FIGURE LIST VOL. II PENINSULAR AREA

	TITLE
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2	TIME CONTOUR MAP, BEKOK FIELD, TOP b3
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4	CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF b3 ZONE, PULAI FIELD (WATER ENC./OIL PROD. = 0.2)
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3	CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF a2 (A-BLOCK) ZONE, SELIGI FIELD
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6	CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF b2 (B-BLOCK) ZONE, SELIGI FIELD
7	CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF C (B-BLOCK) ZONE, SELIGI FIELD
4-1-1	TIME CONTOUR MAP, TAPIS FIELD, TOP J
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5-2-1	STRUCTURE CONTOUR MAP, PETA FIELD, TOP a3
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2	SEISMIC SECTION, BELUMUT FIELD, LINE M74A3
6-2-1	STRUCTURE CONTOUR MAP, BELUMUT FIELD, TOP a1
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7-1-1	TIME CONTOUR MAP, ANGSI FIELD, NEAR TOP b2
2	SEISMIC SECTION, ANGSI FIELD, LINE M75B265
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9-1-1	TIME CONTOUR MAP, JERNEH FIELD, TOP c1
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12-1-1	TIME CONTOUR MAP, SEPAT FIELD, TOP a5
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2	SEISMIC SECTION, DUYONG FIELD, Line 223
15-2-1	STRUCTURE CONTOUR MAP, DUYONG FIELD, TOP b2
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17-5-1	FACILITIES ARRANGEMENT FOR BEKOK, PULAI AND SELIGI FIELDS - CASE IA
2	BLOCK FLOW DIAGRAM FOR BEKOK, PULAI AND SELIGI FIELDS - CASE IA
3	FACILITIES ARRANGEMENT FOR BEKOK, PULAI AND SELIGI FIELDS - CASE IB
4	BLOCK FLOW DIAGRAM FOR BEKOK, PULAI AND SELIGI FIELDS - CASE IB
5	FACILITIES ARRANGEMENT FOR BEKOK, PULAI AND SELIGI FIELDS - CASE II
6	BLOCK FLOW DIAGRAM FOR BEKOK, PULAI AND SELIGI FIELDS - CASE II
7	FACILITIES ARRANGEMENT FOR BEKOK, PULAI AND SELIGI FIELDS - CASE III
8	BLOCK FLOW DIAGRAM FOR BEKOK, PULAI AND SELIGI FIELDS - CASE III
17-6-1	PROJECT SCHEDULE BEKOK, PULAI AND SELIGI FIELDS - CASE IA
18-5-1	FACILITIES ARRANGEMENT FOR TAPIS OIL FIELD - CASE IA
2	BLOCK FLOW DIAGRAM FOR TAPIS OIL FIELD - CASE IA
3	FACILITIES ARRANGEMENT FOR TAPIS OIL FIELD - CASE IB
4	BLOCK FLOW DIAGRAM FOR TAPIS OIL FIELD - CASE IB
18-6-1	PROJECT SCHEDULE TAPIS OIL FIELD - CASE IA
19-5-1	FACILITIES ARRANGEMENT FOR BEKOK AND PULAI FIELDS GAS UTILIZATION
2	BLOCK FLOW DIAGRAM FOR BEKOK AND PULAI FIELDS GAS UTILIZATION
19-6-1	PROJECT SCHEDULE BEKOK AND PULAI FIELDS GAS UTILIZATION

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2	BLOCK FLOW DIAGRAM FOR TAPIS OIL FIELD GAS UTILIZATION
21-5-1	FACILITIES ARRANGEMENT FOR JERNEH GAS FIELD
2	BLOCK FLOW DIAGRAM FOR JERNEH GAS FIELD
30-5-2	TYPICAL MECHANICAL FLOW DIAGRAM FOR OIL PRODUCTION PLATFORM
6	TYPICAL MECHANICAL FLOW DIAGRAM FOR GAS PRODUCTION & COMPRESSOR PLATFORM
10	TYPICAL UTILITY FLOW DIAGRAM FOR OIL & GAS PRODUCTION PLATFORM
12	TYPICAL UTILITY FLOW DIAGRAM FOR GAS COMPRESSOR PLATFORM
14	TYPICAL PLAN AND ELEVATION FOR 8-LEG OIL PRODUCTION PLATFORM
16	TYPICAL PLAN AND ELEVATION FOR 6-LEG WELL & OIL PRODUCTION PLATFORM
17	TYPICAL PLAN AND ELEVATION FOR 8-LEG SELF-CONTAINED WELL PLATFORM
18	TYPICAL PLAN AND ELEVATION FOR 8-LEG SELF-CONTAINED WELL & OIL PRODUCTION PLATFORM
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31-6-1	DRILLING & COMPLETION COST OF DEVELOPMENT WELL
2	TENTATIVE ORGANIZATION FOR FIELD OPERATION (80 PERSONS CASE)
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5	TENTATIVE ORGANIZATION FOR FIELD OPERATION (146 PERSONS CASE)
6	SENSITIVITY CURVE OF PENINSULAR AREA

Fig. 1-1-1

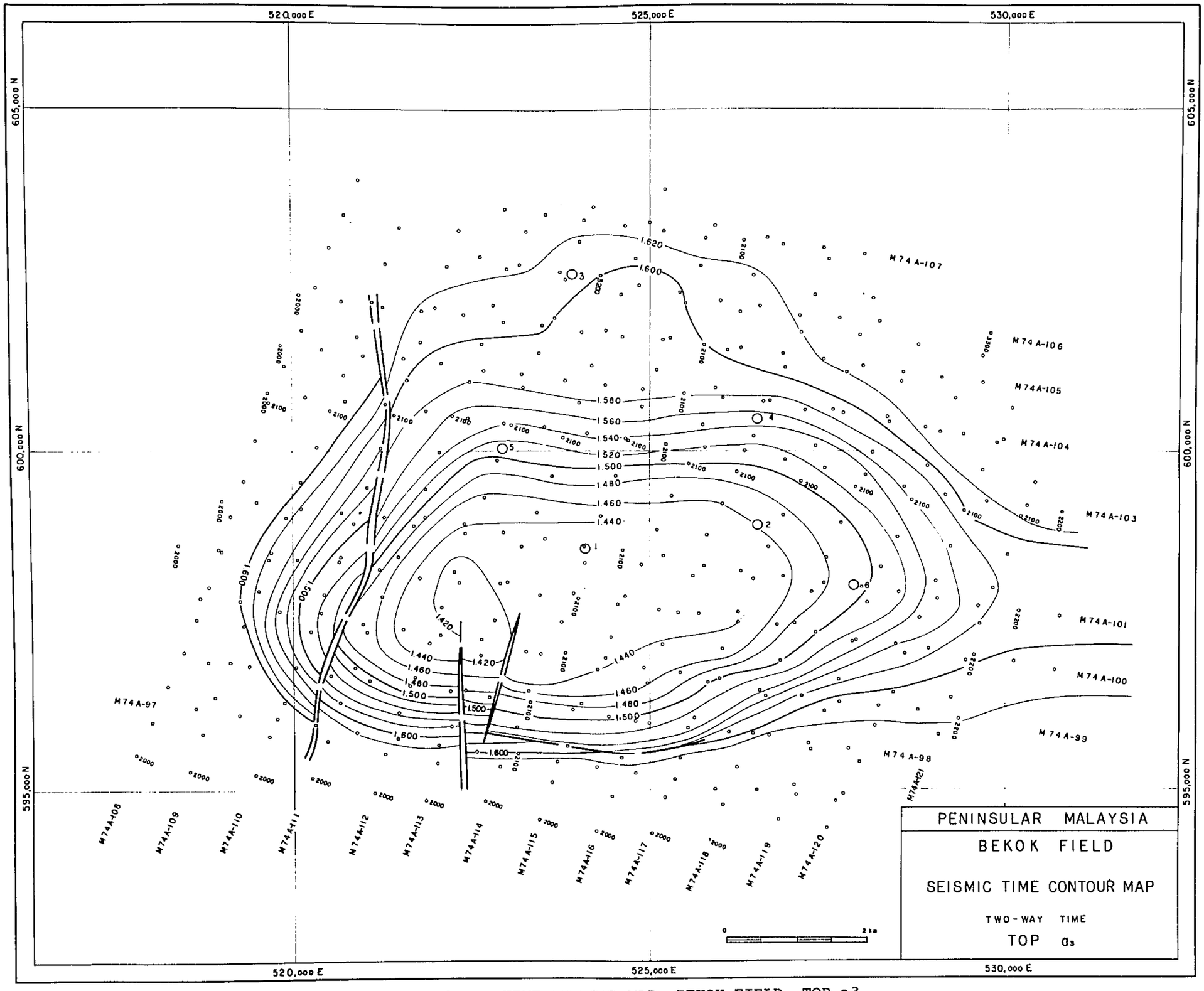

Fig. 1-1-1 TIME CONTOUR MAP, BEKOK FIELD, TOP a3
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Fig. 1-1-2

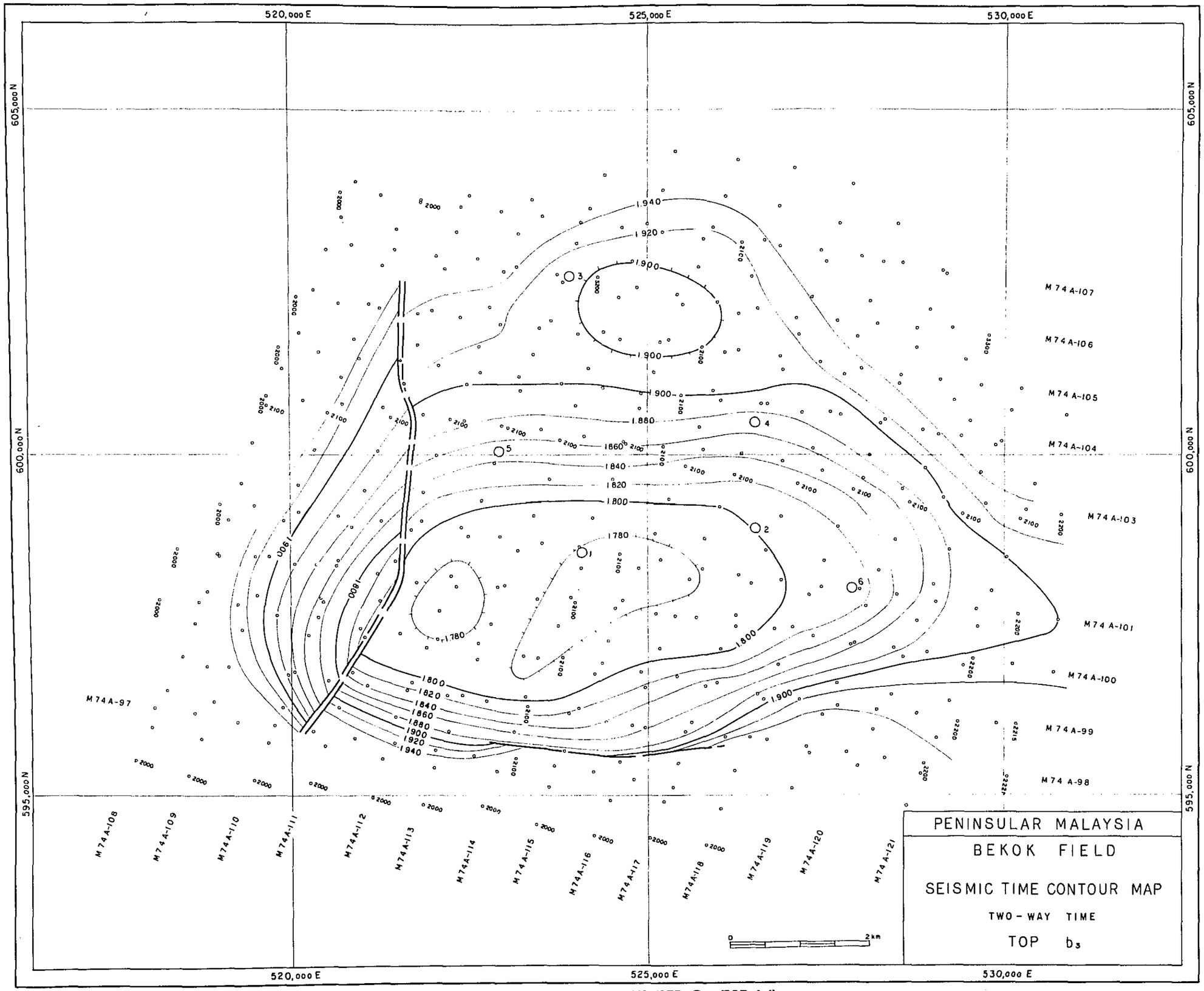


Fig. 1-1-2 TIME CONTOUR MAP, BEKOK FIELD, TOP b3
Vol. II

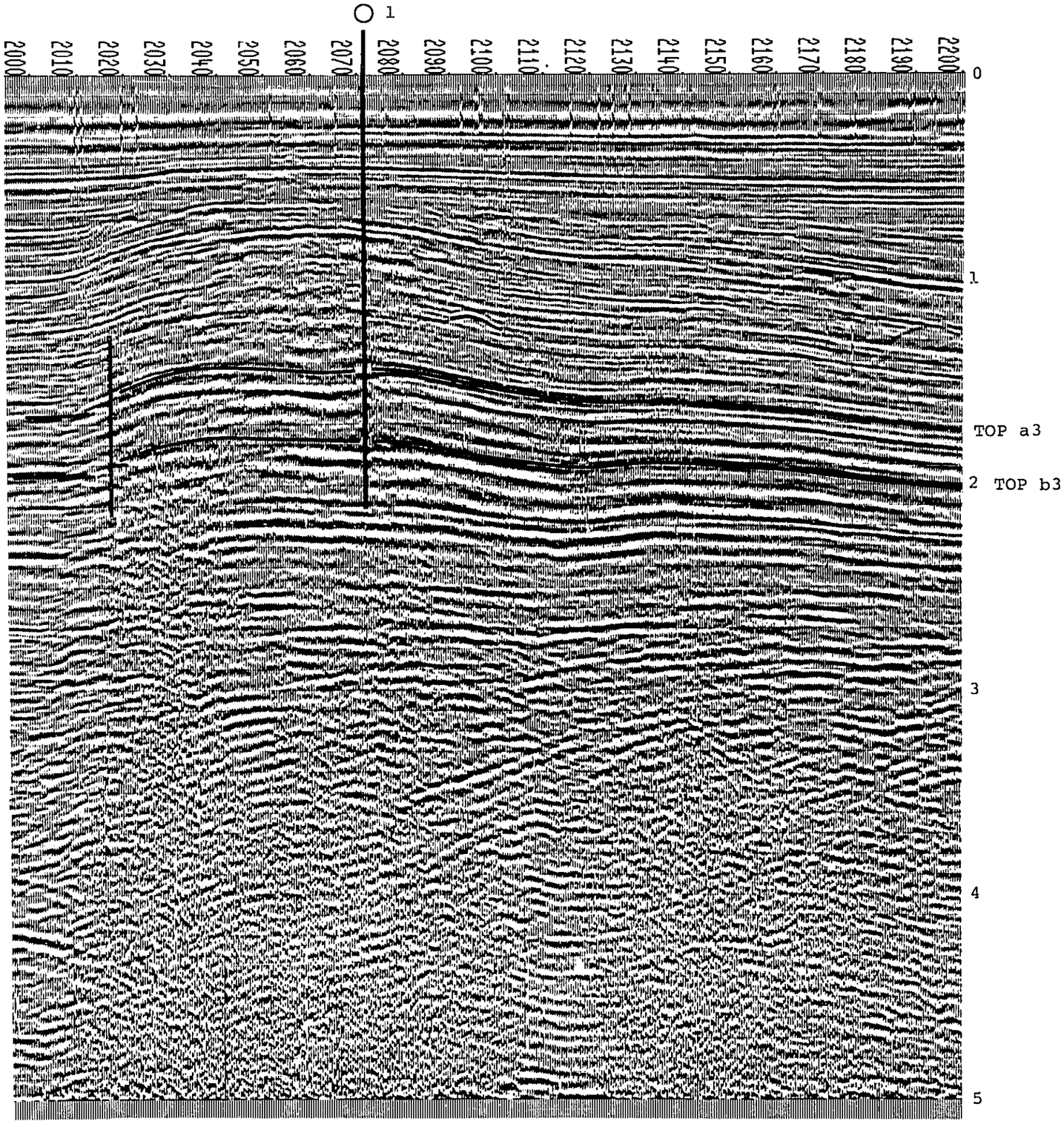


Fig. 1-1-3 SEISMIC SECTION, BEKOK FIELD, Line M74A114
Vol. II

Fig. 1-2-1 STRATIGRAPHIC SUMMARY OF FIELDS IN PENINSULAR AREA
Vol. II

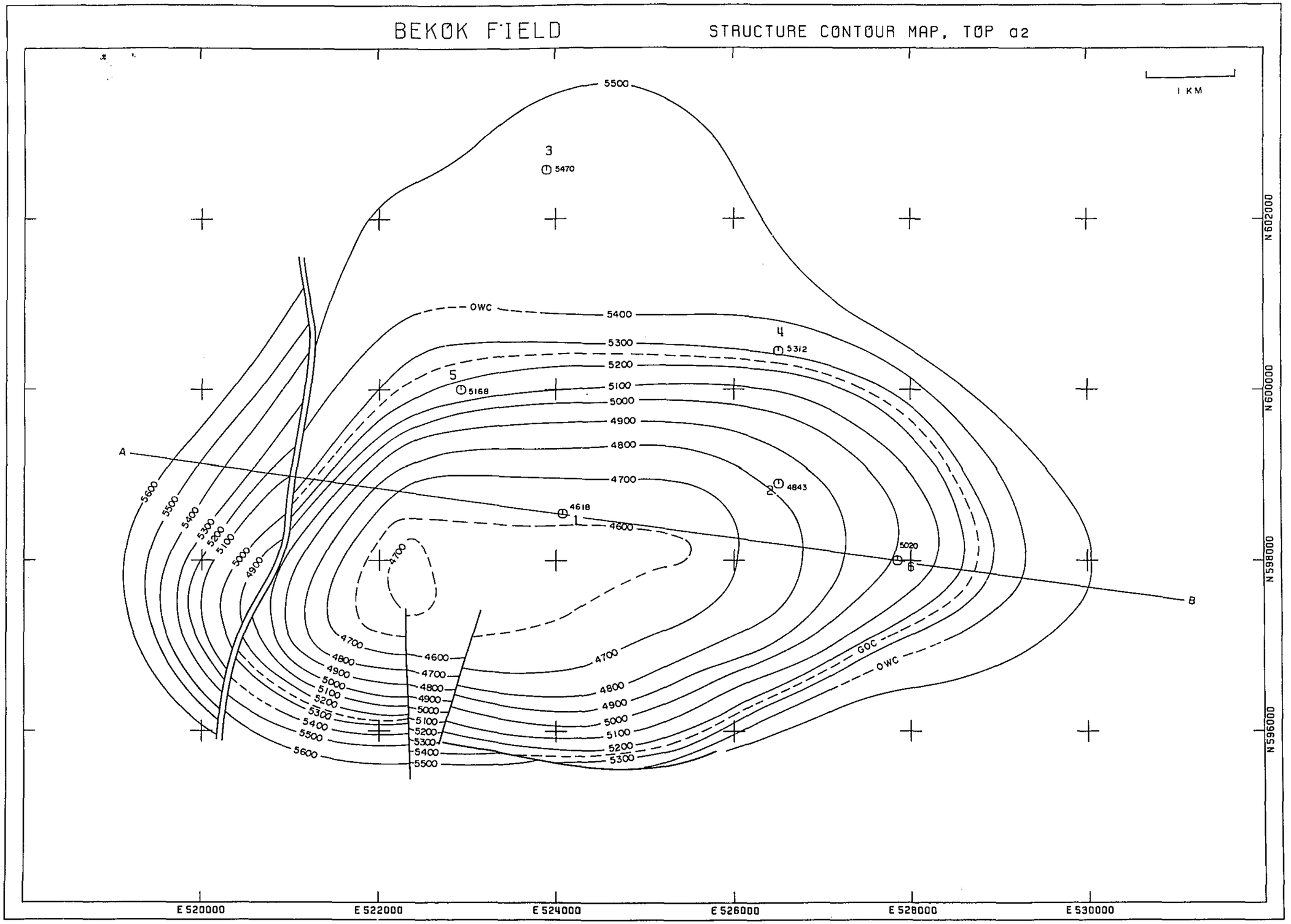


Fig. 1-2-2 STRUCTURE CONTOUR MAP, BEKOK FIELD, TOP a2
Vol. II

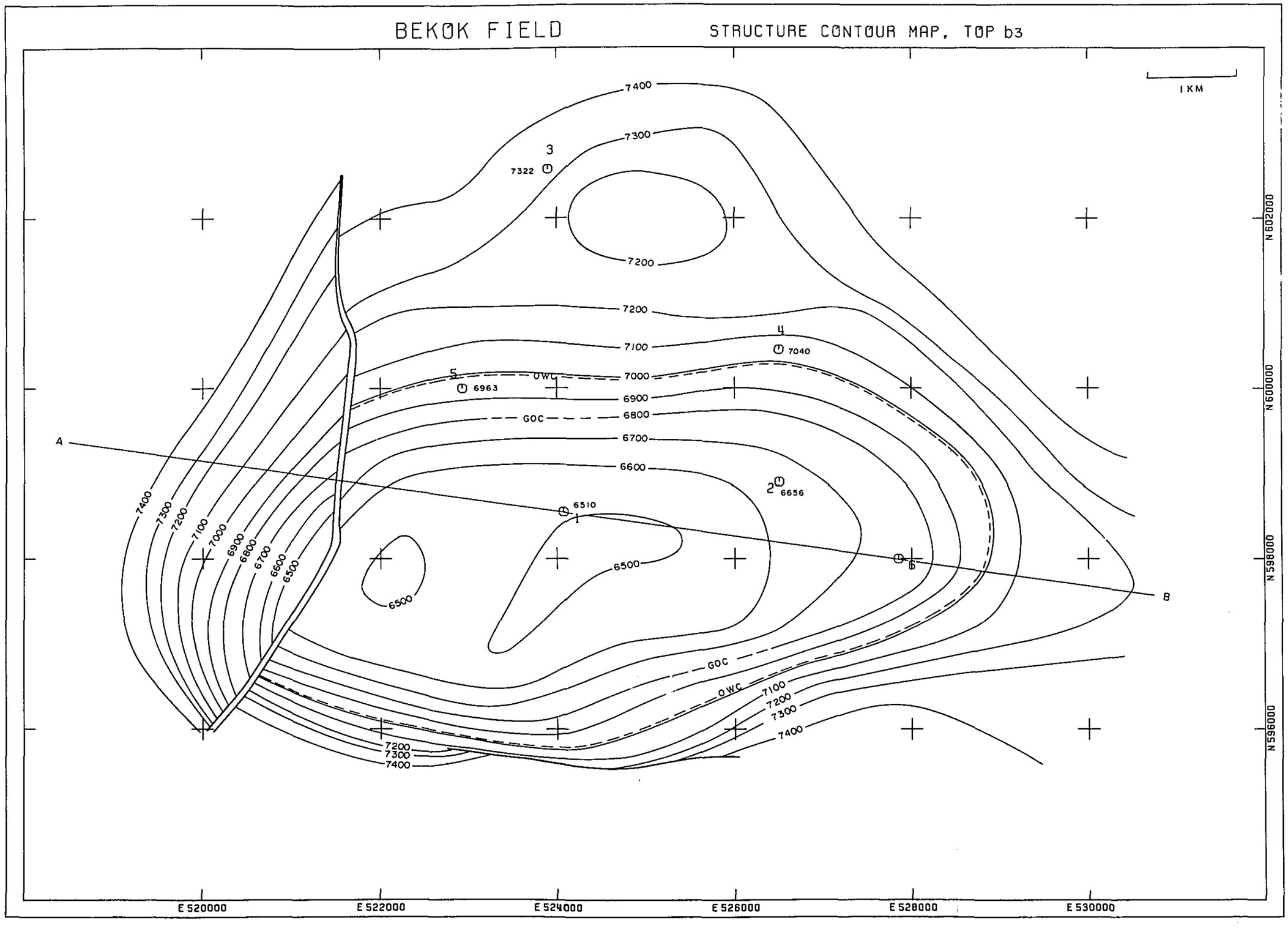


Fig. 1-2-3 STRUCTURE CONTOUR MAP, BEKOK FIELD, TOP b3
Vol. II

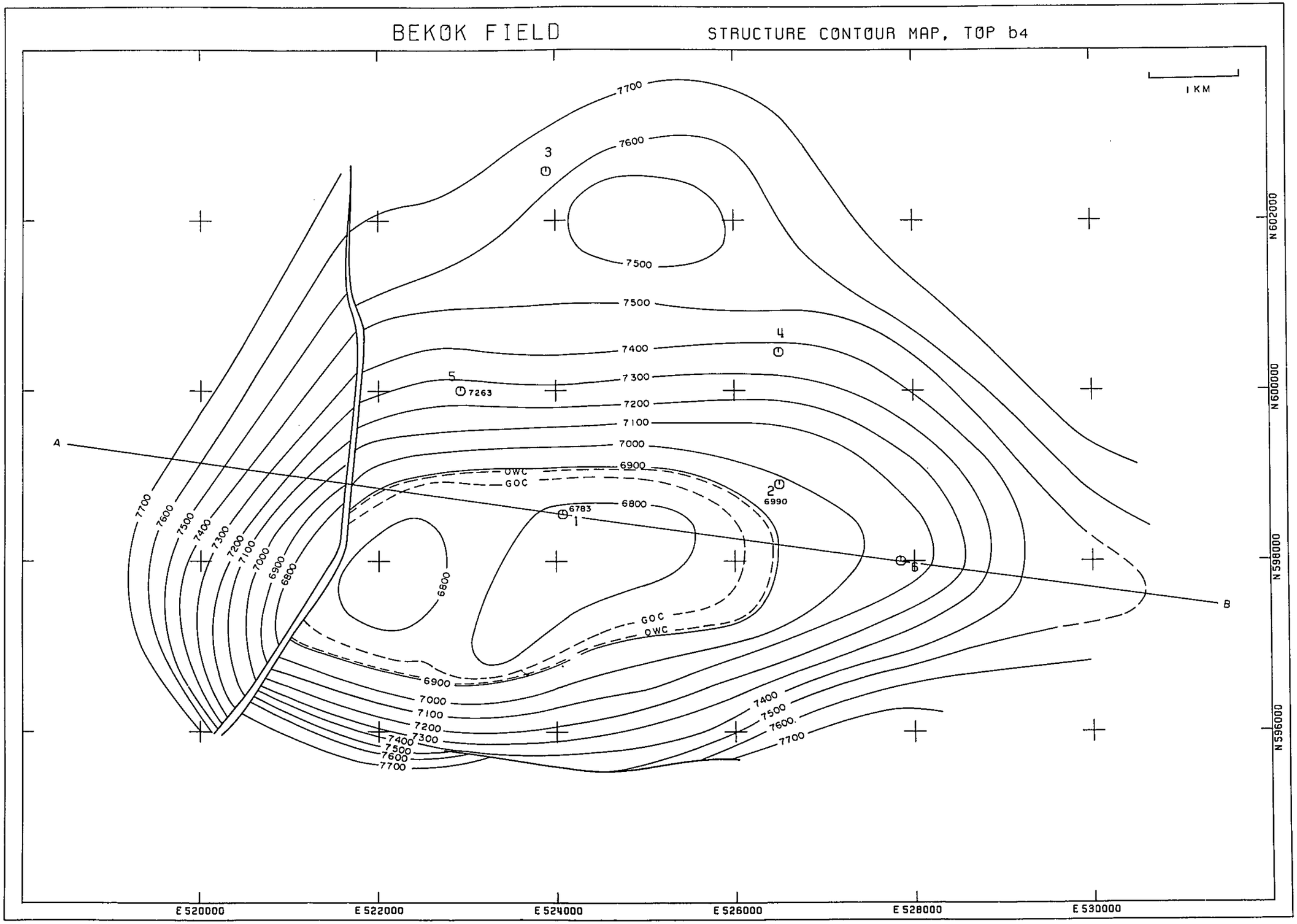


Fig. 1-2-4 STRUCTURE CONTOUR MAP, BEKOK FIELD, TOP b4
Vol. II

Fig. 1-2-5

BEKOK FIELD

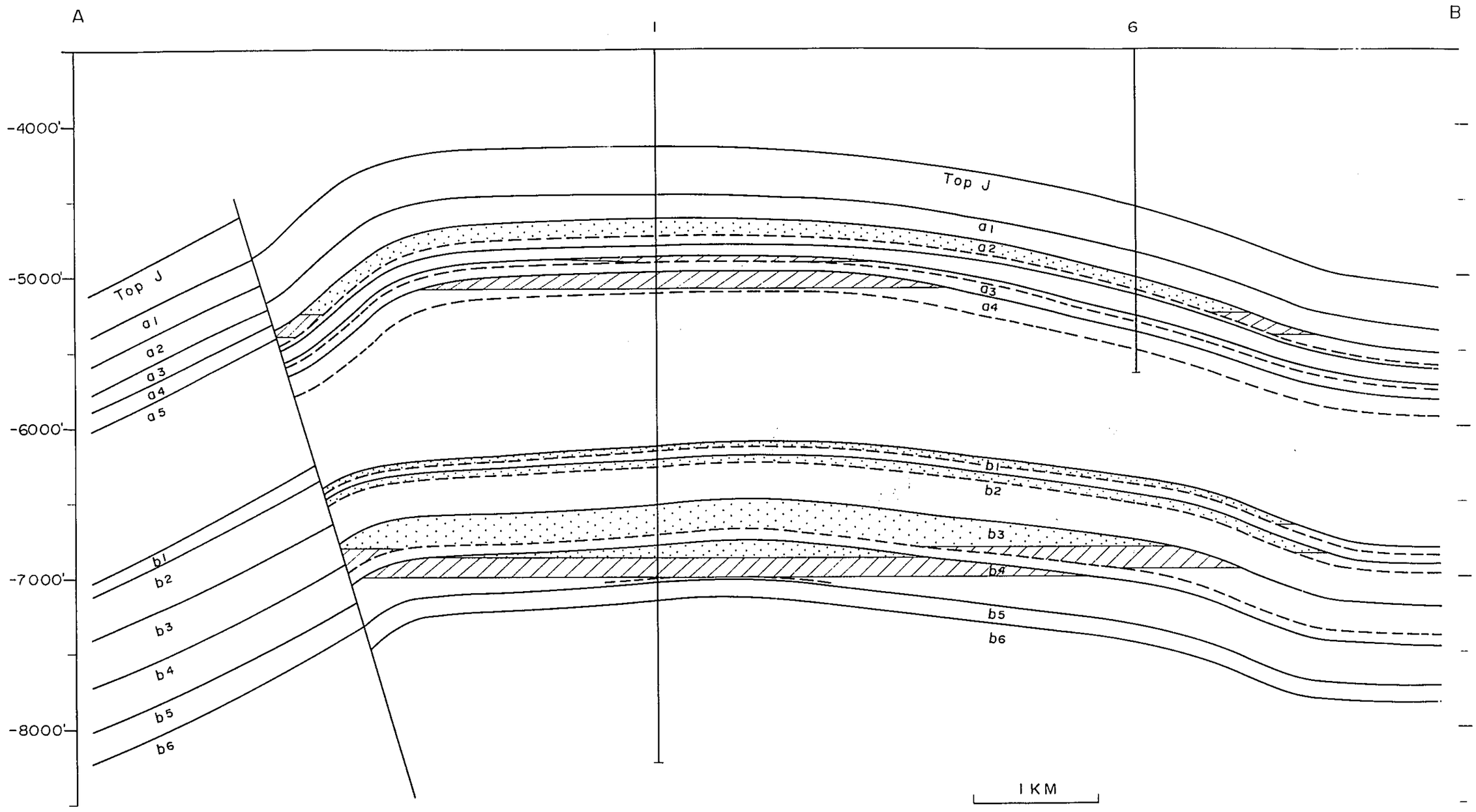
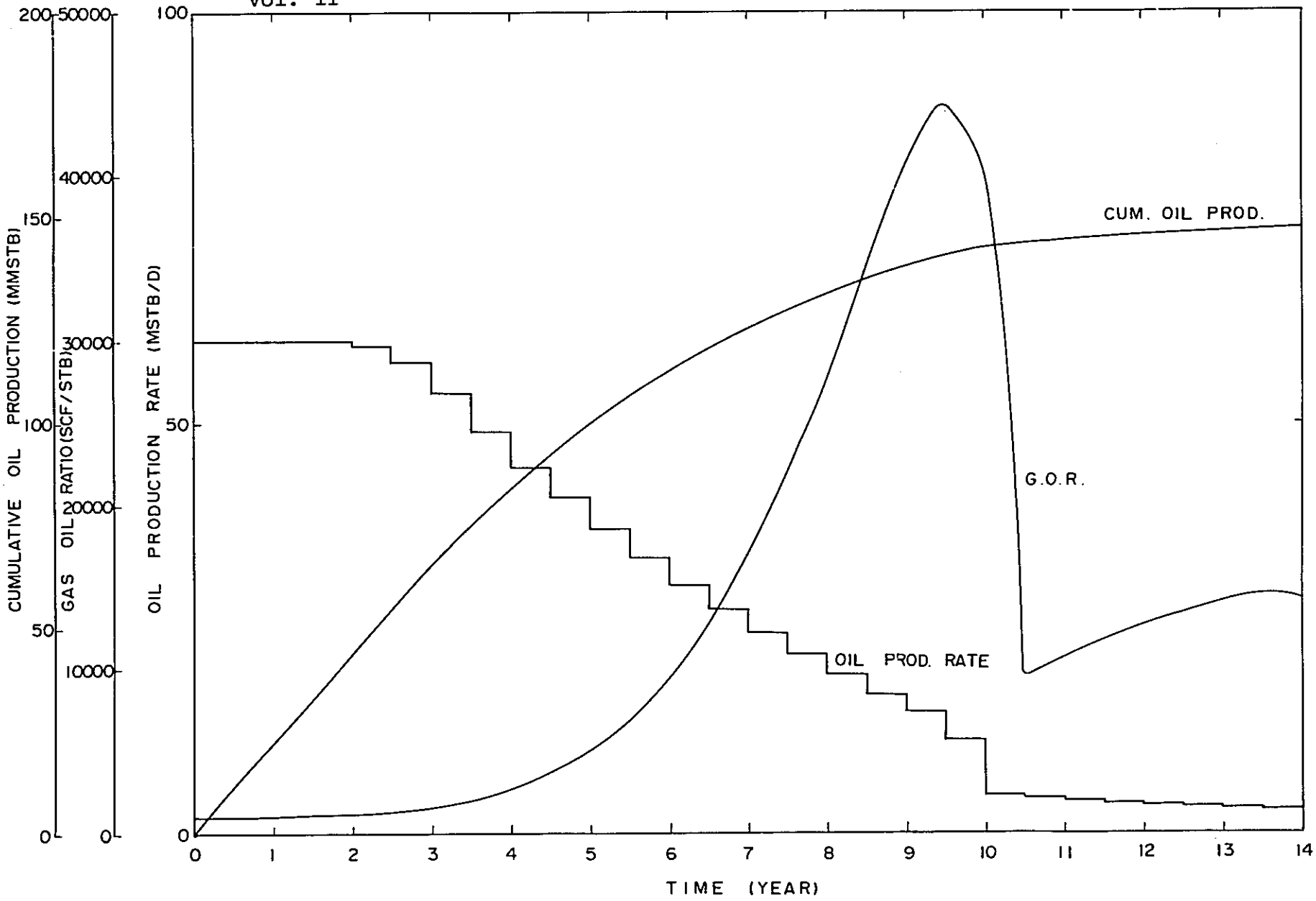


Fig. 1-2-5 STRUCTURAL CROSS-SECTION, BEKOK FIELD
Vol. II

Fig. 1-3-1
Vol. II

PREDICTED PERFORMANCE OF BEKOK FIELD (NATURAL DEPLETION CASE)



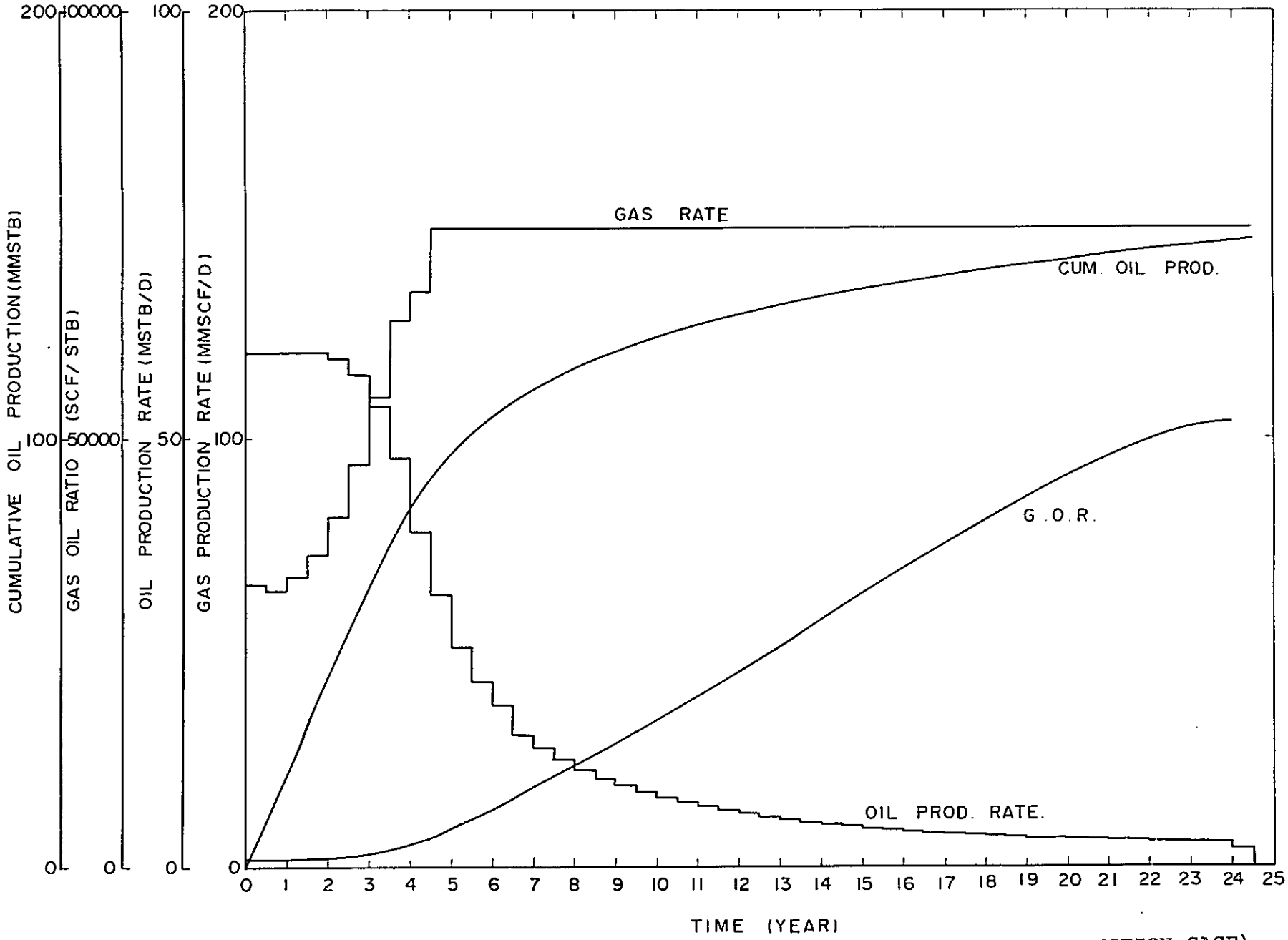


Fig. 1-3-2 PREDICTED PERFORMANCE OF BEKOK FIELD (RESTRICTED GAS PRODUCTION CASE)
Vol. II

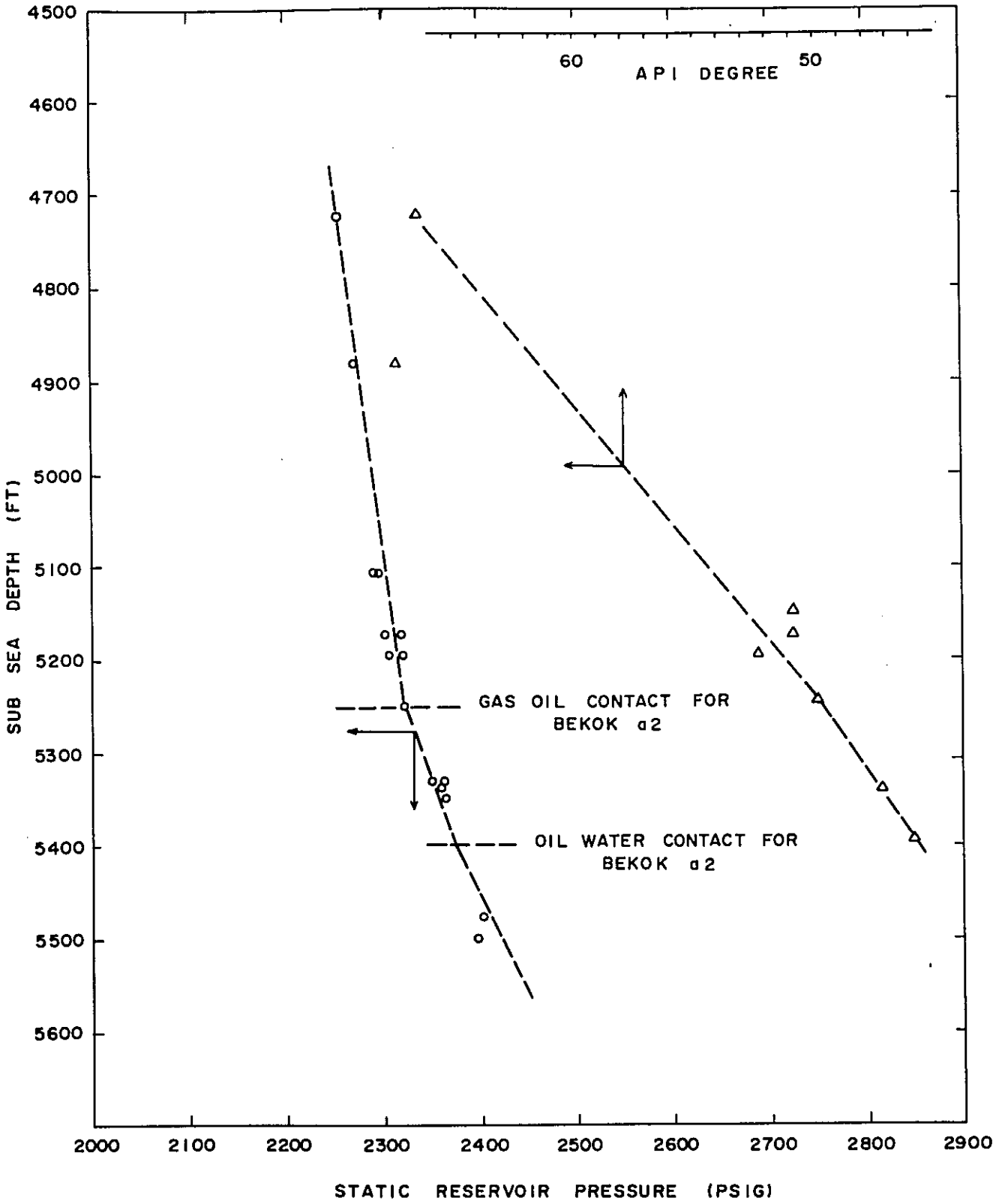


Fig. 1-3-3 RESERVOIR PRESSURE VS. DEPTH, BEKOK FIELD a2
Vol. II

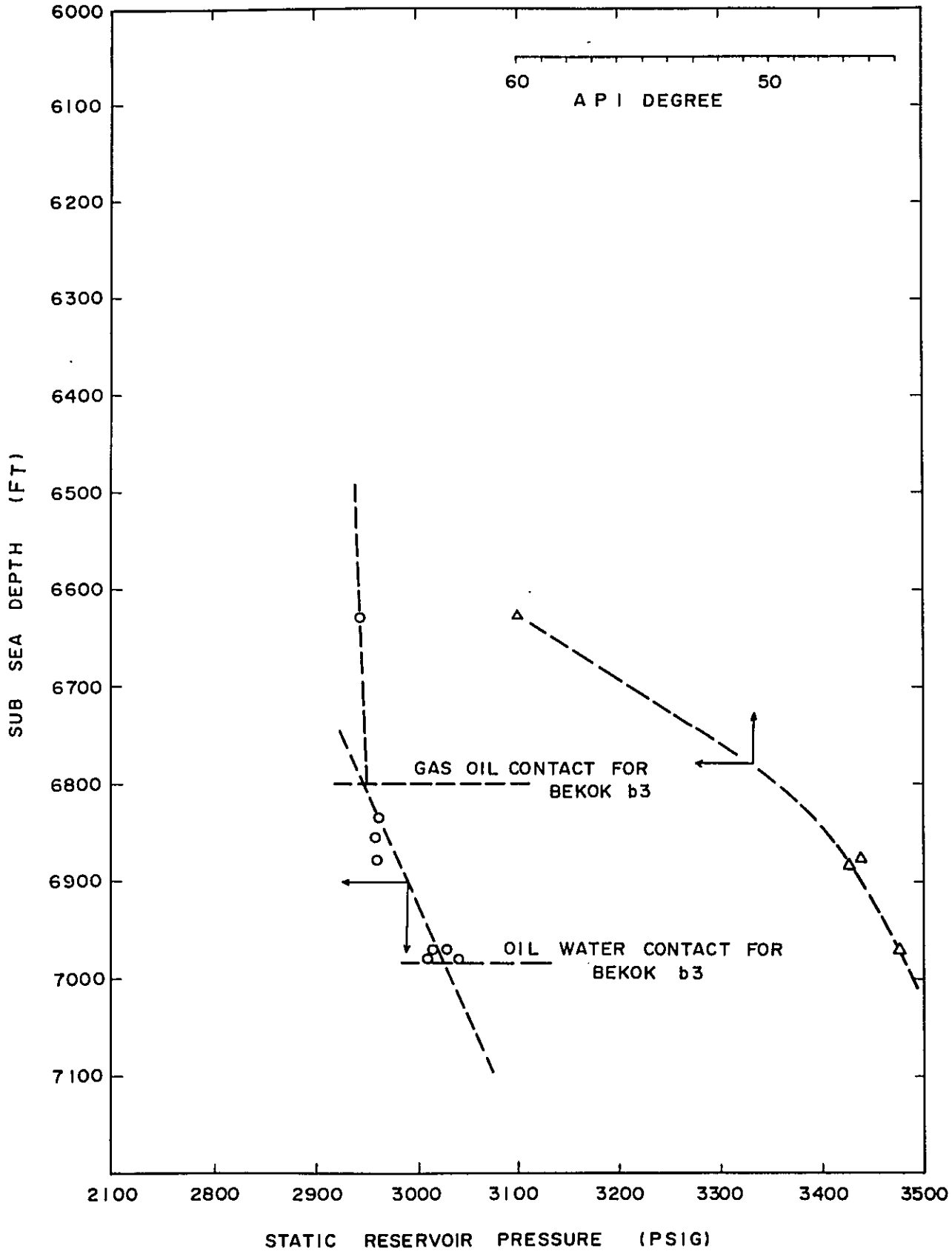


Fig. 1-3-4 RESERVOIR PRESSURE VS. DEPTH, BEKOK FIELD b3
Vol. II

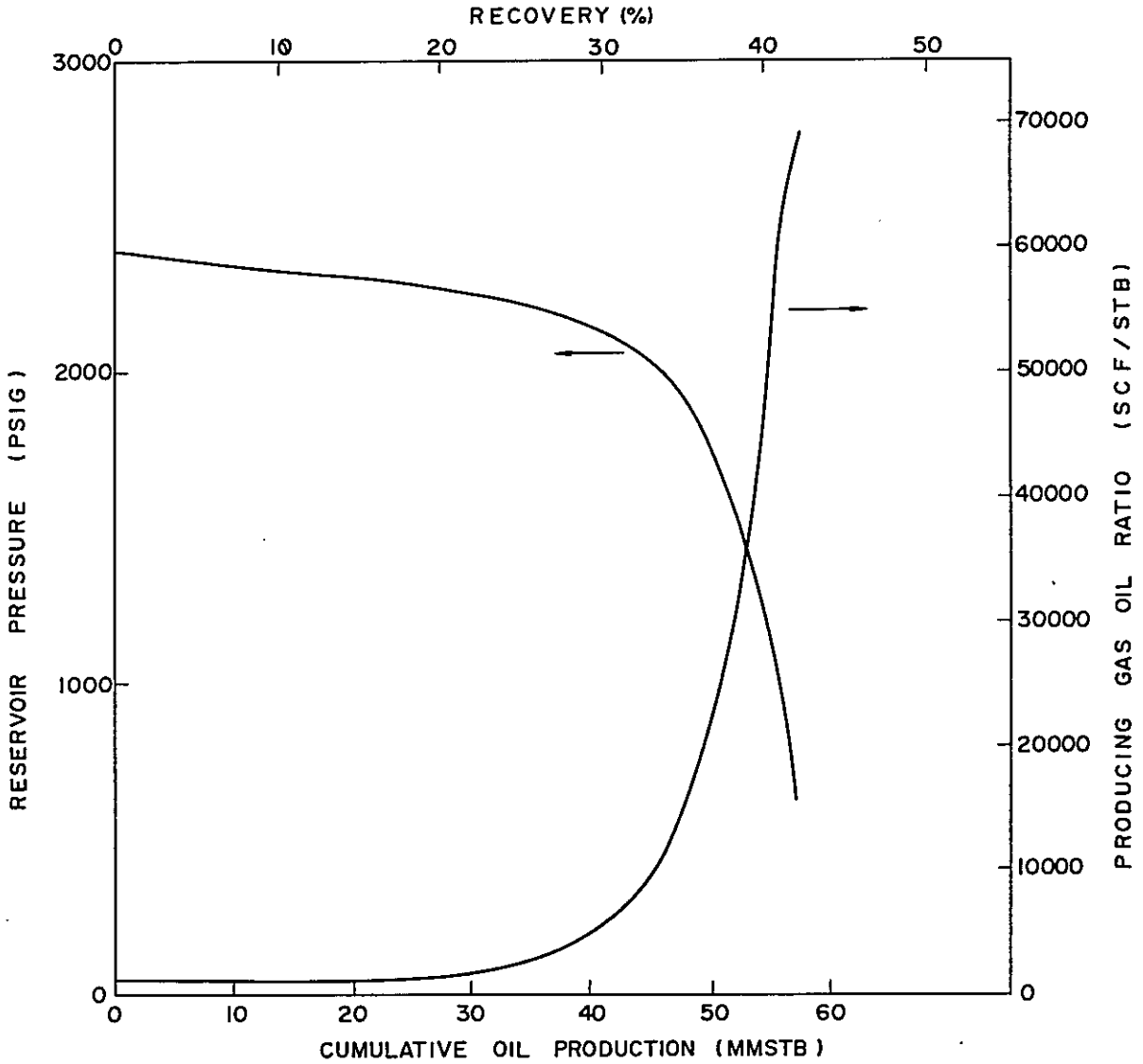


Fig. 1-3-5
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF A2 ZONE, BEKOK FIELD (NATURAL DEPLETION CASE AND RESTRICTED GAS PRODUCTION CASE)

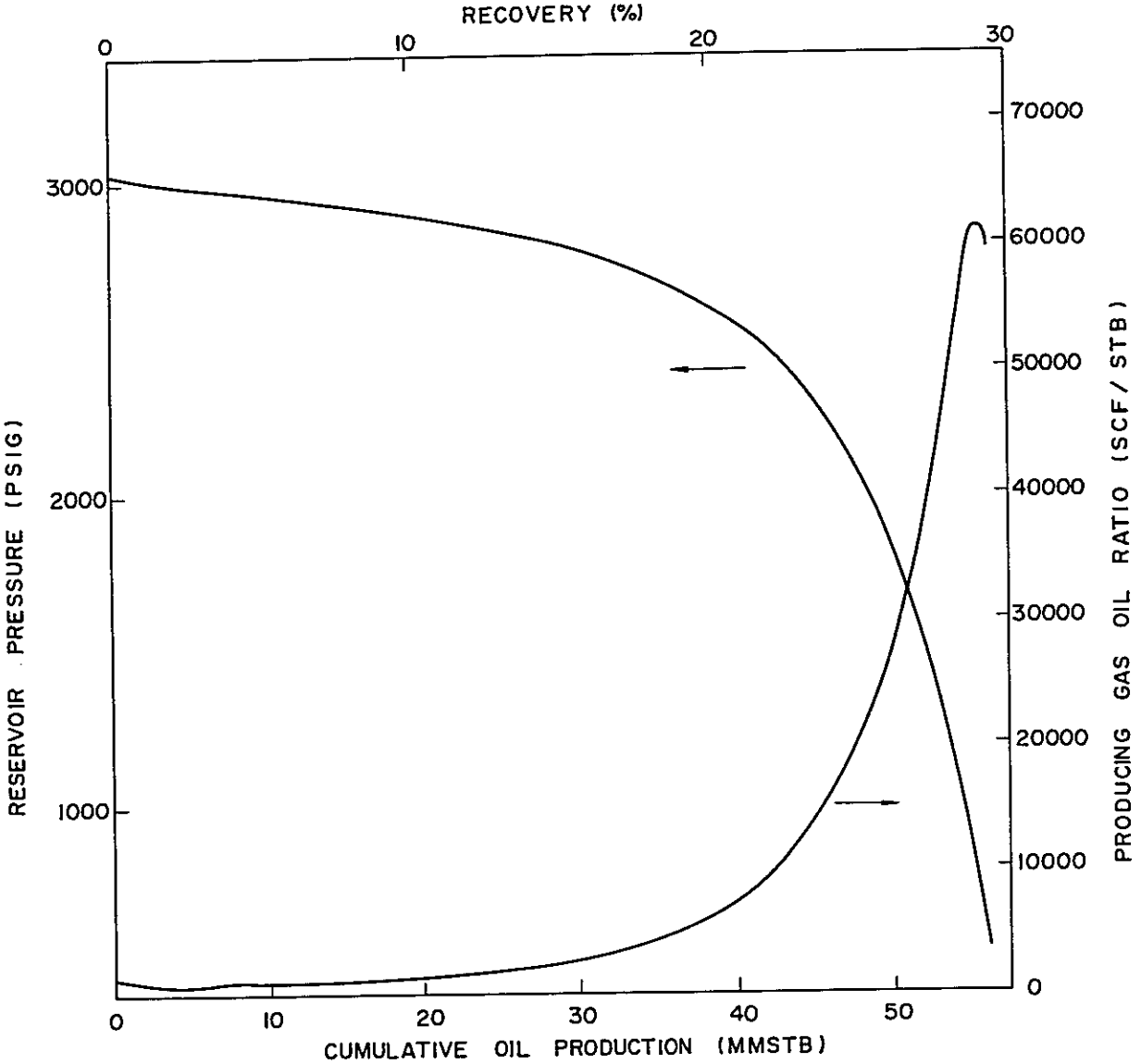


Fig. 1-3-6
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF b3 ZONE, BEKOK FIELD (NATURAL DEPLETION CASE AND RESTRICTED GAS PRODUCTION CASE)

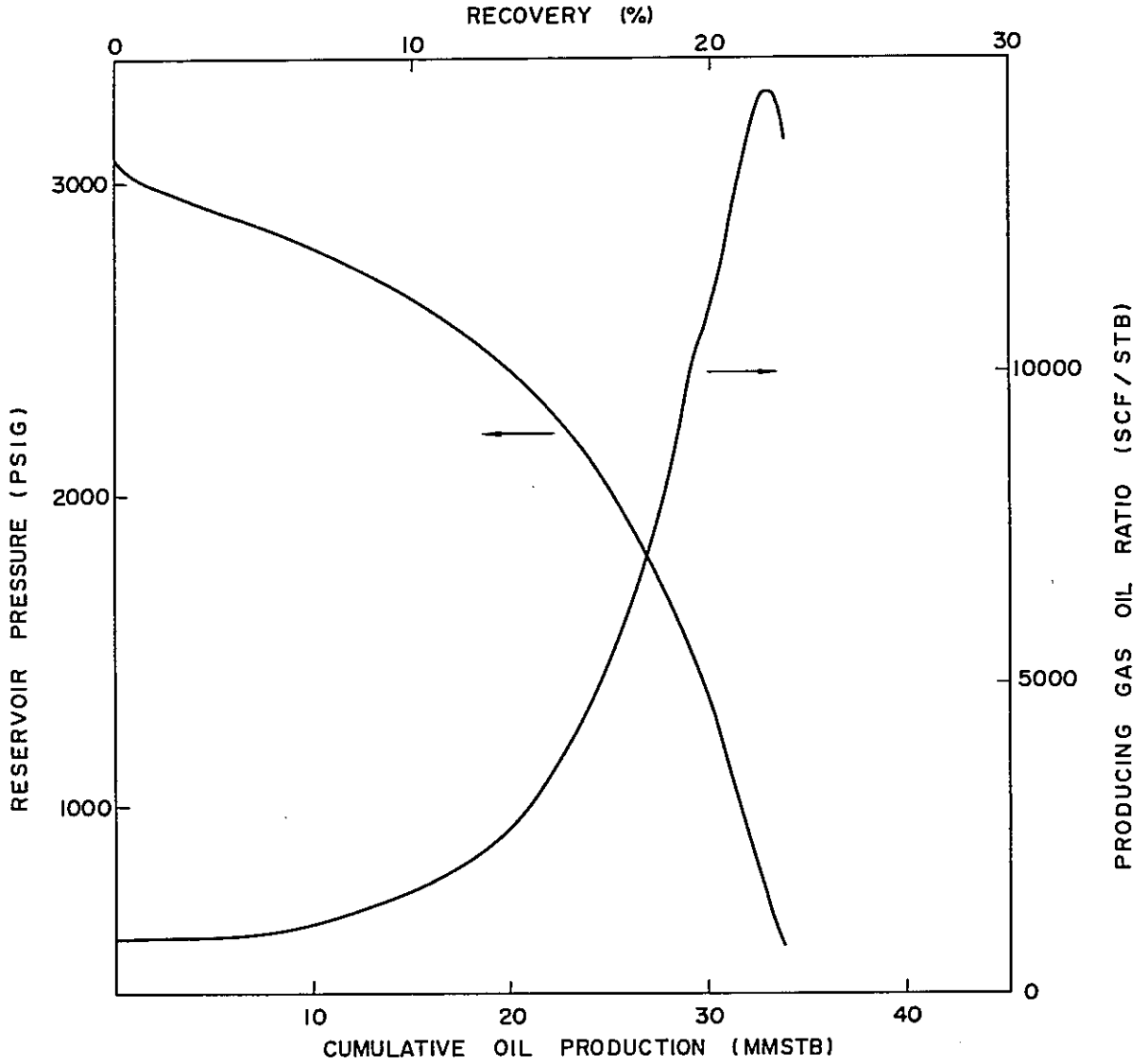


Fig. 1-3-7
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF b4 ZONE, BEKOK FIELD (NATURAL DEPLETION CASE AND RESTRICTED GAS PRODUCTION CASE)

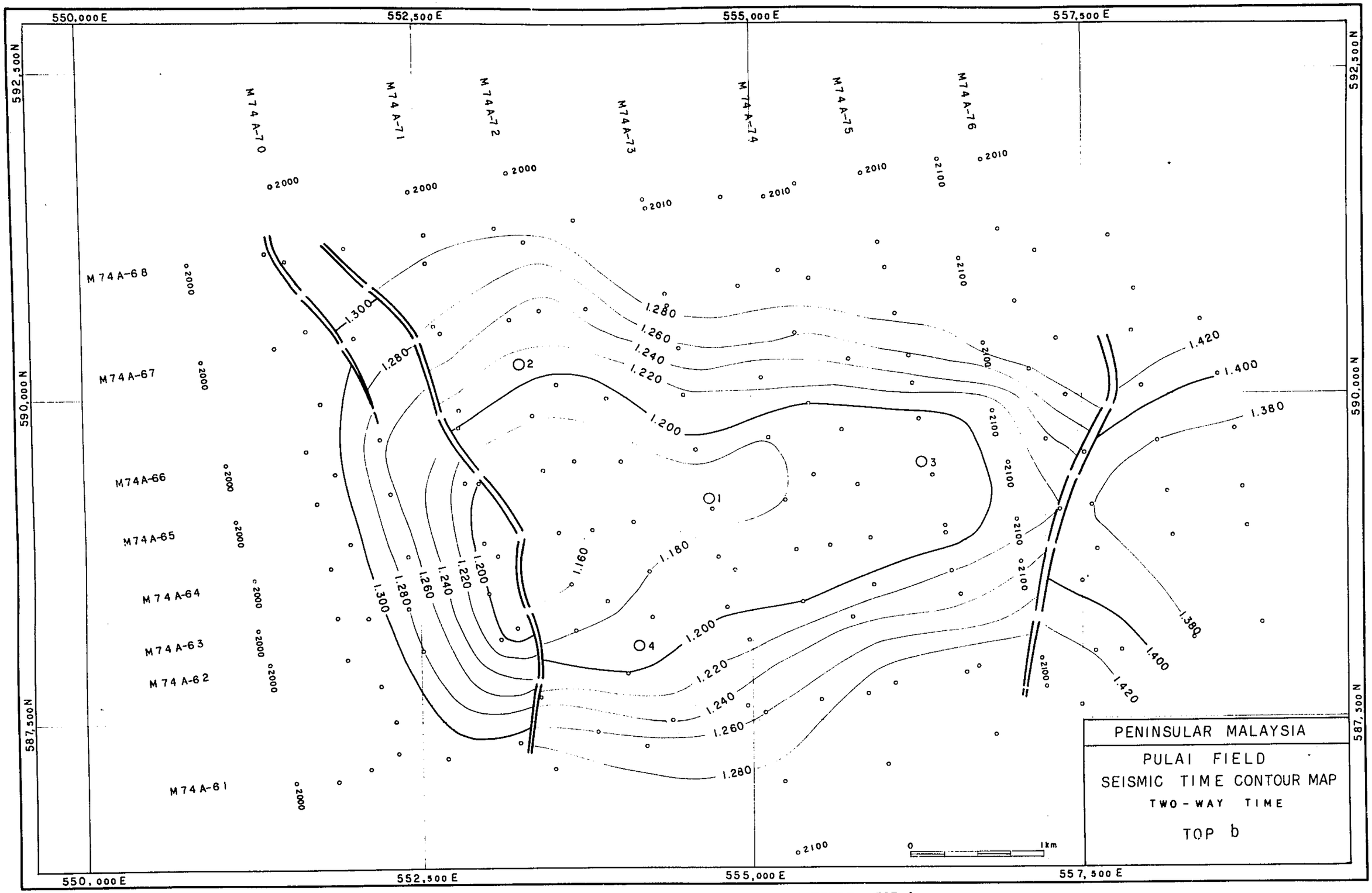


Fig. 2-1-1 TIME CONTOUR MAP, PULAI FIELD, TOP b
Vol. II

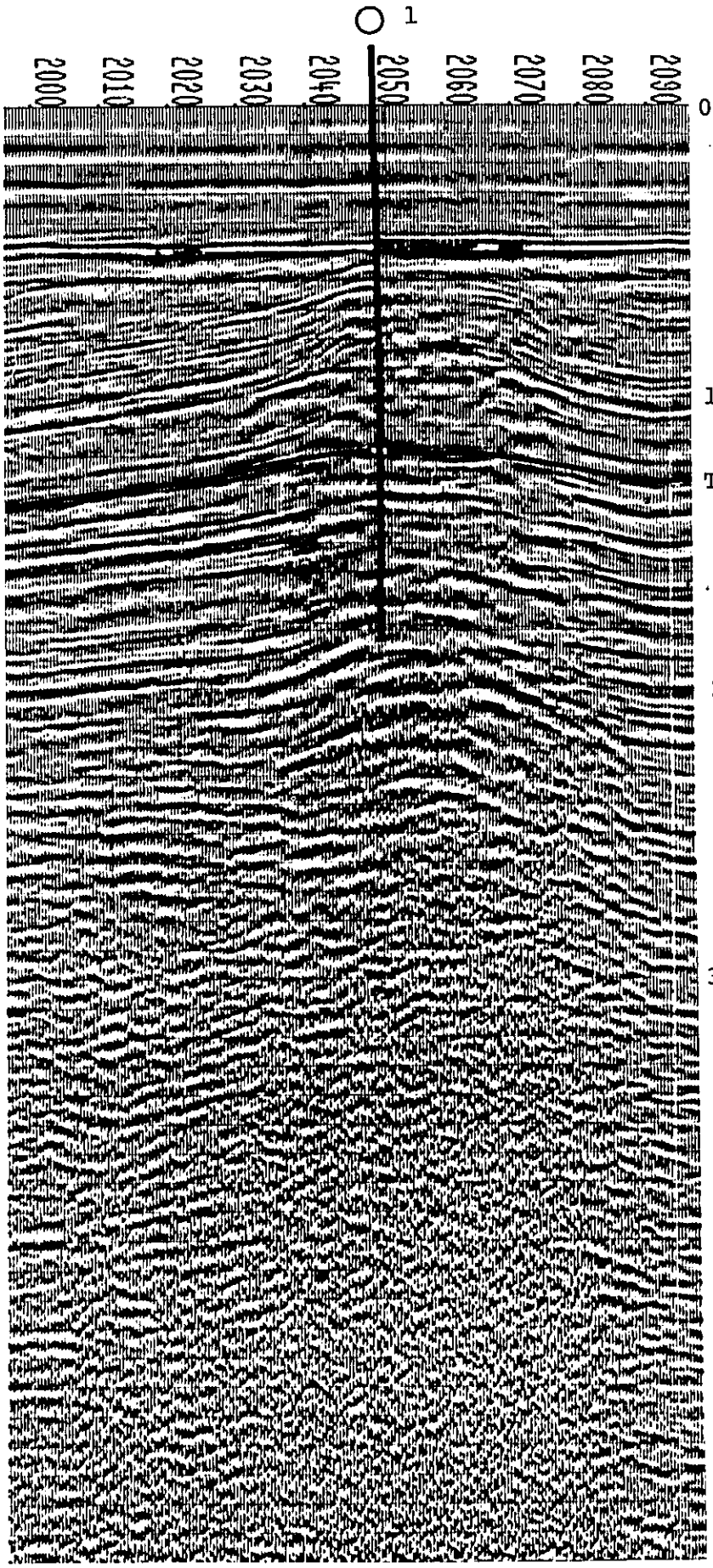


Fig. 2-1-2 SEISMIC SECTION, PULAI FIELD, Line M74A-73
Vol. II

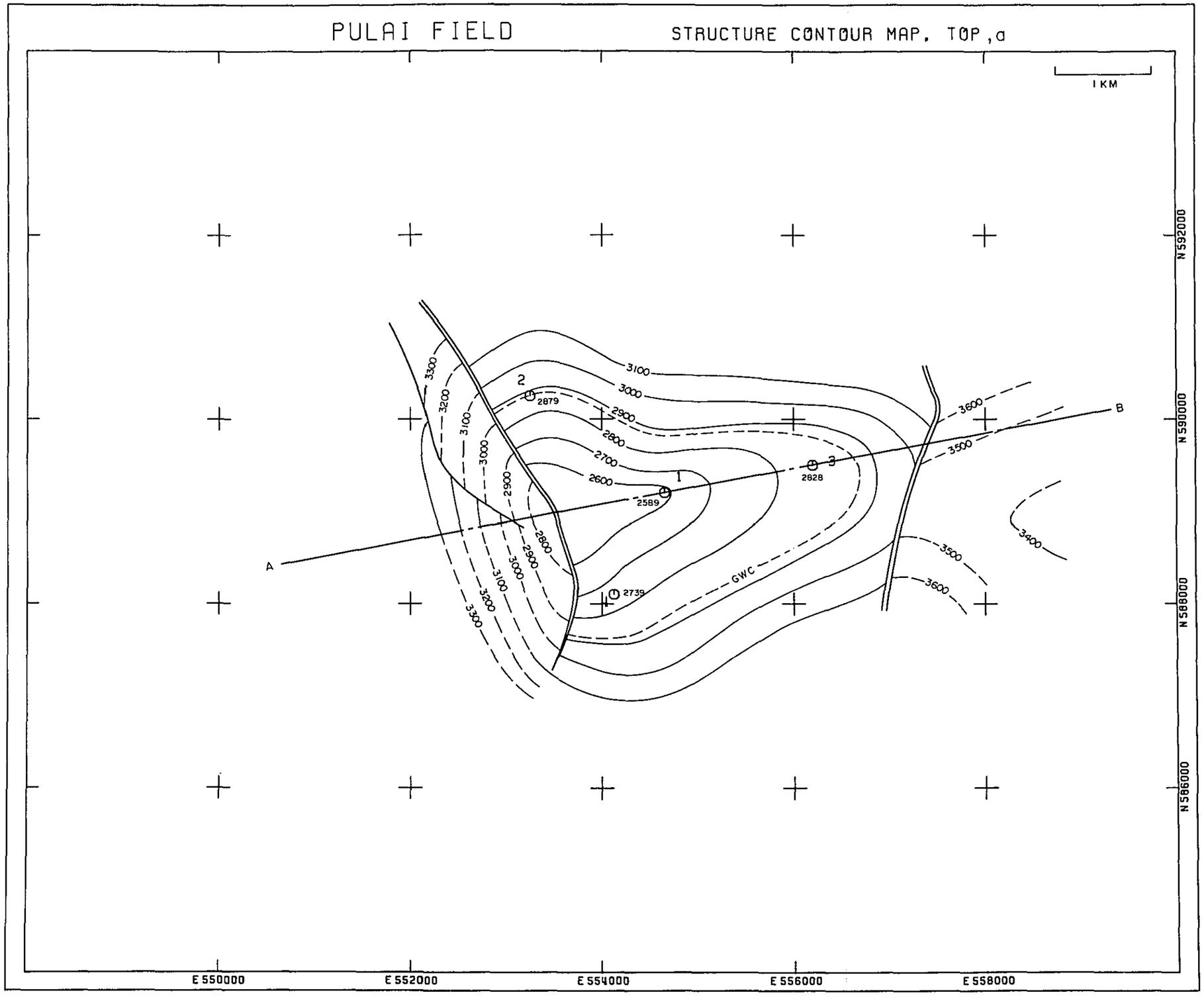


Fig. 2-2-1 STRUCTURE CONTOUR MAP, PULAI FIELD, TOP a
Vol. II

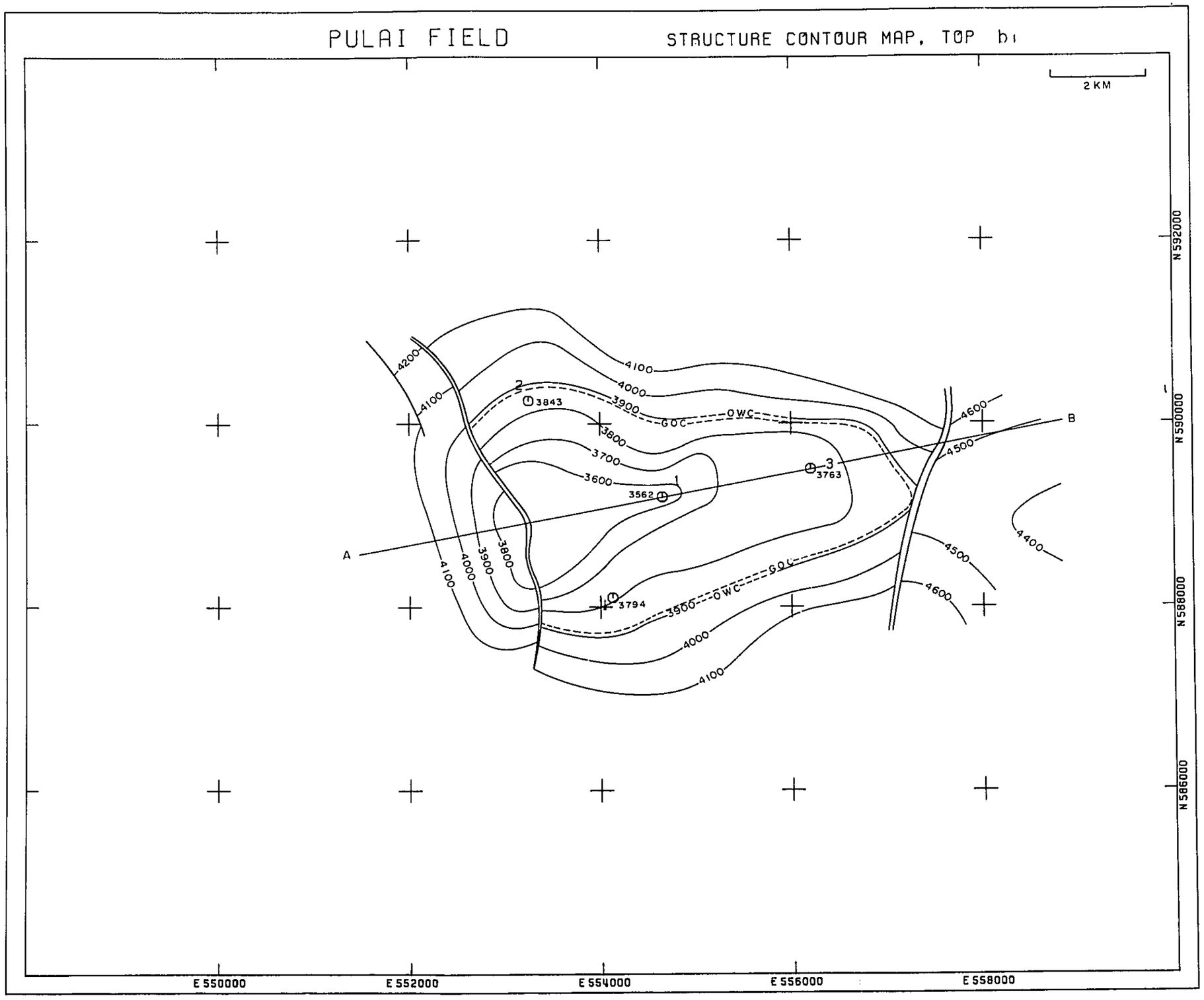


Fig. 2-2-2 STRUCTURE CONTOUR MAP, PULAI FIELD, TOP b1
Vol. II

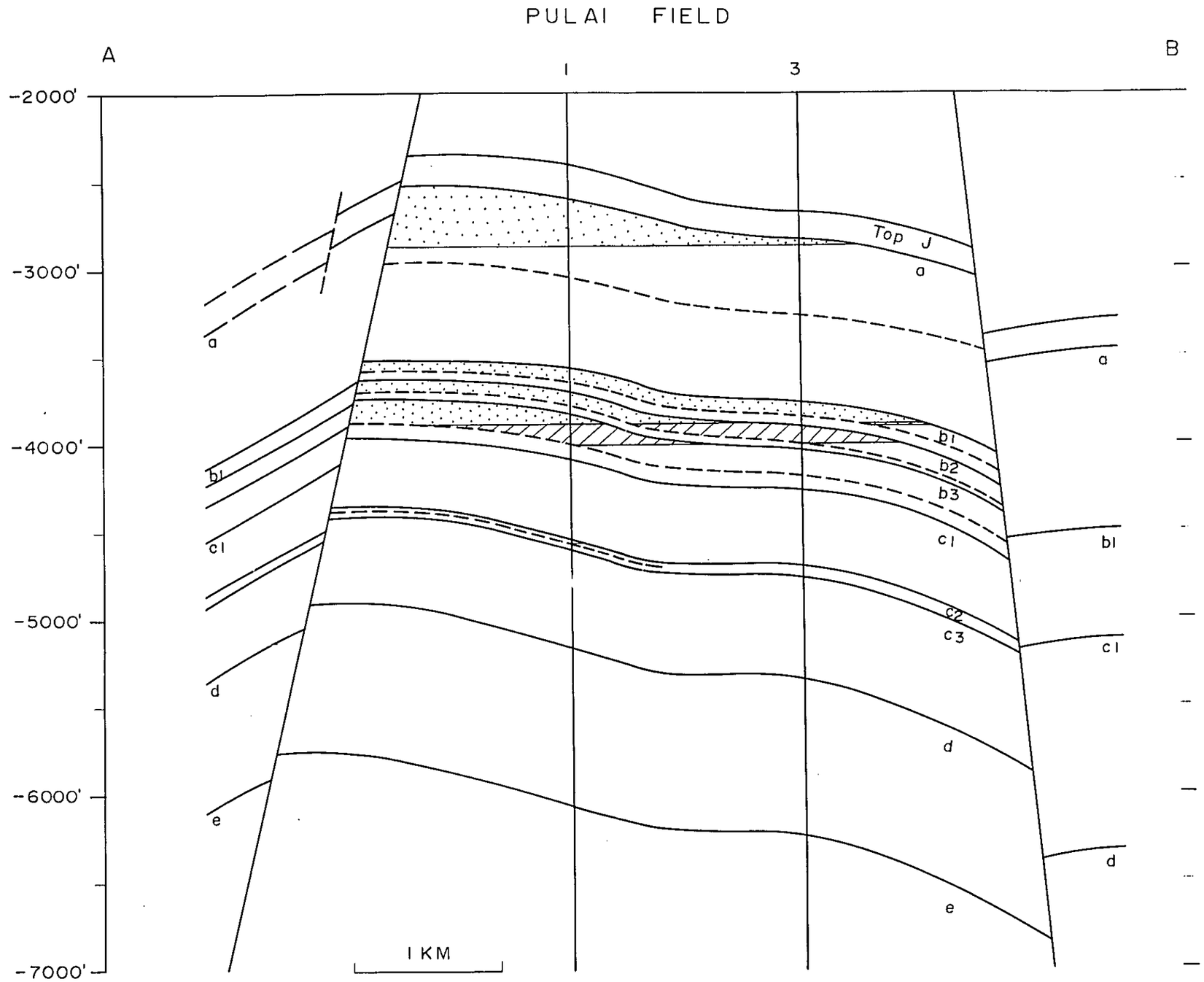


Fig. 2-2-3 STRUCTURAL CROSS-SECTION, PULAI FIELD
Vol. II

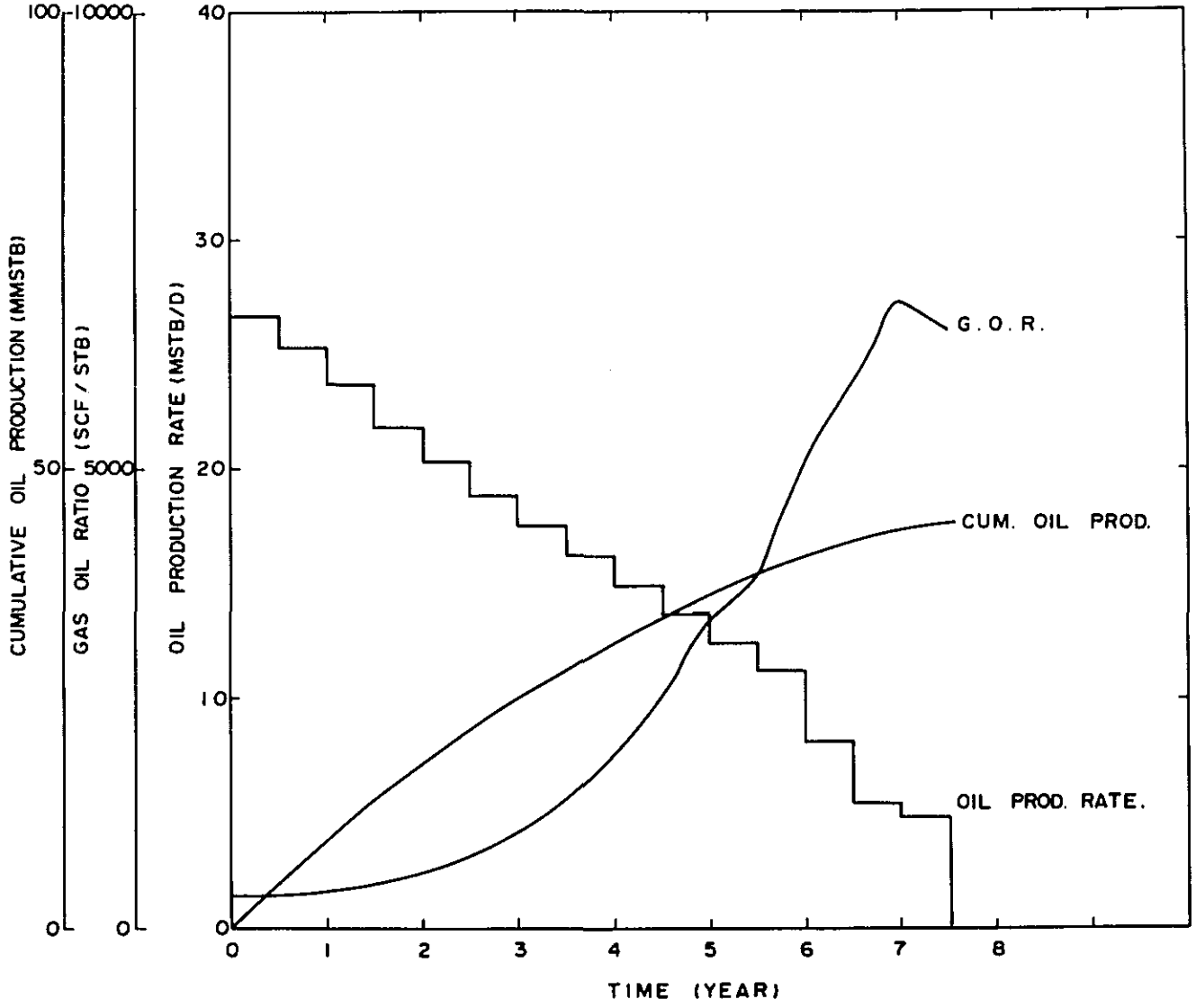


Fig. 2-3-1 PREDICTED PERFORMANCE OF PULAI FIELD
Vol. II

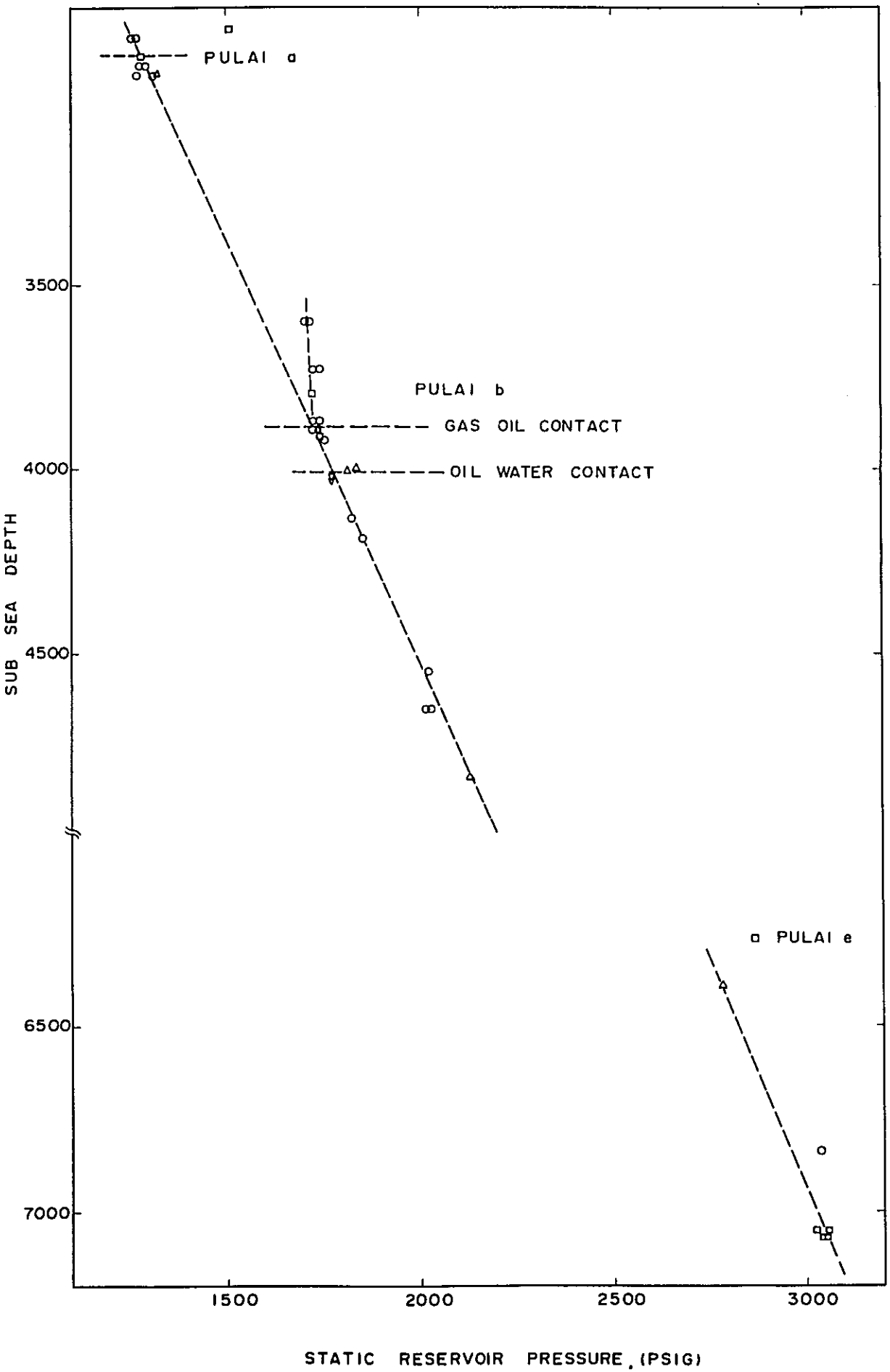


Fig. 2-3-2 RESERVOIR PRESSURE VS. DEPTH, PULAI FIELD
Vol. II

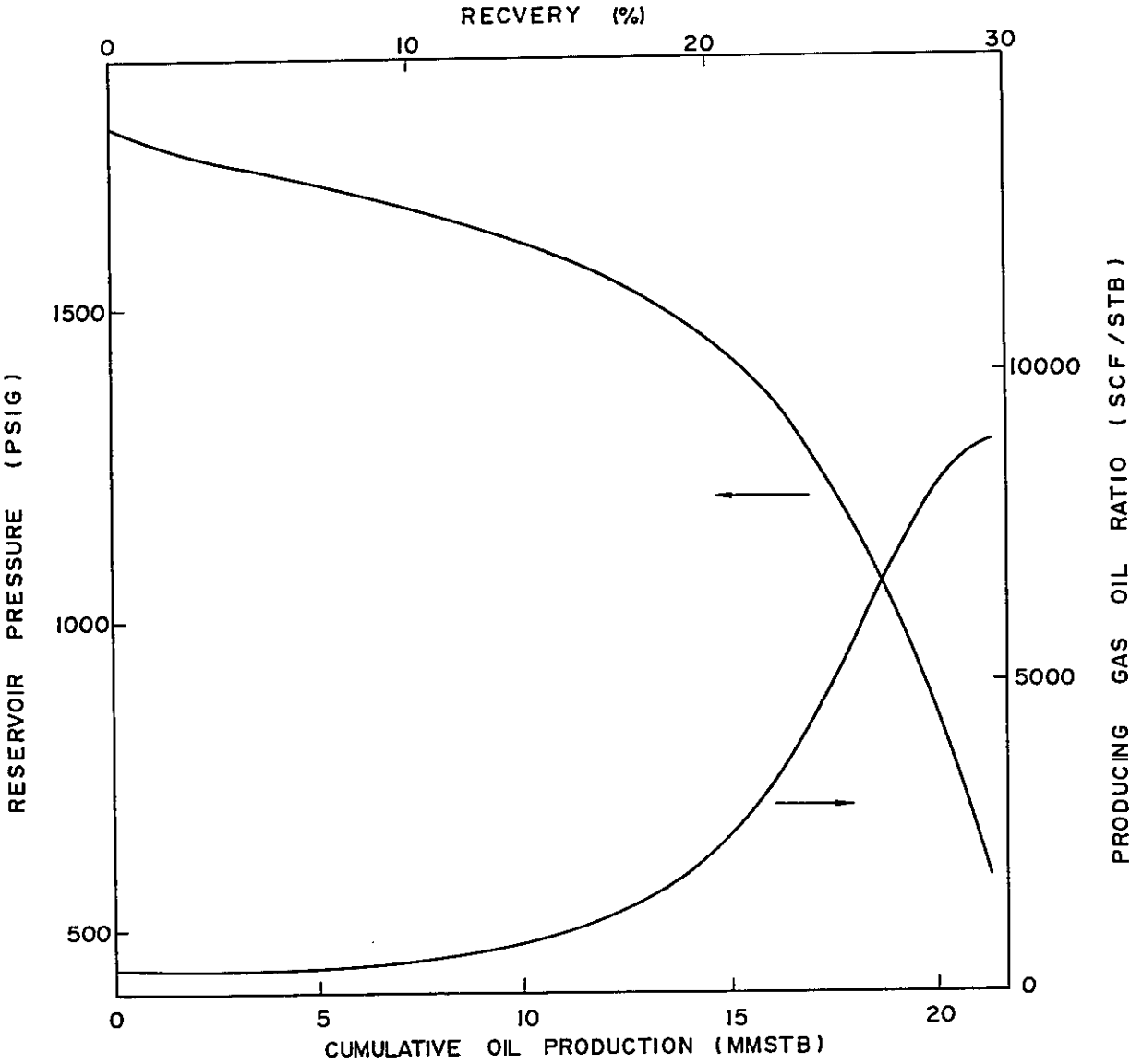


Fig. 2-3-3
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF b2 ZONE, PULAI FIELD (WATER ENC./OIL PROD.=0.2)

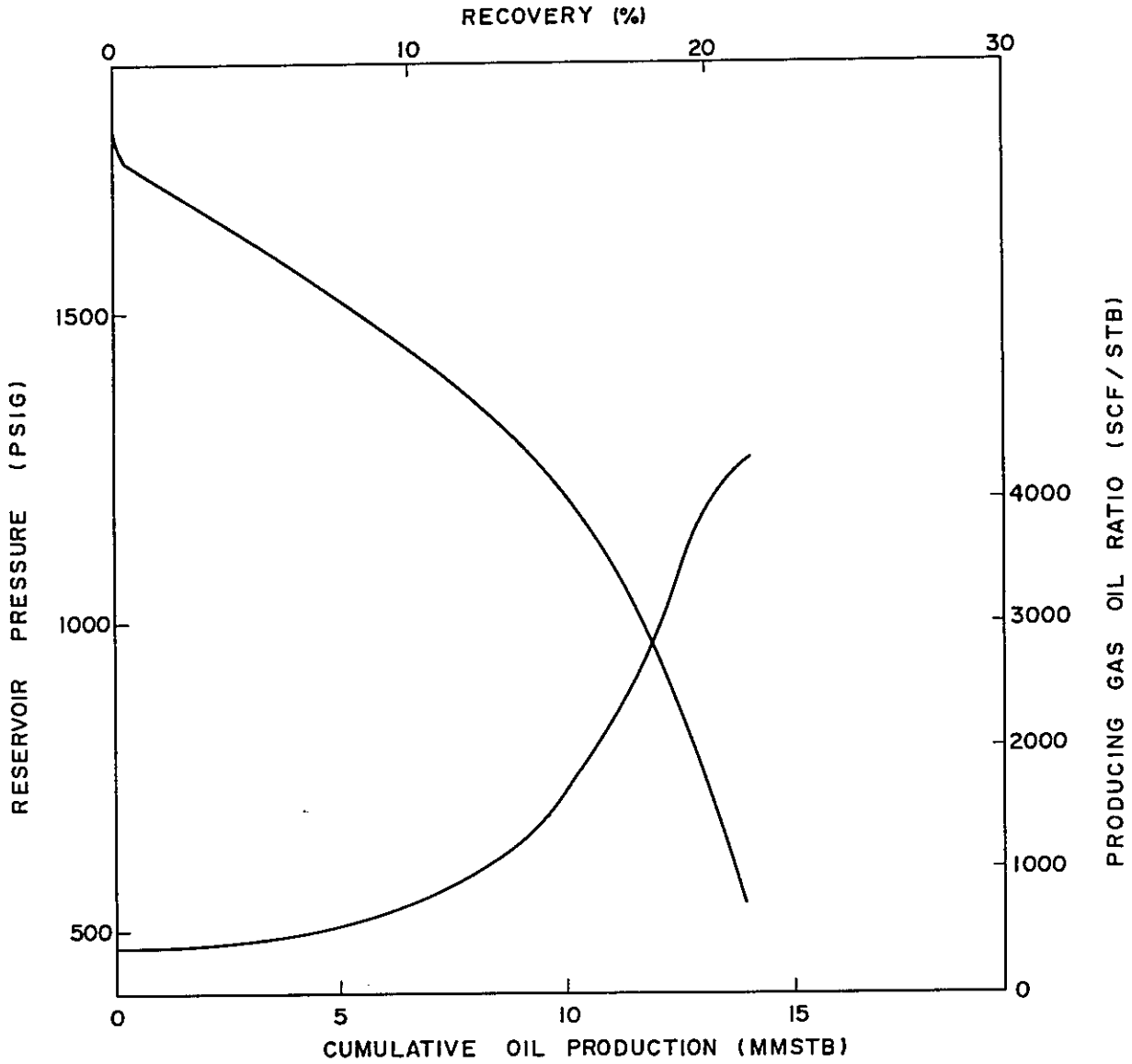


Fig. 2-3-4
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF b3 ZONE, PULAI FIELD (WATER ENC./OIL PROD.=0.2)

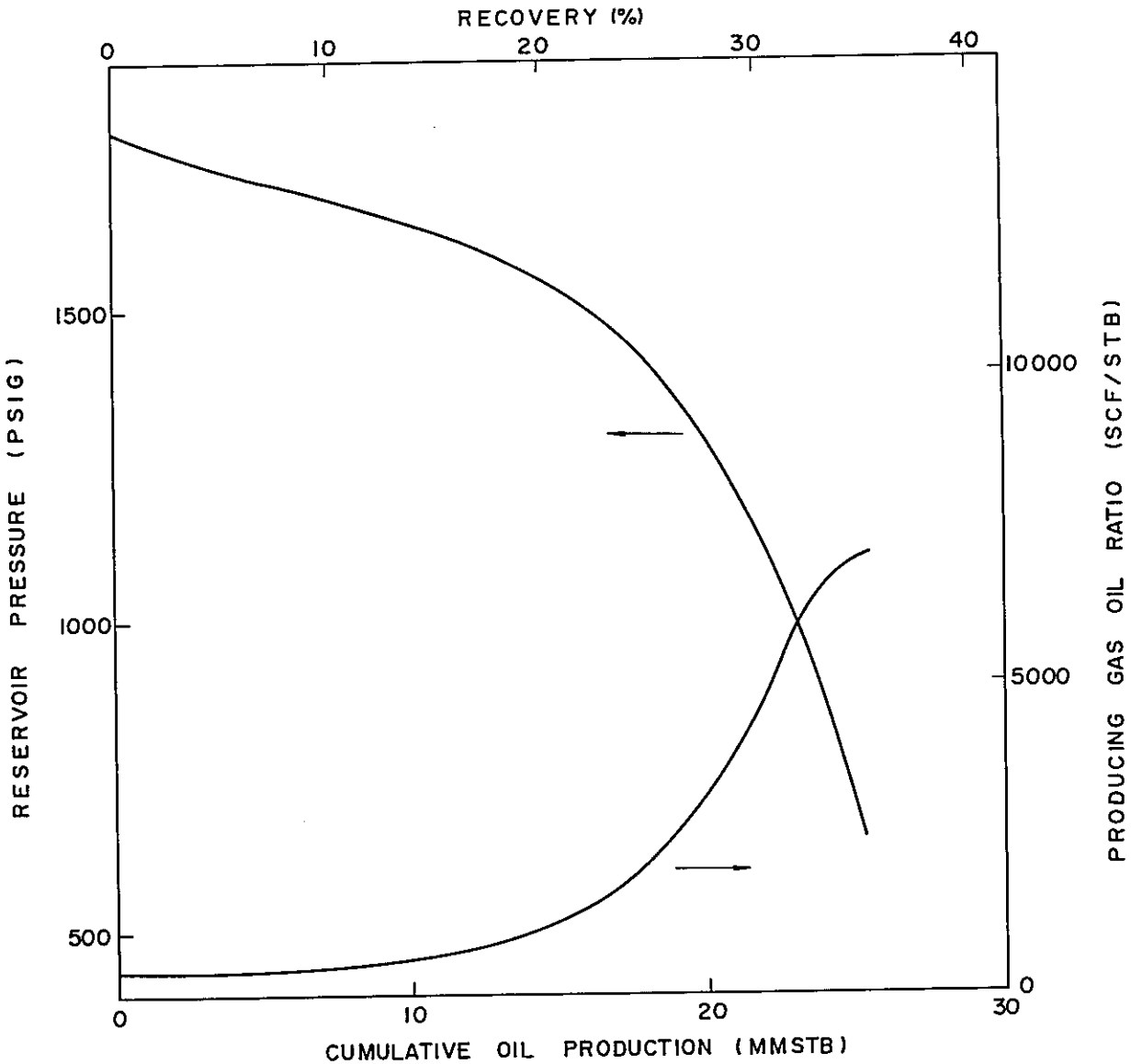


Fig. 2-3-5
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF b2 ZONE, PULAI FIELD (WATER ENC./OIL PROD.=0.4)

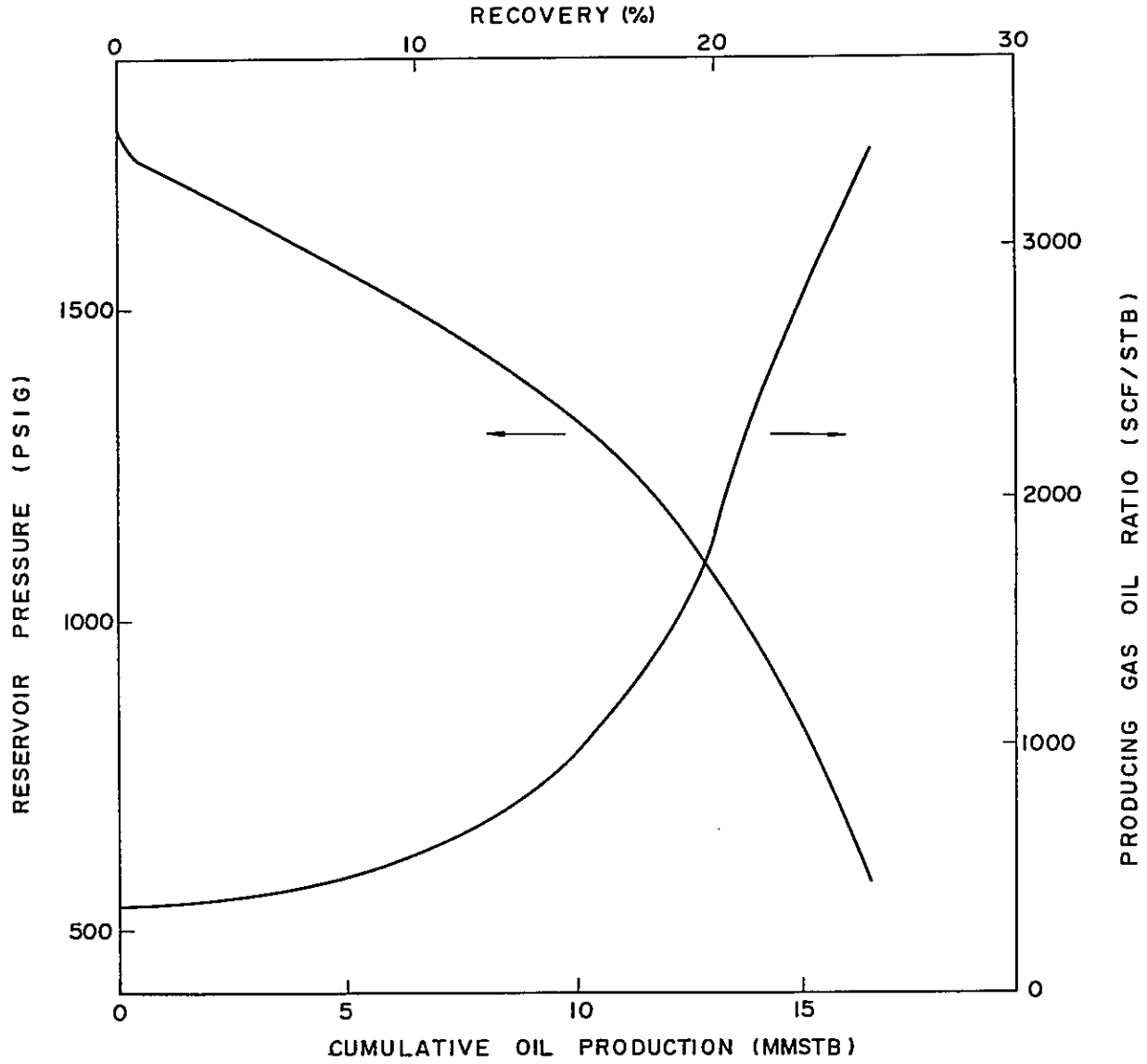


Fig. 2-3-6 Vol. II CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF b3 ZONE, PULAI FIELD (WATER ENC./OIL PROD.=0.4)

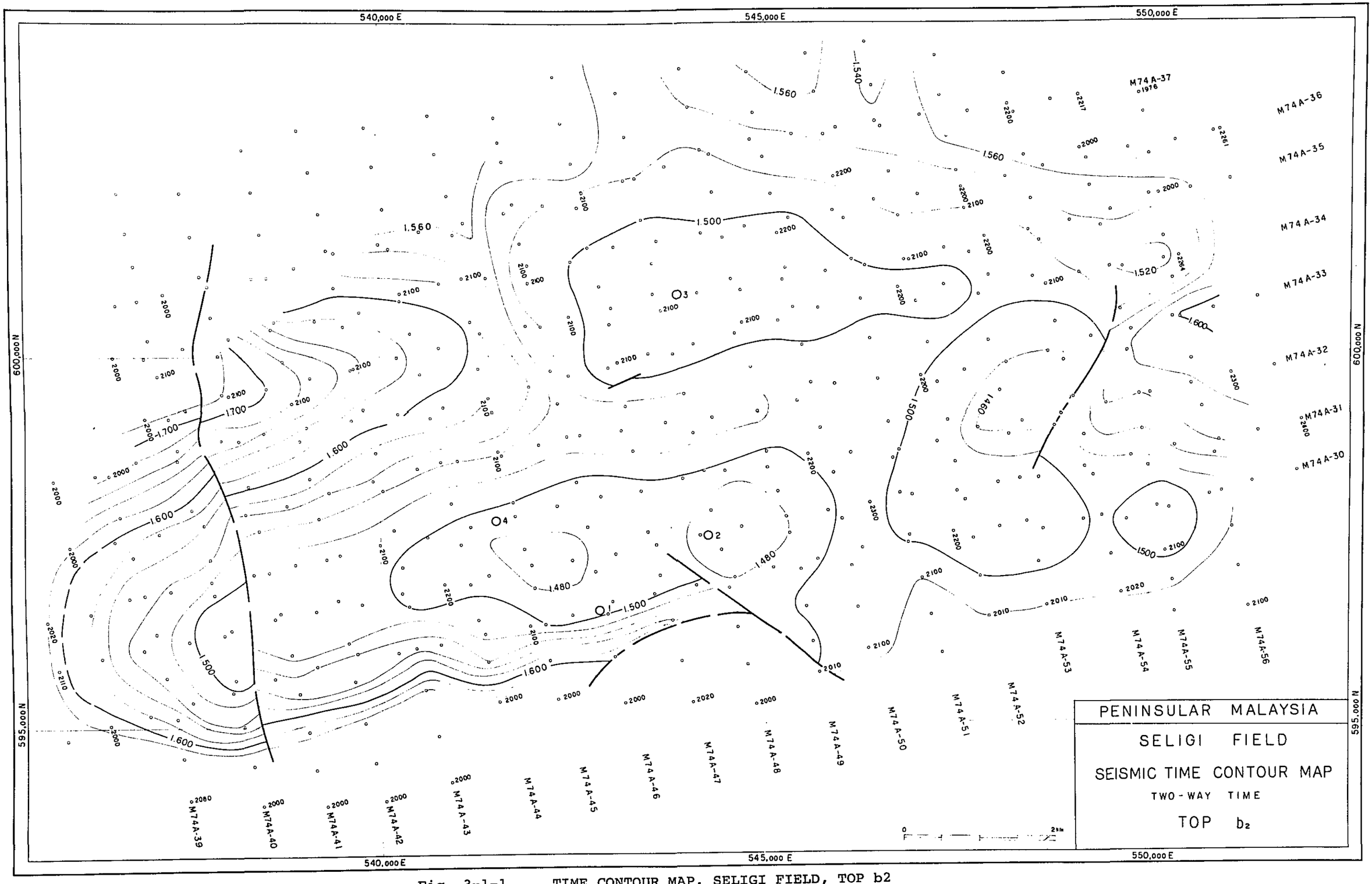


Fig. 3-1-1 TIME CONTOUR MAP, SELIGI FIELD, TOP b2
Vol. II

Fig. 3-1-2

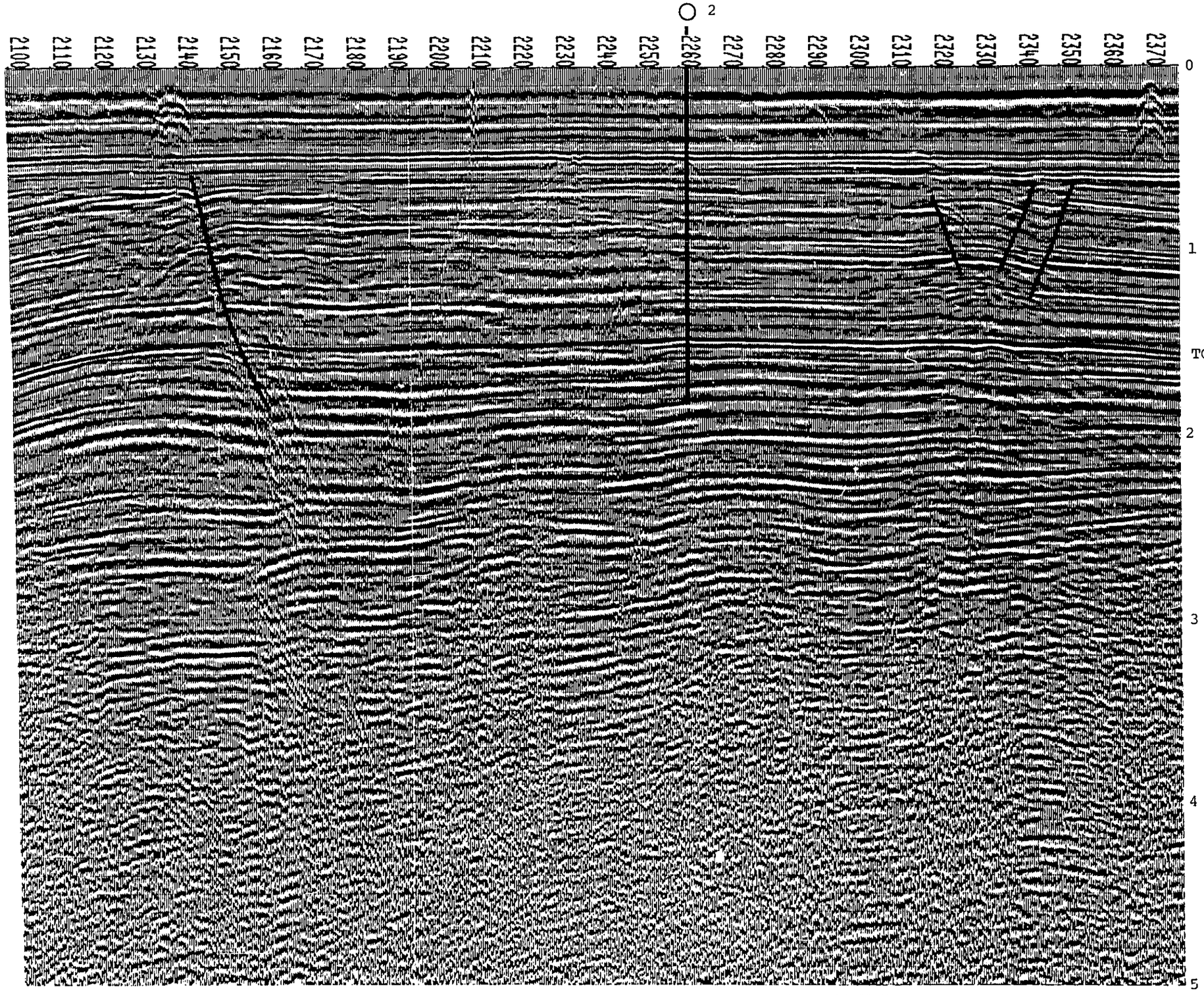


Fig. 3-1-2 SEISMIC SECTION, SELIGI FIELD, Line M74A31
Vol. II

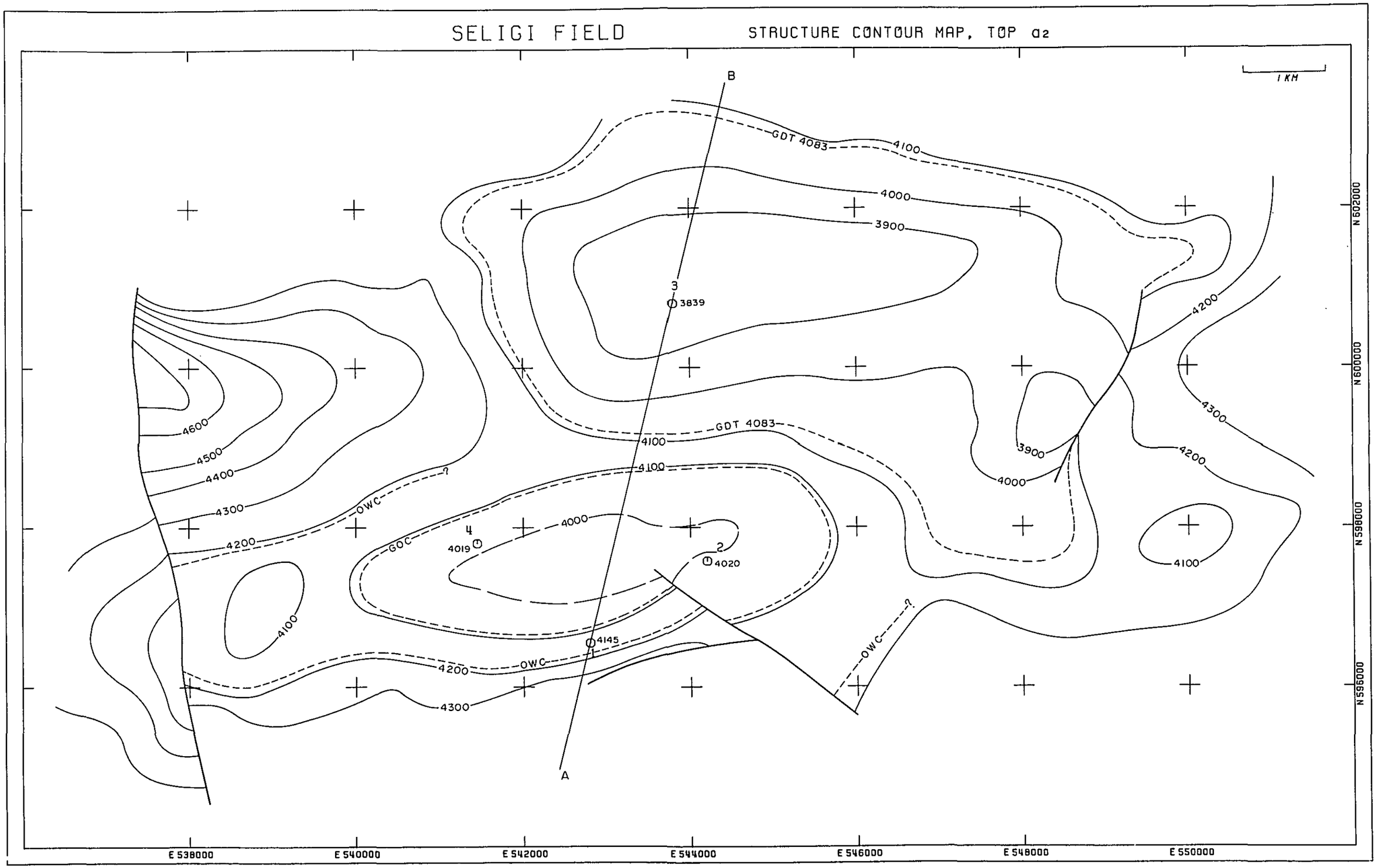


Fig. 3-2-1 STRUCTURE CONTOUR MAP, SELIGI FIELD, TOP a2
Vol. II

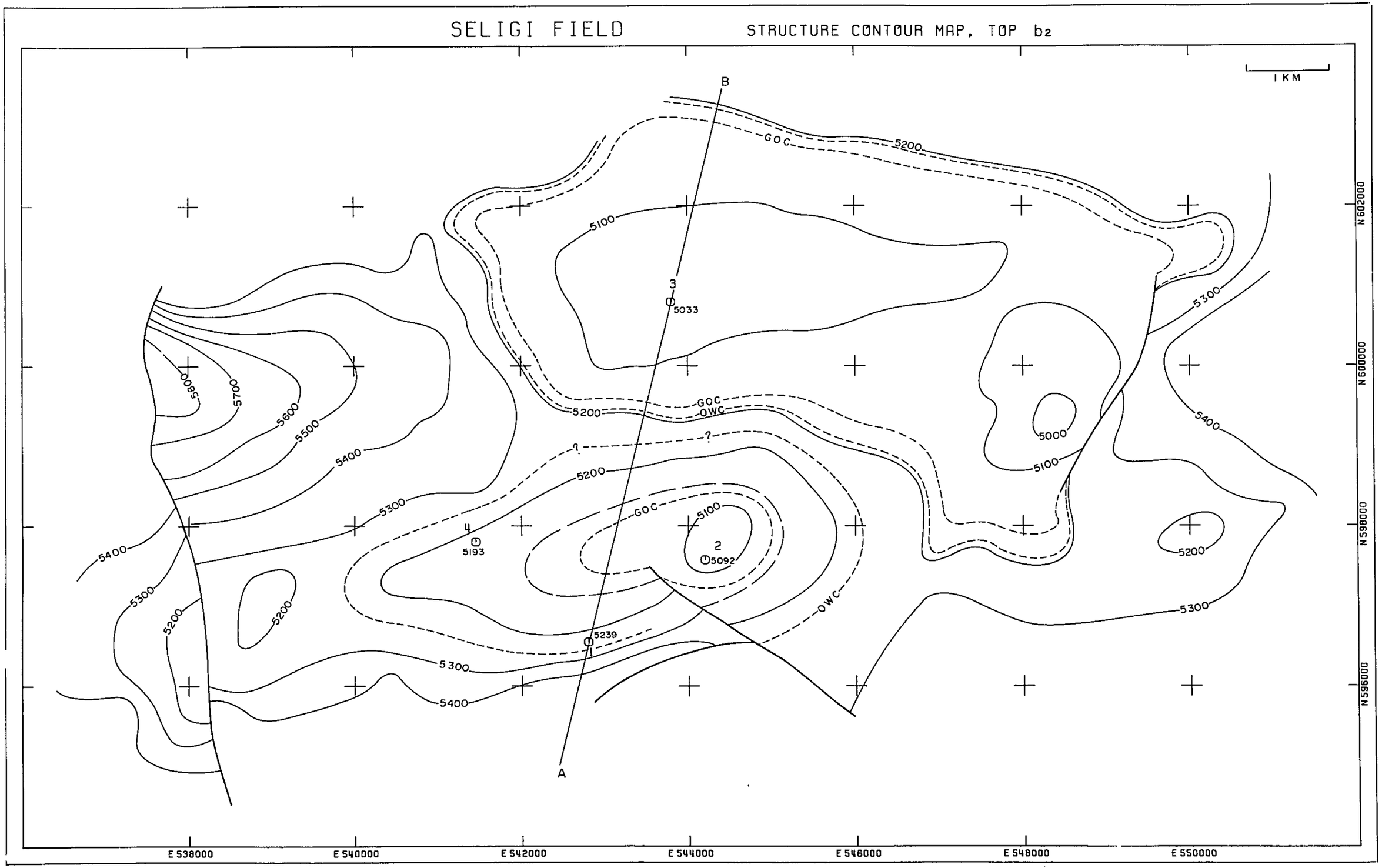


Fig. 3-2-2 STRUCTURE CONTOUR MAP, SELIGI FIELD, TOP b2
Vol. II

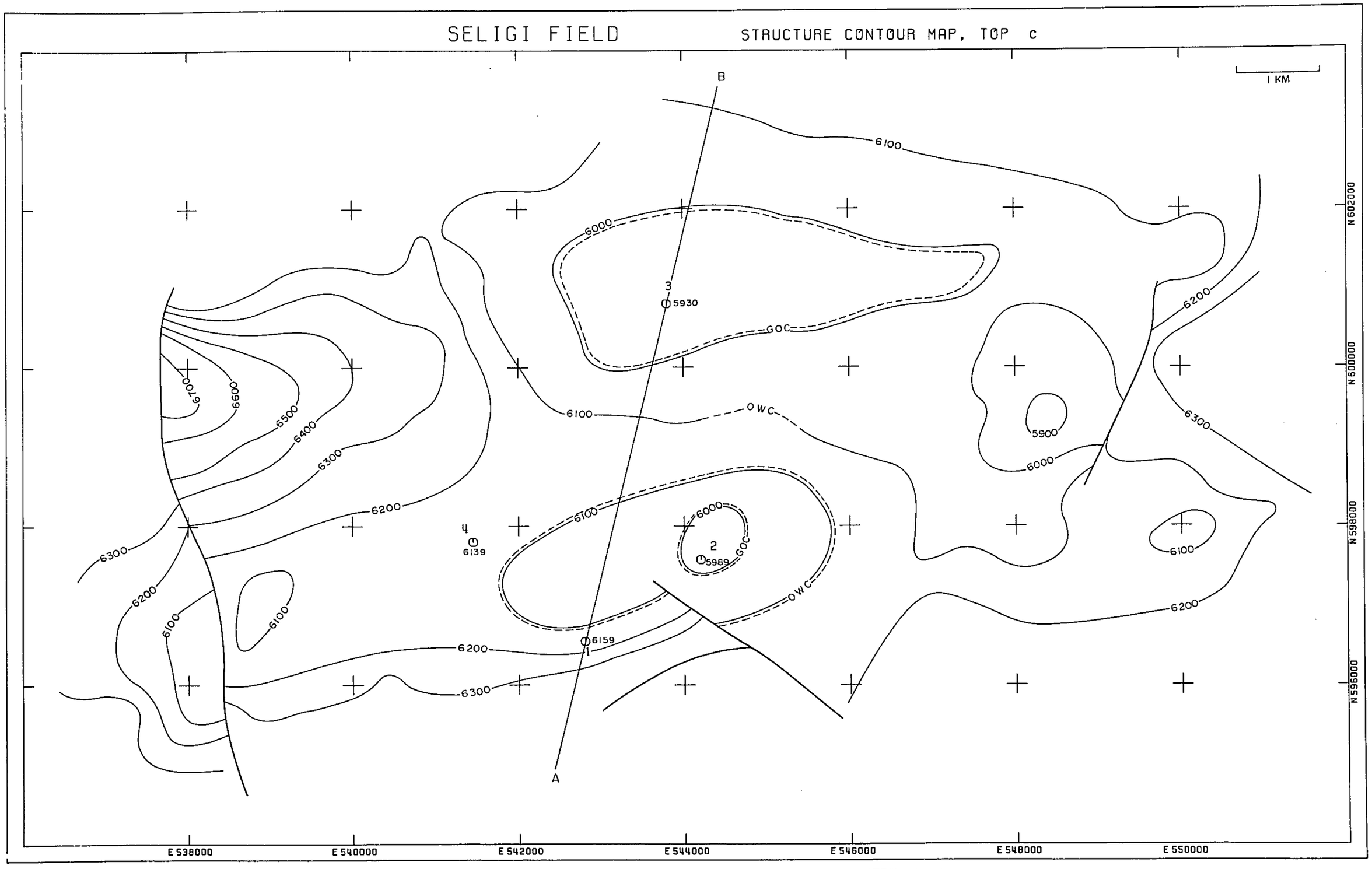


Fig. 3-2-3 STRUCTURE CONTOUR MAP, SELIGI FIELD, TOP c
Vol. II

SELIGI FIELD

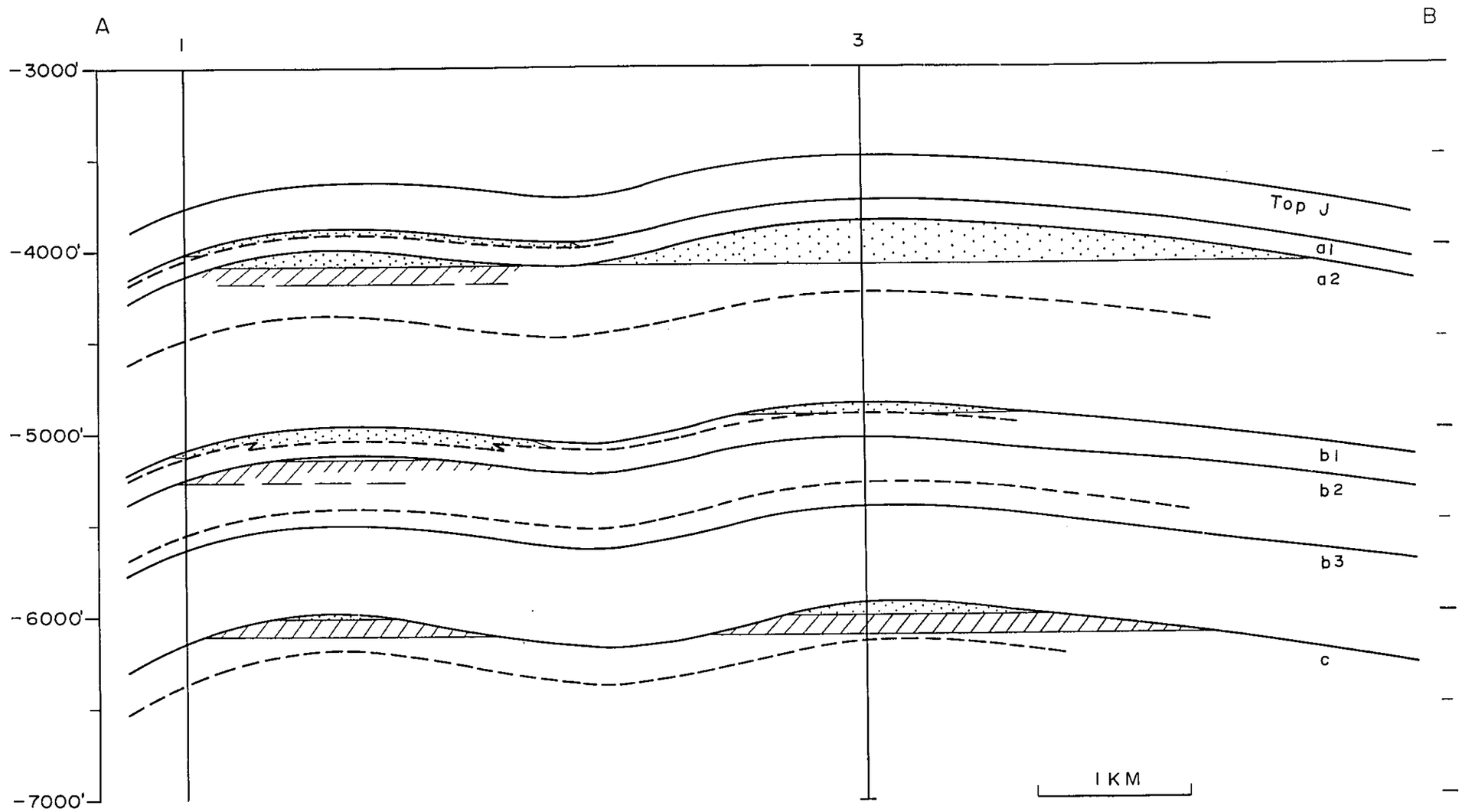


Fig. 3-2-4 STRUCTURAL CROSS-SECTION, SELIGI FIELD
Vol. II

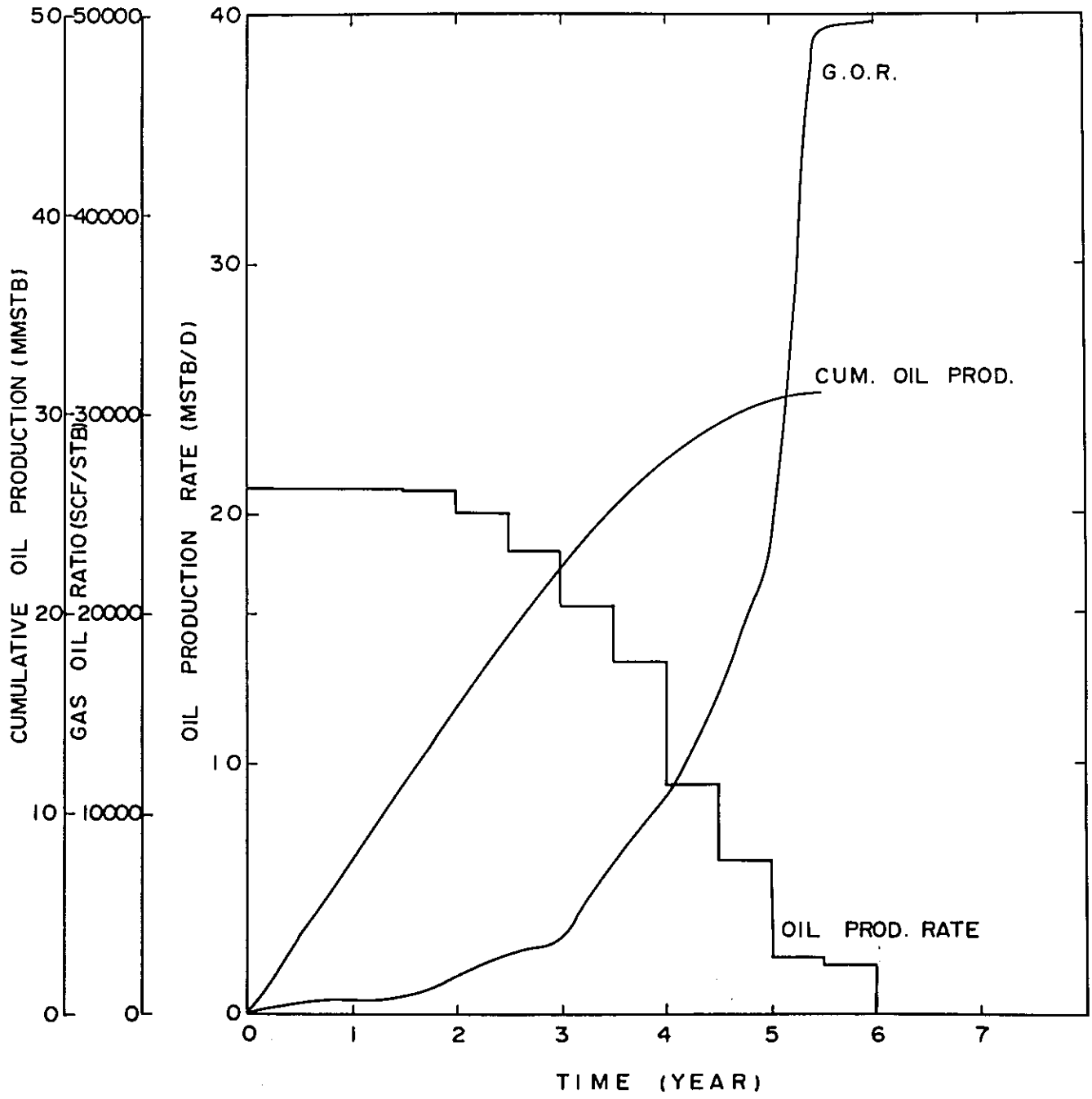


Fig. 3-3-1 PREDICTED PERFORMANCE OF SELIGI FIELD
Vol. II

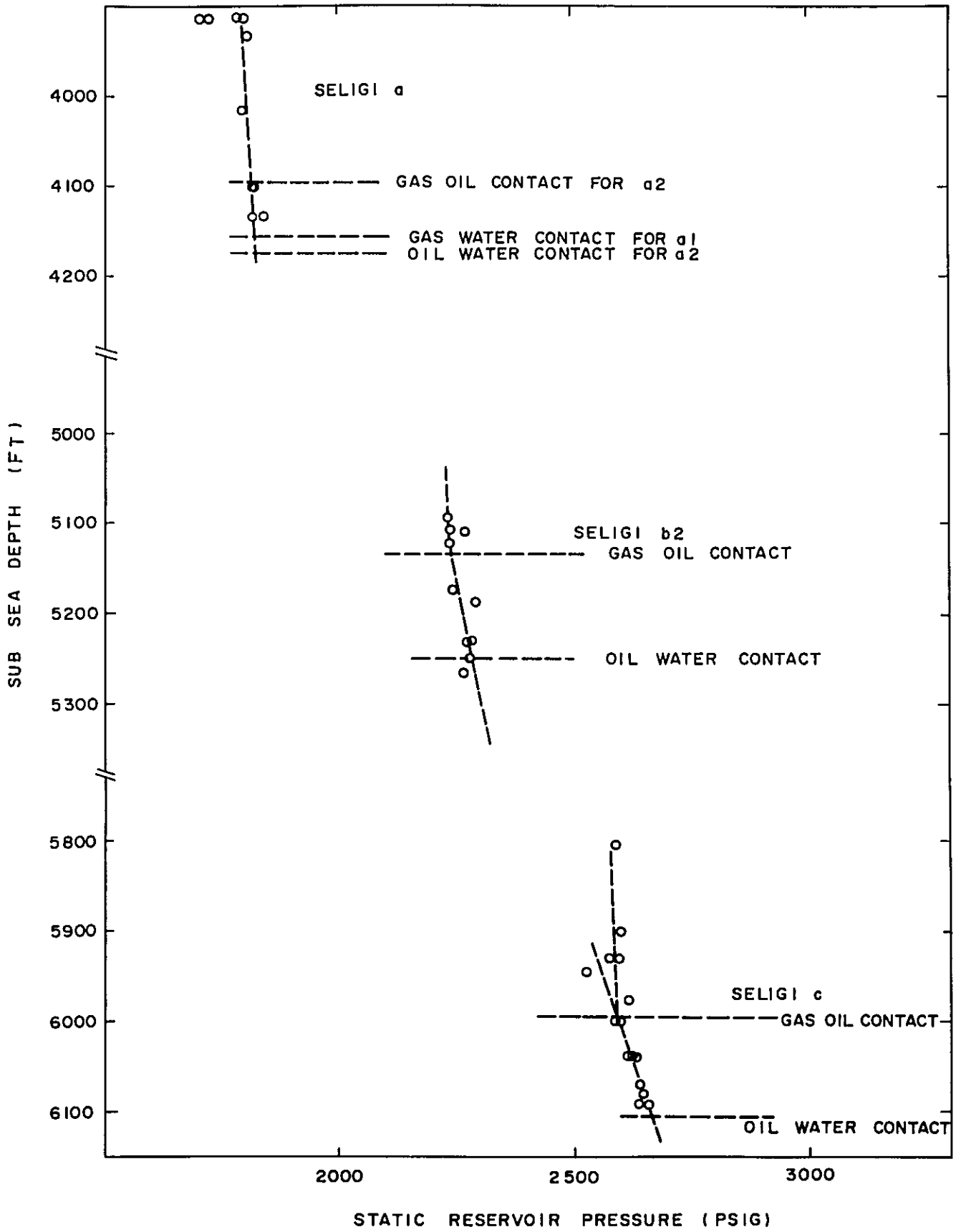


Fig. 3-3-2 RESERVOIR PRESSURE VS. DEPTH OF SELIGI FIELD
Vol. II

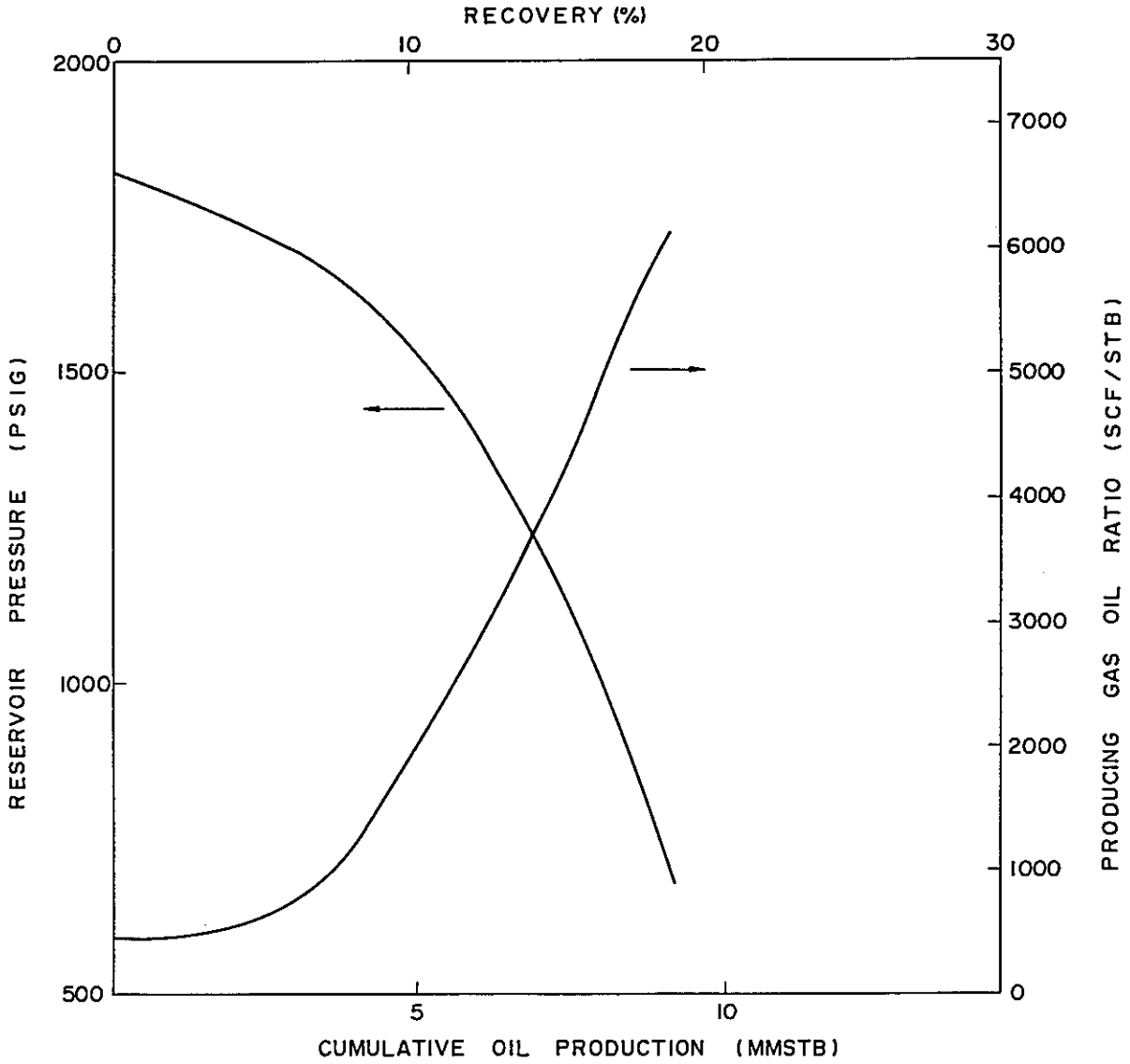


Fig. 3-3-3
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF a2 (A-BLOCK) ZONE, SELIGI FIELD

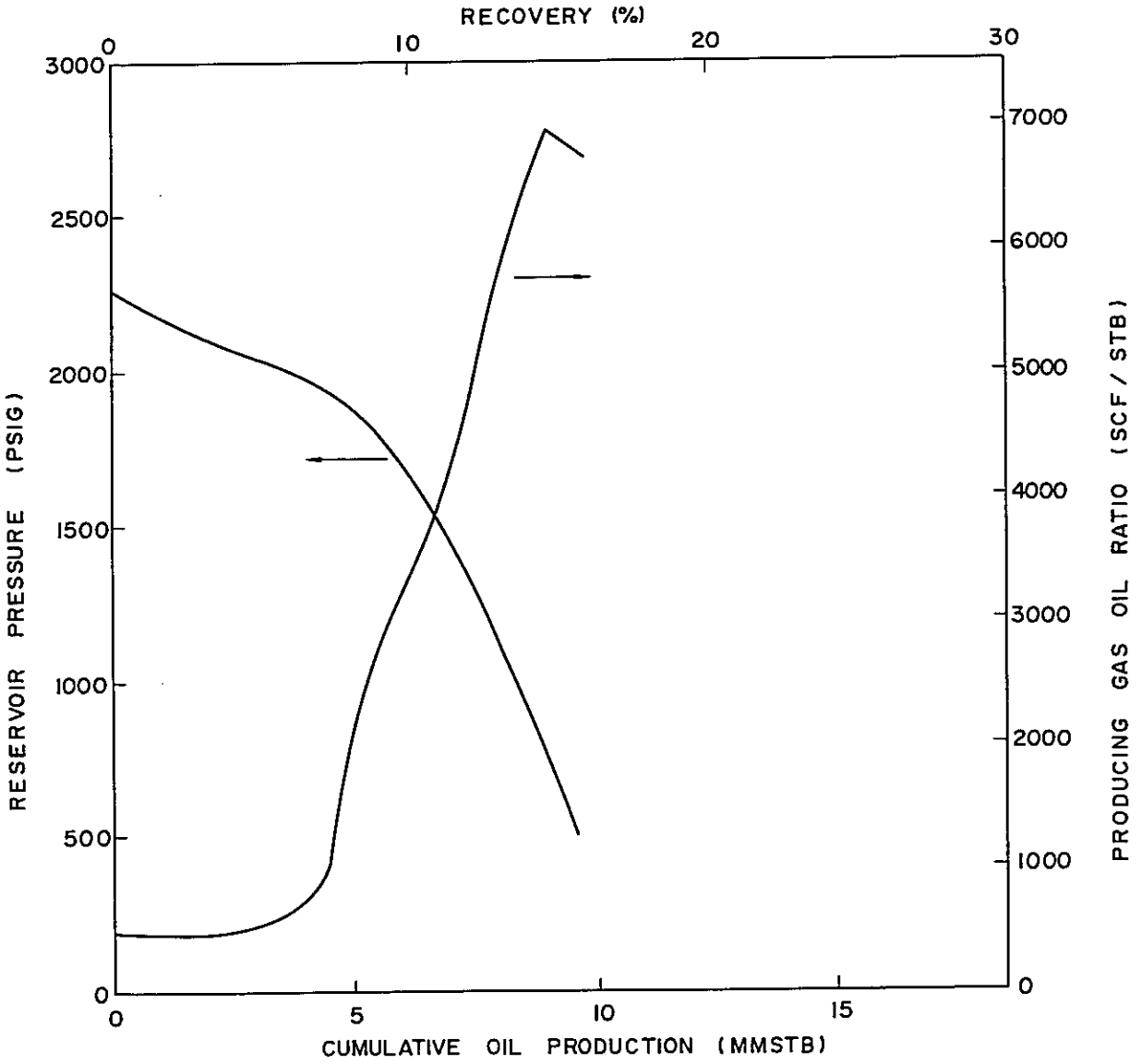


Fig. 3-3-4
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF b2 (A-BLOCK) ZONE, SELIGI FIELD

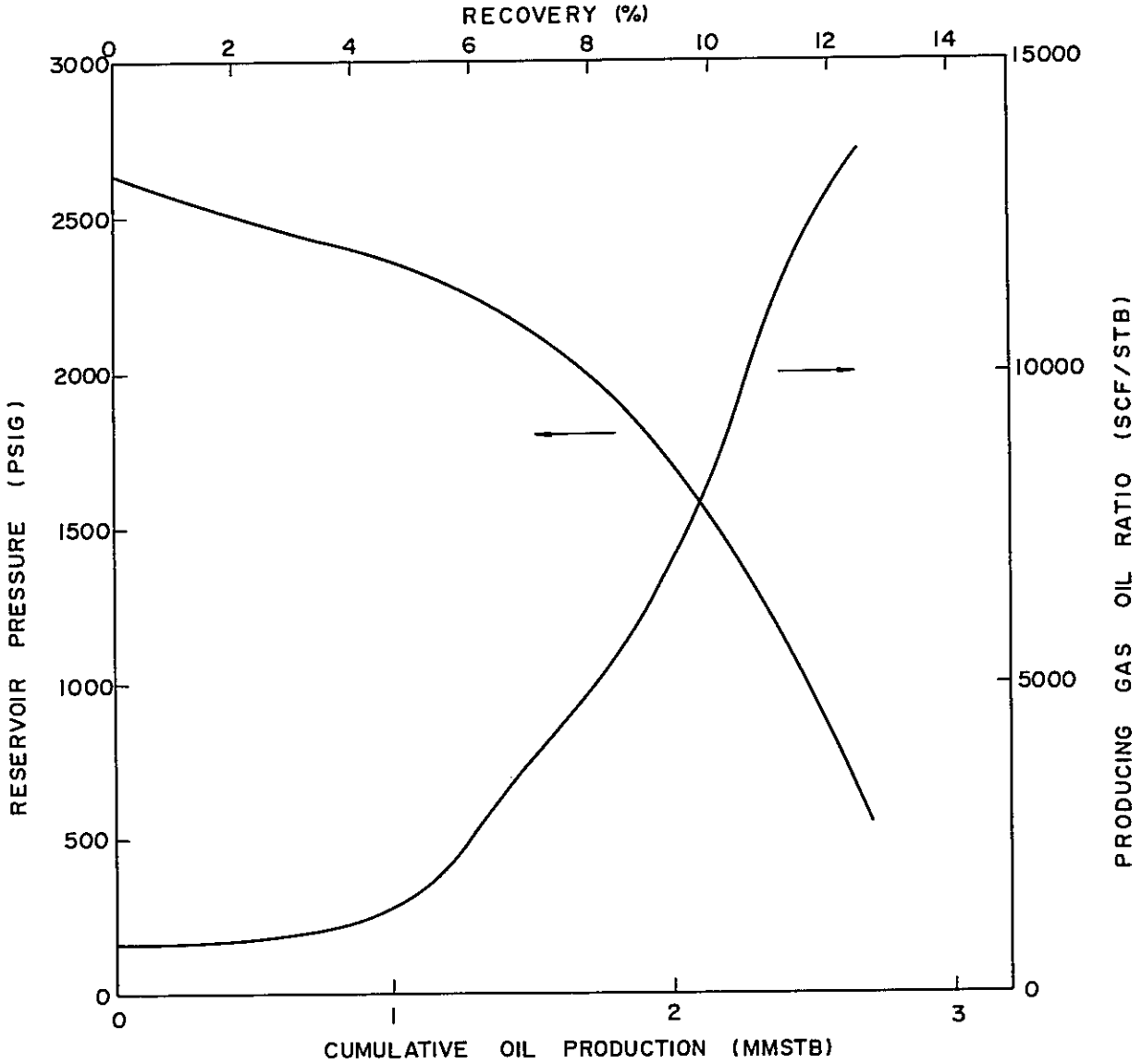


Fig. 3-3-5
vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF C (A-BLOCK) ZONE, SELIGI FIELD

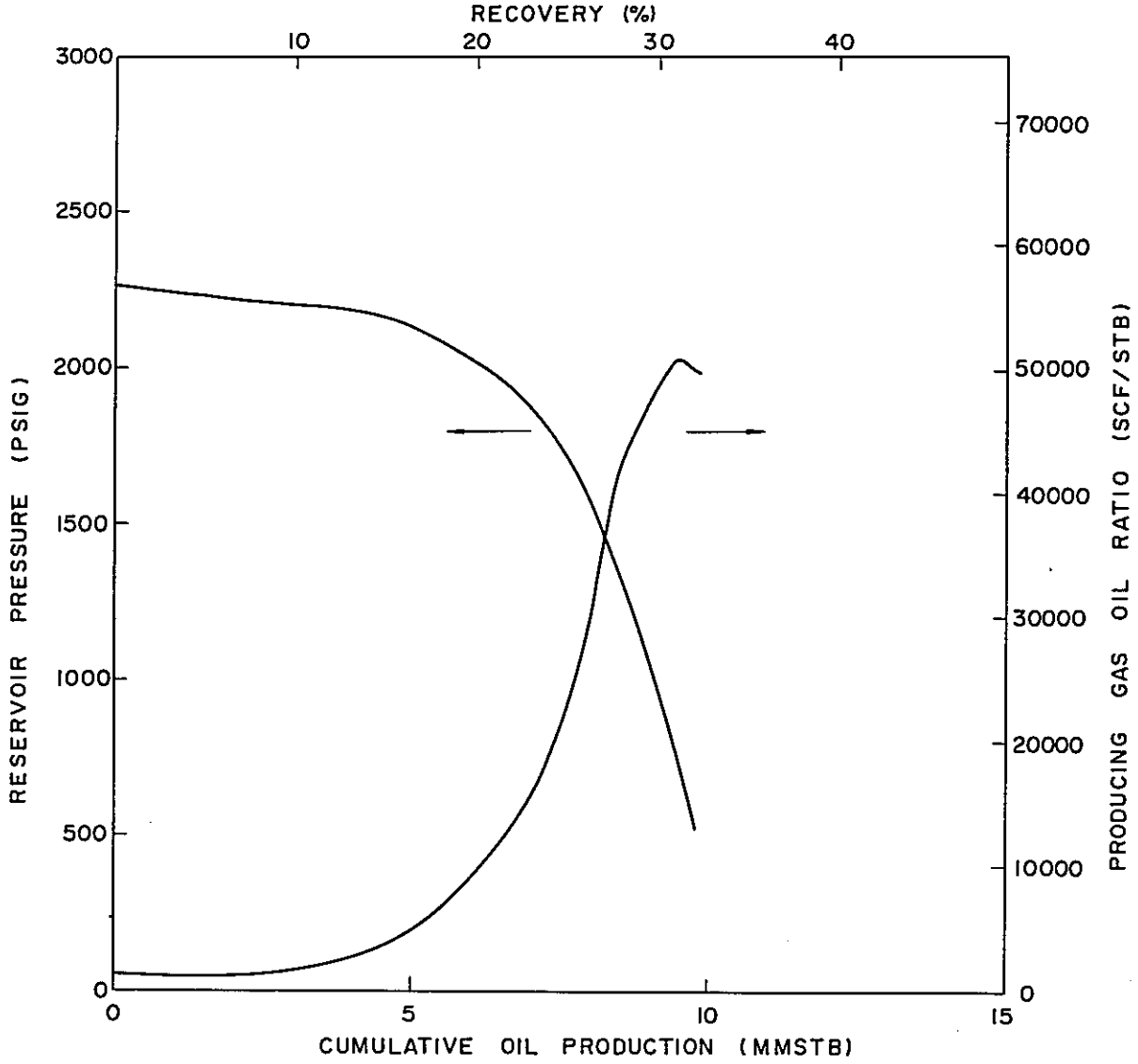


Fig. 3-3-6
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF b2 (B-BLOCK) ZONE, SELIGI FIELD

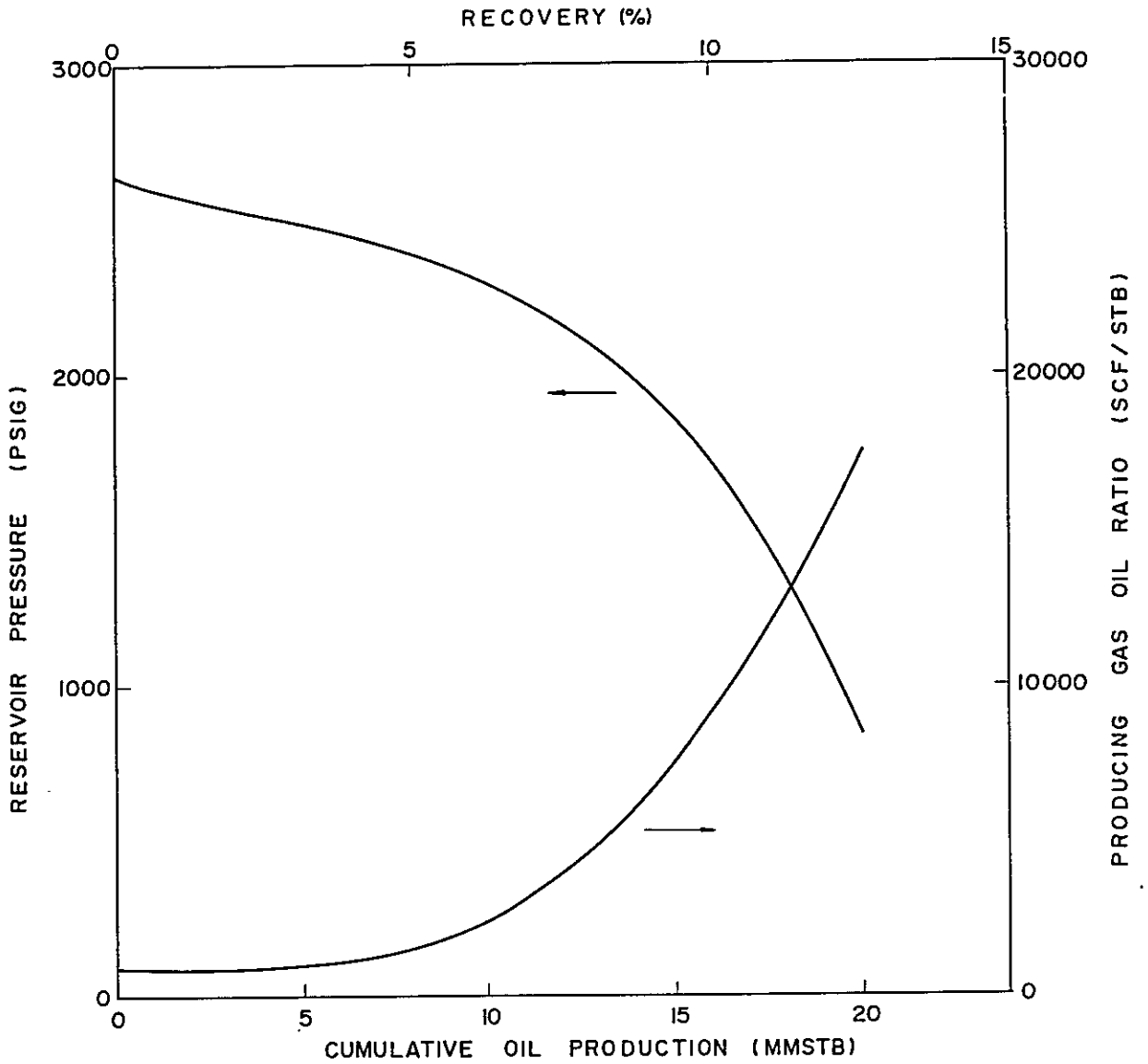


Fig. 3-3-7
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF C (B-BLOCK) ZONE, SELIGI FIELD

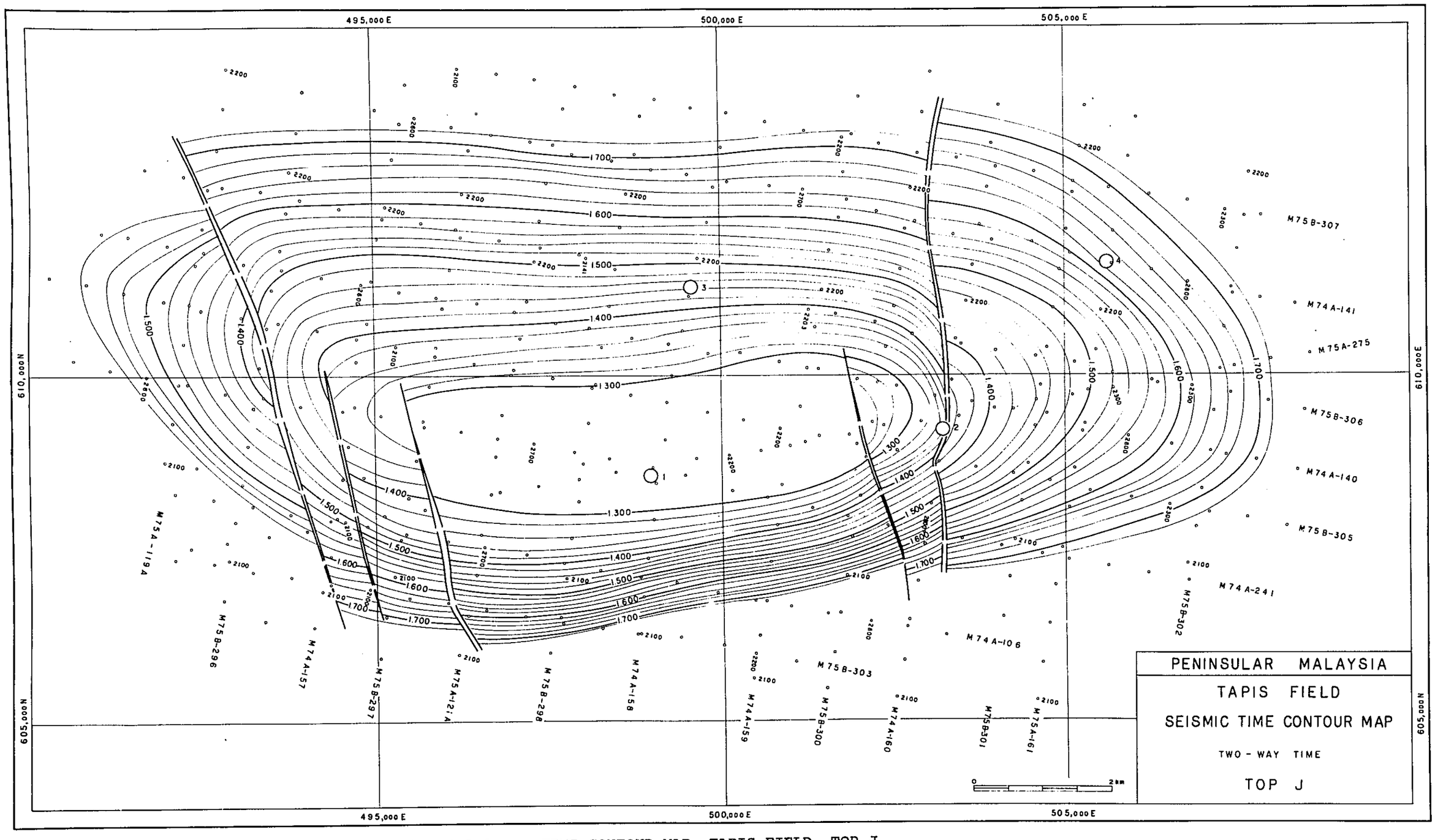


Fig. 4-1-1 TIME CONTOUR MAP, TAPIS FIELD, TOP J
Vol. II

Fig. 4-1-2

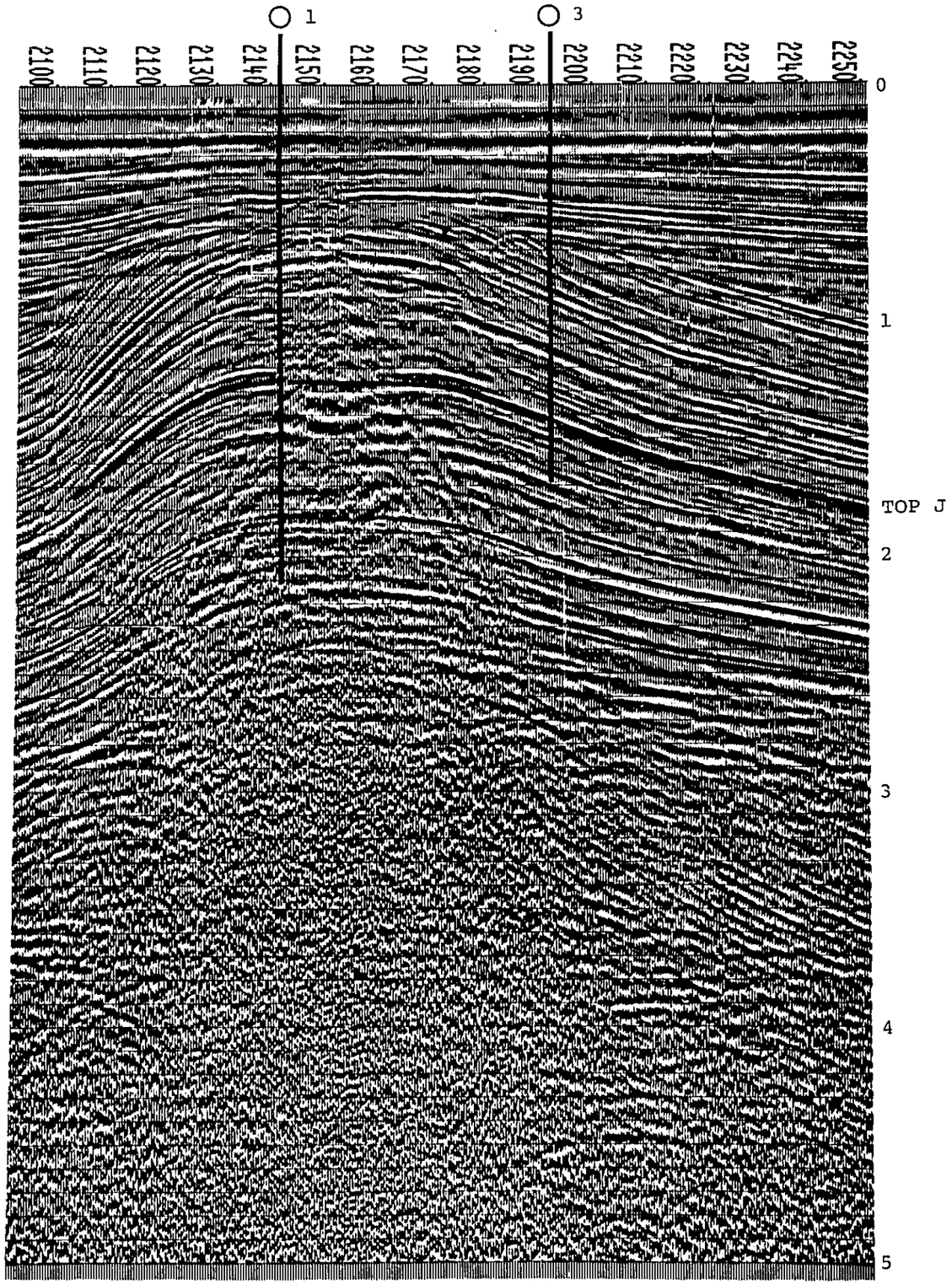


Fig. 4-1-2 SEISMIC SECTION, TAPIS FIELD, Line M74A158
Vol. II

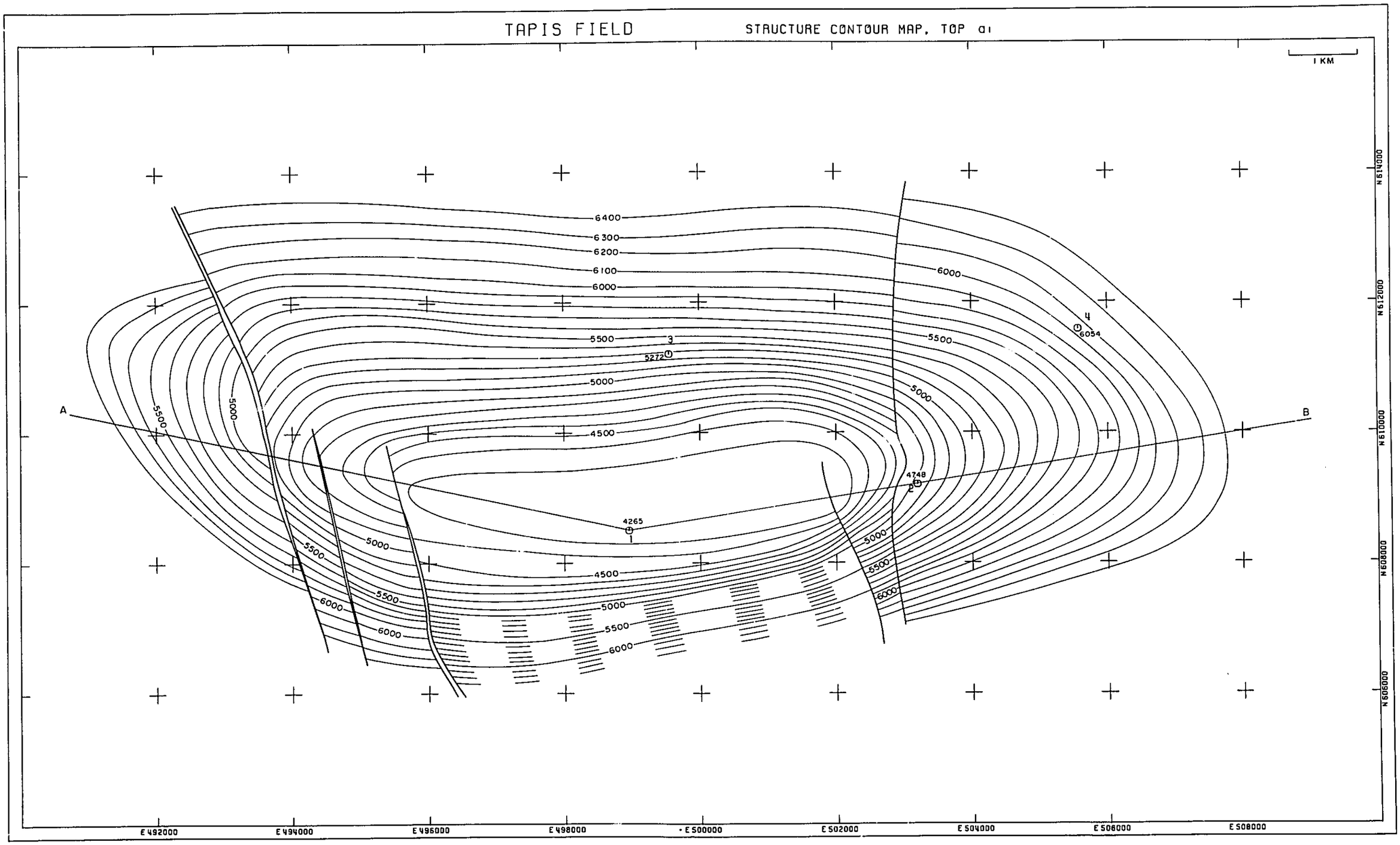


Fig. 4-2-1 STRUCTURE CONTOUR MAP, TAPIS FIELD, TOP a1
Vol. II

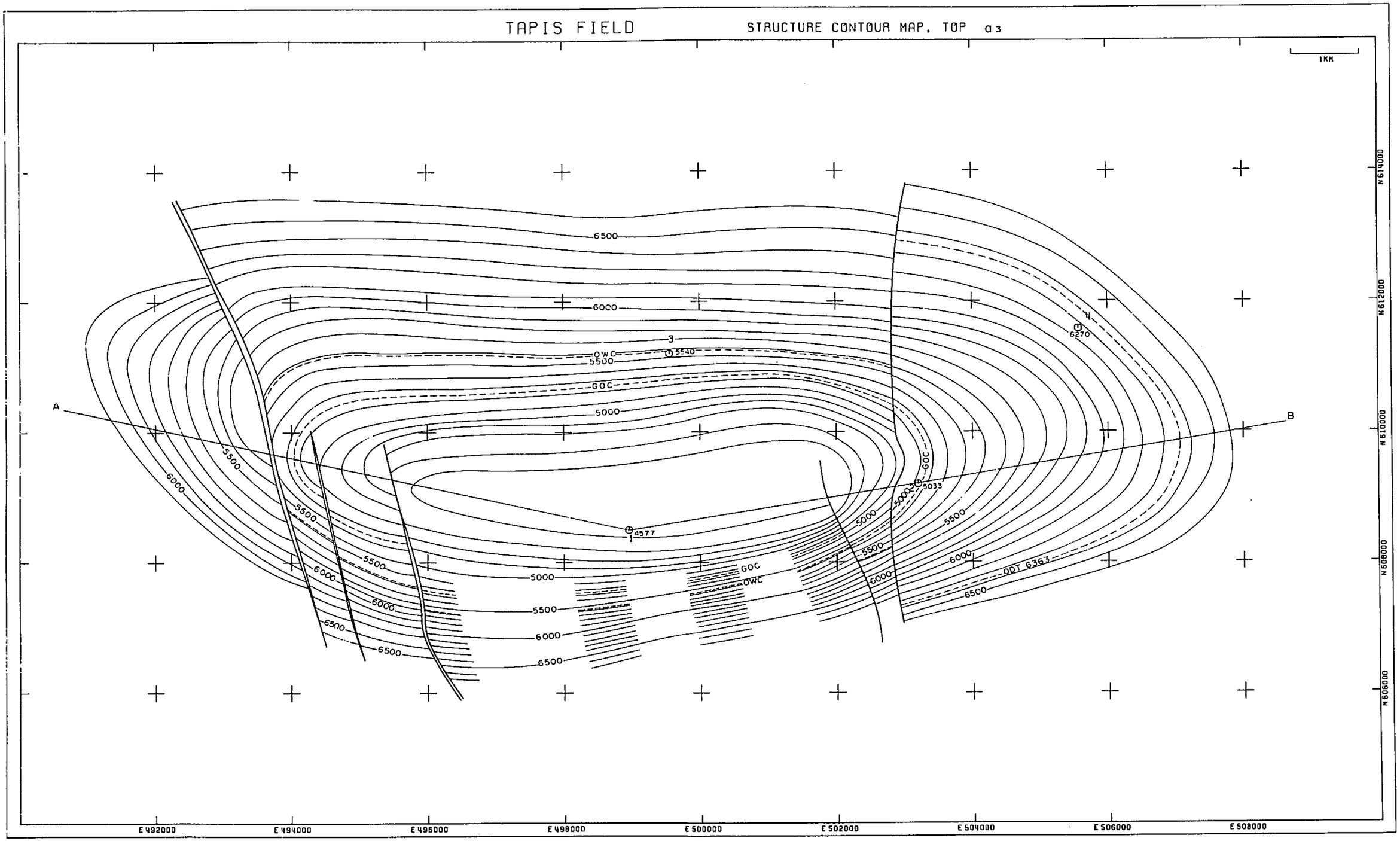


Fig. 4-2-2 STRUCTURE CONTOUR MAP, TAPIS FIELD, TOP a3
Vol. II

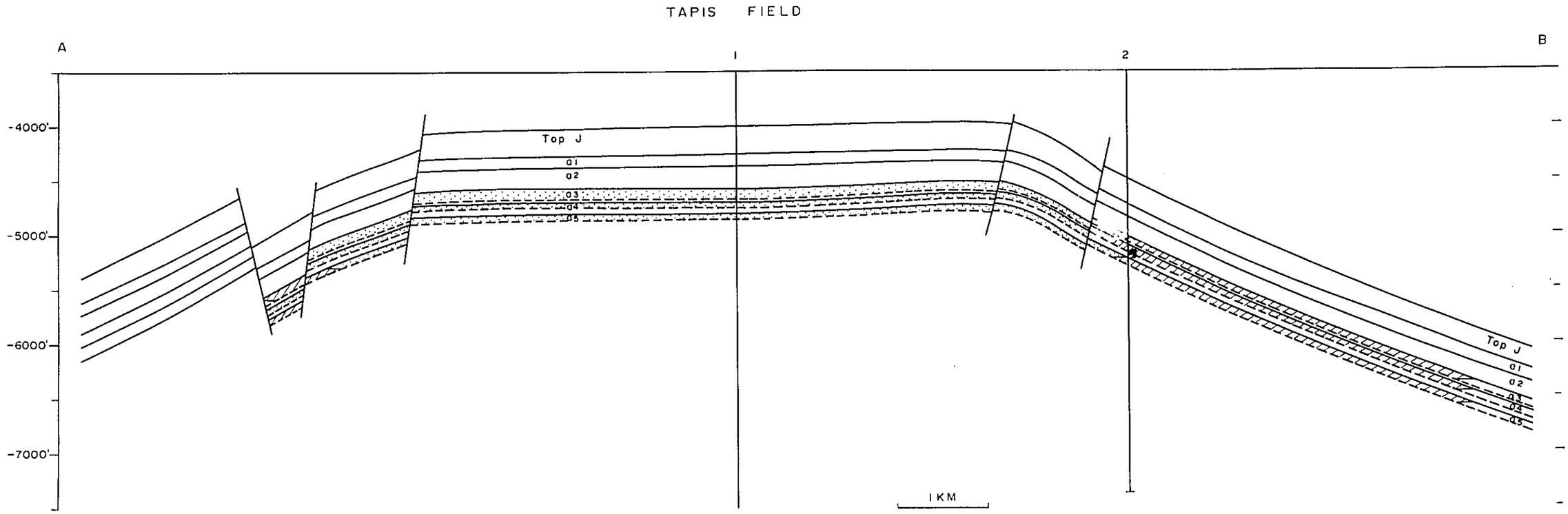


Fig. 4-2-3 STRUCTURAL CROSS-SECTION, TAPIS FIELD
Vol. II

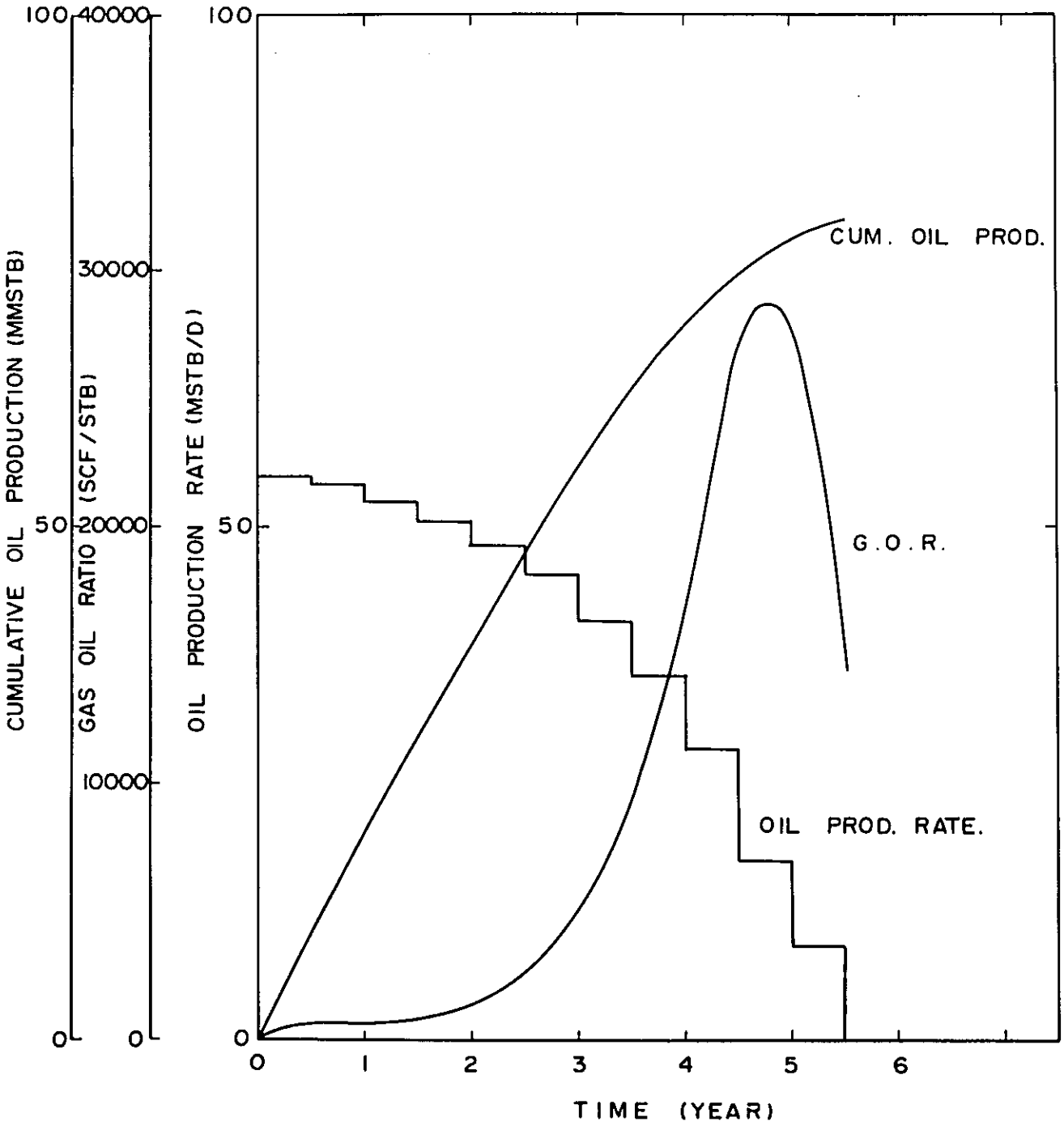


Fig. 4-3-1 PREDICTED PERFORMANCE OF TAPIS FIELD
Vol. II

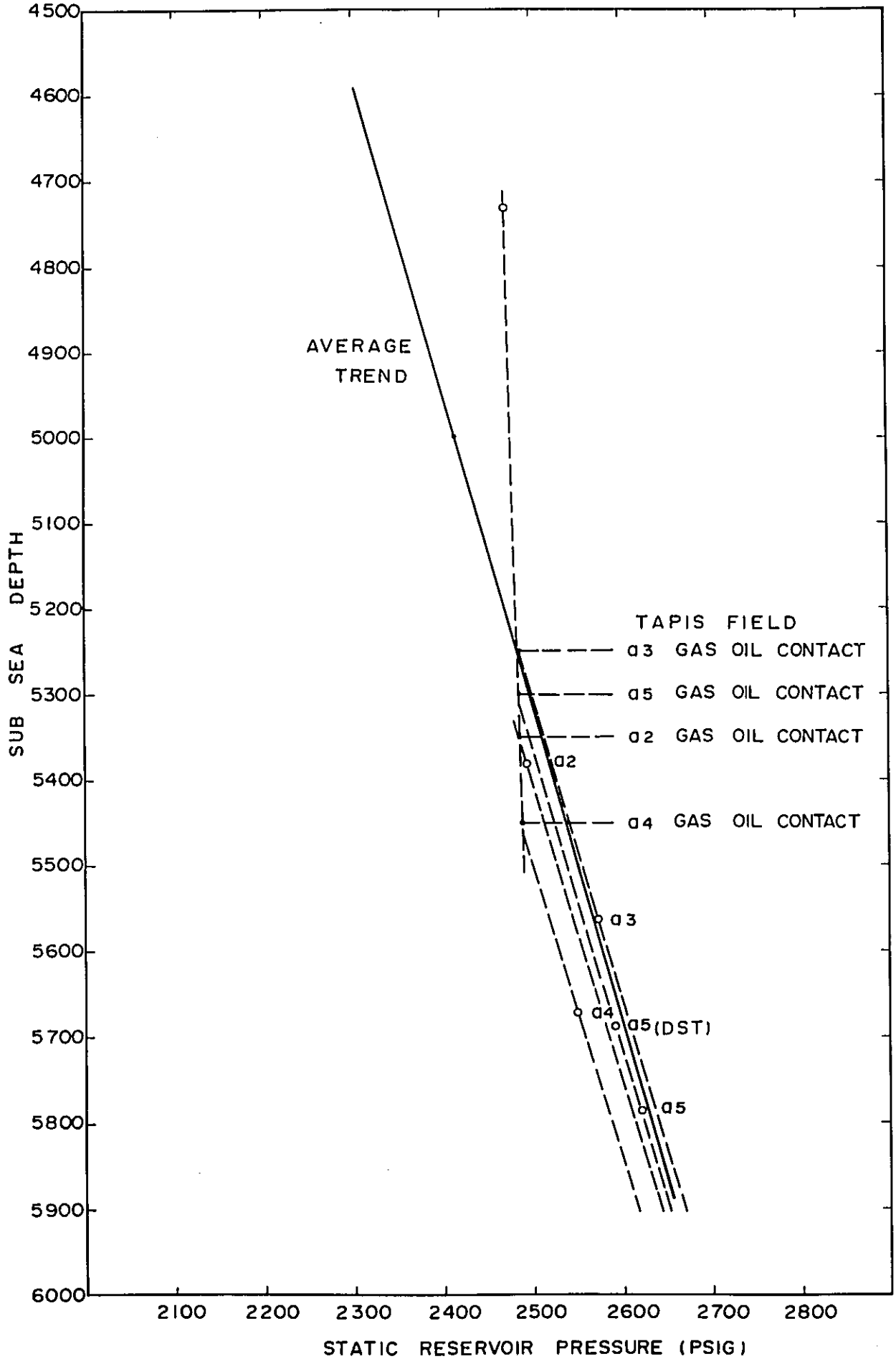


Fig. 4-3-2 RESERVOIR PRESSURE VS, DEPTH, TAPIS FIELD
Vol. II

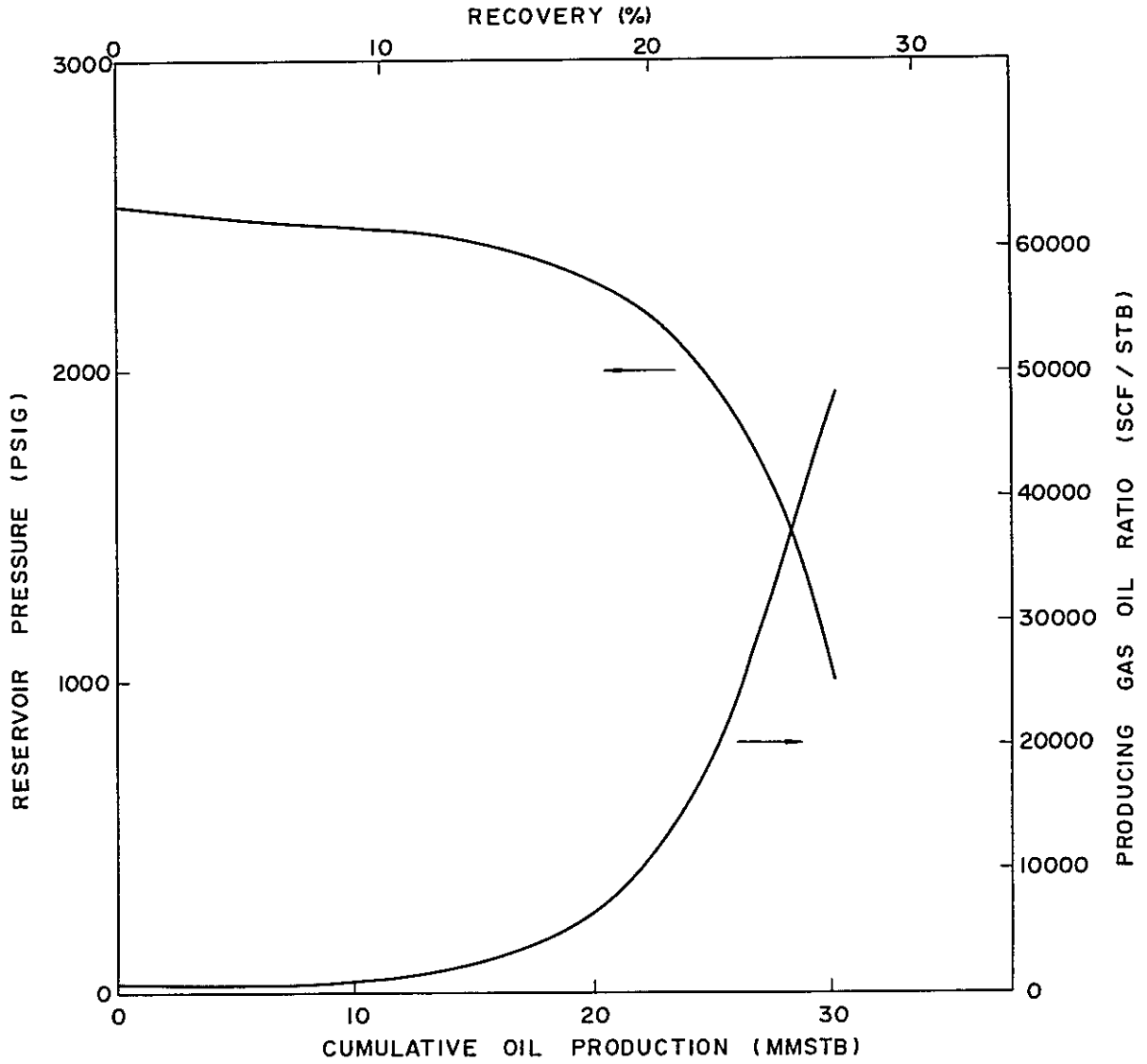


Fig. 4-3-3
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF a3 (A-BLOCK) ZONE, TAPIS FIELD

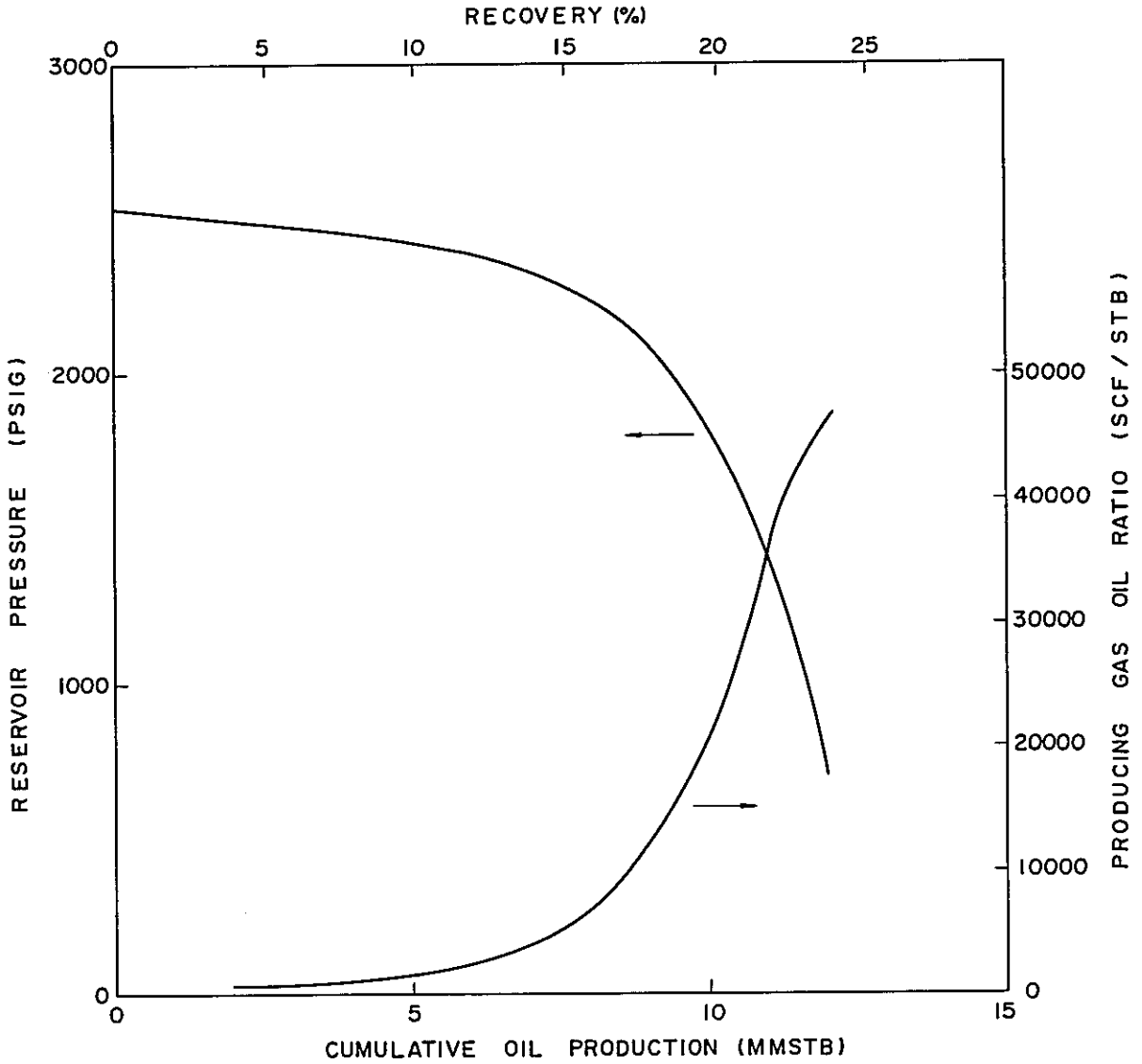


Fig. 4-3-4
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF a5 (A-BLOCK) ZONE, TAPIS FIELD

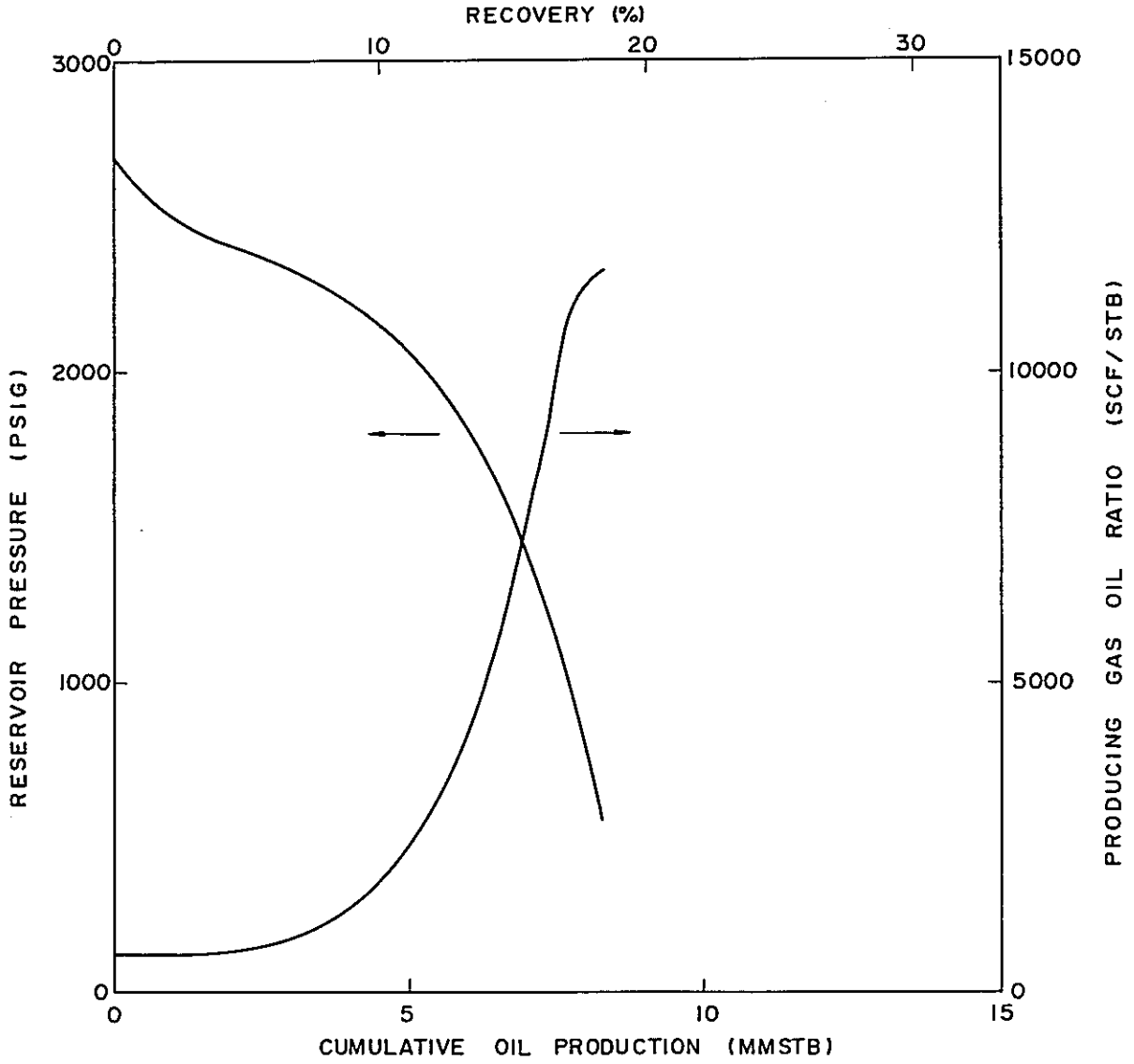


Fig. 4-3-5
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF a3 (B-BLOCK) ZONE, TAPIS FIELD

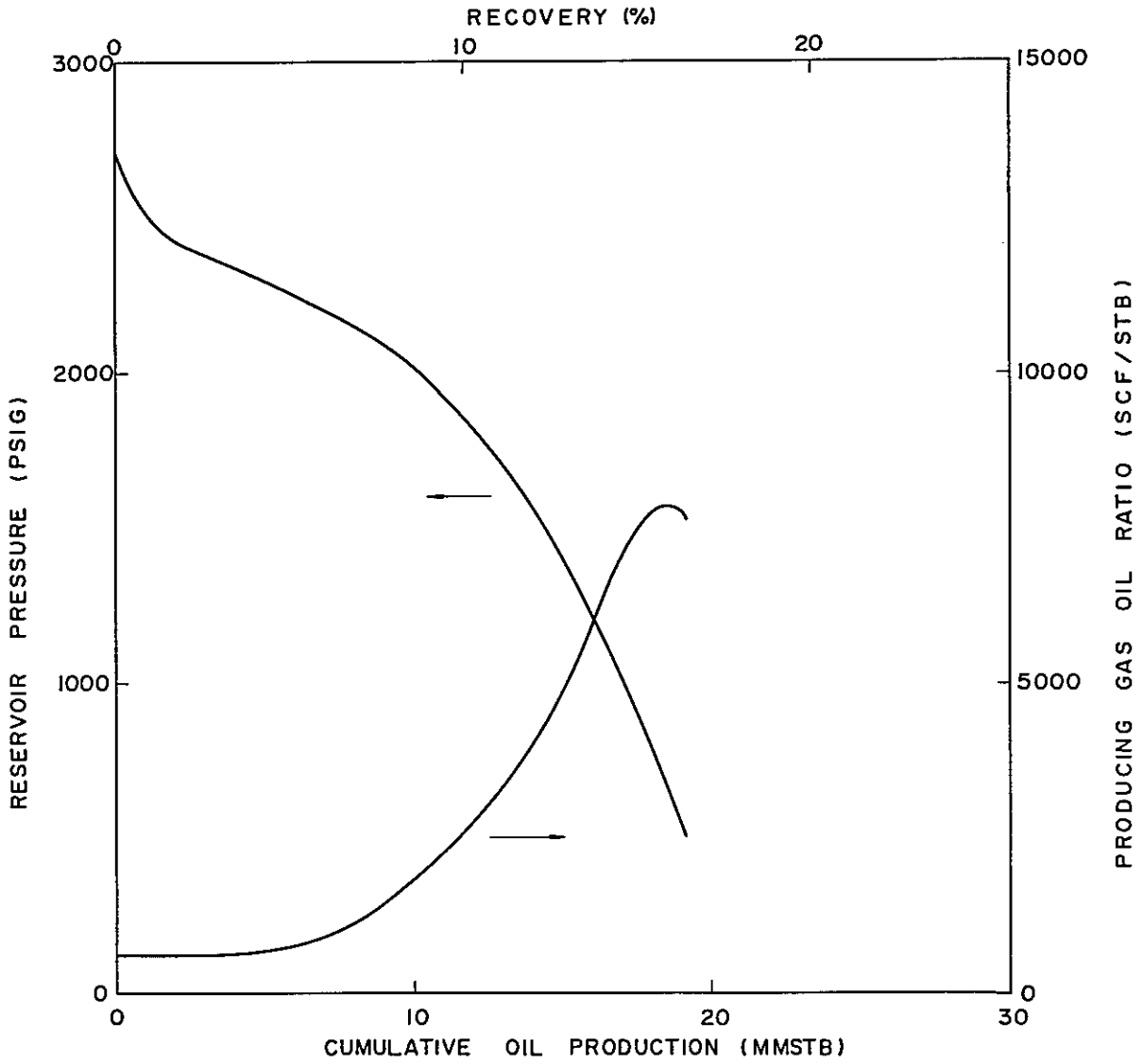


Fig. 4-3-6
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF a4 (B-BLOCK) ZONE, TAPIS FIELD

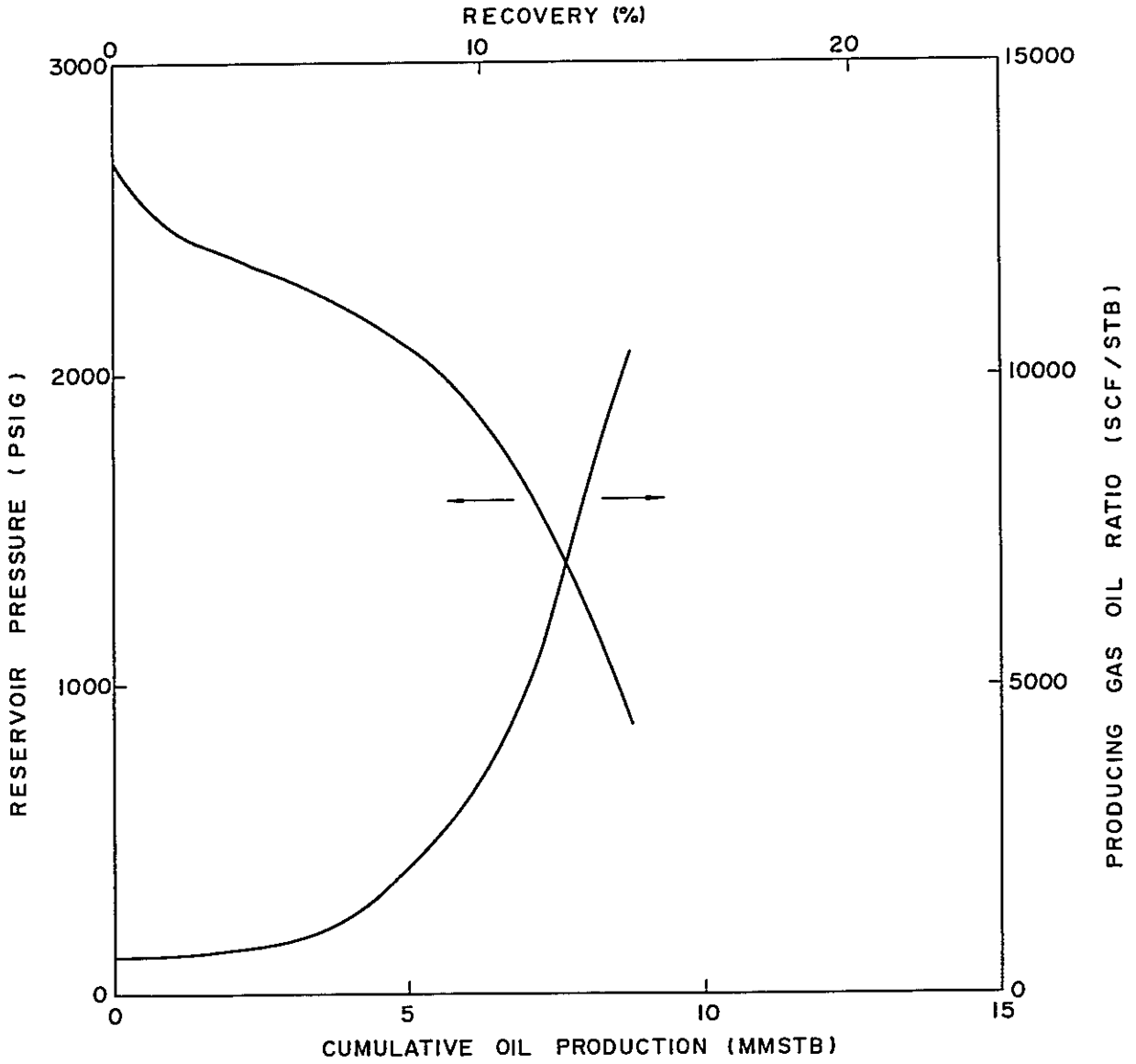


Fig. 4-3-7
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF a5 (B-BLOCK) ZONE, TAPIS FIELD

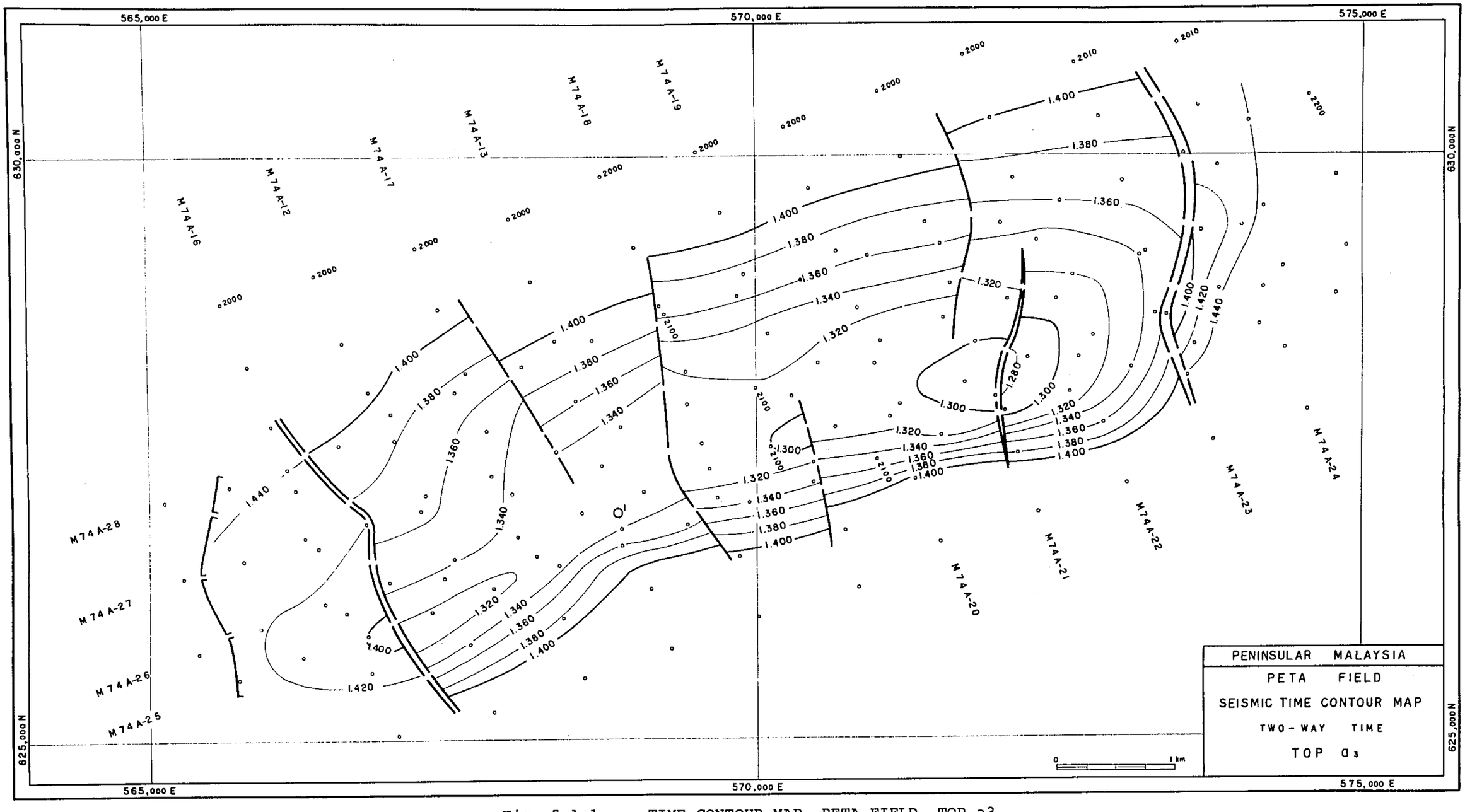


Fig. 5-1-1 TIME CONTOUR MAP, PETA FIELD, TOP a3
Vol. II

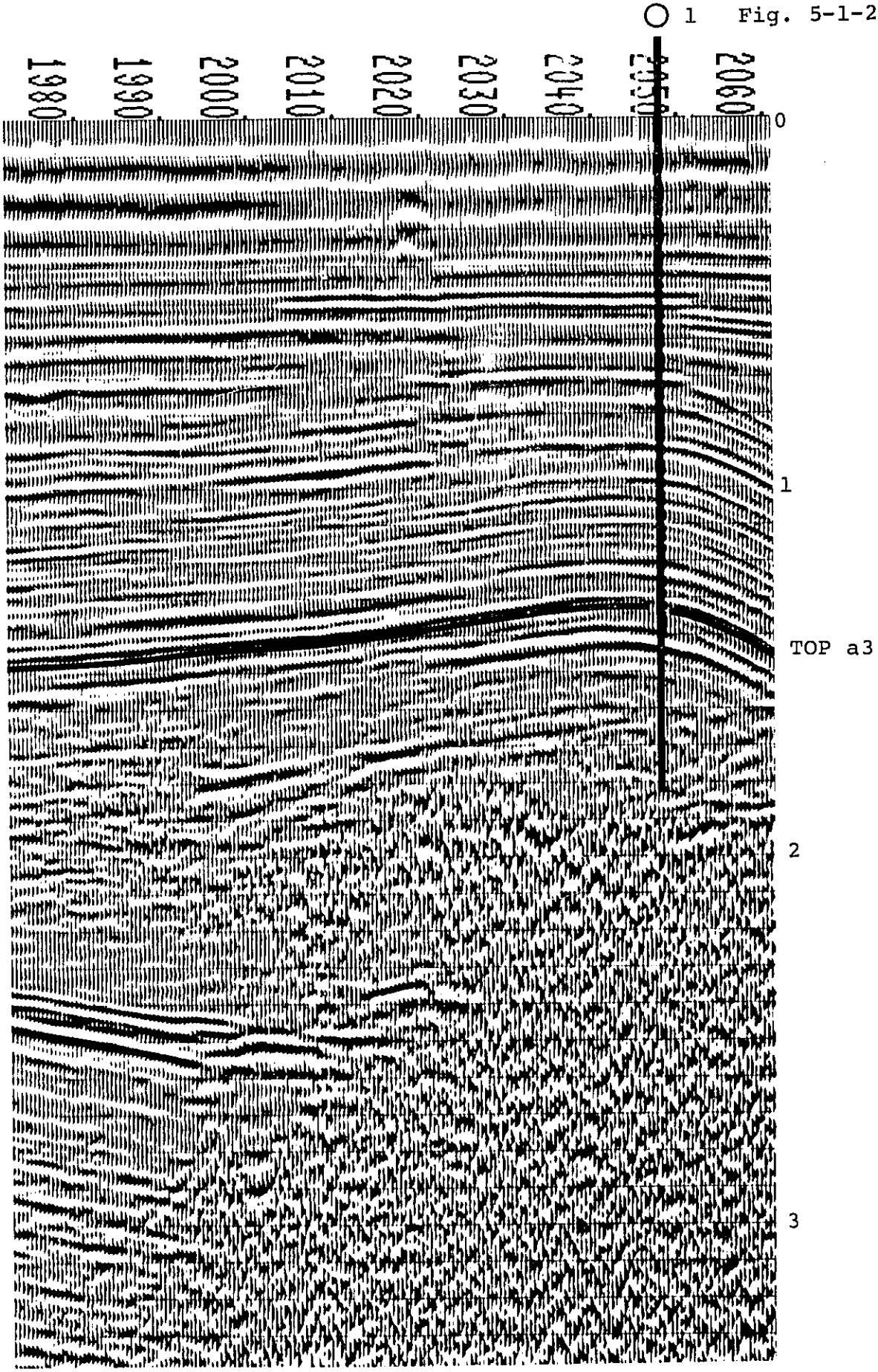


Fig. 5-1-2 SESMIC SECTION, PETA FIELD, Line M74A13
Vol. II

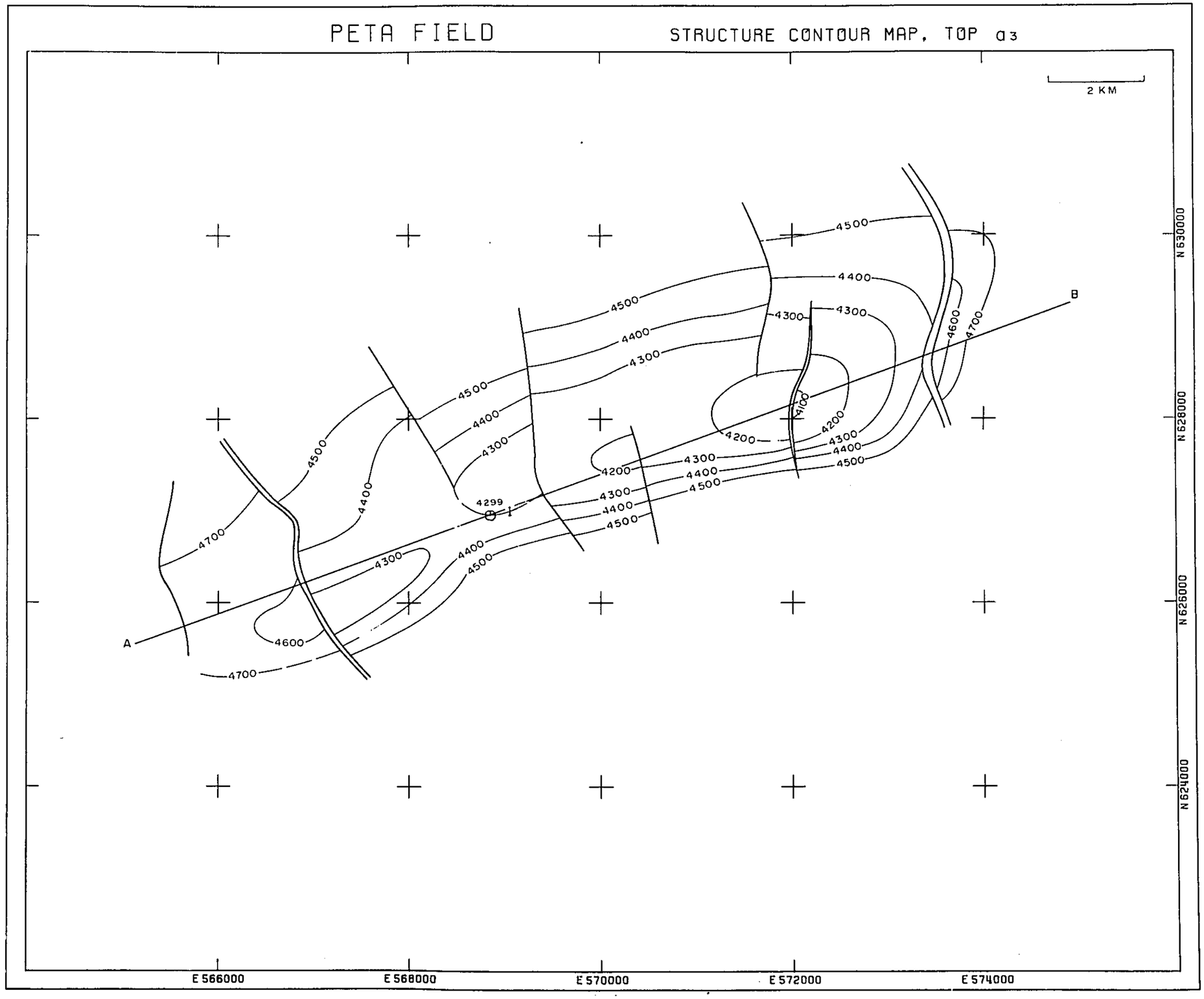


Fig. 5-2-1 STRUCTURE CONTOUR MAP, PETA FIELD, TOP a3
Vol. II

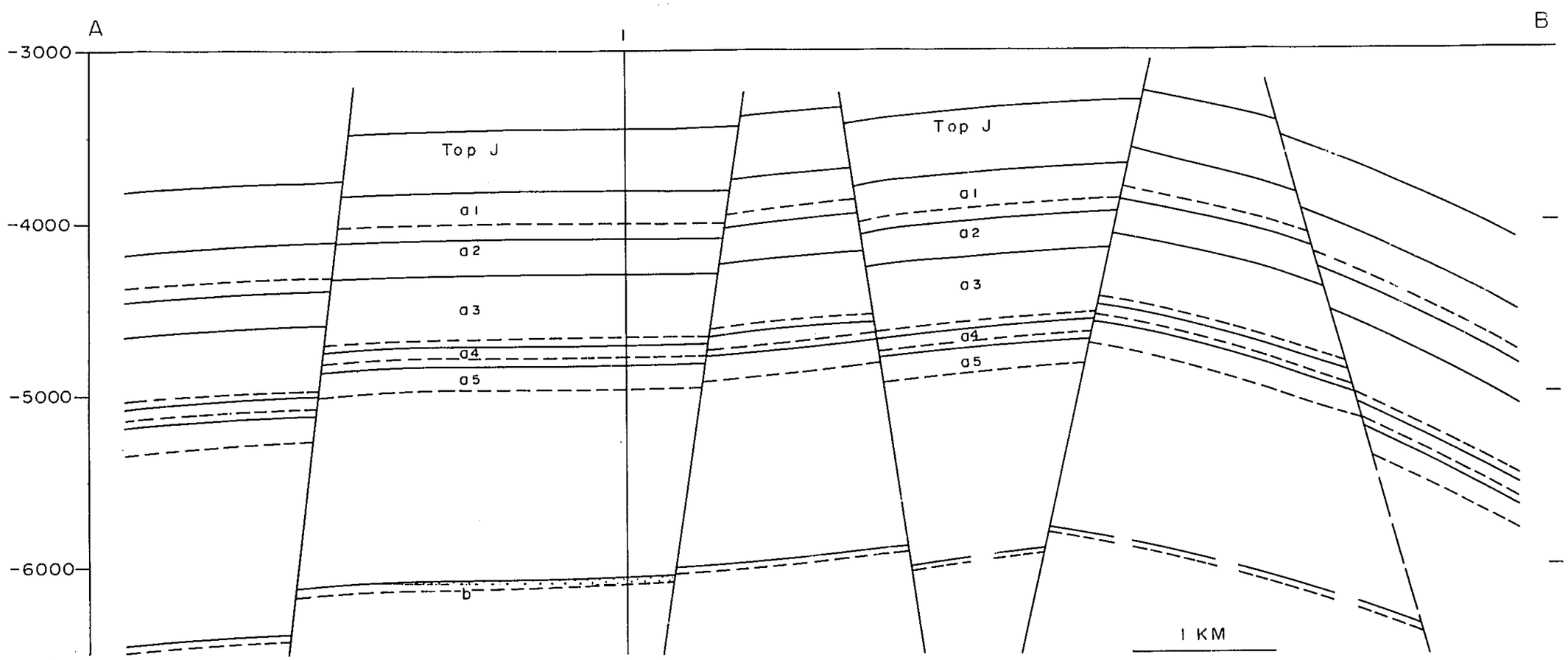


Fig. 5-2-2 STRUCTURAL CROSS-SECTION, PETA FIELD
Vol. II

Fig. 6-1-1

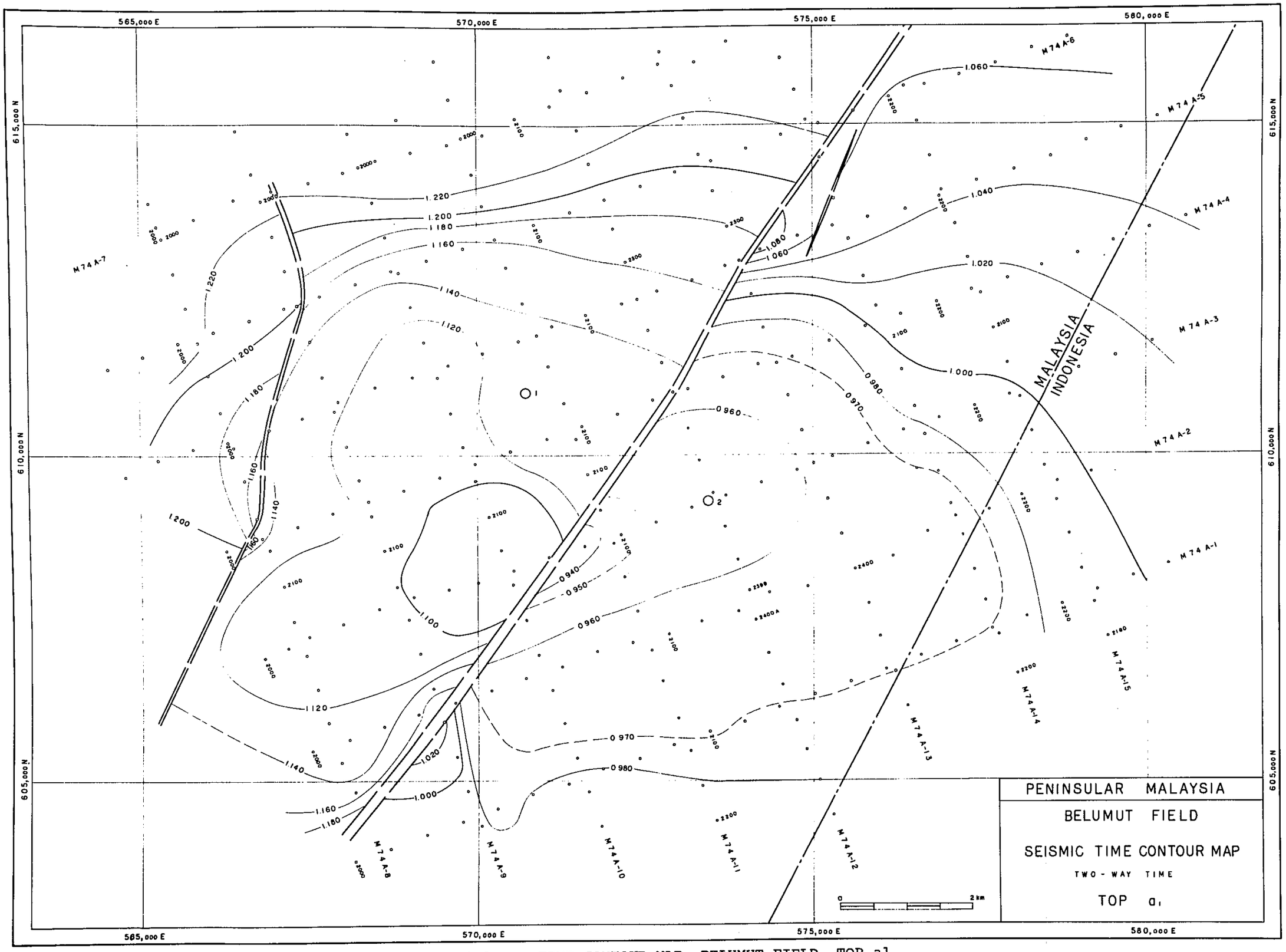


Fig. 6-1-1 TIME CONTOUR MAP, BELUMUT FIELD, TOP a1
Vol. II

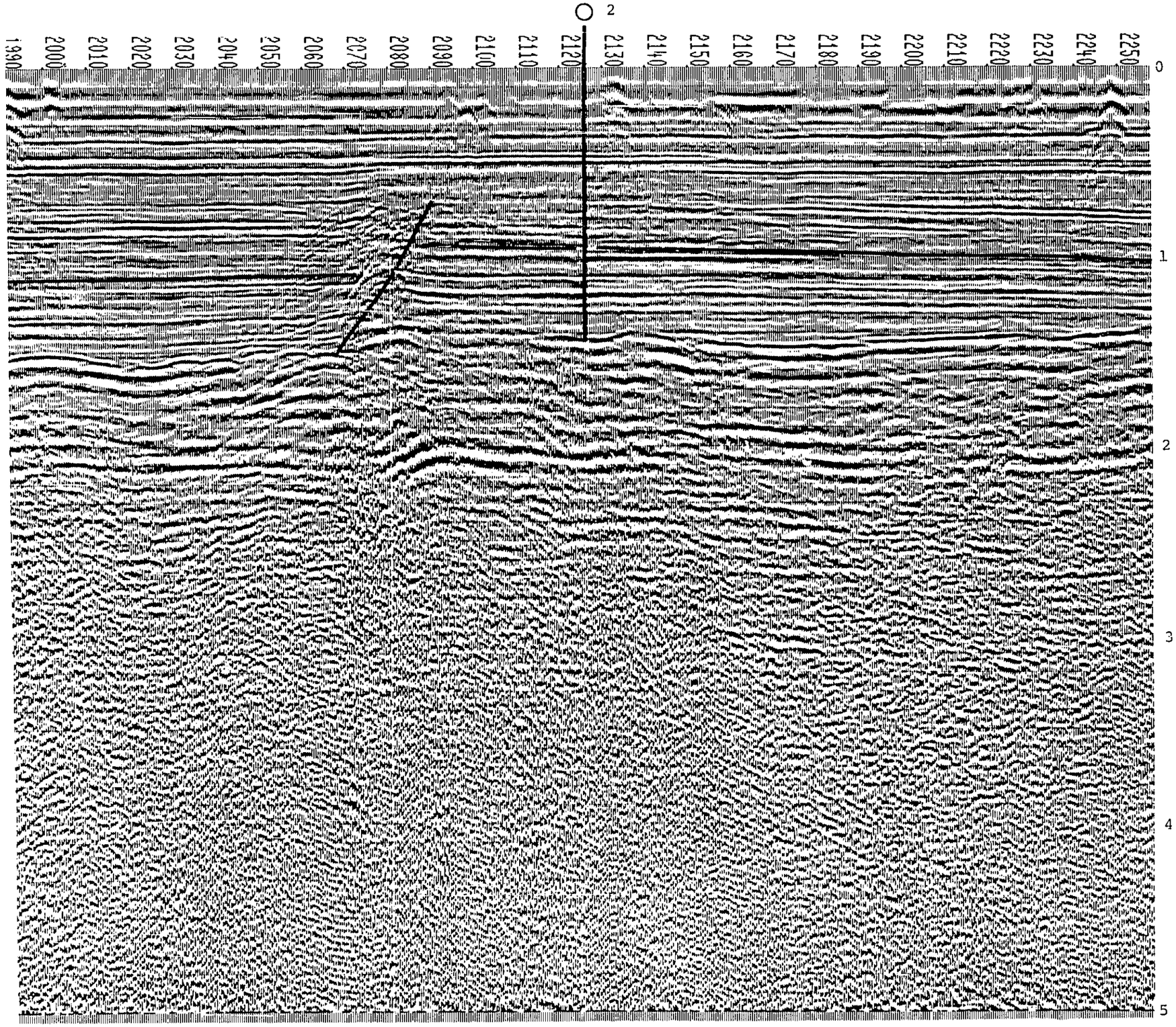


Fig. 6-1-2

Fig. 6-1-2 SEISMIC SECTION, BELUMUT FIELD, Line M74A3
Vol. II

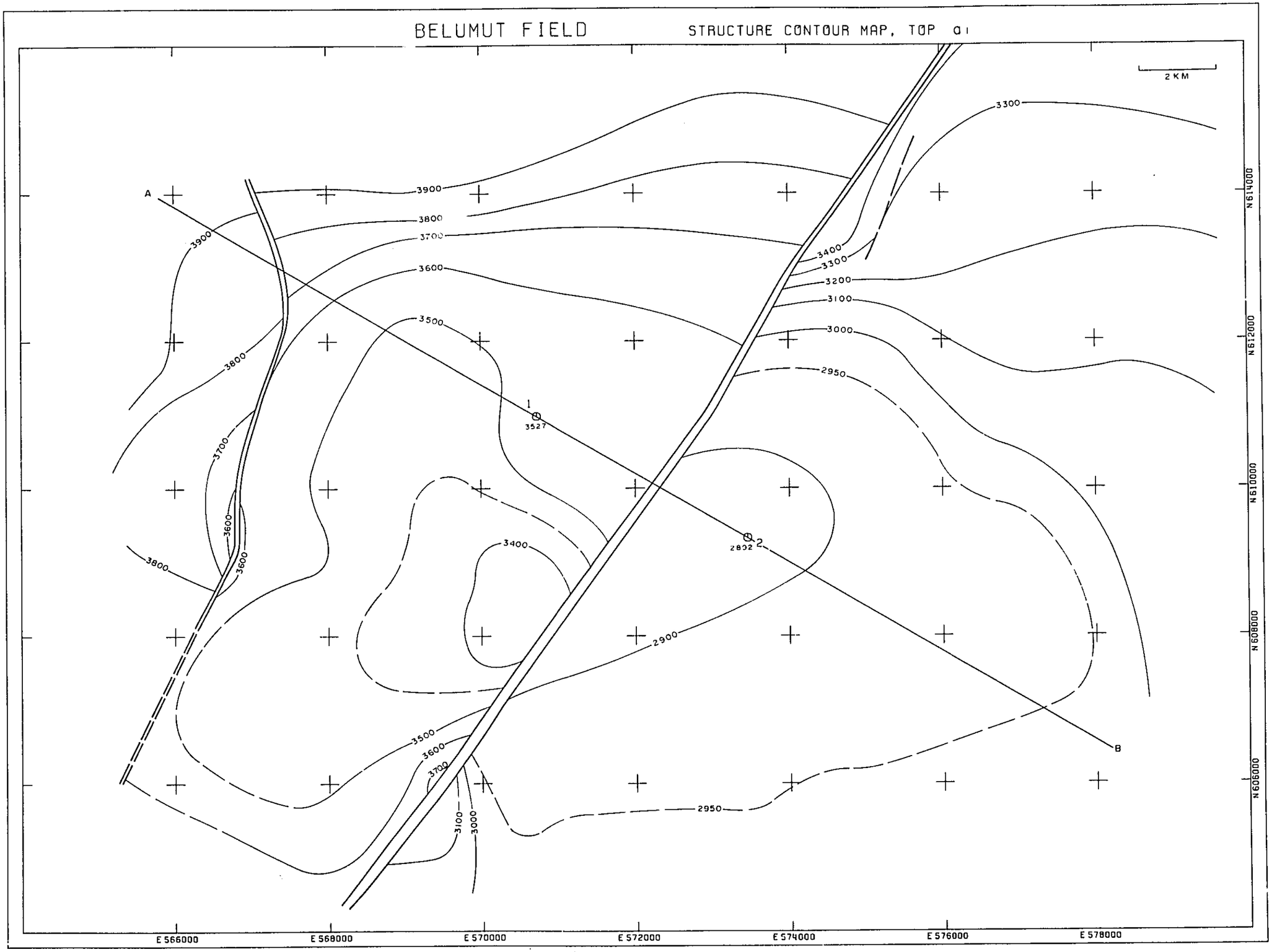


Fig. 6-2-1 STRUCTURE CONTOUR MAP, BELUMUT FIELD, TOP a1
Vol. II

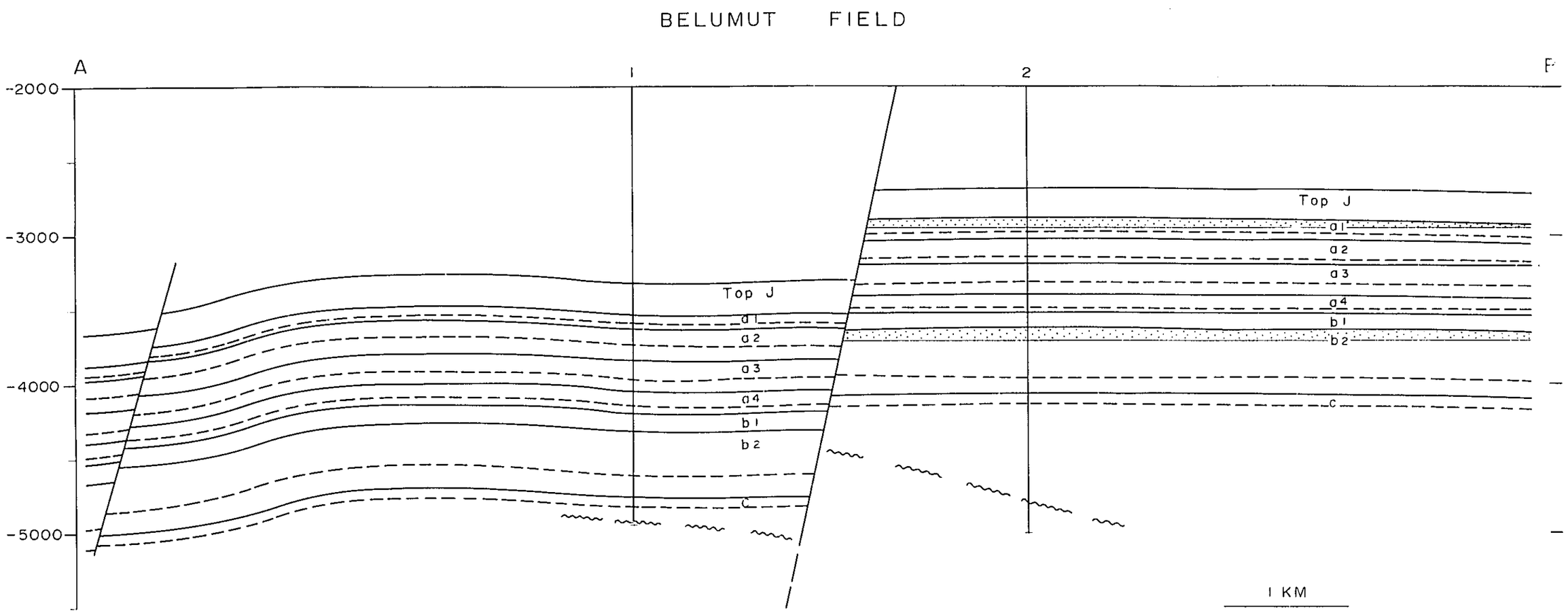


Fig. 6-2-2 STRUCTURAL CROSS-SECTION, BELUMUT FIELD
Vol. II

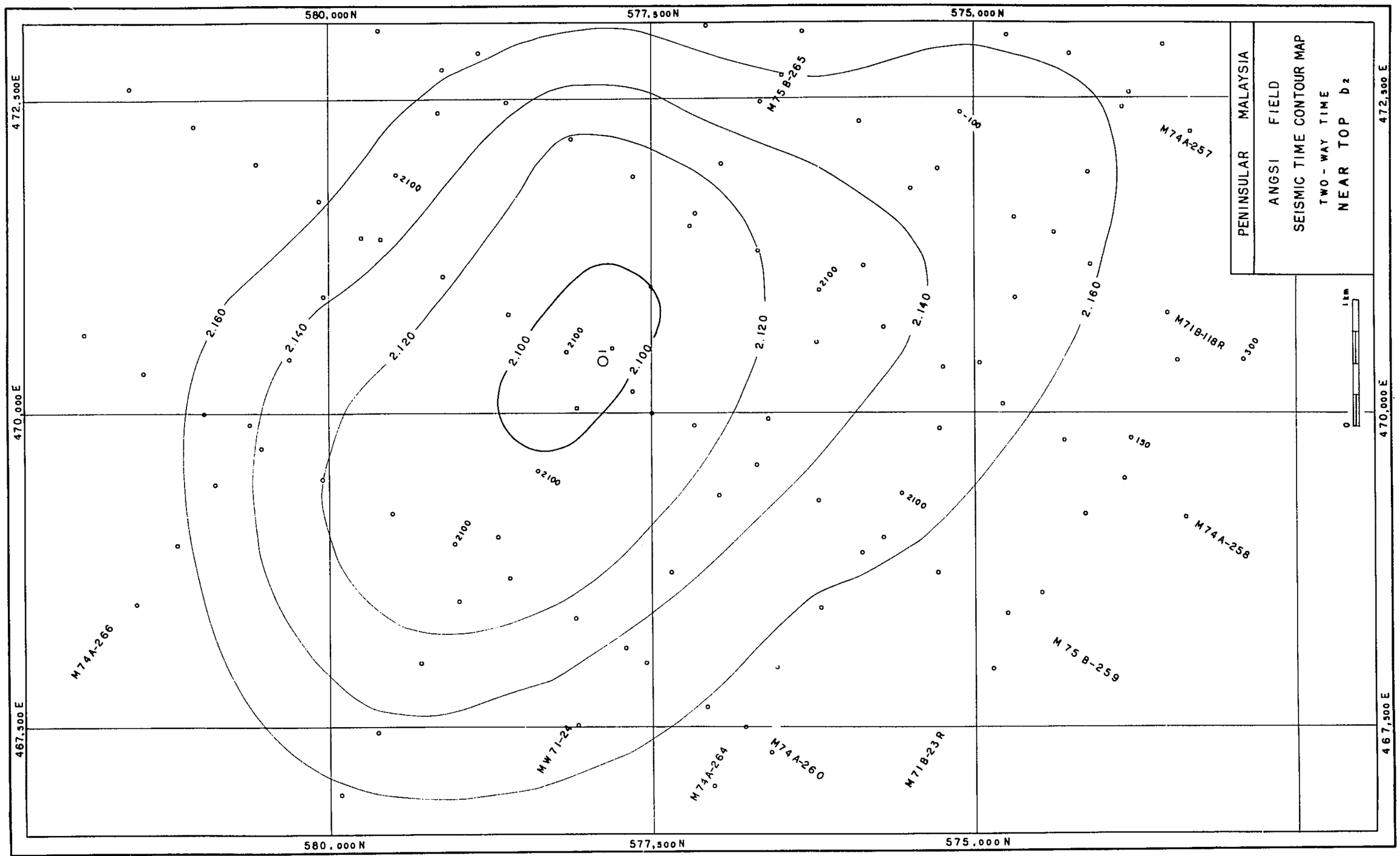


Fig. 7-1-1 TIME CONTOUR MAP, ANGSI FIELD, NEAR TOP b2
Vol. II

Fig. 7-1-2

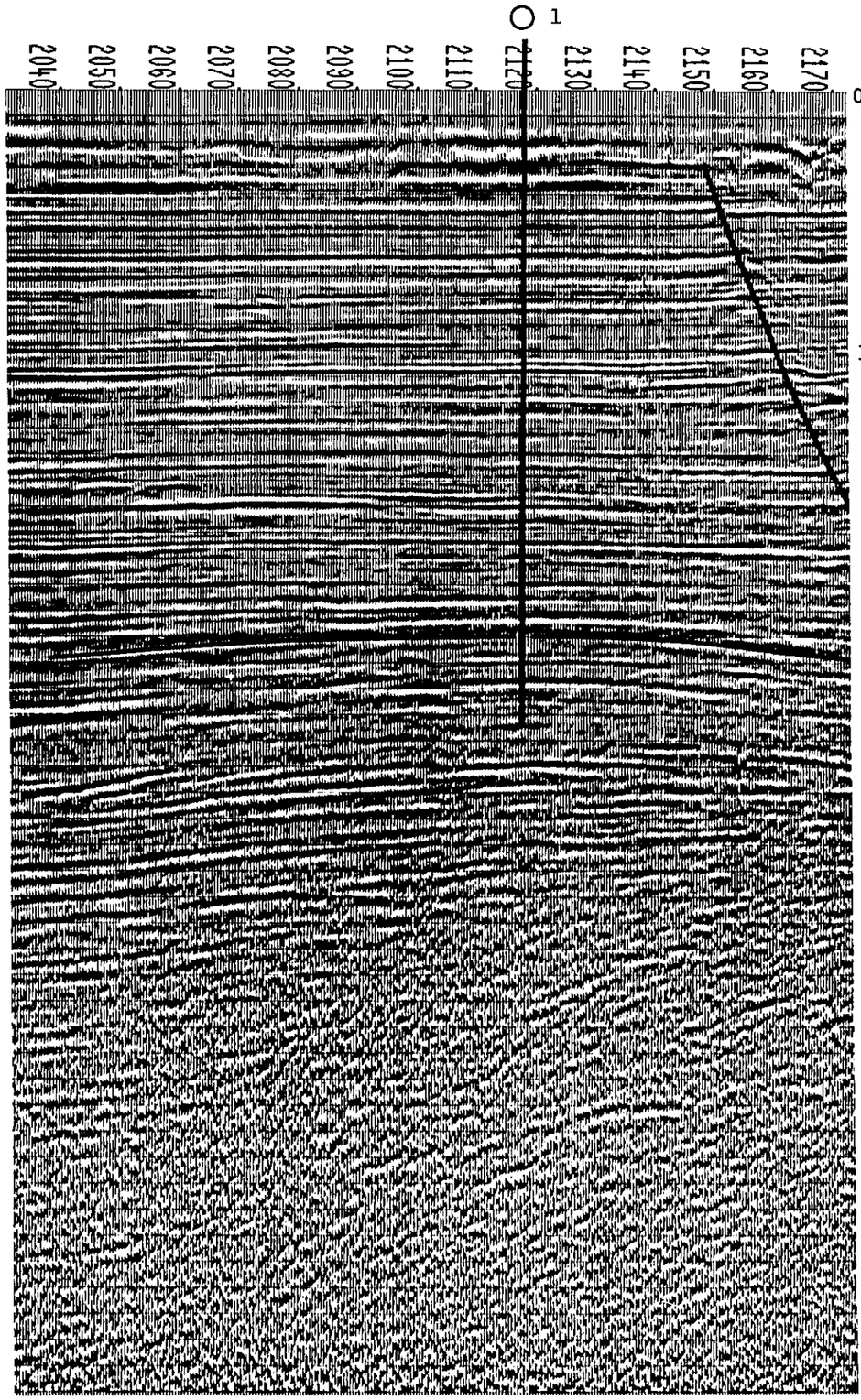


Fig. 7-1-2 SEISMIC SECTION, ANGSI FIELD, Line M75B265
Vol. II

Fig. 7-2-1

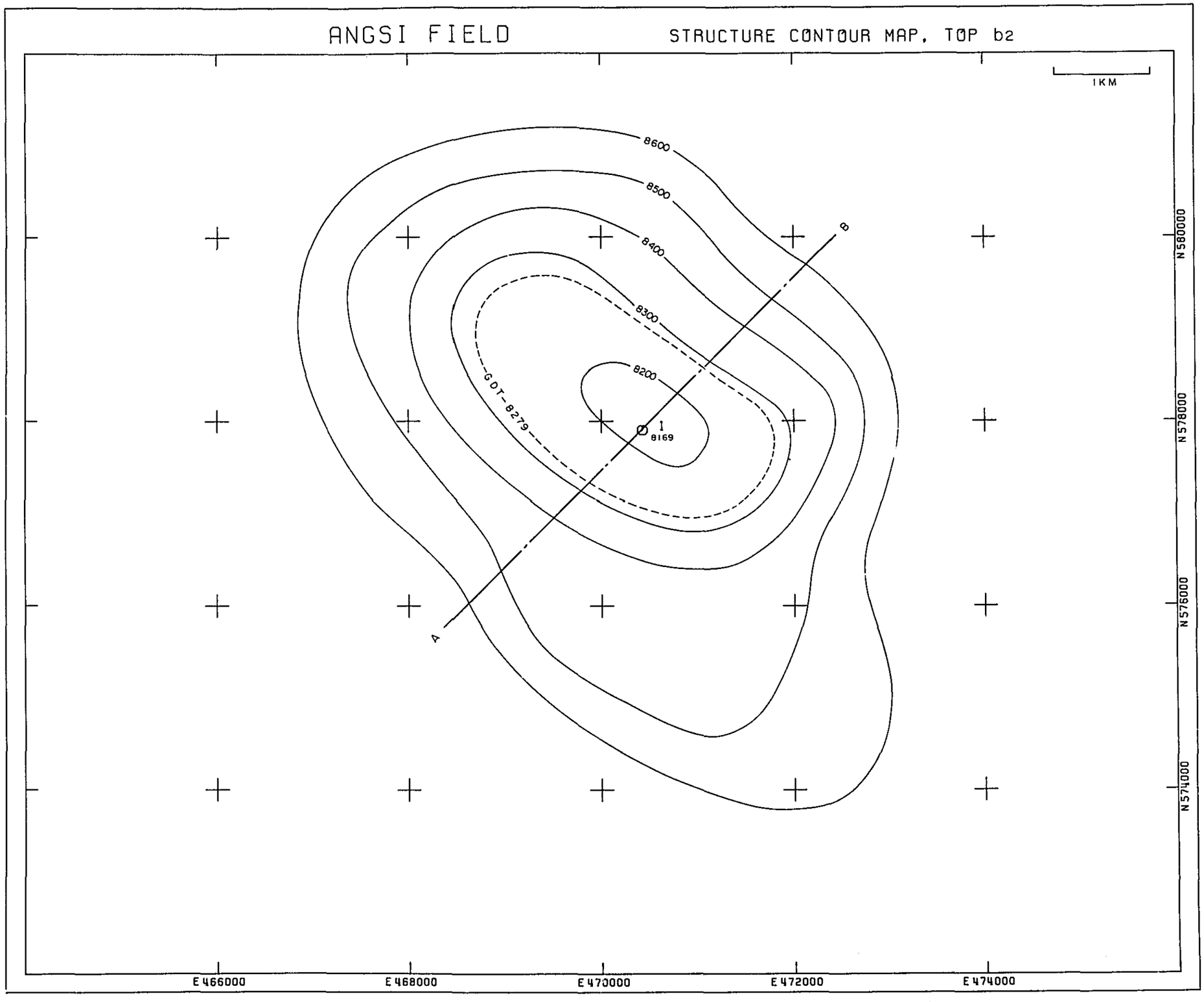


Fig. 7-2-1 STRUCTURE CONTOUR MAP, ANGSI FIELD, TOP b2
Vol. II

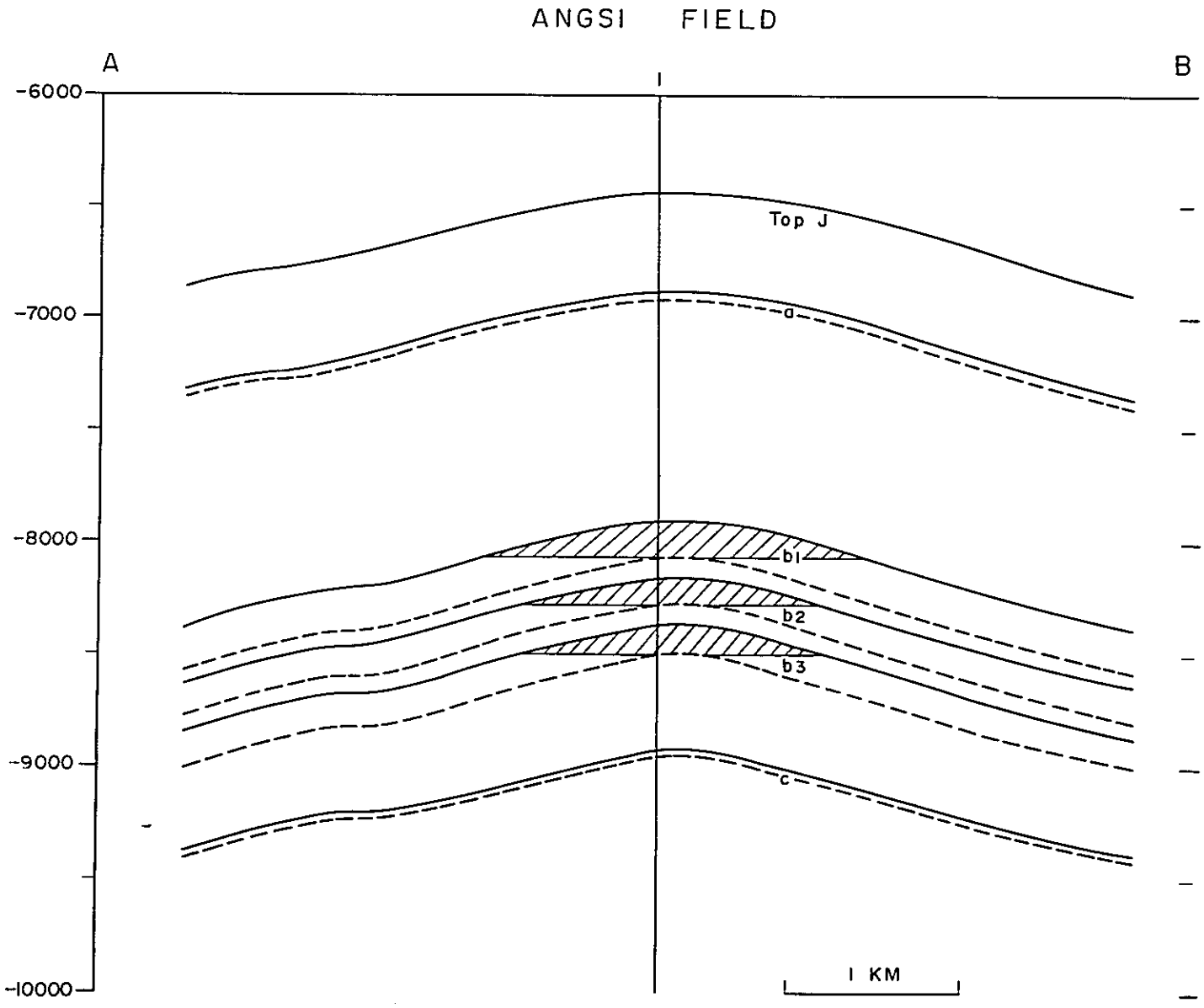


Fig. 7-2-2 STRUCTURAL CROSS-SECTION, ANGSI FIELD
Vol. II

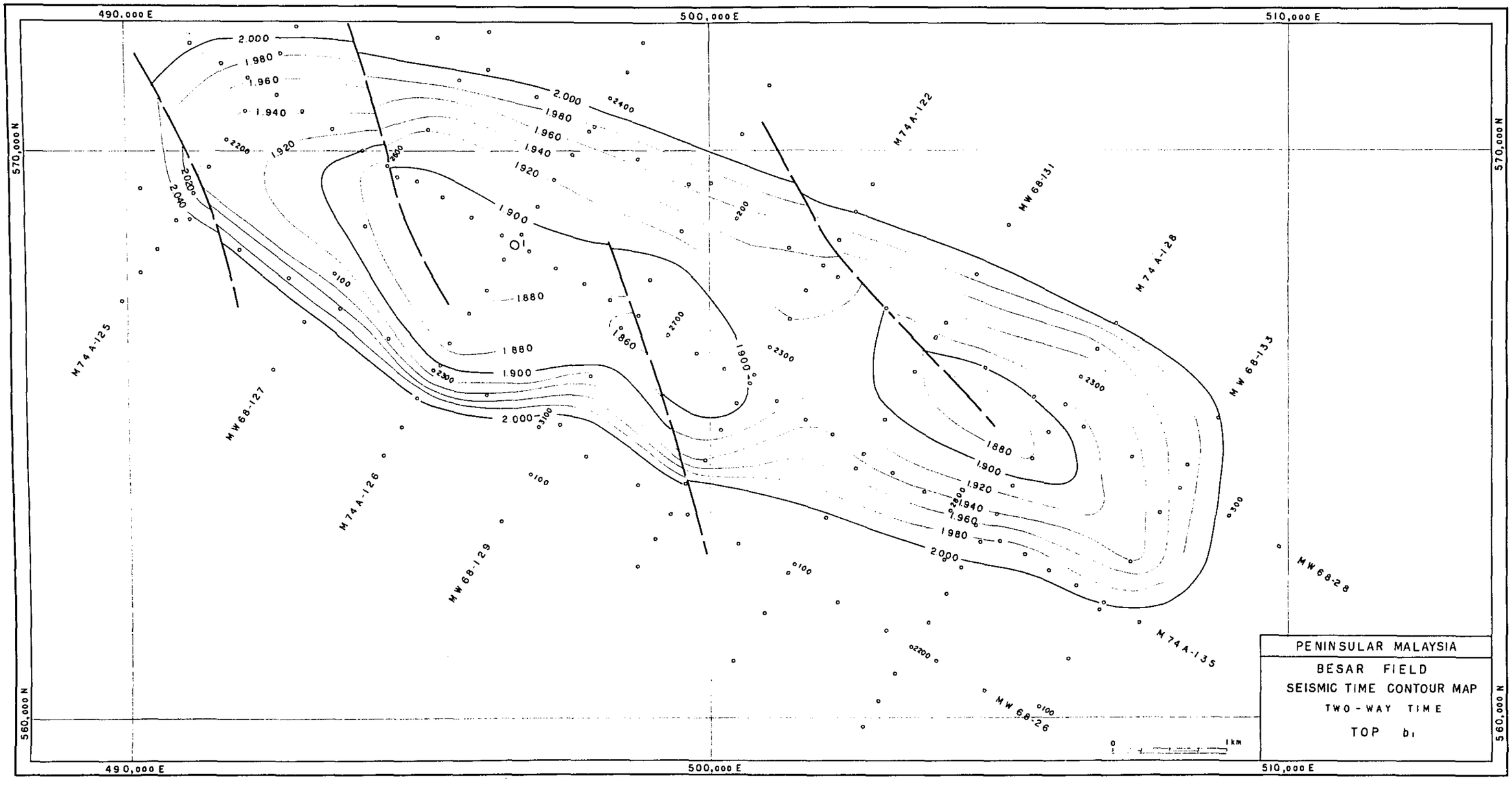


Fig. 8-1-1 TIME CONTOUR MAP, BESAR FIELD, TOP b1
Vol. II

Fig. 8-1-2

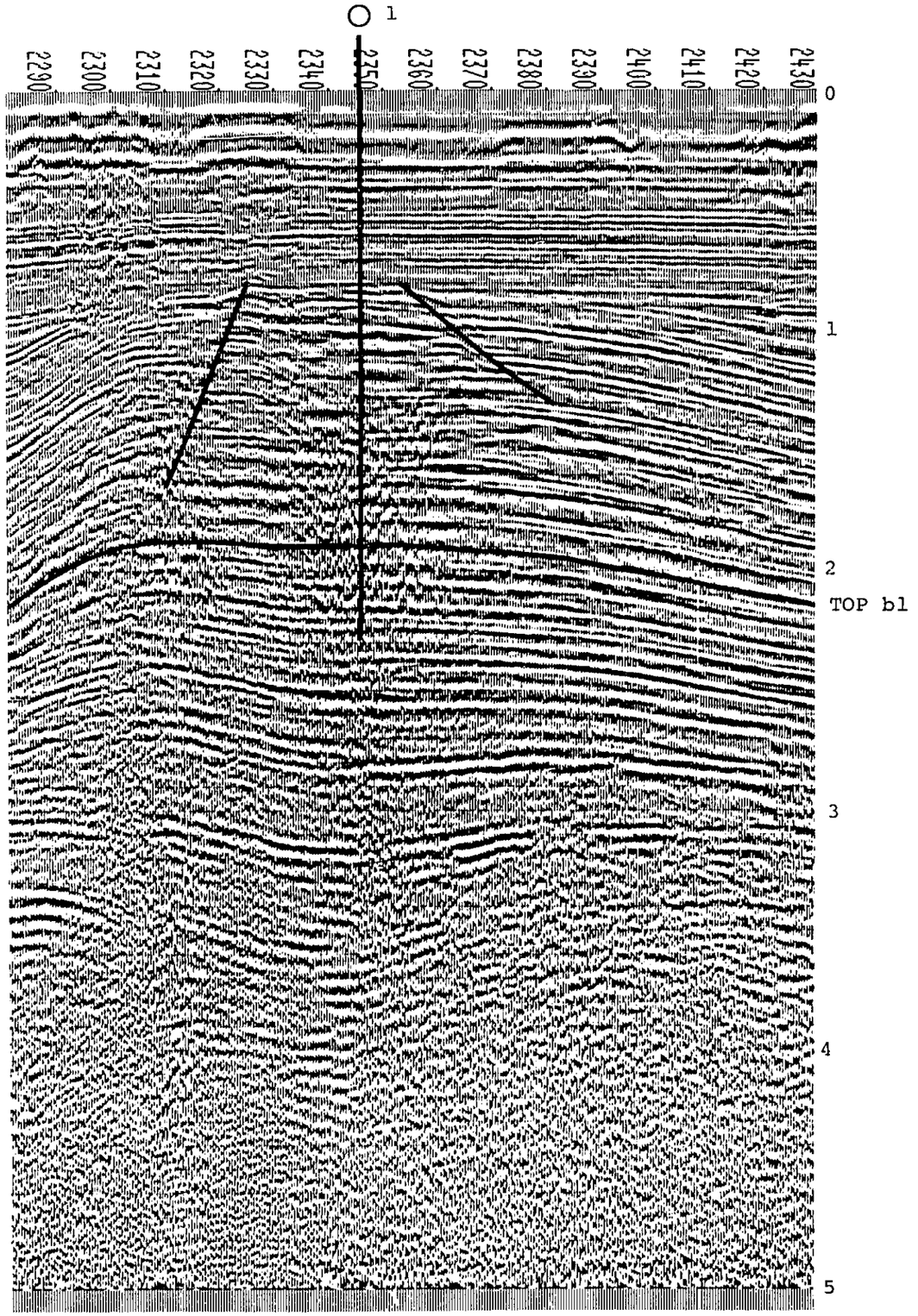


Fig. 8-1-2 SEISMIC SECTION, BESAR FIELD, Line M74A126
Vol. II

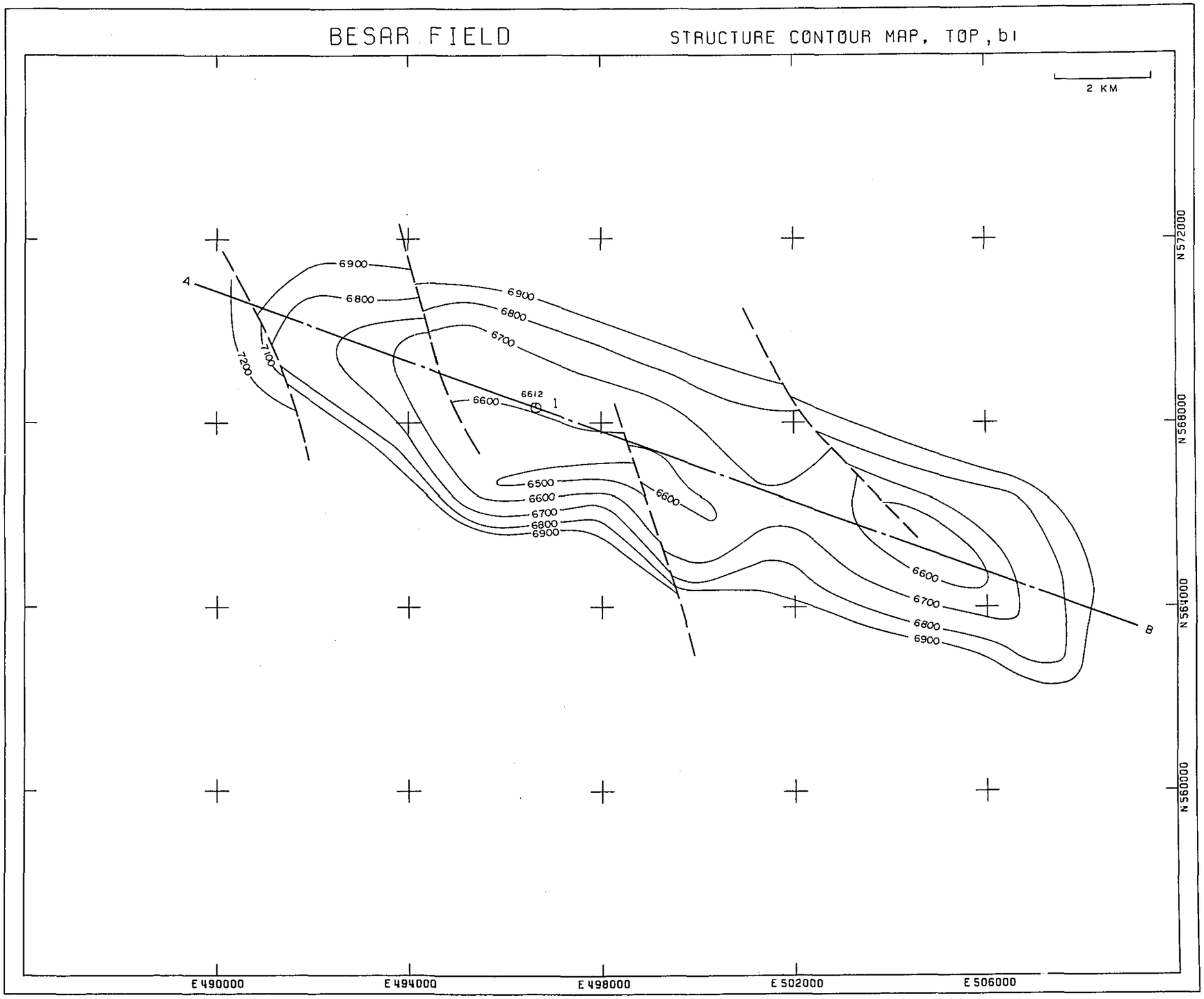


Fig. 8-2-1 STRUCTURE CONTOUR MAP, BESAR FIELD, TOP b1
Vol. II

BESAR FIELD

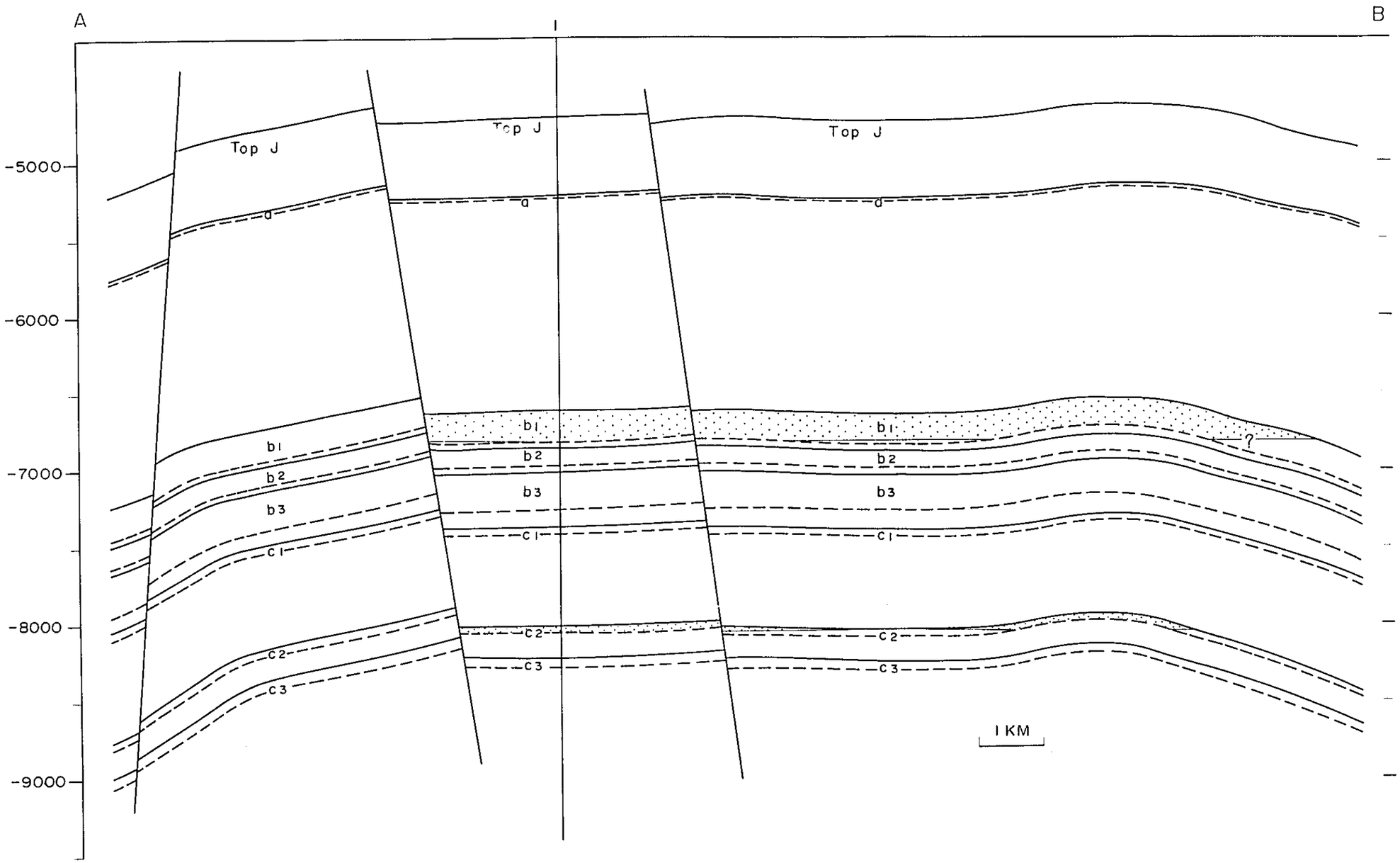


Fig. 8-2-2 STRUCTURAL CROSS-SECTION, BESAR FIELD
Vol. II

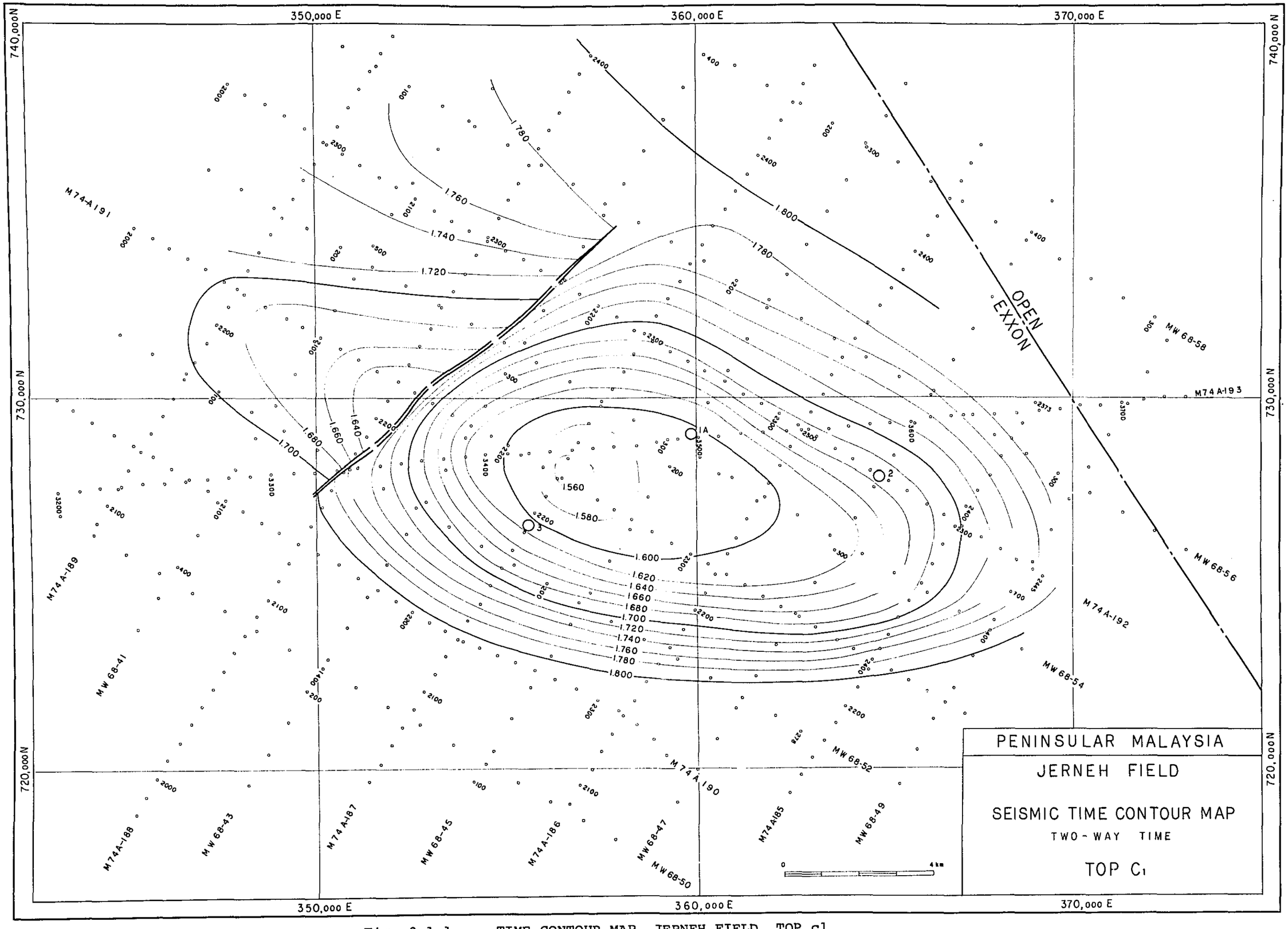


Fig. 9-1-1

Fig. 9-1-1 TIME CONTOUR MAP, JERNEH FIELD, TOP c1
Vol. II

Fig. 9-1-2

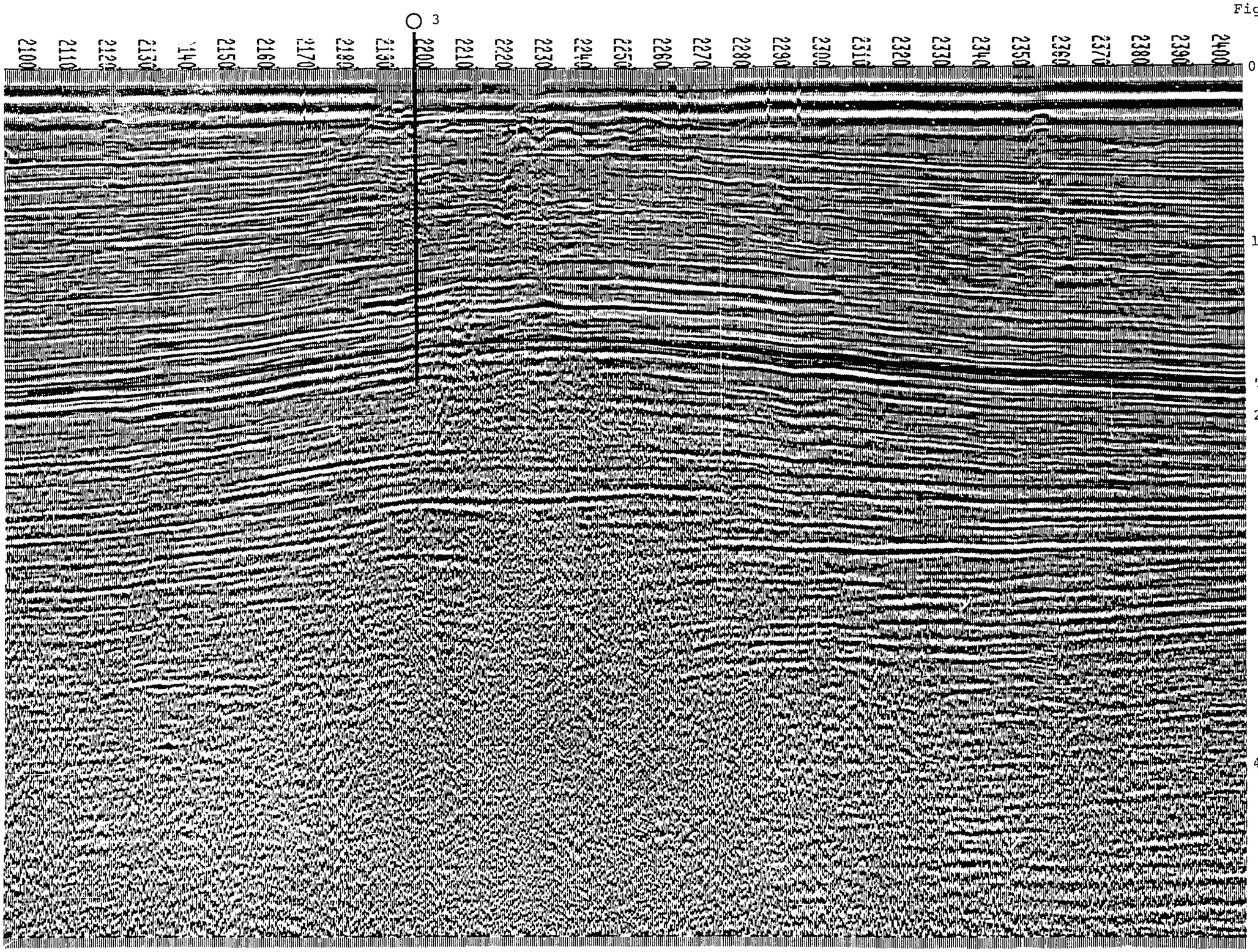


Fig. 9-1-2 SEISMIC SECTION, JERNEH FIELD, Line M74A187
Vol. II

Fig. 9-2-1

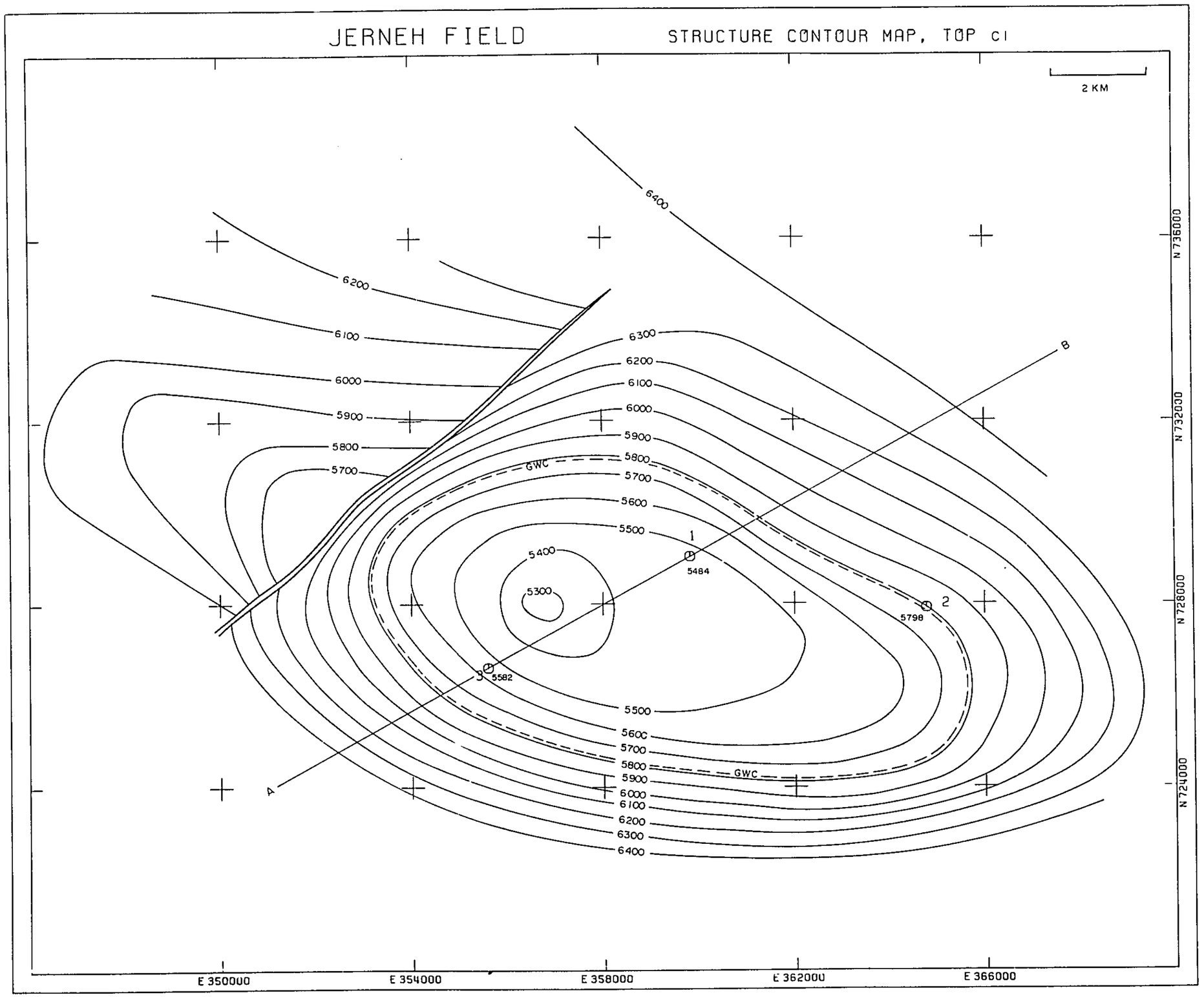


Fig. 9-2-1 STRUCTURE CONTOUR MAP, JERNEH FIELD, TOP c1
Vol. II

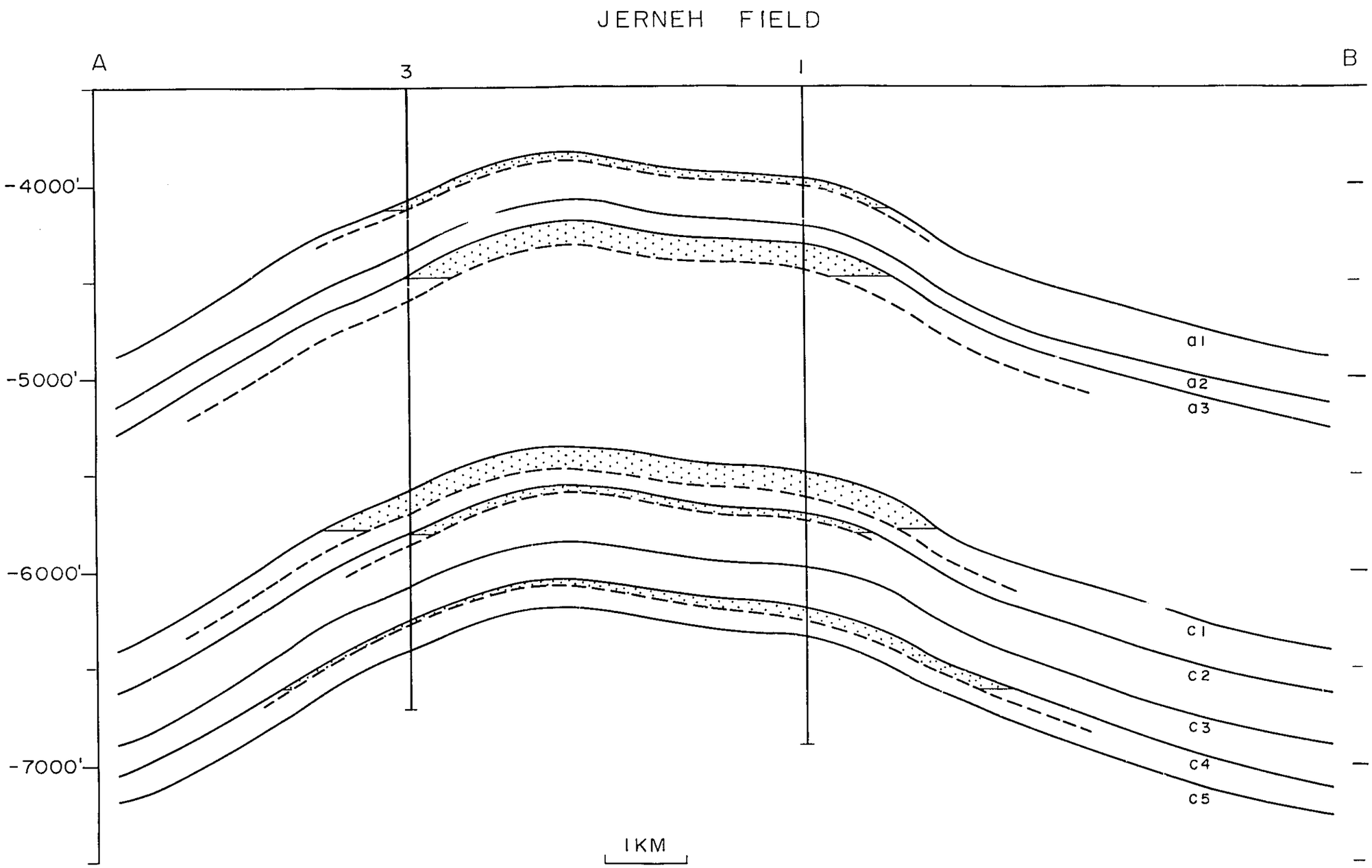


Fig. 9-2-2 STRUCTURAL CROSS-SECTION, JERNEH FIELD
Vol. II

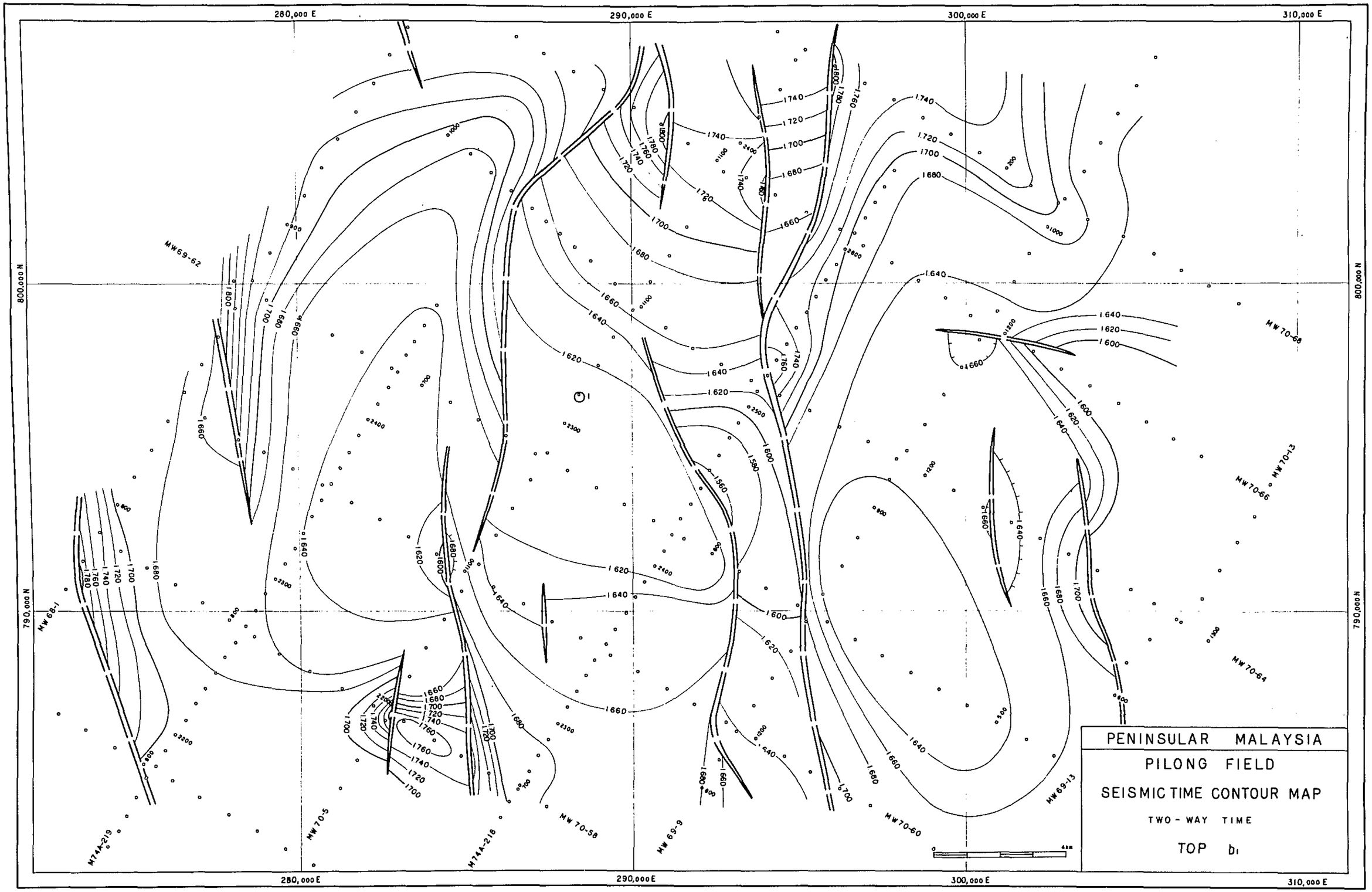


Fig. 10-1-1 TIME CONTOUR MAP, PILONG FIELD, TOP b1
Vol. II

Fig. 10-1-2

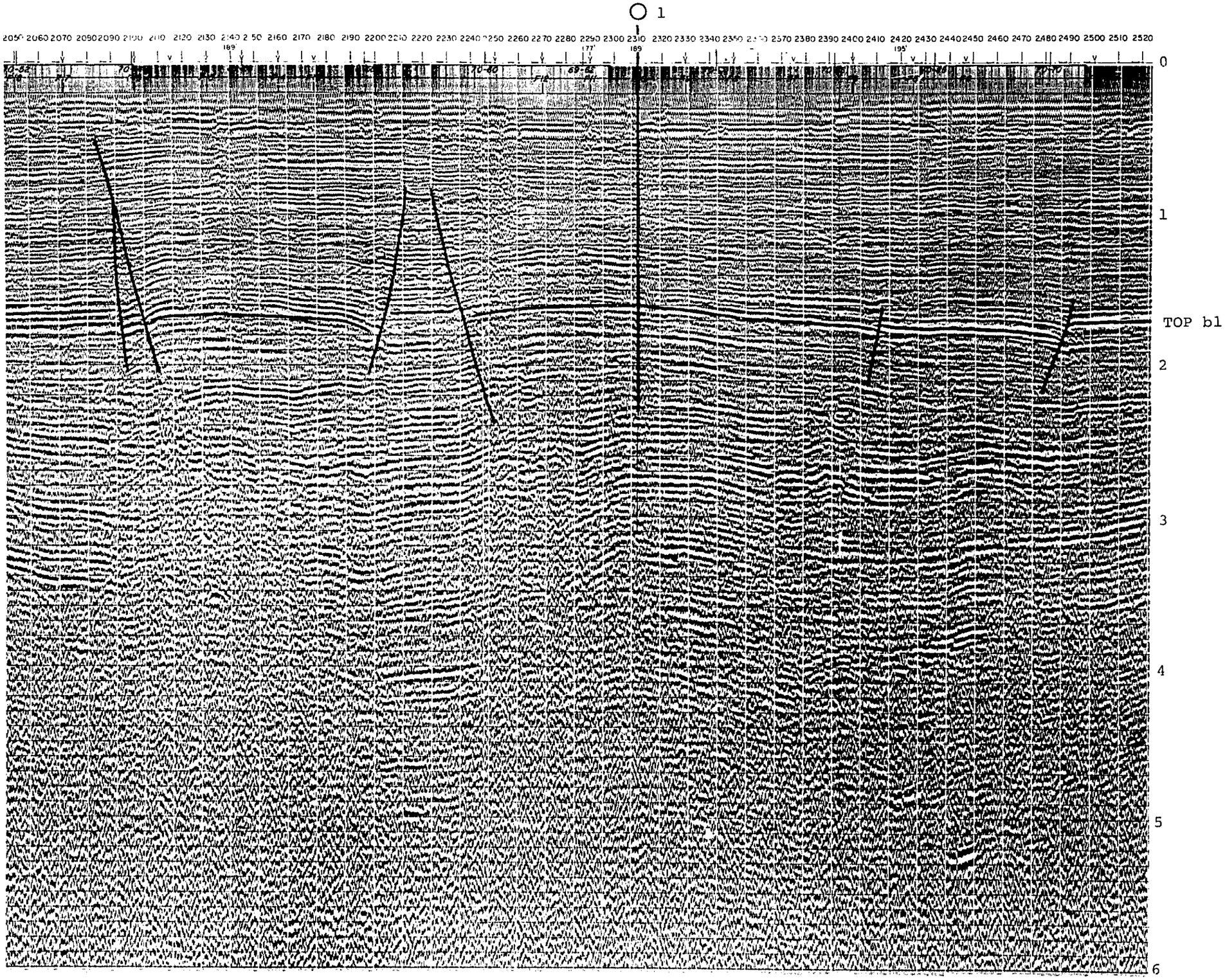


Fig. 10-1-2 SEISMIC SECTION, PILONG FIELD, Line MW70-5
Vol. II

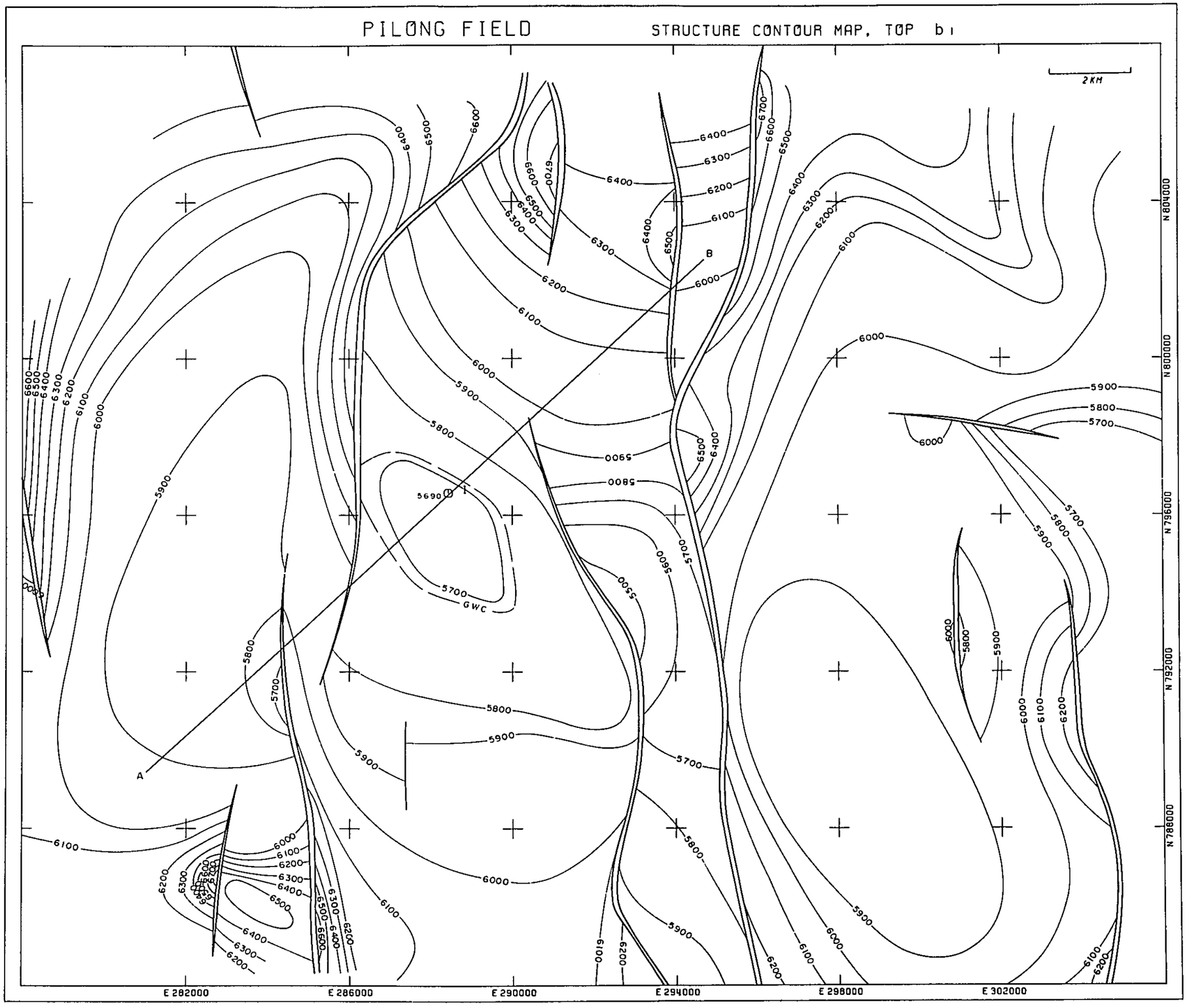


Fig. 10-2-1 STRUCTURE CONTOUR MAP, PILONG FIELD, TOP b1
Vol. II

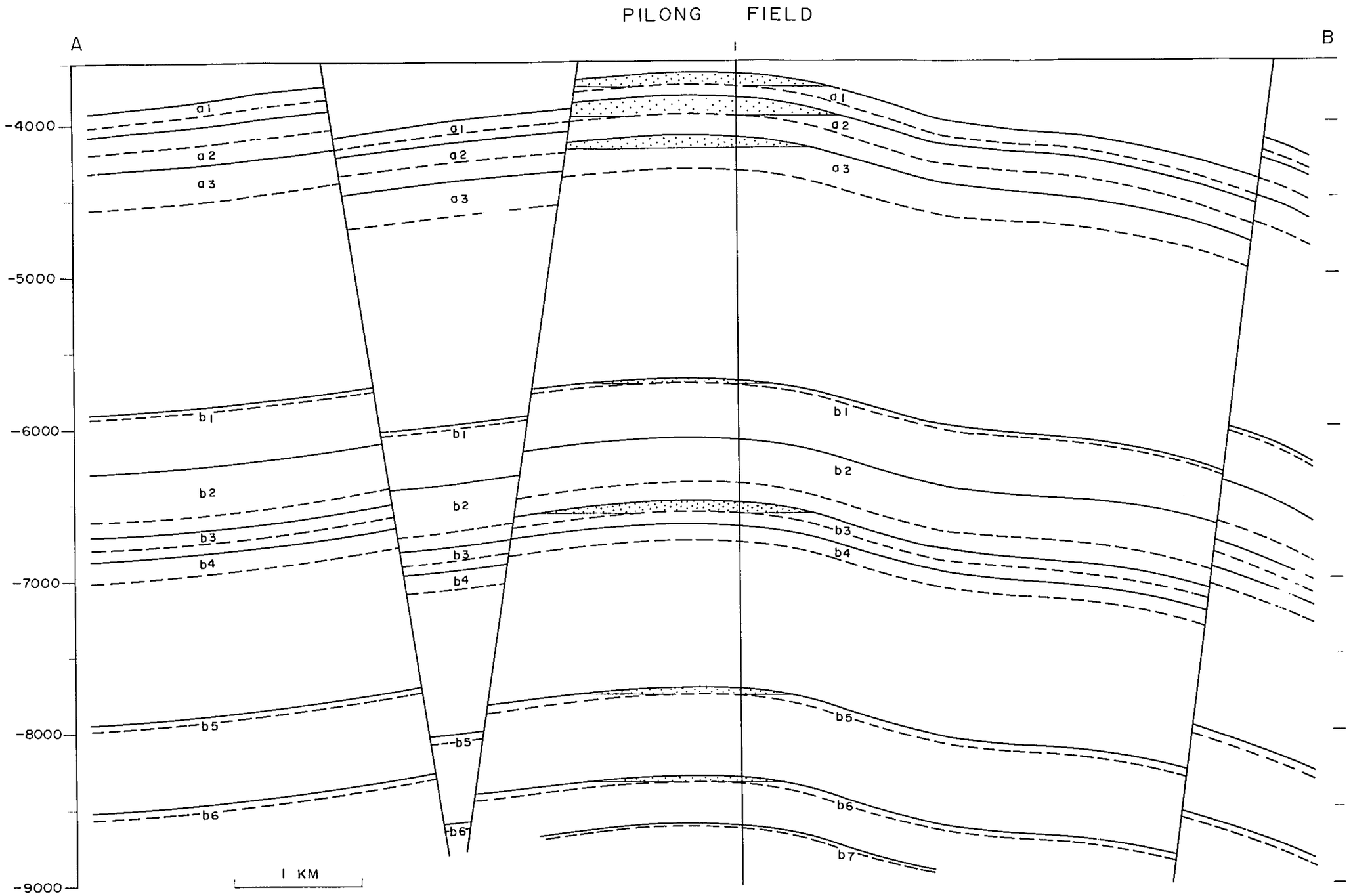


Fig. 10-2-2 STRUCTURAL CROSS-SECTION, PILONG FIELD
Vol. II

Fig, 11-1-1

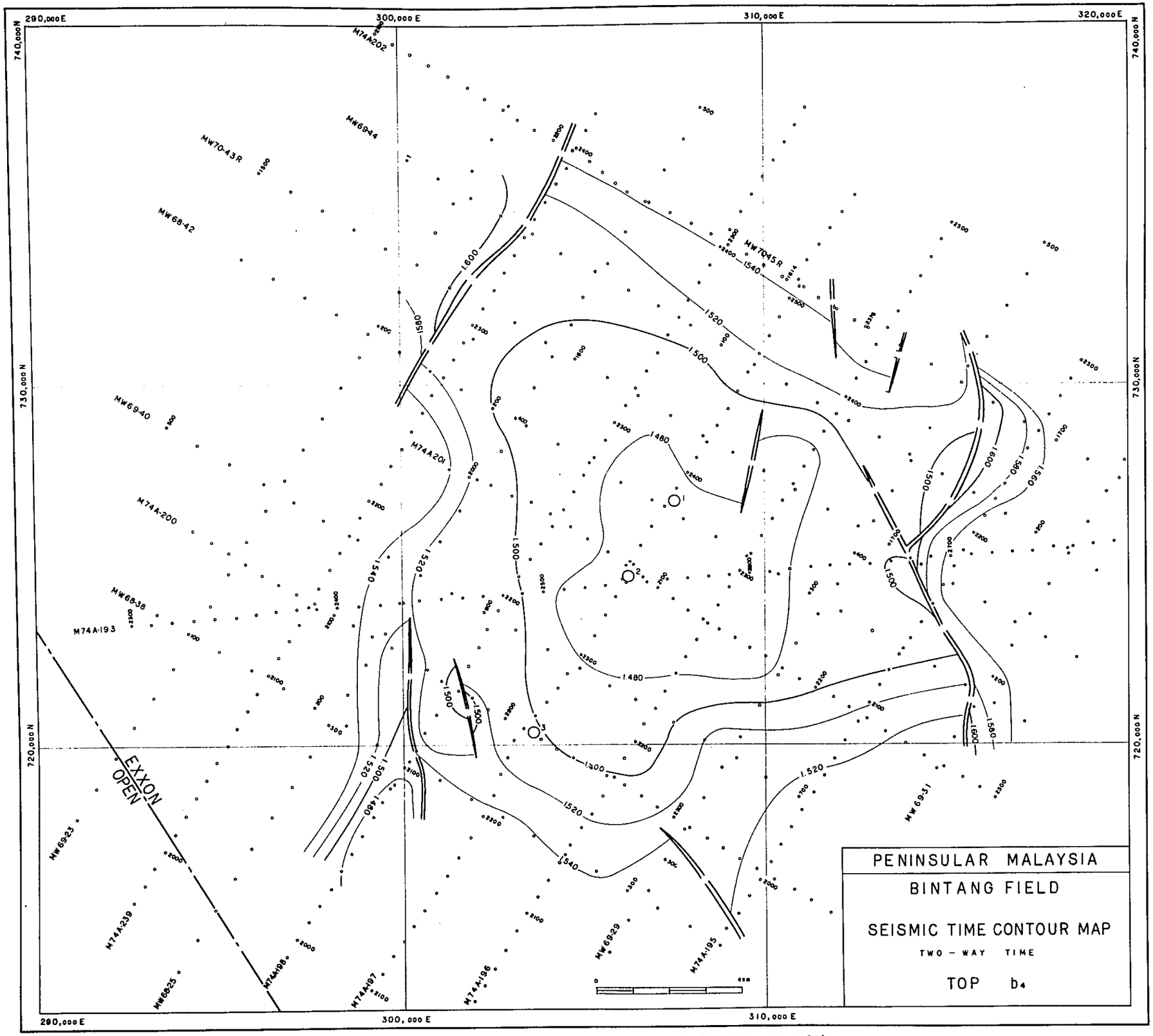


Fig. 11-1-1 TIME CONTOUR MAP, BINTANG FIELD, TOP b4
Vol. II

Fig. 11-1-2

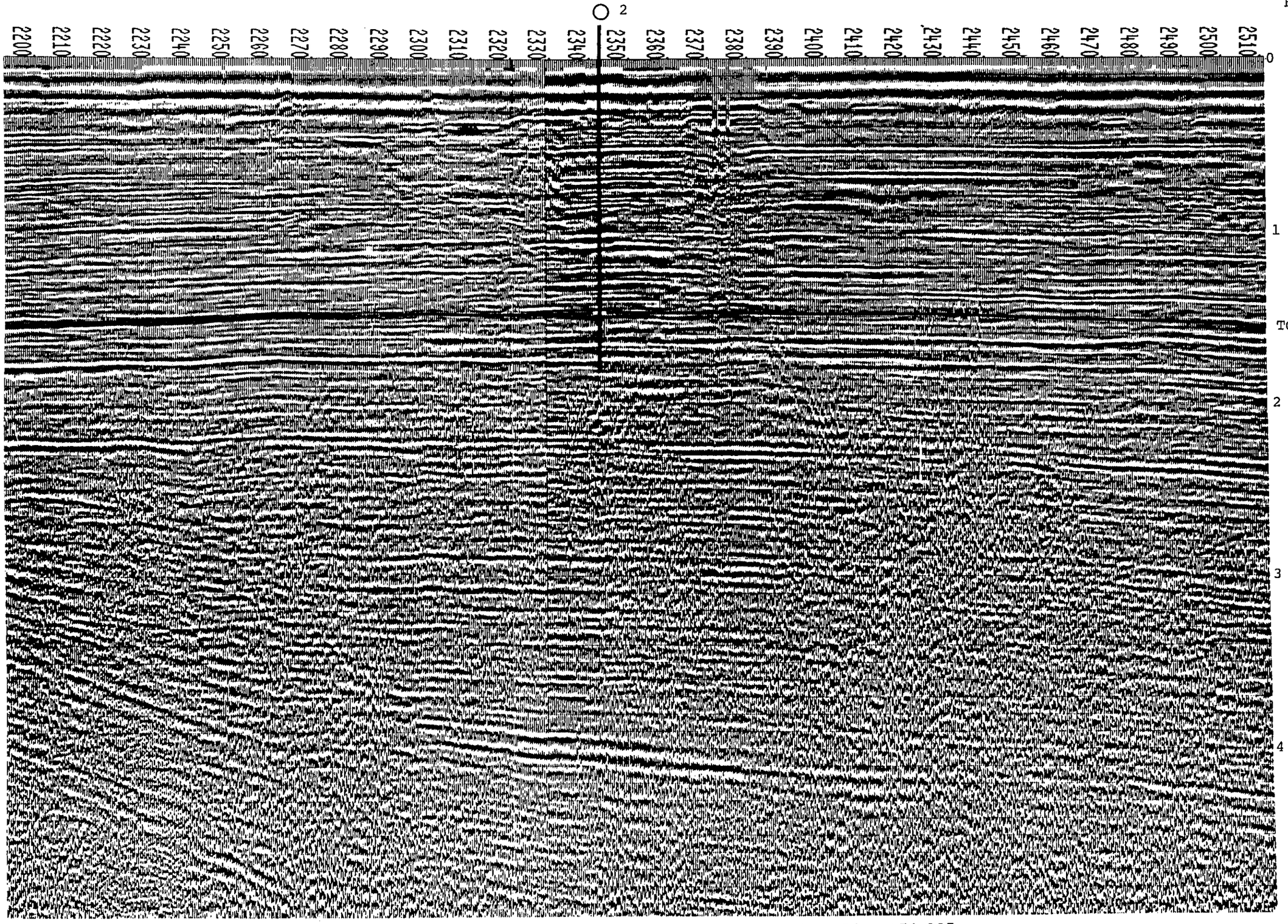


Fig. 11-1-2 SEISMIC SECTION, BINTANG FIELD, Line M74A197
Vol. II

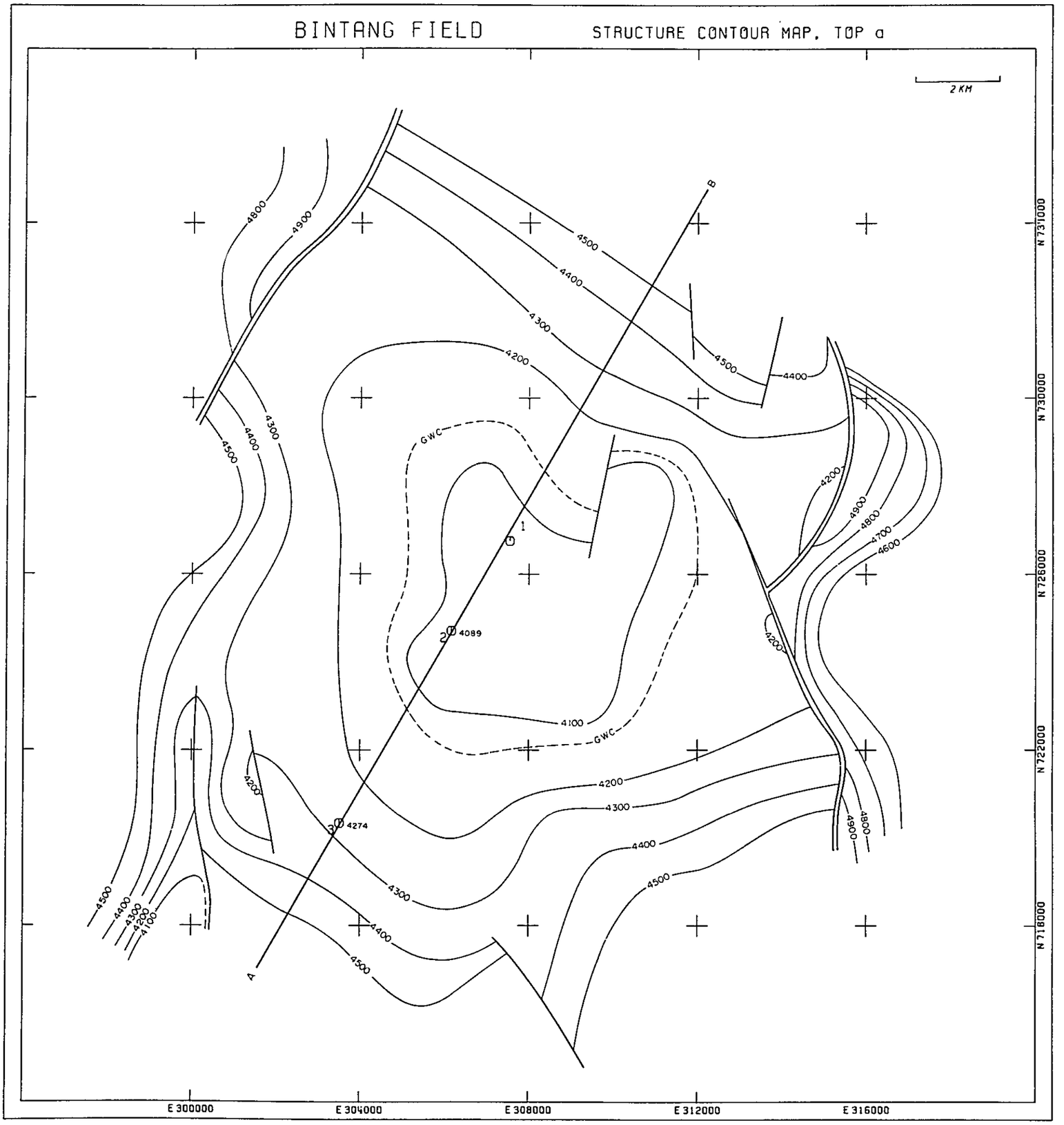


Fig. 11-2-1 STRUCTURE CONTOUR MAP, BINTANG FIELD, TOP a
Vol. II

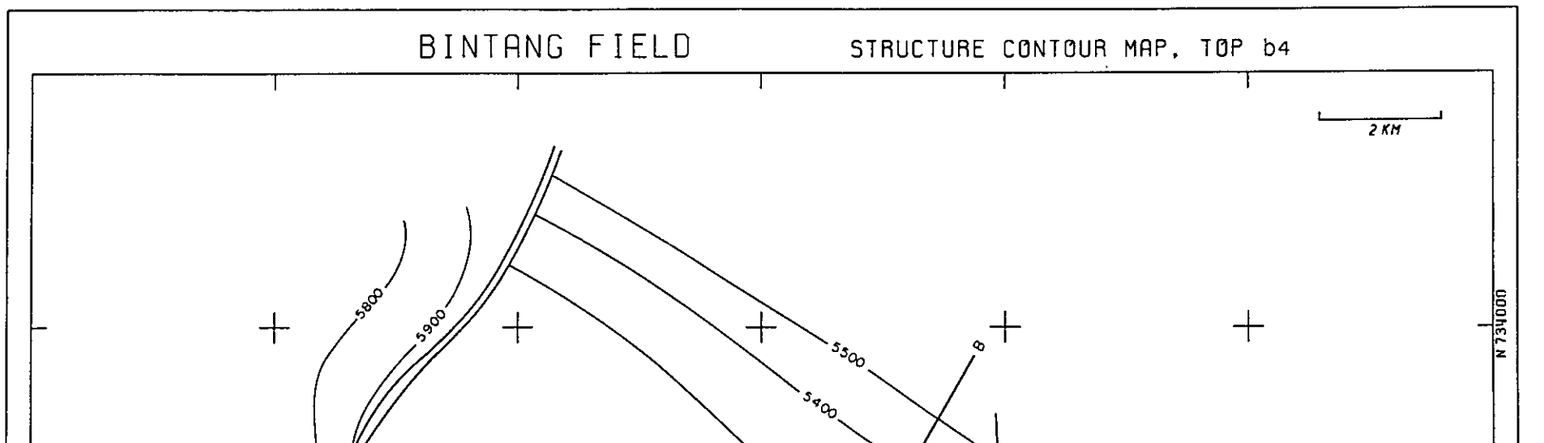


Fig. 11-2-2 STRUCTURE CONTOUR MAP, BINTANG FIELD, TOP b4
Vol. II

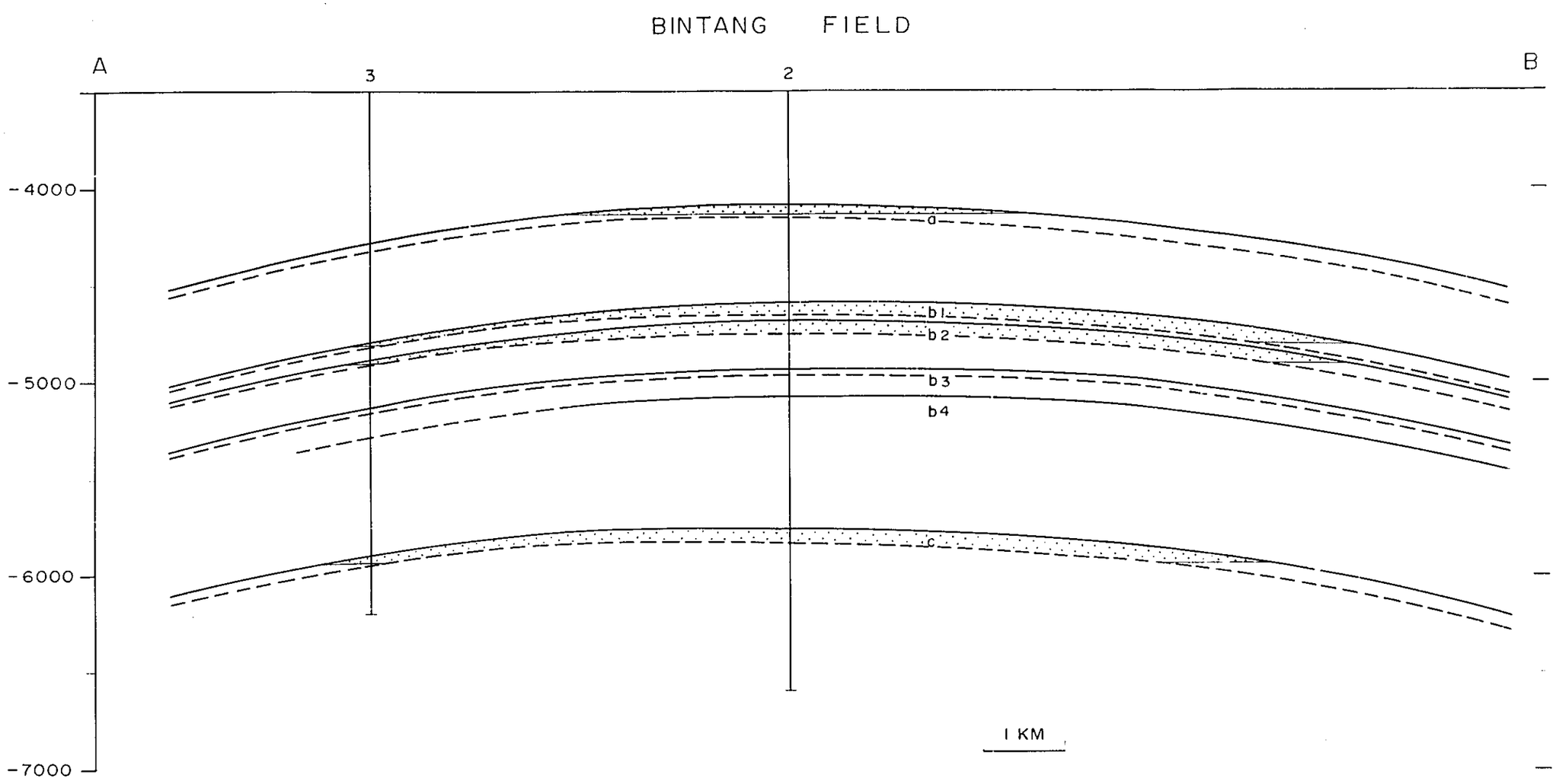


Fig. 11-2-3 STRUCTURAL CROSS-SECTION, BINTANG FIELD
Vol. II

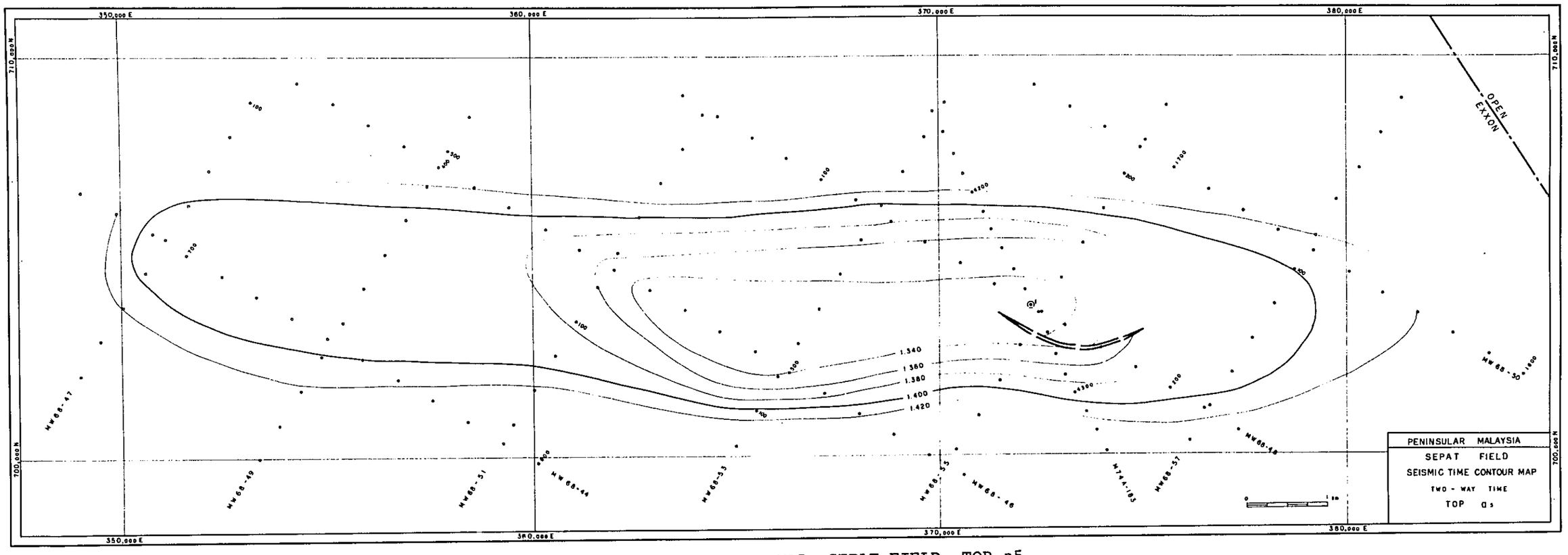


Fig. 12-1-1 TIME CONTOUR MAP, SEPAT FIELD, TOP a5
Vol. II

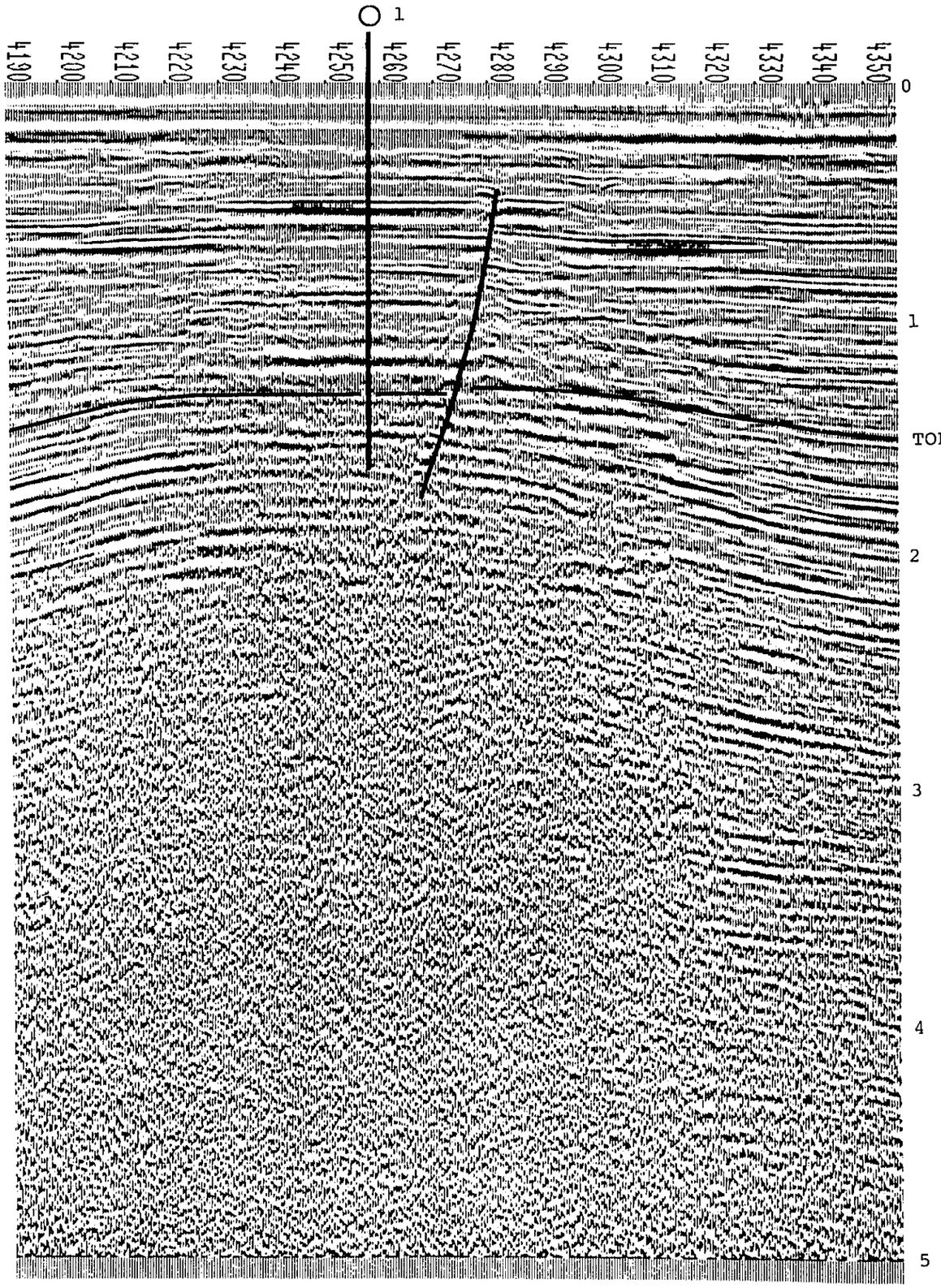


Fig. 12-1-2

Fig. 12-1-2 SEISMIC SECTION, SEPAT FIELD, Line M74A183
Vol. II

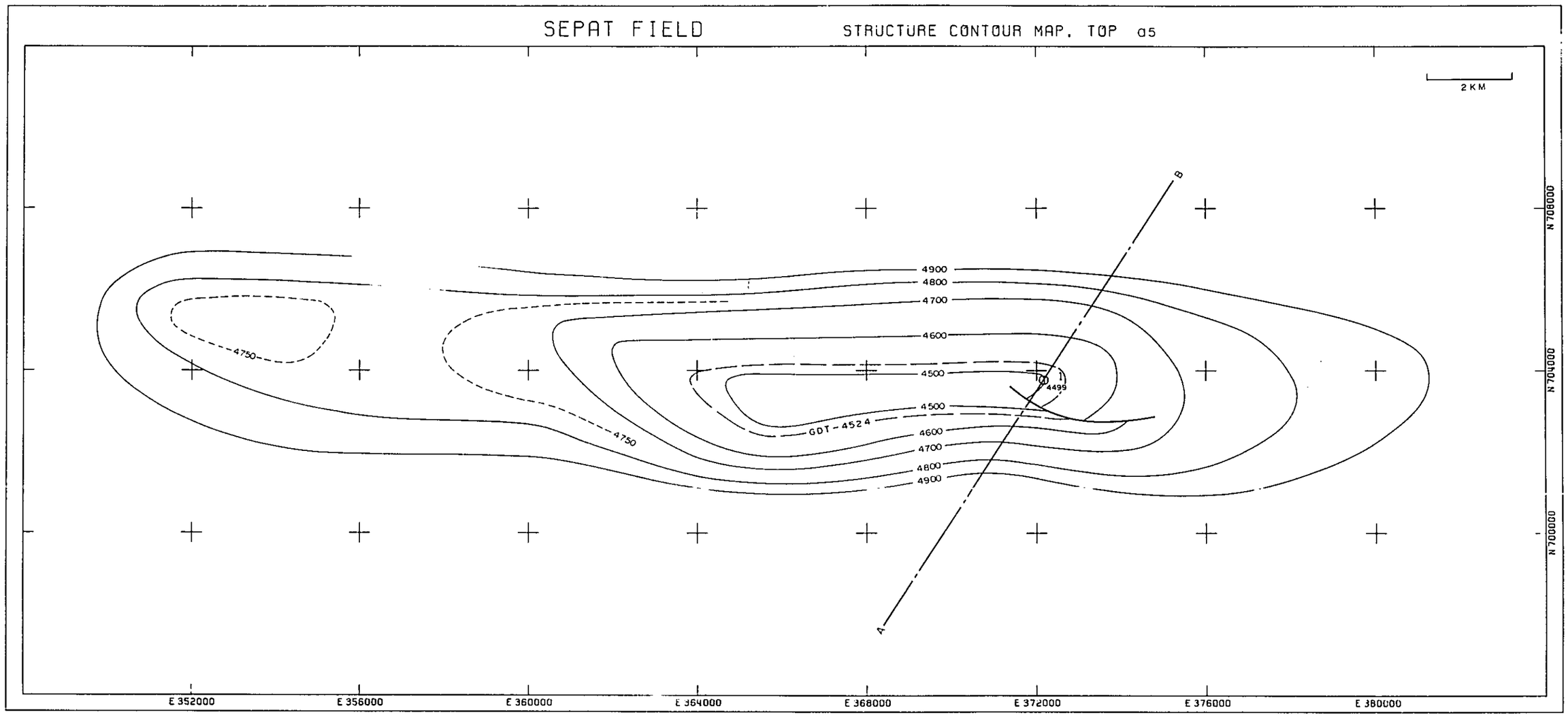


Fig. 12-2-1 STRUCTURE CONTOUR MAP, SEPAT FIELD, TOP a5
Vol. II

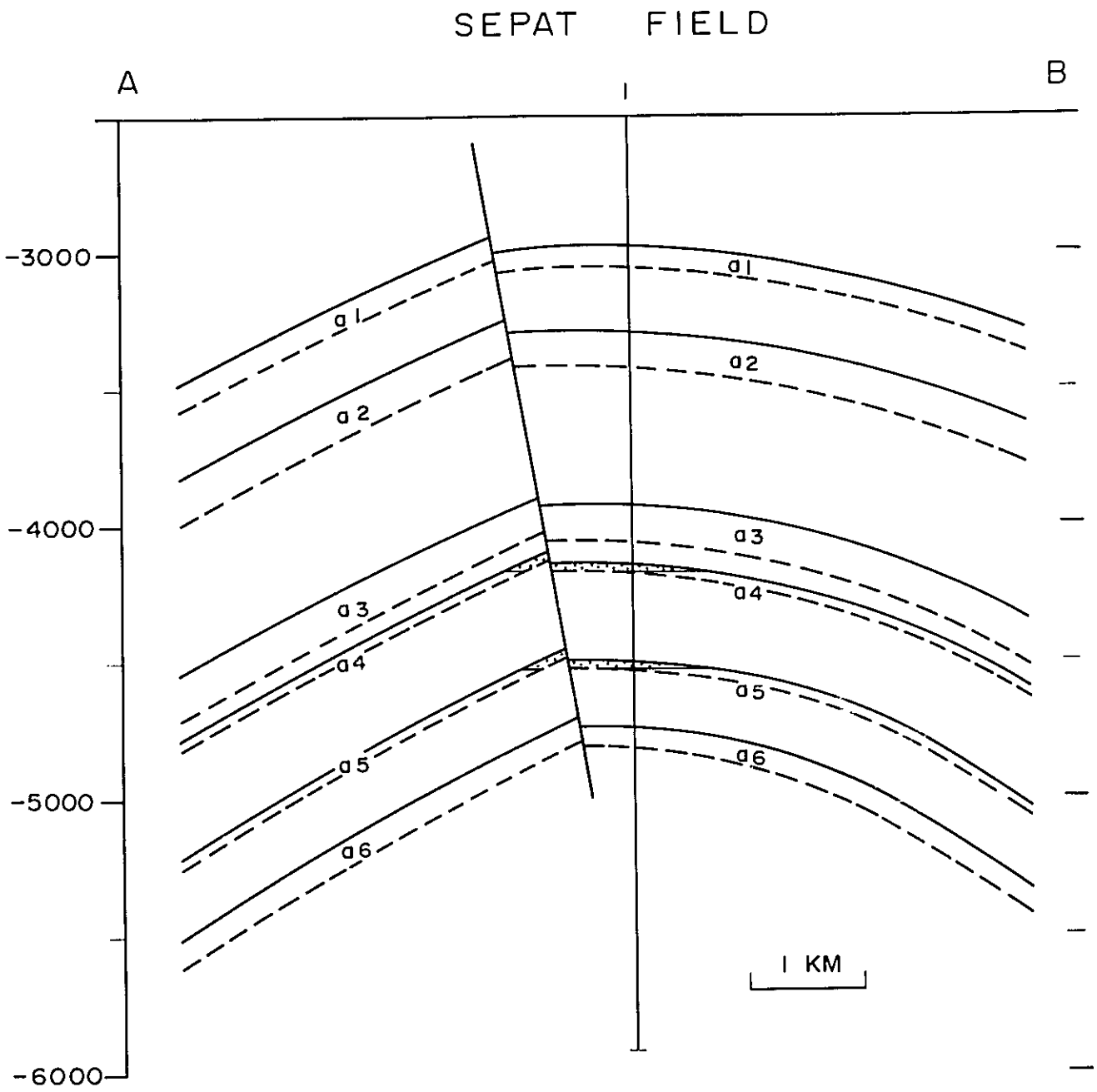


Fig. 12-2-2 STRUCTURAL CROSS-SECTION, SEPAT FIELD
Vol. II

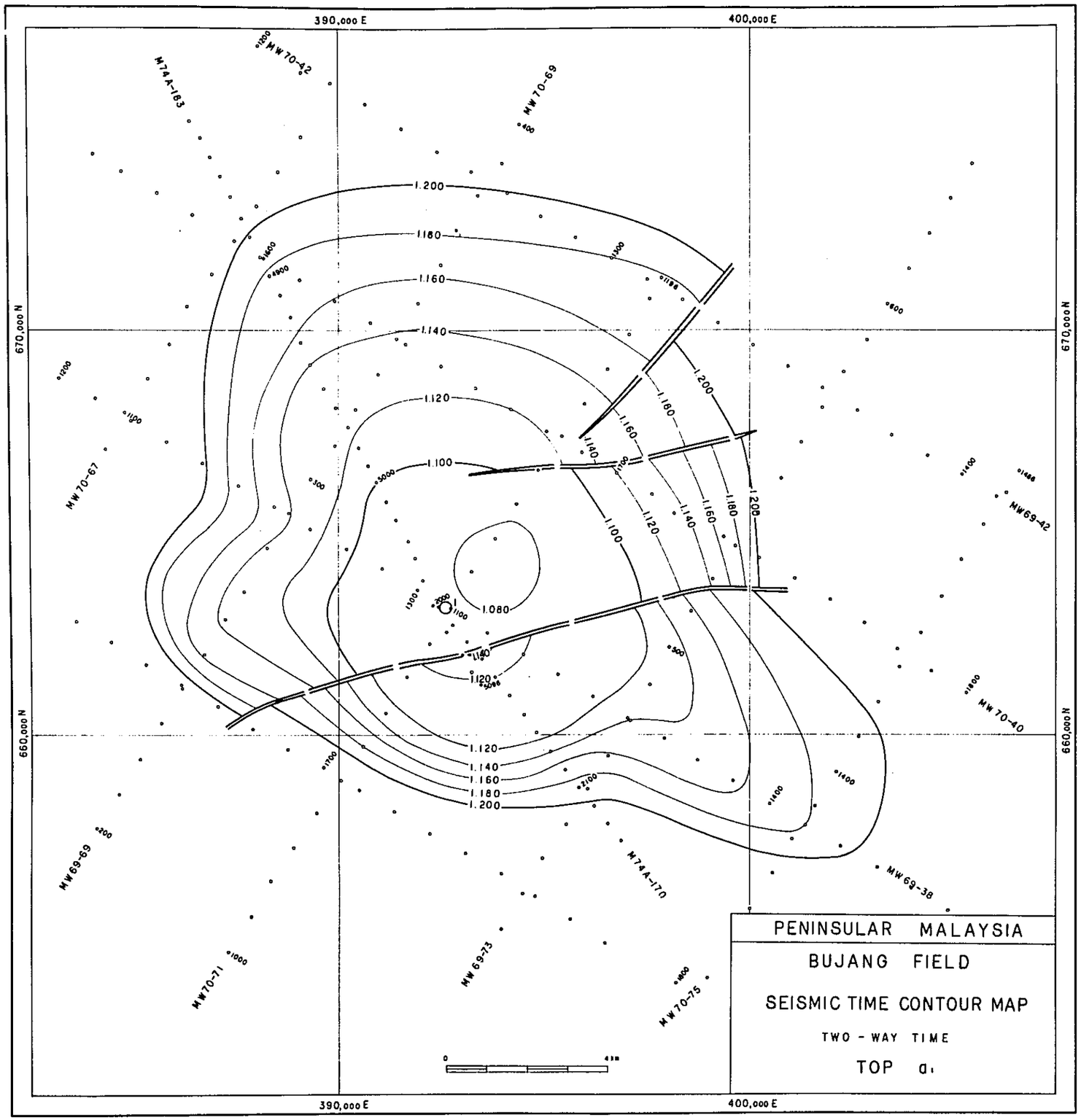


Fig. 13-1-1 TIME CONTOUR MAP, BUJANG FIELD, TOP a1
Vol. II

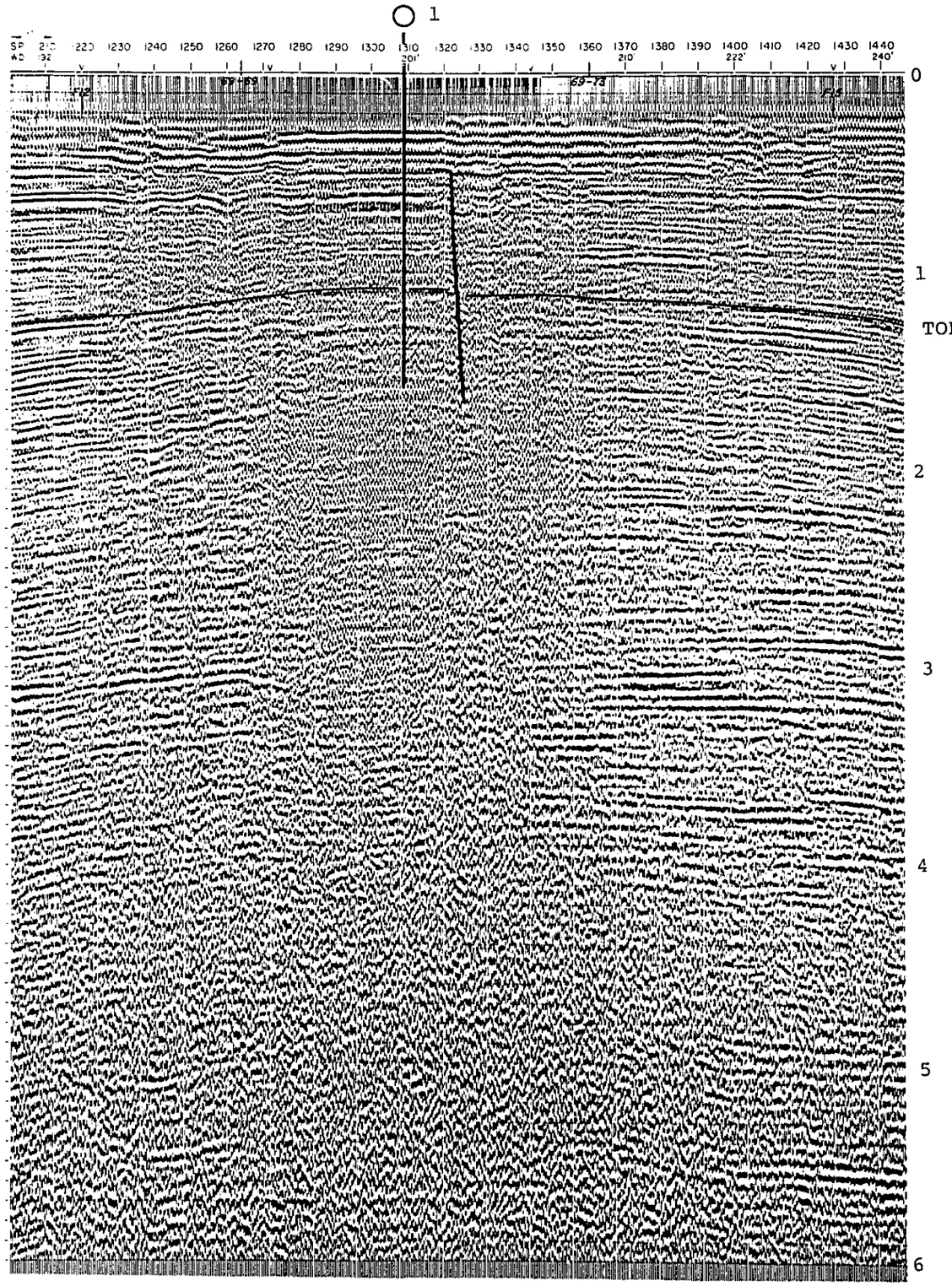


Fig. 13-1-2

Fig. 13-1-2 SEISMIC SECTION, BUJANG FIELD, Line MW69-38
Vol. II

Fig. 13-2-1

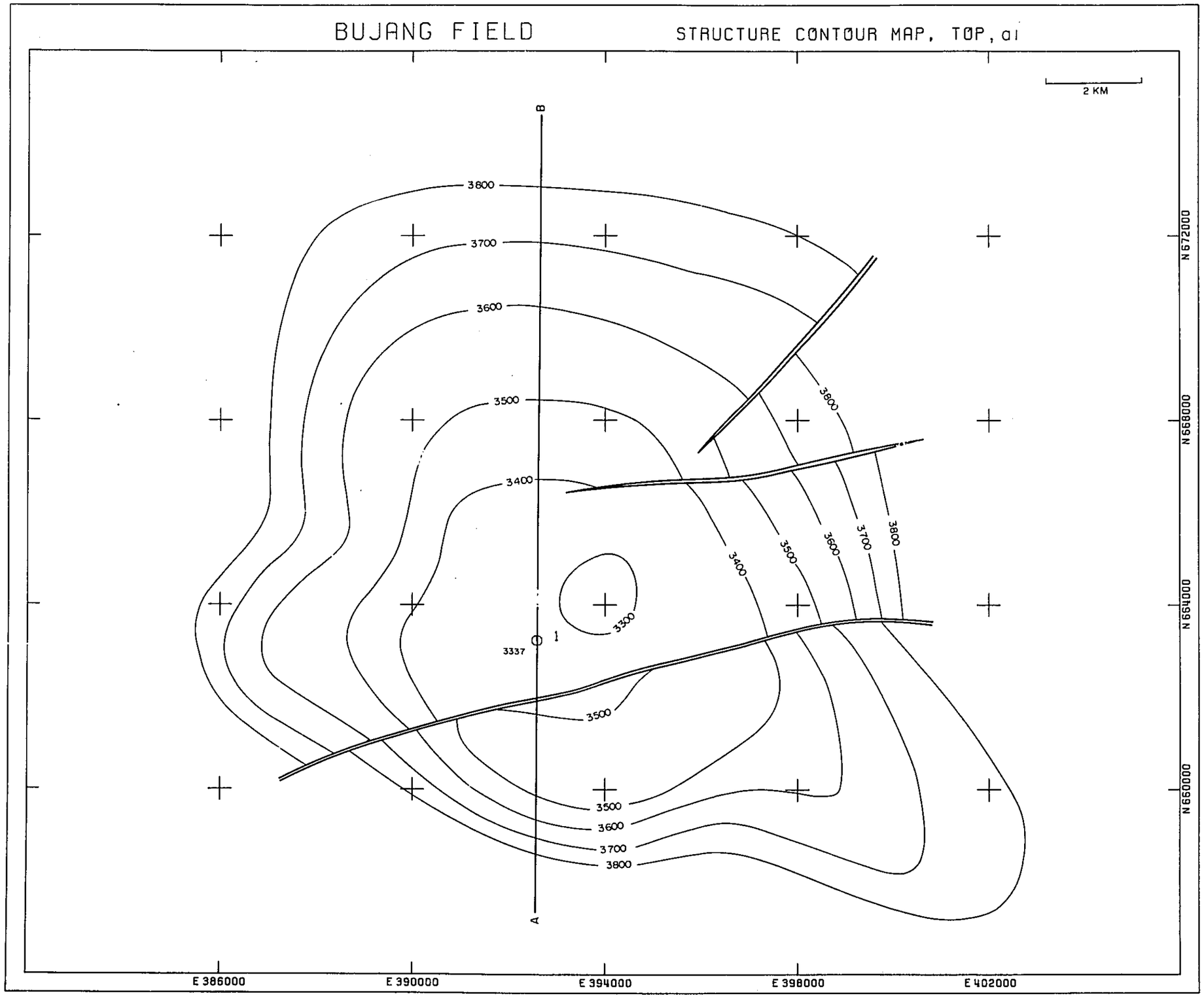


Fig. 13-2-1 STRUCTURE CONTOUR MAP, BUJANG FIELD, TOP a1
Vol. II

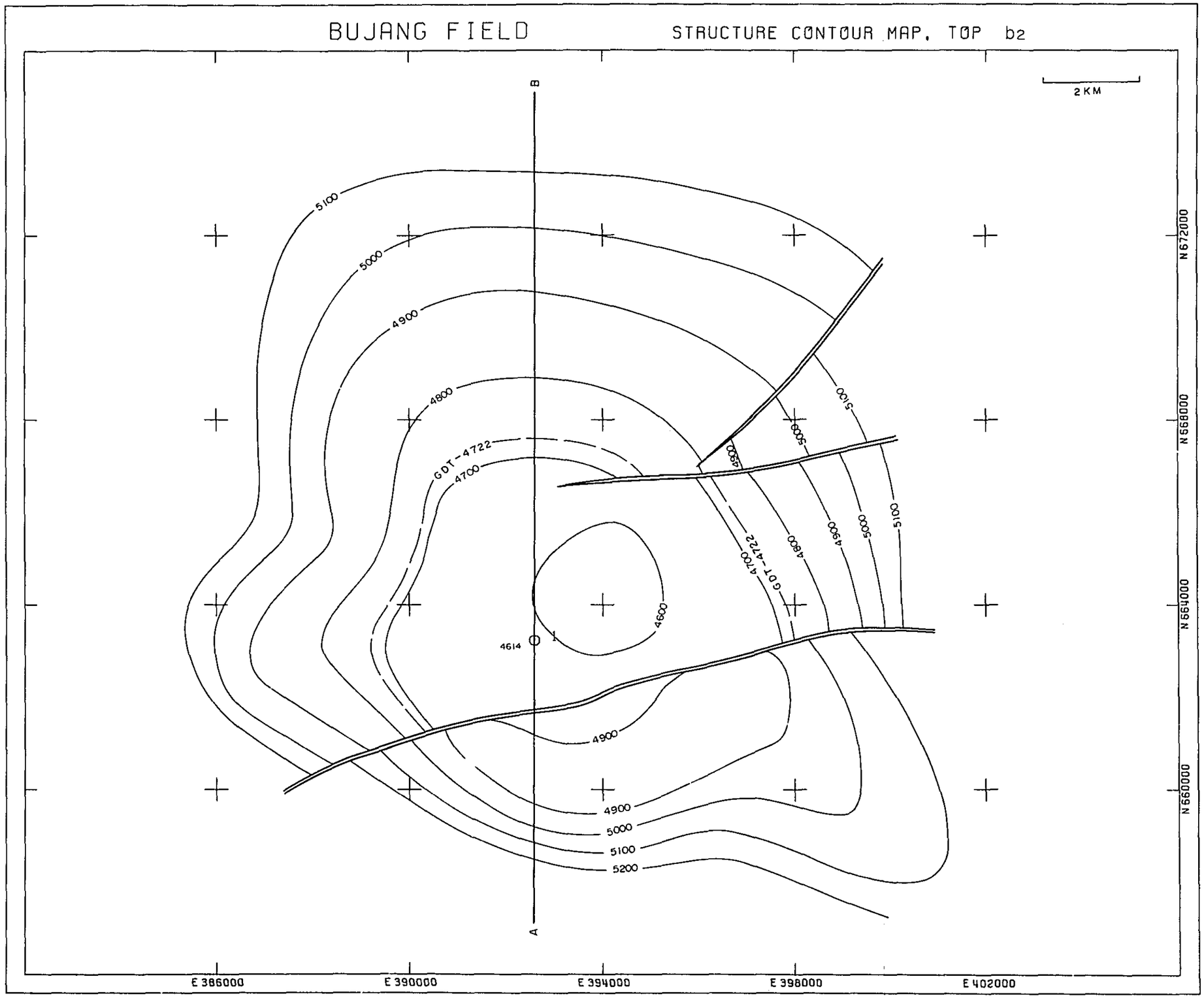


Fig. 13-2-2 STRUCTURE CONTOU MAP, BUJANG FIELD, TOP b2
Vol. II

BUJANG FIELD

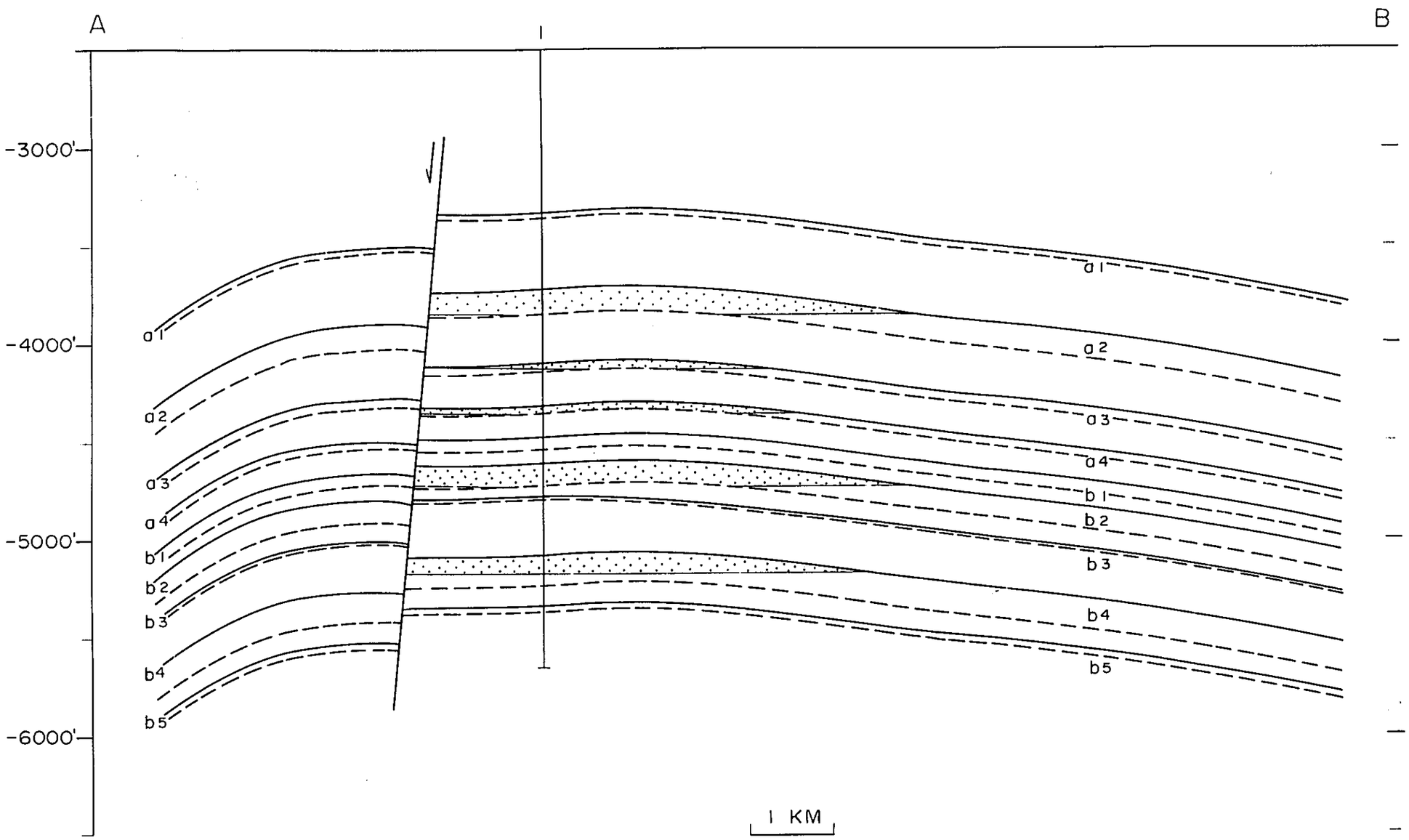


Fig. 13-2-3 STRUCTURAL CROSS-SECTION, BUJANG FIELD
Vol. II

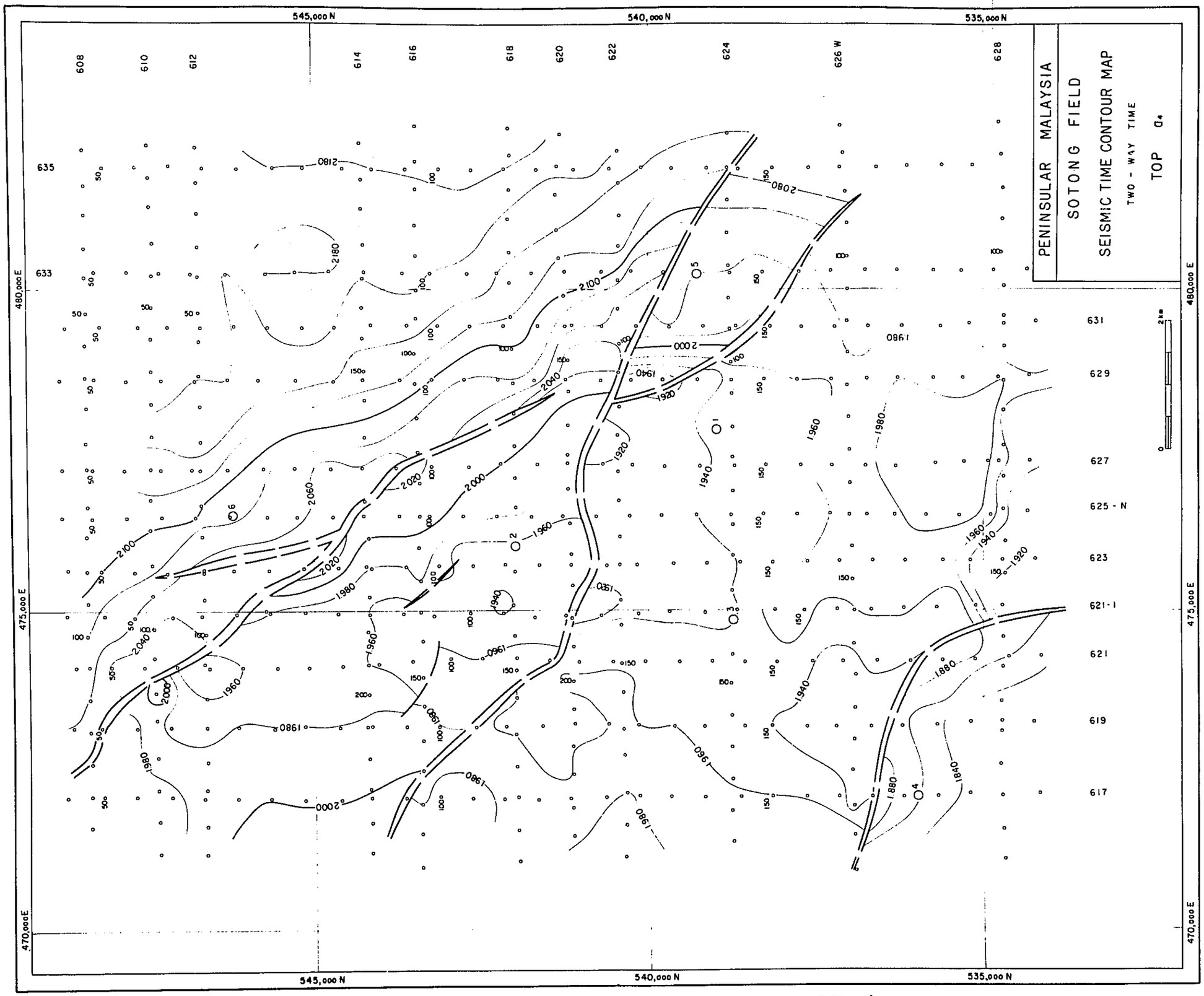


Fig. 14-1-1

Fig. 14-1-1 TIME CONTOUR MAP, SOTONG FIELD, TOP a4
Vol. II

Fig. 14-1-2

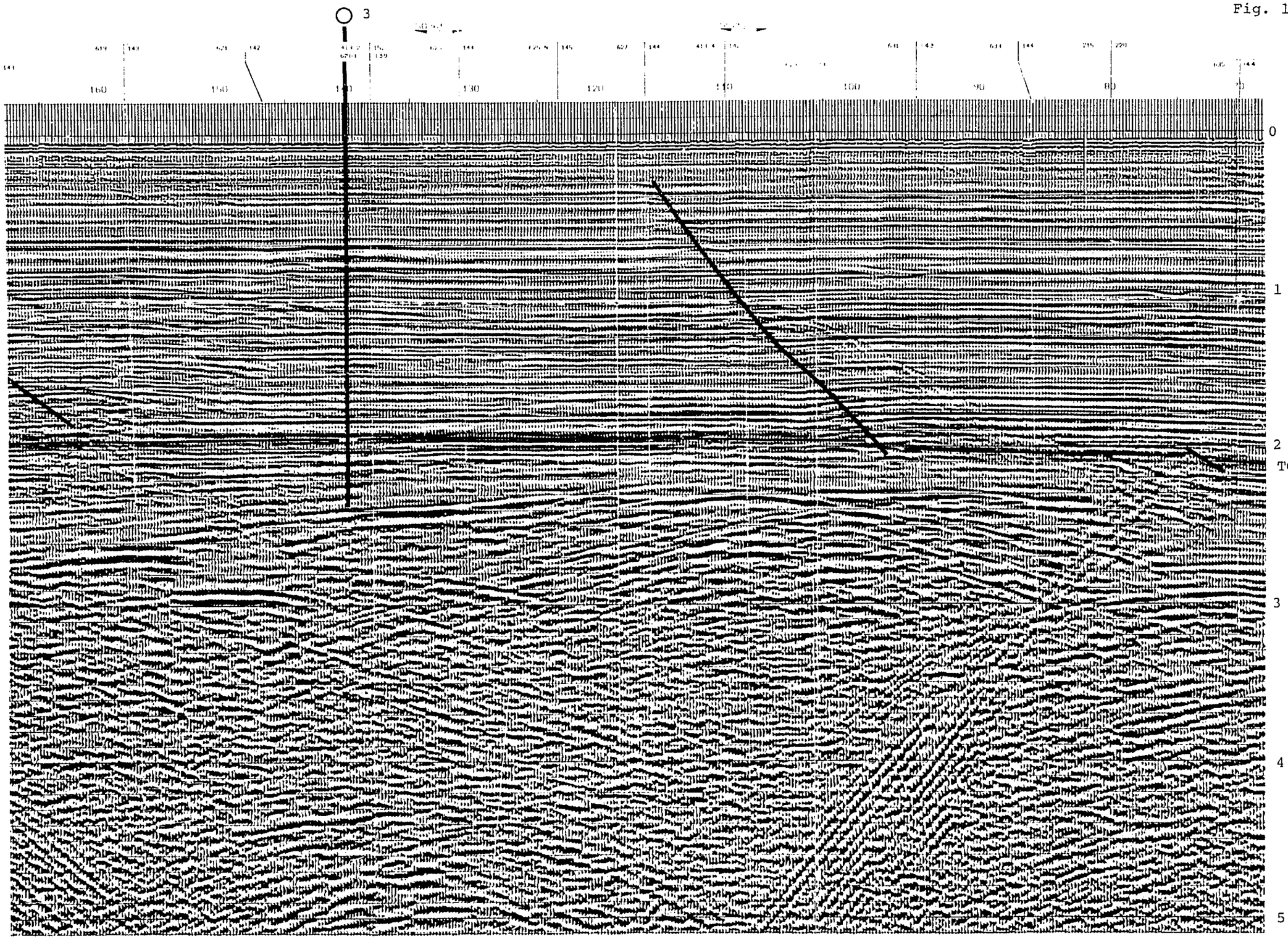


Fig. 14-1-2 SEISMIC SECTION, SOTONG FIELD, Line 624
Vol. II

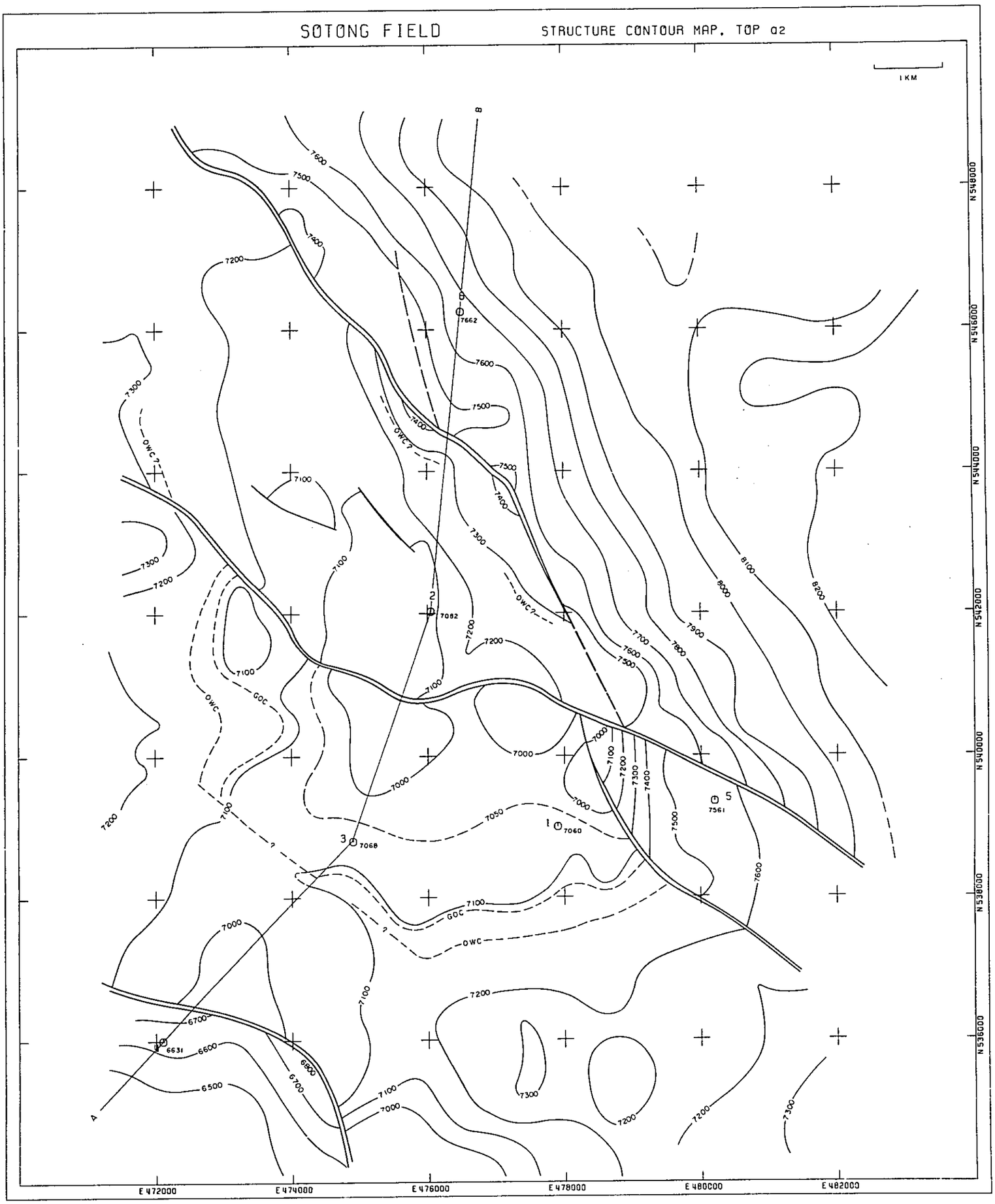
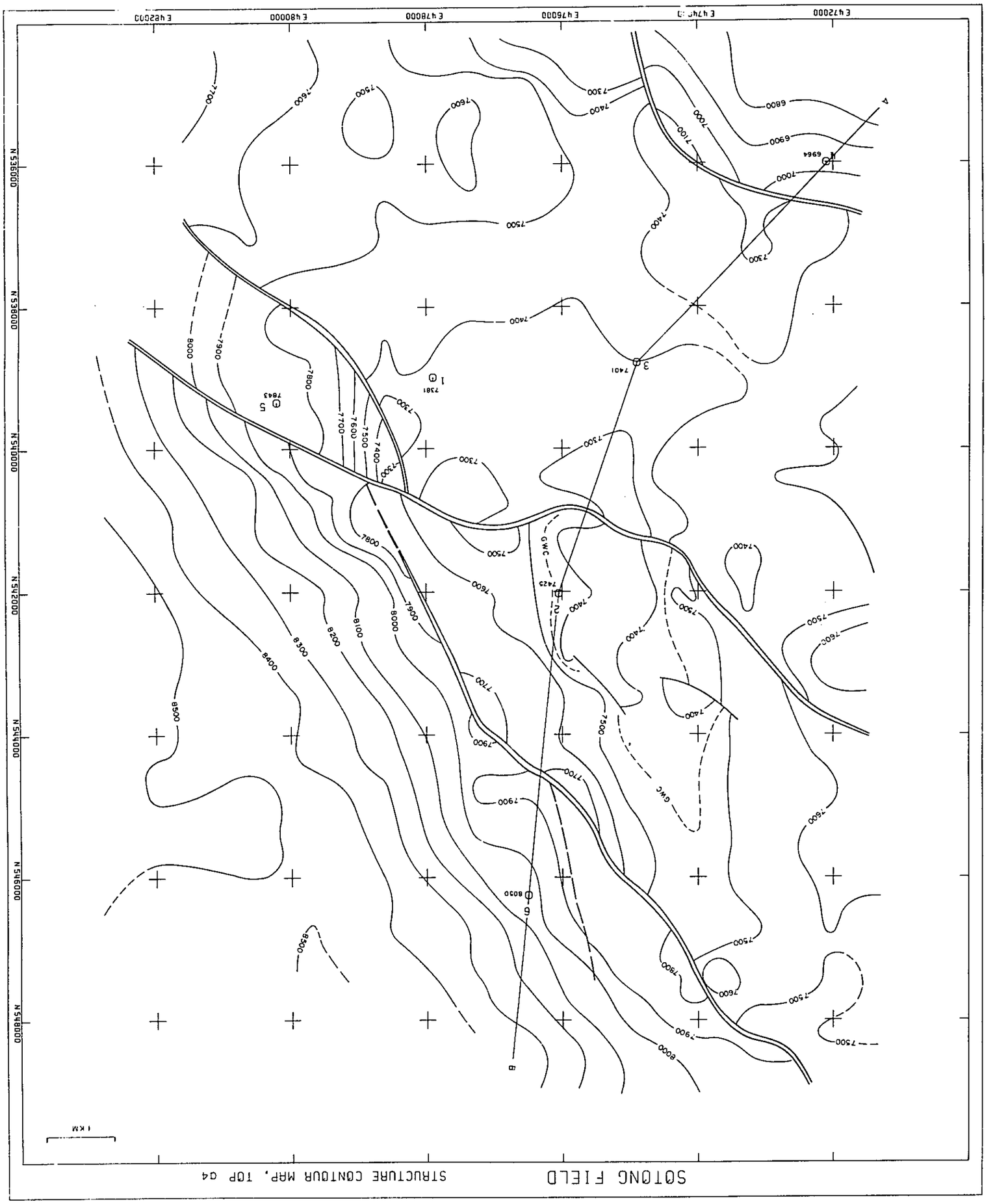


Fig. 14-2-1 STRUCTURE CONTOUR MAP, SOTONG FIELD, TOP a2
Vol. II

Fig. 14-2-2 STRUCTURE CONTOUR MAP, SOTONG FIELD, TOP a4
Vol. II



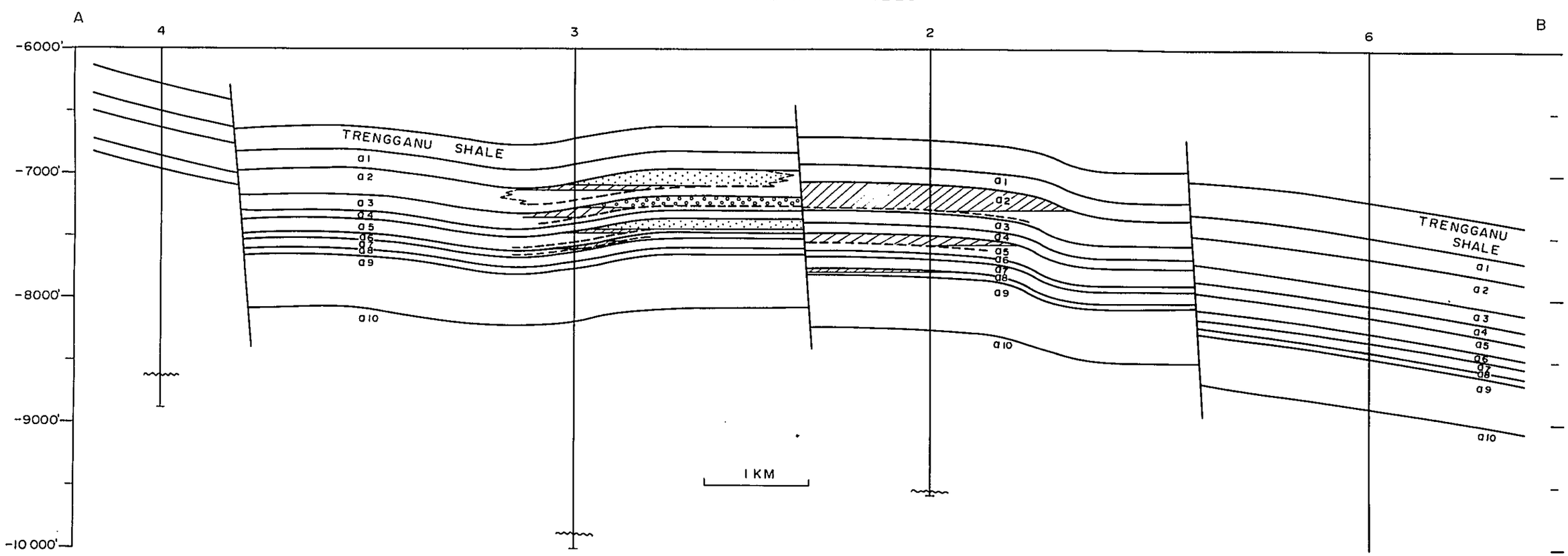


Fig. 14-2-3 STRUCTURAL CROSS-SECTION, SOTONG FIELD
Vol. II

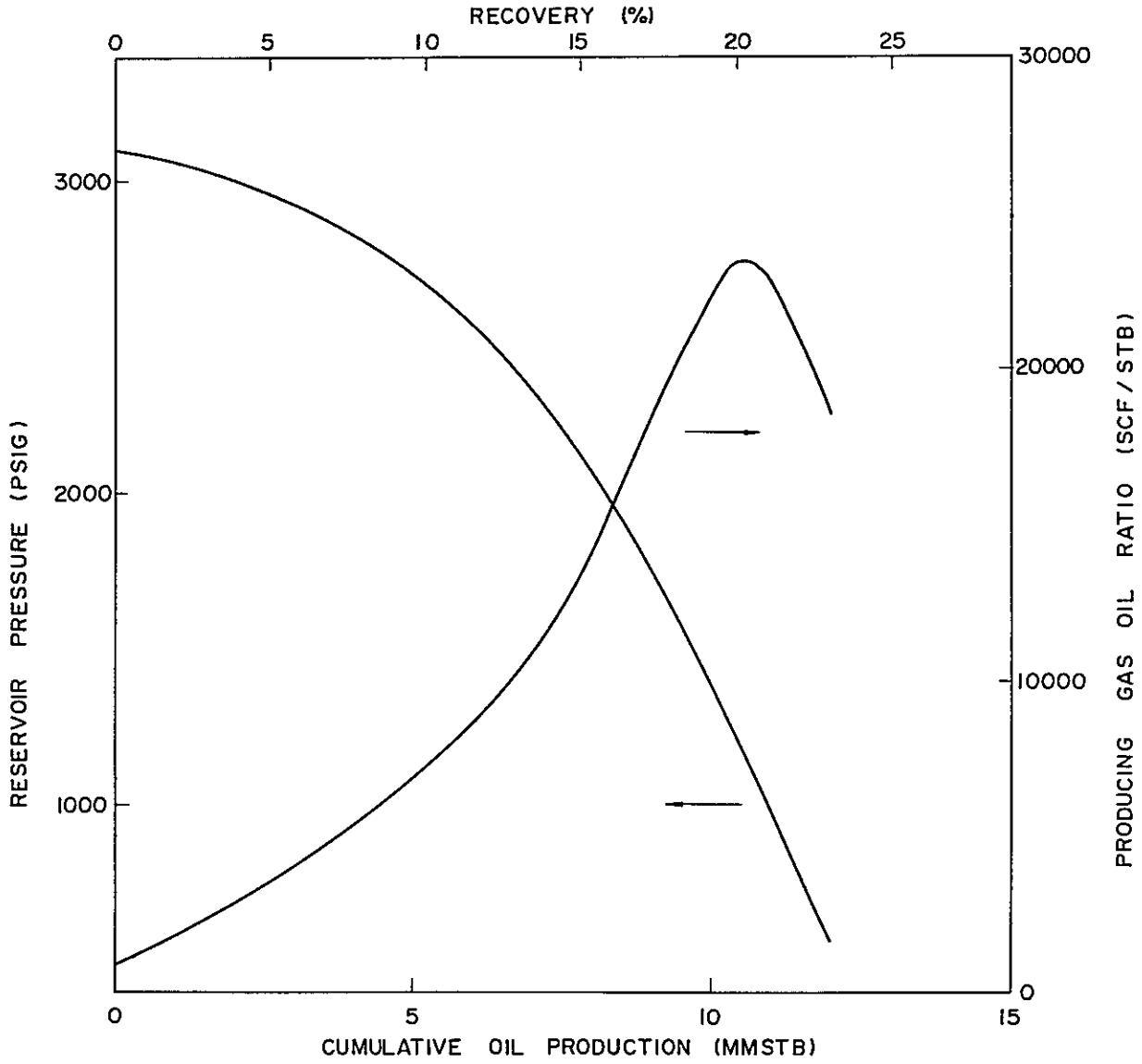


Fig. 14-3-1
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF a2 (A-BLOCK) ZONE, SOTONG FIELD

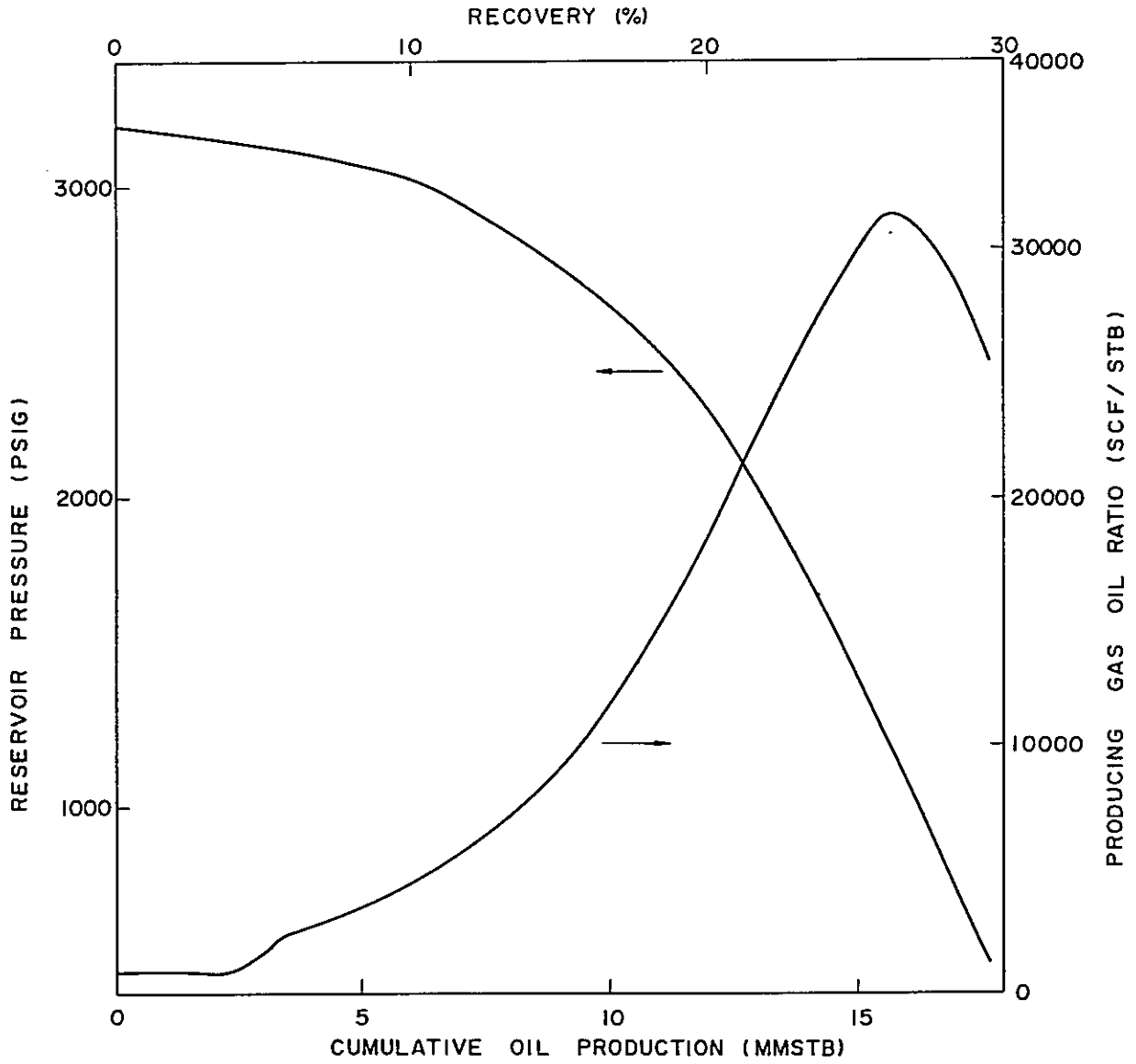


Fig. 14-3-2 Vol. II CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OS A, B, C-BLCOK (CASE 1), SOTONG FIELD

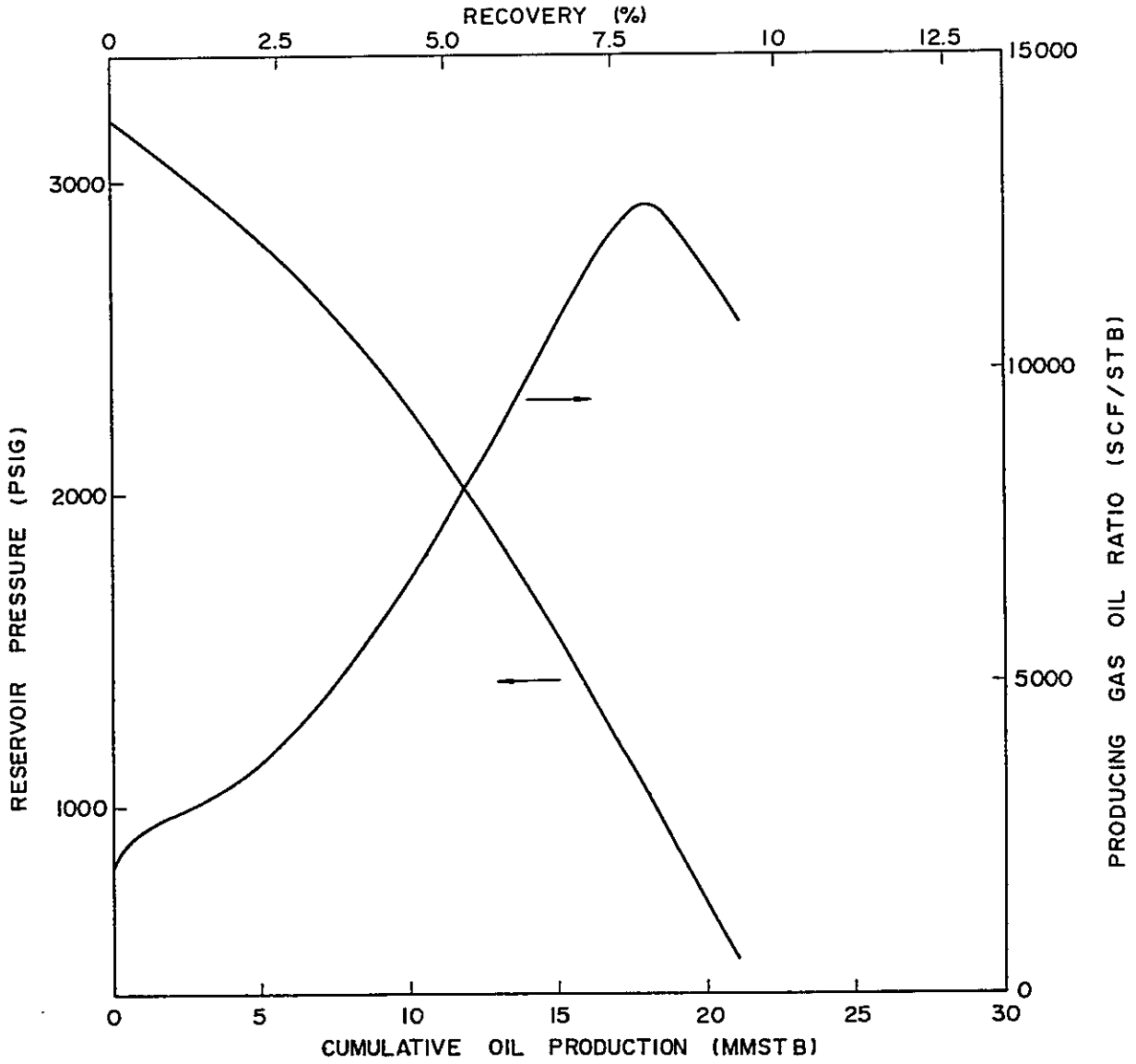


Fig. 14-3-3
Vol. II

CUMULATIVE OIL PRODUCTION VS. RESERVOIR PRESSURE AND PRODUCING GAS OIL RATIO OF A, B, C-BLOCK (CASE 2), SOTONG FIELD

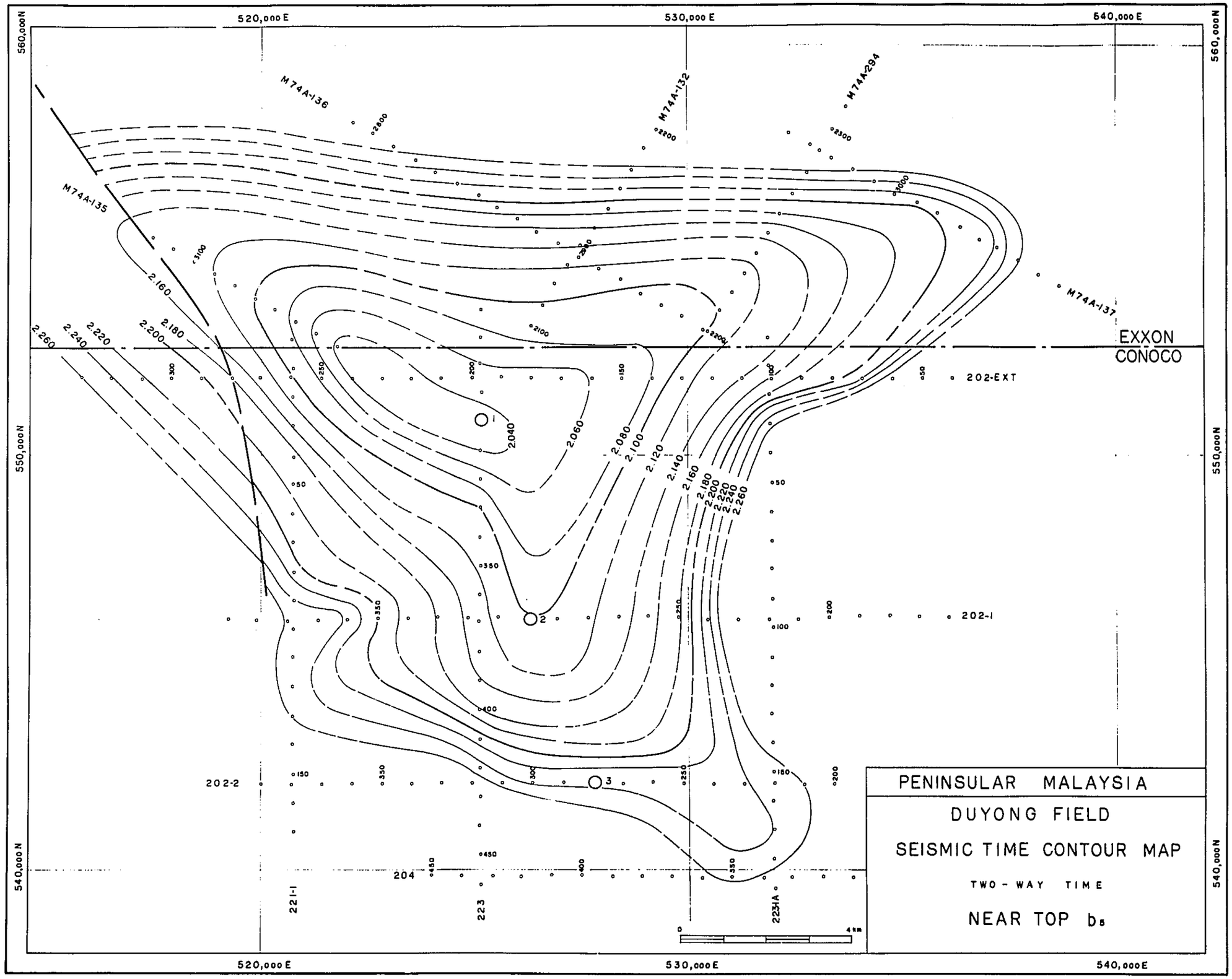


Fig. 15-1-1

Fig. 15-1-1 TIME CONTOUR MAP, DUYONG FIELD, NEAR TOP b5
Vol. II

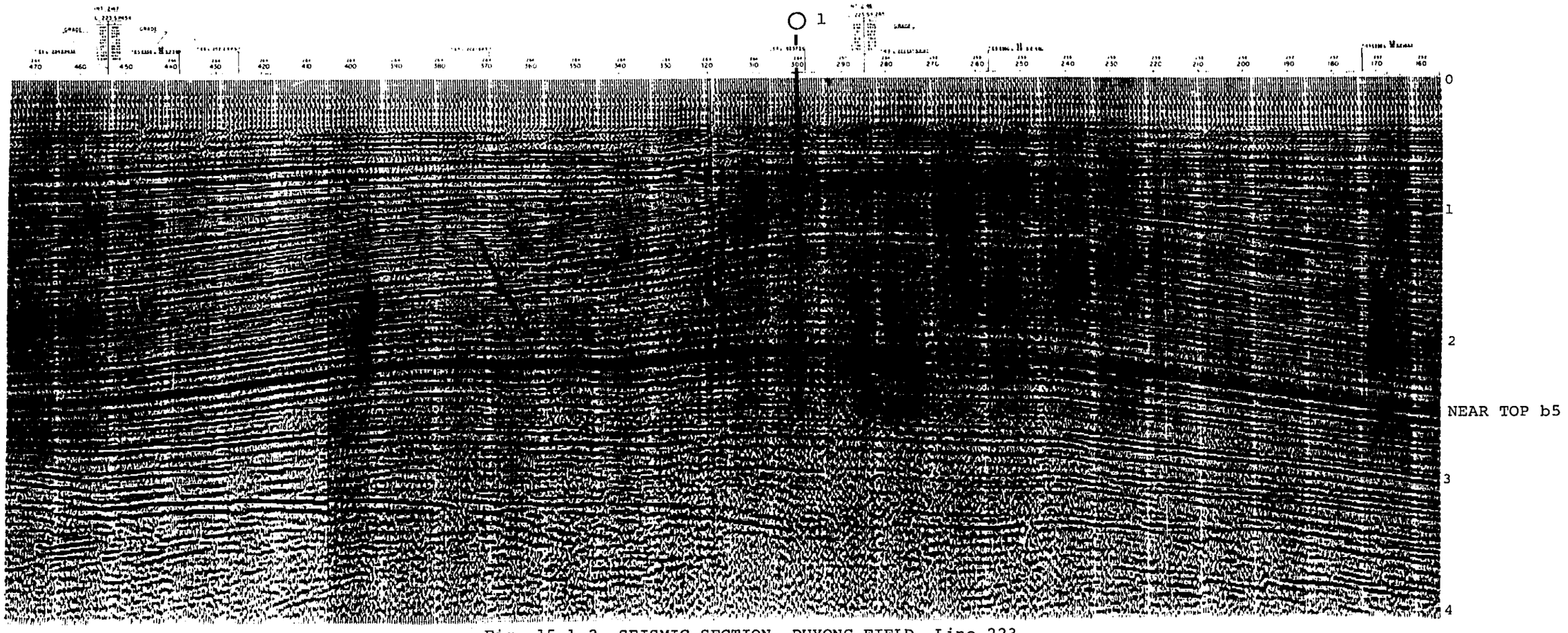


Fig. 15-1-2 SEISMIC SECTION, DUYONG FIELD, Line 223
Vol. II

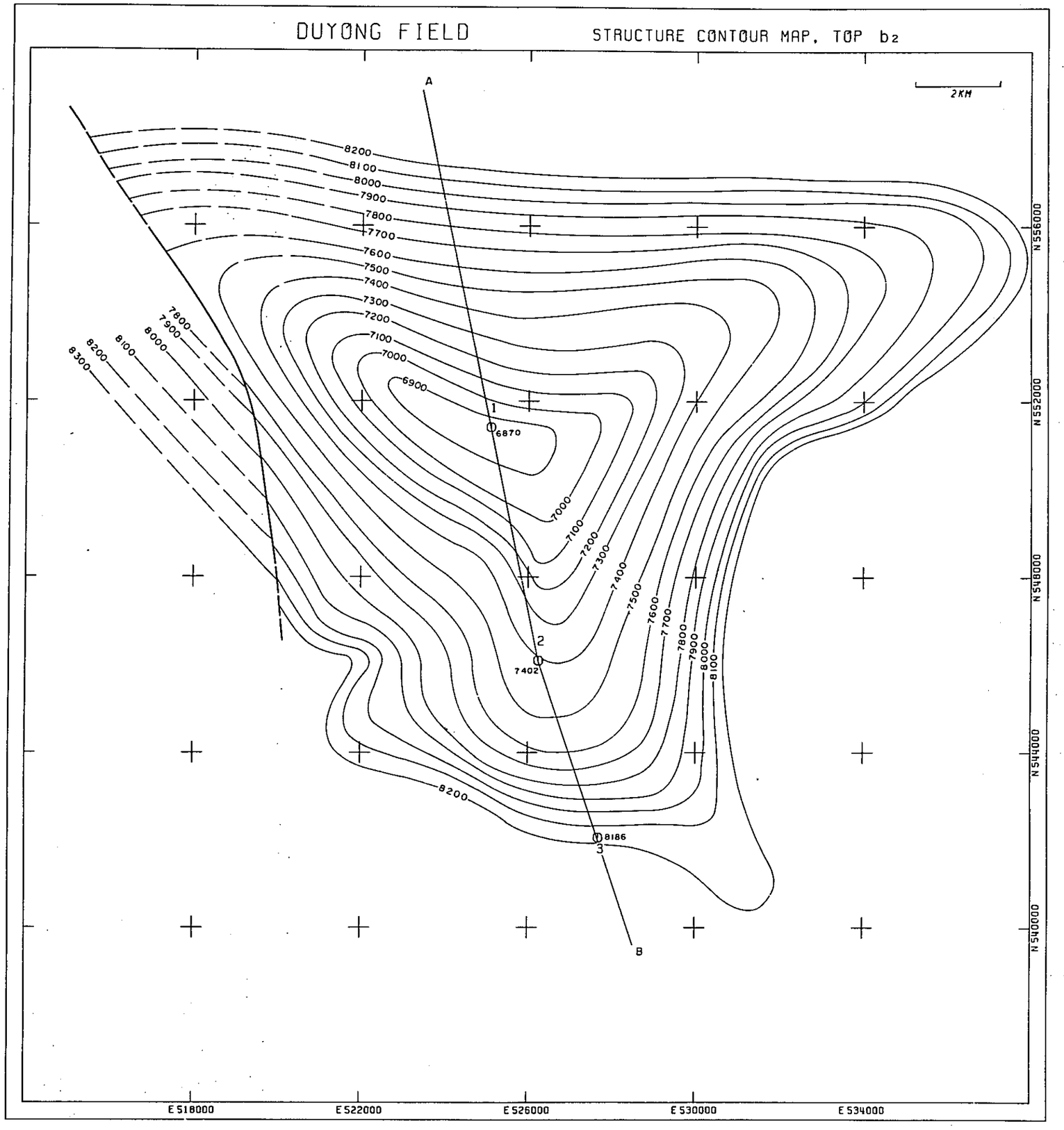


Fig. 15-2-1 STRUCTURE CONTOUR MAP, DUYONG FIELD, TOP b2
Vol. II

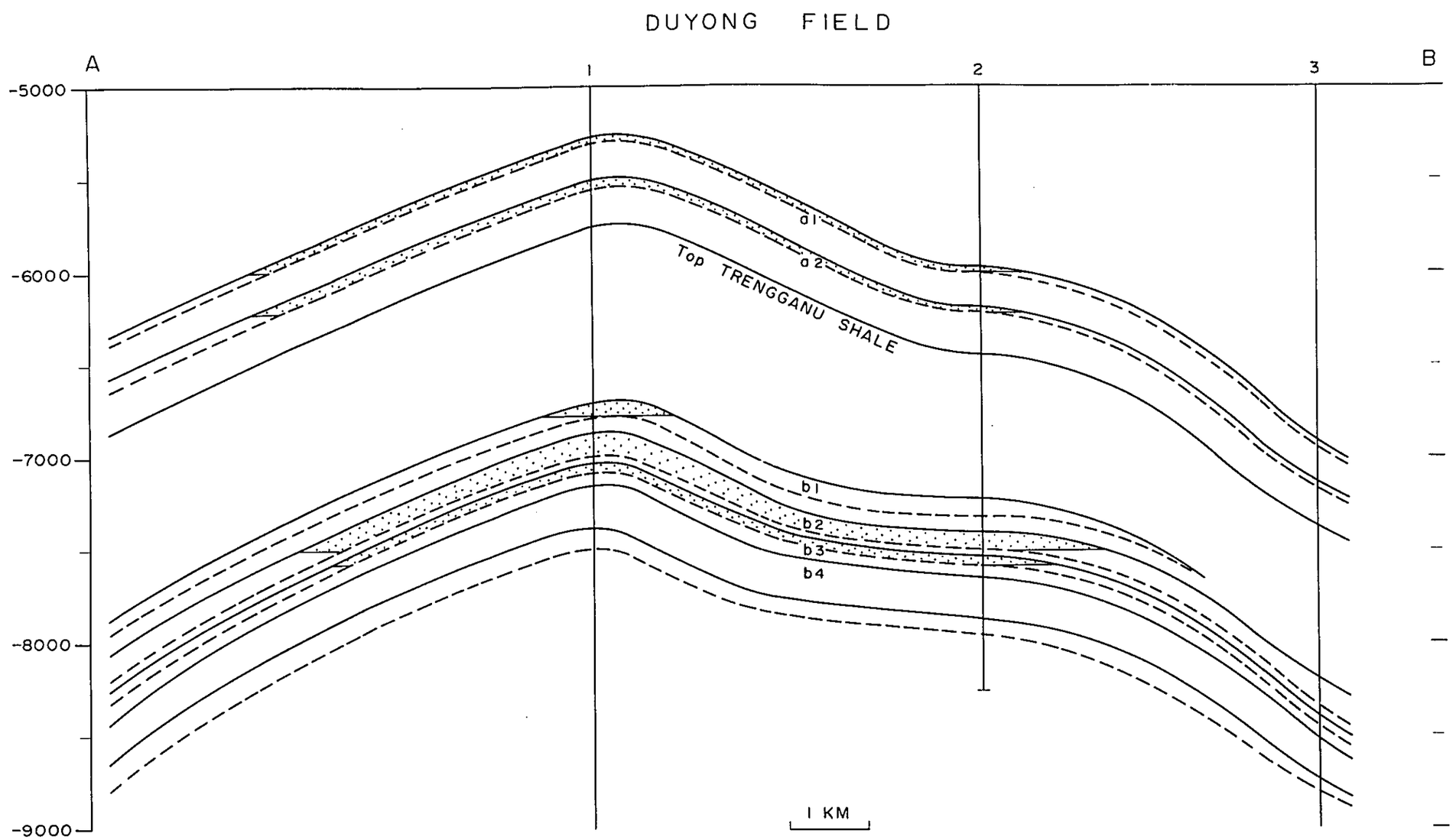


Fig. 15-2-2 STRUCTURAL CROSS-SECTION, DUYONG FIELD
Vol. II

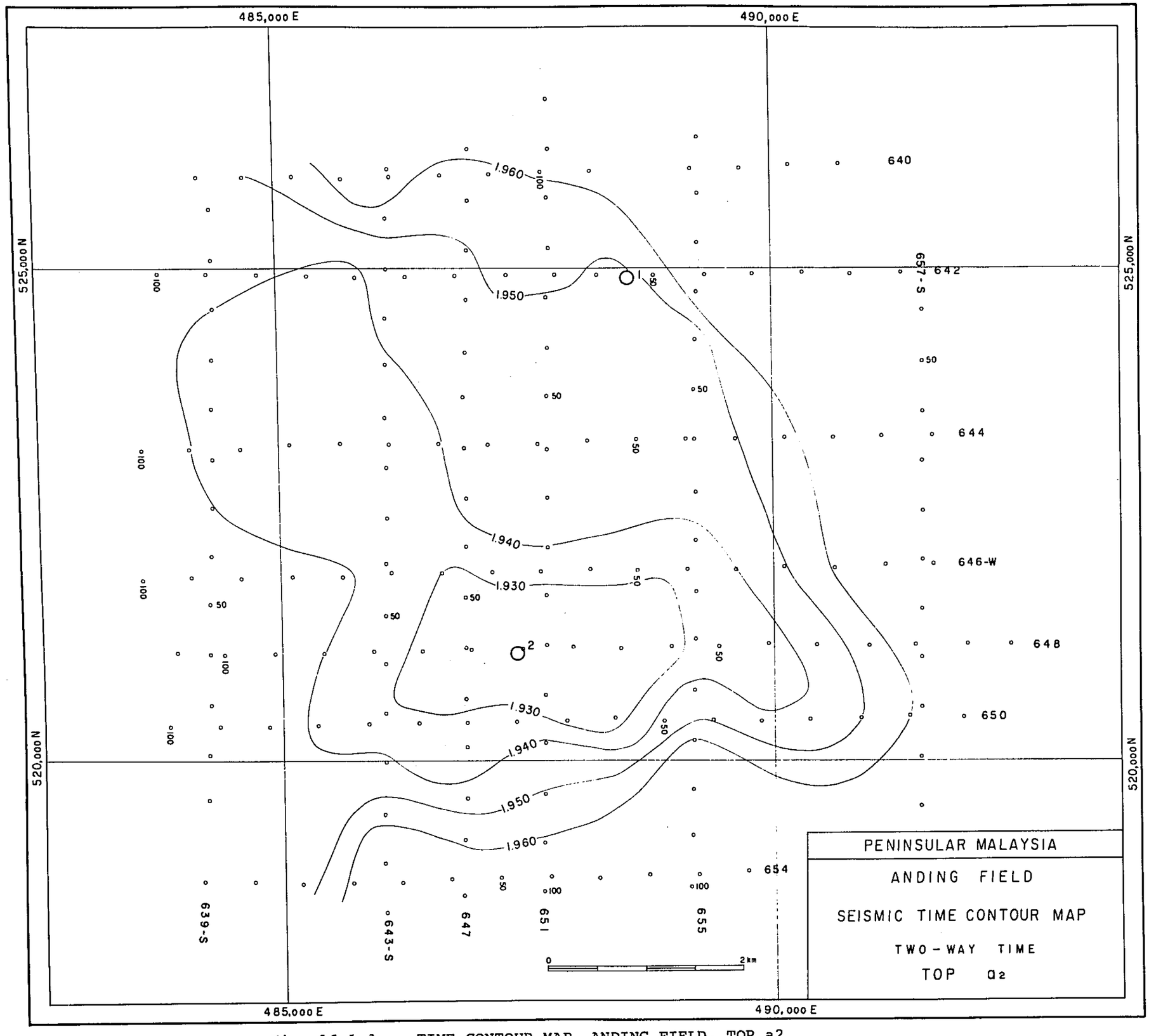


Fig. 16-1-1

Fig. 16-1-1 TIME CONTOUR MAP, ANDING FIELD, TOP a2
Vol. II

Fig. 16-1-2

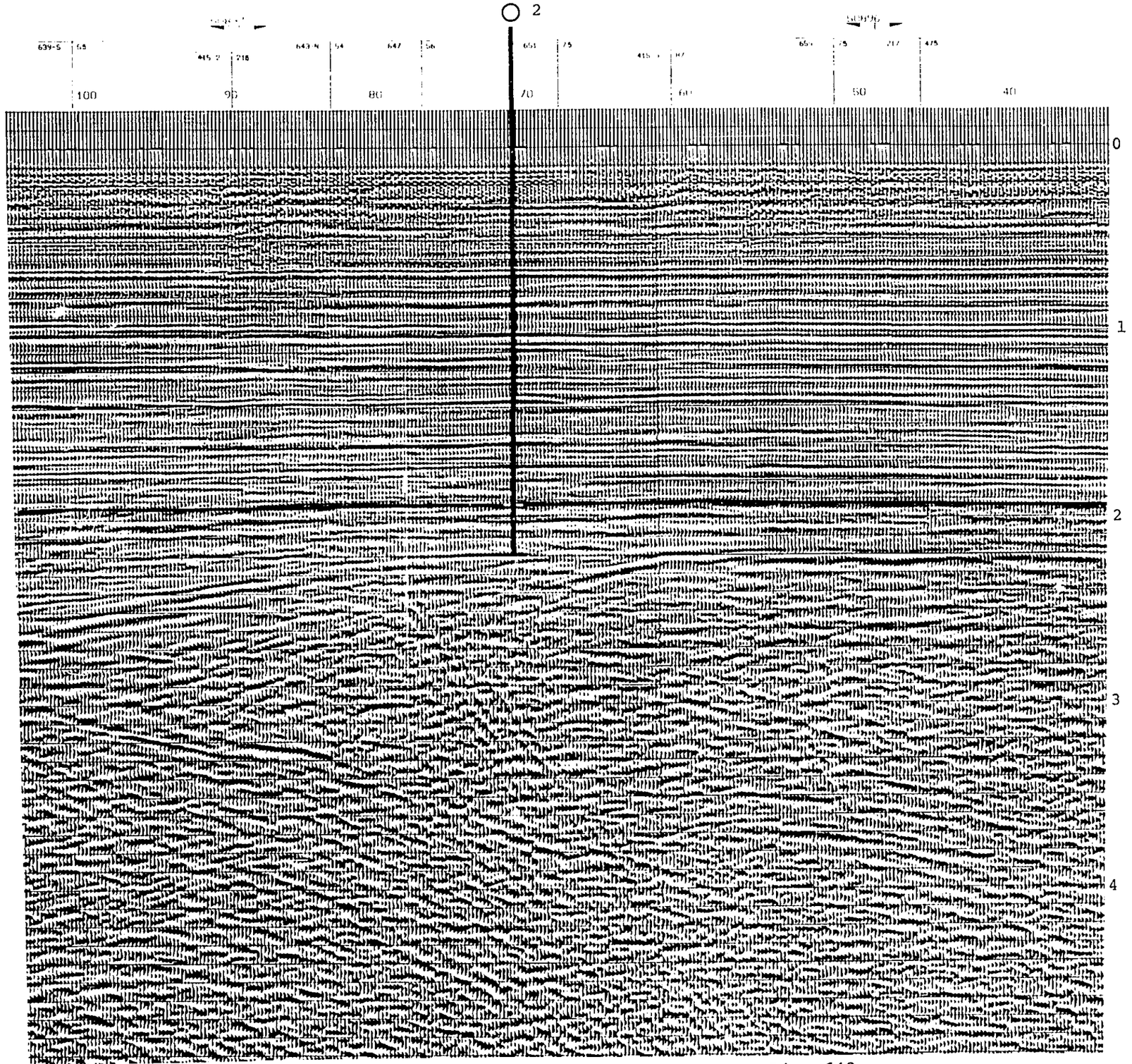


Fig. 16-1-2 SEISMIC SECTION, ANDING FIELD, Line 648
Vol. II

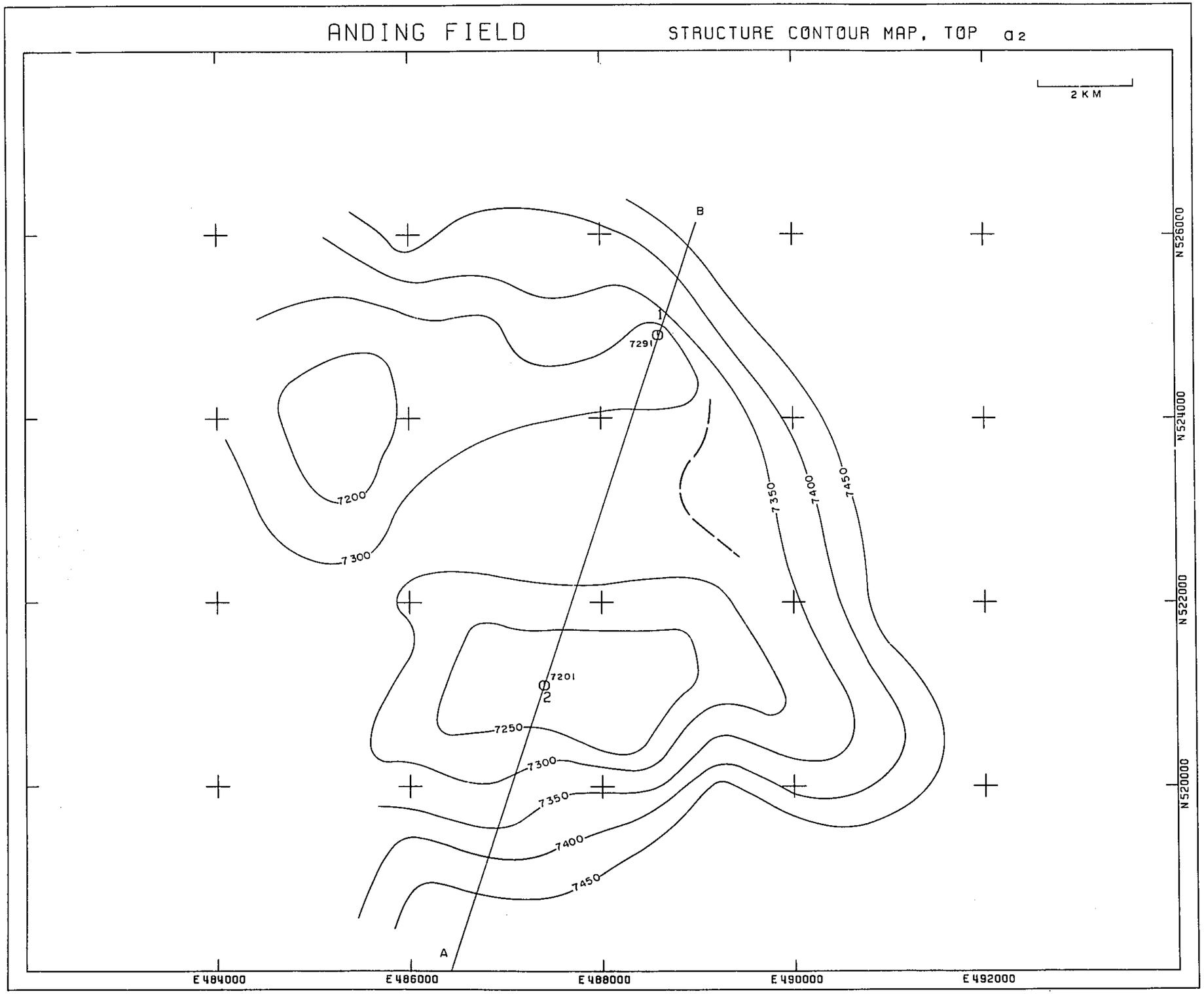


Fig. 16-2-1 STRUCTURE CONTOUR MAP, ANDING FIELD, TOP a2
Vol. II

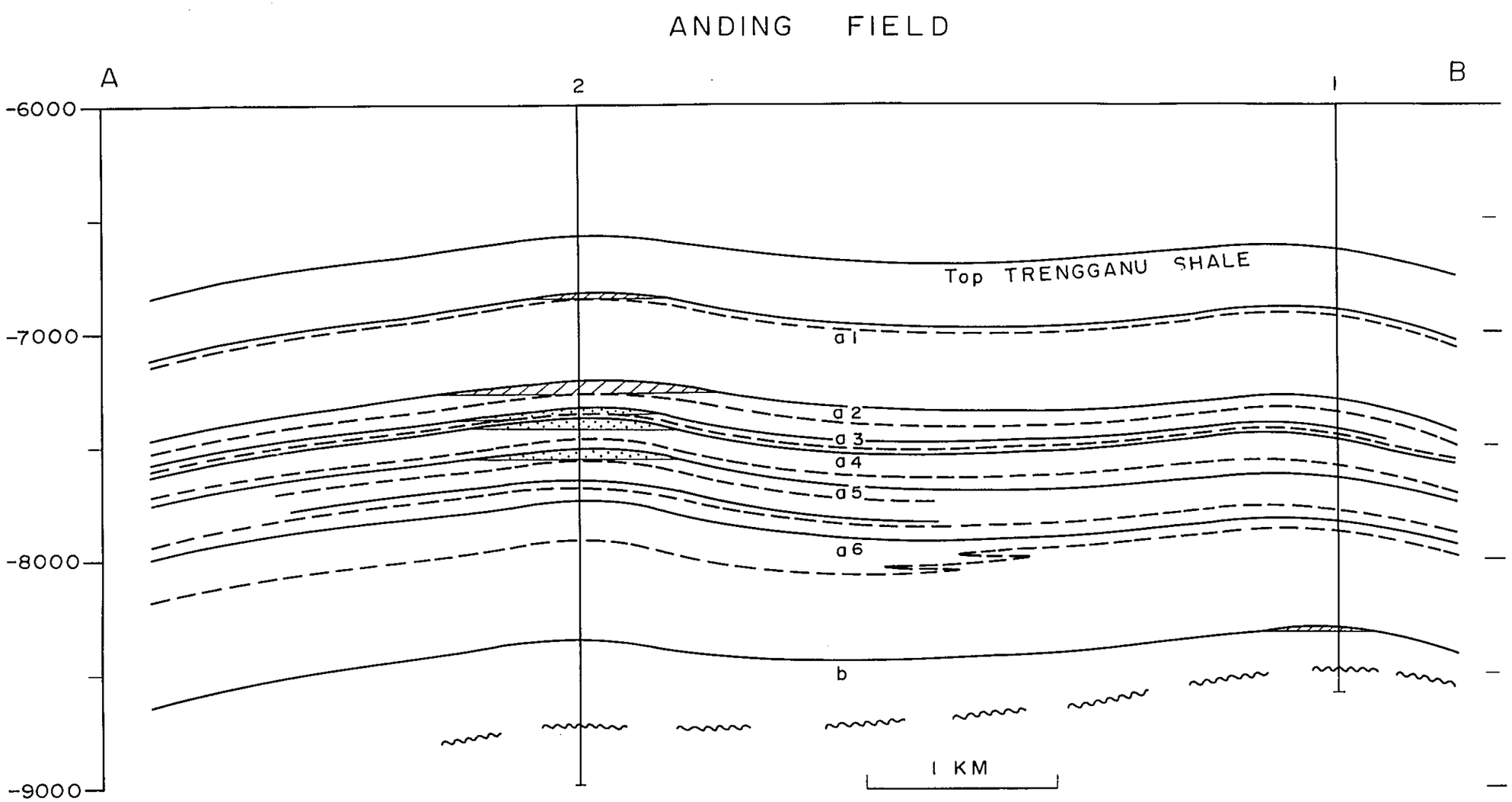


Fig. 16-2-2 STRUCTURAL CROSS-SECTION, ANDING FIELD
Vol. II

FIG. 17-5-1 (VOL. II)

FACILITIES ARRANGEMENT FOR BEKOK, PULAI AND SELIGI FIELDS - CASE I A

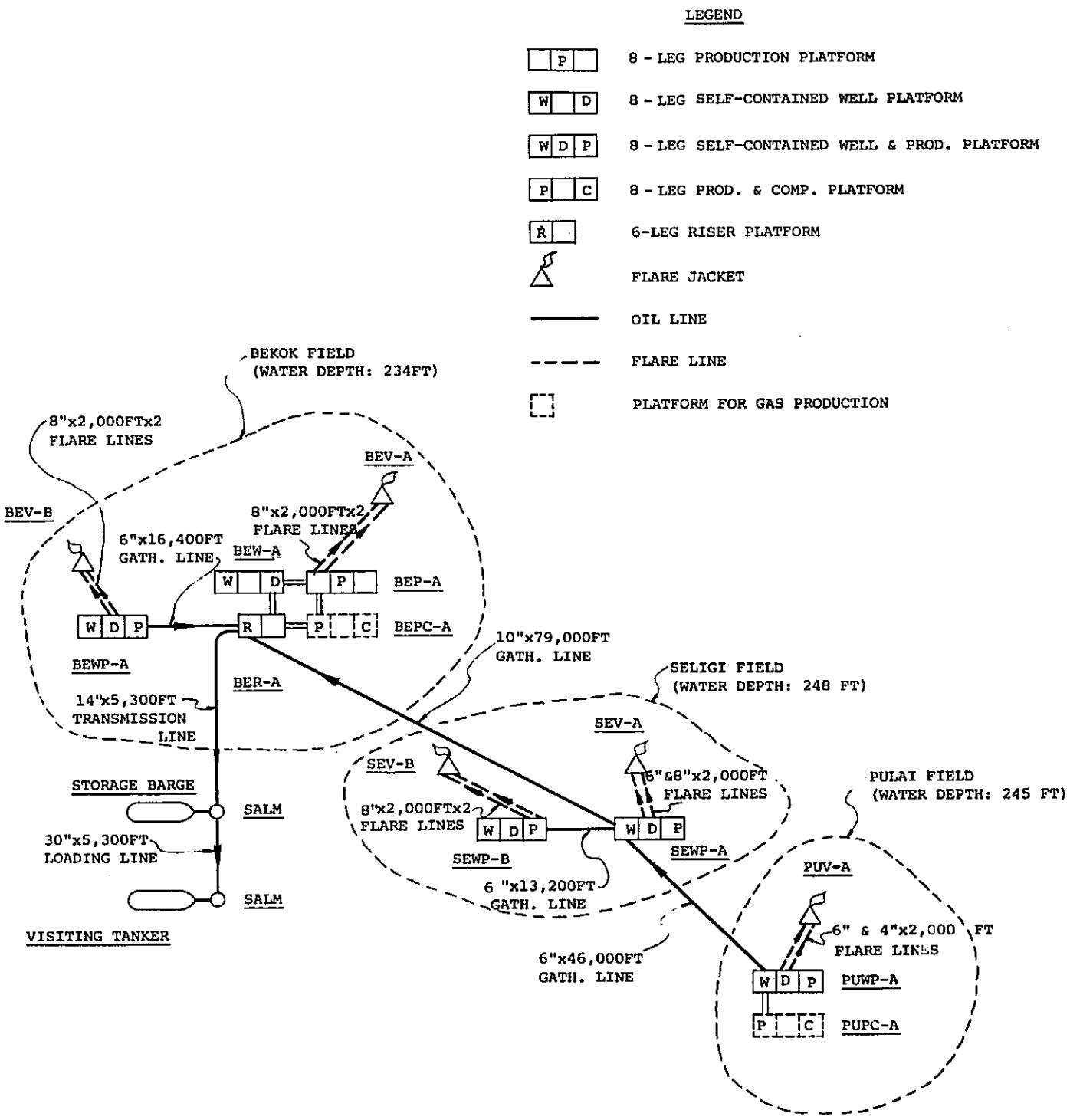


FIG. 17-5-2 (VOL. II)

BLOCK FLOW DIAGRAM

FOR BEKOK, PULAI AND SELIGI FIELDS - CASE I A

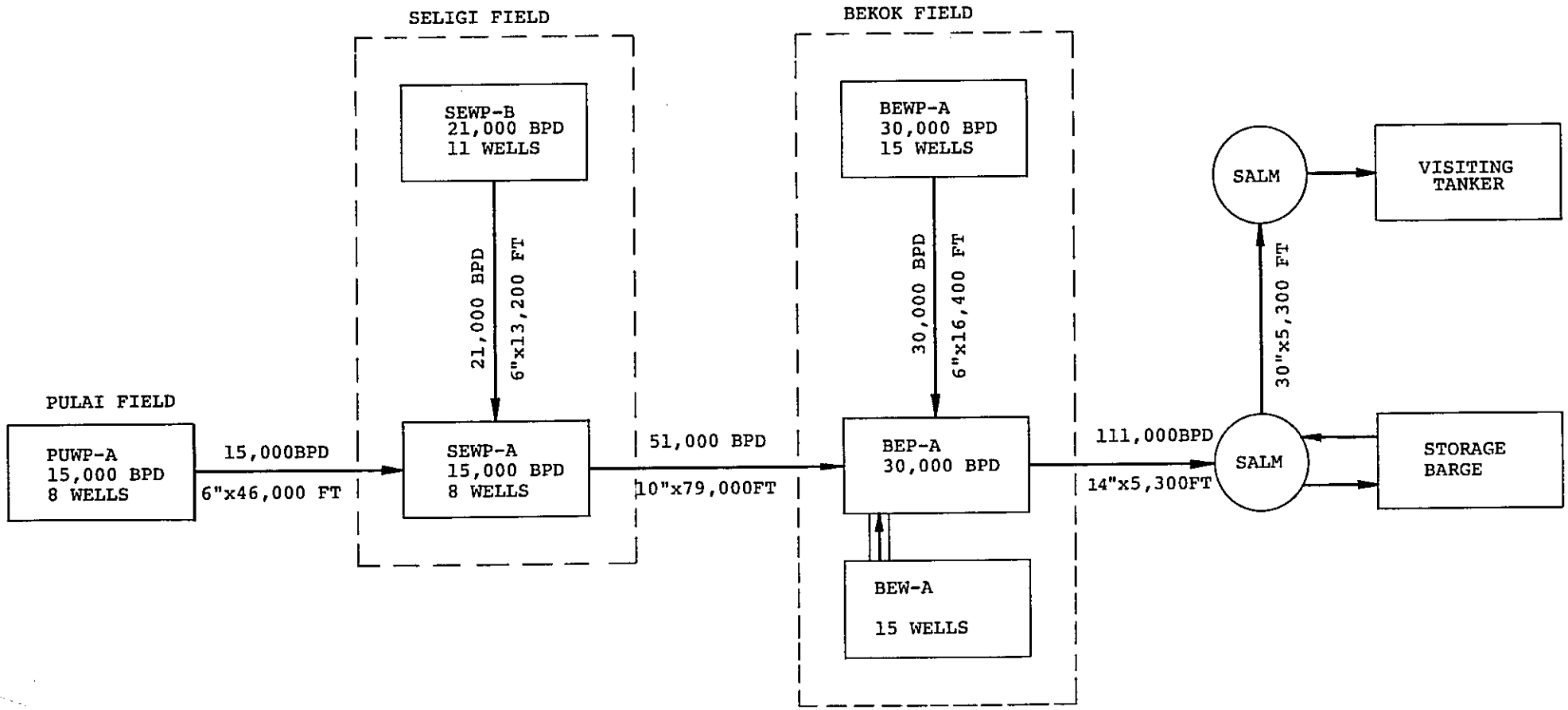


FIG. 17-5-3 (VOL. II)

FACILITIES ARRANGEMENT

FOR BEKOK, PULAI AND SELIGI FIELDS - CASE I B

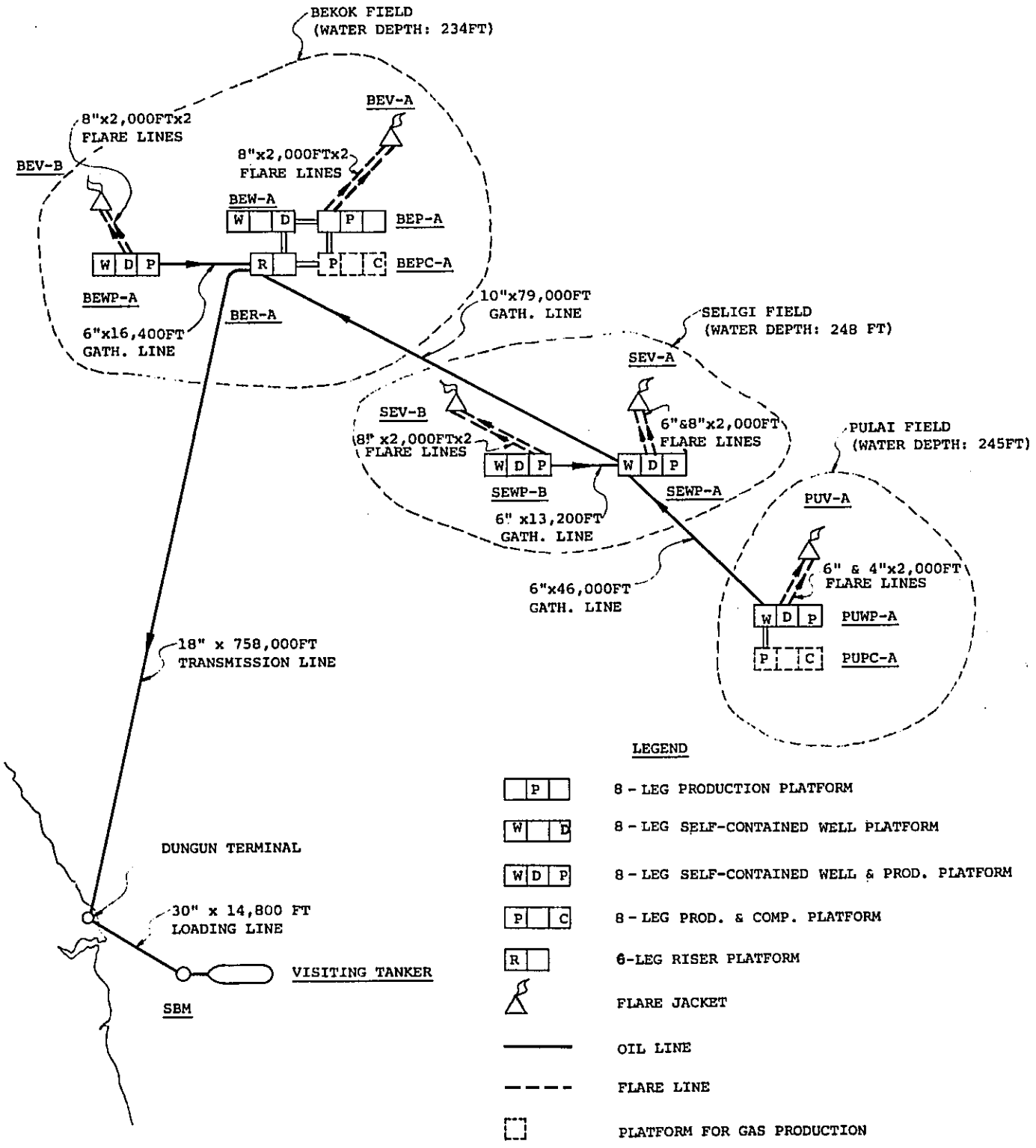


FIG. 17-5-4 (VOL. II)

BLOCK FLOW DIAGRAM

FOR BEKOK, PULAI AND SELIGI FIELDS - CASE I B

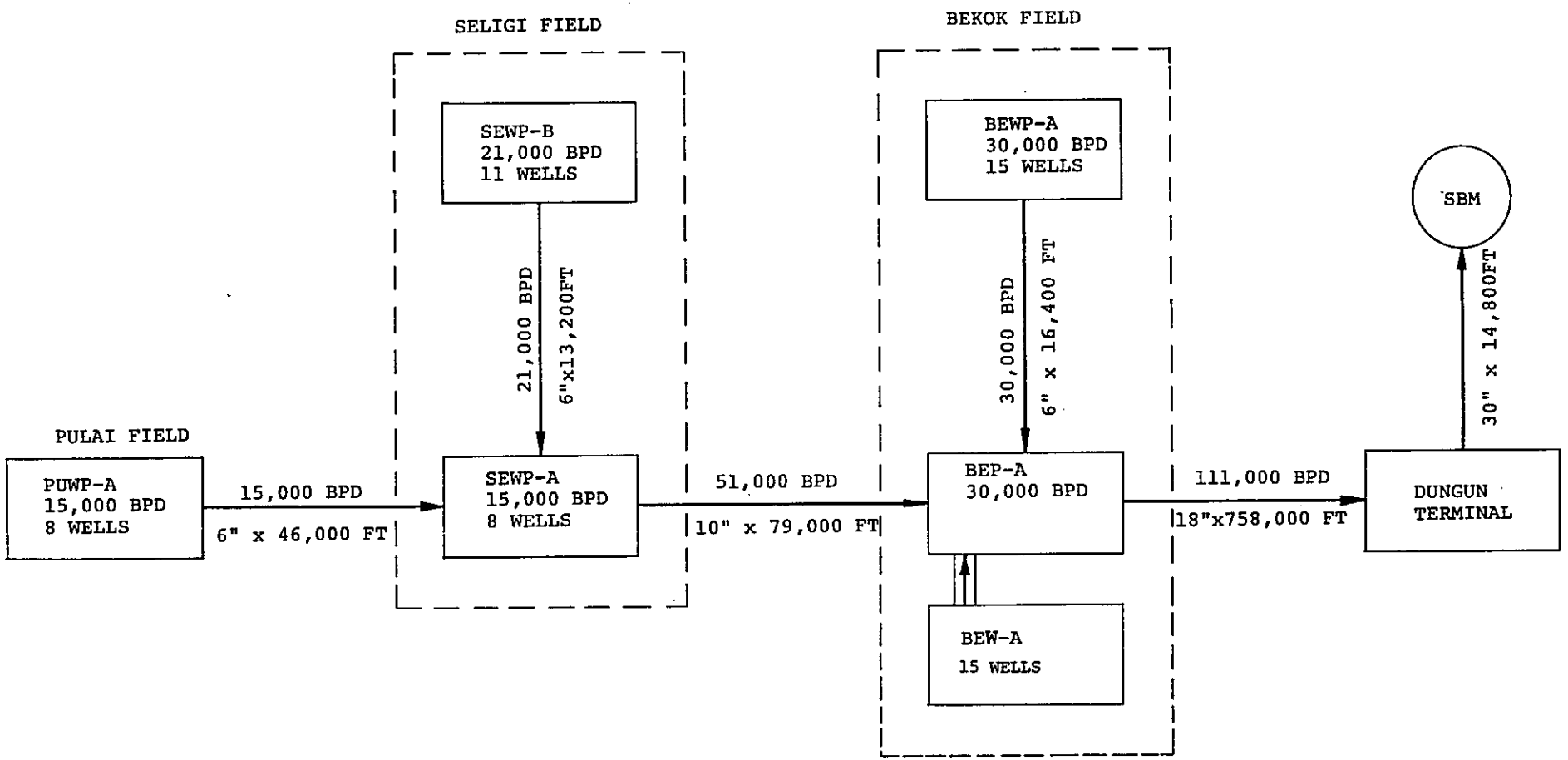


FIG. 17-5-5 (VOL. II)

FACILITIES ARRANGEMENT

FOR BEKOK, PULAI AND SELIGI FIELDS - CASE II

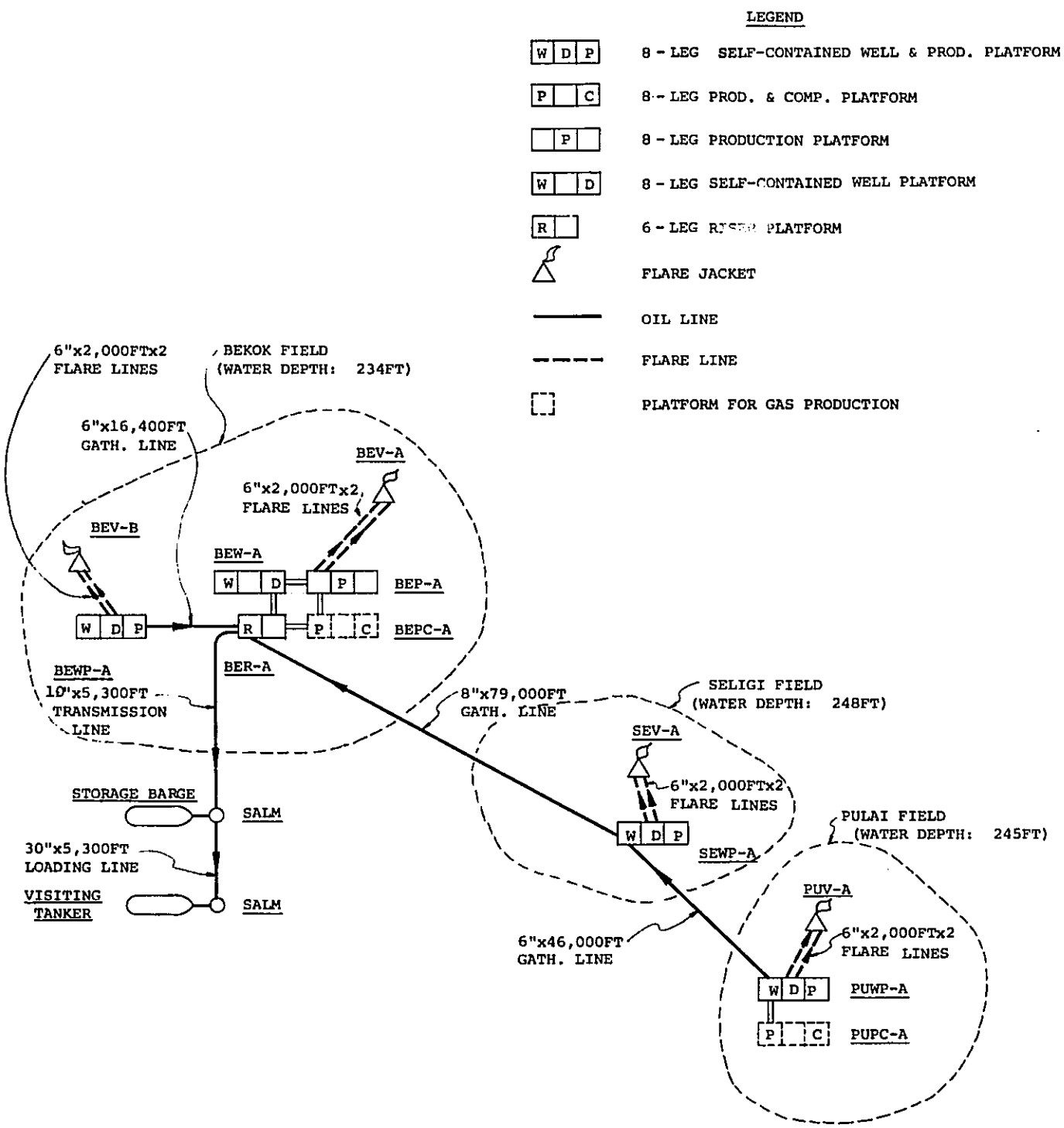


FIG. 17-5-6 (VOL. II)

BLOCK FLOW DIAGRAM

FOR BEKOK, PULAI AND SELIGI FIELDS - CASE II

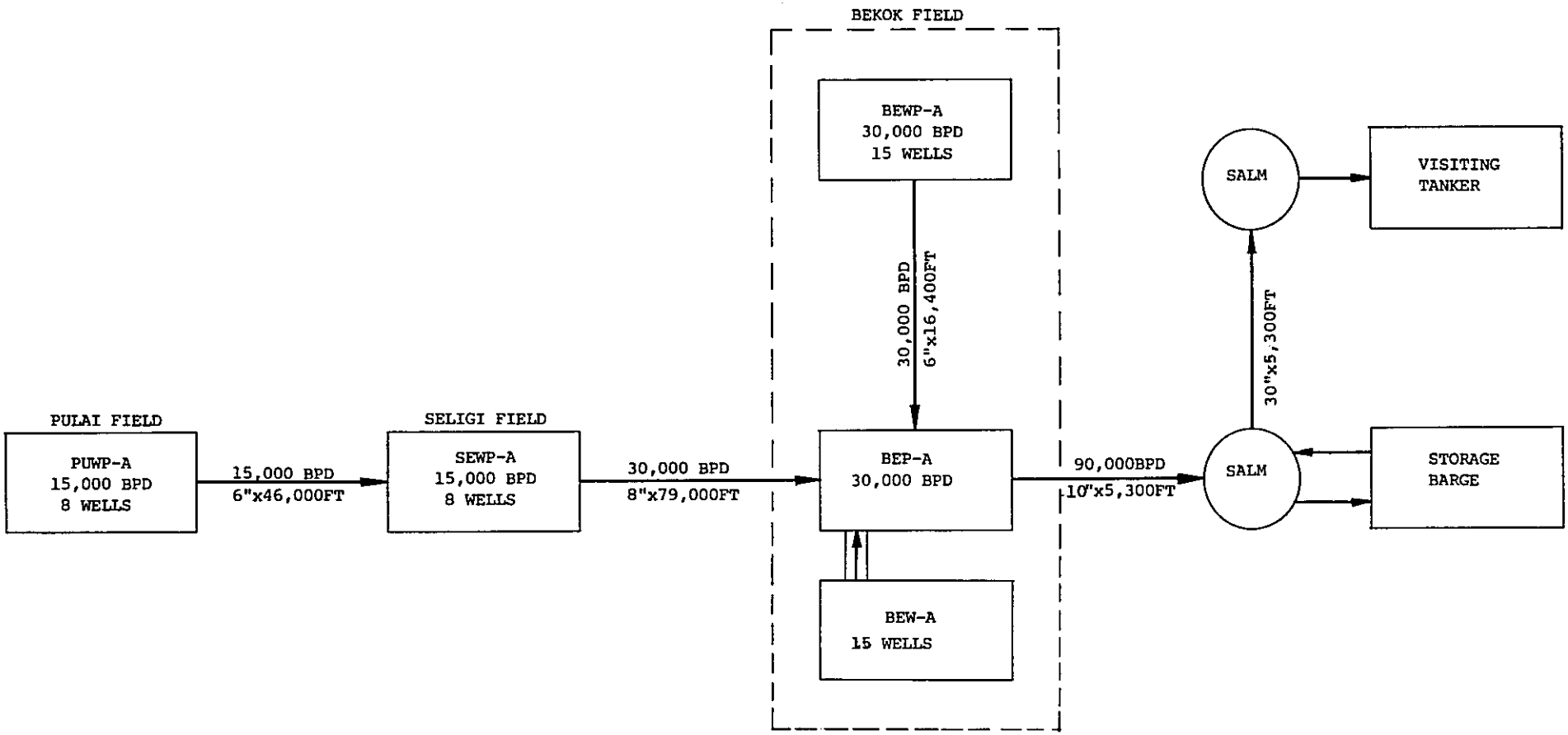


FIG. 17-5-7 (VOL II)

FACILITIES ARRANGEMENT

FOR BEKOK, PULAI AND SELIGI FIELDS CASE III

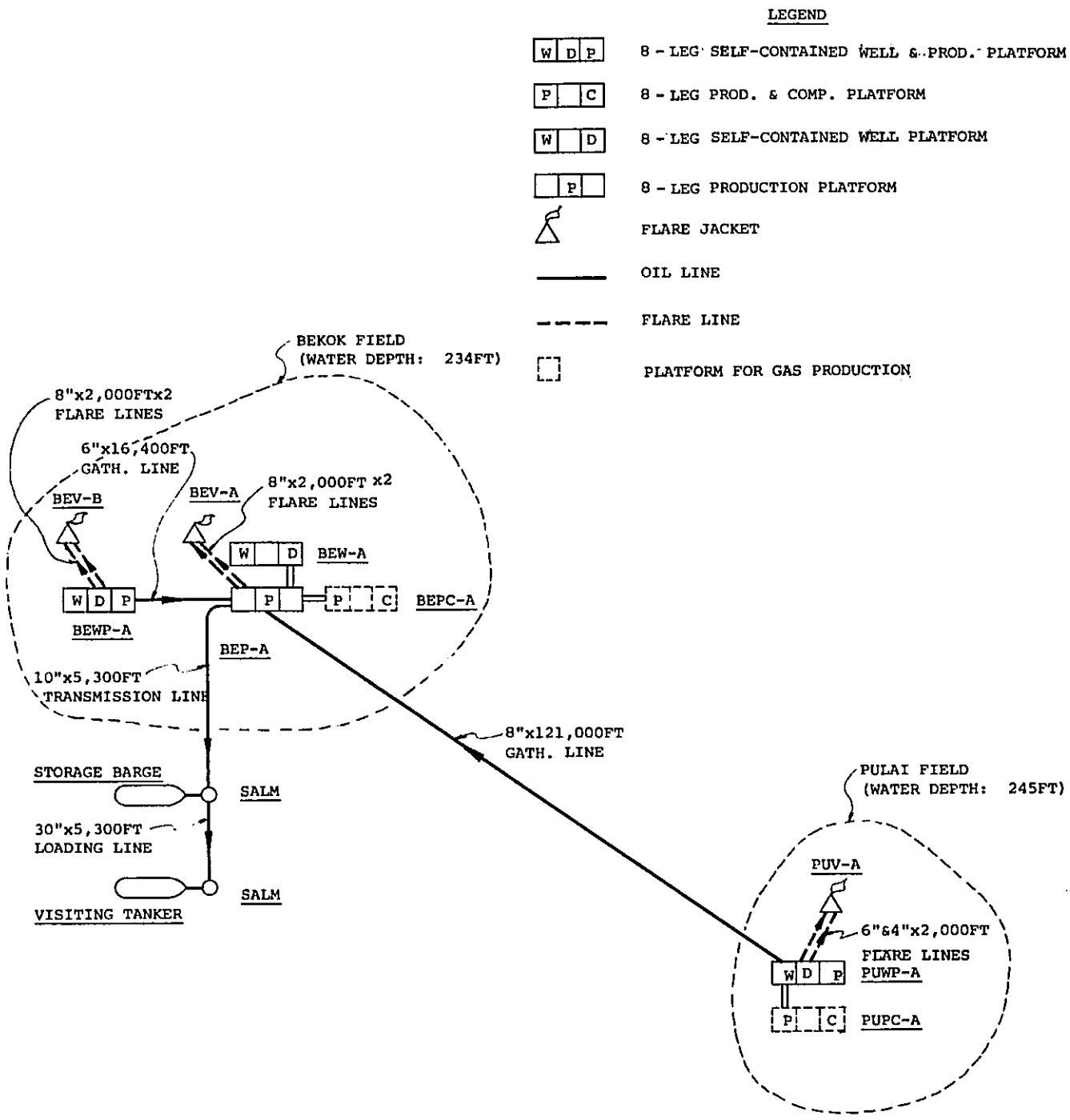


FIG. 17-5-8 (VOL. II)

BLOCK FLOW DIAGRAM

FOR BEKOK, PULAI AND SELIGI FIELDS - CASE III

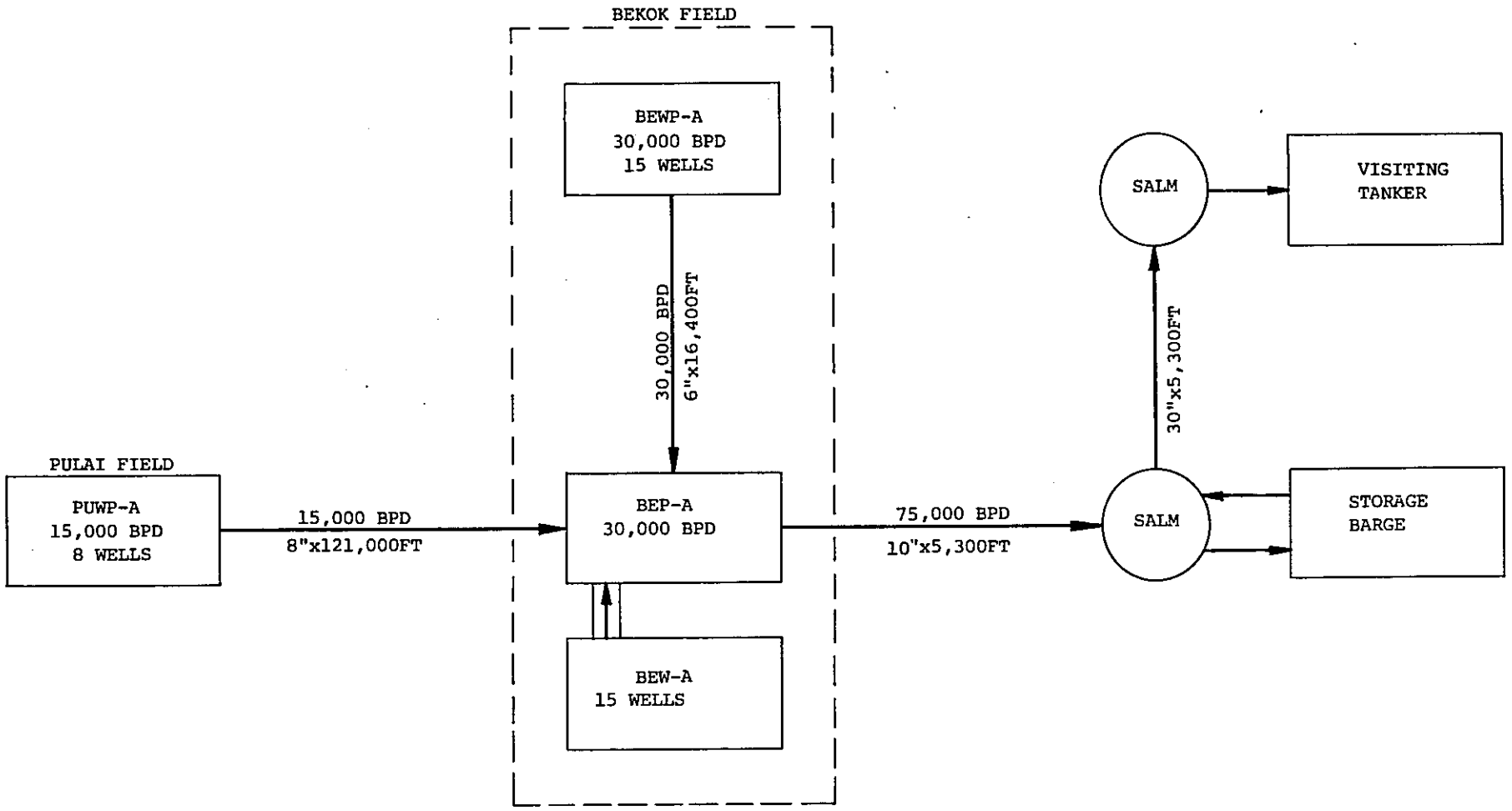


Fig. 17-6-1 (Vol. II)

PROJECT SCHEDULE

BEKOK, PULAI AND SELIGI FIELDS CASE IA

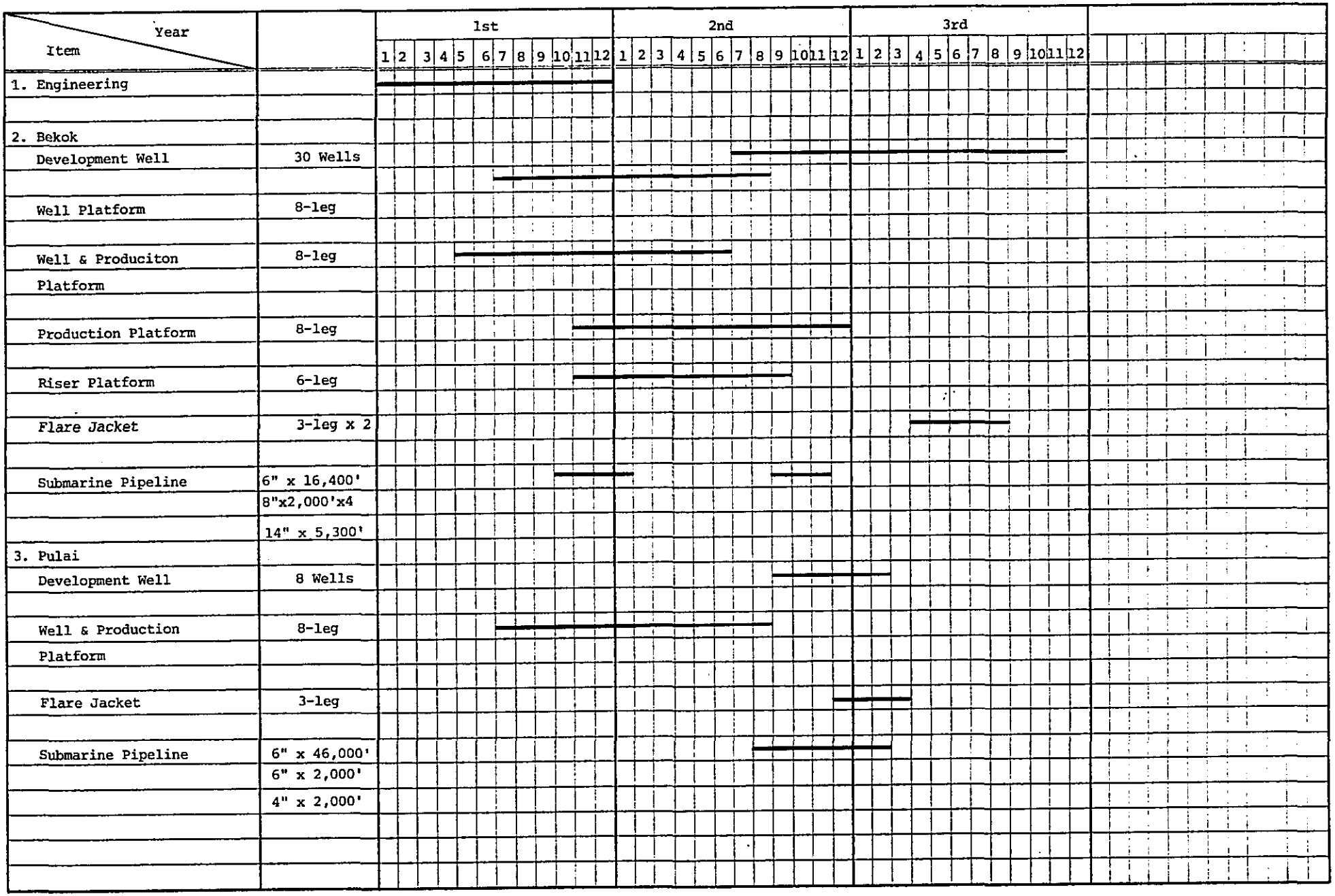


Fig. 17-6-1 (Vol. II)

PROJECT SCHEDULE (Cont'd)

BEKOK, PULAI AND SELIGI FIELDS CASE IA

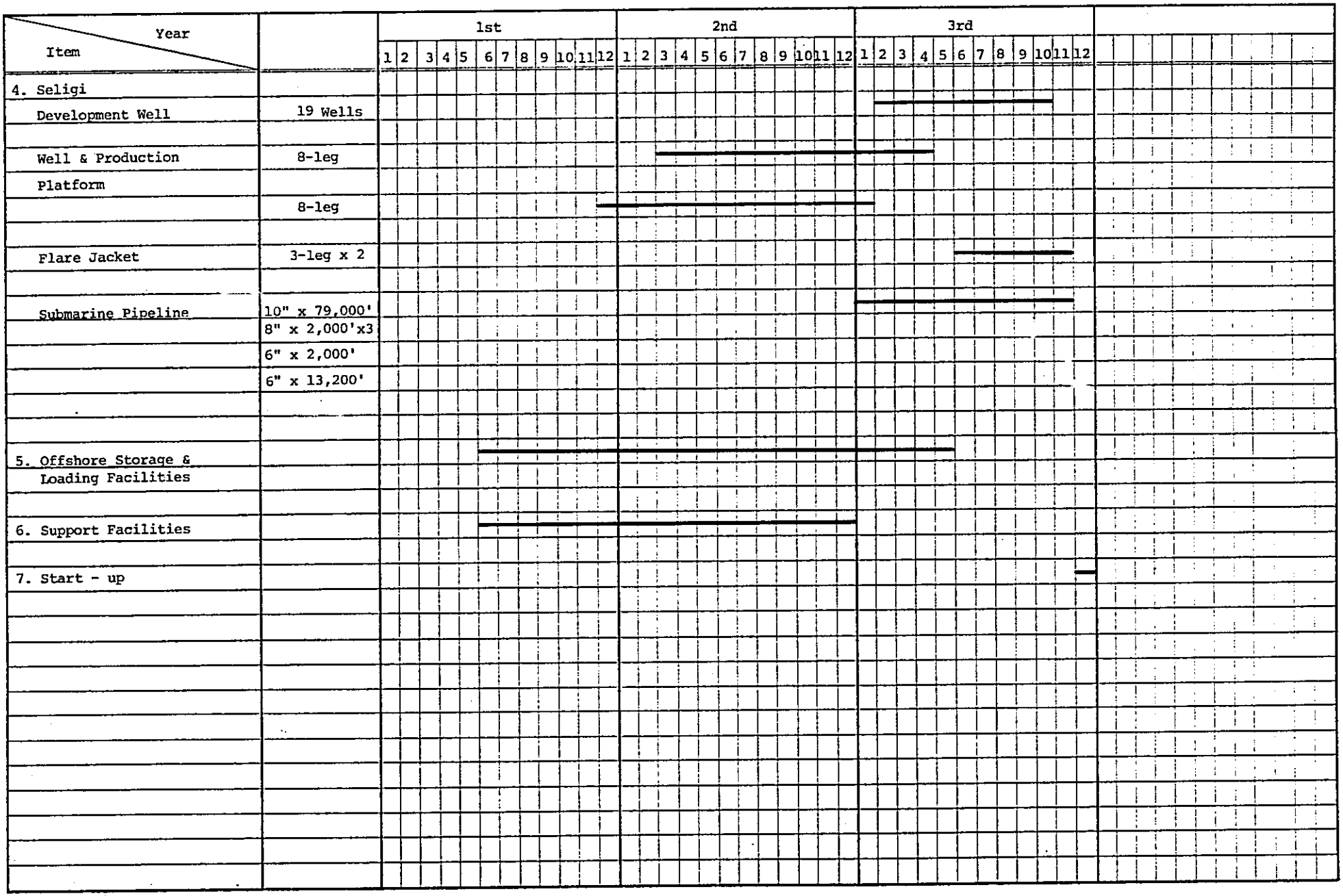
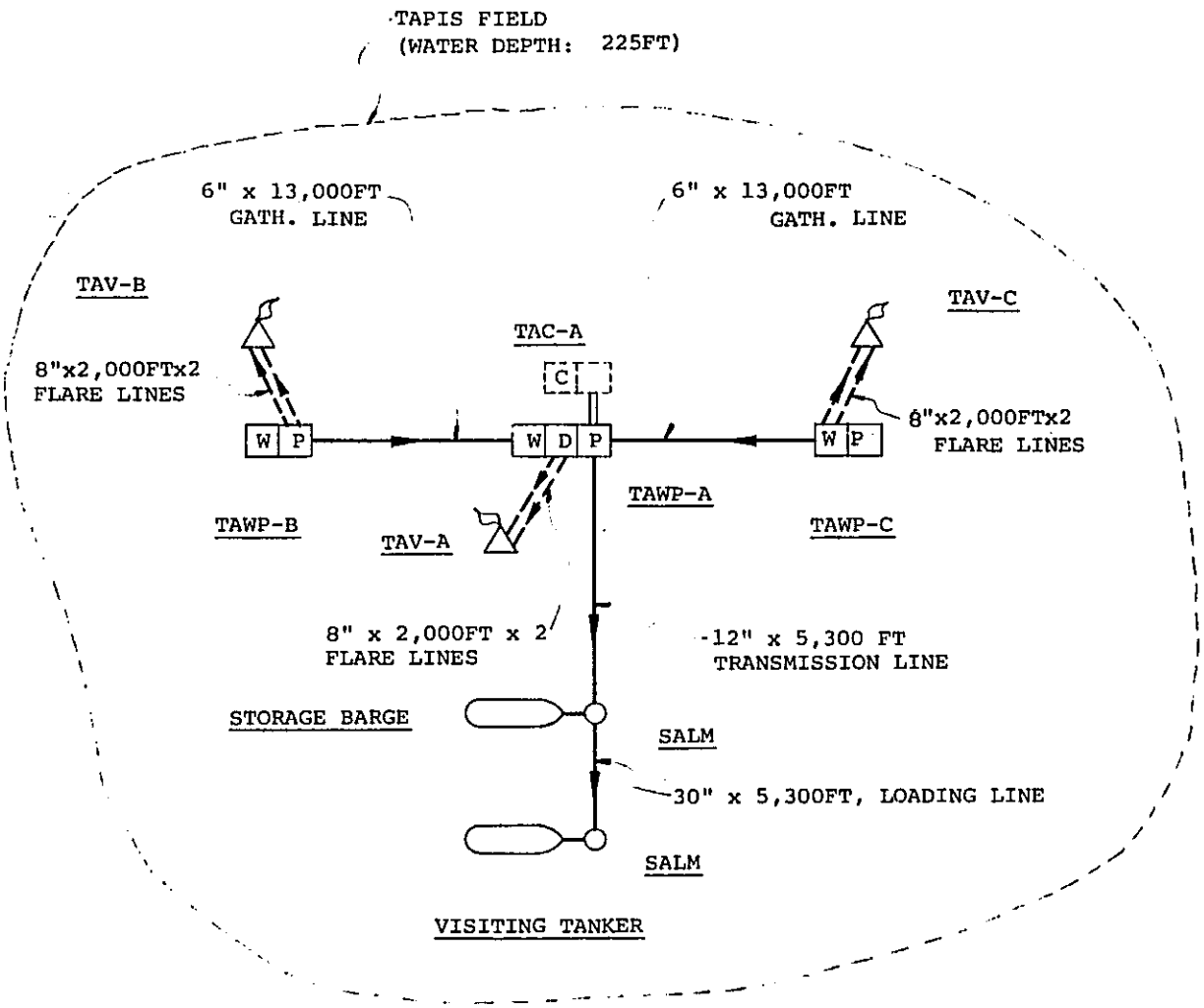


FIG. 18-5-1 (VOL. II)

FACILITIES ARRANGEMENT FOR TAPIS OIL FIELD - CASE I A



LEGEND

W D P	8 - LEG SELF-CONTAINED WELL & PROD. PLATFORM
W P	6 - LEG WELL & PROD. PLATFORM
C	6 - LEG COMPRESSOR PLATFORM
	FLARE JACKET
———	OIL LINE
- - - -	FLARE LINE
	PLATFORM FOR GAS PRODUCTION

FIG. 18-5-2 (VOL II)

BLOCK FLOW DIAGRAM

FOR TAPIS OIL FIELD - CASE I A

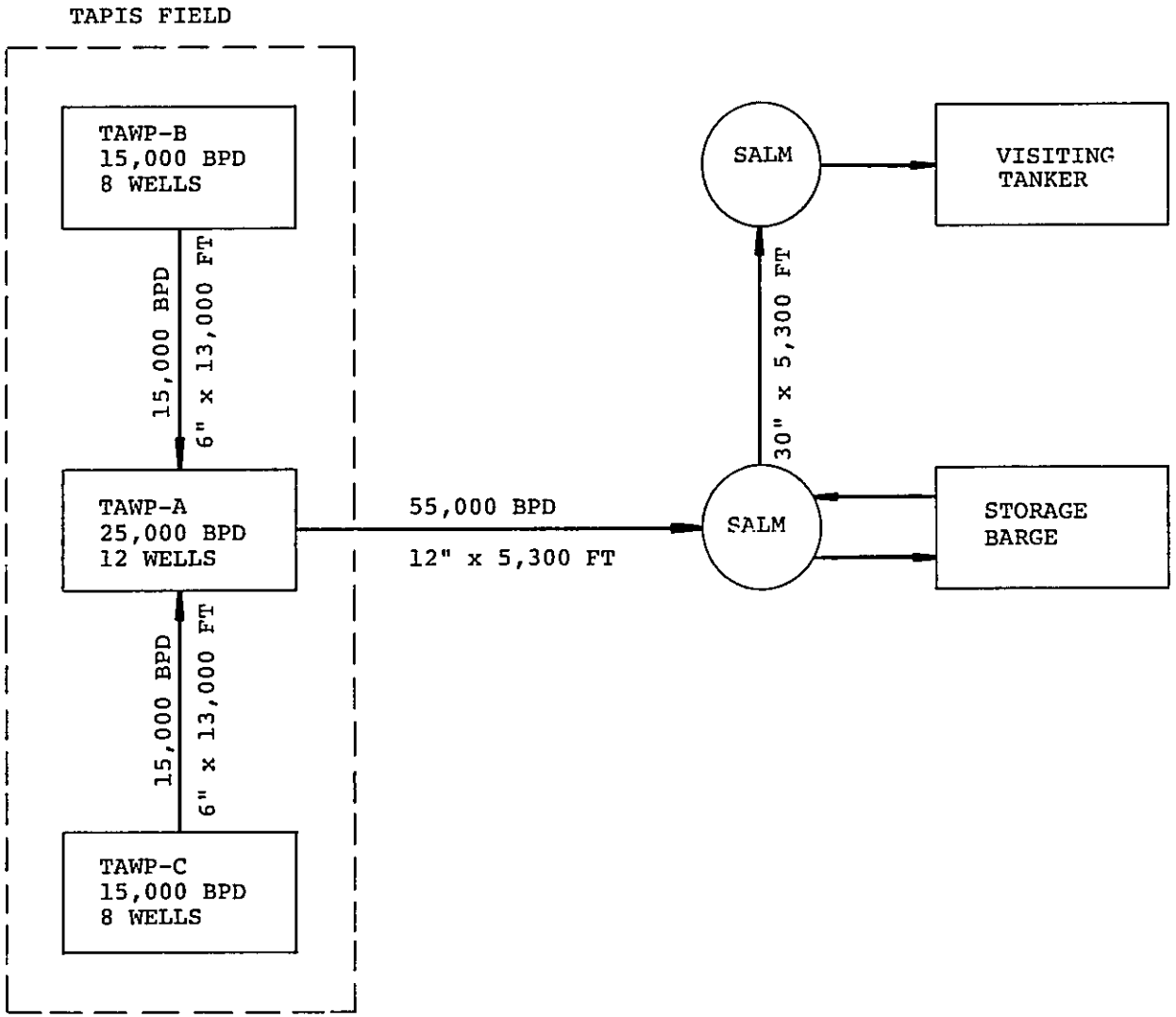


FIG. 18-5-3 (VOL. II)

FACILITIES ARRANGEMENT

FOR TAPIS OIL FIELD - CASE I B

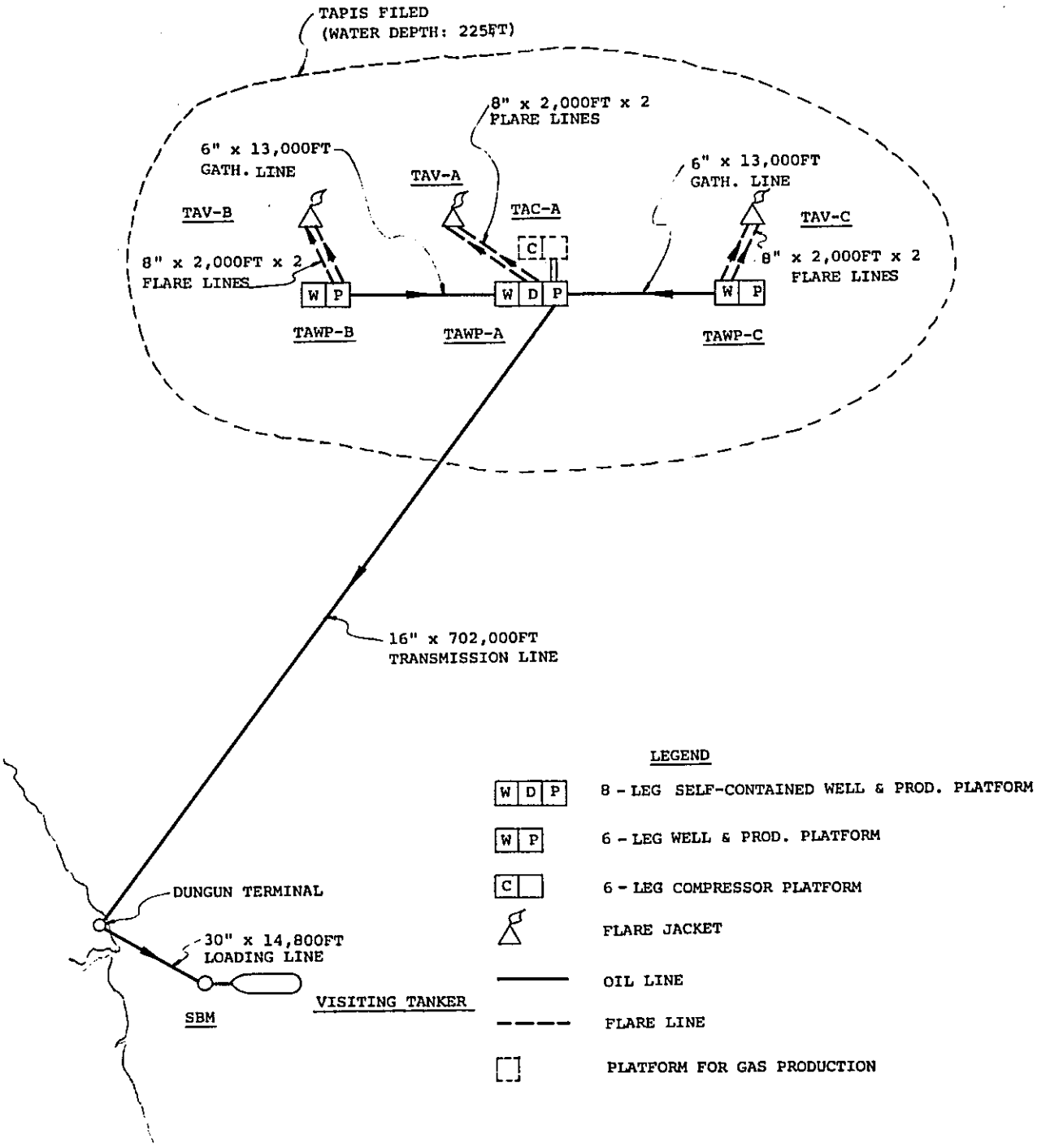


FIG. 18-5-4 (VOL. II)

BLOCK FLOW DIAGRAM

FOR TAPIS OIL FIELD - CASE I B

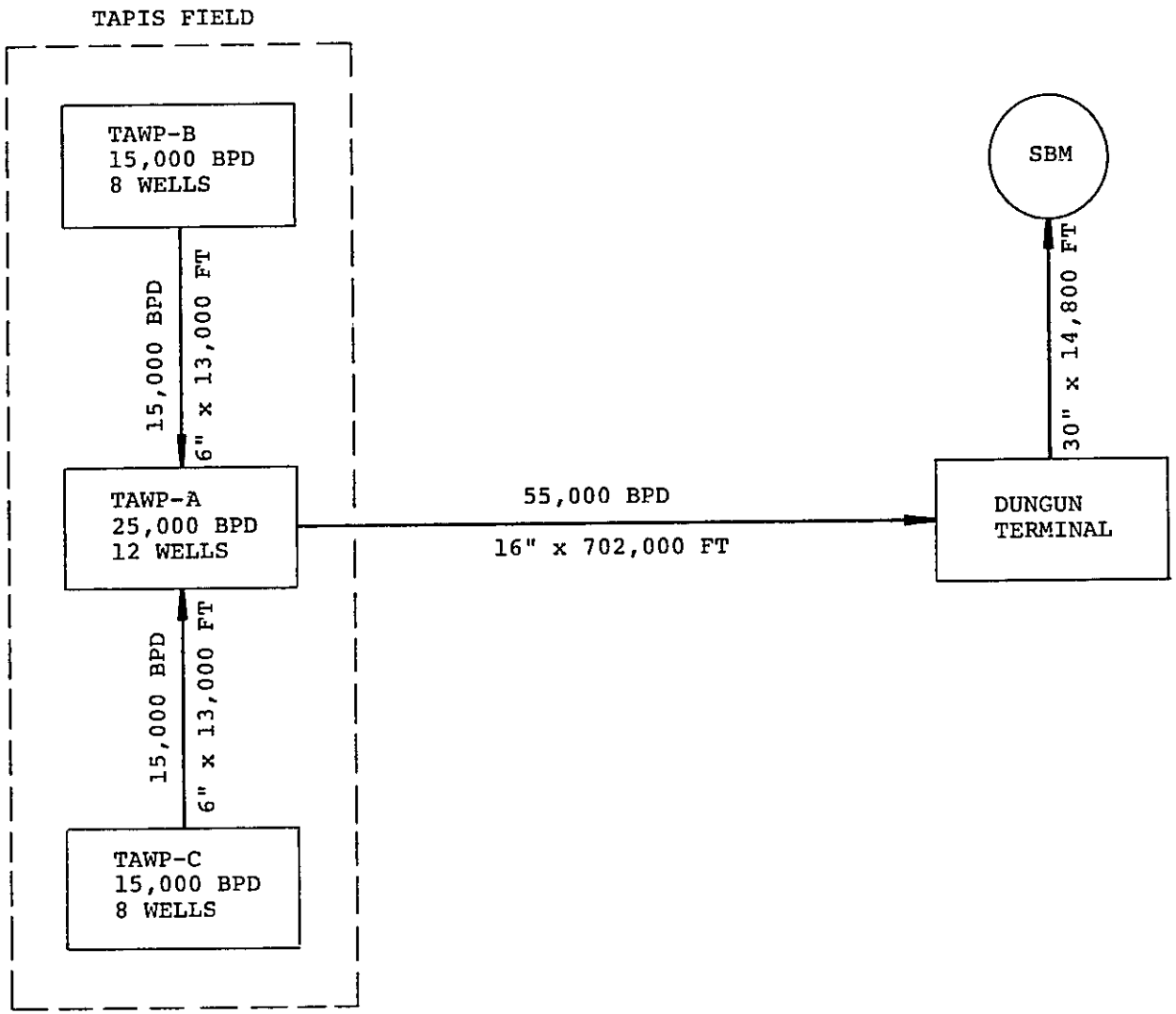


Fig. 18-6-1 (Vol. II)

PROJECT SCHEDULE

TAPIS OIL FIELD CASE I A

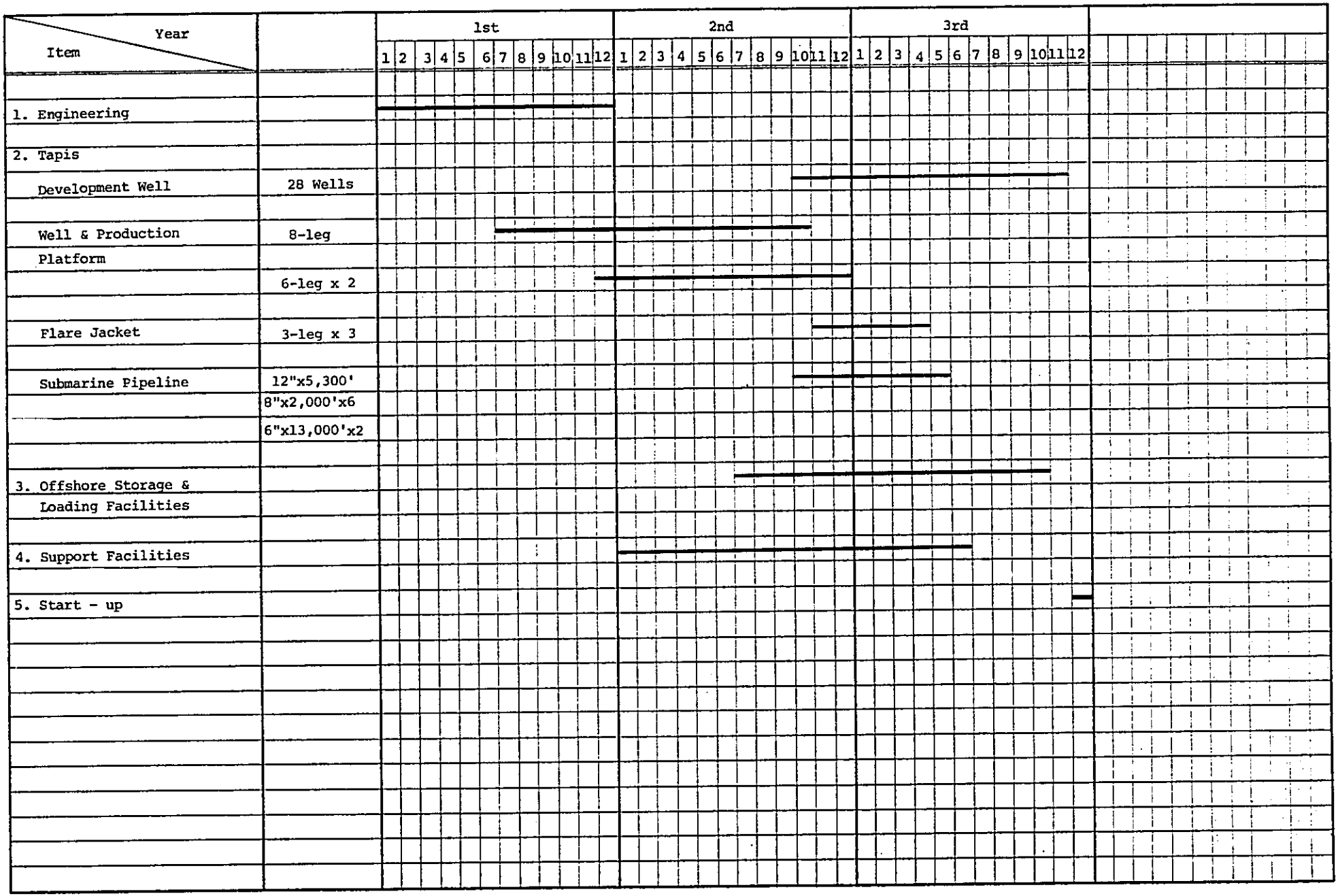


FIG. 19-5-1 (VOL. II)

FACILITIES ARRANGEMENT

FOR BEKOK AND PULAI FIELDS GAS UTILIZATION

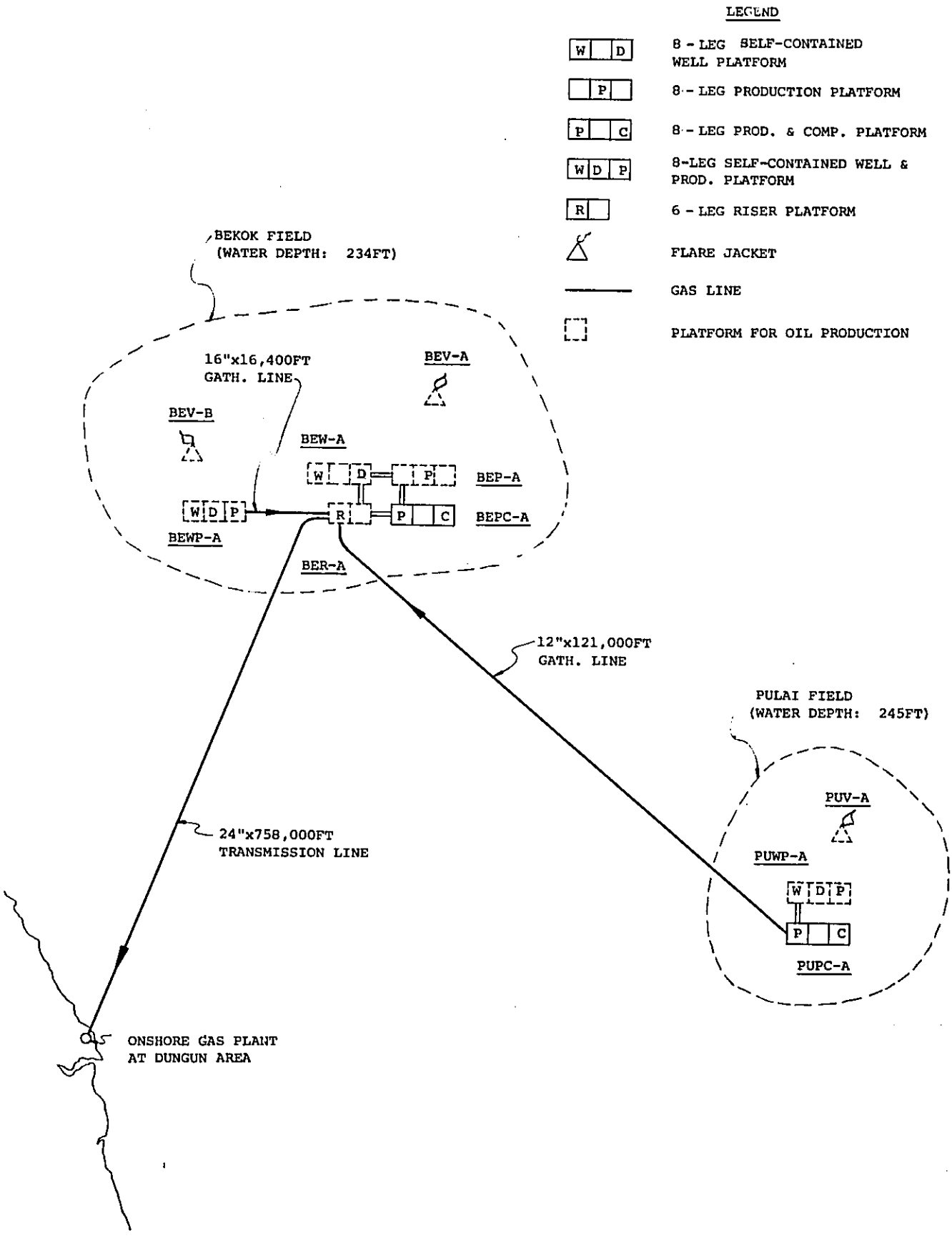


FIG. 19-5-2 (VOL. II)

BLOCK FLOW DIAGRAM

FOR BEKOK AND PULAI FIELDS GAS UTILIZATION

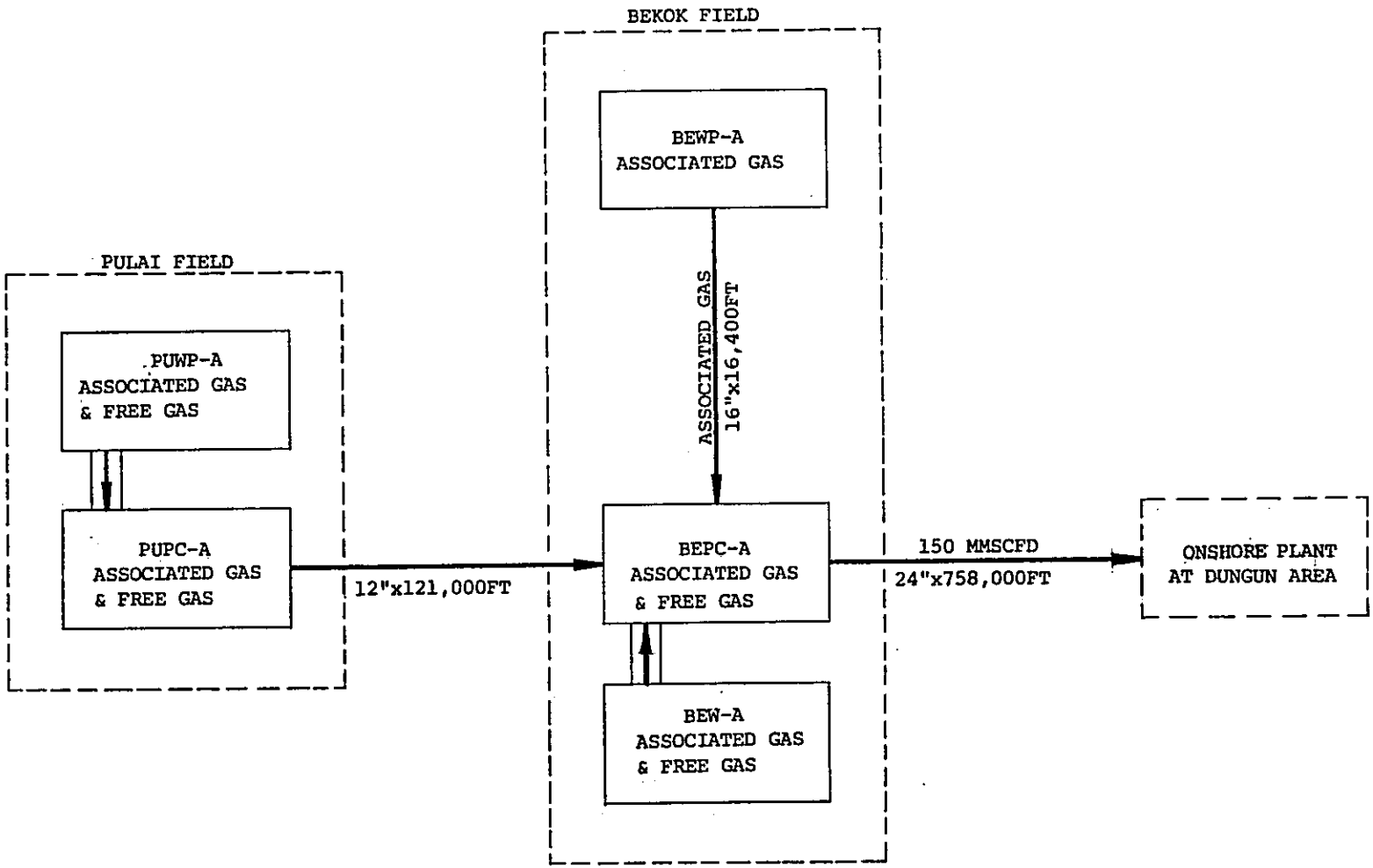


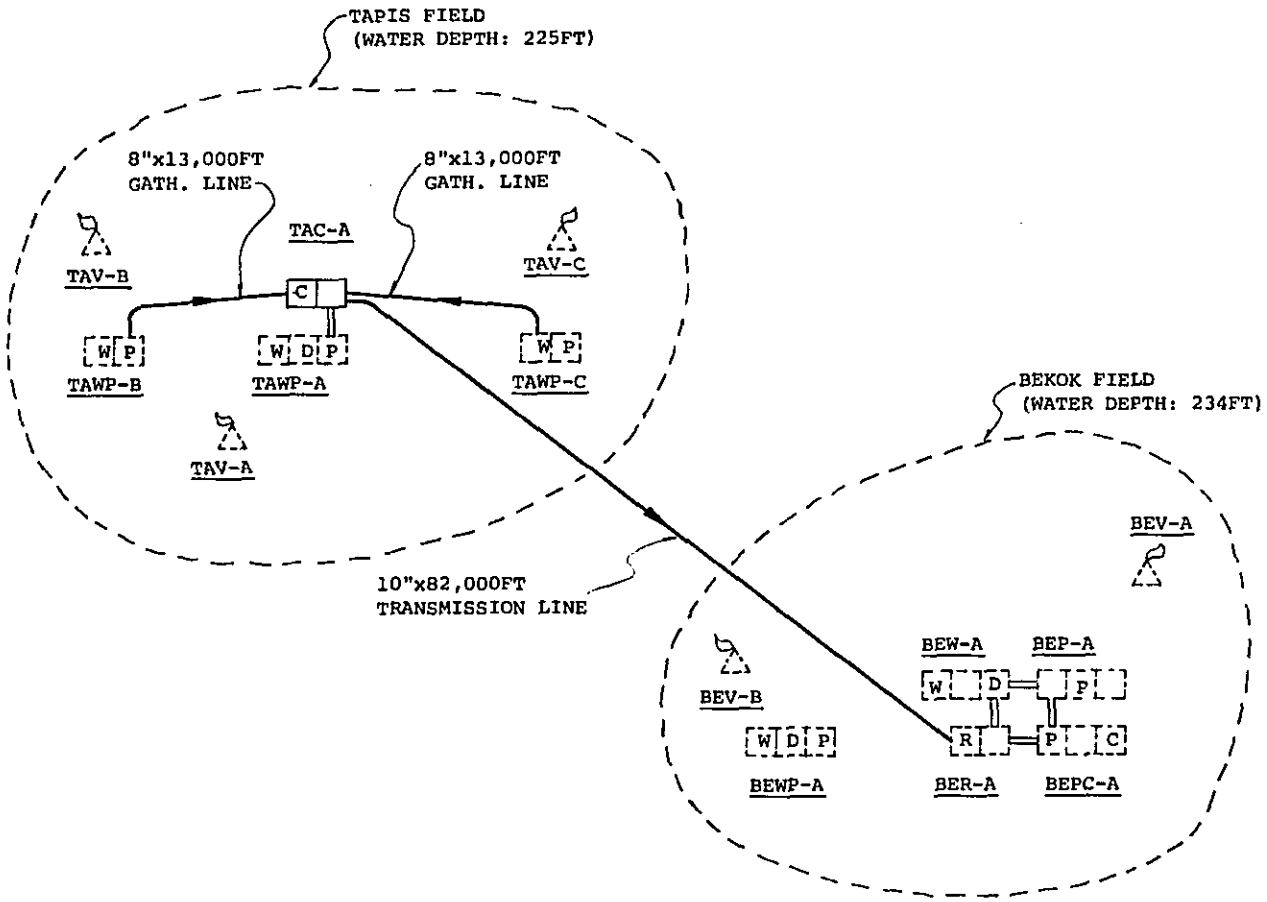
Fig. 19-6-1 (Vol. II)

PROJECT SCHEDULE

BEKOK AND PULAI FIELDS GAS UTILIZATION

Item \ Year		1st												2nd												3rd											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1. Engineering																																					
2. Bekok																																					
Development Well	2 Wells																																				
Prod. & Comp. Platform	8-leg																																				
Submarine Pipeline	24"x758,000'																																				
	16"x16,400'																																				
3. Pulai																																					
Development Well	2 Wells																																				
Prod. & Comp. Platform	8-leg																																				
Submarine Pipeline	12"x121,000'																																				
4. Start - up																																					

FIG. 20-5-1 (VOL. II)
FACILITIES ARRANGEMENT
FOR TAPIS OIL FIELD GAS UTILIZATION



LEGEND

P C	8-LEG PROD. & COMP. PLATFORM
P	8 - LEG PRODUCTION PLATFORM
W D	8 - LEG SELF-CONTAINED WELL PLATFORM
W D P	8 - LEG SELF-CONTAINED WELL & PROD. PLATFORM
W P	6 - LEG WELL & PRODUCTION PLATFORM
C	6 - LEG COMPRESSOR PLATFORM
R	6 - LEG RISER PLATFORM
	FLARE JACKET
	GAS LINE
	PLATFORM FOR OIL PRODUCTION

FIG. 20-5-2 (VOL. II)

BLOCK FLOW DIAGRAM

FOR TAPIS OIL FIELD GAS UTILIZATION

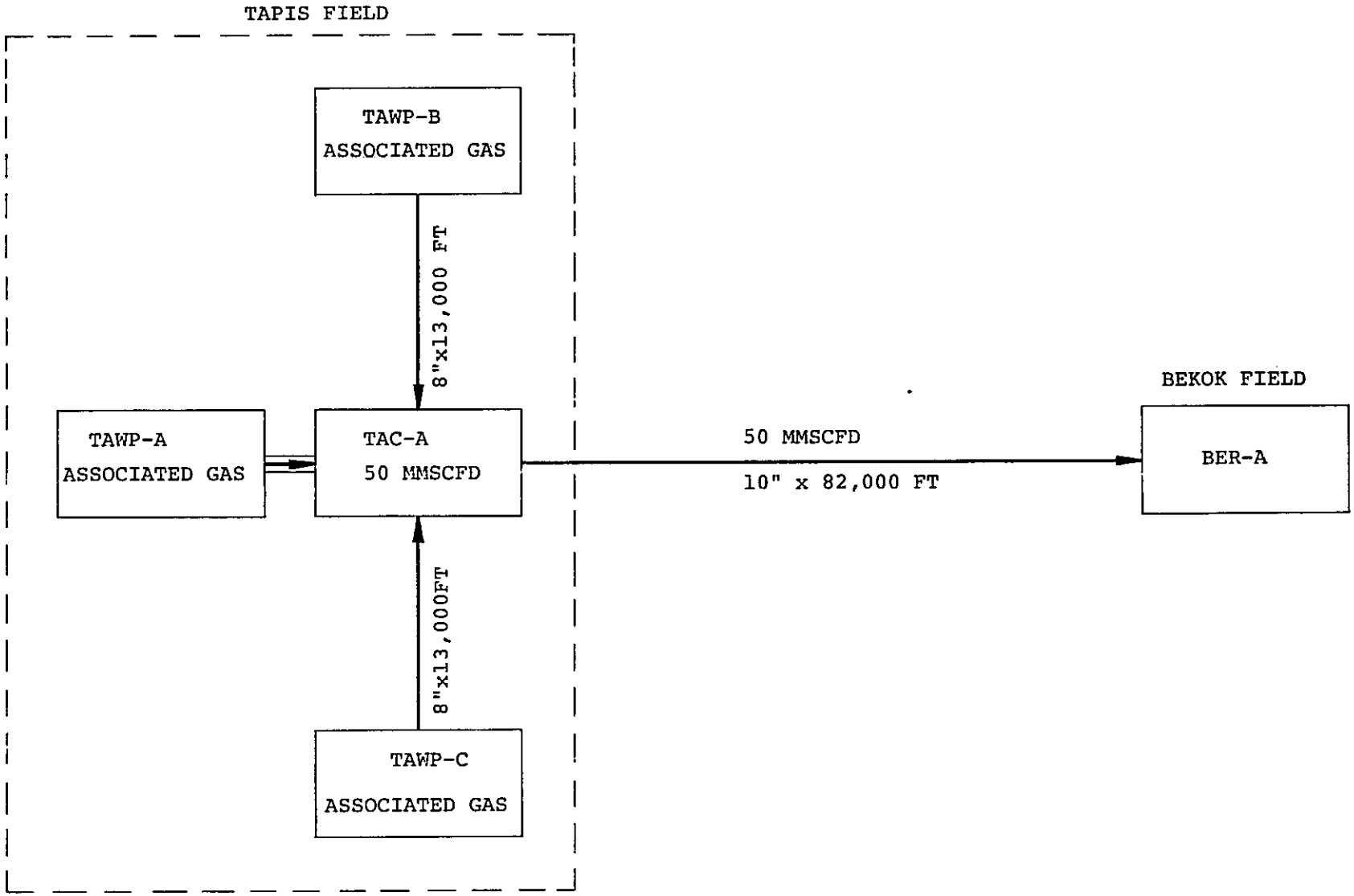


FIG. 21-5-1 (VOL. II)

FACILITIES ARRANGEMENT

FOR JERNEH GAS FIELD

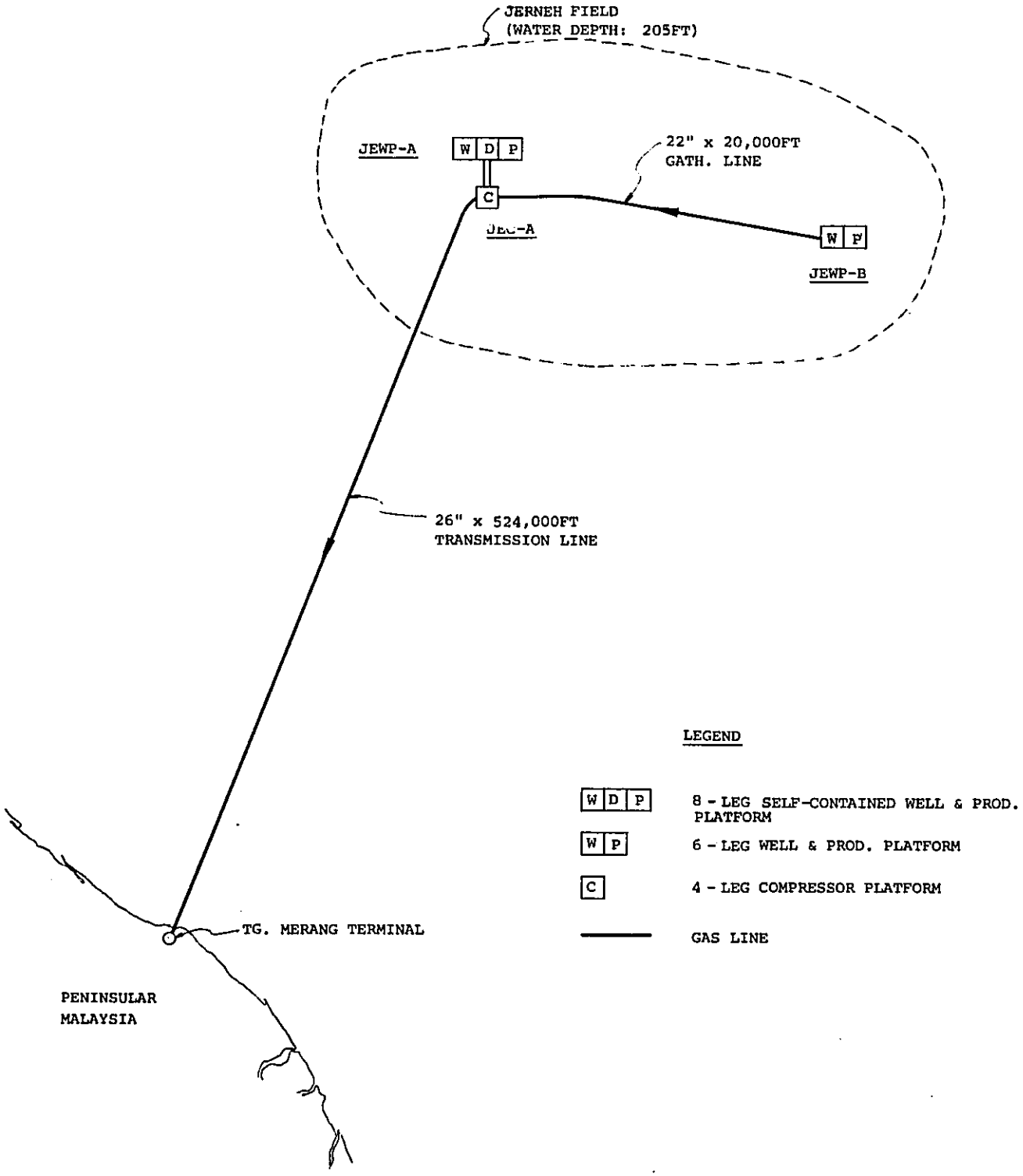
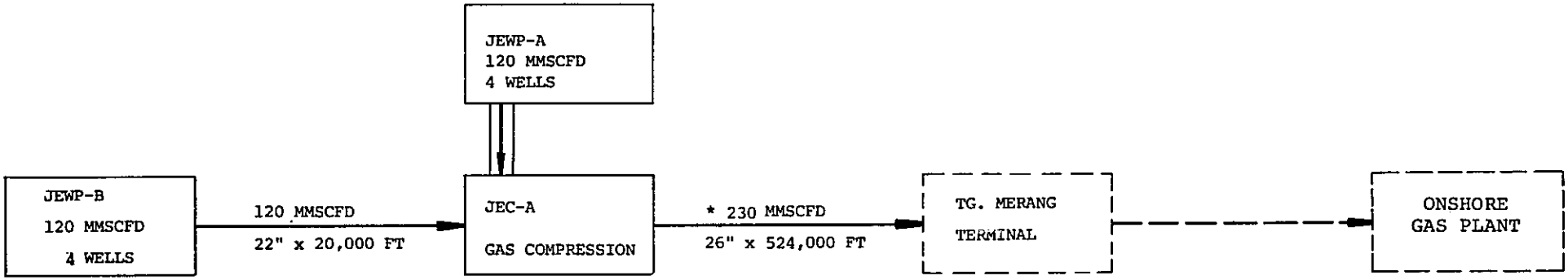


FIG. 21-5-2 (VOL. II)

BLOCK FLOW DIAGRAM

FOR JERNEH GAS FIELD



* Note; Gas handling facilities on each platform (JEWP-A&B) are designed to treat 120 MMSCFD in spite of 230 MMSCFD total field deliverability.

V-1 1ST STAGE PRODUCTION SEPARATOR

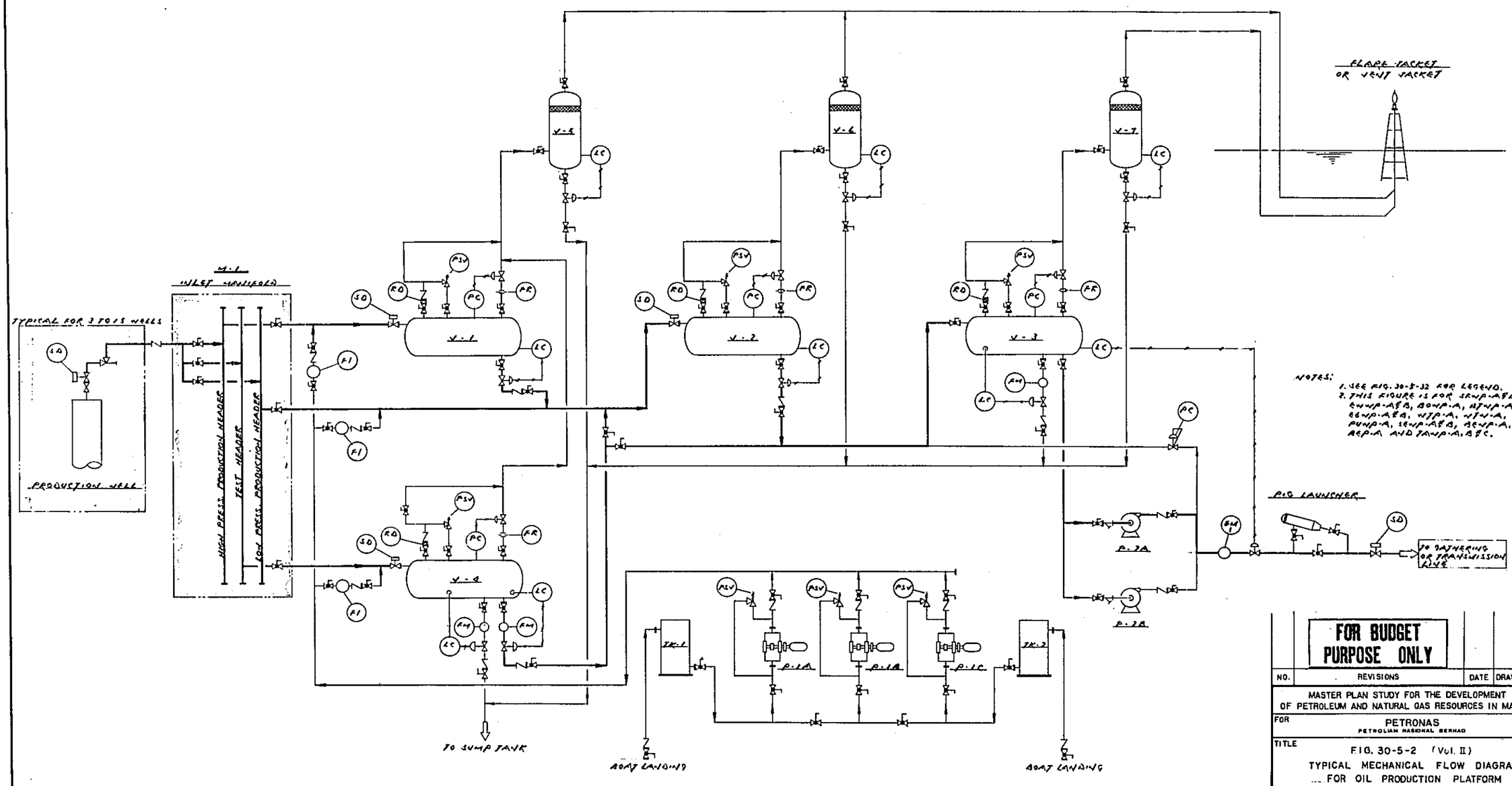
V-5 1ST STAGE FLARE SCRUBBER

V-2 2ND STAGE PRODUCTION SEPARATOR

V-6 2ND STAGE FLARE SCRUBBER

V-3 3RD STAGE PRODUCTION SEPARATOR

V-7 3RD STAGE FLARE SCRUBBER



NOTES:
1. SEE FIG. 30-5-32 FOR LEGEND.
2. THIS FIGURE IS FOR SEVP-A&B, EHVP-A&B, BOVP-A, HTVP-A, EGVP-A&B, WTP-A, WTV-A, PUMP-A, SEVP-A&B, AEVP-A, AEW-A, AEP-A AND TANP-A, B&C.

V-4 TEST SEPARATOR

TK-1 DEEMULSIFIER TANK

P-1A,B&C CHEMICAL INJECTION PUMPS

TK-2 DEGASSANT TANK

P-2A&B CRUDE TRANSFER PUMPS

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NO.	REVISIONS	DATE	DRAWN	CHIEF

MASTER PLAN STUDY FOR THE DEVELOPMENT OF PETROLEUM AND NATURAL GAS RESOURCES IN MALAYSIA

FOR PETRONAS
PETROLIAM NASIONAL BERHAD

TITLE
FIG. 30-5-2 (Vol. II)
TYPICAL MECHANICAL FLOW DIAGRAM
... FOR OIL PRODUCTION PLATFORM

DESIGN CHIEF		SCALE	
CHECKED BY		PROJECT NO.	
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E-101A&B — HEAT EXCHANGERS

V-103A&B — LIQUID KNOCK OUT DRUMS

V-101 — PRODUCTION SEPARATOR

V-102 — TEST SEPARATOR

V-111 — KNOCK OUT DRUM

V-112A&B — UNIT SUCTION SCRUBBERS

C-111A&B — GAS TURBINE COMPRESSORS

E-111A&B — AFTER COOLERS

V-104 — GLYCOL CONTACTOR

E-102 — GLYCOL COOLER

P-102A&B — GLYCOL CIRCULATION PUMPS

V-106 — FUEL GAS SCRUBBER

VENT STACK

TYPICAL FOR 2 WELLS

WELL

E-101A

V-103A

M-101 INLET MANIFOLD

TEST HEADER

PRODUCTION HEADER

V-1 1ST STAGE PRODUCTION SEPARATOR

TO FLARE

OIL PRODUCTION FACILITIES

GAS PRODUCTION FACILITIES

OIL INLET

OIL OUTLET

V-101

V-102

V-111

V-112A

V-112B

C-111A

C-111B

SURGE CONTROL

E-111A

E-111B

COOLING WATER

FIQN

PRESS.

V-104

E-102

P-102A&B

V-106

FUEL GAS SUPPLY

TO SUMP TANK

TO BLOWCASE

P-103A&B

FILTER

P-101

TK-102

GLYCOL SUPPLY

P-104A&B

TK-101

SUPPLY

V-107

SEAL GAS SUPPLY

P-105A&B

M-101

V-105

PIG LAUNCHER

TREATED GAS

V-111 DRAIN SEPARATOR

TO OIL PRODUCTION PLATFORM 3RD STAGE PRODUCTION SEPARATOR

NOTES:
1. SEE FIG. 30-5-32 FOR LEGEND.
2. THIS FIGURE IS FOR PUMP-A, PUMP-B, REPO-A AND GEN-A.

P-104A&B — CORROSION INHIBITOR PUMPS

TK-101 — CORROSION INHIBITOR TANK

V-107 — HEATING MEDIUM SURGE VESSEL

P-105A&B — HEATING MEDIUM CIRCULATION PUMPS

M-101 — START-UP HEATER

V-105 — CONDENSATE SURGE VESSEL

TR-101 — GLYCOL REGENERATOR

P-103A&B — GLYCOL CHARGE PUMPS

TK-102 — GLYCOL STORAGE TANK

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NO.	REVISIONS	DATE	DRAWN	CHIEF

MASTER PLAN STUDY FOR THE DEVELOPMENT OF PETROLEUM AND NATURAL GAS RESOURCES IN MALAYSIA

FOR PETRONAS PETROLIAM NASIONAL BERHAD

TITLE

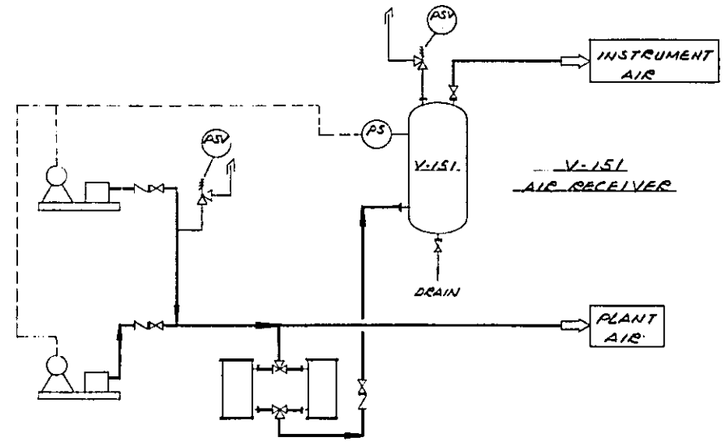
FIG. 30-5-6 (Vol. II)

TYPICAL MECHANICAL FLOW DIAGRAM FOR GAS PRODUCTION & COMPRESSOR PLATFORM

DESIGN CHIEF		SCALE	
CHECKED BY		PROJECT NO.	
DESIGNED BY		DRAWING NO.	
DRAWN BY		DATE	

JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN

INSTRUMENT AIR SYSTEM

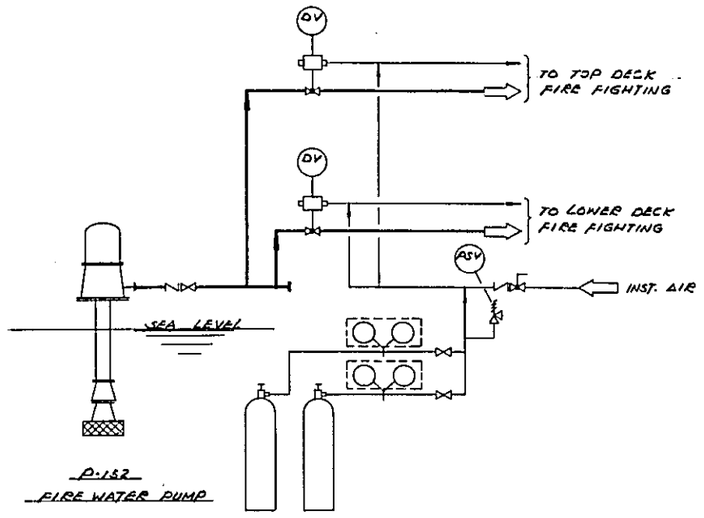


V-151
AIR RECEIVER

C-151A,B
AIR COMPRESSORS

AD-151
AIR DRYER

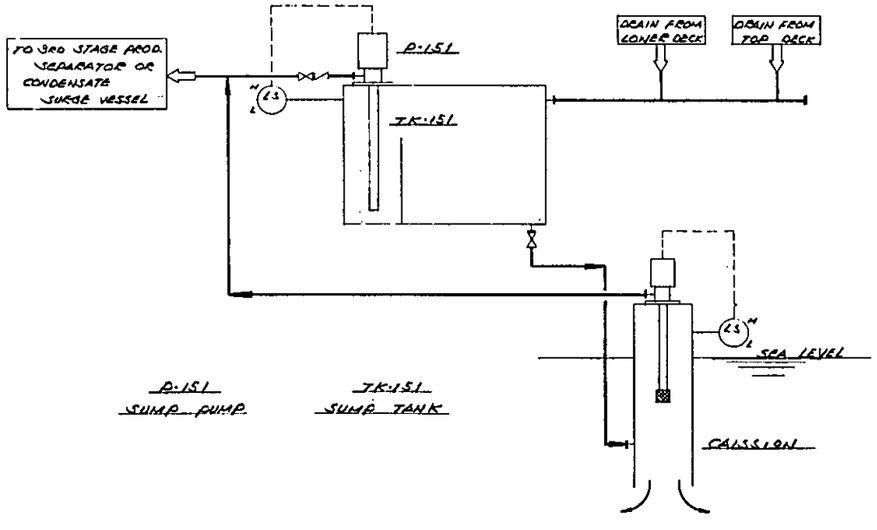
FIRE FIGHTING SYSTEM



P-152
FIRE WATER PUMP

CO_2 BOTTLES

DRAIN SYSTEM



P-151
SUMP PUMP

TK-151
SUMP TANK

NOTES:
1. SEE FIG. 30-5-33 FOR LEGEND.
2. THIS FIGURE IS FOR SEWP-A&A, EWWP-A&A, AOWP-A, ATWP-A, EGWP-A&A, WTP-A, PUWP-A, SEWP-A&A, AEWP-A, BEP-A, JAWP-A,B&C, FL3WP-A, FIEWP-A, F23P-A, AGWP-A&A, EBWP-A EIWP-A, AI3WP-A, PUFC-A, AND BEFC-A.

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MASTER PLAN STUDY FOR THE DEVELOPMENT OF PETROLEUM AND NATURAL GAS RESOURCES IN MALAYSIA

FOR PETRONAS
PETROLIAM NASIONAL BERHAD

TITLE
FIG. 30-5-10 (Vol. II)
TYPICAL UTILITY FLOW DIAGRAM
FOR OIL & GAS PRODUCTION PLATFORM

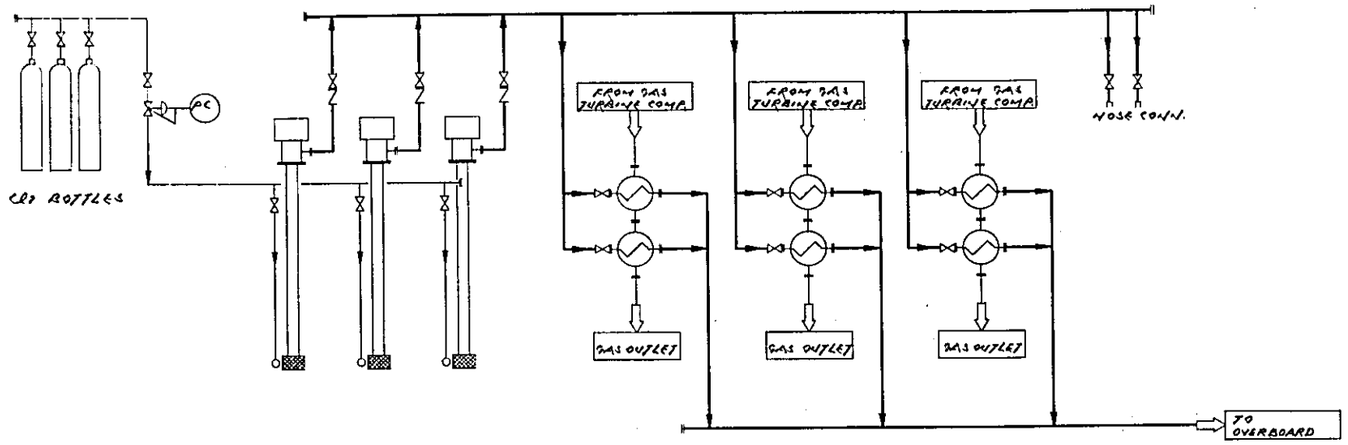
DESIGN CHIEF		SCALE	
CHECKED BY		PROJECT NO.	
DESIGNED BY		DRAWING NO.	
DRAWN BY		DATE	

JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN

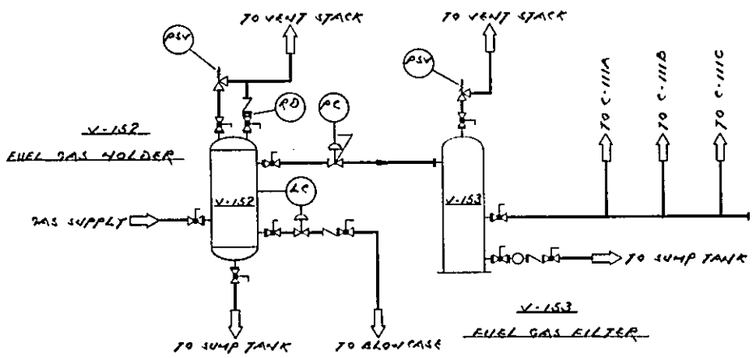
COOLING WATER SYSTEM

P-153A,B,C
SEAWATER PUMPS

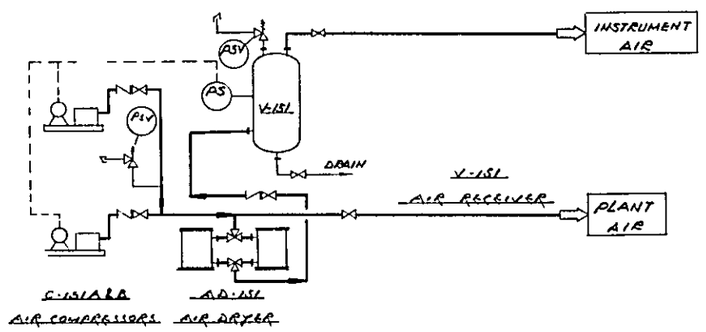
E-111A~F
AFTER COOLERS



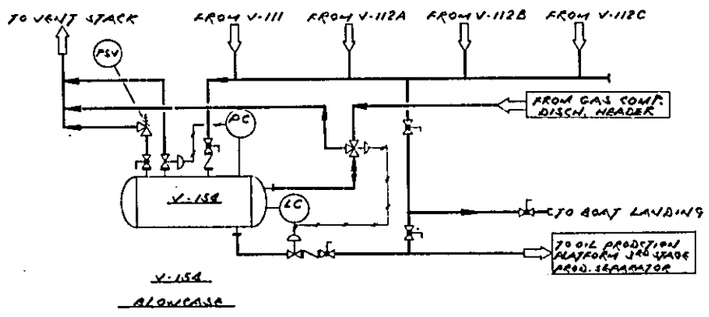
FUEL GAS SYSTEM



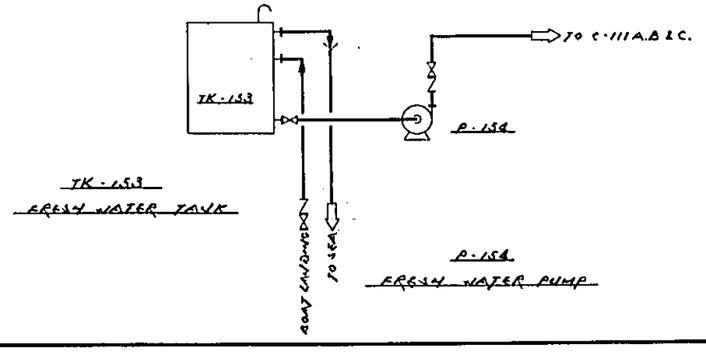
INSTRUMENT AIR SYSTEM



DUMP SYSTEM



FRESH WATER SYSTEM



NOTES:
1. SEE FIG. 30-5-32 FOR LEGEND.
2. THIS FIGURE IS FOR 4 EC-A.

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FOR PETRONAS
PETROLIAM NASIONAL BERHAD

TITLE
FIG. 30-5-12 (Vol. II)
TYPICAL UTILITY FLOW DIAGRAM FOR GAS COMPRESSOR PLATFORM

DESIGN CHIEF		SCALE	
CHECKED BY		PROJECT NO.	
DESIGNED BY		DRAWING NO.	
DRAWN BY		DATE	

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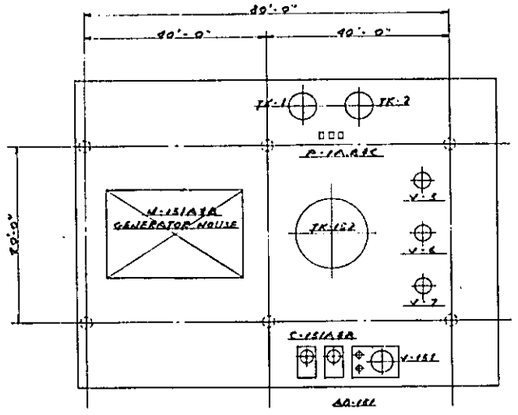
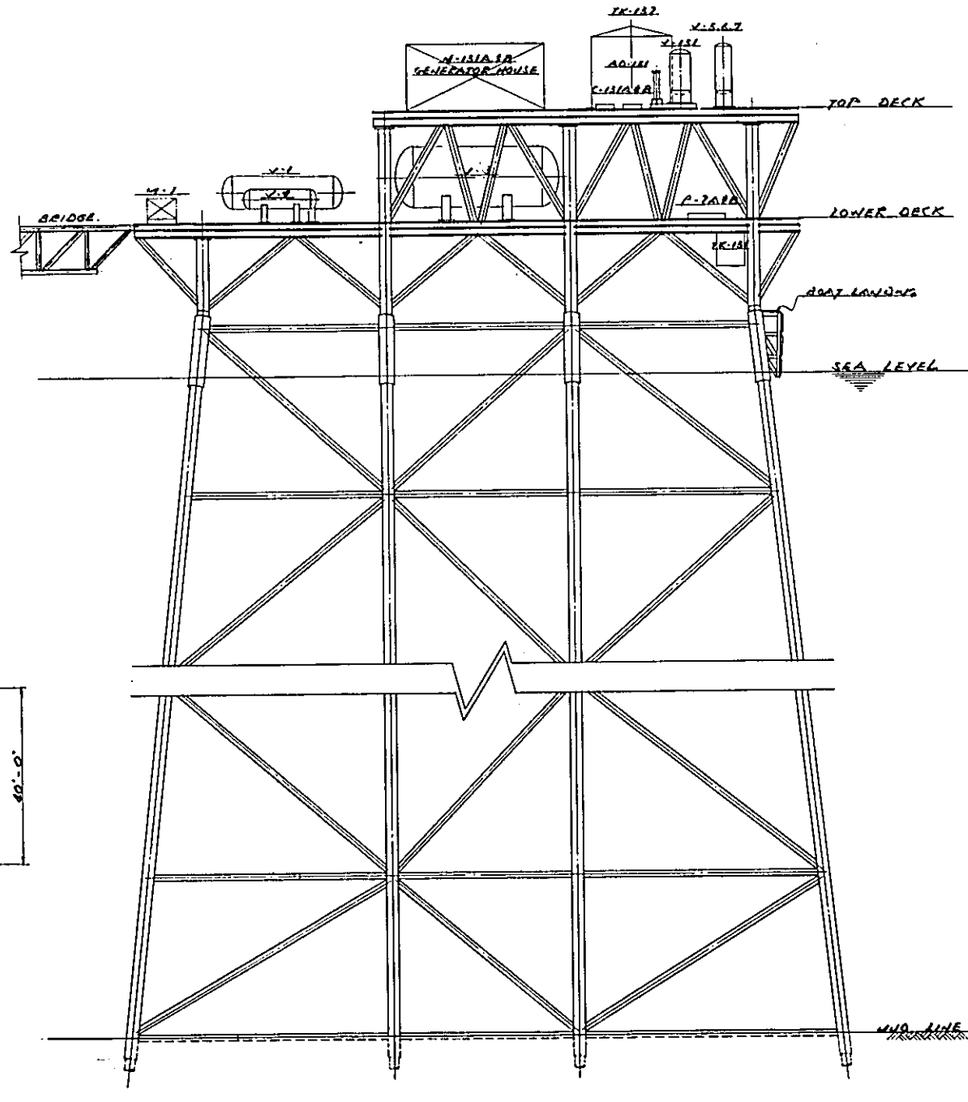
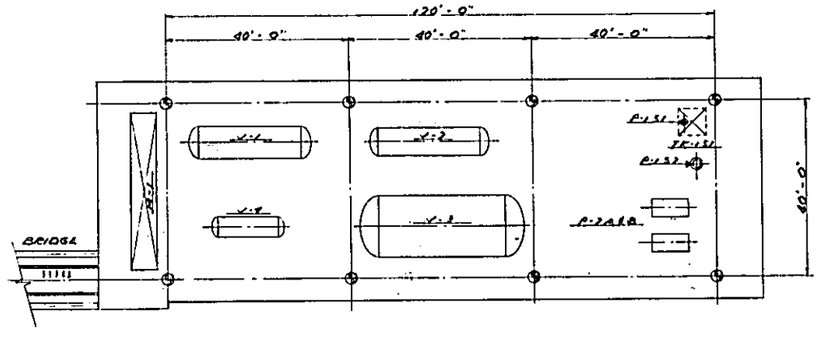


TOP DECK PLAN



ELEVATION



LOWER DECK PLAN

EQUIPMENT LIST

ITEM NO.	DESCRIPTION
	VESSEL
V-1	1ST STAGE PRODUCTION SEPARATOR
V-2	2ND STAGE PRODUCTION SEPARATOR
V-3	3RD STAGE PRODUCTION SEPARATOR
V-4	TEST SEPARATOR
V-5	1ST STAGE FLARE SCRUBBER
V-6	2ND STAGE FLARE SCRUBBER
V-7	3RD STAGE FLARE SCRUBBER
V-151	INSTRUMENT AIR RECEIVER
	MACHINERY
C-151A&B	INSTRUMENT AIR COMPRESSORS
AO-151	INSTRUMENT AIR DRYER
	PUMP
P-1A,B&C	CHEMICAL INJECTION PUMPS
P-2A&B	CRUDE TRANSFER PUMPS
P-151	SUMP PUMP
P-152	FIRE WATER PUMP
	TANK
TK-1	DEEMULSIFIER TANK
TK-2	DEFOAMANT TANK
TK-151	SUMP TANK
TK-152	DIESEL STORAGE TANK
	MISCELLANEOUS
M-1	INLET MANIFOLD
M-151A&B	DIESEL DRIVEN GENERATORS

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NOTE:
THIS FIGURE IS FOR BEP-A.

NO.	REVISIONS	DATE	DRAWN	CHIEF

MASTER PLAN STUDY FOR THE DEVELOPMENT OF PETROLEUM AND NATURAL GAS RESOURCES IN MALAYSIA

FOR PETRONAS
PETROLIAM NASIONAL BERHAD

TITLE
FIG. 30-5-14 (Vol. II)
TYPICAL PLAN AND ELEVATION FOR 8-LEG OIL PRODUCTION PLATFORM

DESIGN CHIEF		SCALE	
CHECKED BY		PROJECT NO.	
DESIGNED BY		DRAWING NO.	
DRAWN BY		DATE	

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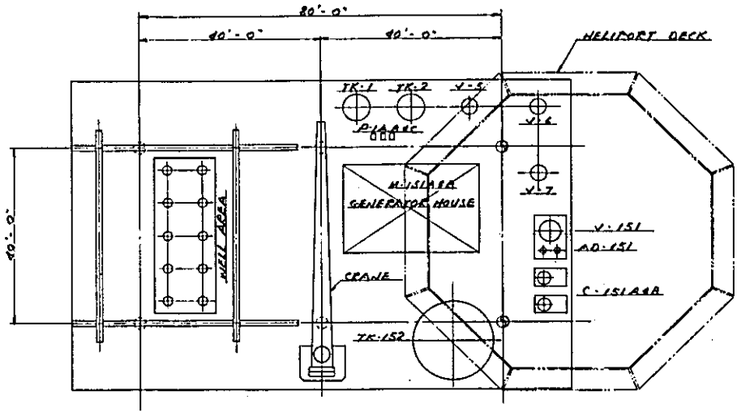
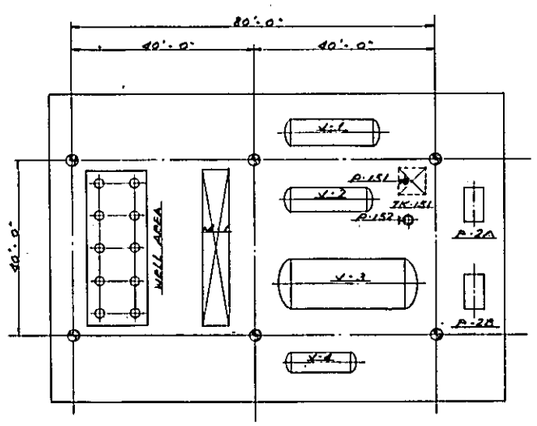
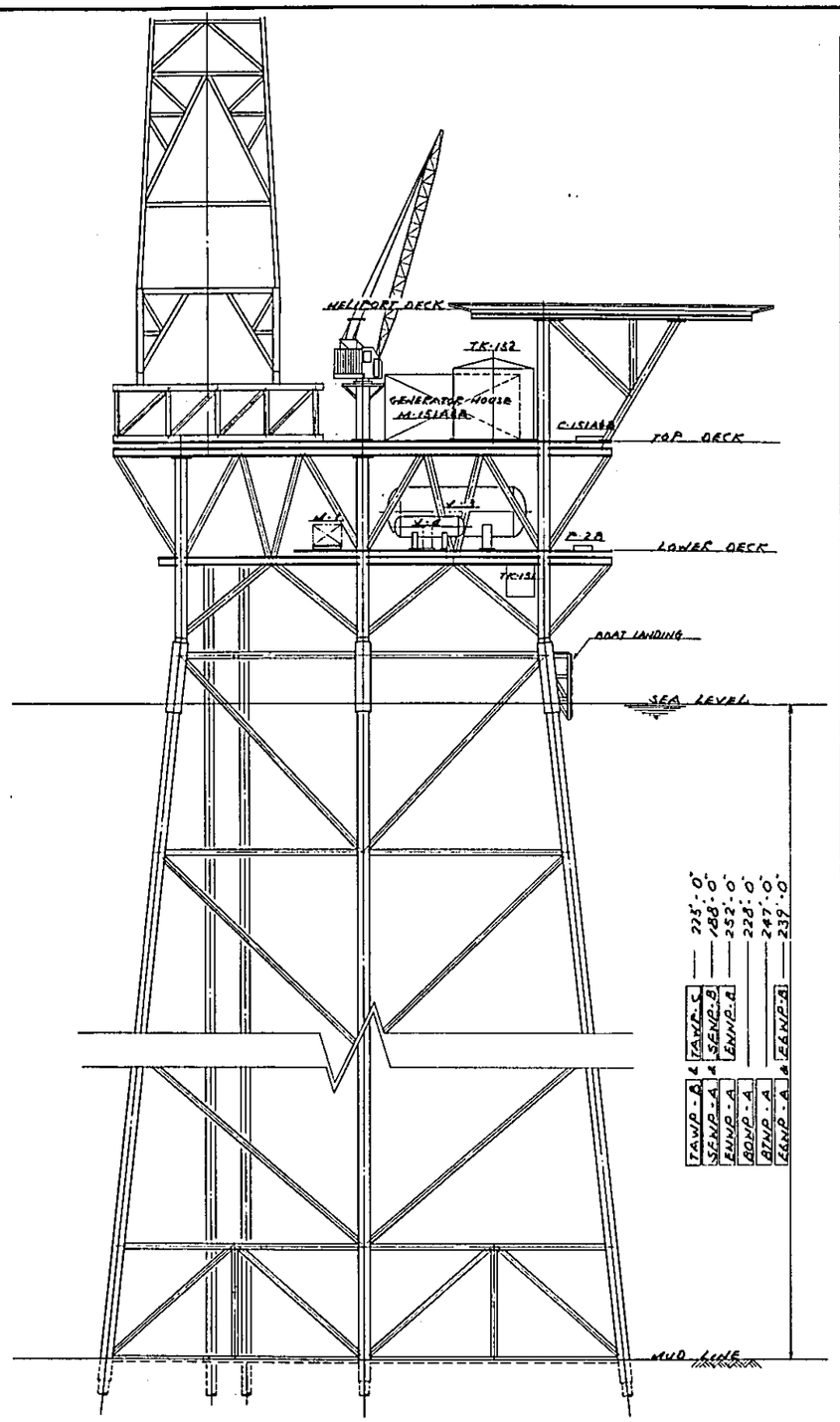


TOP DECK PLAN



LOWER DECK PLAN



ELEVATION

EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
	VESSEL
V - 1	1ST STAGE PRODUCTION SEPARATOR
V - 2	2ND STAGE PRODUCTION SEPARATOR
V - 3	3RD STAGE PRODUCTION SEPARATOR
V - 4	TEST SEPARATOR
V - 5	1ST STAGE FLARE SCRUBBER
V - 6	2ND STAGE FLARE SCRUBBER
V - 7	3RD STAGE FLARE SCRUBBER
V - 151	INSTRUMENT AIR RECEIVER
	MACHINERY
C - 151A&B	INSTRUMENT AIR COMPRESSORS
AD - 151	INSTRUMENT AIR DRYER
	PUMP
P - 1A,B&C	CHEMICAL INJECTION PUMPS
P - 2A&B	CRUDE TRANSFER PUMPS
P - 151	SUMP PUMP
P - 152	FIRE WATER PUMP
	TANK
TK - 1	DEEMULSIFIER TANK
TK - 2	DEFOAMANT TANK
TK - 151	SUMP TANK
TK - 152	DIESEL STORAGE TANK
	MISCELLANEOUS
M - 1	INLET MANIFOLD
M - 151A&B	DIESEL DRIVEN GENERATORS

FOR BUDGET PURPOSE ONLY

NOTE:
- THIS FIGURE IS FOR SFNP-A & B, ENWP-A&B, BDWP-A, BTWP-A, EGWP-A&B, AND TAWP-B&C.

NO.	REVISIONS	DATE	DRAWN	CHIEF

MASTER PLAN STUDY FOR THE DEVELOPMENT OF PETROLEUM AND NATURAL GAS RESOURCES IN MALAYSIA

FOR PETRONAS
PETROLIAM NASIONAL BERHAD

TITLE
FIG 30-5-16 (Vol. II)
TYPICAL PLAN AND ELEVATION FOR 6-LEG WELL & OIL PRODUCTION PLATFORM

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DESIGNED BY		DRAWING NO.	
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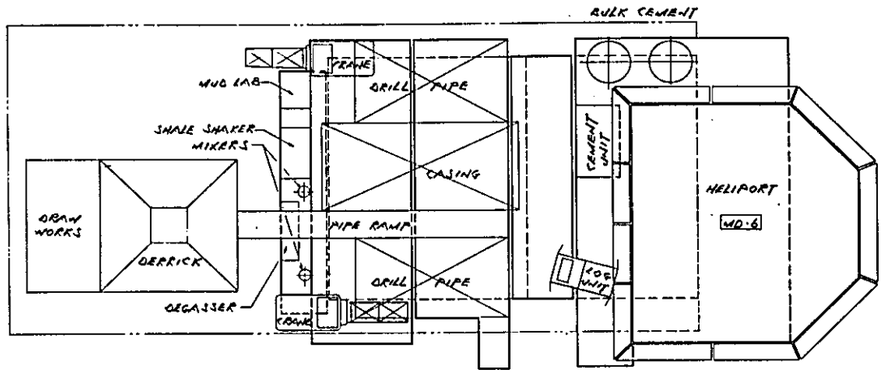
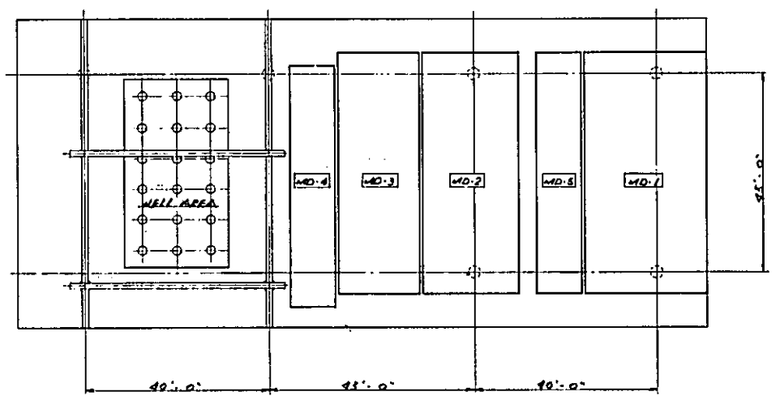
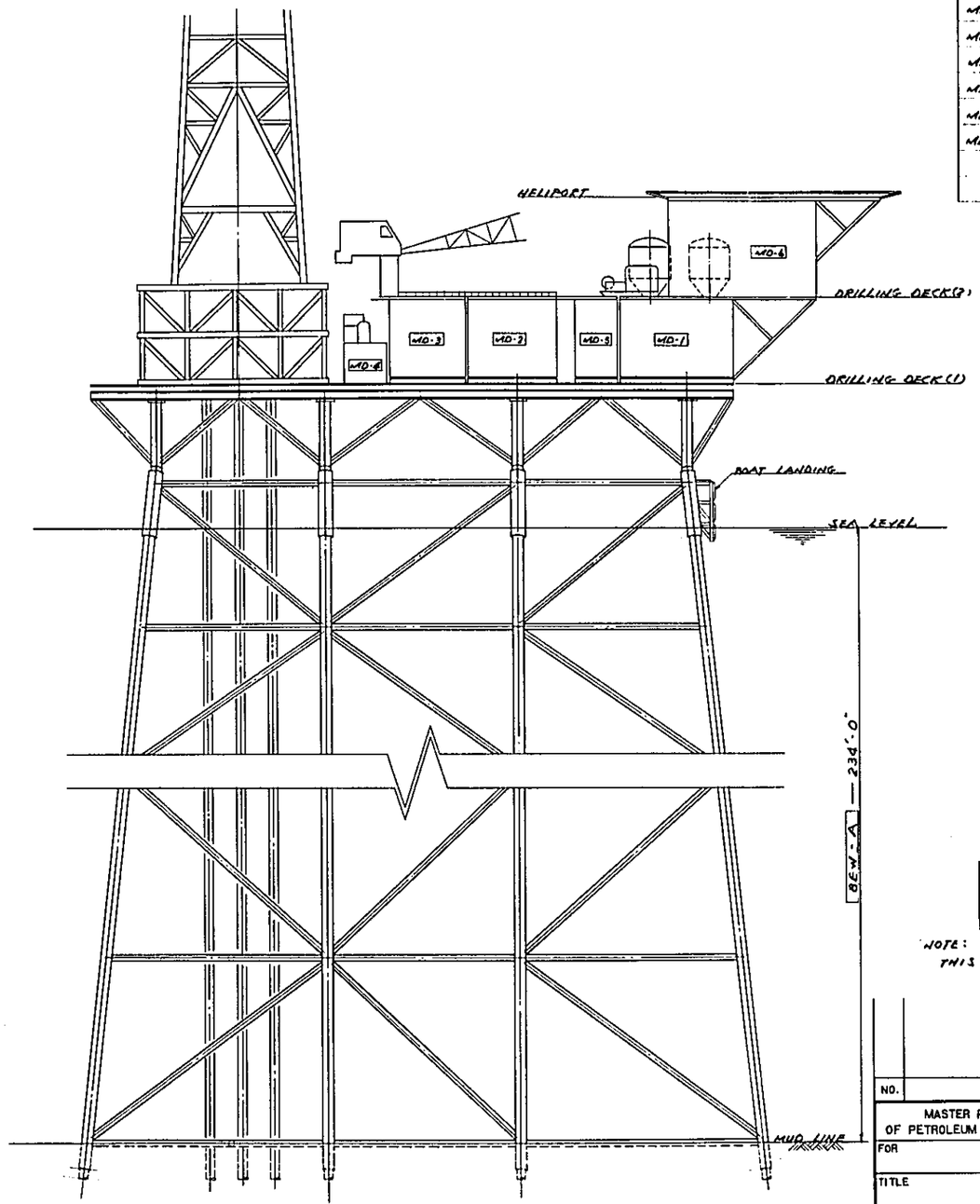
MODULE LIST	
ITEM NO.	DESCRIPTION
MD-1	ENGINE · GENERATION OR POWER MODULE
MD-2	DRY STORAGE MODULE
MD-3	MUD PUMPS MODULE
MD-4	ACTIVE MUD TANKS
MD-5	WATER TANKS
MD-6	QUARTERS WITH HELIPORT



DRILLING DECK (2) PLAN



DRILLING DECK (1) PLAN



ELEVATION

FOR BUDGET PURPOSE ONLY

NOTE:
THIS FIGURE IS FOR REW-A.

NO.	REVISIONS	DATE	DRAWN	CHIEF

MASTER PLAN STUDY FOR THE DEVELOPMENT OF PETROLEUM AND NATURAL GAS RESOURCES IN MALAYSIA

FOR PETRONAS
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TITLE
FIG. 30-5-17 (Vol. II)
TYPICAL PLAN AND ELEVATION FOR
8-LEG SELF-CONTAINED WELL PLATFORM

DESIGN CHIEF		SCALE	
CHECKED BY		PROJECT NO.	
DESIGNED BY		DRAWING NO.	
DRAWN BY		DATE	

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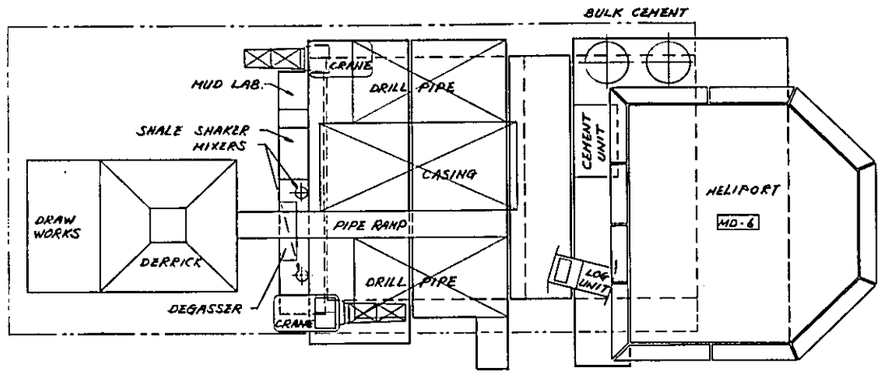
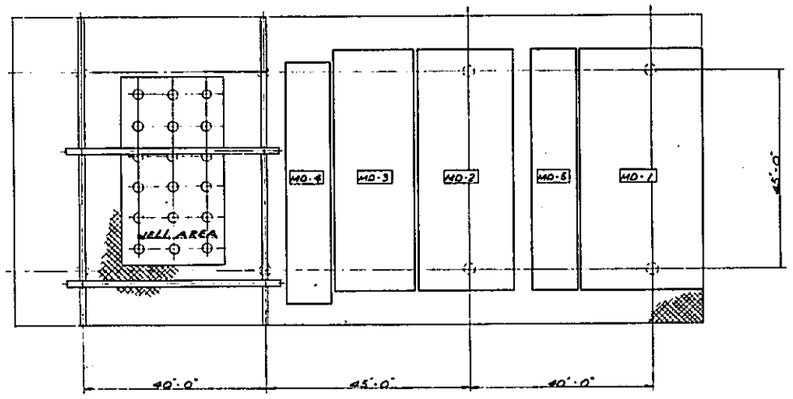
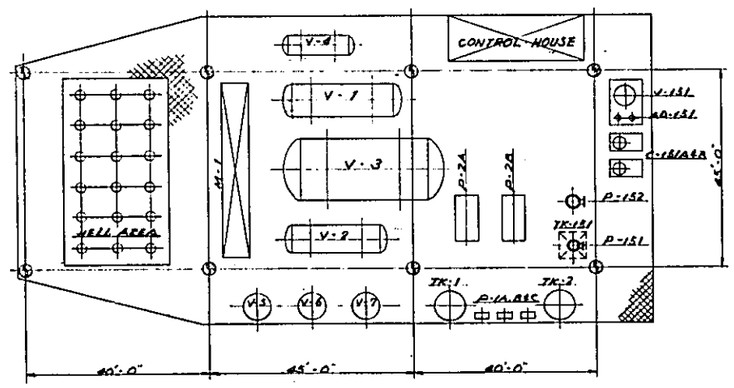


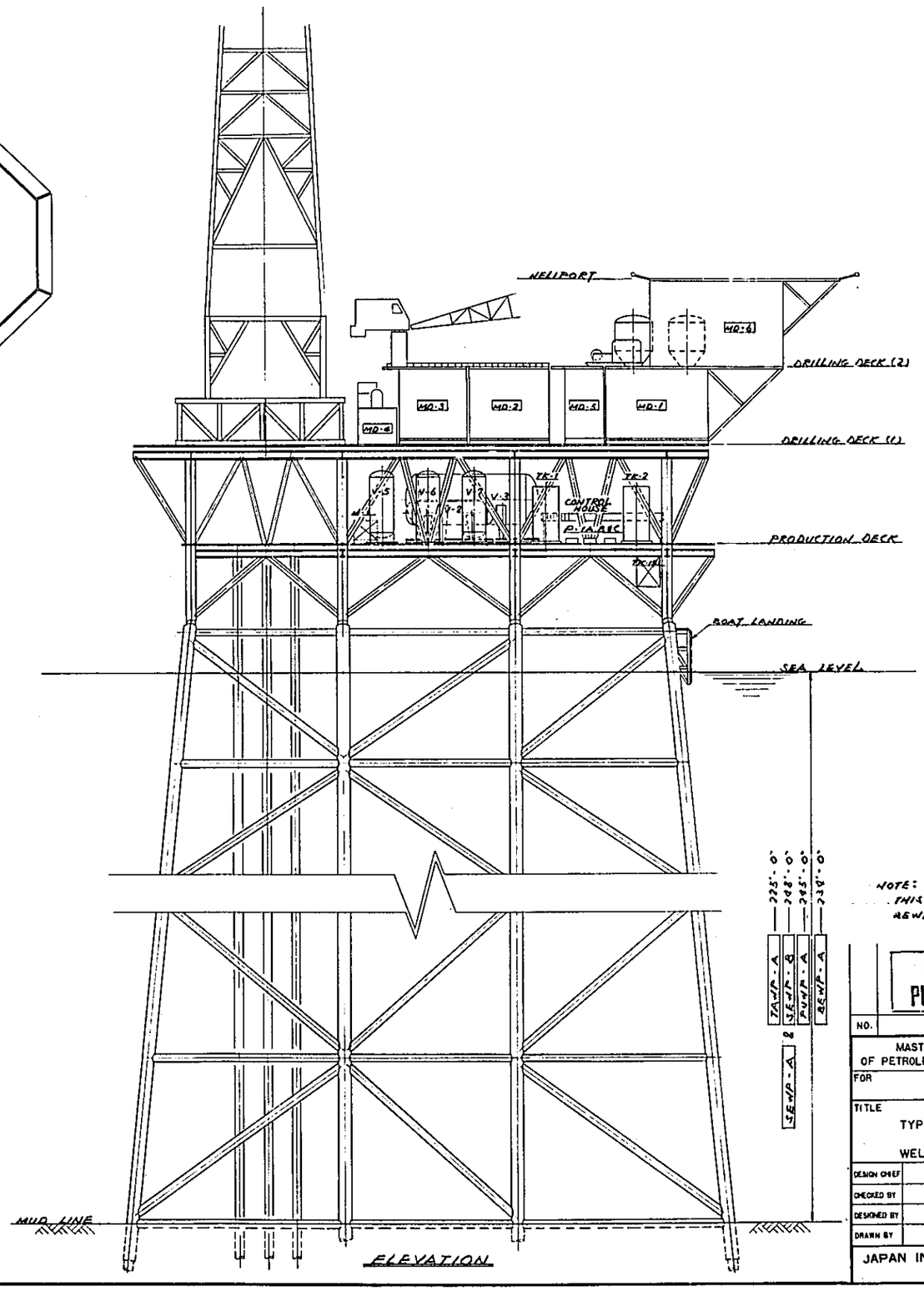
DRILLING DECK (2) PLAN



DRILLING DECK (1) PLAN



PRODUCTION DECK PLAN



ELEVATION

MODULE LIST	
ITEM NO.	DESCRIPTION
MD-1	ENGINE-GENERATION OR POWER MODULE
MD-2	DRY STORAGE MODULE
MD-3	MUD PUMPS MODULE
MD-4	ACTIVE MUD TANKS
MD-5	WATER TANKS
MD-6	QUARTERS WITH HELIPORT

EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
	VESSEL
V-1	1ST STAGE PRODUCTION SEPARATOR
V-2	2ND STAGE PRODUCTION SEPARATOR
V-3	3RD STAGE PRODUCTION SEPARATOR
V-4	TEST SEPARATOR
V-5	1ST STAGE FLARE SCRUBBER
V-6	2ND STAGE FLARE SCRUBBER
V-7	3RD STAGE FLARE SCRUBBER
V-151	INSTRUMENT AIR RECEIVER
	MACHINERY
C-181A&B	INSTRUMENT AIR COMPRESSORS
AD-151	INSTRUMENT AIR DRYER
	PUMP
P-1A,B&C	CHEMICAL INJECTION PUMPS
P-2A&B	CRUDE TRANSFER PUMPS
P-151	SUMP PUMP
P-152	FIRE WATER PUMP
	TANK
TK-1	DEEMULSIFIER TANK
TK-2	DEFOAMANT TANK
TK-151	SUMP TANK
	MISCELLANEOUS
M-1	INLET MANIFOLD

NOTE:
THIS FIGURE IS FOR PUMP-A, SEWP-A&B, REWP-A AND TANP-A.

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MASTER PLAN STUDY FOR THE DEVELOPMENT OF PETROLEUM AND NATURAL GAS RESOURCES IN MALAYSIA

FOR PETRONAS
PETROLIAM NASIONAL BERHAD

TITLE FIG. 30-5-18(Vol. II)
TYPICAL PLAN AND ELEVATION FOR 8-LEG SELF-CONTAINED WELL & OIL PRODUCTION PLATFORM

DESIGN CHIEF		SCALE	
CHECKED BY		PROJECT NO.	
DESIGNED BY		DRAWING NO.	
DRAWN BY		DATE	

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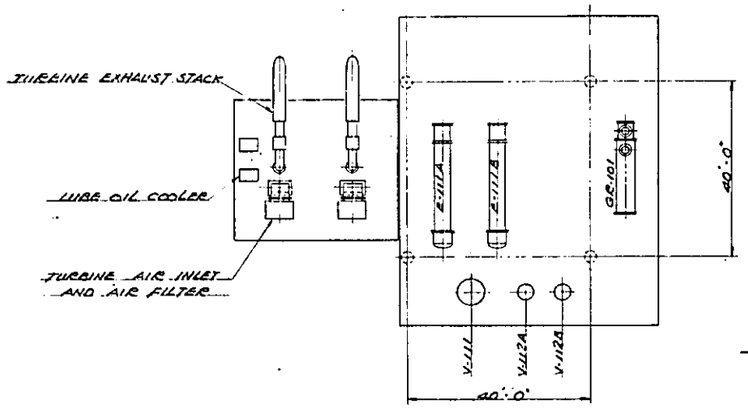
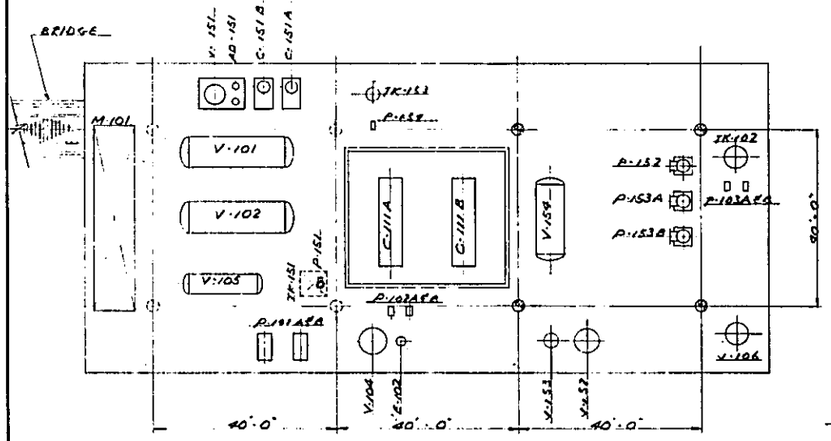
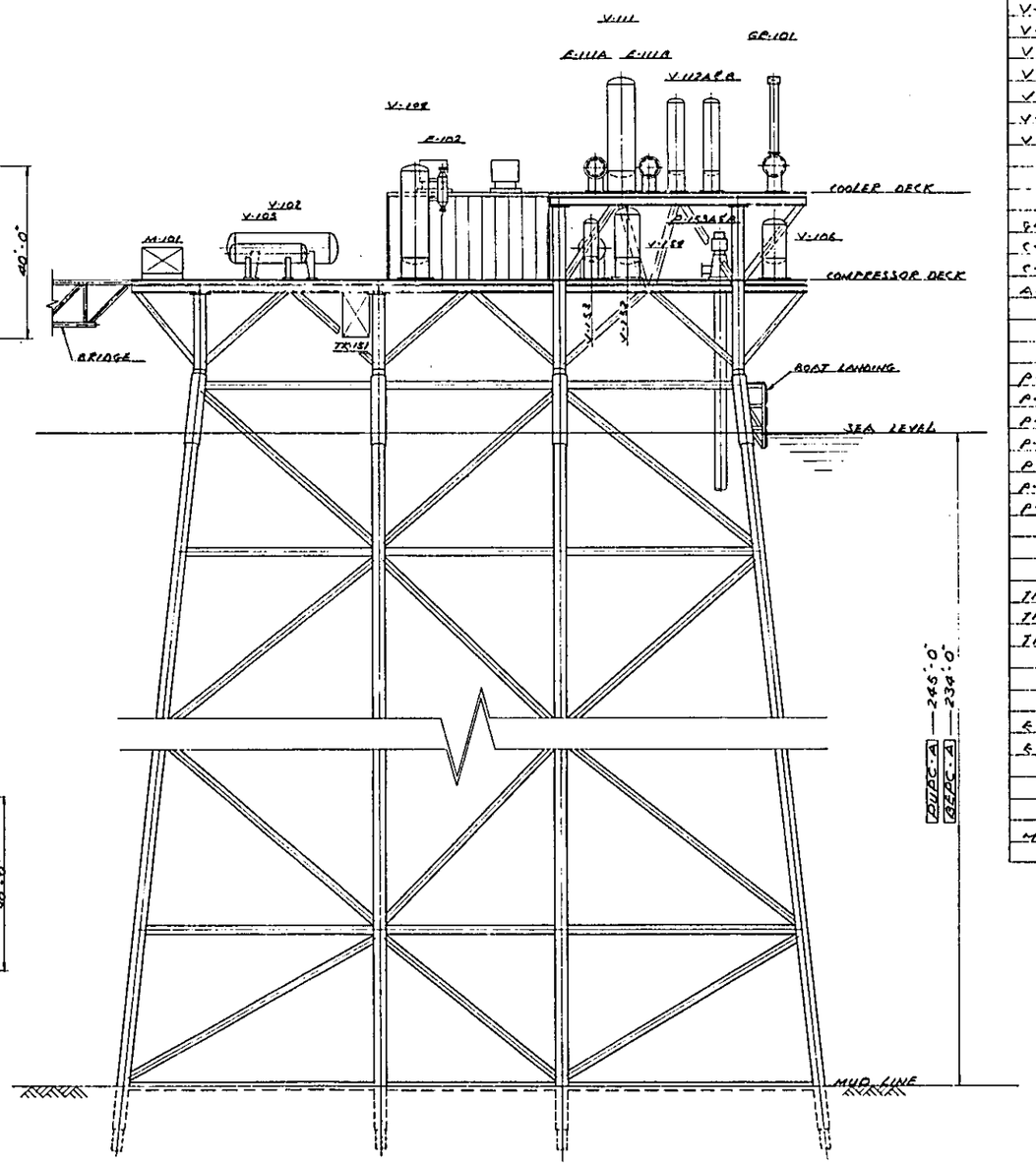


COOLER DECK PLAN



COMPRESSOR DECK PLAN



ELEVATION

EQUIPMENT LIST	
ITEM NO.	VESSEL
V-101	PRODUCTION SEPARATOR
V-102	TEST SEPARATOR
V-104	GLYCOL CONTACTOR
V-105	CONDENSATE SURGE VESSEL
V-106	FUEL GAS SCRUBBER
V-111	KNOCK OUT DRUM
V-112A&B	UNIT SUCTION SCRUBBERS
V-151	INSTRUMENT AIR RECEIVER
V-152	FUEL GAS HOLDER
V-153	FUEL GAS FILTER
V-157	BLOW CASE
	MACHINERY
GR-101	GLYCOL REGENERATOR
C-111A&B	GAS TURBINE COMPRESSORS
C-151A&B	INSTRUMENT AIR COMPRESSOR
AD-151	INSTRUMENT AIR DRYER
	PUMP
P-101A&B	CONDENSATE PUMPS
P-102A&B	GLYCOL CIRCULATION PUMPS
P-103A&B	GLYCOL CHARGE PUMPS
P-151	SUMP PUMP
P-152	FIRE WATER PUMP
P-153A&B	SEAWATER PUMPS
P-158	FRESH WATER PUMP
	TANK
TK-102	GLYCOL STORAGE TANK
TK-151	SUMP TANK
TK-153	FRESH WATER TANK
	HEAT EXCHANGER
E-102	GLYCOL COOLER
E-111A&B	AFTER COOLERS
	MISCELLANEOUS
M-101	INLET MANIFOLD

NOTE:
THIS FIGURE IS FOR PUFC-A AND BEPC-A.

FOR BUDGET PURPOSE ONLY

NO.	REVISIONS	DATE	DRAWN	CHIEF

MASTER PLAN STUDY FOR THE DEVELOPMENT OF PETROLEUM AND NATURAL GAS RESOURCES IN MALAYSIA

FOR PETRONAS
PETROLIAM NASIONAL BERHAD

TITLE
FIG. 30-5-25 (Vol. II)
TYPICAL PLAN AND ELEVATION FOR 8-LEG GAS PRODUCTION & COMPRESSOR PLATFORM

DESIGN CHIEF		SCALE	
CHECKED BY		PROJECT NO.	
DESIGNED BY		DRAWING NO.	
DRAWN BY		DATE	

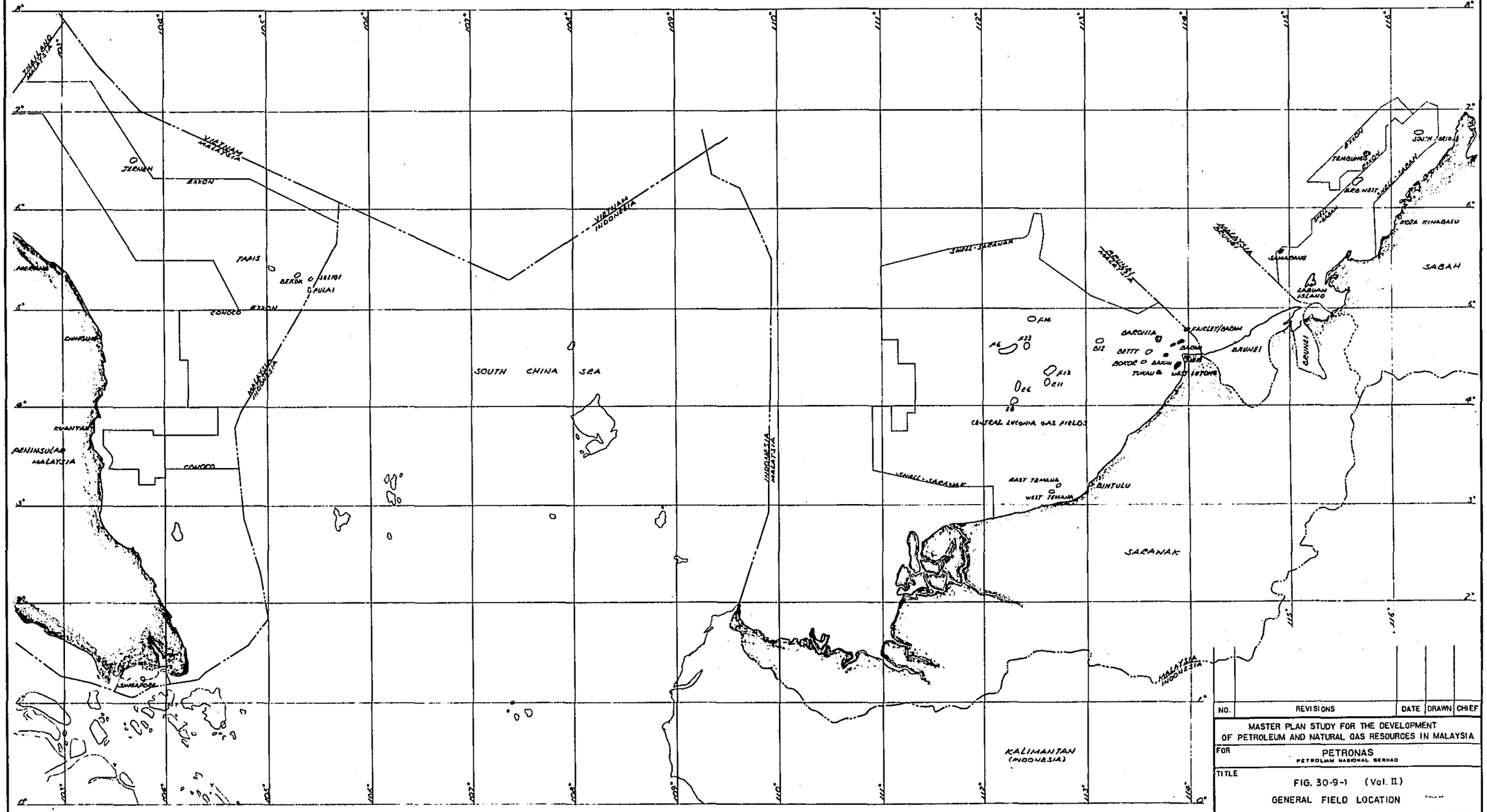
JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN

Fig. 30-5-32 (Vol. II)

LEGEND FOR FLOW DIAGRAMS

PIC	PRESSURE INDICATING CONTROLLER
PC	PRESSURE CONTROLLER
PS	PRESSURE SWITCH
FRC	FLOW RECORDING CONTROLLER
FM	FLOW METER
FR	FLOW RECORDER
FI	FLOW INDICATOR
LC	LEVEL CONTROLLER
LS	LEVEL SWITCH
PSV	PRESSURE SAFETY VALVE
RD	RUPTURE DISC
DV	DELUGE VALVE
SD	SHUTDOWN VALVE
XV	MISCELLANEOUS VALVE

NOTE: PI (PRESSURE INDICATOR) AND TI (TEMPERATURE INDICATOR) ARE NOT SHOWN ON THE FLOW DIAGRAMS FOR SIMPLIFICATION.



NO.	REVISIONS	DATE	DRAWN	CHIEF

MASTER PLAN STUDY FOR THE DEVELOPMENT OF PETROLEUM AND NATURAL GAS RESOURCES IN MALAYSIA

FOR PETRONAS
PETROLIAM NASIONAL BERHAD

TITLE
FIG. 30-9-1 (Vol. II)
GENERAL FIELD LOCATION

DESIGN CHIEF		SCALE	
CHECKED BY		PROJECT NO.	
DESIGNED BY		DRAWING NO.	
DRAWN BY		DATE	

JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN

Fig. 31-6-1
(Vol. II)

DRILLING & COMPLETION COST
OF DEVELOPMENT WELL

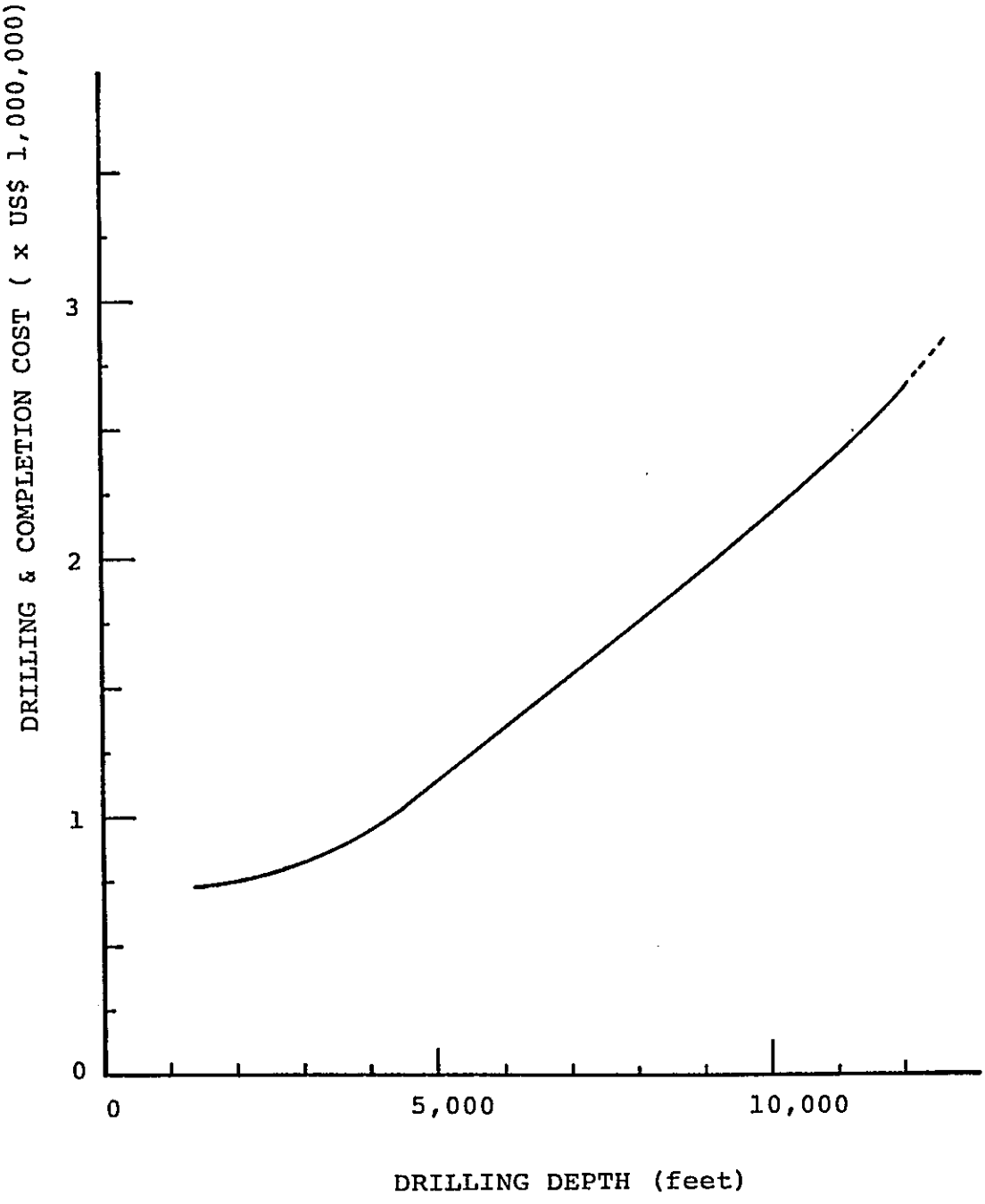


Fig. 31-6-2 (Vol. II)

TENTATIVE ORGANIZATION FOR FIELD OPERATION

(80 Persons Case)

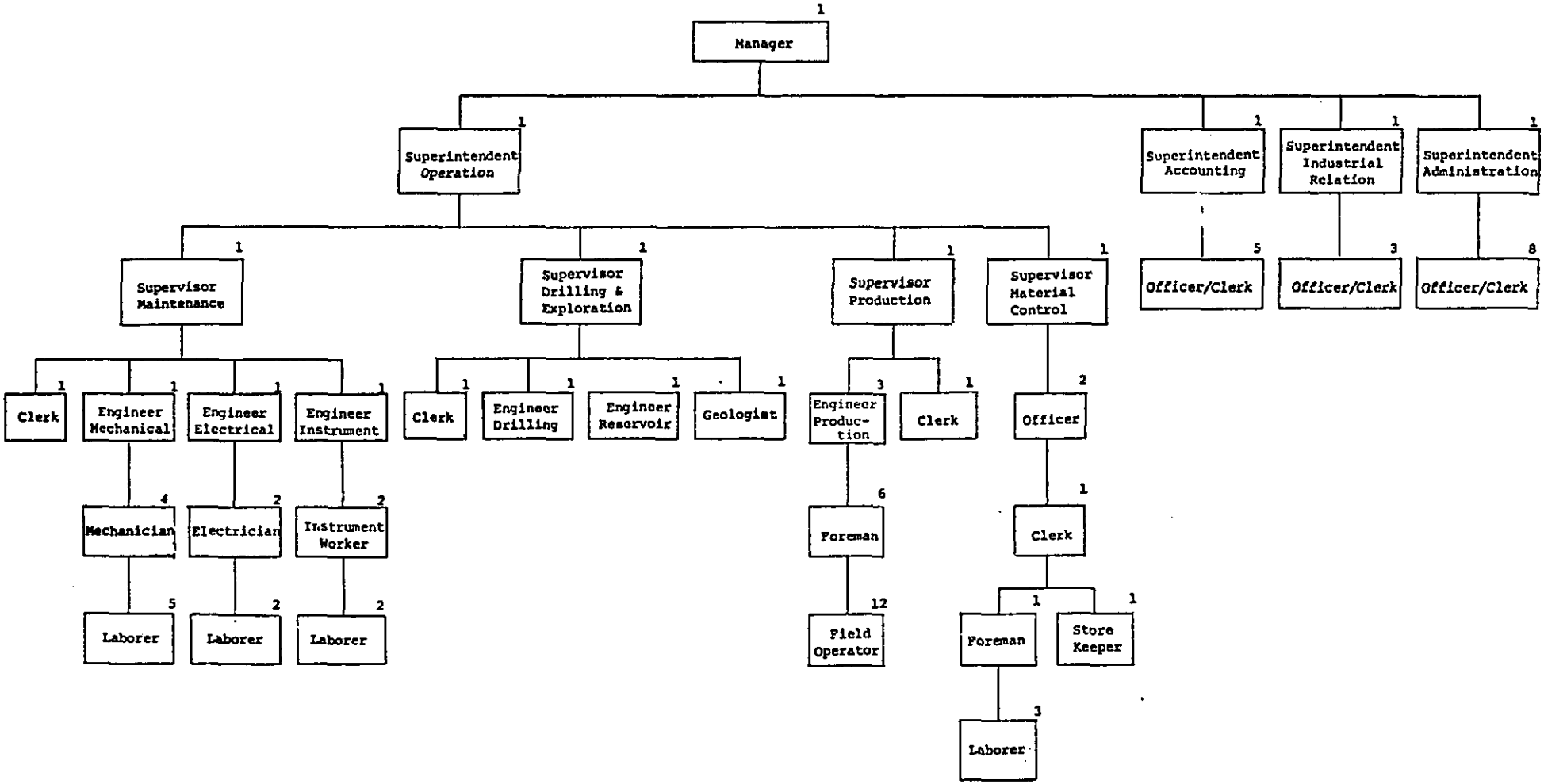


Fig. 31-6-3 (Vol. II)

TENTATIVE ORGANIZATION FOR FIELD OPERATION

(128 Persons Case)

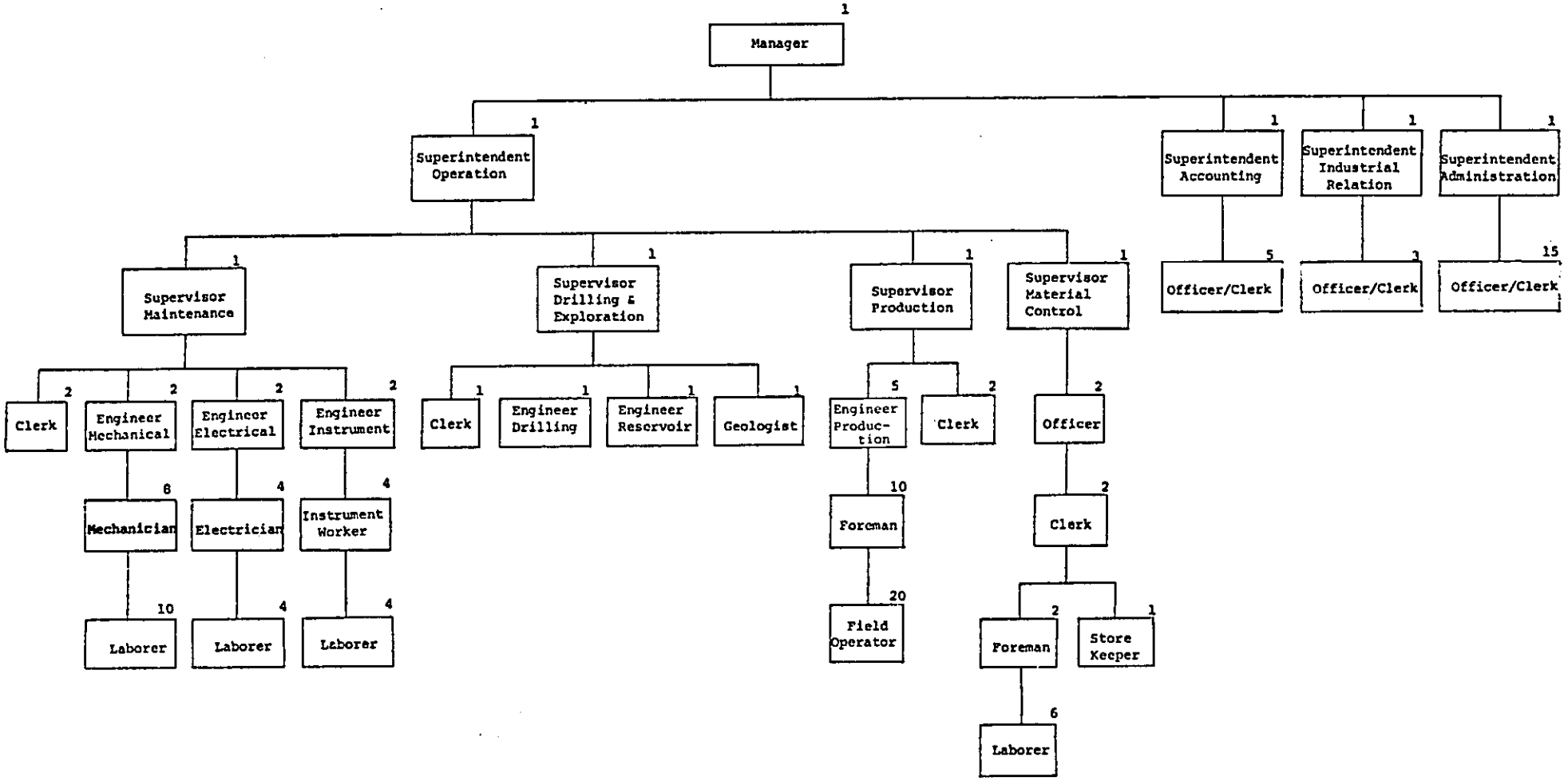


Fig. 31-6-4 (Vol. II)

TENTATIVE ORGANIZATION FOR FIELD OPERATION

(135 Persons Case)

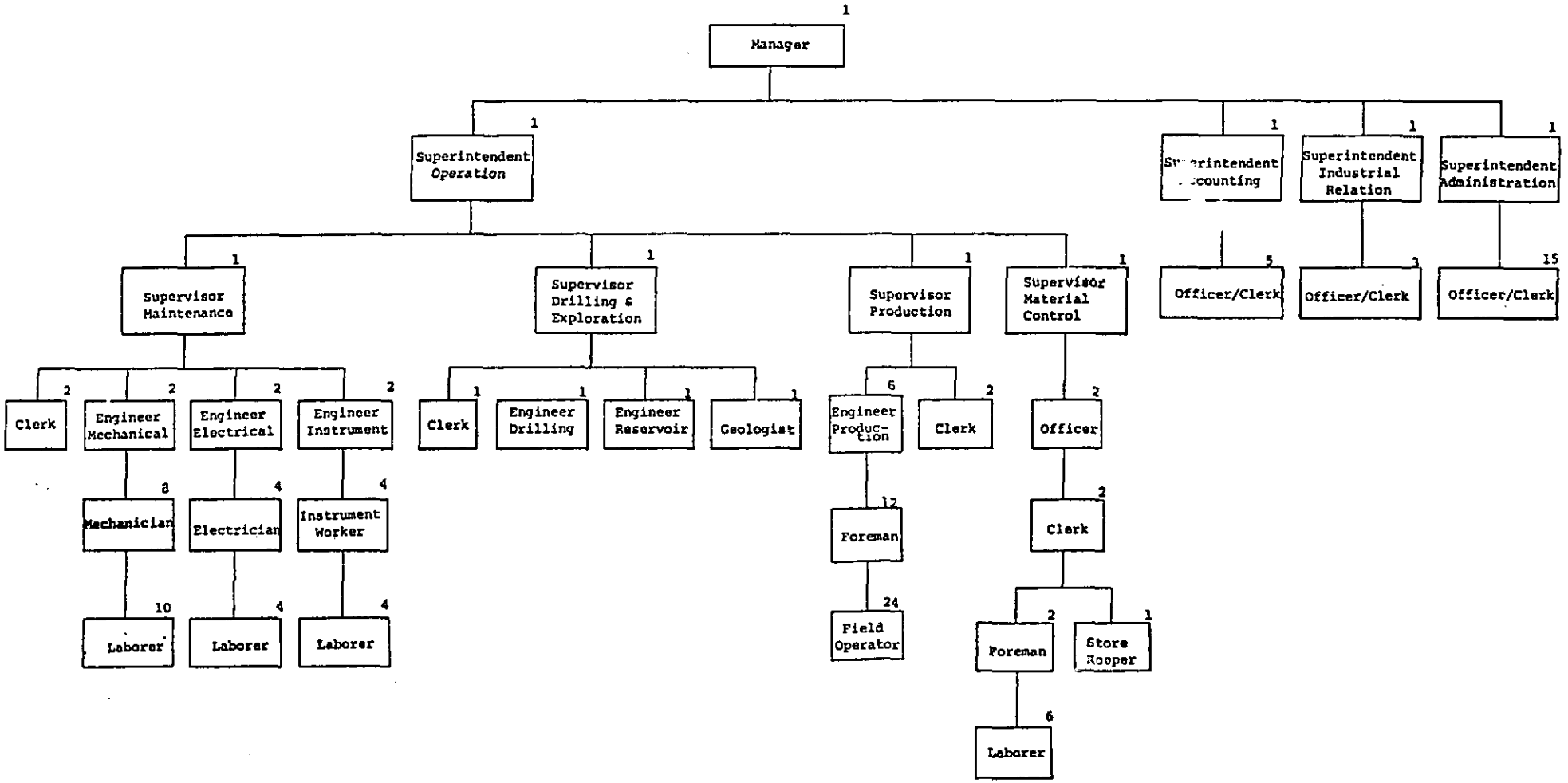


Fig. 31-6-5 (Vol. II)

TENTATIVE ORGANIZATION FOR FIELD OPERATION

(146 Persons Case)

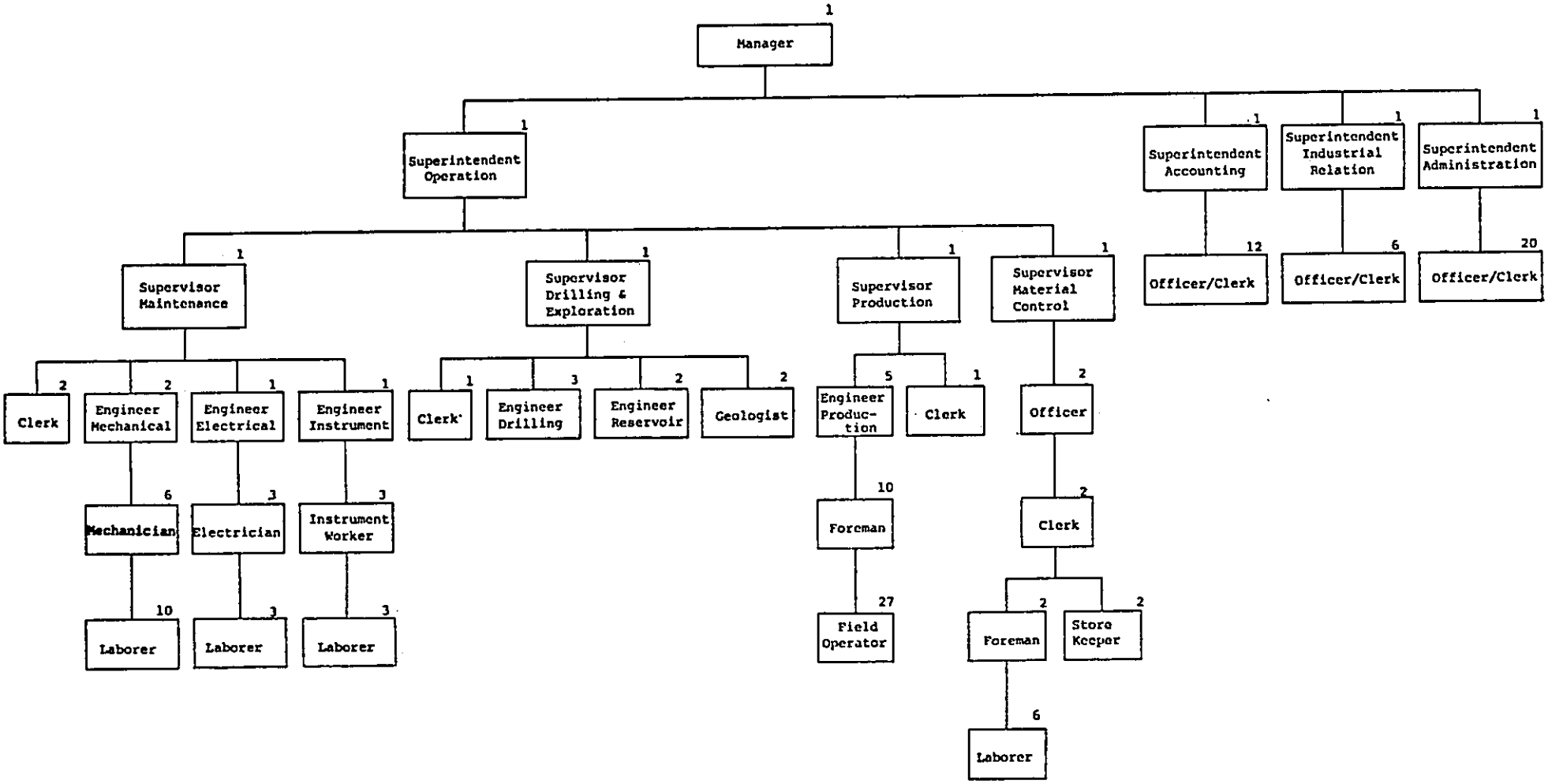
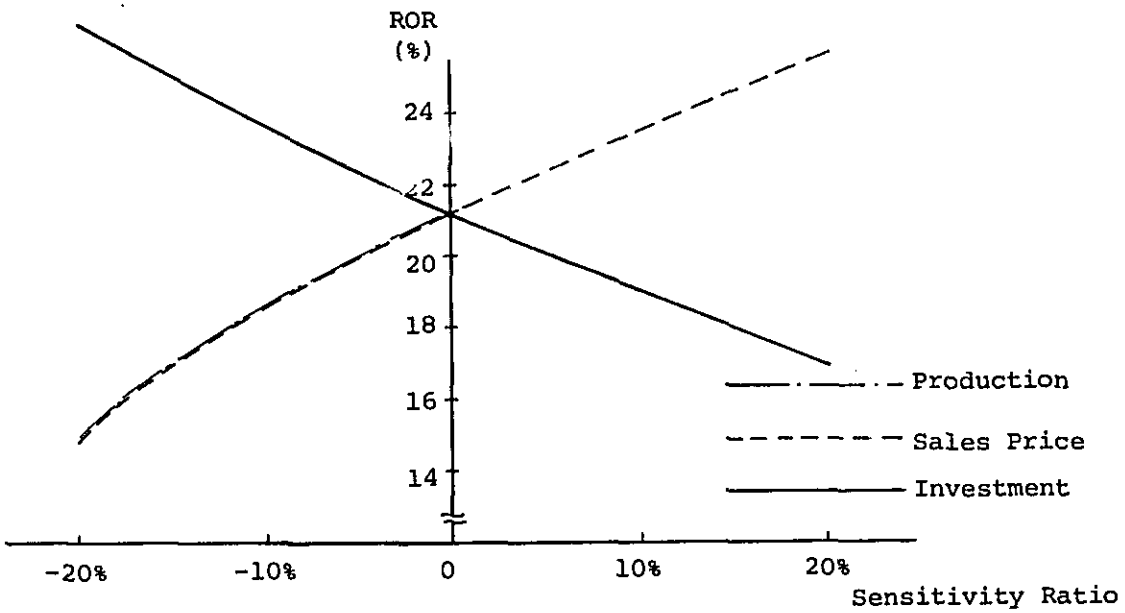


Fig. 31-6-6 SENSITIVITY CURVE FOR PENINSULAR AREA
(Vol. II)

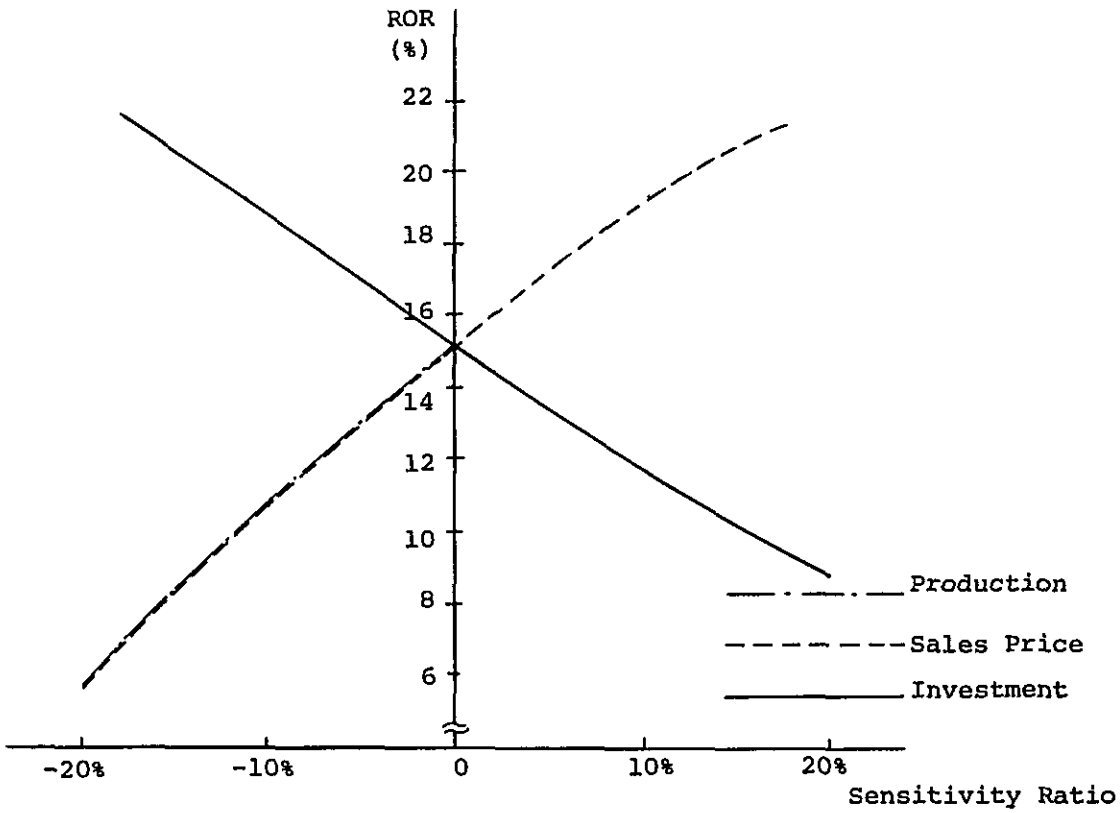
Bekok, Pulai & Seligi Fields

Optimum Case: Bekok, Pulai & Seligi (A, B), Offshore Storage - CASE IA



Tapis Field

Optimum Case: Offshore Storage - CASE IA



APPENDIX

APPENDIX

APPENDIX

LOG INTERPRETATION RESULTS

PENINSULAR AREA

The log analysis of Peninsular area was done by manual method. In the same way of the Sabah Sarawak area the analysis was conducted for only hydrocarbon bearing intervals.

The water resistivity values and the cementation factors, the constatns (a), saturation exponents (n) used was collectively shown in the table.

The comparison between core derived porosity and log derived porosity is in the table. The core derived porosity shows larger value than the log derived porosity. This is considered because the result of core analysis shows better porosity owing to the washing out of shale in analyzing core.

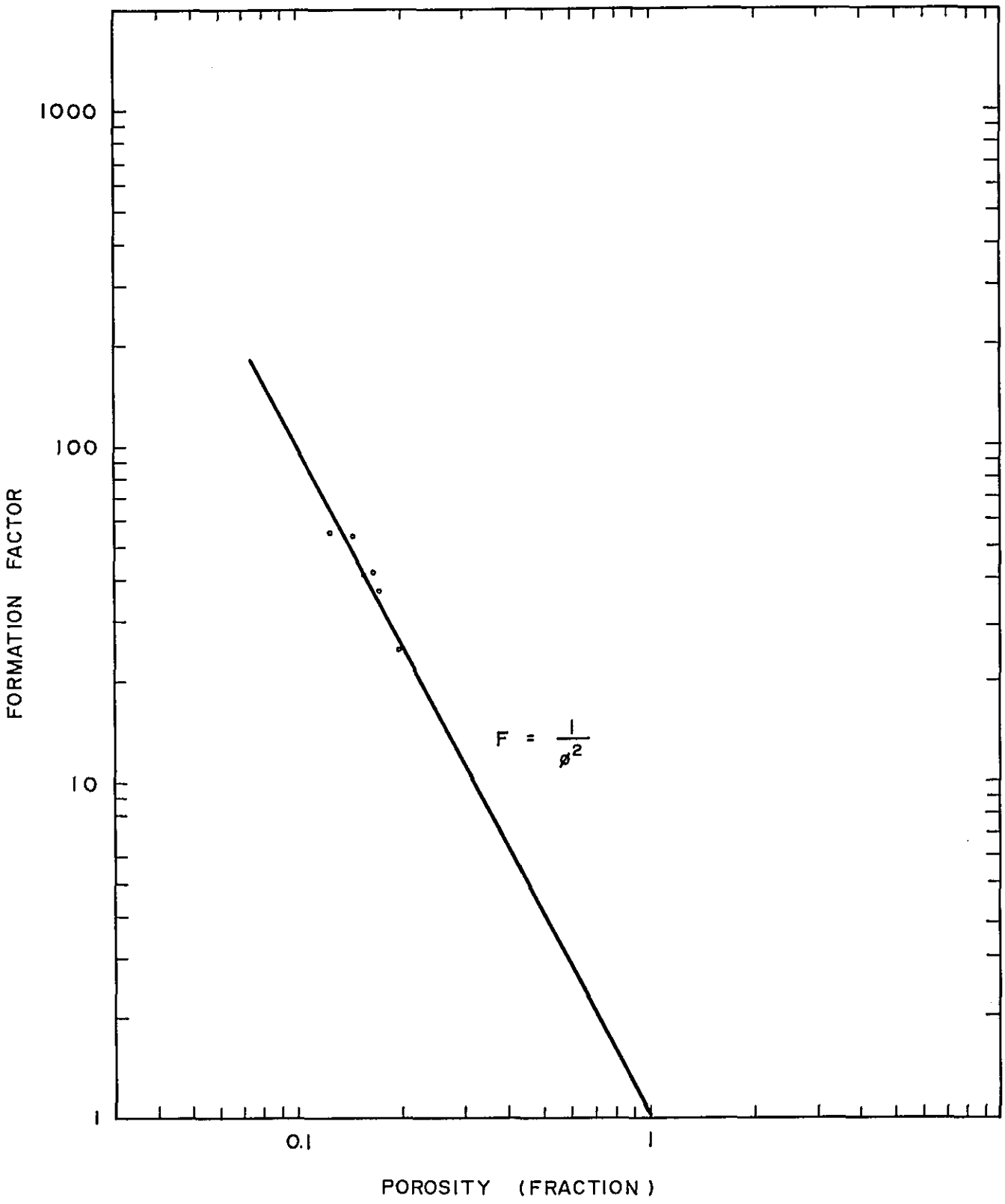
IMPORTANT PARAMETER USED FOR LOG-ANALYSIS

- PENINSULA AREA -

FIELD	CEMENTATION FACTOR (m)	ARCHIE FORMULA'S CONSTANT (a)	SATURATION EXPONENT (n)	WATER RESISTIVITY (Ω-M)
BEKOK	2	1	2	0.22
PULAI	2	1	2	0.2
SELIGI	2	1	2	0.15
TAPIS	1.67	1	2	0.2
SOTONG	1.99	0.86	2.1	0.14
DUYONG	1.87	1	2	0.2
ANDING	2.15	0.62	2	0.296
BELUMUT	2.15	0.62	2	0.17
PETA	2.15	0.62	2	0.21
BESAR	2	1	2	0.15
ANGSI	2.15	0.62	2	0.19
BUJANG	2.15	0.62	2	0.16
SEPAT	2.15	0.62	2	0.20
JERNEH	1.88	1	1.8	0.15
BINTANG	2.15	0.62	2	0.25
PILONG	2	1	2	0.062

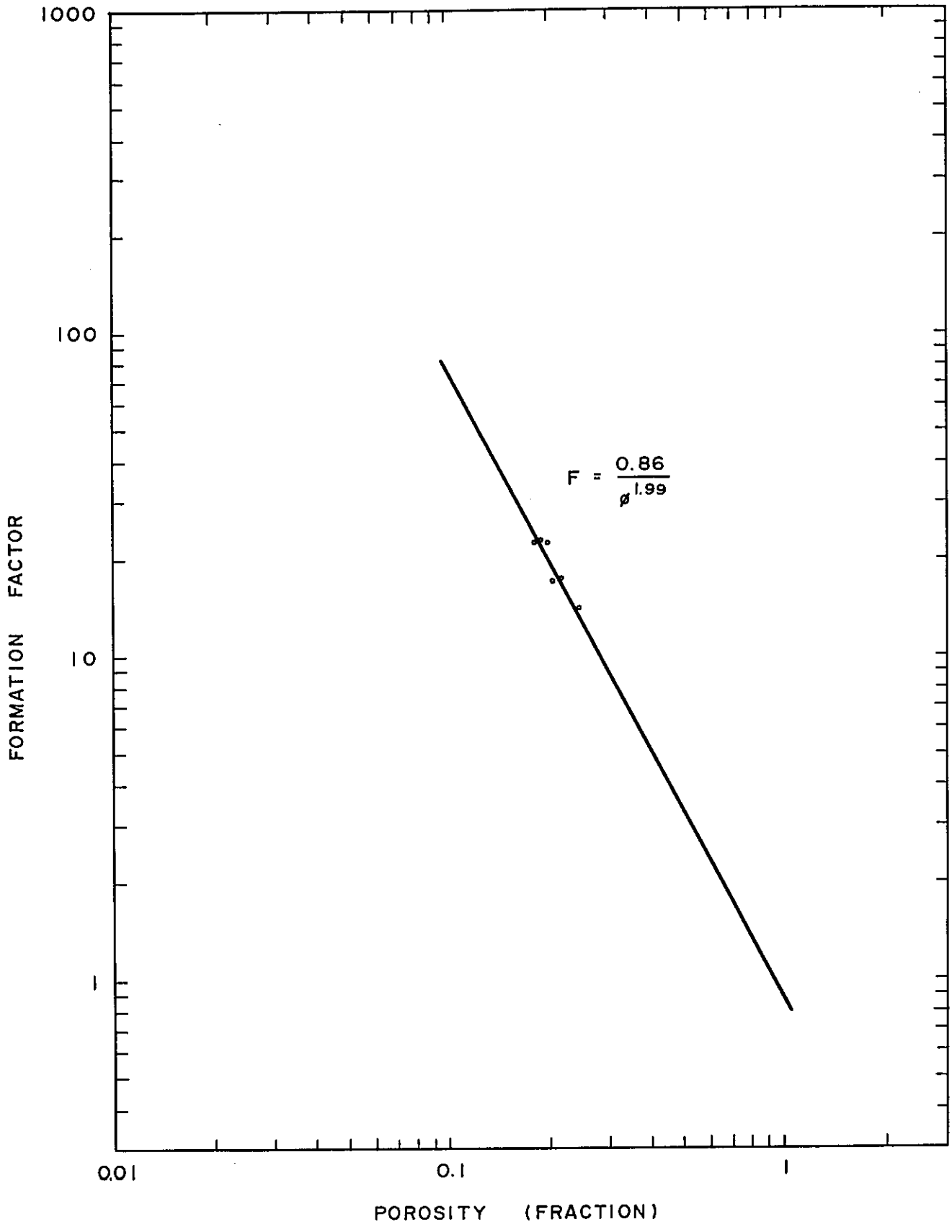
COMPARISON BETWEEN CORE POROSITY AND LOG POROSITY

WELL NAME		INTERVAL FT - FT	CORE POROSITY %	LOG POROSITY %
ANDING	1	8324 - 8342	16.45	15.54
SELIGI	2	6035 - 6130	22.12	18.77
	3	5049 - 5150	25.13	17.01
SOTONG	1	7129 - 7183	19.30	17.64
	2	6993 - 7001	15.53	20.22
		7232 - 7240	20.88	18.67
	5	7698 - 7718	16.43	18.15
		7808 - 7842	15.43	15.50
PULAI	1	3770 - 3799	27.53	29.83
		3879 - 3909	27.43	27.64
		3943 - 4023	26.57	23.07
TAPIS	2	5075 - 5083	20.88	21.73
		5150 - 5188	25.60	22.93
		5246 - 5252	24.2	29.00
	3	5574 - 5620	20.67	22.50
		5789 - 5828	20.01	20.67
JERNEH	2	6600 - 6626	25.32	14.43
BEKOK	1	6198 - 6228	19.74	18.71
	2	6734 - 6994	16.02	
	4	5403 - 5422	24.41	24.30
DUYONG	2	7615 - 7651	12.42	9.46
	3	8228 - 8244	13.52	14.89
		8750 - 8769	7.76	7.11
		9118 - 9150	10.26	9.32
		9418 - 9430	9.59	11.23
BELUMUT	2	3703 - 3735	32.22	32.78
SEPAT	1	4542 - 4550	32.00	23.00



FORMATION FACTOR VS POROSITY PLOT

BEKOK 2



FORMATION FACTOR VS POROSITY PLOT

SOTONG B 3

LOG INTERPRETATION RESULTS

- BEKOK 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE S_w	REMARKS
3764 - 3790	25	17.48	21.75	
4692 - 4820	86	25.58	37.38	Gas
4874 - 4886				
4952 - 4990	8	23	58	
5040 - 5178	28	20.82	43.73	
6180 - 6250	67	13.12	22.50	
6292 - 6340	45	14.98	19.61	
6410 - 6417				
6430 - 6462	16	9.31	30.67	
6482 - 6490	7	12.5	38	
6510 - 6525	11	3.45	48.11	
6533 - 6545	11	7.5	33	
6560 - 6726	166	16.94	28.06	
6770 - 6792	20	18.95	25.16	
6860 - 6916	55	15.45	37.22	
6955 - 7072	105	16.11	36.97	
7650 - 7644				Tight
7718 - 7730				Tight
7765 - 7770				Tight
7795 - 7850				Tight
7871 - 7936				Tight

LOG INTERPRETATION RESULTS

- BEKOK 2 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
4682 - 4690				Gas
4762 - 4790	16	14.81	42.38	?
4915 - 5017	77	25.25	28.12	Gas GWC 5017
6392 - 6445	33	13.24	36.46	?
6478 - 6590	26	4.92	48.04	Oil
6680 - 6712	14	3.86	47.22	Oil
6730 - 7000	161	12.76	34.54	Oil
7982 - 8030				

LOG INTERPRETATION RESULTS

- BEKOK 3 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
		NO HYDROCARBON INTERVAL		

LOG INTERPRETATION RESULTS

- BEKOK 4 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
5235 - 5260	9	24	56	Gas
5403 - 5445	26	24.38	43.21	Oil OWC 5445
6852 - 6910	38	7.59	43.93	Oil OWC 6910
6910 - 6945	5	5	45	Water
7055 - 7068				Tight

LOG INTERPRETATION RESULTS

- BEKOK 5 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS	
5200 - 5255	40	19.95	45.52	Gas	
5274 - 5283	4	23	55	Oil	OWC 5283
6612 - 6682	31	16.77	47.88	Oil	
6682 - 6792	3	5	52	Oil	

LOG INTERPRETATION RESULTS

- BEKOK 6 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
5052 - 5065	13	22.31	38.24	
5077 - 5143	67	23.55	39.20	Gas GWC 5143

LOG INTERPRETATION RESULTS

- PULAI 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
1742 - 2325	78.0	30.23	65.24	Oil
3593 - 3613	15.0	20.70	41.48	Gas
3652 - 3660	4	25.5	53	Gas
3666 - 3670	4	20	61	Oil
3735 - 3825	90.0	28.63	33.43	Gas
3869 - 3915	44	27.67	29.41	Gas GOC 3915
3915 - 4023	108	22.71	19.81	Oil OWC 4023
4570 - 4591	21	19.0	20.0	Oil
2593 - 2900	169	28.5	39.9	Oil OWC 2900
6095 - 6180	21	13.95	62.17	Oil(probable)

LOG INTERPRETATION RESULTS

- PULAI 2 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
3875 - 3932	46.0	19.1	46.36	Gas
6386 - 6451	49.0	13.55	57.64	Gas

LOG INTERPRETATION RESULTS

- PULAI 3 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
2858 - 2910	52.0	29.69	38.90	Gas
3793 - 3830	37.0	26.24	16.98	Gas
3845 - 3850	5.0	22.0	68.0	Gas
3860 - 3868				Gas
3937 - 4040	103	28.0	12.	Gas
6262 - 6357	80.	10.76	49.10	Oil
6376 - 6380	4	10	32	
6383 - 6440	34.0	11.79	54.05	

LOG INTERPRETATION RESULTS

- PULAI 4 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS	
2772 - 2878	106.0	28.90	40.56	Gas	
3825 - 3836	7.0	10.71	63.56	Oil	
3840 - 3897	50.0	26.32	18.50	Gas	GWC 3897
3918 - 3925	7	27.5	51.0	Gas	
3993 - 4045	52.0	25.29	40.38	Oil	OWC 4035

LOG INTERPRETATION RESULTS

- SELIGI 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
4175 - 4192				
5135 - 5155	11	13.09	45.67	

LOG INTERPRETATION RESULTS

- SELIGE 2 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS	
3936 - 3950				Oil	
4060 - 4070				Gas	
4080 - 4110	6	27.33	42.39	Gas	
4962 - 5060	48.00	19.34	50.16	Gas	
5108 - 5208	85.00	22.89	32.12	Oil	
5955 - 5970	15.00	15.67	34.81	Gas	
6020 - 6135	70.00	17.16	42.42	Oil	OWC 6075
6434 - 6535	37.00	13.01	49.04	Gas	

LOG INTERPRETATION RESULTS

- SELIGI 3 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
3230 - 3253	19	18.26	27.64	Gas
3872 - 4114	238	26.77	21.89	Gas J Massive
4863 - 4933	70	25.94	20.10	Gas 1st K sand
5015 - 5023	8	24	38	Gas Massive "K"
5047 - 5150	80	17.01	17.30	Gas
5190 - 5212	10	20.80	36.99	Gas GOC 5212
5212 - 5228	13	25.0	39.66	OWC 5228
5899 - 5915	16	18.50	29.88	Gas Lower "K"
5953 - 6025	68	15.37	37.22	Gas Lower "K" GOC 6025
6025 - 6127	56	20.14	38.96	Oil OWC 6127

LOG INTERPRETATION RESULTS

- SELIGI 4 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
3937 - 3956	19.00	25.00	44.04	J sands stringer
4052 - 4127	54.00	27.05	41.48	Massive "J" GOC 4125
4127 - 4210	5.00	29.00	36.00	Massive 'j' Oil
5069 - 5134	49.00	20.65	43.23	Oil
5216 - 5243	3.00	32.00	53.00	Massive "K" OWC 5243

LOG INTERPRETATION RESULTS

- TAPIS 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
1990 - 2030	-	-	-	Coal
2035 - 2045	-	-	-	Coal
2860 - 2870	-	-	-	Coal
2880 - 2888	-	-	-	Coal
3020 - 3028	-	-	-	
3367 - 3390	20	18	30	
3437 - 3442	20	20	24	
4608 - 4622	20	32	34	
4735 - 4775	50	29.4	37.27	

LOG INTERPRETATION RESULTS

- TAPIS 2 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
4890 - 4900	10	27	36	Gas
5065 - 5083	18	22.61	36.79	Gas
5149 - 5188	40	22.93	44.74	Oil
5248 - 5252	4	29	37	Gas

LOG INTERPRETATION RESULTS

- TAPIS 3 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
5302 - 5310	5	15	15	Oil
5408 - 5420	-	-	-	Oil WUT 5423
5572 - 5620	40	22.5	26.61	Oil OWC 5620
5782 - 5828	34	21.06	25.05	Oil OWC 5828

LOG INTERPRETATION RESULTS

- TAPIS 4 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
6086 - 6090	4	13	29	
6097 - 6101	4	18	34	
6364 - 6380	10	18.2	42.54	
6430 - 6452	20	23.35	42.55	
6456 - 6470	8	18	47	
6540 - 6548	9	4	34	
6570 - 6600	20	22.5	33.43	

LOG INTERPRETATION RESULTS

- PETA 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
6084 - 6020	12.0	19.0	49.0	

LOG INTERPRETATION RESULTS

- BELUMUT 2 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
2923 - 2985	26	32.02	40	Gas bearing GWC 2985'
3530 - 3537				Tight
3653 - 3673	6	34.5	12	Gas
3678 - 3690	22	18.89	52	Gas
3700 - 3742	27	32.78	38	Gas & Oil

LOG INTERPRETATION RESULTS

- ANGSI 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
7885 - 7890	5	16	55	
7960 - 7970	10	10.5	58.2	
8032 - 8048	8	13	48	
8088 - 8097	9	3	53	Tight
8190 - 8262	8	13	66	
8405 - 8420	5	9	78	
8555 - 8530	26	9.65	67.69	
8960 - 8980	13	14.15	70.78	

LOG INTERPRETATION RESULTS

- BESAR 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
2822 - 2837	13	21.85	43.99	
3113 - 3134	21	34.10	50.05	
5247 - 5263	6	24	57	
6646 - 6653	6	12.50	49.08	Gas
6662 - 6670	3	22	51	Gas
6672 - 6683	5	17	37	Gas
6687 - 6705	13	13.38	47.49	Gas
6708 - 6716				Gas
6736 - 6744	8	23.5	18	Gas
6762 - 6772	8	21	47.81	Gas
6778 - 6844				GOC 6844'
6802 - 6845	19	18.21	41.15	
6850 - 7452				Shale
7788 - 7892				
7920 - 7979				
8033 - 8078	23	11.52	54.30	
8035 - 8105				
8248 - 8304				
8378 - 8396				
8552 - 8575				

LOG INTERPRETATION RESULTS

- JERNEH 1 -

INTERVAL	MET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
4014 - 4044	30	25.6	38.86	Gas
4350 - 4360	10	22.8	40.18	Gas
4365 - 4376	11	21.18	42.57	Gas
4395 - 4410	13	24.31	32.86	Gas
4430 - 4482	44	27.52	43.35	Oil?
4495 - 4518	12	23.0	51.81	
5320 - 5328	8	21.0	34.64	
5512 - 5655	144	30.36	17.70	Gas
5675 - 5690	15	22.0	37.0	
5733 - 5752	19	14.95	45.42	
5813 - 5853	5	19.0	35.0	
5915 - 6020	11	19.55	49.49	
6033 - 6080	22	18.45	48.56	
6100 - 6125	6	27.33	52.32	
6225 - 6286	19	31.84	49.58	
6312 - 6319				
6472 - 6488				
6548 - 6610	18	16.22	45.27	

LOG INTERPRETATION RESULTS

- JERNEH 2 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
6568 - 6628	34	18.68	38.11	

LOG INTERPRETATION RESULTS

- JERNEH 3 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
4117 - 4162	45	21.31	30.07	GWC 4162
4370 - 4396	10	18.50	35.32	
4420 - 4436	16	24.75	44.18	
4504 - 4510	6	29	29	
5616 - 5643	27	15.37	49.84	
5680 - 5743	63	16.03	40.96	
5824 - 5847	21	14.95	52.24	GWC 5834
5853 - 5873	4	8	88	
6275 - 6291	16	24.31	23.11	GWC 6291
6587 - 6622	22	17.68	15.61	

LOG INTERPRETATION RESULTS

- PILONG 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
3766 - 3774	5	18	89	
3832 - 3842	10	34.5	39	
3922 - 3948	16	14.25	78	
3987 - 4032	37	25.57	65	
4078 - 4136				Tight
4175 - 4242	44	24.17	51	GWC 4242, Fit Gas
5762 - 5770	8	25.44	55	Fit Gas, GOC 5770
5770 - 5785	6	26.00	65	Oil, OWC 5785
6155 - 6210	4	34.5	47	
6570 - 6592	20	16.63	55	Oil
6620 - 6636	8	19	71	
6722 - 6743				Tight
6803 - 6826				Tight
7063 - 7086				Tight
7143 - 7150				Tight
7240 - 7265				Tight
7376 - 7390				Tight
7780 - 7820	22	19	73	Gas
8357 - 8363	6	13	70	
8450 - 8520				Tight
8677 - 8687	10	20.7	39.5	

LOG INTERPRETATION RESULTS

- BINTANG 2 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
3755 - 3765				
4123 - 4136	7	31	38	
4140 - 4165	20	22	45	OWC 4165'
4612 - 4688	28	27	50	
4723 - 4782	48	29	49	
5048 - 5063				
5092 - 5162				
6126 - 6138	6	20	54	

LOG INTERPRETATION RESULTS

- BINTANG 3 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
5935 - 5960	17	26	33	
5990 - 6005				

LOG INTERPRETATION RESULTS

- SEPAT 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
4173 - 4200	4	27	56	
4530 - 4550	3	23	52	
4565 - 4575	-	-	-	
4580 - 4588	-	-	-	

LOG INTERPRETATION RESULTS

- BUJANG 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
3754 - 3763	5	20	53	
3768 - 3776	8	18.5	46.05	
3794 - 3818	14	21.14	46.91	
3838 - 3868				
3956 - 3965				
4132 - 4157	23	23.7	30.14	OWC 4157
4350 - 4365	13	23.54	42.1	
4647 - 4786	48	26.81	39.9	OWC 4786
4804 - 4814	13	23	50.85	
5112 - 5140	26	22.81	48.53	OWC 5140
5192 - 5220	19	26.63	42.81	OWC 5220
5250 - 5265	3	14	54	

LOG INTERPRETATION RESULTS

- SOTONG "A" 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
7674 - 7940				Tight
8324 - 8342	13	15.54	43.73	

LOG INTERPRETATION RESULTS

- SOTONG B1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
6960 - 6966				
6980 - 6995				
7012 - 7028	11	19	23	
7117 - 7184	66	17.64	38.98	Oil, OWC 7184
7323 - 7342	16	23.69	37.63	Oil
7477 - 7490	2	23	56	Oil
7588 - 7610	10	13.9	53.88	
7640 - 7668				
7692 - 7766				
8421 - 8431				
8567 - 8578				

LOG INTERPRETATION RESULTS

- SOTONG B2 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
6994 - 7005	9	20.22	56.46	
7028 - 7040	12	20.33	64	
7095 - 7098				
7231 - 7245				Gas
7306 - 7334				Gas
7379 - 7383	4	22	70	Gas
7425 - 7430	4	22	70	
7465 - 7482	7	20	67	
7602 - 7612	10	21	53	Gas
7670 - 7683				
7774 - 7780				Gas
7810 - 7850	5	20	65	Oil
8564 - 8571				
8684 - 8716				

LOG INTERPRETATION RESULTS

- SOTONG B3 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
7128 - 7175	45	21	63.58	OWC 7175
7496 - 7503	7	22	66	
7837 - 7850	4	3	77	

LOG INTERPRETATION RESULTS

- SOTONG B5 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
7691 - 7724	26	21.00	50.65	Oil
7809 - 7848	12	4.17	68.90	Oil
7880 - 7926	28	20.14	65.53	Oil
8096 - 8134	30	13.53	53.12	Oil
8170 - 8190	18	23.33	57.19	Oil
8275 - 8280	4	15	67	Oil
8287 - 9312	20	15.95	67.97	Oil or Gas
8330 - 8378				Gas
8714 - 8742	30	20.5	71.0	Oil

LOG INTERPRETATION RESULTS

- DUYONG 1 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
5541 - 5592	9	21.44	77.47	
6643 - 6660	7	7.14	66.80	
6697 - 6715				
6728 - 6740	7	23	62	
6790 - 6808				
6900 - 7200	7	15.14	64.28	
7372 - 7435	31	14.39	36.43	
7466 - 7480	6	18	77	
8075 - 8090	2	8	76	
8212 - 8236	8	17	78	
8303 - 8427	21	4.14	37.09	

LOG INTERPRETATION RESULTS

- DUYONG 2 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
4730 - 4734				Oil
5544 - 5577				
5672 - 5680	3	21	75	
5688 - 5705				Tight
5846 - 5863				
5960 - 5971				
6020 - 6040	6	28	60	9353MCFGPD,119BCPD
6072 - 6078				Tight
6230 - 6260	20	22.30	65.49	6496MCFGPD,60BCPD, 30 BWPD
6278 - 6285				Tight
6350 - 6360				
7265 - 7280	2.0	25.0	35.0	
7290 - 7740				
7575 - 7647	53	12.47	71.56	
7692 - 7706	14	15.14	69.57	
7858 - 7890	32	12.0	62.56	Gas
7946 - 7959	13	11.15	58.21	
7989 - 8020				Tight
8190 - 8194				Tight

LOG INTERPRETATION RESULTS

- DUYONG 3 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
6938 - 6980				
7172 - 7202				
7240 - 7310				
8220 - 8265	45	15	47	
8278 - 8287	9	15	41	
8312 - 8365	43	18	37	
8432 - 8440	8	20	36	
8545 - 8555	7	34	35	
8560 - 8593	30	16	34	
8715 - 8776	28	9	32	
8795 - 8808	13	7	23	
8815 - 8821	6	20	32	
8895 - 8905	5	8	22	
9106 - 9156	9	3	41	Gas
9337 - 9356				
9402 - 9660	8	6	53	
9793 - 9837				
9888 - 9900	8	2	37	
9932 - 9968				
10074 - 10115	14	3	52	

LOG INTERPRETATION RESULTS

- ANDING 2 -

INTERVAL	NET SAND	AVERAGE ϕ	AVERAGE Sw	REMARKS
6865 - 6876	11	17.73	39.28	Oil
6967 - 6985	9	12.00	42.67	Oil
7238 - 7267	24	15.00	50.36	Oil
7282 - 7290				
7362 - 7390	17	11.41	62.56	
7418 - 7466	38	13.00	54.36	Gas GWC 7456
7529 - 7587	36	17.06	50.54	Gas GWC 7587
7610 - 7615	2	19.00	44.00	Oil OWC 7615
7685 - 7692	13	16.00	50.50	Oil OWC 7692
8380 - 8506				Borehole enlargement