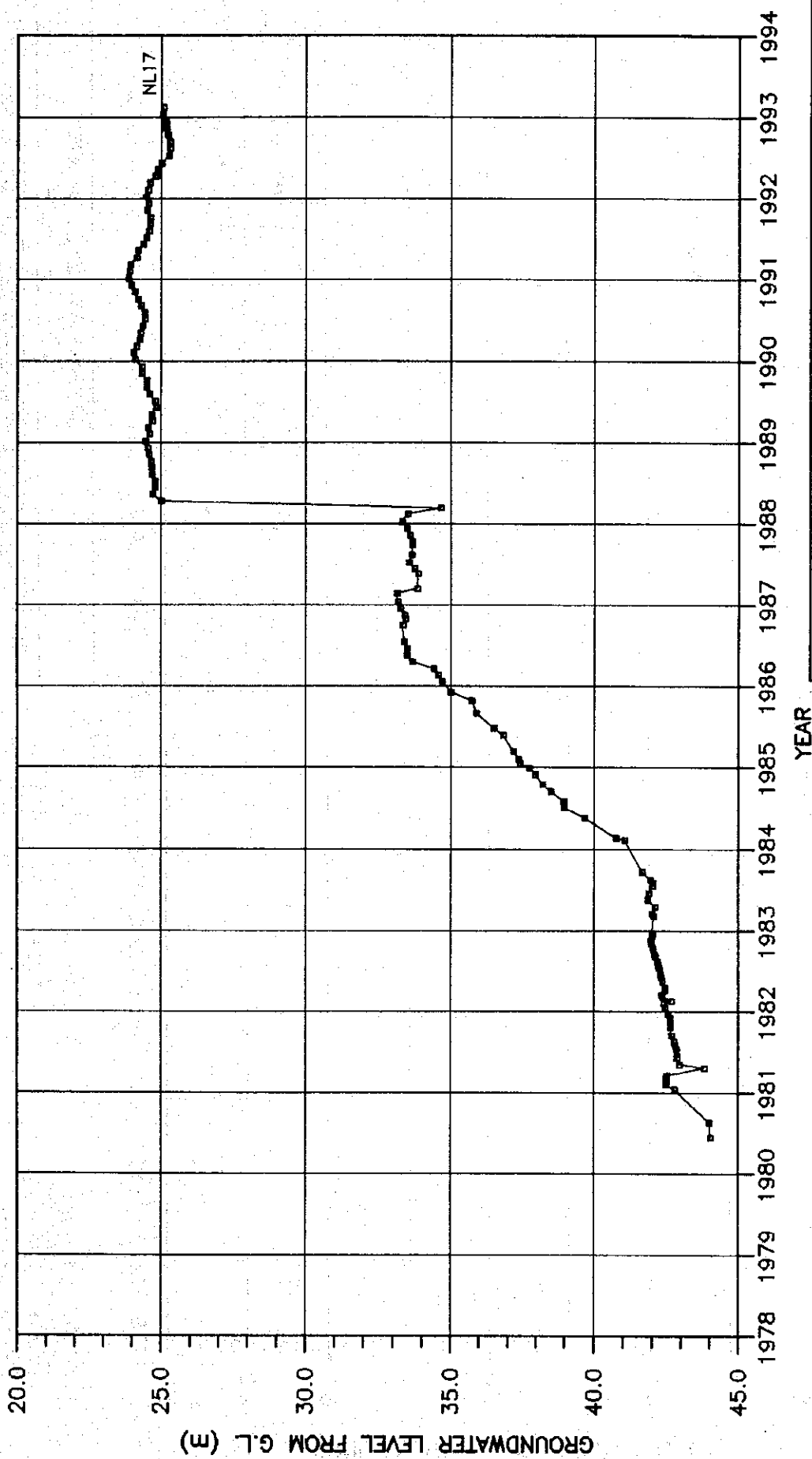
**GROUNDWATER LEVEL CHANGES
AT STATION No. 41**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Bamrung Run
 Tambon : Khlong Sam Prawet
 Amphoe : Lat Krabang
 Changwat : Bangkok
 UTM Grid : 901198

SCREEN DEPTH
 PD33 : 104.0-110.0m
 NL47 : 147.0-153.0m
 NB17 : 183.0-189.0m



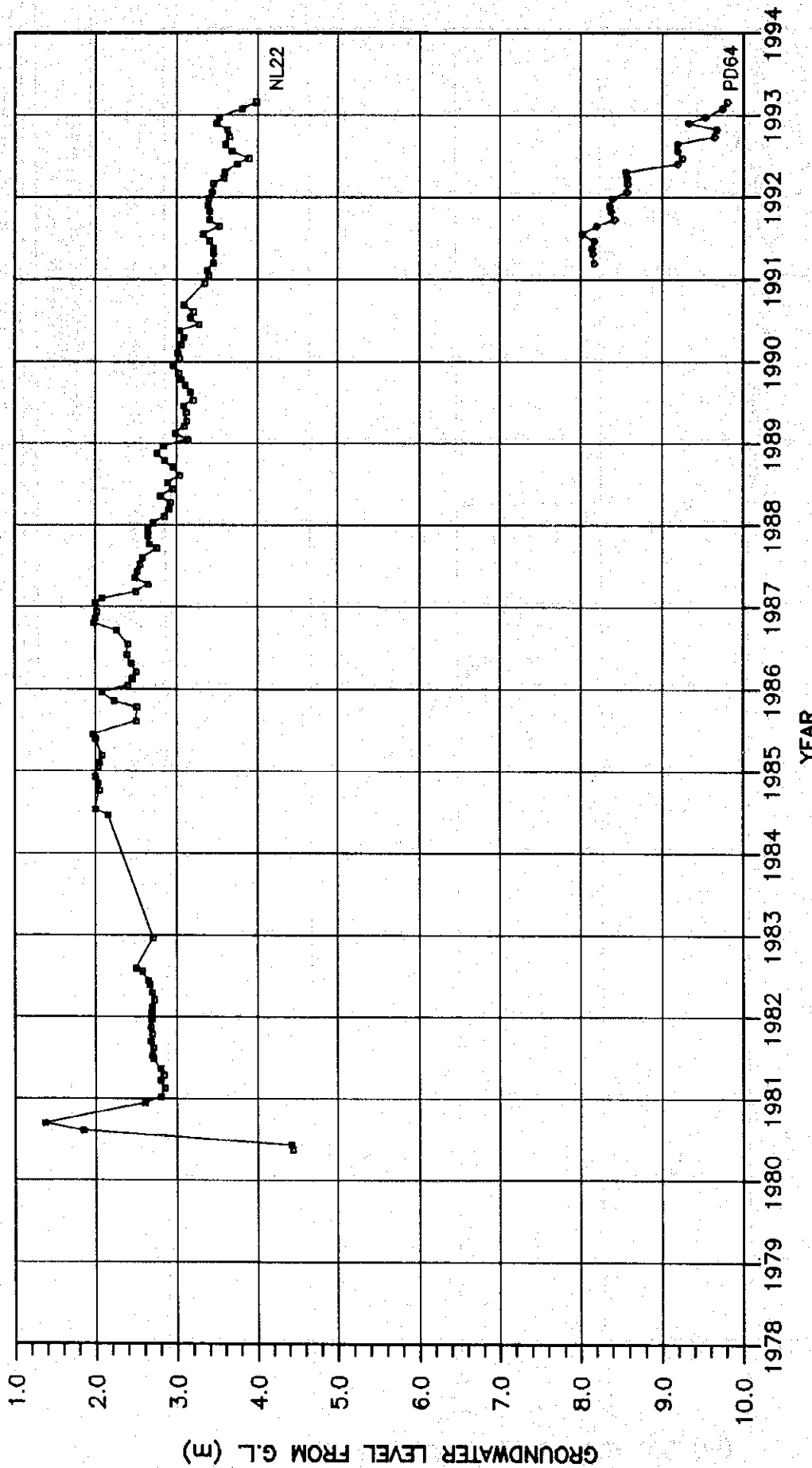
LOCATION : Bangkok Planetarium
 Tambon : Phra Khanong
 Amphoe : Phra Khanong
 Changwat : Bangkok
 UTM Grid : 710/74

SCREEN DEPTH
 NL17 : 134.3-140.3m

GROUNDWATER LEVEL CHANGES
AT STATION No. 42

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.



YEAR

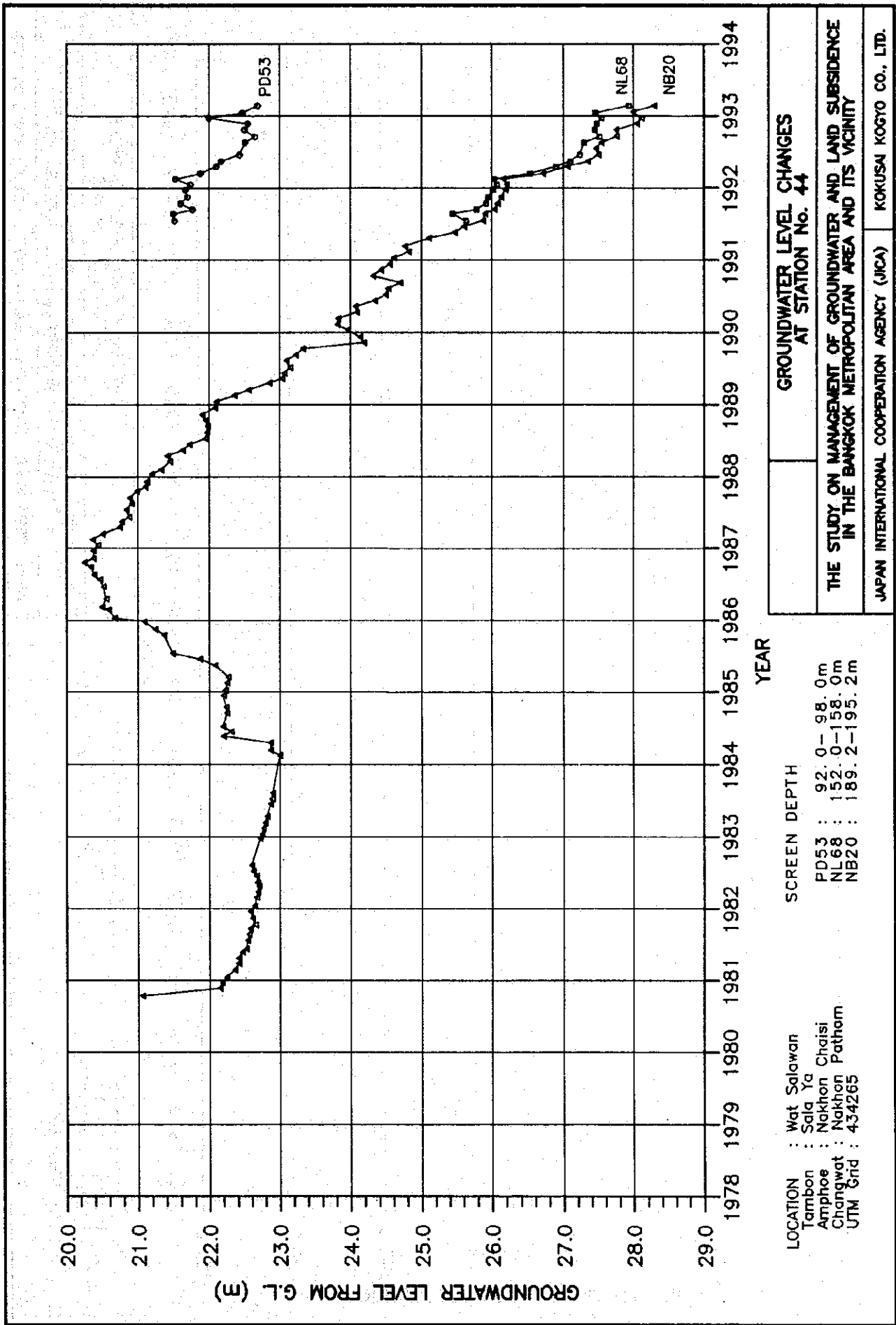
LOCATION : Wat Phut Udam
 Tambon : Phut Udom
 Amphoe : Lam Luk Ka
 Changwat : Pathum Thani
 UTM Grid : 042435

SCREEN DEPTH
 PD64 : 97.0-103.0m
 NL22 : 116.0-122.0m

GROUNDWATER LEVEL CHANGES
 AT STATION No. 43

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



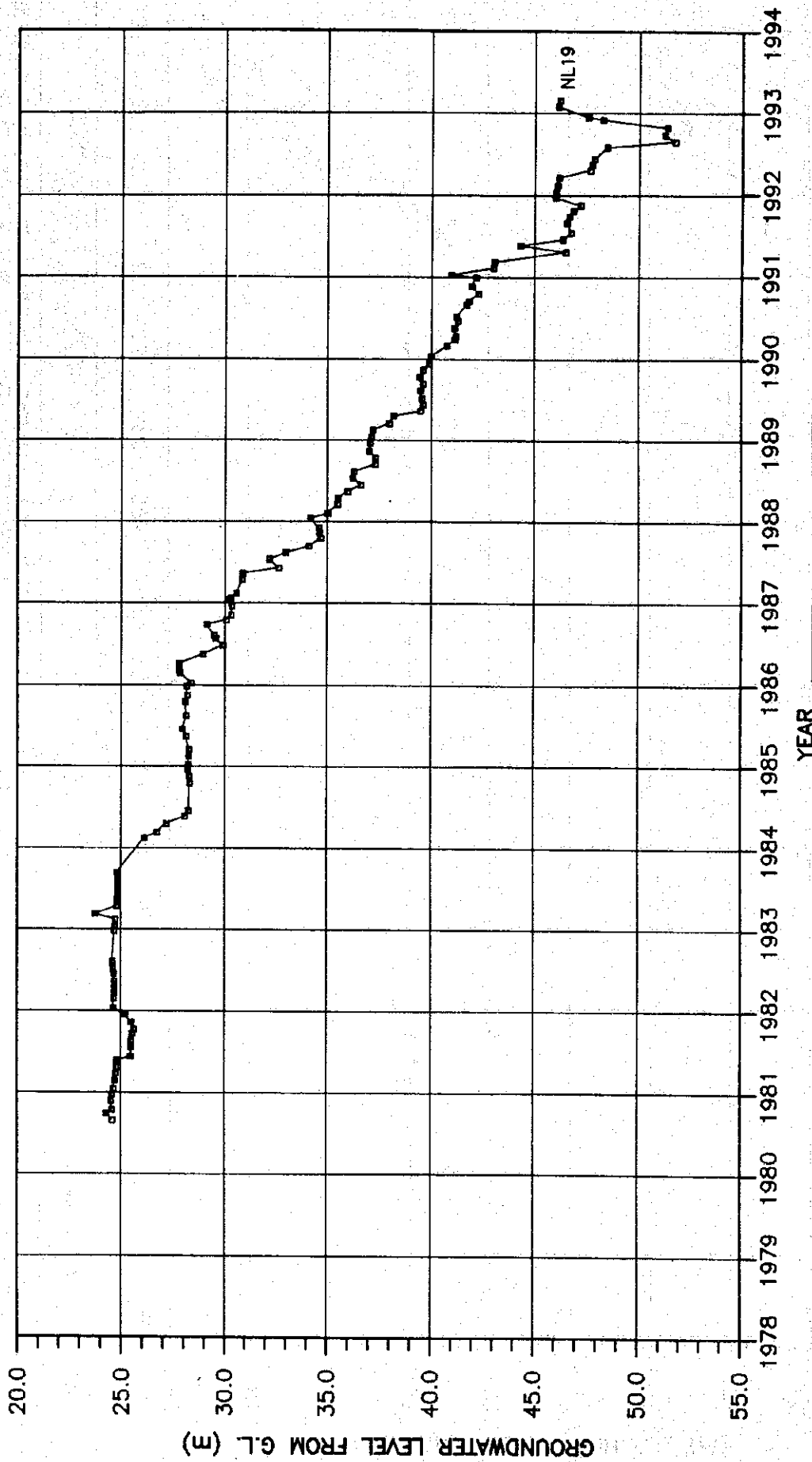
LOCATION : Wat Salawan
 Tambon : Sala Ya
 Amphoe : Nakhon Chaisi
 Changwat : Nakhon Pathom
 UTM Grid : 434265

SCREEN DEPTH
 PD53 : 92.0 - 98.0m
 NL68 : 152.0 - 158.0m
 NB20 : 189.2 - 195.2m

YEAR

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSA KOGYO CO., LTD.



**GROUNDWATER LEVEL CHANGES
AT STATION No. 45**

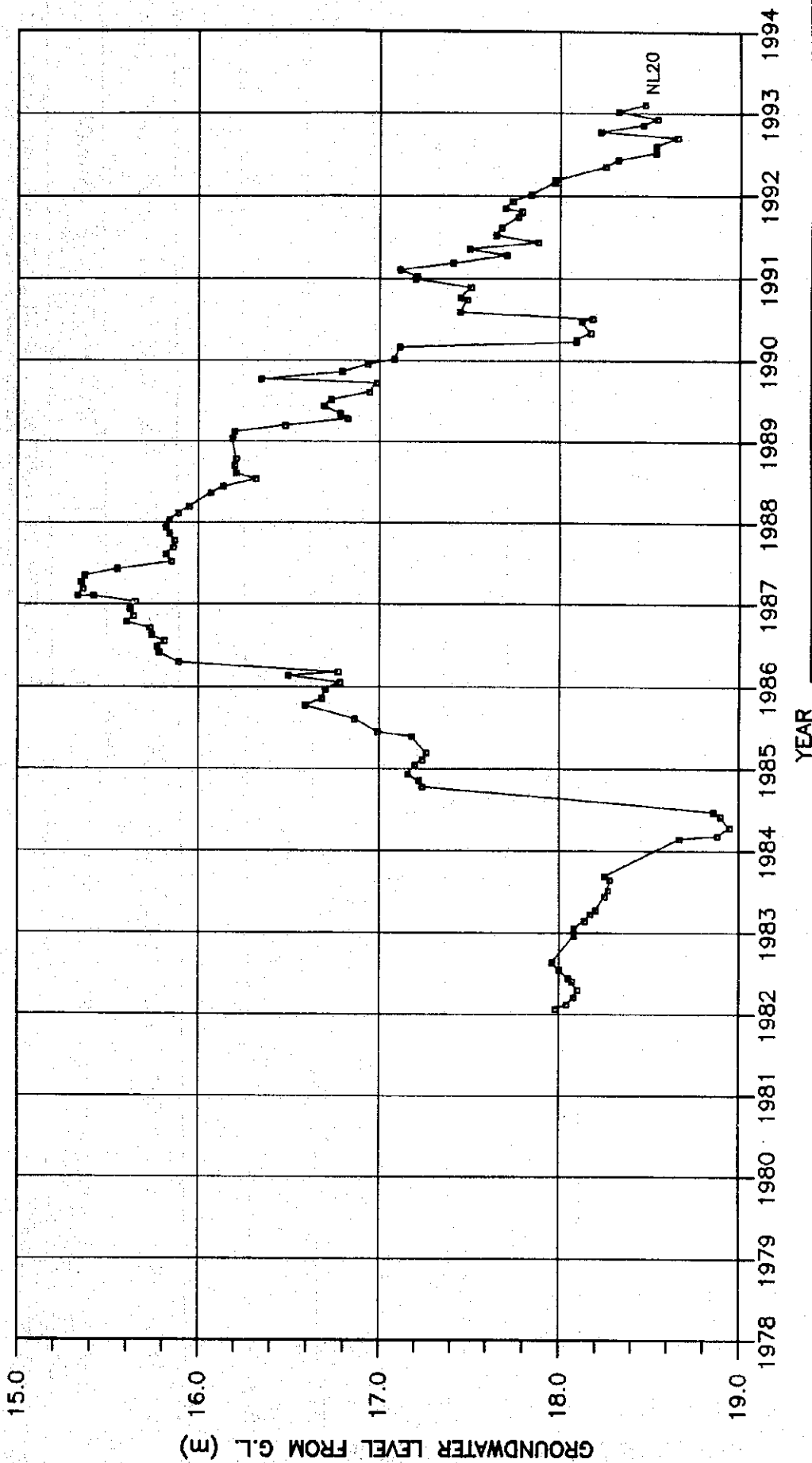
**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Om Yai
 Tambon : Om Yai
 Amphoe : Sam Phram
 Changwat : Nakhon Pathom
 UTM Grid : 367131

SCREEN DEPTH
 NL19 : 123.0-129.0m

YEAR



GROUNDWATER LEVEL CHANGES
AT STATION No. 46

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDIENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

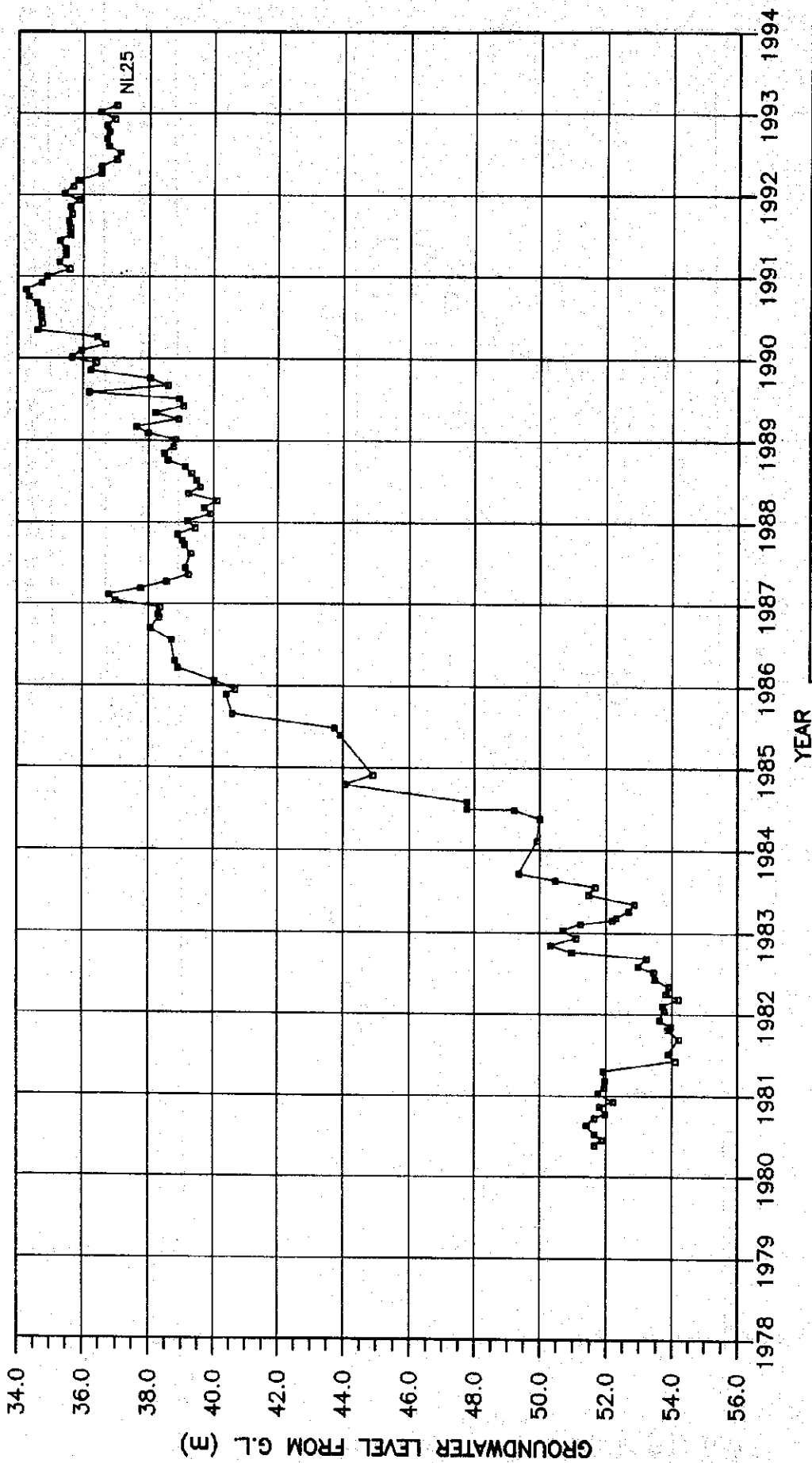
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

YEAR

SCREEN DEPTH

NL20 : 131.0-137.0m

LOCATION : Wat Sakae
 Tambon : Bang Len
 Amphoe : Bang Yai
 Changwat : Nonthaburi
 UTM Grid : 549316



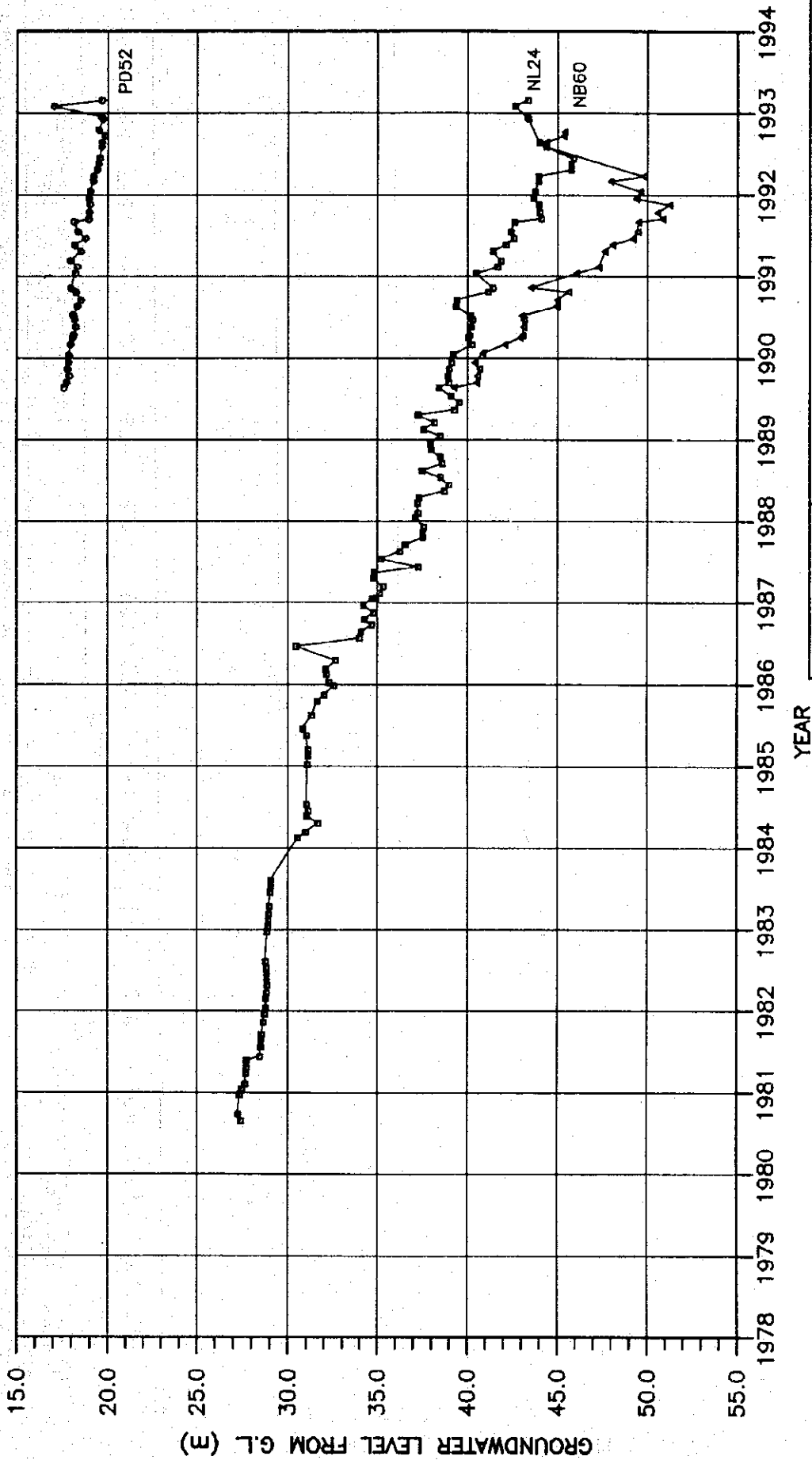
LOCATION : Wat Kunnathi Ruttharam
 Tambon : Huai Khwang
 Amphoe : Huai Khwang
 Changwat : Bangkok
 UTM Grid : 701235

SCREEN DEPTH
 NL25 : 152.0-158.0m

GROUNDWATER LEVEL CHANGES
 AT STATION No. 47

THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
 IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.



**GROUNDWATER LEVEL CHANGES
AT STATION No. 48**

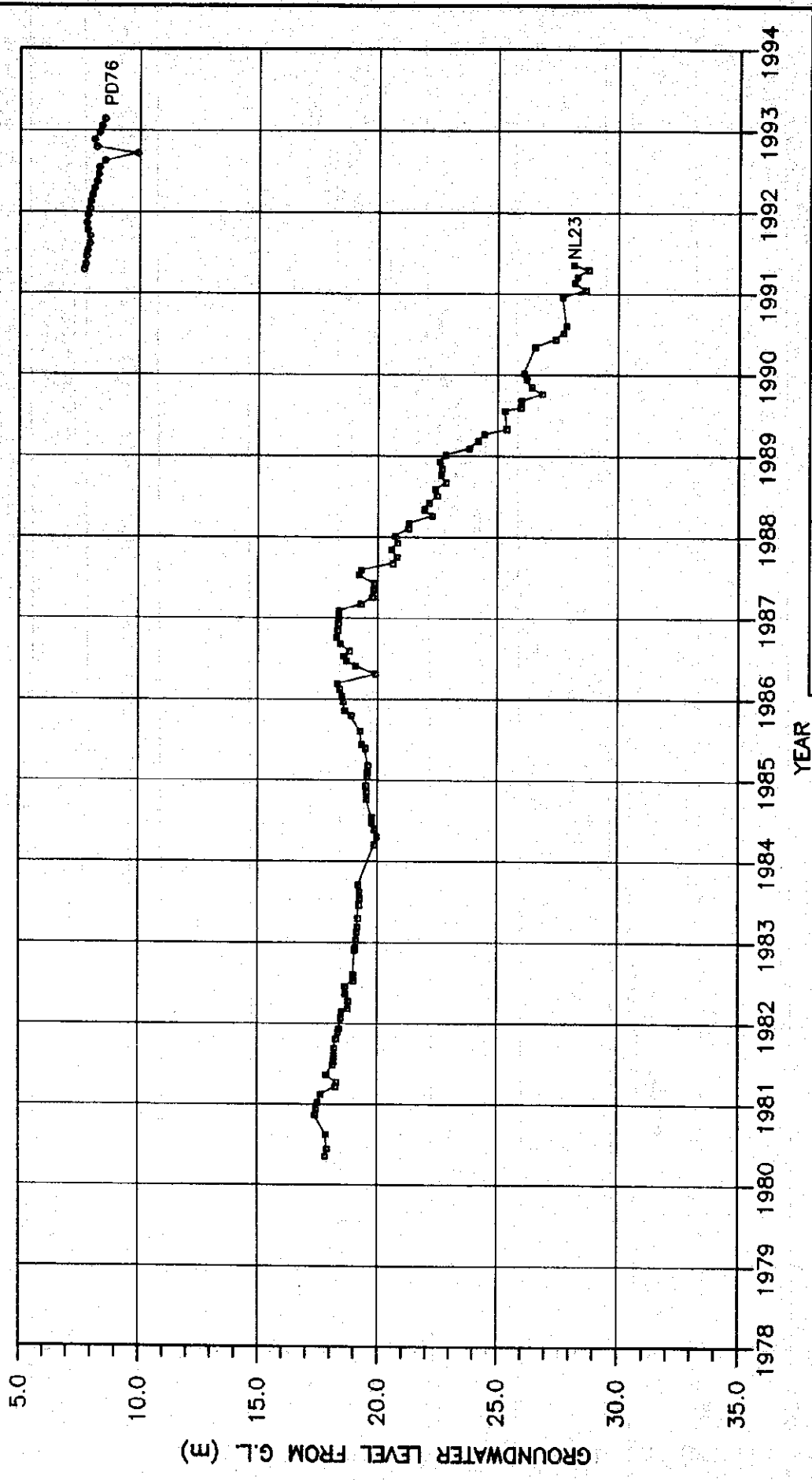
**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Bang Ping
 Tambon : Na Di
 Amphoe : Muang Samut Sakhon
 Changwat : Samut Sakhon
 UTM Grid : 395034

SCREEN DEPTH

PD52 : 77.0-83.0m
 NL24 : 134.0-140.0m
 NB60 : 221.0-227.0m



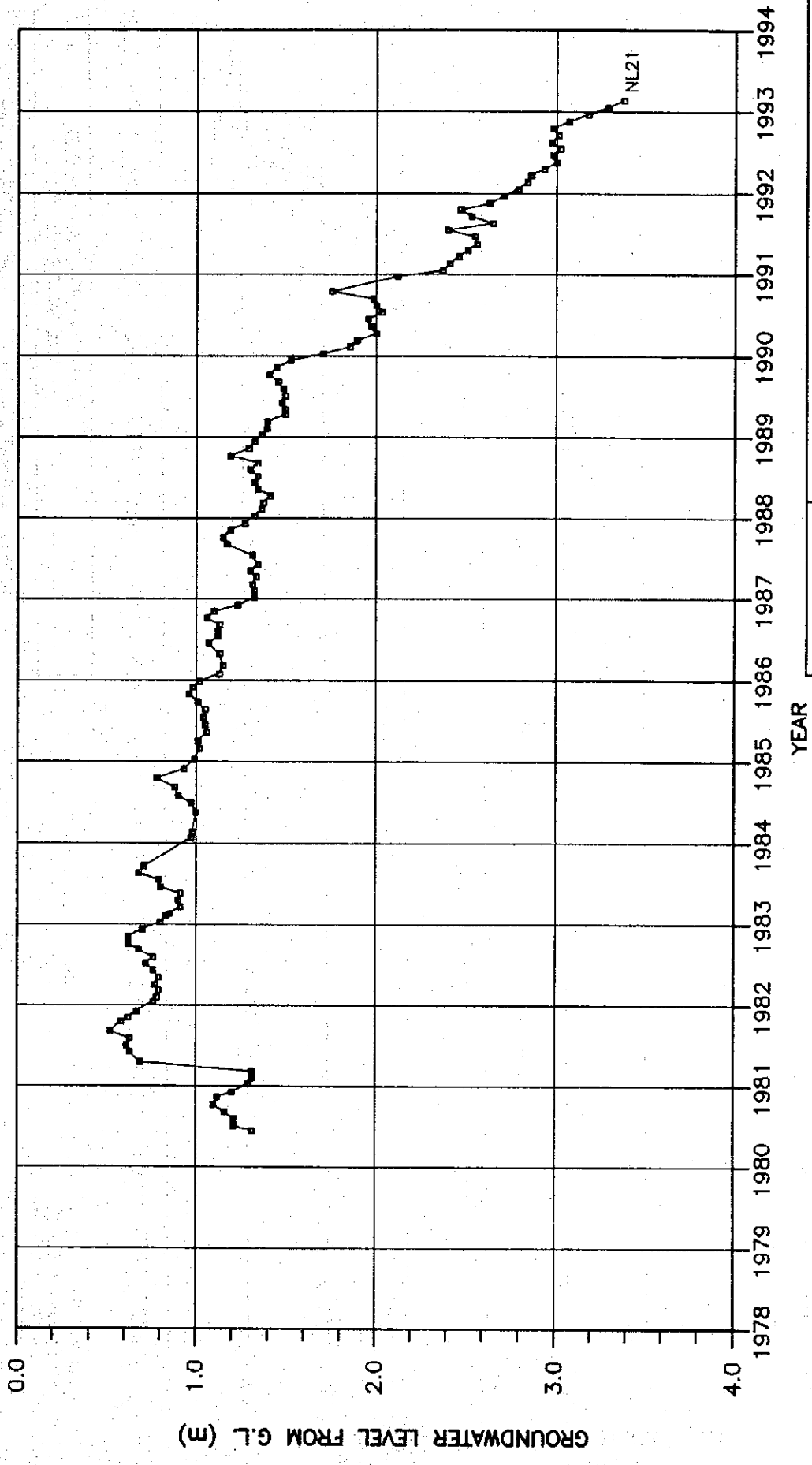
**GROUNDWATER LEVEL CHANGES
AT STATION No. 49**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) | KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Khun Ying Som Chin
 Tambon : Khlong Nung
 Amphoe : Khlong Luang
 Changwat : Pathum Thani
 UTM Grid : 751622

SCREEN DEPTH
 PD76 : 71.0 - 77.0m
 NL23 : 144.0 - 150.0m
 NB52 : 192.0 - 198.0m



**GROUNDWATER LEVEL CHANGES
AT STATION No. 50**

**THE STUDY ON MANAGEMENT OF GROUNDWATER AND LAND SUBSIDENCE
IN THE BANGKOK METROPOLITAN AREA AND ITS VICINITY**

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) KOKUSAI KOGYO CO., LTD.

LOCATION : Wat Bung Ba Praphasawat
 Tambon : Bung Ba
 Amphoe : Nong Sua
 Changwat : Pathum Thani
 UTM Grid : 971628

SCREEN DEPTH
 NL21 : 125.0-131.0m

YEAR