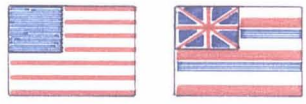
STATE OF HAWAII - U.S.A.

DEPARTMENT OF BUSINESS AND ECONOMIC DEVELOPMENT

CONTRACT No. 27272

AGREEMENT FOR ADVISORY SERVICES
FOR THE GEOTHERMAL/CABLE PROJECT



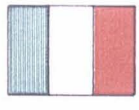
THE KILAUEA EAST RIFT ZONE : GEOTHERMAL EVALUATION OF THE EXISTING DATA

ANNEX B

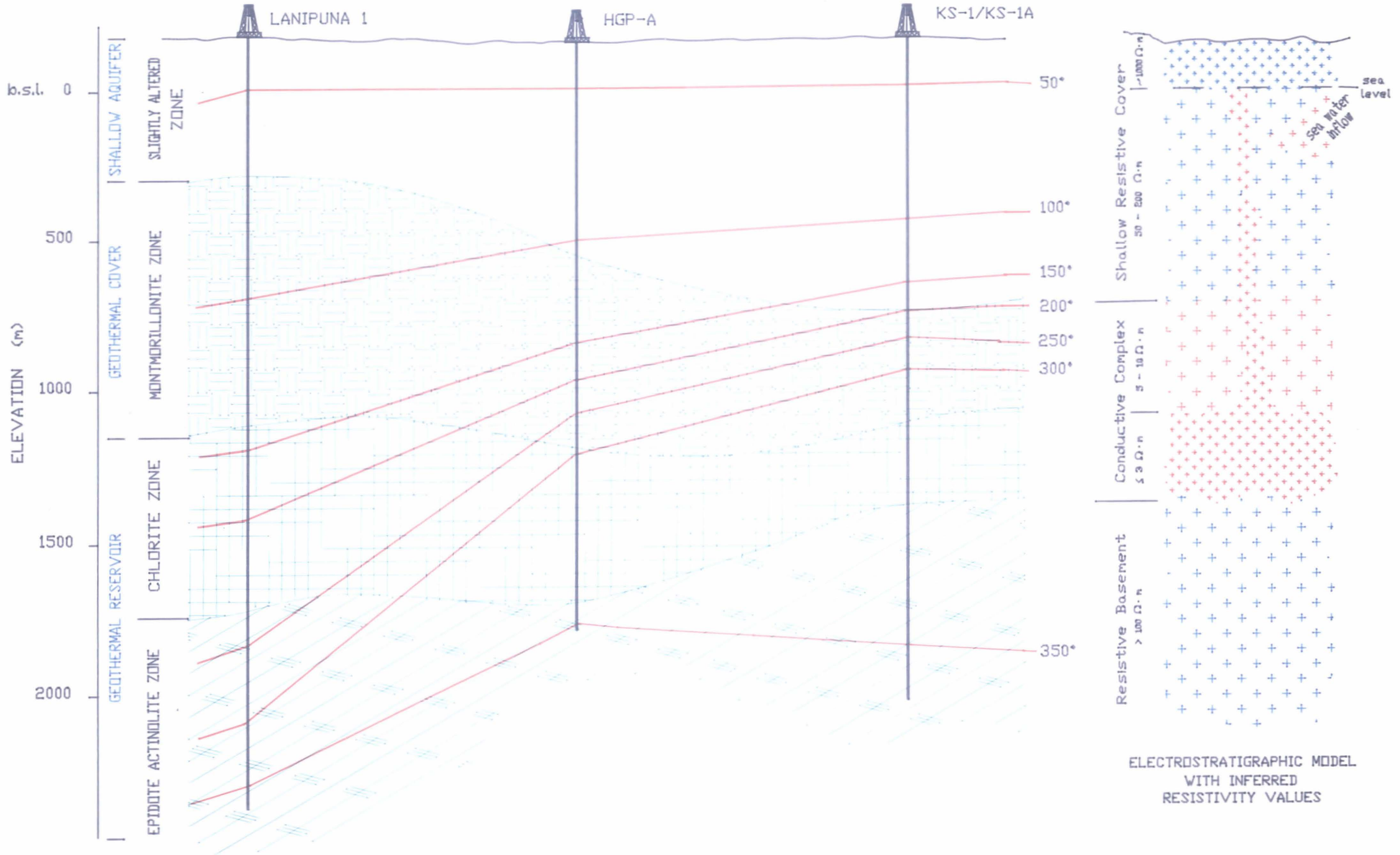
MAIN TECHNICAL WELL DATA

— Figures —

(June 1990)

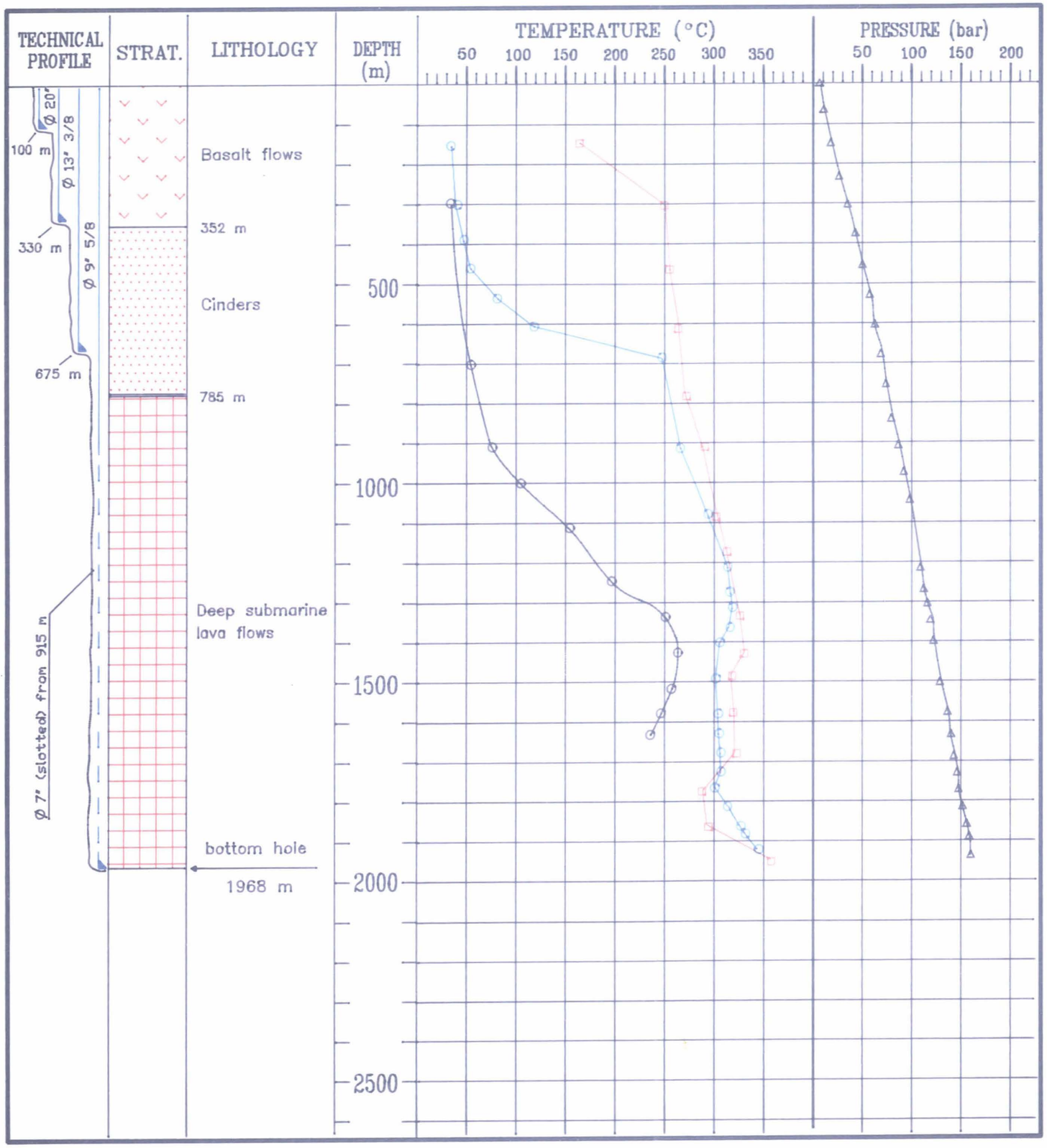


ENEL *ENTE NAZIONALE PER L'ENERGIA ELETTRICA - ITALY*



ELECTROSTRATIGRAPHIC MODEL
WITH INFERRED
RESISTIVITY VALUES

FIG. B - INTERPRETATIVE CROSS SECTION OF THE HGP-A AREA



- o Temp. survey after mud circ. – 5/1/76
- ○ Temp. survey 66 days after shut down – 9/26/76
- □ Temp. survey 3 days after a 4 hours–flow – 7/22/76
- △ Pressure survey – 7/29/76

MAIN PRODUCTION CHARACTERISTICS

Total flow rate : 50000 Kg/h (Steam 43% / Water 57%)

Flowing well–head pressure : 12 bar abs

Enthalpy : 1650 KJ/Kg

Max. Temp. recorded : 358°C at 1968 m depth

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THE KILAUEA EAST RIFT ZONE : GEOTHERMAL EVALUATION OF THE EXISTING DATA

FIG. 1/An.B

HGP–A WELL

Latitude : 19° 28' 15"
Longitude : 154° 53' 34"
Elevation : 183 m

Owner : UNIVERSITY OF HAWAII

Date of completion : Jun. 1976

ENEL ENTE NAZIONALE PER L'ENERGIA ELETTRICA – ITALY

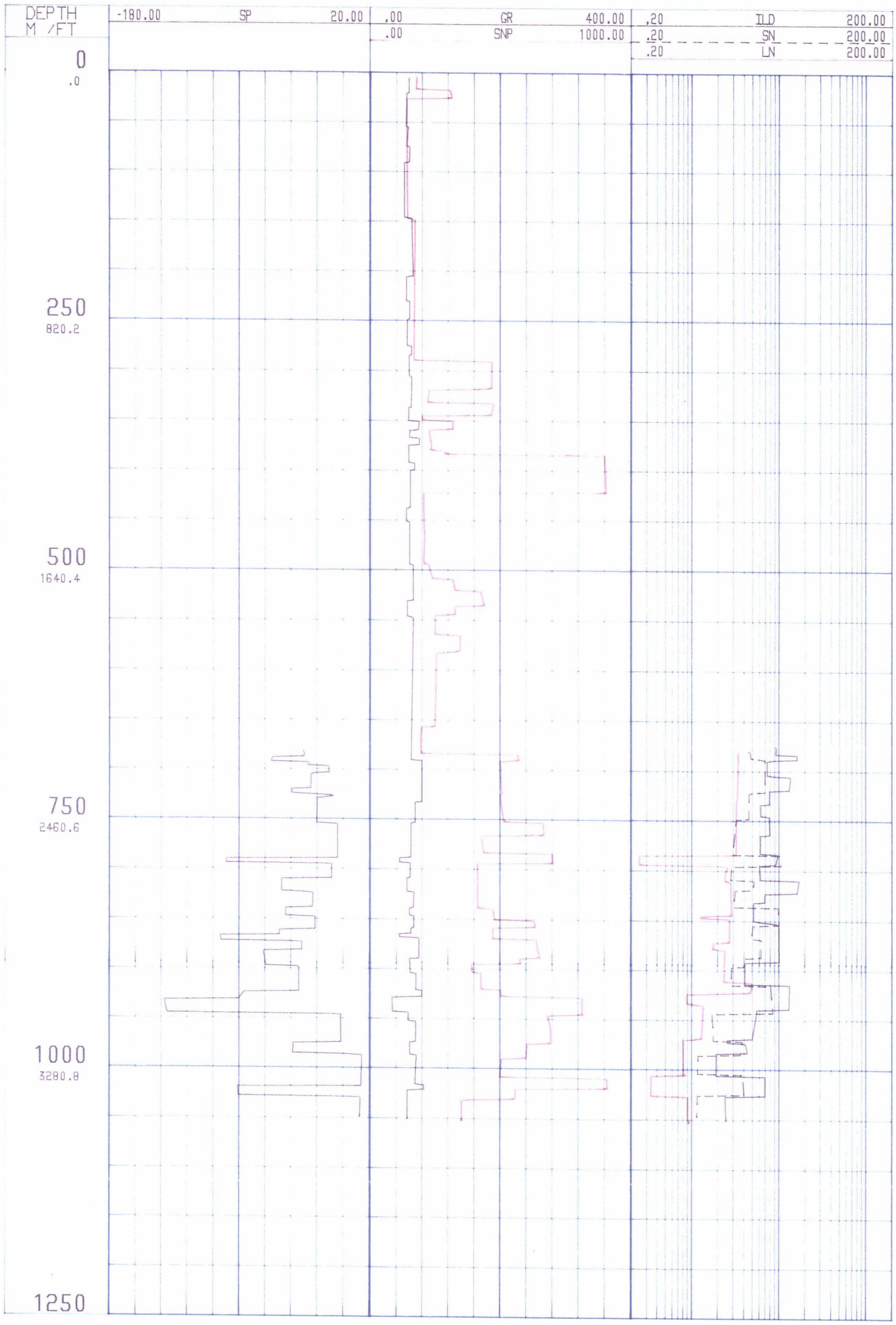
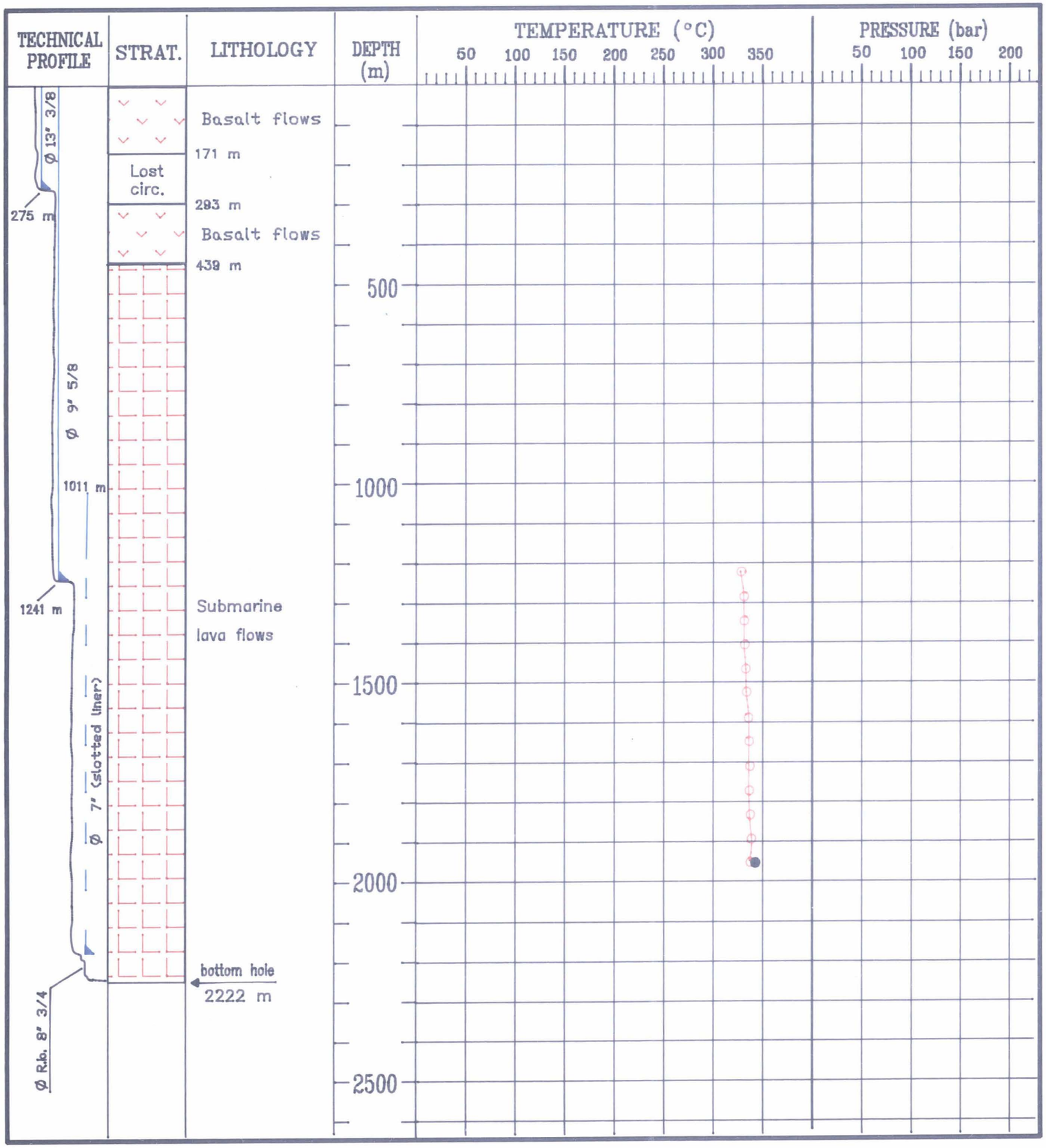


Fig. 2/An.B – HGP–A Well – Geophysical logs



- ● Bottom hole temperature
- ○ Temp. survey (condition unknown) – 12/4/81

MAIN PRODUCTION CHARACTERISTICS

Total flow rate	: 32500 Kg/h $\left(\frac{\text{Steam } 100\%}{\text{Water } ---}\right)$
Flowing well-head pressure	: 8.2 bar abs
Enthalpy	: 2756 KJ/Kg
Max. Temp. recorded	: 343°C at 1950 m depth

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THE KILAUEA EAST RIFT ZONE :
GEOTHERMAL EVALUATION OF THE EXISTING DATA

FIG. 3/An.B

KS–1 WELL

Latitude	: 19°28'21"	**Owner**	: P.G.V.
Longitude	: 154°53'21"	**Date of completion**	: Nov. 1981
Elevation	: 189 m		

ENEL ENTE NAZIONALE PER L'ENERGIA ELETTRICA – ITALY

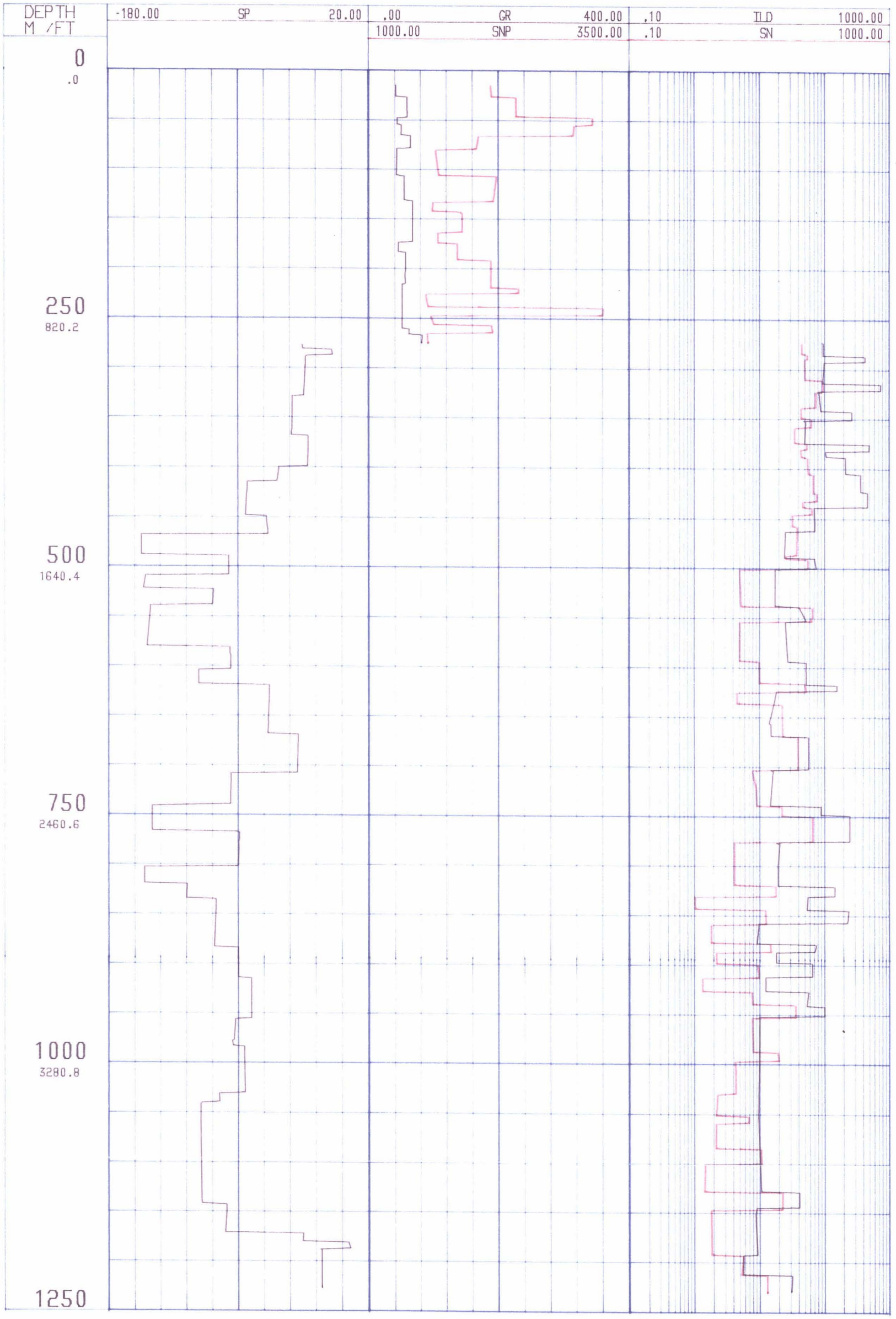
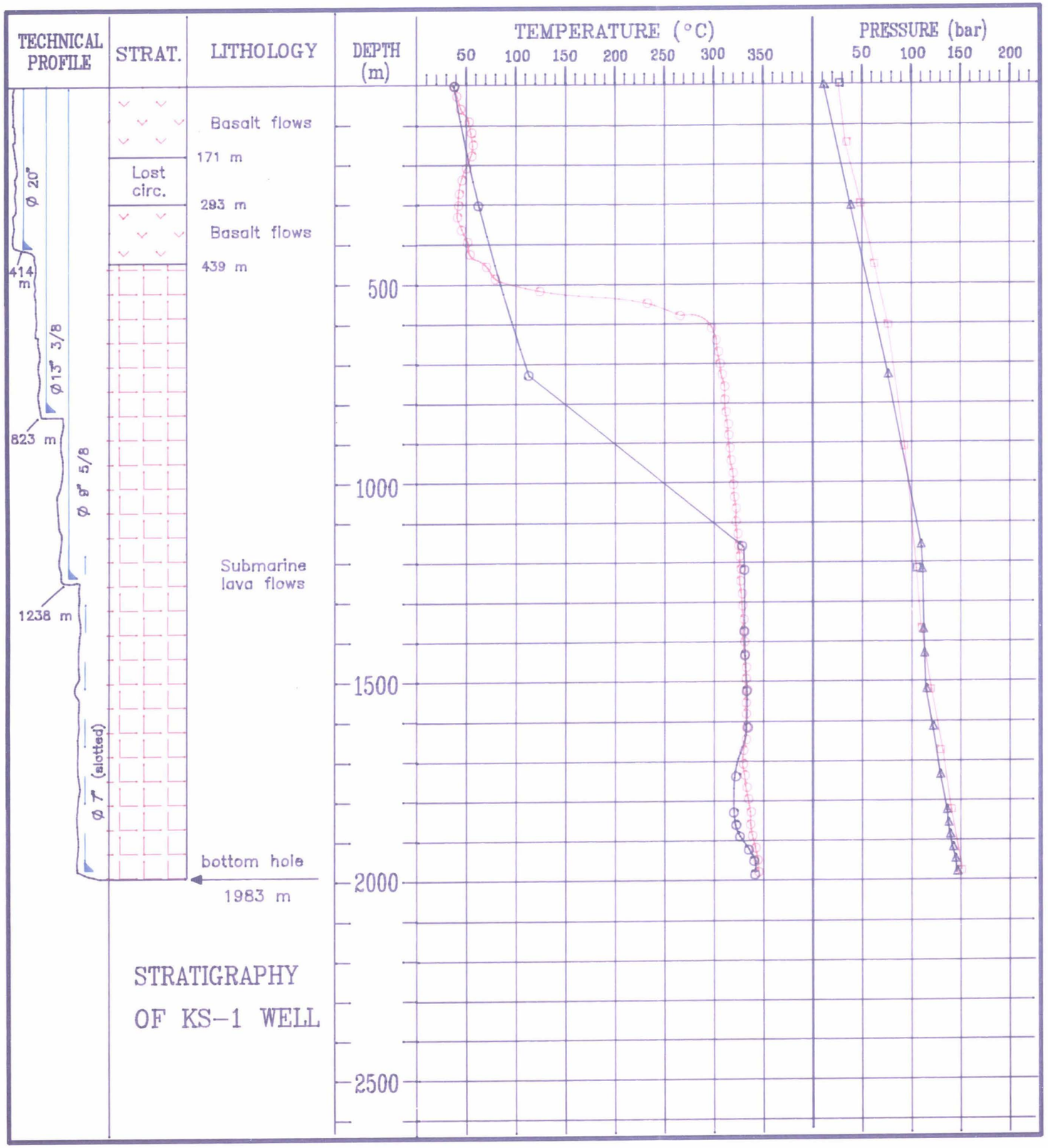


Fig. 4/An.B – KS–1 Well – Geophysical logs



STRATIGRAPHY OF KS-1 WELL

- ○ Temp. survey 7 days after shut-in – 11/7/85
- ○ Temp. survey 39 days after shut-in – 12/9/85
- △ Pressure survey – 11/7/85
- □ Pressure survey – 12/9/85

MAIN PRODUCTION CHARACTERISTICS

Total flow rate	: 36000 Kg/h (Steam 83% / Water 17%)
Flowing well-head pressure	: 11.5 bar abs
Enthalpy	: 2417 KJ/Kg
Max. Temp. recorded	: 346°C at 1983 m depth

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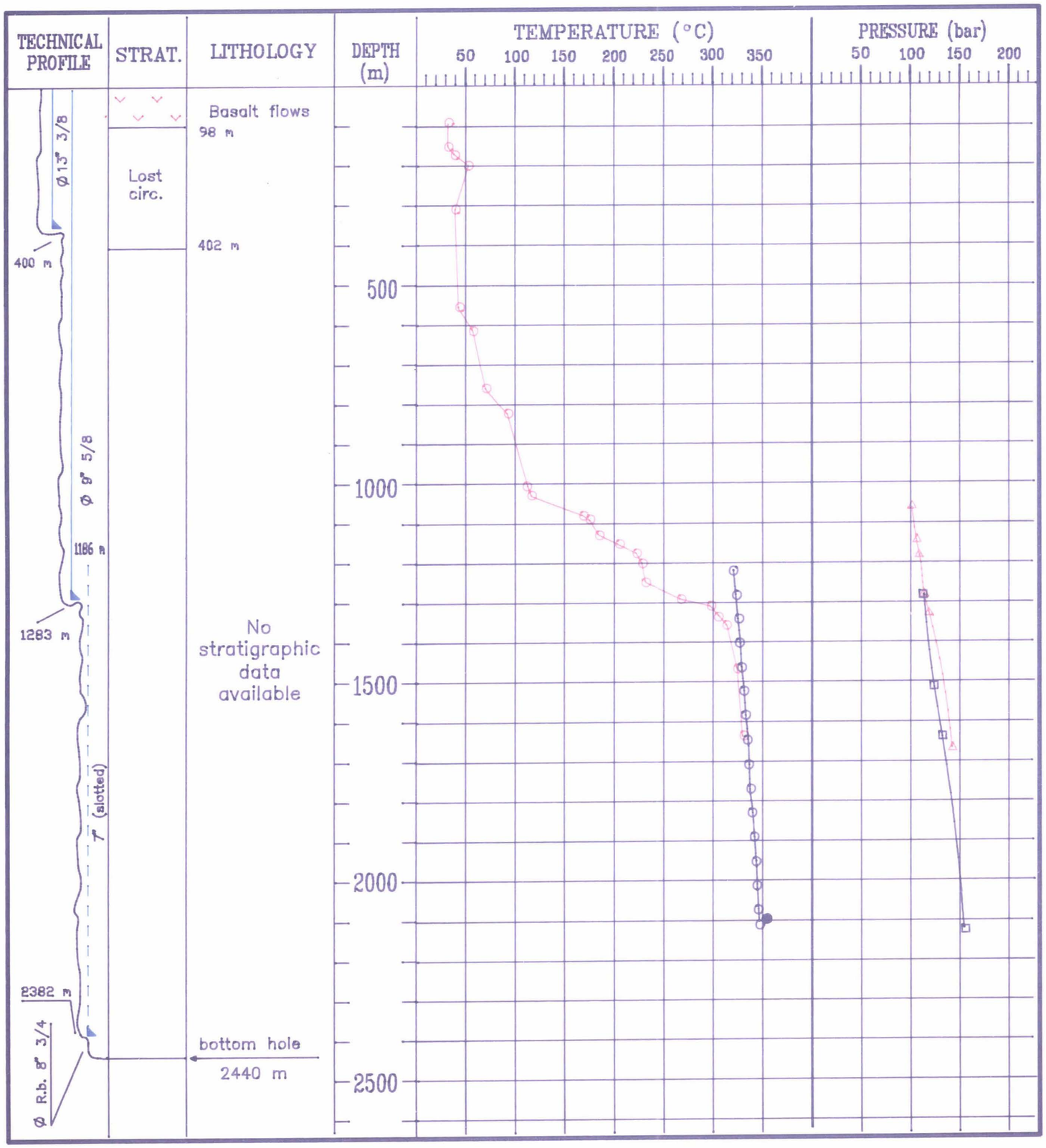
THE KILAUEA EAST RIFT ZONE : GEOTHERMAL EVALUATION OF THE EXISTING DATA

FIG. 5/An.B

KS-1A WELL

Latitude	: 19° 28' 21"	Owner	: P.G.V.
Longitude	: 154° 53' 21"	Date of completion	: Sept. 1985
Elevation	: 189 m		

ENEL ENTE NAZIONALE PER L'ENERGIA ELETTRICA – ITALY



- ● Bottom hole temperature
- ○ Temp. survey – 4/14/82
- ○ Temp. survey after flow test – 4/29/82
- △ Pressure survey – 4/14/82
- □ Pressure survey – 4/29/82

MAIN PRODUCTION CHARACTERISTICS

Total flow rate : about 15000 Kg/h $\left(\frac{\text{Steam 100\%}}{\text{Water ---}}\right)$

Flowing well-head pressure : 13 bar abs

Enthalpy : about 2780 KJ/Kg

Max. Temp. recorded : 354°C at 2103 m depth

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THE KILAUEA EAST RIFT ZONE :
GEOTHERMAL EVALUATION OF THE EXISTING DATA

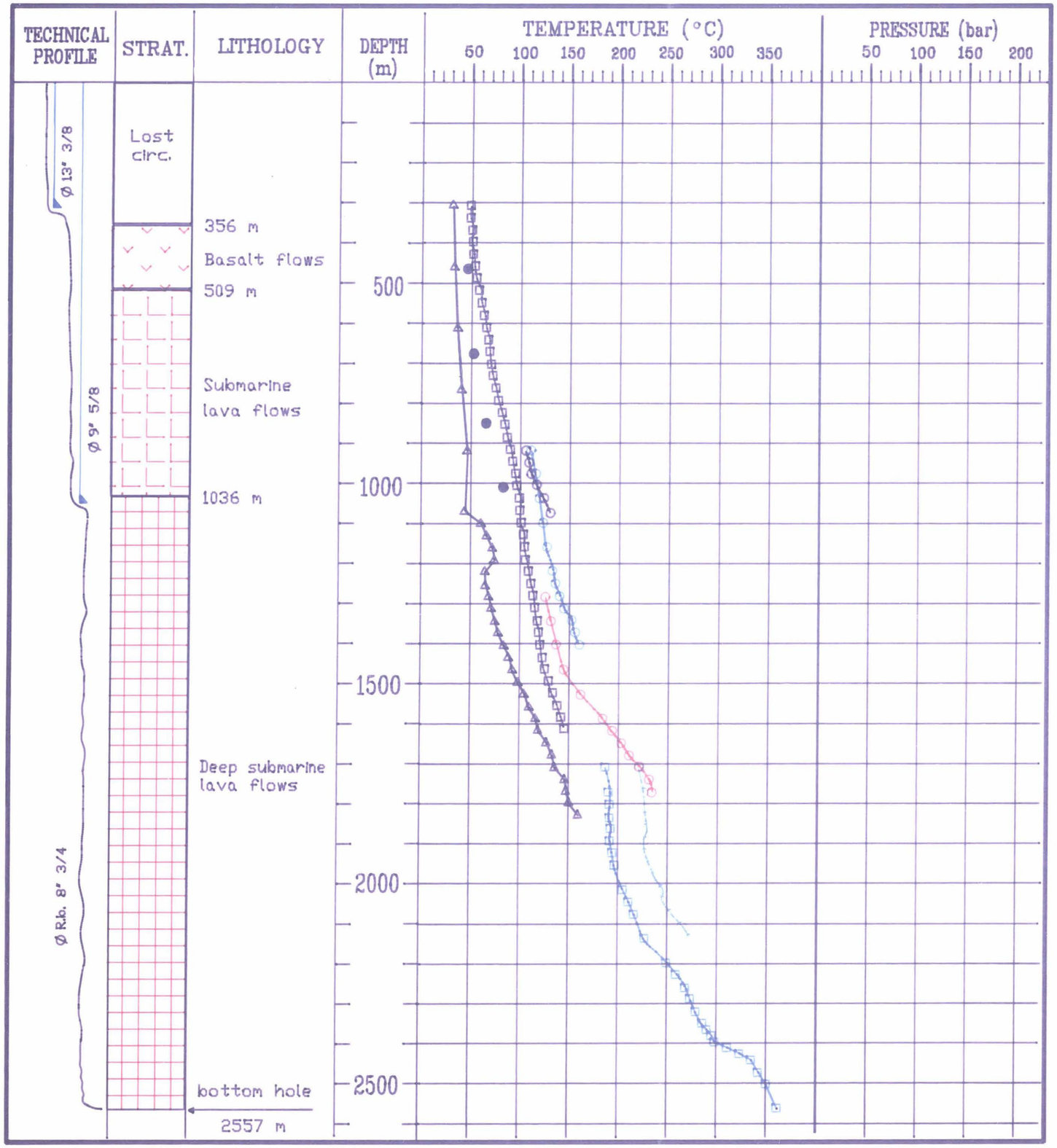
FIG. 6/An.B

KS-2 WELL

Latitude : 19° 28' 23"
Longitude : 154° 53' 07"
Elevation : 219 m

Owner : P.G.V.
Date of completion : April 1982

ENEL ENTE NAZIONALE PER L'ENERGIA ELETTRICA – ITALY



- ● Bottom hole temperature
- ○ Temp. survey at 52 h after circ. – 3/23/81
- ○ Temp. survey at 54 h after circ. – 4/6/81
- ○ Temp. survey at 50 h after circ. – 4/13/81
- · Temp. survey at 50 h after circ. – 4/22/81
- △ Temp. survey after pump test – 4/23/81
- □ Temp. survey at 16 h after circ. – 5/27/81
- □ Temp. survey at 36 h after circ. – 5/28/81

MAIN PRODUCTION CHARACTERISTICS

Total flow rate	: NOT PRODUCTIVE
Flowing well-head pressure	:
Enthalpy	:
Max. Temp. recorded	: 363°C at 2557 m depth

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THE KILAUEA EAST RIFT ZONE :
GEOTHERMAL EVALUATION OF THE EXISTING DATA

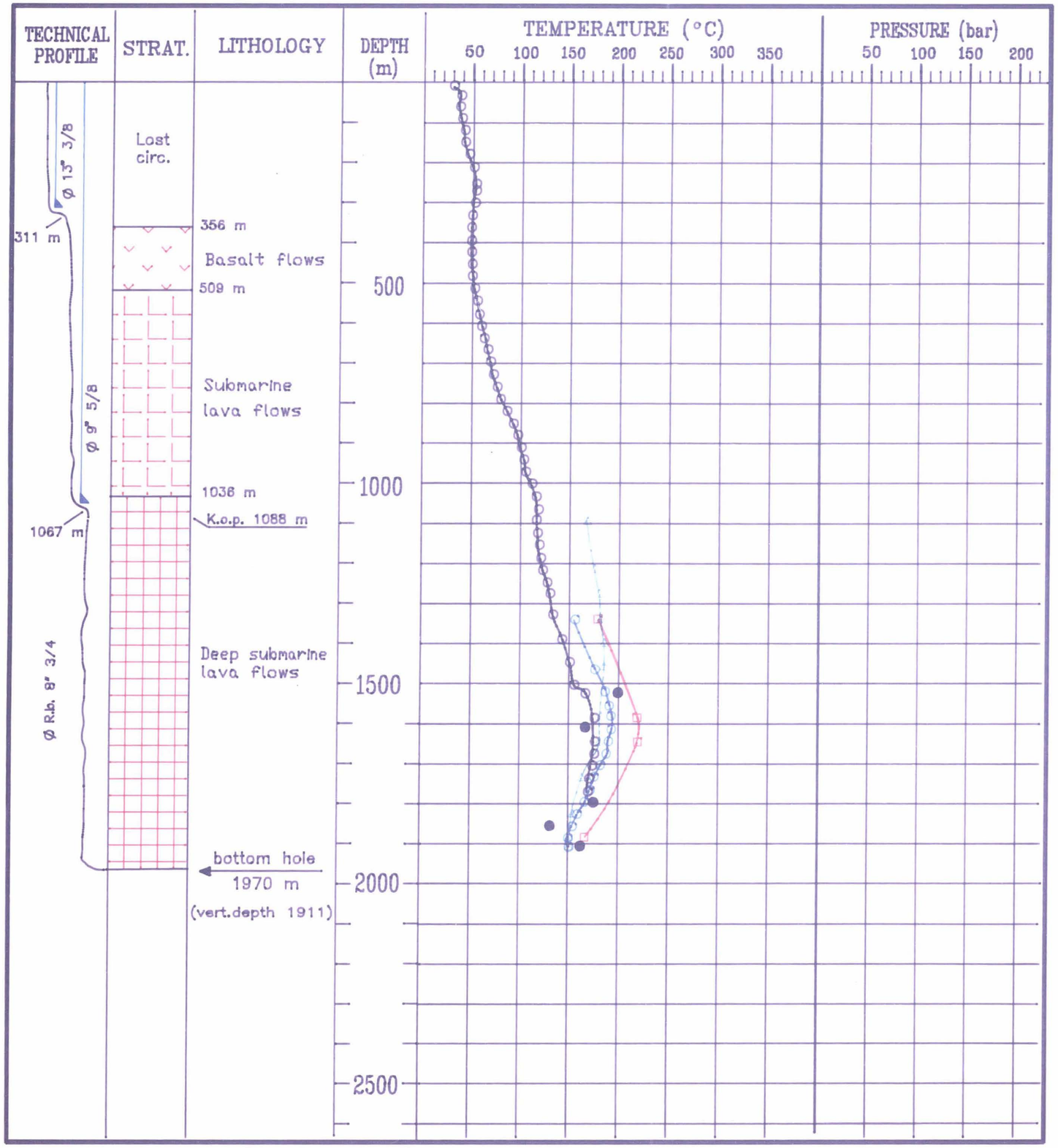
FIG. 7/An.B

LANIPUNA 1 WELL

Latitude : 19° 27′ 57″
Longitude : 154° 53′ 09″
Elevation : 184 m

Owner : BARNWELL INDUSTRIES Inc.
Date of completion : Jun 1981

ENEL ENTE NAZIONALE PER L'ENERGIA ELETTRICA – ITALY



- ● Bottom hole temperature
- ○ Temp. survey at 53 h after circ. – 6/13/83
- ○ Temp. survey at 147.5 h after circ. – 6/27/83
- □ Temp. survey before air lift – 7/18/83
- · Temp. survey after air lift – 7/19/83

MAIN PRODUCTION CHARACTERISTICS

Total flow rate	: NOT PRODUCTIVE
Flowing well-head pressure	:
Enthalpy	:
Max. Temp. recorded	: 211°C at 1646 m depth

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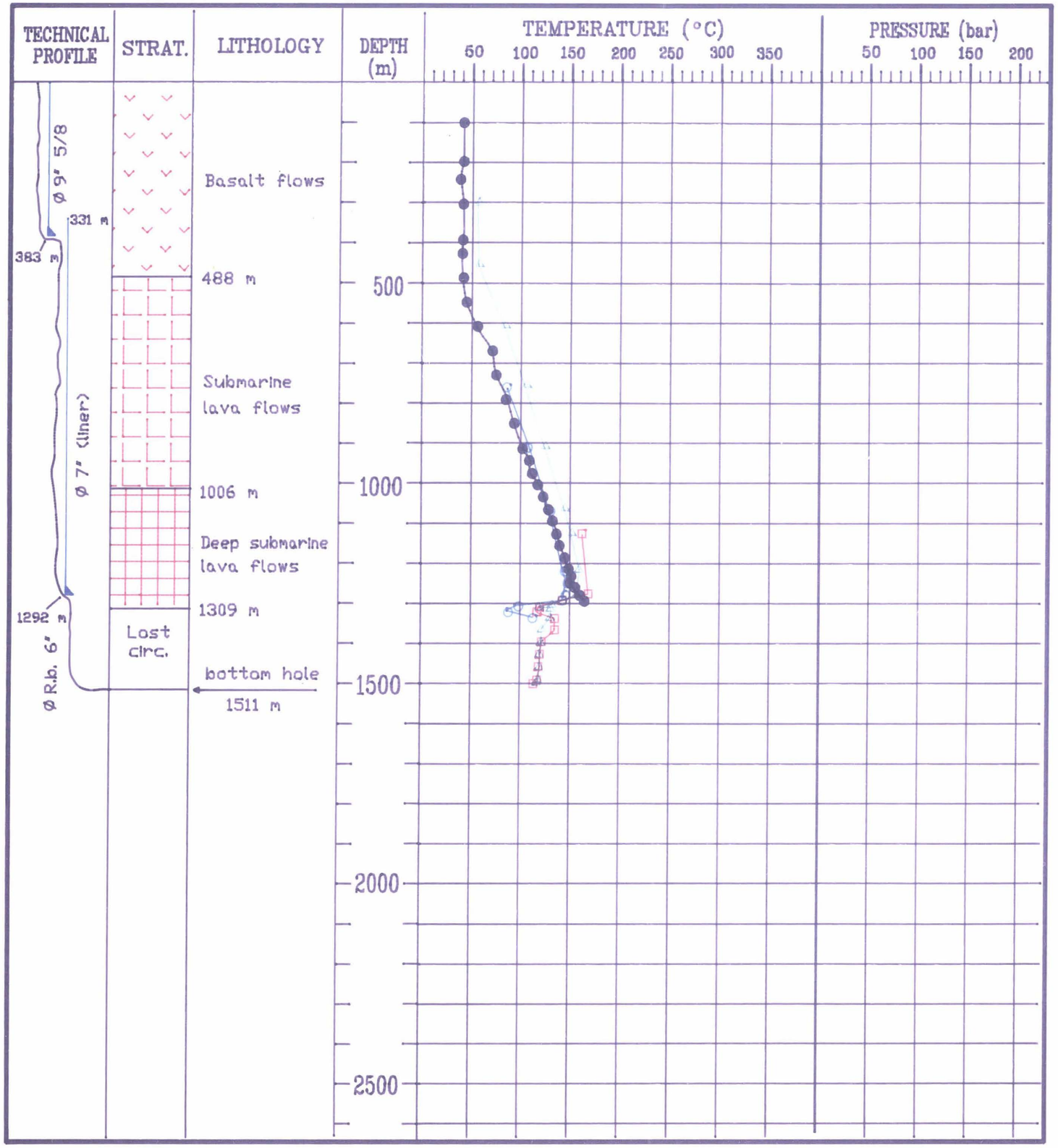
THE KILAUEA EAST RIFT ZONE :
GEOTHERMAL EVALUATION OF THE EXISTING DATA

FIG. 8/An.B

LANIPUNA 1 S.T. WELL

Latitude	: 19° 28' 26"	**Owner**	: BARNWELL INDUSTRIES Inc.
Longitude	: 154° 52' 50"	**Date of completion**	: Jun. 1983
Elevation	: 172 m		

ENEL ENTE NAZIONALE PER L'ENERGIA ELETTRICA – ITALY



- ● Temp. survey at 55 h after circ. – 3/23/84
- ○ Temp. survey at 3 days after circ. – 4/6/84
- □ Temp. survey at 34 days after circ. – 7/6/84
- △ Temp. survey at 16 h after circ. – 8/7/84

MAIN PRODUCTION CHARACTERISTICS

Total flow rate	: NOT PRODUCTIVE
Flowing well-head pressure	:
Enthalpy	:
Max. Temp. recorded	: 168°C at 1290 m depth

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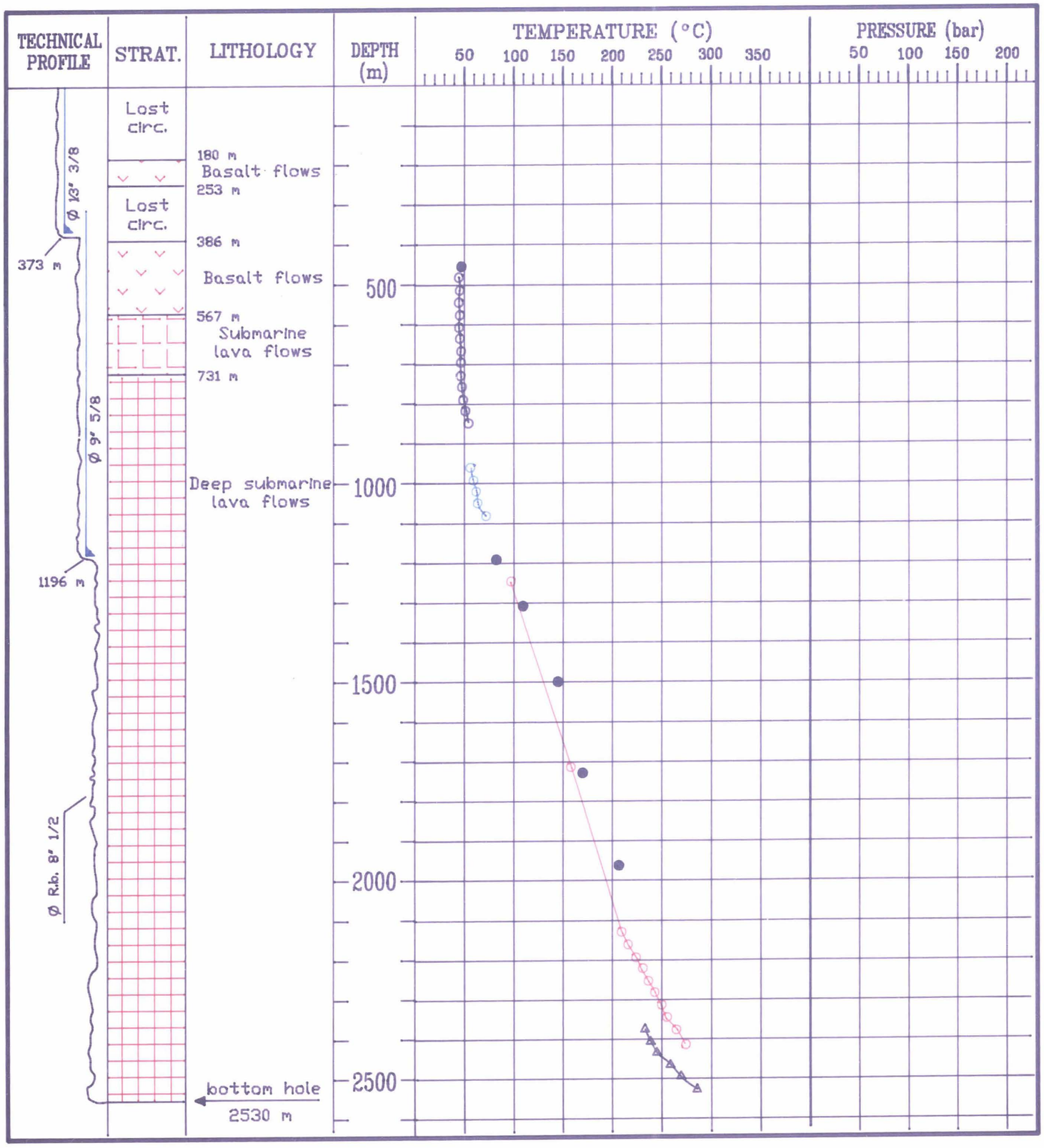
THE KILAUEA EAST RIFT ZONE :
GEOTHERMAL EVALUATION OF THE EXISTING DATA

FIG. 9/An.B

LANIPUNA 6 WELL

Latitude	: 19° 28′ 26″	**Owner**	: BARNWELL INDUSTRIES Inc.
Longitude	: 154° 52′ 50″	**Date of completion**	: Jun. 1984
Elevation	: 172 m		

ENEL ENTE NAZIONALE PER L'ENERGIA ELETTRICA – ITALY



- ● Bottom hole temperature
- o Temp. survey at 51 h after circ. – 8/4/80
- ○ Temp. survey at 50 h after circ. – 8/11/80
- ○ Temp. survey at 232 h after circ. – 10/24/80
- △ Temp. survey at 25 h after circ. – 10/31/80

MAIN PRODUCTION CHARACTERISTICS

Total flow rate	: NOT PRODUCTIVE
Flowing well-head pressure	:
Enthalpy	:
Max. Temp. recorded	: 288°C at 2530 m depth

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THE KILAUEA EAST RIFT ZONE :
GEOTHERMAL EVALUATION OF THE EXISTING DATA

FIG. 10/An.B

ASHIDA 1 WELL

Latitude : 19°26'53"
Longitude : 154°55'19"
Elevation : 244.0 m

Owner : BARNWELL INDUSTRIES Inc.
Date of completion : Oct. 1980

ENEL ENTE NAZIONALE PER L'ENERGIA ELETTRICA – ITALY