

**ESTUDIO DE LOS RECURSOS HIDRICOS
SUBTERRANEOS DE LA UNIDAD DEL
SUBBETICO DE MURCIA**

TOMO 5. ANEXO II

**HOJAS DE DATOS Y CURVAS DE CAMPO
Y ORDENADOR DE LOS S.E.V.BULLAS**

TOMO 5

A N E X O II

**HOJAS DE DATOS Y CURVAS DE CAMPO Y ORDENADOR DE LOS SEV.
BULLAS**

DATA SET: 11

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 920.00
 SOUNDING COORDINATES: X: 599600.0000 Y: 4204450.0000

DATE: 91
 SOUNDING: 11
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 2.792 PERCENT

#	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				920.0	
1	71.52		3.45	916.5	0.0483
2	12.89		24.04	892.4	1.86
3	30.09		102.1	790.2	3.39
4	52.08				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	65.00	67.24	-3.45
2	3.73	64.00	61.91	3.25
3	5.18	53.00	52.60	0.745
4	7.20	40.50	39.80	1.70
5	10.00	26.00	27.26	-4.85
6	13.90	19.50	18.93	2.91
7	19.30	15.50	15.45	0.291
8	26.80	15.00	14.86	0.895
9	37.30	15.00	15.71	-4.74
10	51.80	18.00	17.52	2.66
11	72.00	20.50	19.99	2.47
12	100.0	22.00	22.77	-3.51
13	139.0	26.00	25.73	1.01
14	193.0	29.00	28.96	0.111

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER
 P 1 1.00

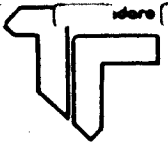
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ADARO

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P 2	0.00	1.00						
P 3	0.00	0.00	0.99					
P 4	0.00	0.00	-0.01	0.71				
T 1	0.00	0.00	0.00	0.00	1.00			
T 2	0.00	0.00	-0.01	0.00	0.00	0.99		
T 3	0.00	0.00	-0.04	-0.42	0.00	-0.03	0.29	
	P 1	P 2	P 3	P 4	T 1	T 2	T 3	

* ADAFO *



Proyecto:
 Zona: Bullas - Murcia
 Observador:
 Situación: Hoya del 1: 50000 - 911 - CAHEGIN

COORDENADA
 X 599.600
 Y 4204.450
 Z 920

m V:
 m A:

tipo A
E - W

S.E.V.

1

Perfil:

I

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m	
1	2,88	1	59	300mv	175	65							21,78				
2	3,73		56	100mv	84	64							42,92				
3	5,18		165	300mv	105	53							83,51				
4	7,2		160	100mv	40	40,5							182,1				
5	10		150	30mv	12,5	26							313,4				
6	13,9		140	10mv	4,5	19,5							608,2				
7	19,3		170	3mv	2,25	15,5	10	170	30mv	25,5	16,4		1.189	109,2			
8	26,8		150	"	1,05	15		150	"	10,5	15		2.258	217,8			
9	37,3	10	160	10mv	5,7	15							4.370	429,2			
10	51,8		160	"	3,4	18							8.429	836,1			
11	72		135	"	1,7	20,5							16.290	1.621			
12	100		150	3mv	1,05	22							31.420	3.134			
13	139		150	"	0,65	26							60.700	6.062	1.175		
14	193		160	1mv	0,40	29								11.890	2.301		
15	268													22.560	4.474		
16	373													43.700	8.702	4.292	
17	518													84.290	16.820	8.361	
18	720													162.900	32.530	16.210	
19	1.000														62.790	31.340	
20	1.300														121.400	60.620	
21	1.930														234.000	116.900	
22	2.680														451.200	225.600	
23	3.730															437.000	
24	5.180															842.880	
25	7.200															1.628.520	
26	10.000															3.141.510	

OBSERVACIONES:

FECHA:

17-01-91

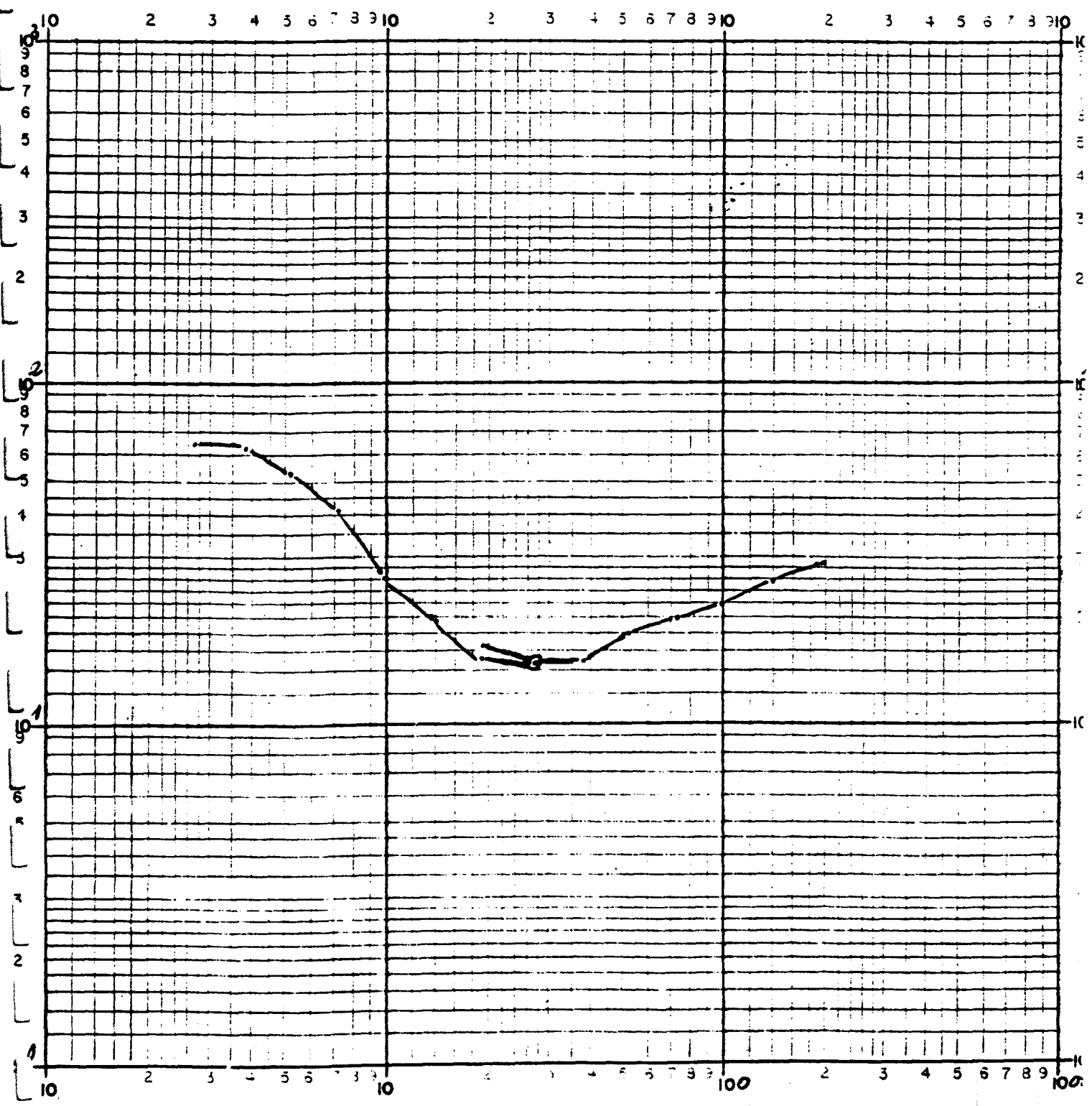


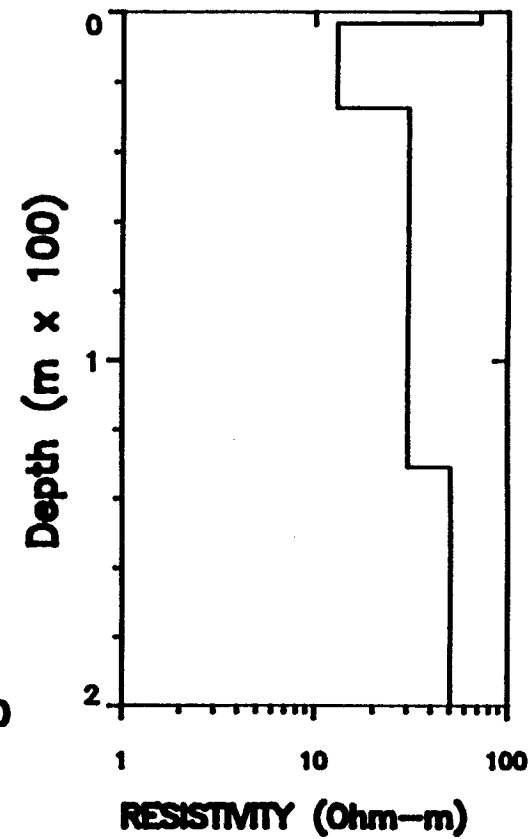
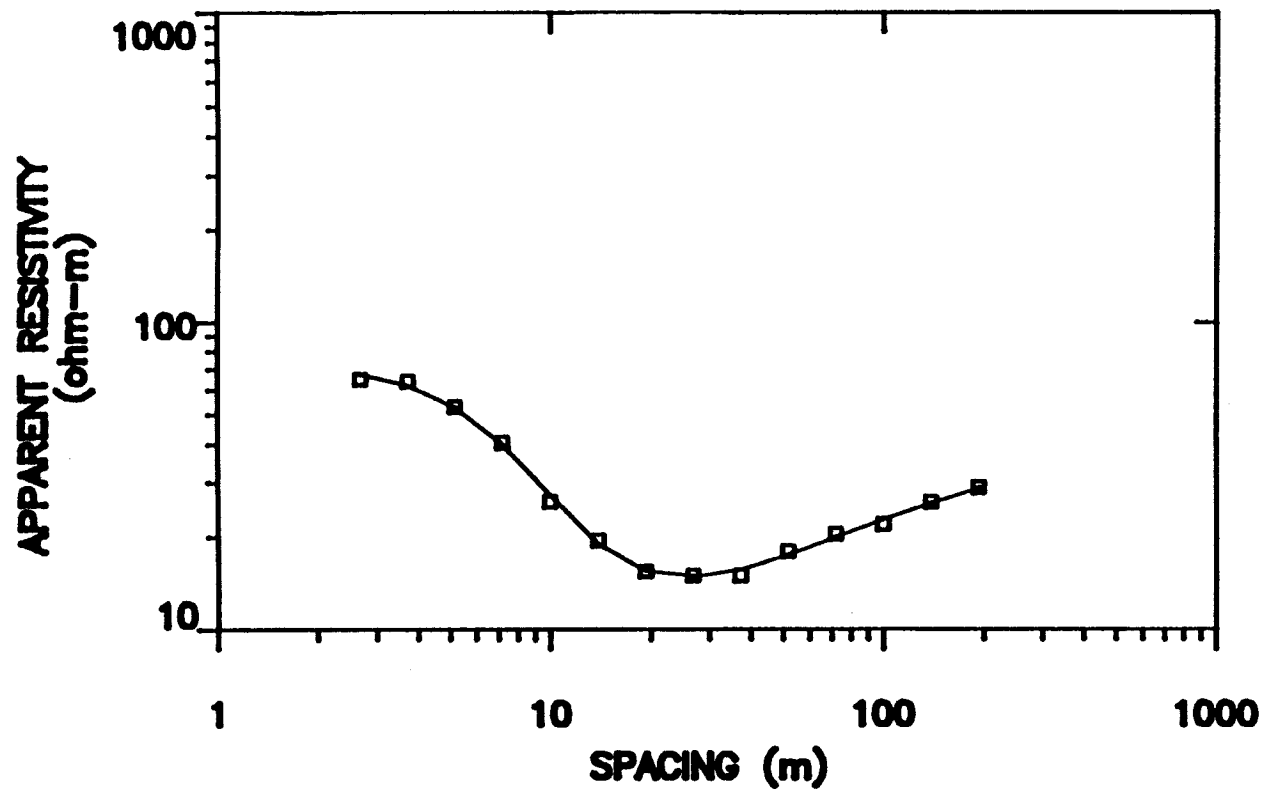
Departamento de Geofísica

Estudio Bullas - Murcia S.E.V. 1

Fecha 17-01-91 Rumbo AB E-W PERFIL I

Interpretación	Observaciones:
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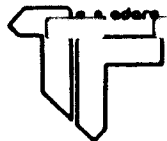
for: ITGE		SEGURA
by: ADARO		
Data Set: 11	Date: 91	BULLAS (MU)
Equipment: ADARO	Soundings: 11	
		Azimuth: E-W

P 1	0.17																			
P 2	-0.02	1.00																		
P 3	-0.03	-0.01	0.78																	
P 4	0.02	0.01	0.21	0.52																
P 5	-0.01	0.00	-0.02	-0.10	0.44															
T 1	0.20	0.01	0.02	-0.01	0.00	0.93														
T 2	0.03	0.01	0.17	-0.15	0.02	-0.03	0.84													
T 3	-0.01	0.00	-0.12	-0.24	-0.05	0.00	0.07	0.14												
T 4	-0.01	0.00	0.11	-0.21	-0.25	0.01	-0.04	0.20	0.64											
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4											

ACARD

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Proyecto:
 Zona: *Bullas - Murcia*
 Observador:
 Situación: *Hoja del 1:50000 - 911 - CEHEGIN*

COORDENADA
 X *600.000*
 Y *4203.150*
 Z *860*

m A:
 S.E.V.

2

Perfil:
E-W
I

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN			
													1 m	10 m	50 m	100 m
1	2.68	1	145	300mv	120	18							21,78			
2	3.73		155	100mv	55	15							42,92			
3	5.18		160	11	28	14.5							83,51			
4	7.2		160	30mv	13.5	14							182,1			
5	10		160	11	6.5	13							313,4			
6	13.9		155	10mv	3.3	13							606,2			
7	19.3		155	3mv	1.55	12	10	155	30mv	19	13		1.169	109,2		
8	26.8		160	11	0.70	10		155	10mv	19	11		2.256	217,8		
9	37.3		175	11	0.40	10		170	11	4.6	12		4.370	429,2		
10	51.8	10	175	10mv	2.5	12							8.429	836,1		
11	72		155	11	1.3	13.5							16.290	1.621		
12	100		150	3mv	0.8	17							31.420	3.134		
13	139		145	11	0.55	23							60.700	6.062	1.175	
14	193		170	1mv	0.425	29								11.690	2.301	
15	268													22.560	4.474	
16	373													43.700	8.702	4.292
17	518													84.290	16.820	8.361
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.680														451.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA:

17-01-91

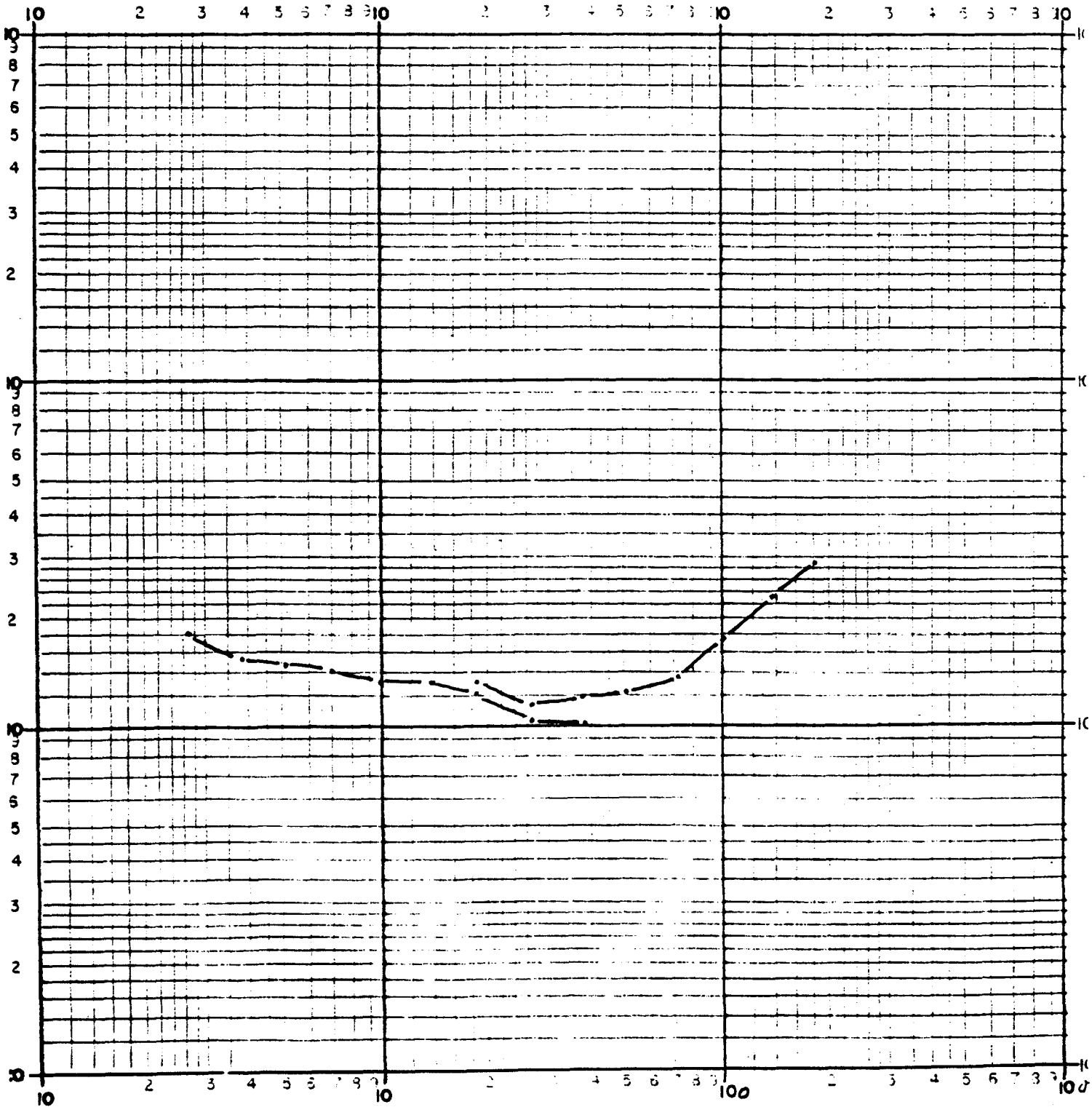


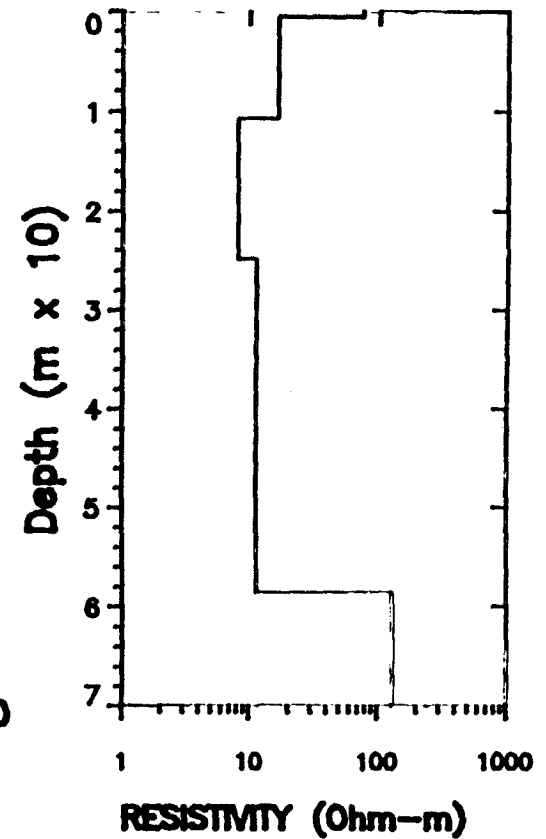
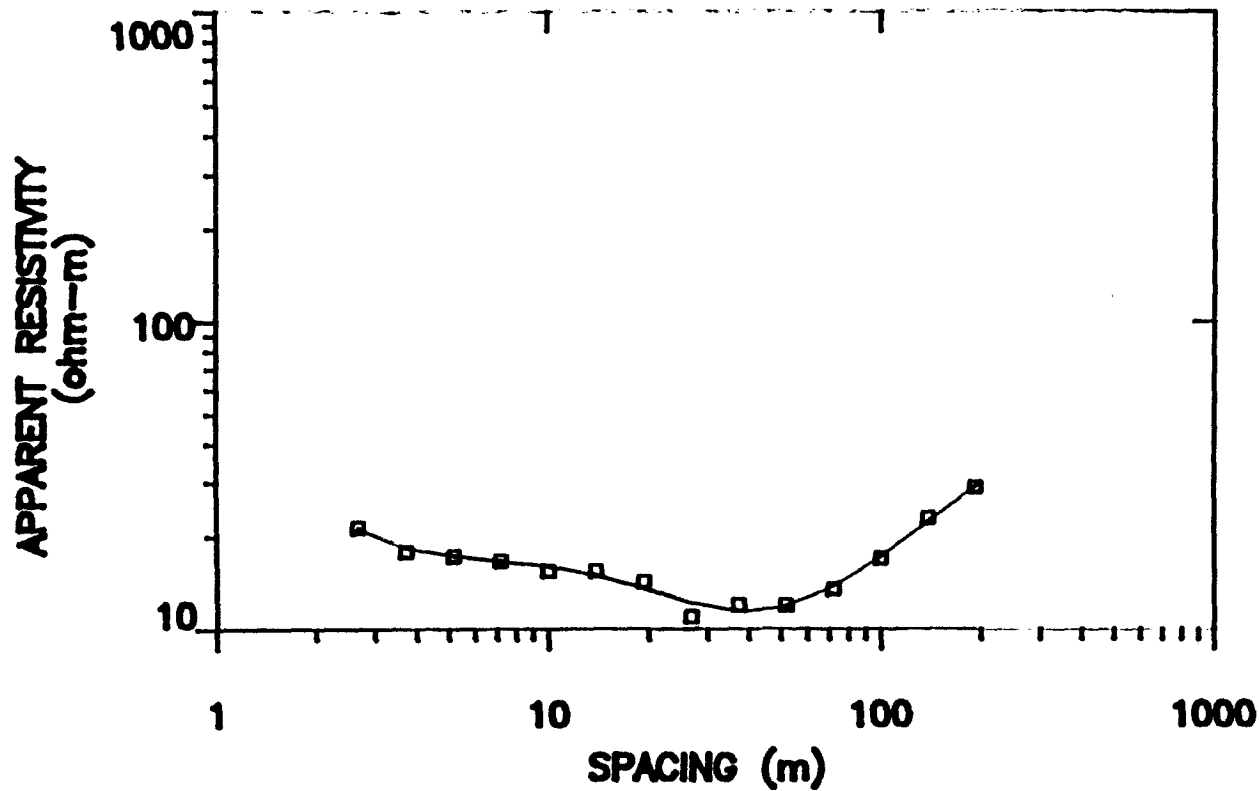
Departamento de Geofísica

Estudio Bullay - Murcia S.E.V. 2

Fecha 17-01-91 Rumbo AB E-W PERFIL I

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		
Data Set: 21	Date: 91	BULLAS (MU)
Equipment: ADARO	Soundings: 21	
		Azimuth: E-W

DATA SET: 311

CLIENT: ITGE	DATE: 91
LOCATION: BULLAS	SOUNDING: 311
COUNTY: (MU)	AZIMUTH: E-W
PROJECT: SEGURA	EQUIPMENT: ADARO
ELEVATION: 910.00	
SOUNDING COORDINATES: X: 600150.0000 Y: 4204350.0000	

Schlumberger Configuration

FITTING ERROR: 8.501 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				910.0	
1	107.7		3.06	906.9	0.0284
2	71.14		0.692	906.2	0.00974
3	3.28		4.23	902.0	1.28
4	16.49		13.87	888.1	0.841
5	24.08		14.31	873.8	0.594
6	201.7				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	3.73	77.63	89.51	-15.30
2	5.18	72.54	71.96	0.791
3	7.20	58.54	48.24	17.59
4	10.00	26.72	26.04	2.53
5	13.90	11.45	13.24	-15.69
6	19.30	10.18	10.05	1.18
7	26.80	12.00	11.40	4.94
8	37.30	14.00	14.23	-1.67
9	51.80	18.00	18.24	-1.33
10	72.00	24.00	23.90	0.390
11	100.0	31.00	31.57	-1.84
12	139.0	44.00	41.53	5.60
13	193.0	54.00	53.90	0.169

PARAMETER RESOLUTION MATRIX:
"F" INDICATES FIXED PARAMETER

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ADARO

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P 1	0.78												
P 2	0.02	0.02											
P 3	-0.03	0.01	0.34										
P 4	0.01	0.00	0.22	0.16									
P 5	0.02	0.00	0.06	0.07	0.08								
P 6	0.01	0.00	0.02	0.02	0.06	0.09							
T 1	0.07	0.13	0.06	-0.02	-0.02	-0.01	0.89						
T 2	0.01	0.02	0.00	0.00	0.00	0.00	0.14	0.02					
T 3	0.02	0.00	-0.34	-0.22	-0.08	-0.03	-0.02	0.00	0.34				
T 4	-0.03	0.00	-0.09	-0.09	-0.11	-0.10	0.03	0.00	0.11	0.17			
T 5	-0.02	0.00	-0.05	-0.05	-0.08	-0.07	0.02	0.00	0.06	0.12			
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4			

SECOND PART OF RESOLUTION MATRIX:

T 5	0.09
	T 5

DATA SET: 311

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 910.00
 SOUNDING COORDINATES: X: 600150.0000 Y: 4204350.0000

DATE: 91
 SOUNDING: 21
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 8.909 PERCENT

#	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
1	7.14		0.132	910.0	
2	376.5		0.791	909.8	0.0185
3	2.05		3.57	909.0	0.00210
4	29.99		32.69	905.4	1.73
5	243.2			872.7	1.09

ALL PARAMETERS ARE FREE

No.	Spacing (m)	DATA	FA (ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	67.45	77.54	-14.95
2	3.73	77.63	78.18	-0.703
3	5.18	72.54	67.86	6.45
4	7.20	58.54	48.08	17.86
5	10.00	26.72	26.96	-0.886
6	13.90	11.45	13.55	-18.30
7	19.30	10.18	9.77	4.03
8	26.80	12.00	11.17	6.84
9	37.30	14.00	14.29	-2.11
10	51.60	18.00	18.44	-2.45
11	72.00	24.00	24.07	-0.295
12	100.0	31.00	31.69	-2.25
13	139.0	44.00	41.85	4.88
14	193.0	54.00	54.79	-1.46

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

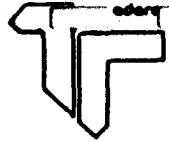
* ADARO *

P 1	0.54								
P 2	0.00	0.50							
P 3	0.03	0.00	0.47						
P 4	-0.08	0.00	0.07	0.46					
P 5	0.01	0.00	-0.01	-0.03	0.38				
T 1	-0.45	-0.04	0.04	-0.09	0.01	0.59			
T 2	-0.02	0.50	0.01	-0.02	0.00	0.02	0.50		
T 3	-0.02	0.01	-0.48	-0.12	0.00	-0.01	0.00	0.48	
T 4	0.00	0.00	0.05	-0.29	-0.27	0.00	0.00	-0.02	0.65
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4

ADARO

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Proyecto:
 Zona: Bulloy - Murcia
 Observador:
 Situación: Plano 1:50.000 - H^o 911
CEHEGIN

COORDENADAS
 X 610150
 Y 4204350
 Z 910

m A:
 S.E.V. 3
 Rumbo AB E-W
 Perfil: II

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m	
1	2.68	1	28	10mV	68	53							21.78				
2	3.73		28	"	39.5	61							42.92				
3	5.18		32	"	22	57							83.51				
4	7.2		57	30mV	16	46							182.1				
5	10		59	10mV	4	31							313.4				
6	13.9		105	"	1.55	9							606.2				
7	19.3		96	3mV	0.65	8							1.189	109.2			
8	26.8		89	"	0.37	9	10	96	30mV	8.8	10		2.258	217.8			
9	37.3		115	1mV	0.30	11		89	10mV	4.85	12		4.370	429.2			
10	51.8	10	120	10mV	2.6	18		115	"	3.8	14		8.429	836.1			
11	72		125	10mV	1.85	24							16.290	1.621			
12	100		140	"	1.4	31							31.420	3.134			
13	139		150	"	1.1	44							60.700	6.062	1.175		
14	193		140	3mV	0.65	54								11.690	2.301		
15	268													22.560	4.474		
16	373													43.700	8.702	4.292	
17	518													84.290	16.820	8.361	
18	720													162.900	32.530	16.210	
19	1.000														62.790	31.340	
20	1.390														121.400	60.620	
21	1.930														234.000	116.900	
22	2.690														451.200	226.600	
23	3.730															437.000	
24	5.180															842.880	
25	7.200															1.628.520	
26	10.000															3.141.510	

OBSERVACIONES:

FECHA: 16-01-91

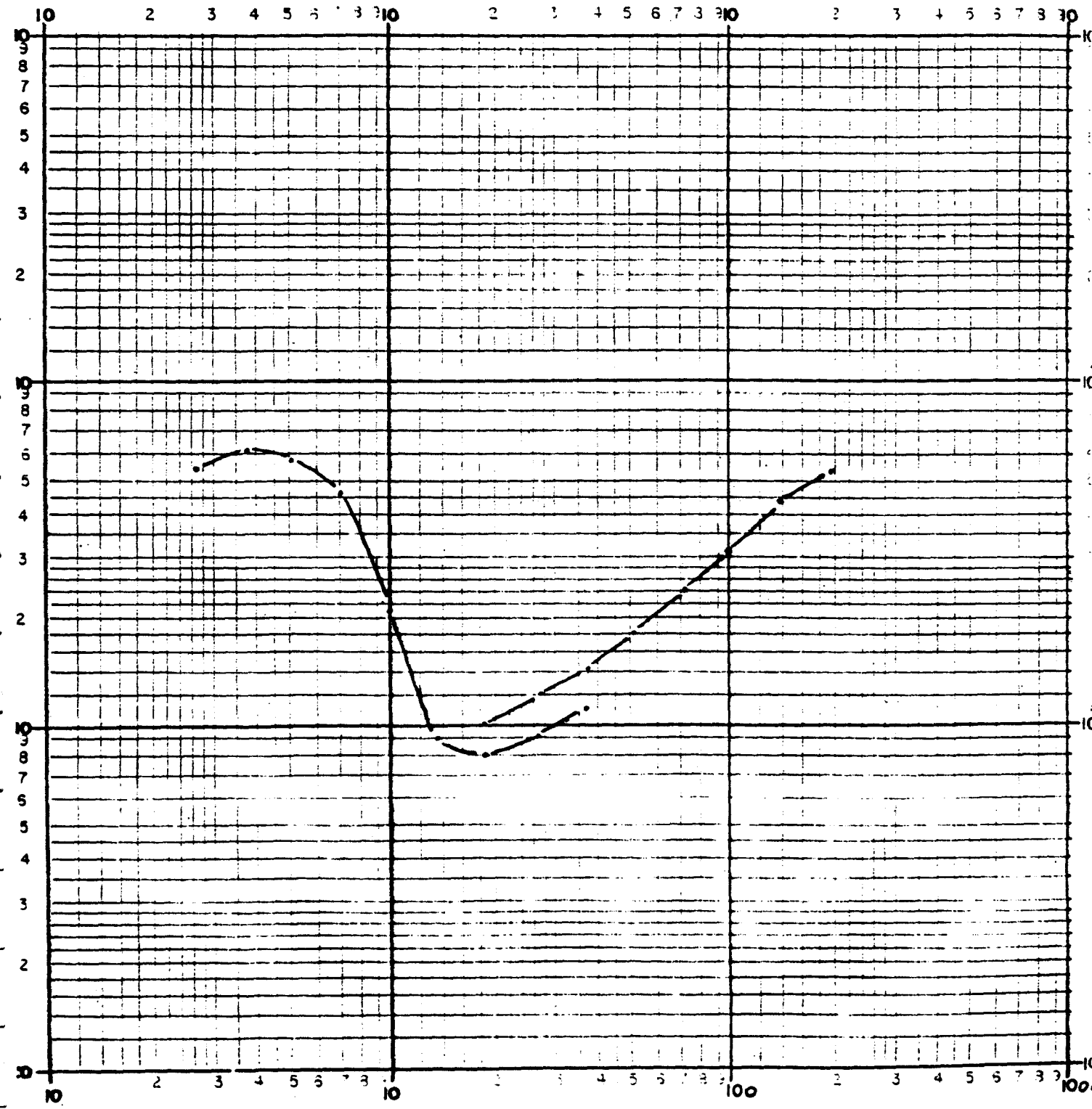


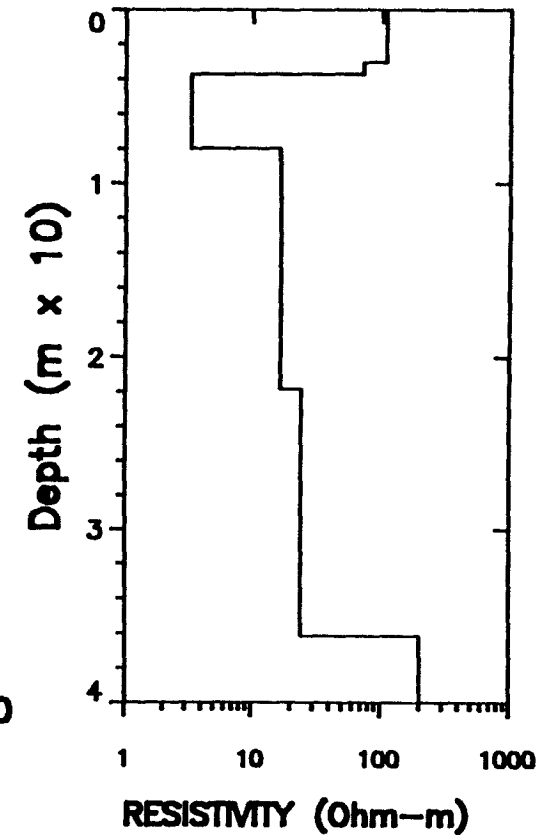
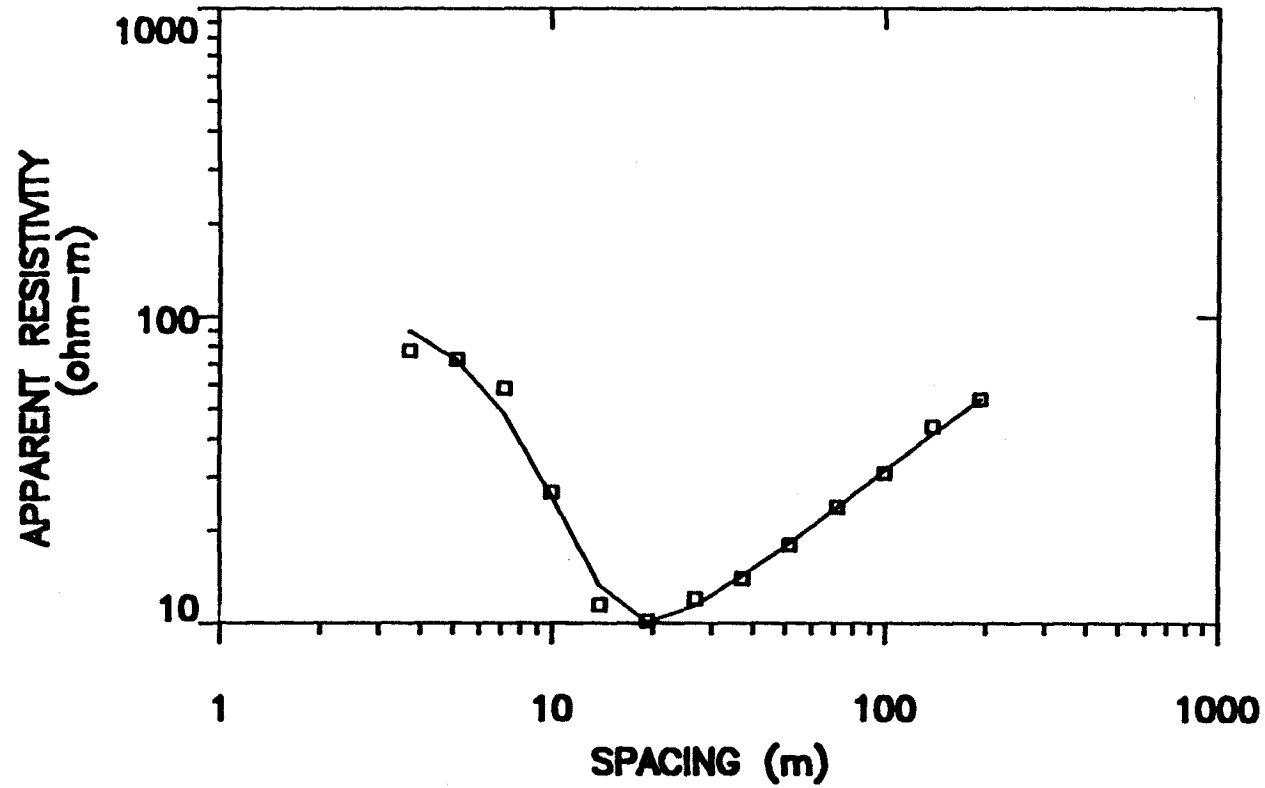
Departamento de Geofísica

Estudio Bullay - Murcia. S.E.V. 3

Fecha 16-01-91 Rumbo AB E-W PERFIL II

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 311	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 311	

DATA SET: 411

CLIENT: ITGE	DATE: 91
LOCATION: BULLAS	SOUNDING: 2I
COUNTY: (MU)	AZIMUTH: E-W
PROJECT: SEGURA	EQUIPMENT: ADARO
ELEVATION: 865.00	
SOUNDING COORDINATES: X: 601200.0000 Y: 4203350.0000	

Schlumberger Configuration

FITTING ERROR: 5.911 PERCENT

#	RESISTIVITY (ohm-m)	CHARGEABILITY (pfa)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				865.0	
1	52.13		0.894	864.1	0.0171
2	29.45		3.85	860.2	0.135
3	8.00		5.37	854.8	0.671
4	38.36		7.96	846.9	0.207
5	10.68		12.99	833.9	1.21
6	232.2				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	35.39	35.58	-0.533
2	3.73	30.22	31.03	-2.68
3	5.18	26.81	27.06	-0.939
4	7.20	25.35	22.99	9.29
5	10.00	18.52	19.00	-2.56
6	13.90	14.62	16.42	-12.30
7	19.30	18.52	16.26	12.22
8	26.80	18.00	17.90	0.510
9	37.30	19.50	20.44	-4.84
10	51.80	23.00	24.04	-4.54
11	72.00	30.00	29.82	0.593
12	100.0	39.00	38.54	1.16
13	139.0	51.00	50.37	1.22
14	193.0	66.00	65.13	1.30

PARAMETER RESOLUTION MATRIX:

* ADARO *

"F" INDICATES FIXED PARAMETER

P 1	0.31													
P 2	0.08	0.78												
P 3	-0.04	0.03	0.47											
P 4	0.01	0.00	0.17	0.17										
P 5	0.00	0.02	0.06	0.06	0.36									
P 6	0.00	0.00	0.00	-0.05	0.11	0.11								
T 1	0.24	0.24	-0.02	-0.01	-0.01	0.00	0.23							
T 2	-0.15	0.18	0.17	-0.06	-0.09	-0.01	-0.04	0.49						
T 3	0.00	0.01	-0.34	-0.16	-0.11	-0.02	0.01	0.00	0.28					
T 4	0.01	0.00	0.07	0.11	-0.05	-0.07	0.00	-0.03	-0.06	0.09				
T 5	0.00	-0.02	-0.03	-0.01	-0.37	-0.14	0.01	0.07	0.09	0.08				
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4				

SECOND PART OF RESOLUTION MATRIX:

T 5	0.39
	T 5

* ADARO *



Proyecto:
 Zona: Bullay - Murcia
 Observador:
 Situación: Luja del 1:50.000 - 911 - CEHEGIN

COORDENADAS
 X 601200
 Y 4203350
 Z 865

m V
 m A:
 S.E.V. 4
 Rumbo AB E-W
 Perfil: II

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m	
1	2.68	1	50	100mv	82	36.23							21.78				
2	3.73		49	"	35	31							42.92				
3	5.18		53	30mv	17.5	27.5							83.51				
4	7.2		48	10mv	7.75	26							182.1				
5	10		48	10mv	2.85	19							313.4				
6	13.9		46	"	1.15	15							606.2				
7	19.3		110	3mv	18	19	10	100	30mv	16	17.5		1.189	109.2			
8	26.8		140	10mv	1.2	19		140	30mv	11.5	18		2.256	217.8			
9	37.3		150	3mv	0.7	20		140	10mv	6.4	19.5		4.370	429.2			
10	51.8	10	160	10mv	4.45	23							8.429	835.1			
11	72		150	"	2.8	30							16.290	1.621			
12	100		160	"	2	39							31.420	3.134			
13	139		160	"	1.85	51							60.700	6.062	1.175		
14	183		150	3mv	0.85	66								11.690	2.301		
15	268													22.560	4.474		
16	373													43.700	8.702	4.292	
17	518													84.290	16.820	8.351	
18	720													162.900	32.530	16.210	
19	1.000														62.780	31.340	
20	1.300														121.400	60.620	
21	1.930														234.000	116.900	
22	2.680														451.200	225.600	
23	3.730															437.000	
24	5.180															842.880	
25	7.200															1.628.520	
26	10.000															3.141.510	

OBSERVACIONES:

FECHA: 16-01-91



Departamento de Geofísica

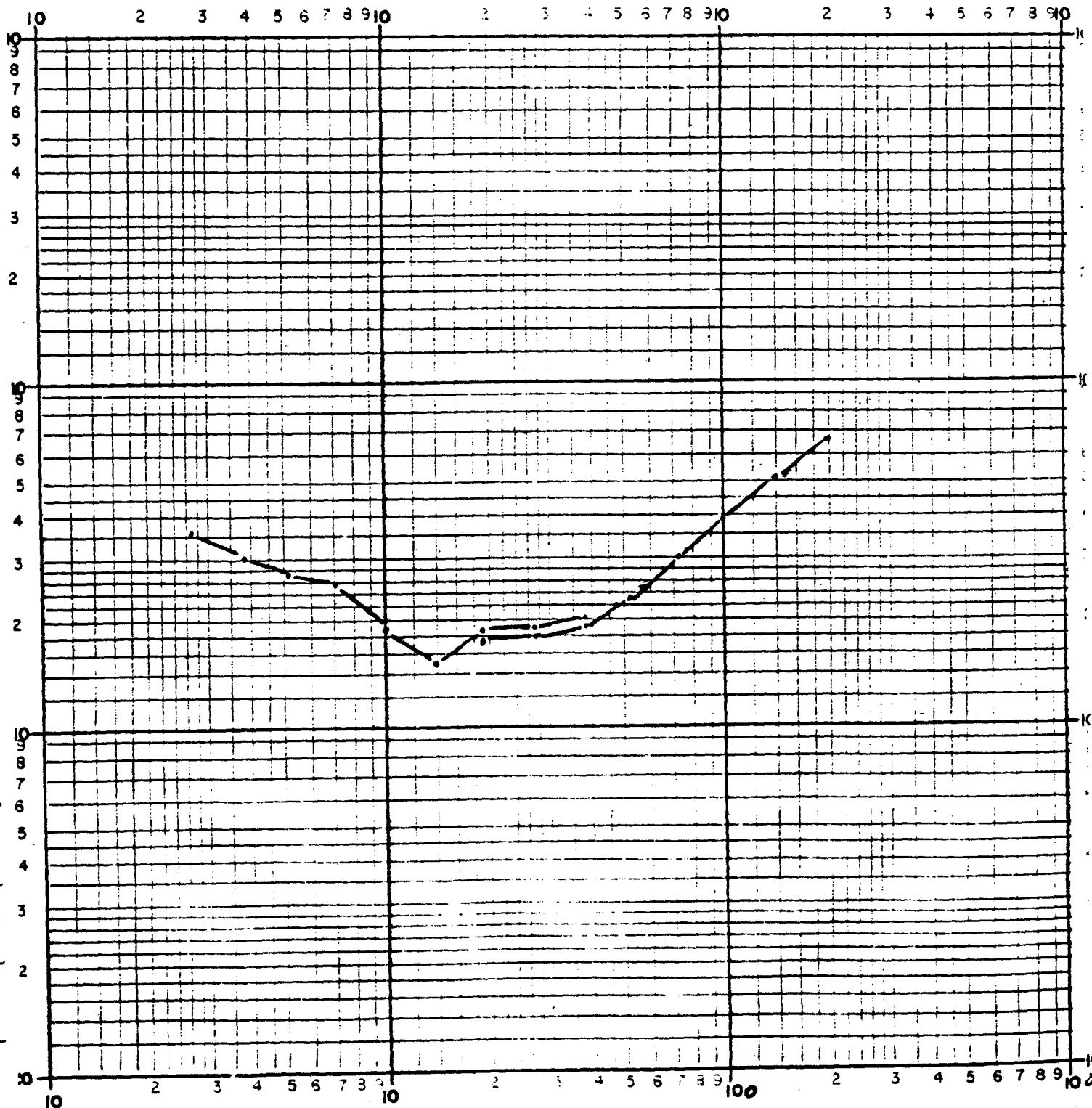
Estudio *Bullas - Murcia*

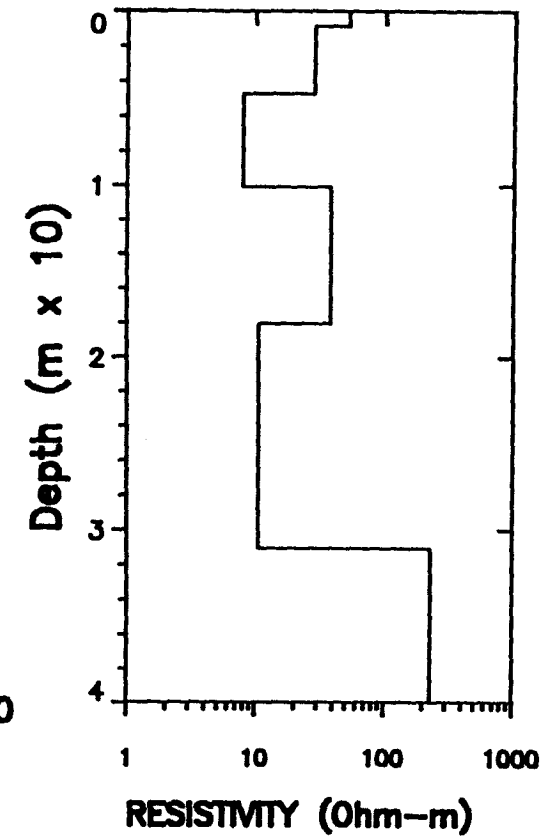
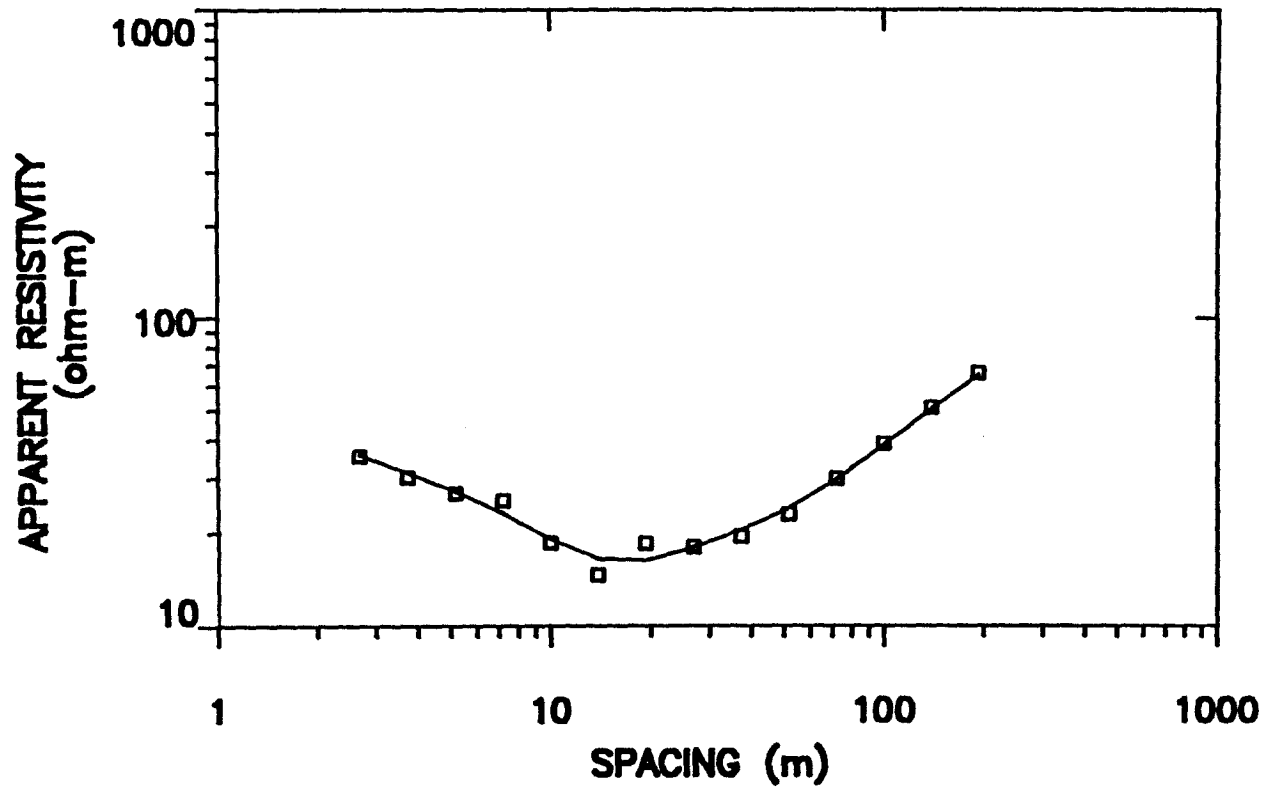
S.E.V. *4*

Fecha *16-01-91* Rumbo AB *E-W*

PERFIL *II*

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 41	Date: 91	
Equipment: ADARO	Sounding: 21	Azimuth: E-W

DATA SET: SIII

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 920.00

DATE: 91
 SOUNDING: SIII
 AZIMUTH: E-W
 EQUIPMENT: ADARO

SOUNDING COORDINATES: X: 602755.0000 Y: 4204650.0000

Schlumberger Configuration

FITTING ERROR: 3.531 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfa)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
1	73.80			920.0	
2	383.8		0.895	919.1	0.0121
3	95.49		1.58	917.5	0.00414
4	427.1		3.37	914.1	0.0353
5	149.2		15.88	898.2	0.0371
6	209.2		15.10	883.1	0.101
7	87.38		13.99	869.1	0.0668
8	118.3		227.4	841.6	2.60

ALL PARAMETERS ARE FREE

No.	Spacing (m)	DATA	PA (ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	140.0	141.1	-0.832
2	3.73	161.0	162.3	-0.847
3	5.18	183.0	176.8	3.34
4	7.20	182.0	183.7	-0.938
5	10.00	191.0	188.1	1.50
6	13.90	188.0	199.1	-5.91
7	19.30	230.0	219.6	4.50
8	26.80	258.0	241.8	6.24
9	37.30	235.0	253.4	-7.86
10	51.80	239.0	245.7	-2.84
11	72.00	231.0	218.7	5.31
12	100.0	182.0	180.4	0.832
13	139.0	139.0	142.9	-2.85
14	193.0	117.0	115.1	0.733
15	268.0	103.0	102.4	0.572

* ADARO *

No.	Spacing (m)	DATA	PA (ohm-m)	SYNTHETIC	DIFFERENCE (percent)
16	378.0	98.00		98.43	
17	518.0	100.0		99.97	-0.446
18	720.0	104.0		103.9	0.0214 0.0295

PARAMETER RESOLUTION MATRIX:
"F" INDICATES FIXED PARAMETER

P 1	0.65										
P 2	-0.02	0.66									
P 3	0.04	0.06	0.63								
P 4	-0.04	0.03	-0.01	0.83							
P 5	0.02	-0.02	0.03	-0.04	0.46						
P 6	-0.01	0.00	0.02	-0.09	0.16	0.52					
P 7	0.00	0.00	0.00	0.00	-0.03	0.01	0.99				
P 8	0.00	0.00	0.00	0.00	-0.01	0.02	-0.01	0.96			
T 1	-0.41	-0.12	0.07	-0.04	0.01	-0.01	0.00	0.00	0.49		
T 2	0.00	0.40	0.11	-0.06	0.02	-0.02	0.00	0.00	0.10	0.43	
T 3	0.03	0.03	-0.41	-0.10	0.03	-0.02	0.00	0.00	0.05	0.15	
T 4	0.04	-0.03	0.00	0.26	0.27	0.11	0.01	0.00	0.04	0.07	
T 5	-0.01	0.01	-0.01	0.01	-0.17	0.17	0.03	0.01	-0.01	-0.01	
T 6	-0.01	0.00	0.01	-0.04	0.01	0.36	0.02	0.01	-0.01	-0.02	
T 7	0.00	0.00	0.00	0.00	-0.12	0.05	-0.06	-0.15	0.00	0.00	
	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	T 1	T 2	

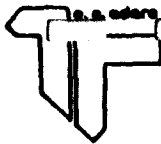
SECOND PART OF RESOLUTION MATRIX:

T 3	0.47				
T 4	0.13	0.51			
T 5	0.00	-0.02	0.20		
T 6	-0.01	0.05	0.19	0.29	
T 7	0.01	0.05	0.14	0.10	0.32
	T 3	T 4	T 5	T 6	T 7

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ADARO

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Proyecto:
 Zona: Bullas - Murcia
 Observador:
 Situación: Plano 1. Soano - n.º 9M

COORDENADAS
 X 602755
 Y 4204680
 Z 920

n:
 mA:
 S.E.V. 5

Rumbo AB
E-W
 Perfil:
III

CEHEGIN

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN			
													1 m	10 m	50 m	100 m
1	2.68	10	45	300	290	140							21.78			
2	3.73		44	"	165	161							42.92			
3	5.18		42	100m	92	183							83.51			
4	7.2		45	"	50.5	182							182.1			
5	10		46	"	28	191							313.4			
6	13.9		45	30m	14	188							606.2			
7	19.3		110	"	22	233.8	10	110	300m	220	218		1.189	109.2		
8	26.8		96	"	11	258.5		97	"	115	258		2.256	217.8		
9	37.3	10	95	100m	52	235							4.370	429.2		
10	51.8		115	"	33	239							8.429	836.1		
11	72		84	80m	12	231							16.290	1.621		
12	100		110	10m	6.4	188							31.420	3.134		
13	139		135	"	3.1	139							60.700	6.082	1.175	
14	193		120	"	1.2	117								11.690	2.301	
15	268		120	3m	0.55	103								22.560	4.474	
16	373		120	"	0.27	98								43.700	8.702	4.292
17	518		135	"	0.16	100								84.290	16.820	8.361
18	720		125	1m	0.08	104								162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.300														121.400	60.620
21	1.930														234.000	116.900
22	2.680														451.200	226.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA:



Departamento de Geofísica

Estudio *Bullay - Anukua*

S.E.V. *5*

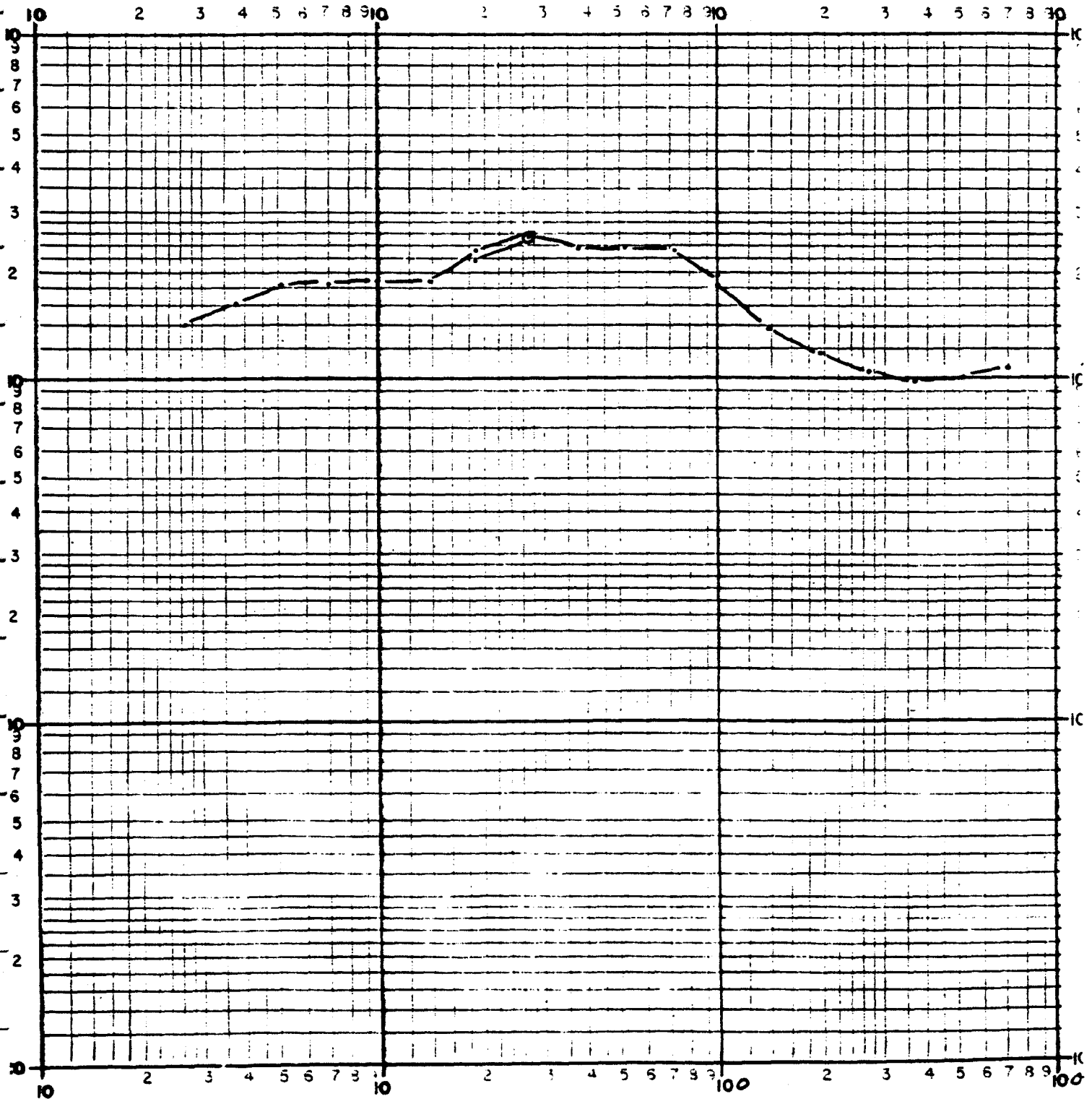
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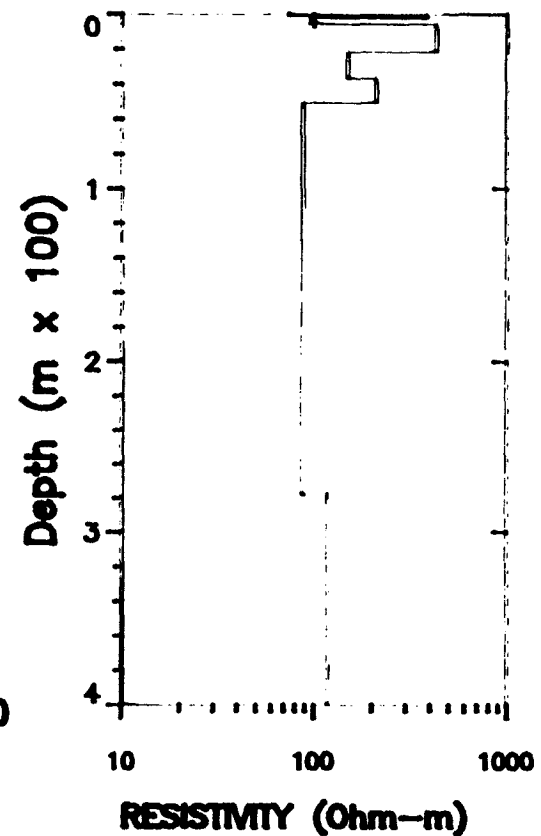
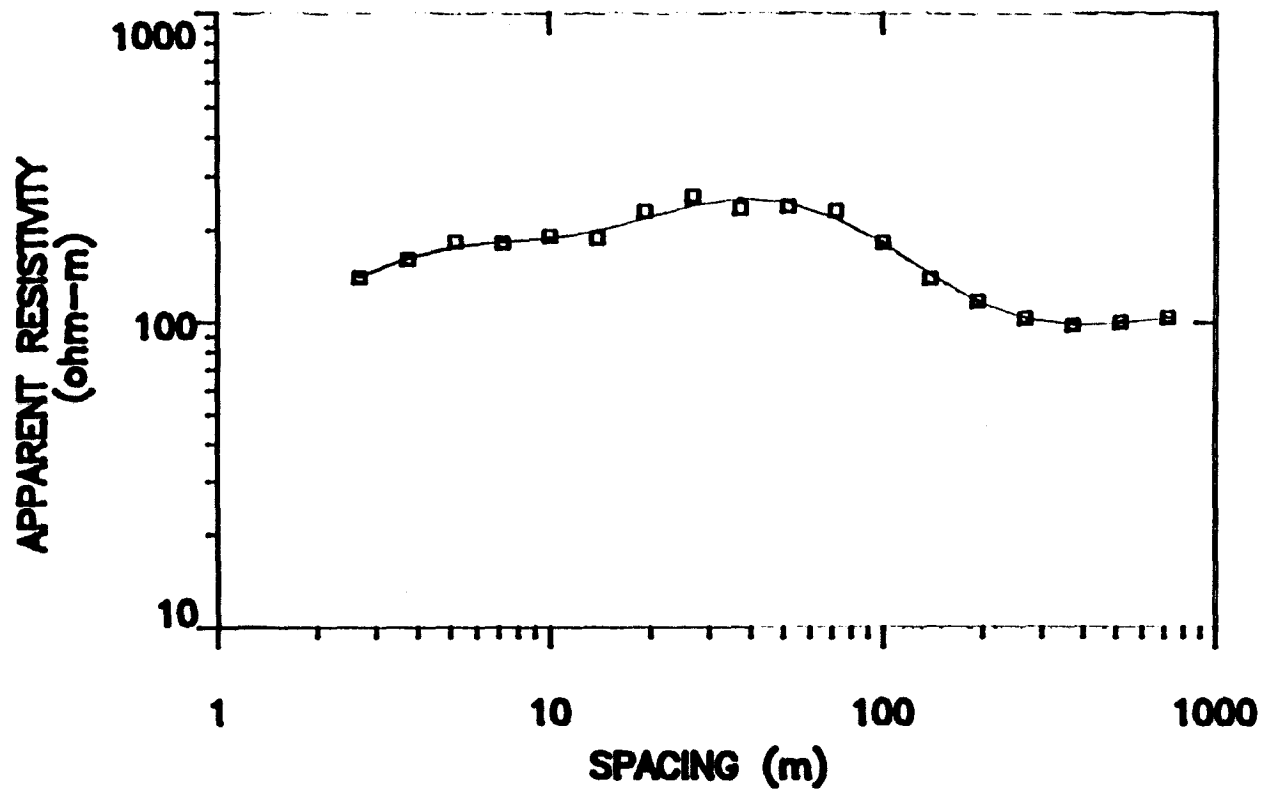
Rumbo AB *E-W*

PERFIL *III*

Interpretación

Observaciones:





for: ITGE		SEGURA BULLAS (MU)
by: ADARO		
Data Set: 5III	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 5III	

DATA SET: 6111

CLIENT: ITGE DATE: 91
 LOCATION: BULLAS SOUNDING: 6111
 COUNTY: (MU) AZIMUTH: E-W
 PROJECT: SEGURA EQUIPMENT: ADARO
 ELEVATION: 880.00
 SOUNDING COORDINATES: X: 602550.0000 Y: 4203850.0000

Schlumberger Configuration

FITTING ERROR: 5.370 PERCENT

#	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				880.0	
1	787.6		3.65	876.3	0.00463
2	231.6		47.85	828.4	0.206
3	107.3		68.86	759.6	0.638
4	44.98				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	753.1	754.9	-0.240
2	3.73	794.9	712.8	10.33
3	5.18	587.5	636.1	-8.27
4	7.20	487.2	524.3	-7.61
5	10.00	409.6	404.6	1.22
6	13.90	330.3	313.7	5.03
7	19.30	292.0	264.7	6.11
8	26.80	231.0	243.0	-5.21
9	37.30	215.0	230.6	-7.28
10	51.80	220.0	217.5	1.12
11	72.00	209.0	197.6	5.43
12	100.0	166.0	169.0	-1.85
13	139.0	133.0	135.2	-1.70
14	268.0	79.00	76.82	2.75
15	373.0	58.00	59.86	-3.21
16	518.0	52.00	51.33	1.27

PARAMETER RESOLUTION MATRIX:

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ADARO

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"F" INDICATES FIXED PARAMETER

P 1	1.00							
P 2	0.00	1.00						
P 3	0.00	0.00	0.93					
P 4	0.00	0.00	-0.01	1.00				
T 1	0.00	0.00	0.00	0.00	1.00			
T 2	0.00	0.00	0.04	0.00	0.00	0.97		
T 3	0.00	0.00	0.04	0.01	0.00	-0.02	0.97	
	P 1	P 2	P 3	P 4	T 1	T 2	T 3	

DATA SET: 6III

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 880.00
 SOUNDING COORDINATES: X: 602550.0000 Y: 4203850.0000

DATE: 91
 SOUNDING: 6III
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 6.479 PERCENT

#	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				880.0	
1	802.3		3.42	876.5	0.00427
2	246.6		13.84	862.7	0.0561
3	211.1		22.00	840.7	0.104
4	161.4		88.89	751.8	0.550
5	15.41		89.03	662.8	5.77
6	84.00				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	753.1	764.0	-1.44
2	3.73	794.9	716.3	9.88
3	5.18	597.5	632.7	-7.70
4	7.20	487.2	516.9	-6.09
5	10.00	409.6	400.0	2.34
6	13.90	330.3	315.5	4.47
7	19.30	292.0	269.9	4.26
8	26.80	231.0	246.1	-6.55
9	37.30	215.0	228.8	-6.44
10	51.20	220.0	212.3	3.48
11	72.00	209.0	194.0	7.13
12	100.0	166.0	172.8	-4.12
13	139.0	133.0	147.0	-10.57
14	193.0	130.0	115.5	11.11
15	268.0	79.00	82.37	-4.27
16	373.0	58.00	58.63	-1.09
17	518.0	52.00	51.25	1.42

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ADARO

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PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

P 1	1.00																			
P 2	0.00	0.99																		
P 3	0.00	0.01	0.88																	
P 4	0.00	-0.01	0.03	0.92																
P 5	0.00	0.00	0.01	-0.04	0.37															
P 6	0.00	0.00	-0.01	0.04	0.29	0.38														
T 1	0.01	0.01	-0.01	0.01	0.00	0.00	0.98													
T 2	0.00	0.03	0.22	0.03	0.01	-0.02	-0.02	0.10												
T 3	0.00	-0.01	0.07	0.12	0.02	-0.03	0.01	0.03	0.06											
T 4	0.00	0.01	-0.09	0.05	0.12	-0.10	-0.01	0.14	0.13	0.85										
T 5	0.00	0.00	-0.01	0.02	-0.34	-0.30	0.00	0.00	0.00	-0.02										
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4										

SECOND PART OF RESOLUTION MATRIX:

T 5	0.32
	T 5



Proyecto:
 Zona: Dulles - Murcia
 Observador:
 Situación: Hoja del 1.50000 - 9M - CEHEG.N.....

COORDENADAS
 X 602.550
 Y 4203.850
 Z 880

Rumbo AB
 E - W
 Perfil: III
 S.E.V. 6

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m
1	2.68	1	29	3000 mv	1150	864							21.78			
2	3.73		24	1000 mv	510	912							42.92			
3	5.18		26	1000 mv	210	614							83.51			
4	7.2		29	300 mv	100	559							162.1			
5	10		27	100 mv	40.5	410							313.4			
6	13.9		28	30 mv	17.5	379							606.2			
7	19.3		21	10 mv	5.7	317	10	19	100 mv	49	282.		1.169	109.2		
8	26.8		34	"	4	265		33	100 mv	35	201 231		2.256	217.8		
9	37.3		19	"	1.15	264		19	30 mv	9.50	215		4.370	429.2		
10	51.8	10	35	30 mv	9.25	220							8.429	835.1		
11	72		41	10 mv	5.3	209							16.290	1.621		
12	100		32	"	1.7	166							31.420	3.134		
13	139		155	"	3.4	133							60.700	6.062	1.175	
14	193		135	3 mv	1.5	130								11.690	2.301	
15	268		80	1 mv	0.28	79								22.560	4.474	
16	373		30	"	0.04	58								43.700	8.702	4.292
17	518		105	"	0.065	52								84.290	16.820	8.351
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.300														121.400	60.620
21	1.930														234.000	116.900
22	2.680														451.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA:

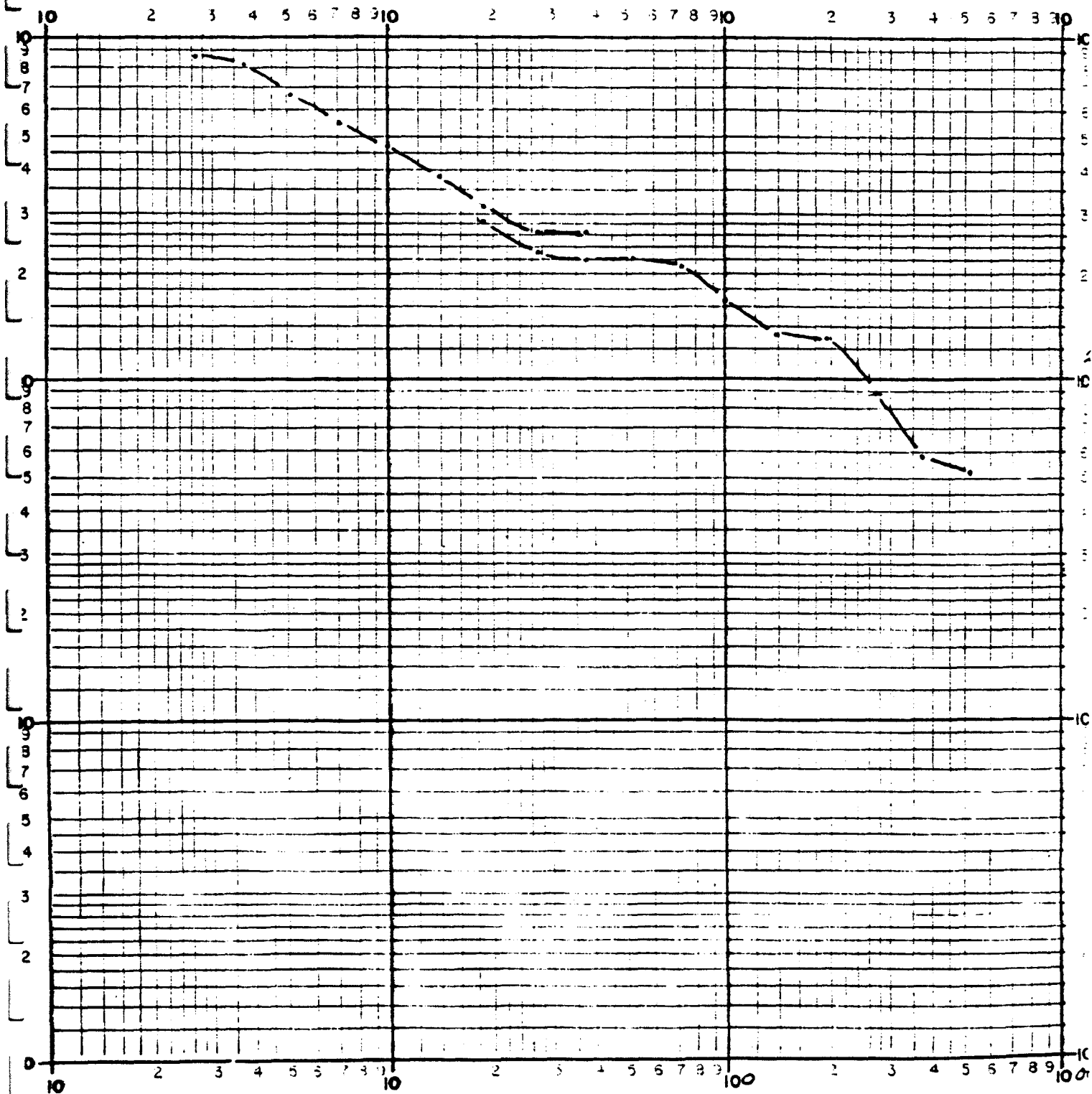


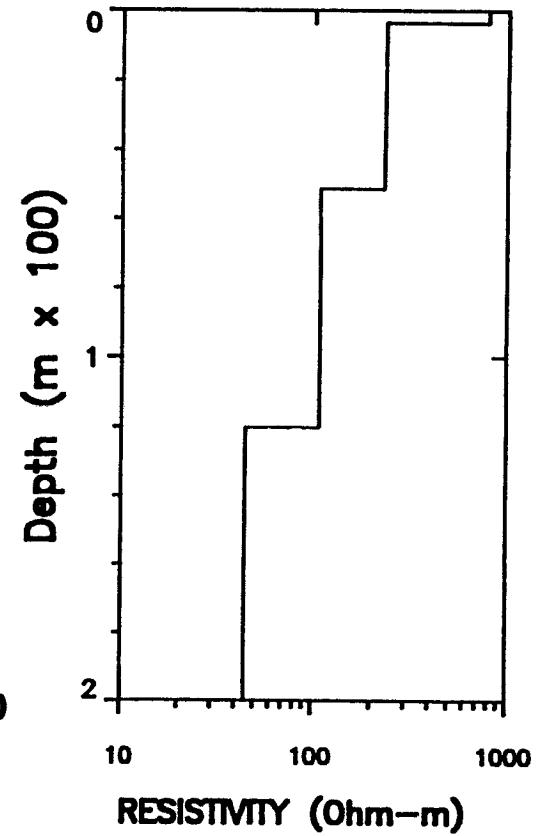
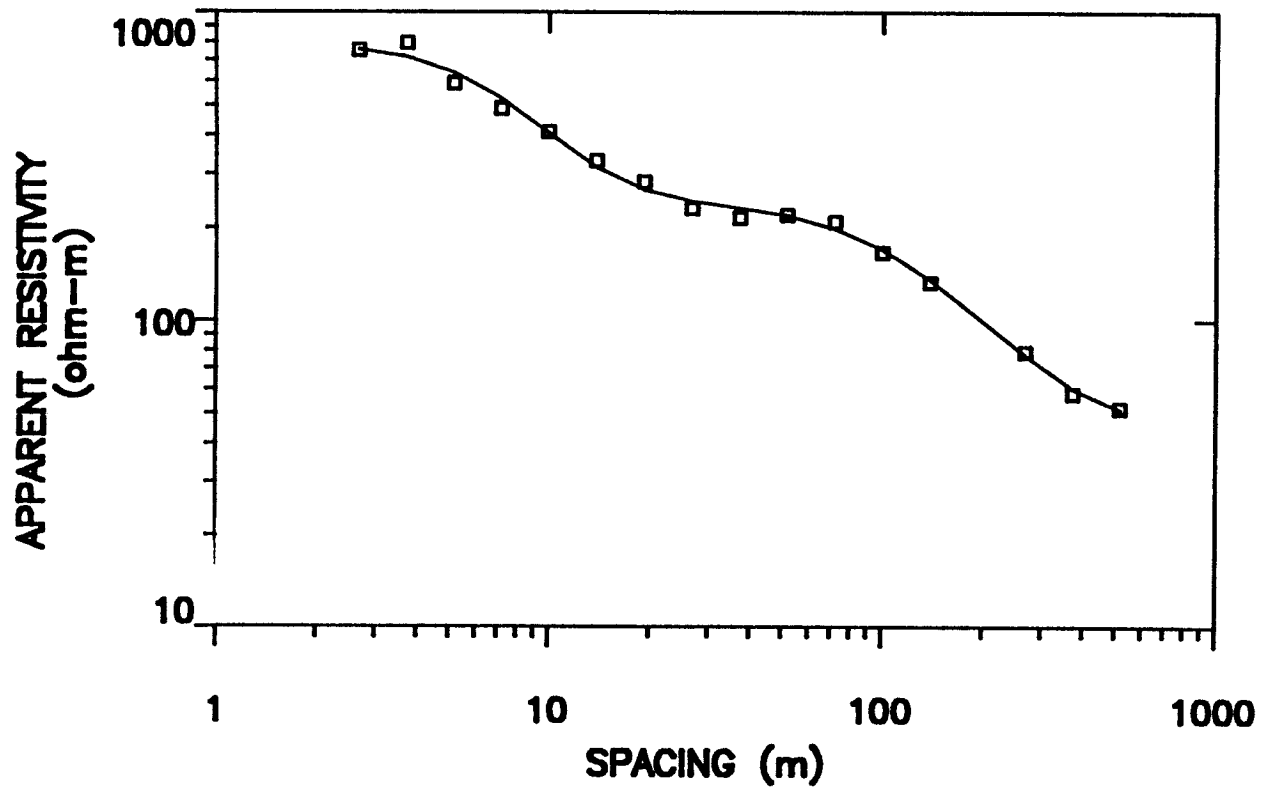
Departamento de Geofísica

Estudio Bullas - Murcia S.E.V. 6

Fecha Rumbo AB E-W PERFIL II

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 611	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 611	

DATA SET: 7IV

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 920.00
 SOUNDING COORDINATES: X: 604190.0000 Y: 4204275.0000

DATE: 91
 SOUNDING: 7IV
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 2.486 PERCENT

#	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				920.0	
1	74.51		1.57	918.4	0.0211
2	25.36		5.21	913.2	0.205
3	10.64		8.66	904.5	0.814
4	35.47		39.02	865.5	1.10
5	12.96		51.28	814.2	3.95
6	50.71				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	56.00	56.26	-0.469
2	3.73	46.00	45.41	1.26
3	5.18	35.00	35.32	-0.941
4	7.20	28.00	27.98	0.0375
5	10.00	23.00	23.05	-0.256
6	13.90	20.00	19.55	2.21
7	19.30	17.00	17.76	-4.48
8	26.80	19.00	18.15	4.42
9	37.30	20.00	20.16	-0.847
10	51.80	22.00	22.49	-2.26
11	72.00	24.00	24.18	-0.757
12	100.0	26.00	24.83	4.48
13	139.0	24.00	24.90	-3.76
14	193.0	26.00	25.63	1.40
15	268.0	28.00	28.03	-0.132

* ADARO *

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER.

P 1	0.97											
P 2	-0.03	0.93										
P 3	0.00	-0.02	0.72									
P 4	0.01	0.03	0.01	0.80								
P 5	-0.01	-0.02	0.00	0.07	0.53							
P 6	0.00	0.01	-0.02	0.00	0.19	0.47						
T 1	0.05	0.08	0.01	-0.03	0.01	-0.01	0.90					
T 2	0.03	0.08	0.19	-0.07	0.03	-0.01	-0.07	0.77				
T 3	-0.01	-0.03	-0.37	-0.11	0.06	-0.03	0.02	0.23	0.41			
T 4	-0.01	-0.03	-0.03	0.29	0.14	-0.20	0.03	0.08	0.13	0.39		
T 5	0.00	0.00	0.00	0.02	-0.36	-0.26	0.00	0.00	0.00	0.05		
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4		

SECOND PART OF RESOLUTION MATRIX:

T 5	0.31
	T 5



Proyecto: B. L. P.
 Zona: Bullas - Murcia
 Observador: Juan Cu. Cuatrecasas
 Situación: Hoja del 1:50.000

DEN S
 X 604190
 Y 4204275
 Z 920

m V: 500
 mA: 650 N° 328
 S.E.V. 7

Rum B
E-W
 Perfil: IV

CONSTANTES PARA DISPOSITIVO SCHULUMBERGE SIMETRICO MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	OBSERVACIONES	1 m	10 m	50 m	100 m
1	2,68	1	29	100w	75	56							21,78			
2	3,73		30	"	32	46							42,92			
3	6,18		91	"	38	35							83,51			
4	7,2		92	30w	16	28							182,1			
5	10		95	10w	7,1	23							313,4			
6	13,9		93	"	3,05	20							606,2			
7	19,3		102	30w	1,52	17	10	102	30w	16,8	18		1,169	109,2		
8	26,8		95	"	0,80	19		95	"	8,6	20		2,256	217,8		
9	37,3	10	98	10w	4,6	20							4,370	429,2		
10	51,8		100	"	2,6	22							8,429	836,1		
11	72		100	30w	1,45	24							16,290	1,621		
12	100		115	"	0,95	26							31,420	3,134		
13	139		125	"	0,50	24							60,700	6,062	1,175	
14	193		125	"	0,275	26								11,890	2,301	
15	268		260	"	0,32	38								22,560	4,474	
16	373													43,700	8,702	4,292
17	518													84,290	16,820	8,351
18	720													182,900	32,530	16,210
19	1.000														62,780	31,340
20	1.300														121,400	60,620
21	1.930														234,000	116,900
22	2.680														461,200	225,600
23	3.730															437,000
24	5.180															842,880
25	7.200															1.628.620
26	10.000															3.141.510

OBSERVACIONES:

FECHA: 21-01-91



Departamento de Geofísica

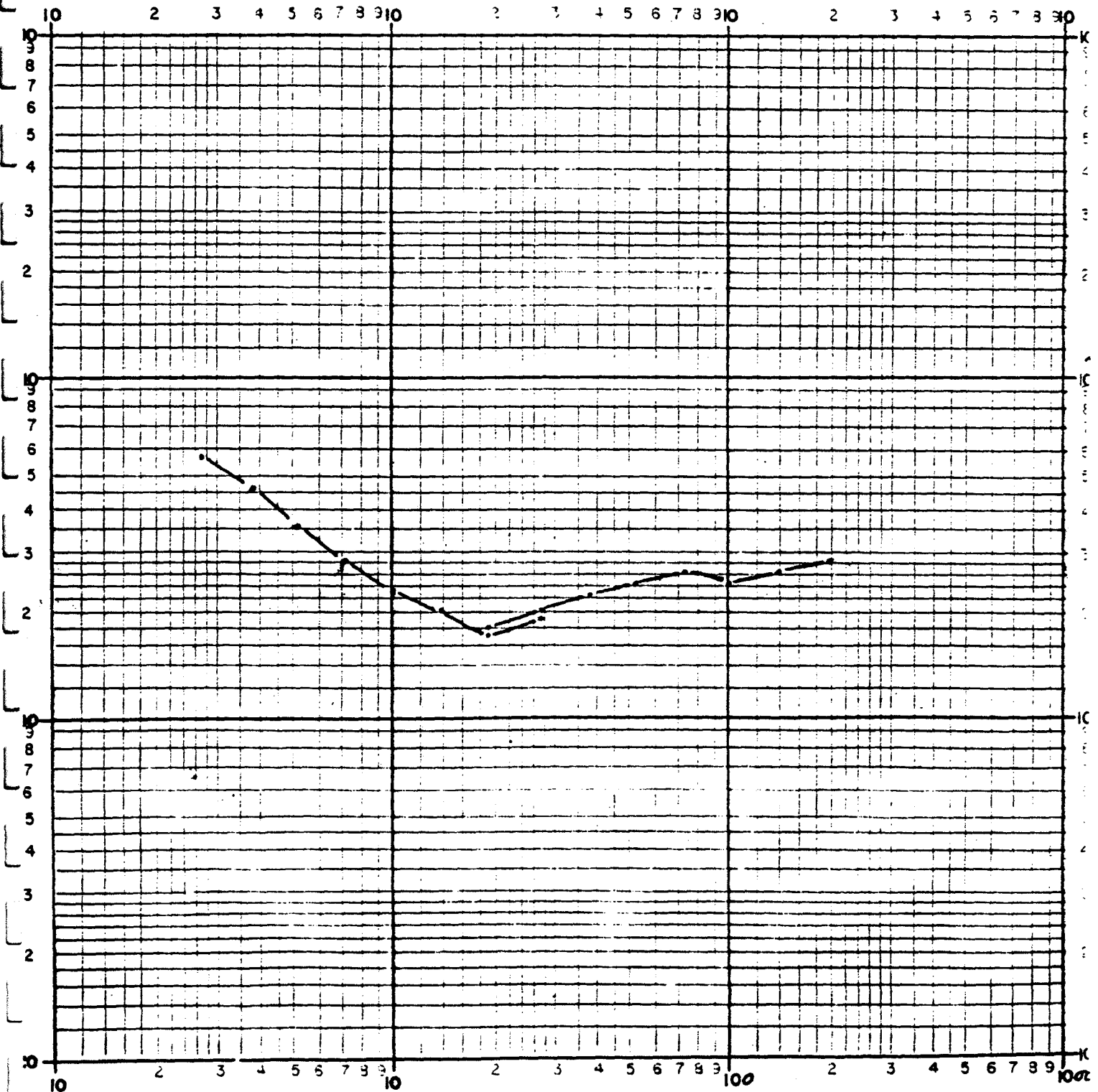
Estudio *Ballas - Murcia*

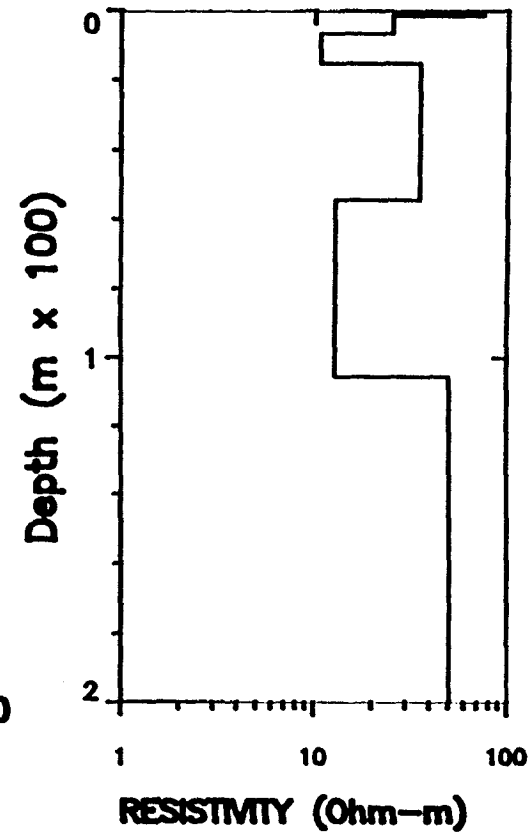
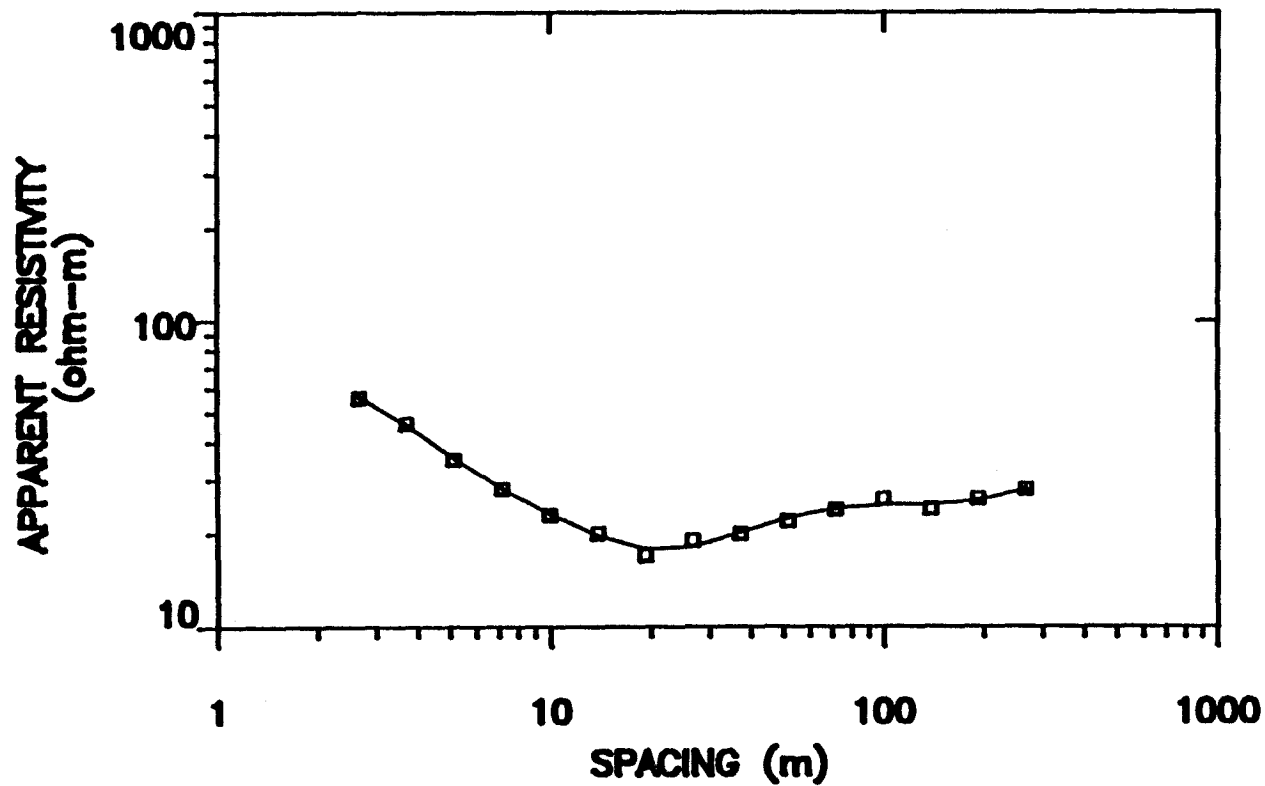
S.E.V. *7*

Fecha *21-01-91* Rumbo AB *E-W*

PERFIL *IV*

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 7V	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 7V	

DATA SET: SIV

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 935.00
 SOUNDING COORDINATES: X: 605500.0000 Y: 4205000.0000

DATE: 91
 SOUNDING: SIV
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 1.623 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				935.0	
1	78.88		2.78	932.2	0.0353
2	30.99		17.78	914.4	0.573
3	50.56		55.85	858.5	1.10
4	295.3				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	75.00	73.64	1.80
2	3.73	67.00	67.93	-1.39
3	5.18	58.00	59.21	-2.09
4	7.20	50.00	49.12	1.75
5	10.00	41.00	40.80	0.472
6	13.90	36.00	36.04	-0.134
7	19.30	34.00	34.51	-1.50
8	26.80	36.00	35.22	2.16
9	37.30	37.00	37.74	-2.00
10	51.80	42.00	41.89	0.251
11	72.00	49.00	47.87	2.29
12	100.0	55.00	56.58	-2.87
13	139.0	70.00	69.48	0.729
14	193.0	88.00	87.26	0.830
15	268.0	109.0	109.5	-0.477

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

F 1	1.00							
F 2	0.00	1.00						
F 3	0.00	0.00	0.99					
F 4	0.00	0.00	-0.01	0.97				
T 1	0.00	0.00	0.00	0.00	1.00			
T 2	0.00	0.00	-0.02	-0.02	0.00	0.96		
T 3	0.00	0.00	-0.01	-0.02	0.00	-0.01	0.99	
	P 1	P 2	P 3	P 4	T 1	T 2	T 3	

*

ADARD

*



edari

Proyecto:
 Zona: Bullop - Murcia
 Observador: Juan Cu. Cuartero
 Situación:

COD NAD
 X 605500
 Y 4205000
 Z 935

m v: Adm - 05
 mA: 66 N° 338

mbo
E - W

S.E.V. 8

Perfil: IV

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN				
													1 m	10 m	50 m	100 m	
1	2.68	1	35	300μV	120	75							21.78				
2	3.73		100	"	157	67						<u>A-70 =</u>	42.92				
3	5.18		95	100μV	66.5	58							83.51				
4	7.2		98	"	30	50							182.1				
5	10		100	30μV	13	41							313.4				
6	13.9		100	10μV	5.9	36							606.2				
7	19.3		96	"	2.8	34	10	98	100μV	30	33		1.169	109.2			
8	26.8	10	105	30μV	17.5	36							2.256	217.8			
9	37.3		98	"	8.4	37							4.370	429.2			
10	51.8		83	10μV	4.2	42							8.429	836.1			
11	72		75	"	2.25	49							18.290	1.621			
12	100		120	"	2.1	55							31.420	3.134			
13	139		115	3μV	1.33	70							60.700	6.062	1.176		
14	193		120	"	0.90	88								11.690	2.301		
15	268		125	"	0.605	109								22.560	4.474		
16	373													43.700	8.702	4.292	
17	518													84.290	16.820	8.351	
18	720													162.900	32.530	18.210	
19	1.000														62.790	31.340	
20	1.390															121.400	60.620
21	1.930															234.000	116.900
22	2.680															461.200	225.600
23	3.730																437.000
24	5.180																842.880
25	7.200																1.628.520
26	10.000																3.141.510

OBSERVACIONES:

FECHA: 21-01-91



endimso

Departamento de Geofísica

Estudio *Bullaf - Murcia*

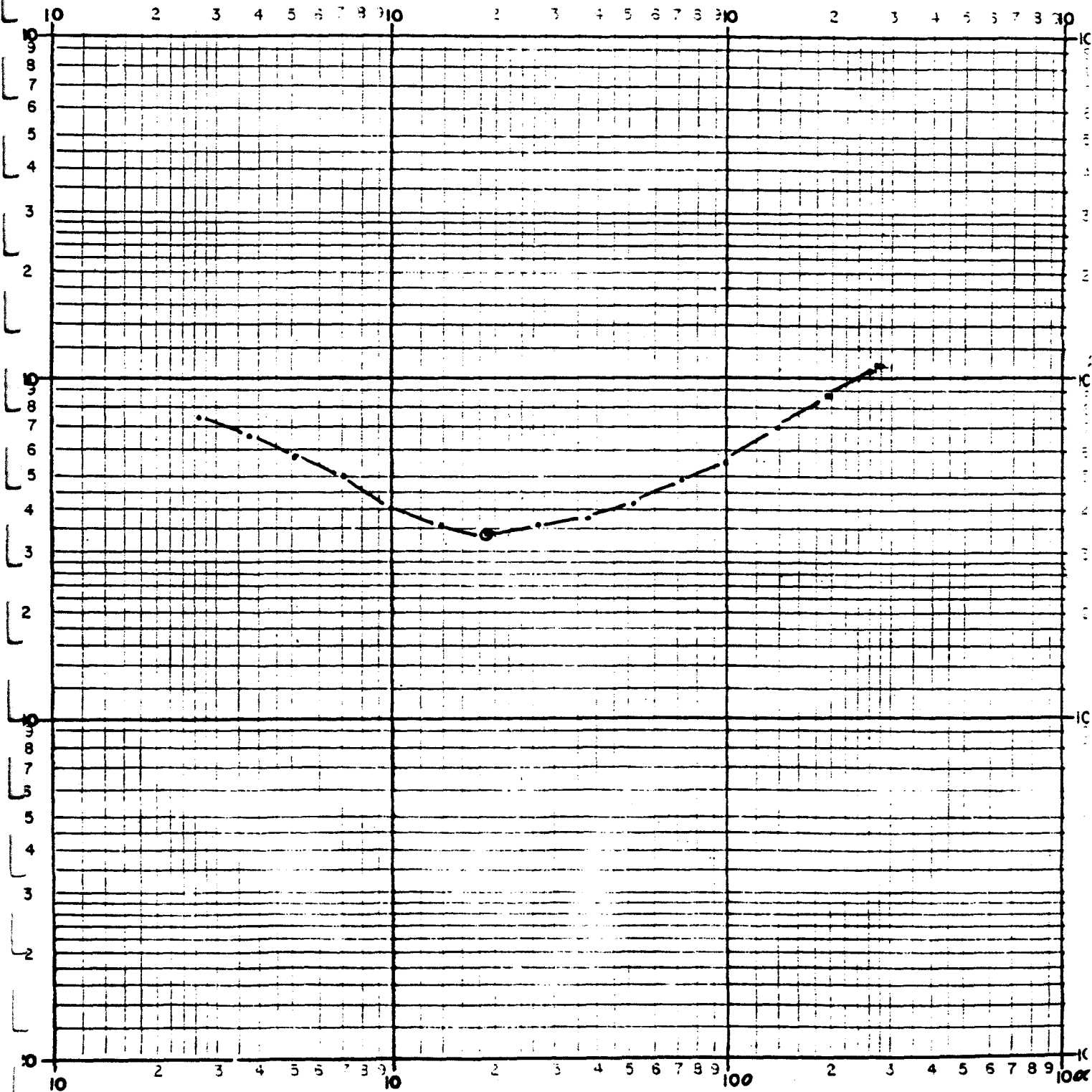
S.E.V. *8*

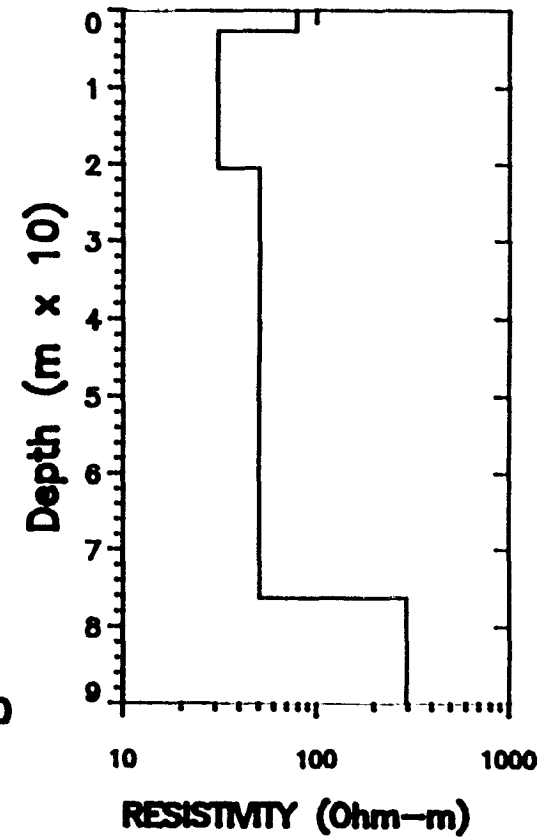
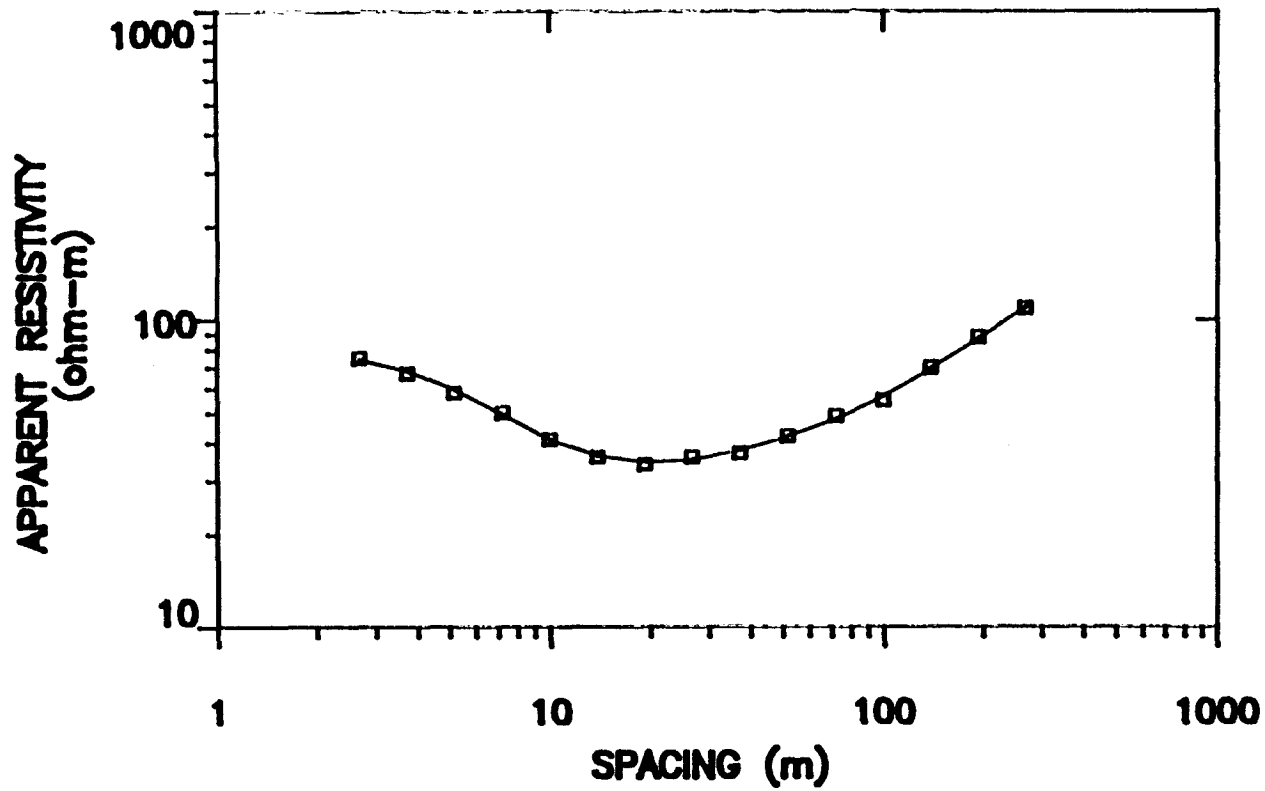
Fecha *21-01-91* Rumbo AB *E-W*

PERFIL *IV*

Interpretación

Observaciones:

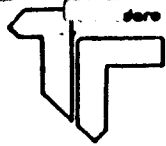




for: ITGE		SEGURA
by: ADARO		
Data Set: 8V	Date: 91	BULLAS (MU)
Equipment: ADARO	Sounding: 8V	
		Azimuth: E-W

"F" INDICATES FIXED PARAMETER

P 1	0.97									
P 2	-0.04	0.91								
P 3	0.00	-0.03	0.94							
P 4	0.00	0.00	0.01	0.99						
P 5	0.00	0.00	0.00	0.01	0.34					
T 1	0.05	0.09	0.02	0.00	0.00	0.90				
T 2	-0.06	-0.19	-0.12	0.02	-0.01	0.16	0.52			
T 3	0.00	0.00	-0.09	-0.03	0.08	0.00	-0.09	0.09		
T 4	0.00	0.00	-0.02	0.03	0.41	0.00	-0.03	0.12	0.52	
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4	



Proyecto:
 Zona: Bullas: Murcía
 Observador: Alfredo Carrasco Martínez
 Situación:

COORDENADA
 X 606.650
 Y 4205.700
 Z 840m

m V:
m A:

S.E.V.

9

bo A

E.-W.

Perfil:

IV

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
SIMETRICO
MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m
1	2.68	1	208	3V	1150	110							21.78			
2	3.73		195	1V	440	97							42.92			
3	5.18		250	300 mV	240	80							83.51			
4	7.2		160	100 mV	70.5	71							182.1			
5	10		300	"	66	69							313.4			
6	13.9		232	"	30	78							608.2			
7	19.3		338	"	25.5	88							1.189	109.2		
8	26.8		280	30 mV	12	97	10	280	800 mV	104	81		2.258	217.8		
9	37.3		160	30 mV	3.9	104		280	10 mV	6.6	86	340-8.1 // 340-68	4.370	429.2		
10	51.8		282	10 mV	3.9	116		285	"	33.5	98		8.429	836.1		
11	72	10	270	30 mV	17	102							16.290	1.621		
12	100		263	10 mV	8.8	105							31.420	3.134		
13	139		310	"	5.5	107.5							60.700	6.082	1.176	
14	193		560	"	5	104								11.690	2.301	
15	268		250	3 mV	1.1	99								22.560	4.474	
16	373		250		1.1									43.700	8.702	4.292
17	518													84.290	16.820	8.351
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.680														451.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA:

28-11-91

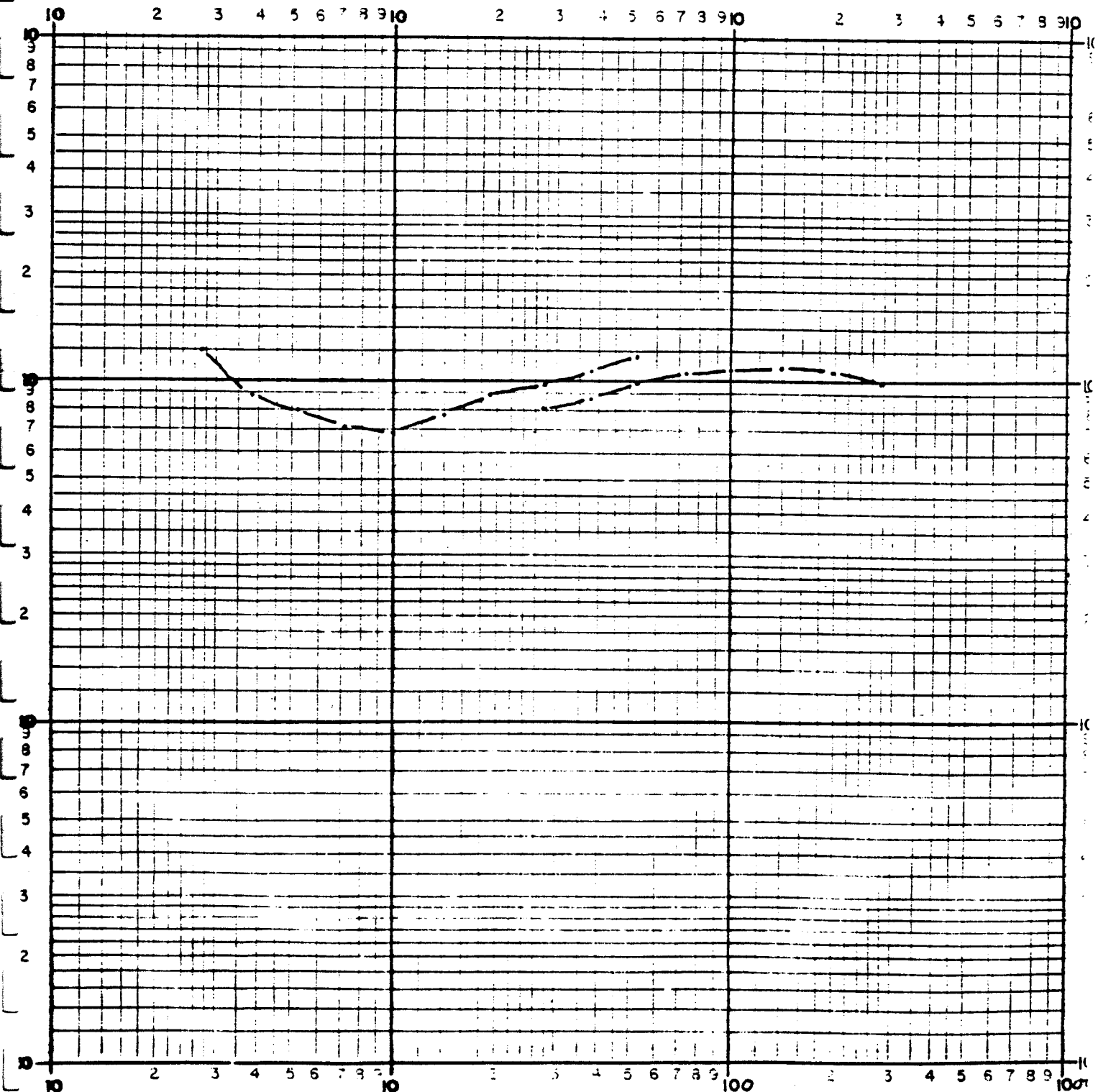


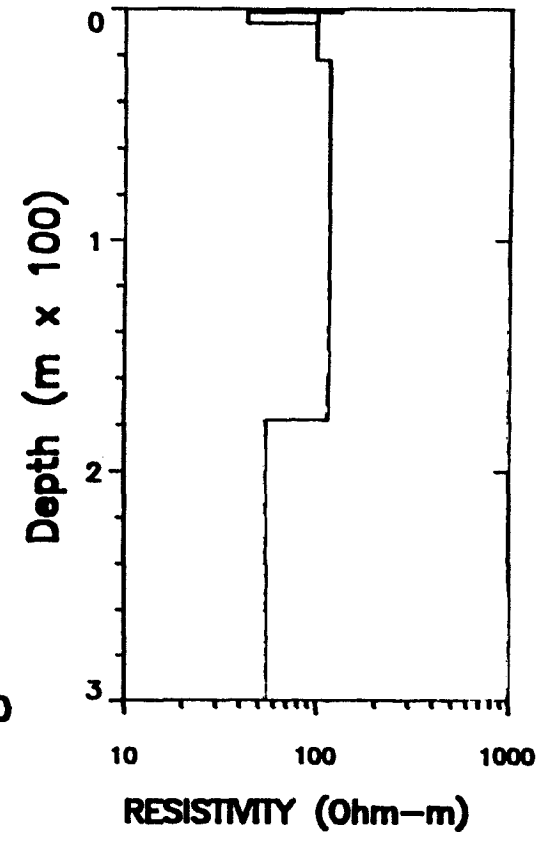
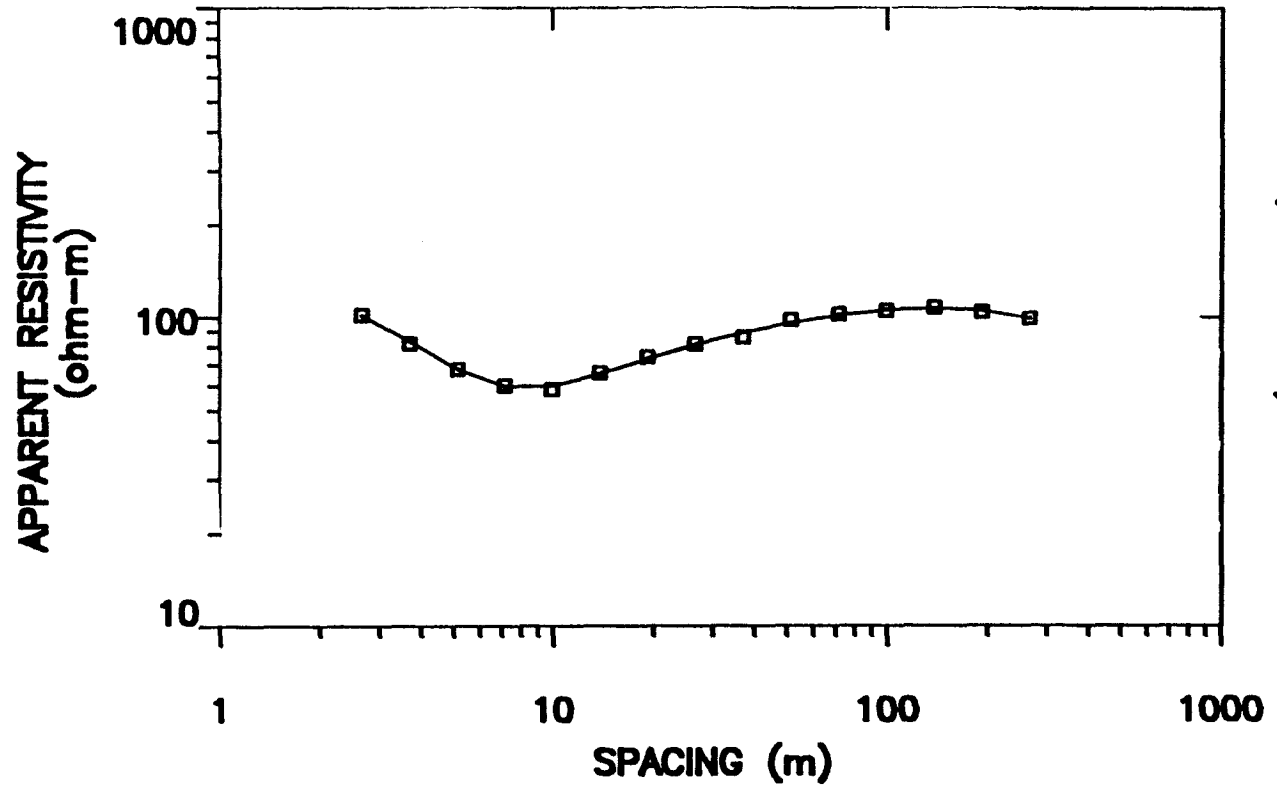
Departamento de Geofísica

Estudio Bullay - Amocia S.E.V. 9

Fecha 28-01-91 Rumbo AB E-W PERFIL IV

Interpretación	Observaciones:
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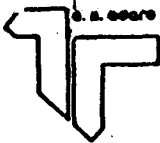




for: ITGE		SEGURA
by: ADARO		
Data Set: 9V	Date: 91	BULLAS (MU)
Equipment: ADARO	Sounding: 9V	
		Azimuth: E-W

"F" INDICATES FIXED PARAMETER

F 1	0.46									
F 2	0.06	0.45								
F 3	-0.03	0.15	0.09							
F 4	-0.02	0.03	0.14	0.69						
F 5	0.00	-0.01	0.00	0.04	0.78					
T 1	-0.45	-0.05	0.04	0.03	-0.01	0.43				
T 2	-0.01	0.42	0.15	0.04	-0.02	0.02	0.40			
T 3	0.00	0.00	-0.01	-0.08	-0.03	0.00	0.00	0.01		
T 4	-0.01	0.04	-0.01	-0.27	-0.17	0.02	0.05	0.05	0.29	
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4	



Proyecto:
 Zona: *Bullas - Murcía*
 Observador: *Alfredo Carrasco Martínez*
 Situación:

COORDENADAS
 X *607.690*
 Y *4206.460*
 Z *780m*

m V:
m A:

Rumbo AB

E-W

S.E.V.

10

Perfil:

IV

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
SIMETRICO
MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m	
1	2.68	<i>1</i>	<i>178</i>	<i>1V</i>	<i>375</i>	<i>46</i>							21.78				
2	3.73		<i>260</i>	<i>"</i>	<i>340</i>	<i>56</i>							42.92				
3	5.18		<i>255</i>	<i>300mv</i>	<i>215</i>	<i>70</i>							83.51				
4	7.2		<i>130</i>	<i>100mv</i>	<i>59</i>	<i>73</i>							182.1				
5	10		<i>157</i>	<i>"</i>	<i>32</i>	<i>64</i>							313.4				
6	13.9		<i>190</i>	<i>30mv</i>	<i>14.25</i>	<i>45</i>							606.2				
7	19.3		<i>340</i>	<i>30mv</i>	<i>11.5</i>	<i>39.5</i>	<i>10</i>	<i>345</i>	<i>300mv</i>	<i>140</i>	<i>44</i>		1.169	109.2			
8	26.8		<i>295</i>	<i>10mv</i>	<i>4.6</i>	<i>35</i>		<i>295</i>	<i>100mv</i>	<i>52</i>	<i>38</i>		2.256	217.8			
9	37.3		<i>270</i>	<i>3mv</i>	<i>2.15</i>	<i>35</i>		<i>270</i>	<i>30mv</i>	<i>24</i>	<i>38</i>		4.370	429.2			
10	51.8	<i>10</i>	<i>250</i>	<i>30mv</i>	<i>13.5</i>	<i>45</i>							8.429	836.1			
11	72		<i>320</i>	<i>"</i>	<i>10</i>	<i>51</i>							16.290	1.621			
12	100		<i>420</i>	<i>10mv</i>	<i>7.7</i>	<i>57</i>							31.420	3.134			
13	139		<i>390</i>	<i>"</i>	<i>4.3</i>	<i>67</i>							60.700	6.062	1.175		
14	193		<i>390</i>	<i>3mv</i>	<i>2.4</i>	<i>72</i>								11.690	2.301		
15	268		<i>270</i>	<i>"</i>	<i>1</i>	<i>83</i>								22.560	4.474		
16	373													43.700	8.702	4.292	
17	518													84.290	16.820	8.351	
18	720													162.900	32.530	16.210	
19	1.000														62.790	31.340	
20	1.390														121.400	60.620	
21	1.930														234.000	116.900	
22	2.680														451.200	225.800	
23	3.730															437.000	
24	5.180															842.880	
25	7.200															1.628.620	
26	10.000															3.141.510	

OBSERVACIONES:

FECHA:

28-01-91

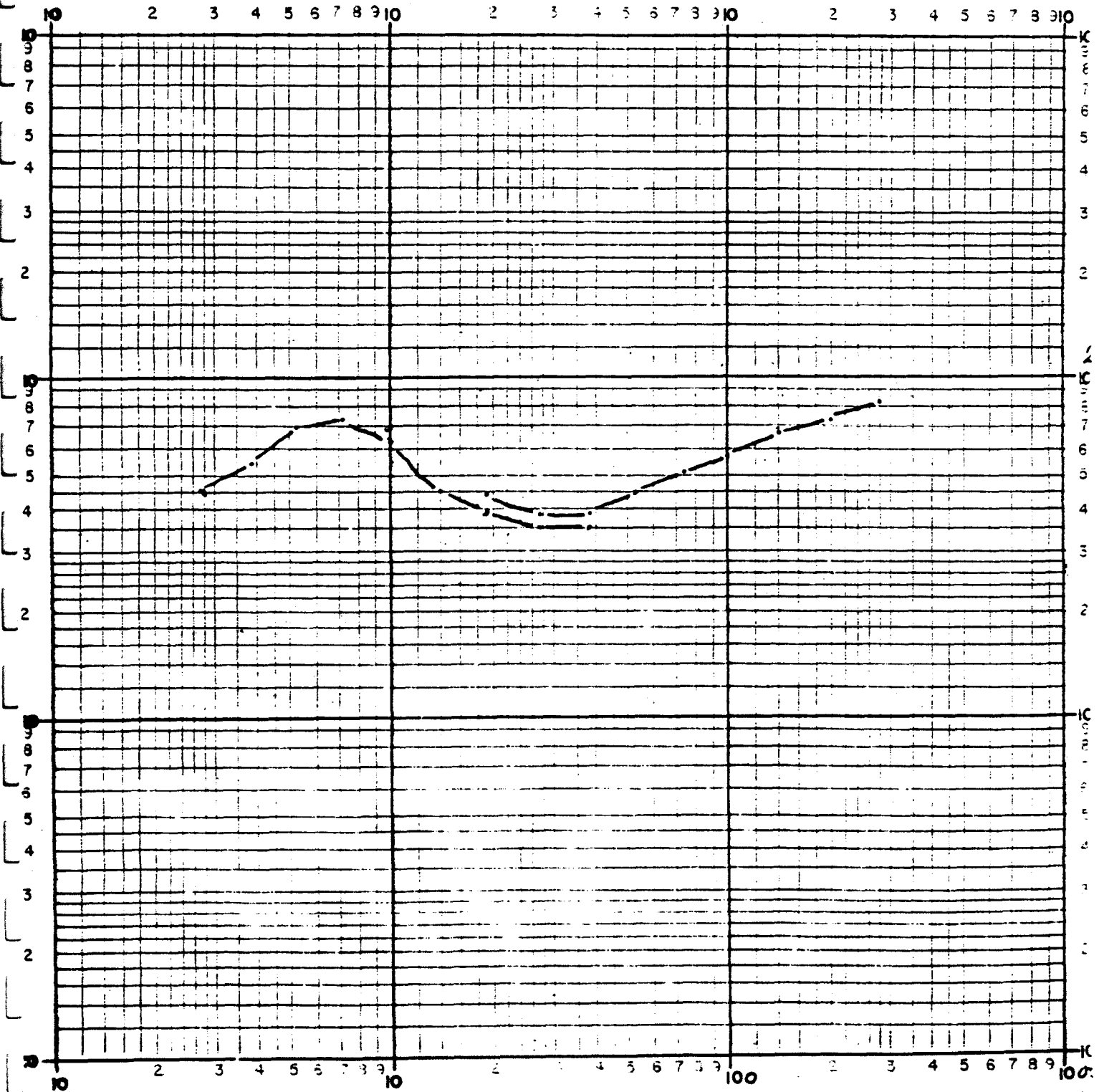


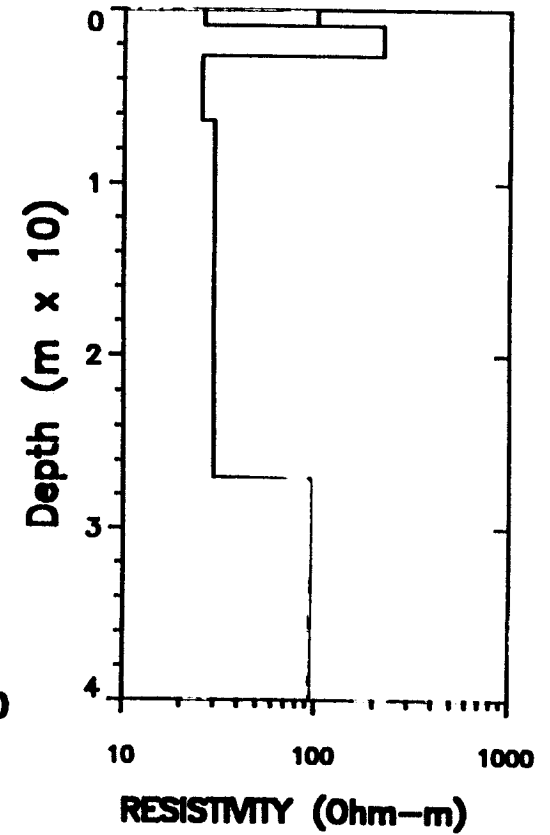
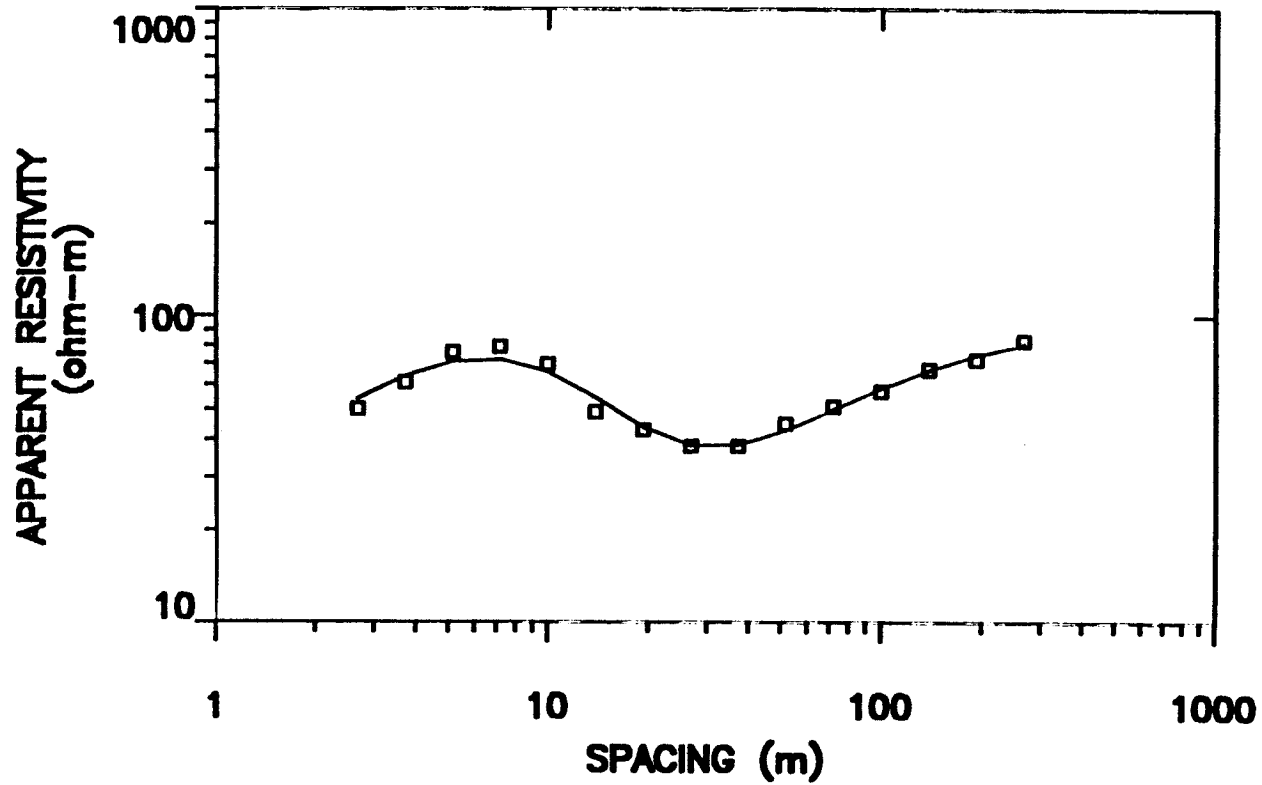
Departamento de Geofísica

Estudio Bullay - Murcia S.E.V. 10

Fecha 28-01-91 Rumbo AB E-W PERFIL IV

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 10V	Date: 91	
Equipment: ADARO	Sounding: 10V	Azimuth: E-W

DATA SET: 11IV

CLIENT: ITGE DATE: 91
 LOCATION: BULLAS SOUNDING: 11V
 COUNTY: (MU) AZIMUTH: E-W
 PROJECT: SEGURA EQUIPMENT: ADARO
 ELEVATION: 780.00
 SOUNDING COORDINATES: X: 608755.0000 Y: 4206650.0000

Schlumberger Configuration

FITTING ERROR: 1.386 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				780.0	
1	256.4		0.831	779.1	0.00324
2	581.8		1.64	777.5	0.00283
3	213.3		31.63	745.8	0.148
4	114.8		41.49	704.3	0.361
5	378.3				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	369.0	369.0	-0.0252
2	3.73	380.0	380.3	-0.0794
3	5.18	367.0	364.8	0.596
4	7.20	324.0	326.6	-0.817
5	10.00	299.0	282.4	2.26
6	13.90	244.0	248.1	-1.69
7	19.30	223.0	227.8	-2.18
8	26.80	216.0	215.8	0.0599
9	37.30	215.0	205.4	4.42
10	51.80	189.0	193.7	-2.49
11	72.00	181.0	182.5	-0.849
12	100.0	183.0	179.6	1.82
13	139.0	188.0	192.0	-2.13
14	193.0	222.0	218.1	1.75
15	268.0	249.0	250.4	-0.592

PARAMETER RESOLUTION MATRIX:

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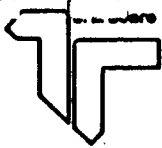
ADARO

*

"F" INDICATES FIXED PARAMETER

P 1	0.67								
P 2	0.10	0.77							
P 3	0.01	-0.01	1.00						
P 4	0.00	0.00	0.00	0.76					
P 5	-0.01	0.01	0.01	0.00	0.87				
T 1	-0.39	-0.07	0.01	0.00	-0.01	0.34			
T 2	-0.06	0.33	0.02	0.01	-0.02	0.22	0.48		
T 3	-0.02	0.02	0.01	0.18	-0.06	-0.02	-0.04	0.79	
T 4	0.00	0.00	0.00	-0.36	-0.13	0.00	0.01	0.21	0.34
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4

* ADARO *



Proyecto:
 Zona: Bullas - Murcia
 Observador: Alfredo Carrasco Martínez
 Situación:

COORDENADAS
 X 608.755
 Y 4206.650
 Z 780 m

m V:
 m A:

RUMBO AL
E - W

S.E.V.

11

Perfil: IV

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN					
													1 m	10 m	50 m	100 m		
1	2.68	1	94.5	3V	1600	369												
2	3.73		88	1V	780	380												
3	5.18		86	"	378	367												
4	7.2		110	800mv	220	324												
5	10		90	100mv	83	289												
6	13.9		84.5	"	34	244												
7	19.3		78	30mv	14.9	223	10	78	300mv	170	239							
8	26.8		115	"	M	216		115	"	115	218							
9	37.3		150	10mv	7.4	215		150	100mv	76	217							
10	51.8	10	168	100mv	3.8	189												
11	72		313	"	35	181												
12	100		420 ¹²⁰	30mv	24.5	183												
13	139		255	10mv	7.9	188 ¹⁷⁹												
14	193		290	"	5.5	222												
15	268		480		5.3	249												
16	373																	
17	518																	
18	720																	
19	1.000																	
20	1.390																	
21	1.930																	
22	2.680																	
23	3.730																	
24	5.180																	
25	7.200																	
26	10.000																	

OBSERVACIONES:

FECHA:

28-11-91

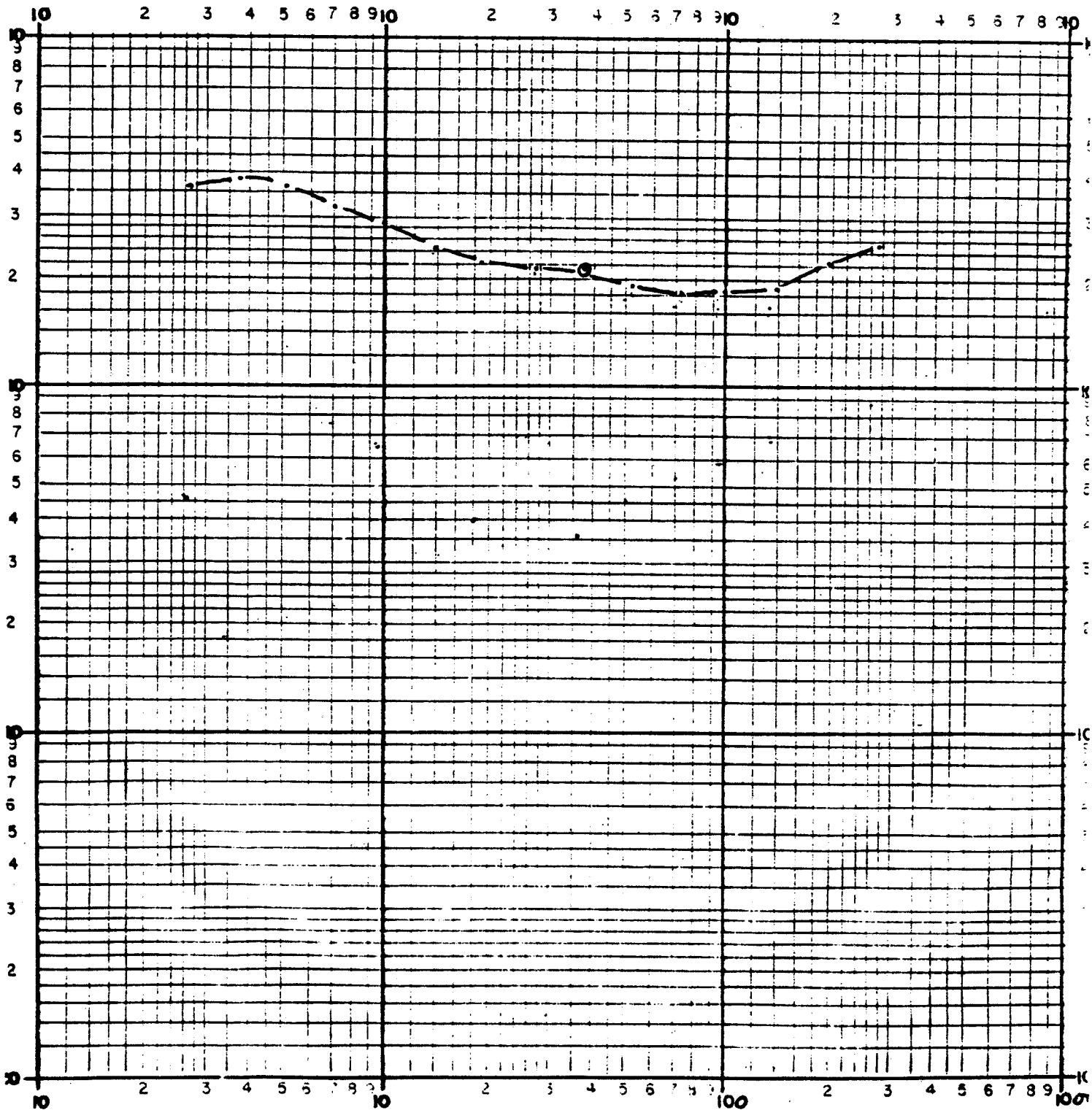


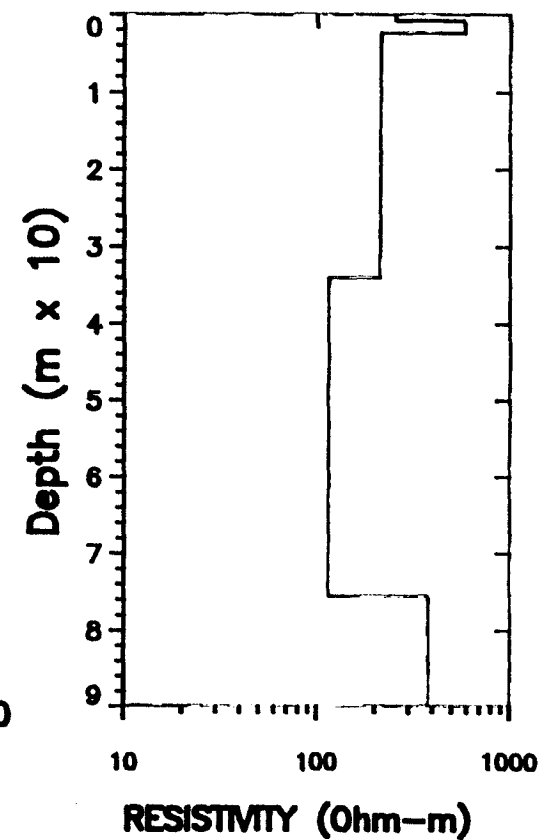
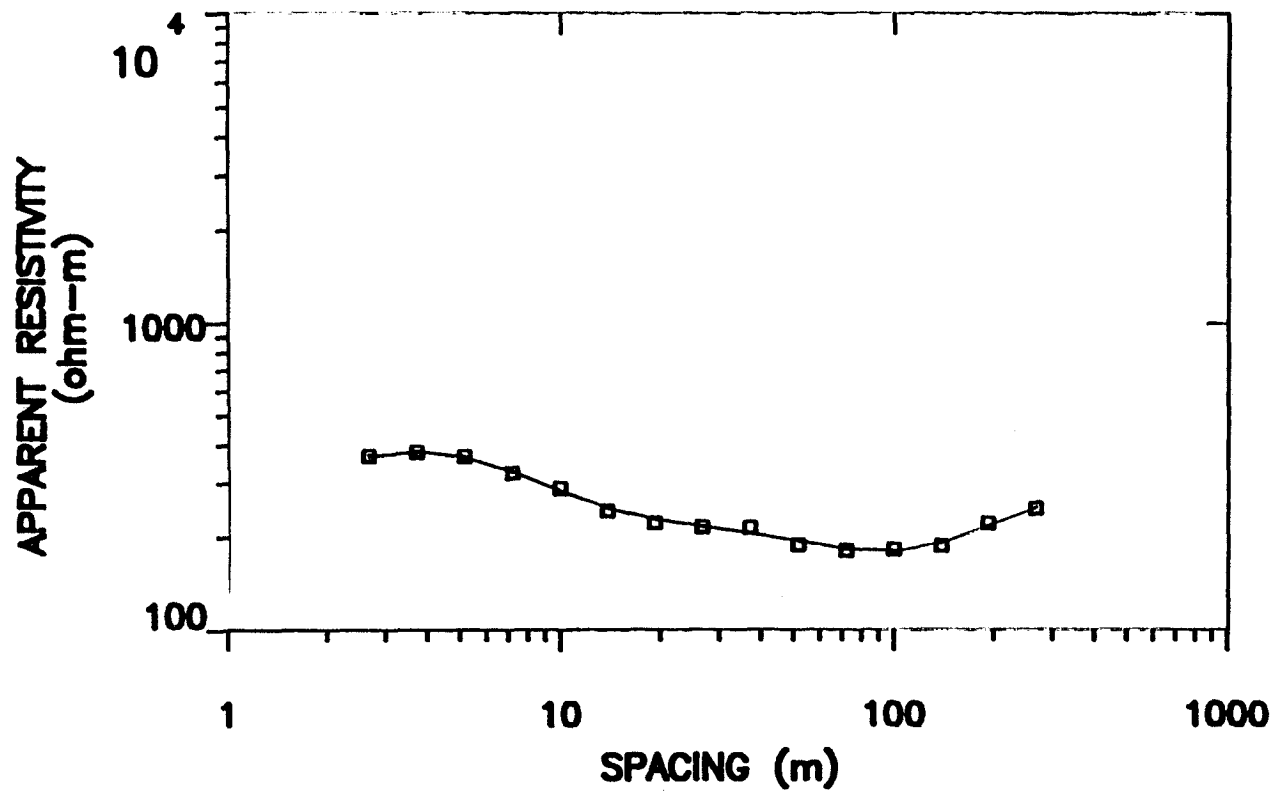
Departamento de Geofísica

Estudio Ballal - Murcia S.E.V. 11

Fecha 28-01-91 Rumbo AB E-W PERFIL IV

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		
Data Set: 11V	Date: 91	BULLAS (MU)
Equipment: ADARO	Sounding: 1V	
		Azimuth: E-W

DATA SET: 12IV

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 820.00
 SOUNDING COORDINATES: X: 609680.0000 Y: 4207050.0000

DATE: 91
 SOUNDING: 12IV
 AZIMUTH: N-30-E
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 4.302 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
1	483.9		2.34	820.0	
2	121.3		3.59	817.6	0.00485
3	227.6		32.27	814.0	0.0296
4	90.22		62.48	781.7	0.141
5	949.2			719.2	0.692

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	412.0	420.7	-2.12
2	3.73	364.0	362.6	0.374
3	5.18	300.0	288.8	3.72
4	7.20	216.0	223.8	-3.65
5	10.00	186.0	190.2	-2.30
6	13.90	189.0	185.8	1.69
7	19.30	208.0	193.4	7.00
8	26.80	179.5	200.3	-11.62
9	37.30	205.0	201.2	1.84
10	51.80	203.0	193.5	4.63
11	72.00	174.0	178.7	-2.73
12	100.0	166.0	165.3	0.381
13	139.0	166.0	167.5	-0.933
14	193.0	196.0	194.6	0.695
15	268.0	261.0	244.7	6.22

PARAMETER RESOLUTION MATRIX:

* ADARO *

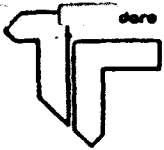
"F" INDICATES FIXED PARAMETER

P 1	0.99								
P 2	-0.02	0.84							
P 3	0.00	0.00	0.98						
P 4	0.00	0.01	-0.01	0.70					
P 5	0.00	-0.01	0.01	0.04	0.07				
T 1	0.02	0.08	0.00	-0.01	0.00	0.95			
T 2	-0.02	-0.29	-0.06	0.01	0.01	0.12	0.31		
T 3	0.00	0.02	0.06	0.21	-0.08	0.00	0.16	0.73	
T 4	0.00	0.01	-0.02	-0.36	-0.15	-0.01	0.00	0.24	0.51
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4

*

ADARO

*



Proyecto:
 Zona: Bullas - Murcia
 Observador: Juan Miguel Martínez Peña
 Situación:

COORDENADA

X 609.680
 Y 4207.050
 Z 820

mV:

mA:

S.E.V.

12

íbo A

N.-30°-E

Perfil:

IV

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
SIMETRICO
MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m
1	2.68	1	132	3V	2500	412							21.78			
2	3.73		118	"	1000	364							42.92			
3	5.18		103	1V	330	300							83.51			
4	7.2		96	300mV	128	216							182.1			
5	10		135	100mV	80	186							313.4			
6	13.9		160	"	50	189							608.2			
7	19.3		180	"	32	208	10	180	1mV	350	212		1.189	109.2		
8	26.8		330	30mV	26.5	179.5		300	"	325	214	330 - 32.5 = 214	2.256	217.8		
9	37.3		215	"	10.1	205		245	300mV	107	214	215 - 107 = 214	4.370	429.2		
10	51.8	10	272		66	203							8.429	836.1		
11	72		182		19.5	174							16.290	1.821		
12	100		320		17	166							31.420	3.134		
13	139		357		9.8	166							60.700	6.062	1.175	
14	193		250		4.2	196								11.690	2.301	
15	268		190		2.2	261								22.560	4.474	
16	373													43.700	8.702	4.292
17	518													84.290	16.820	8.351
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.380														121.400	60.520
21	1.930														234.000	116.900
22	2.680														451.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA:

24-01-91



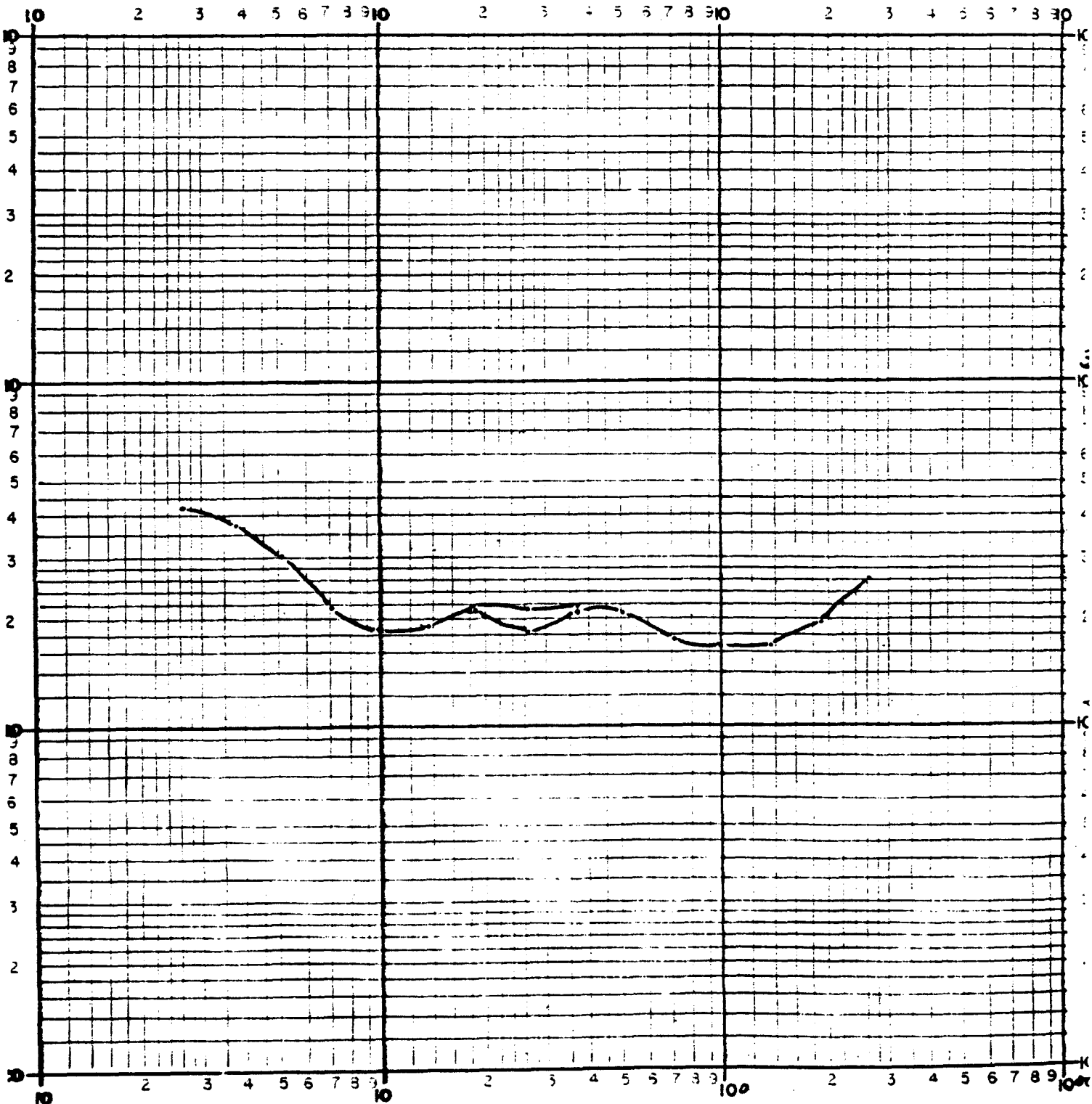
Departamento de Geofísica

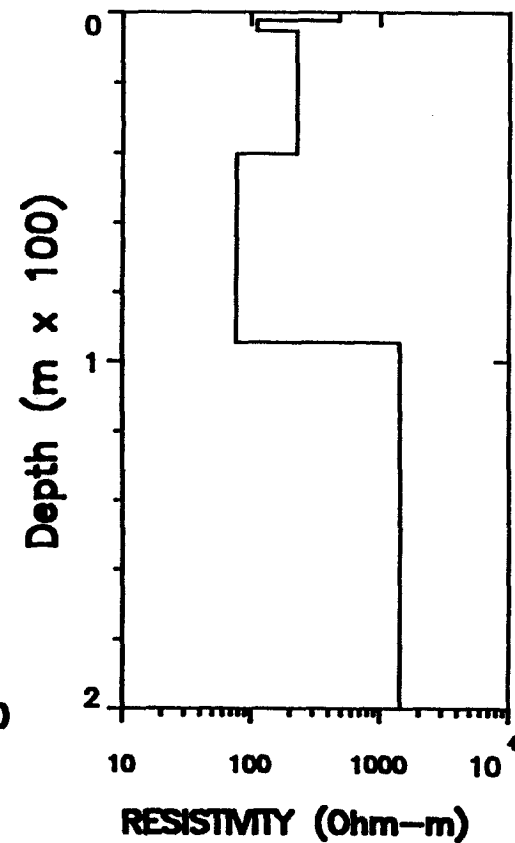
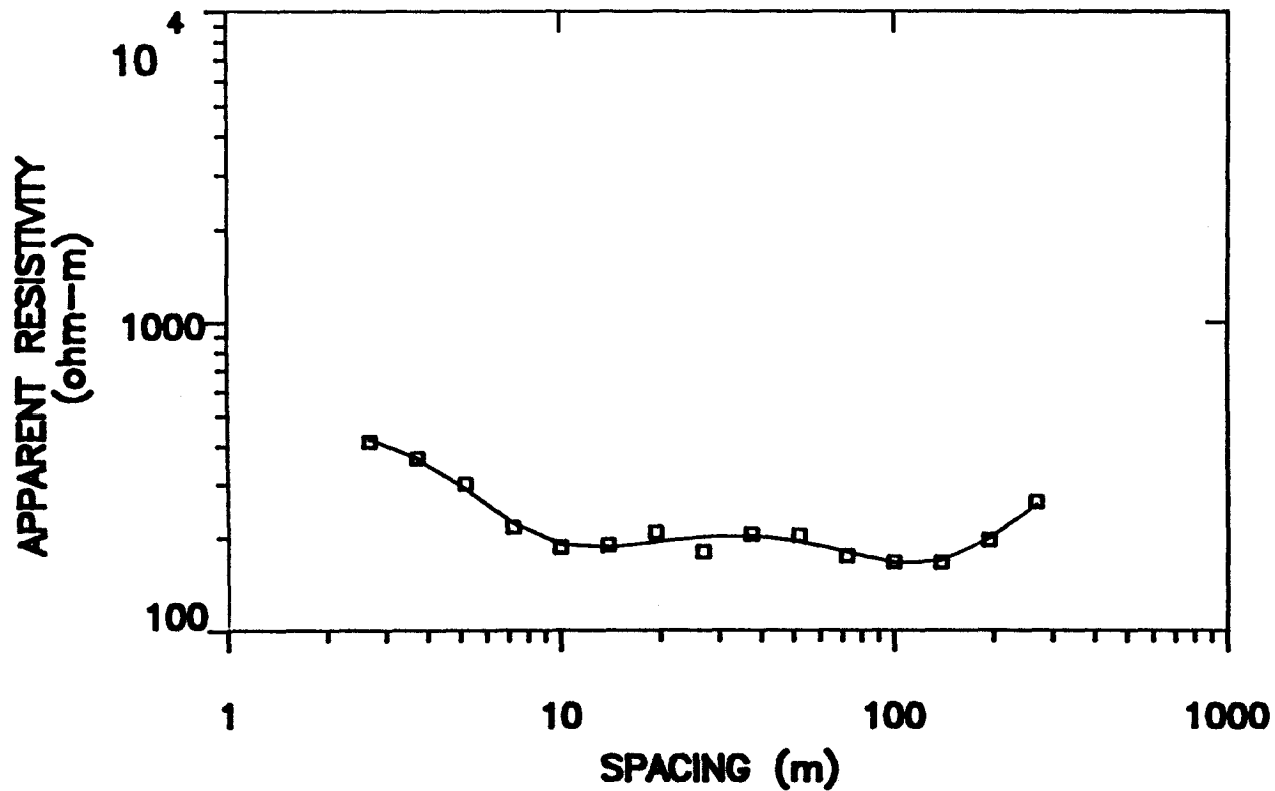
Estudio Bullas - Murcia S.E.V. 12

Fecha 24-01-91 Rumbo AB N. 30° E PERFIL IV

Interpretación

Observaciones:





for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 12V	Date: 91	Azimuth: N-30-E
Equipment: ADARO	Sounding: 12V	

DATA SET: 13IV

CLIENT: ITGE	DATE: 91
LOCATION: BULLAS	SOUNDING: 13IV
COUNTY: (MU)	AZIMUTH: N-140-E
PROJECT: SEGURA	EQUIPMENT: ADARO
ELEVATION: 790.00	
SOUNDING COORDINATES: X: 610445.0000 Y: 4207100.0000	

Schlumberger Configuration

FITTING ERROR: 7.727 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				790.0	
1	71.56		1.97	788.0	0.0276
2	1806.6		5.54	782.4	0.00307
3	655.3		25.95	756.5	0.0303
4	32.73		23.72	732.7	0.724
5	2131.9				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	FA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	103.0	100.9	1.99
2	3.73	124.0	128.9	-3.97
3	5.18	164.0	170.6	-4.07
4	7.20	228.0	226.6	0.603
5	10.00	305.0	295.9	2.95
6	13.90	411.0	377.4	8.16
7	19.30	485.0	465.1	4.09
8	26.80	510.0	547.1	-7.29
9	37.30	546.0	603.7	-10.56
10	51.80	577.0	609.2	-5.59
11	72.00	615.0	546.8	11.07
12	100.0	479.0	429.8	10.26
13	139.0	270.0	315.7	-16.96
14	193.0	280.0	270.5	3.38
15	268.0	313.0	307.1	1.86

PARAMETER RESOLUTION MATRIX:

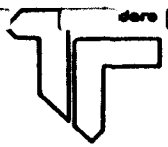
*

ADARO

*

"F" INDICATES FIXED PARAMETER

P 1	0.99									
P 2	-0.03	0.69								
P 3	0.02	0.10	0.78							
P 4	0.00	0.01	-0.02	0.50						
P 5	0.00	-0.04	0.07	0.04	0.16					
T 1	-0.02	-0.06	0.03	0.00	-0.01	0.97				
T 2	0.01	0.23	0.22	0.00	-0.01	0.02	0.17			
T 3	-0.01	-0.10	0.09	0.04	-0.08	-0.01	0.04	0.93		
T 4	0.00	0.00	-0.02	-0.49	-0.08	0.00	0.01	0.03	0.50	
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4	



Proyecto:
 Zona: Bullas - Murcia
 Observador:
 Situación:

COORDENADAS
 x 610.445
 y 4207.100
 z 790 m.

m:
 mA:
 S.E.V.
 13

Perfil:
 N-140 E.
 IV

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN					
													1 m	10 m	50 m	100 m		
1	268	1	198	1V	985	103												
2	373		200	"	580	124												
3	618		280	"	590	164												
4	72		213	"	300	228												
5	10		180	300 mV	175	305												
6	139		330	"	224	411												
7	193		275	"	114	485	10	275	3V	1250	496							
8	268		165	100 mV	37.3	510		165	1V	400	528							
9	373		520	"	40	546		320	"	425	570							
10	618	10	282	300 mV	195	577												
11	72		290	"	110	615												
12	100		288	100 mV	44	479												
13	139		220	30 mV	9.8	270												
14	193		330	10 mV	7.9	280												
16	268		310	"	4.3	313												
18	373																	
17	618																	
18	720																	
19	1.000																	
20	1.390																	
21	1.930																	
22	2.680																	
23	3.730																	
24	6.180																	
25	7.200																	
26	10.000																	

OBSERVACIONES:

FECHA:

28-01-91



Departamento de Geofísica

Estudio *Bullay - Inuvia*

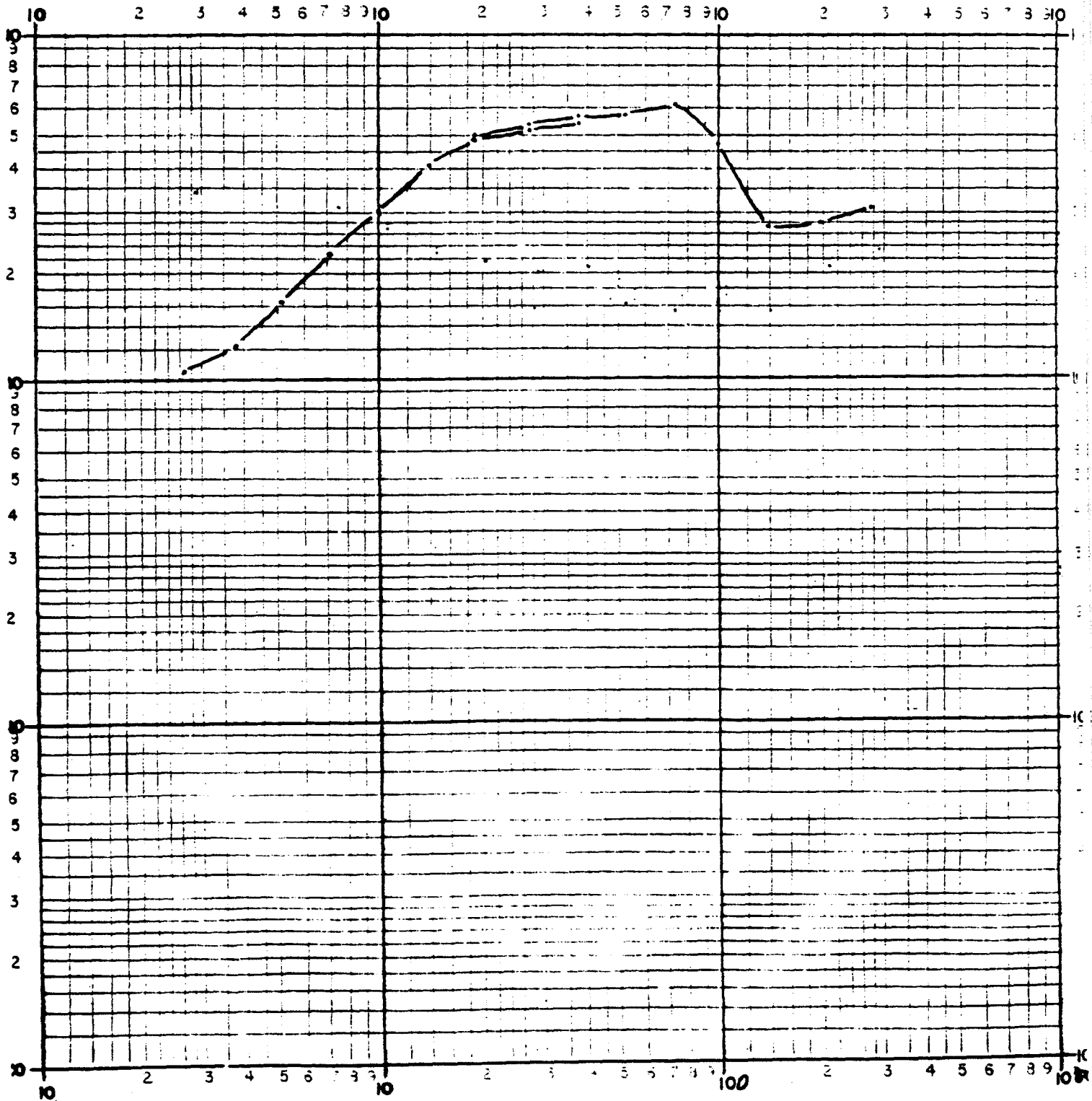
S.E.V. *13*

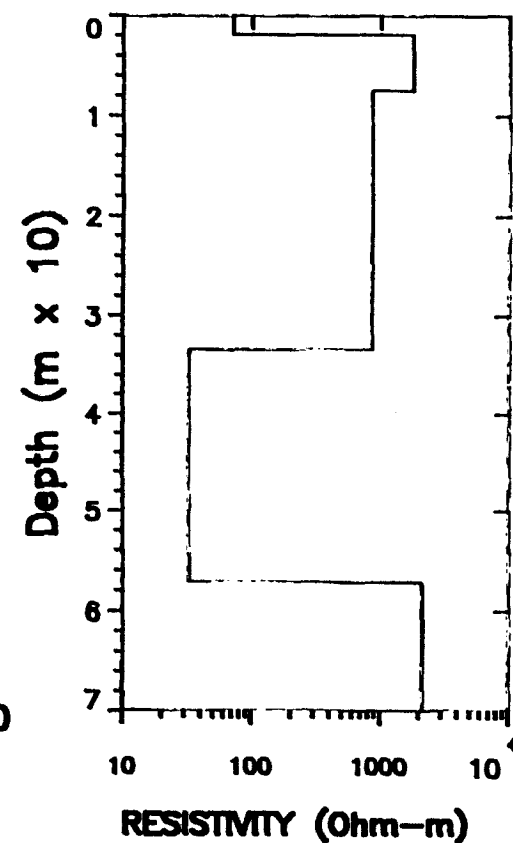
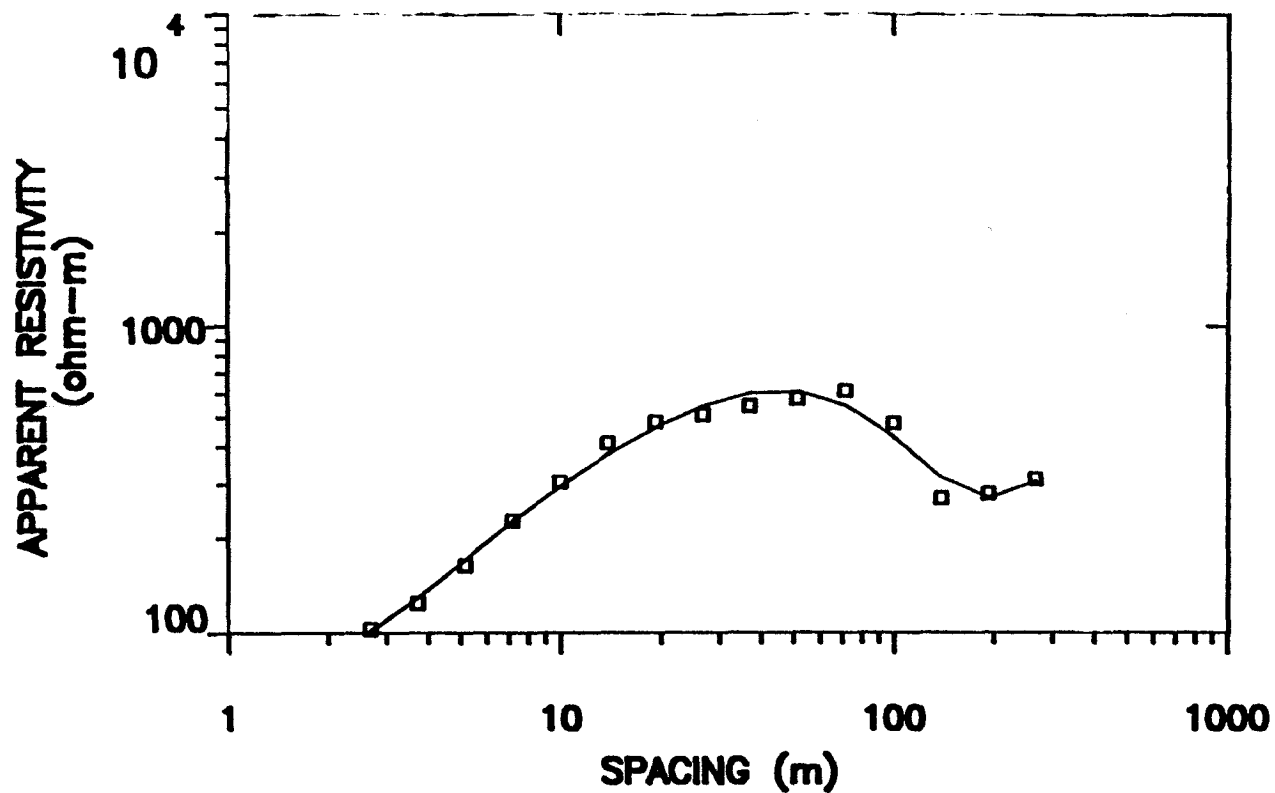
Fecha *28-01-71* Rumbo AB *E-W*

PERFIL *IV*

Interpretación

Observaciones:





for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 13V	Date: 91	
Equipment: ADARO	Sounding: 13V	Azimuth: N-140-E

DATA SET: 14IV

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 675.00
 SOUNDING COORDINATES: X: 611725.0000 Y: 4207250.0000

DATE: 91
 SOUNDING: 14IV
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 4.990 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
1	219.8		9.14	675.0	
2	216.9		14.79	665.8	0.0416
3	154.3		34.33	651.0	0.0682
4	320.6		24.89	616.7	0.222
5	105.8		170.5	591.8	0.0776
6	639.7			421.2	1.61

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	214.3	219.8	-2.56
2	3.73	221.2	219.8	0.670
3	5.18	219.5	219.7	-0.0695
4	7.20	210.8	219.4	-4.07
5	10.00	213.4	218.9	-2.56
6	13.90	224.7	217.8	3.09
7	19.30	238.6	215.3	9.77
8	26.80	213.0	210.6	1.11
9	37.30	197.0	203.1	-3.13
10	51.80	187.5	193.9	-3.45
11	72.00	174.5	185.8	-6.49
12	100.0	187.0	180.5	3.46
13	139.0	189.0	175.5	7.14
14	193.0	169.0	168.4	0.332
15	266.0	150.0	164.2	-9.50
16	373.0	182.0	173.5	4.62

*

ADARO

*

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

P 1	0.96																			
P 2	0.04	0.70																		
P 3	-0.01	0.18	0.58																	
P 4	0.00	-0.03	0.19	0.17																
P 5	0.00	-0.03	0.06	0.18	0.59															
P 6	0.00	0.00	-0.01	0.00	0.08	0.02														
T 1	0.00	0.08	0.04	0.00	0.00	0.00	0.01													
T 2	0.00	0.09	0.07	0.01	0.01	0.00	0.01	0.02												
T 3	0.00	-0.02	-0.09	0.00	0.03	0.00	0.00	-0.01	0.03											
T 4	0.00	-0.02	0.11	0.12	0.12	0.00	0.00	0.01	0.00	0.08										
T 5	0.00	0.00	0.03	-0.01	-0.30	-0.06	0.00	0.00	-0.01	0.00										
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4										

SECOND PART OF RESOLUTION MATRIX:

T 5	0.21																			
	T 5																			



Proyecto:
 Zona: Bullas - Murcia
 Observador:
 Situación:

COORDENADAS
 X 611725
 Y 4207250
 Z 675

mV.
 mA:
 S.E.V.
14

So A
E.-W.
 Perfil:
IV

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AM/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m	
1	2.68	1	150	3V	1700	247							21.78				
2	3.73		148	1V	880	255							42.92				
3	5.18		155	"	470	253							83.51				
4	7.2		140	300mv	210	243							162.1				
5	10		148	"	116	246							313.4				
6	13.9		150	100mv	64	259							606.2				
7	19.3		151	"	35.5	275	10	152	1V	325	233		1.169	109.2			
8	26.8		137	30mv	15.3	252		138	300mv	135	213		2.256	217.8			
9	37.3		150	10mv	7.8	227		148	100mv	68	197		4.370	429.2			
10	51.2	10	148	30mv	26.5	187.5							8.429	836.1			
11	72		130	"	14	174.5							16.290	1.621			
12	100		230	"	13.7	187							31.420	3.134			
13	139		480	"	15	189							60.700	6.062	1.175		
14	193		270	10mv	3.9	169						<i>Cauce de un Arroyo</i>	11.690	2.301			
15	268		510	"	3.4	150							22.560	4.474			
16	373		770	"	3.2	182							43.700	8.702	4.292		
17	518												84.290	16.820	8.351		
18	720												162.900	32.530	16.210		
19	1.000													62.790	31.340		
20	1.390														121.400	60.620	
21	1.930															234.000	116.900
22	2.690															451.200	226.600
23	3.730																437.000
24	5.180																842.880
25	7.200																1.628.520
26	10.000																3.141.510

OBSERVACIONES:

FECHA: 24-7-91

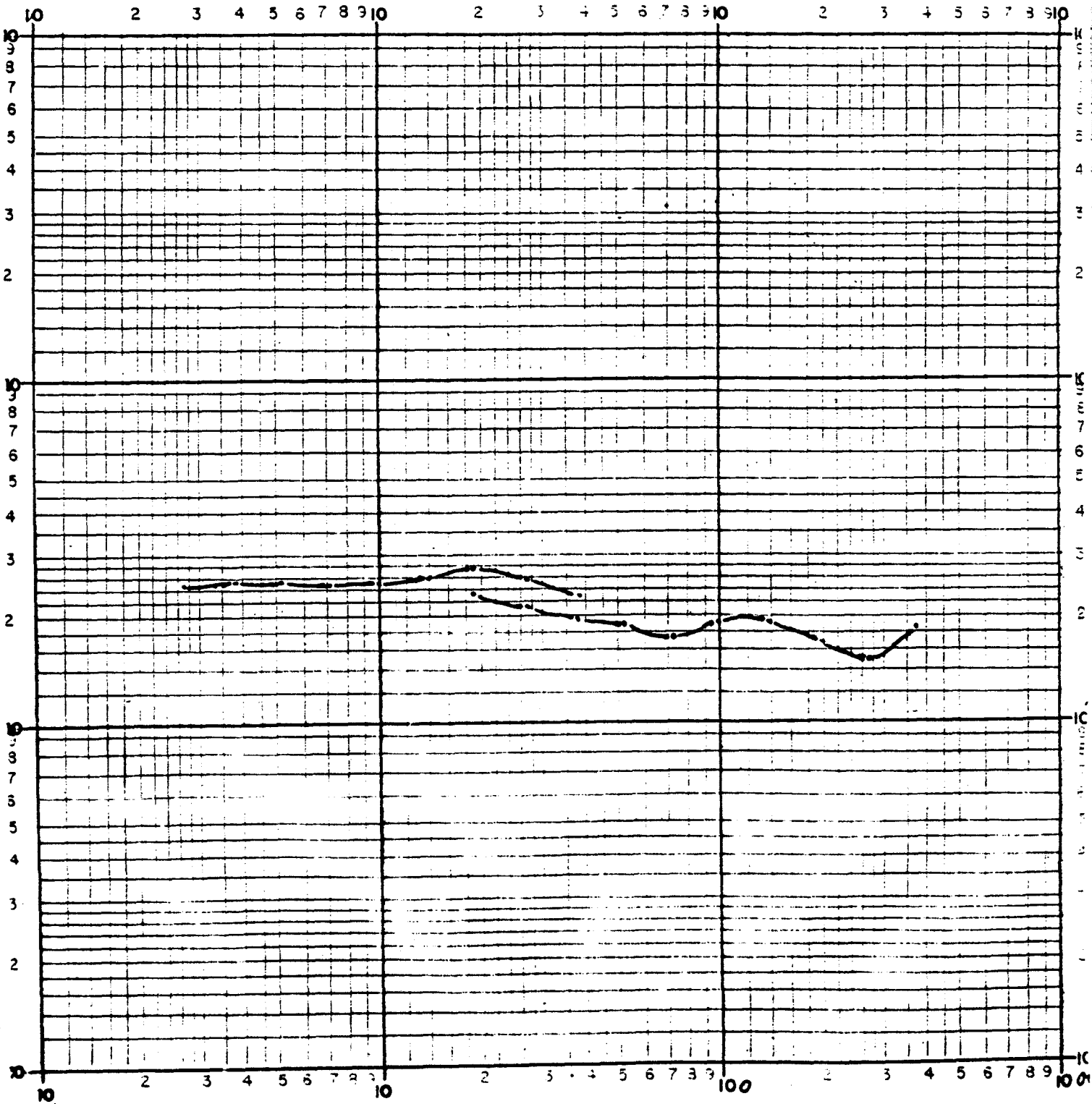


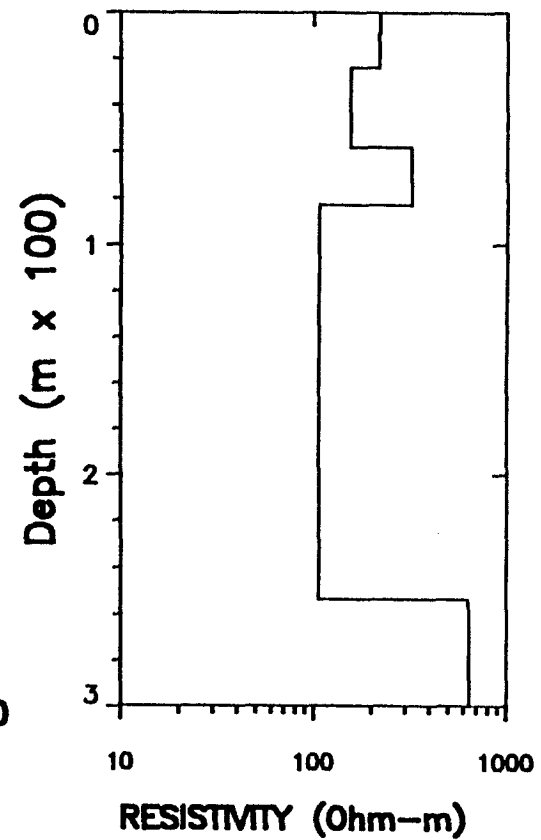
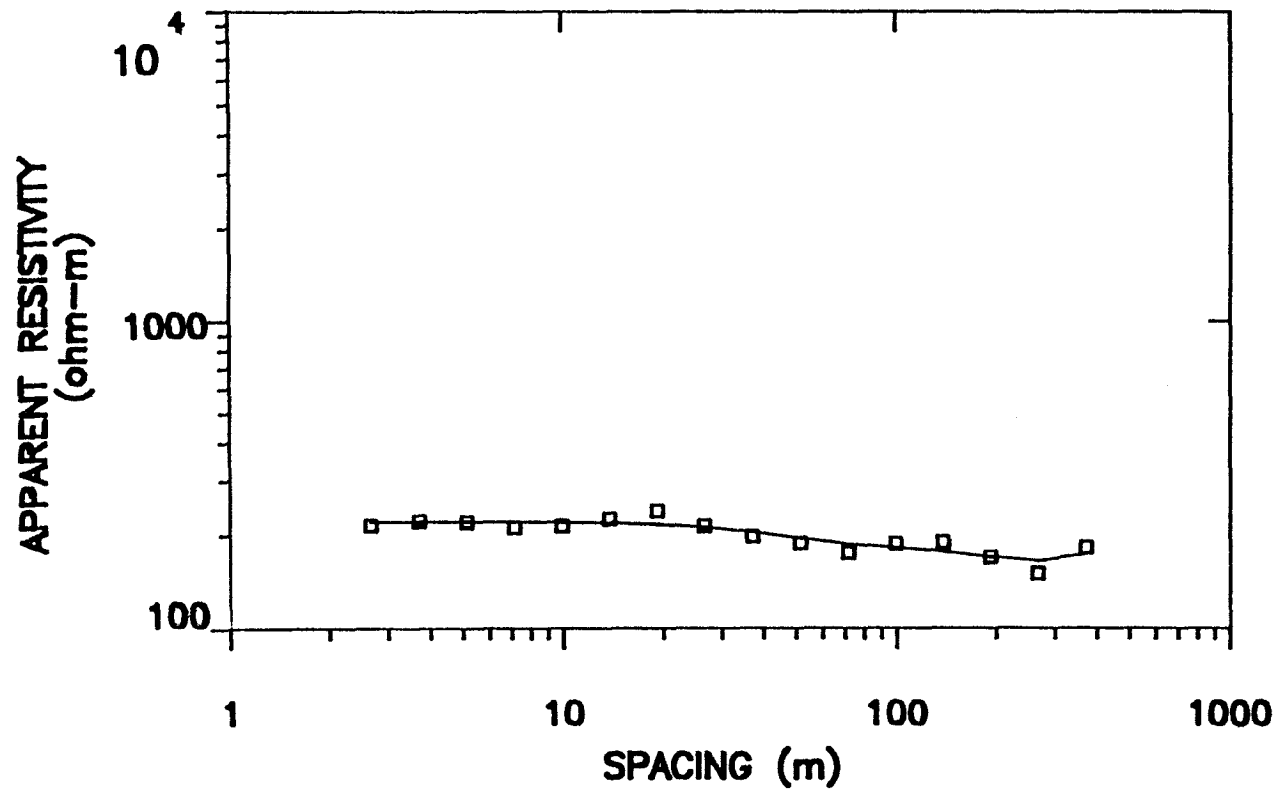
Departamento de Geofísica

Estudio Bullas - Murcia S.E.V. 14

Fecha 24-01-91 Rumbo AB E-W PERFIL IV

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 14V	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 14V	

DATA SET: 15V

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 700.00
 SOUNDING COORDINATES: X: 612995.0000 Y: 4208600.0000

DATE: 91
 SOUNDING: 15V
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 5.265 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				700.0	
1	51.06		1.17	698.8	0.0229
2	286.6		3.62	695.2	0.0126
3	65.33		11.14	684.0	0.170
4	82.17		13.36	670.7	0.162
5	240.5		30.12	640.5	0.125
6	64.29		55.08	585.4	0.656
7	1057.9				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	DATA	FA (ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	88.00	88.08	-0.0909
2	3.73	104.0	107.3	-3.20
3	5.18	129.0	126.2	2.11
4	7.20	145.0	140.1	3.32
5	10.00	141.0	143.8	-2.04
6	13.90	130.0	135.0	-3.87
7	19.30	126.0	117.8	6.45
8	26.80	101.0	102.2	-1.23
9	37.30	92.00	96.68	-5.09
10	51.80	98.00	102.1	-4.22
11	72.00	121.0	113.4	6.27
12	100.0	137.0	125.0	8.75
13	139.0	126.0	135.9	-7.89
14	193.0	142.0	151.6	-6.79
15	268.0	192.0	180.8	5.79

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ADARO

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PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

P 1	0.51									
P 2	0.08	0.51								
P 3	-0.03	0.15	0.47							
P 4	0.00	-0.03	0.24	0.24						
P 5	0.00	-0.02	0.06	0.16	0.30					
P 6	0.00	0.00	-0.01	0.02	0.15	0.40				
P 7	0.00	0.00	0.00	0.00	0.01	0.08	0.02			
T 1	-0.44	-0.10	0.06	0.00	-0.01	0.00	0.00	0.41		
T 2	-0.04	0.37	0.18	-0.03	-0.04	-0.01	0.00	0.04	0.33	
T 3	0.00	0.02	-0.15	-0.17	-0.11	-0.03	0.00	0.00	0.03	0.11
T 4	0.00	0.02	-0.10	-0.13	-0.10	-0.03	0.00	0.01	0.03	0.09
T 5	0.00	-0.01	0.01	0.07	0.16	0.04	-0.01	-0.01	-0.02	-0.04
T 6	0.00	0.00	0.01	0.00	-0.09	-0.36	-0.08	0.00	0.00	0.01
	P 1	P 2	P 3	P 4	P 5	P 6	P 7	T 1	T 2	T 3

SECOND PART OF RESOLUTION MATRIX:

T 4	0.08		
T 5	-0.04	0.10	
T 6	0.02	0.00	0.34
	T 4	T 5	T 6

*

ADARO

*

Proyecto:
 Zona: *Bullas Murcia*
 Observador: *Juan de Martínez*
 Situación:

ORDEN DAS
 X *612.495*
 Y *4208.600*
 Z *700 m.*

m V: *1000*
 mA: *650 N-328*

AB
E-W

S.E.V.
15

Perfil:
V

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m
1	2.68	1	92	1V	370	88						<i>lluvia</i>	21.78			
2	3.73		210	"	510	104							42.92			
3	5.18		235	"	362	129							83.51			
4	7.2		280	"	250	145							182.1			
5	10		260	300uV	117	141							313.4			
6	13.9		360	100uV	77	130							606.2			
7	19.3		270	"	29	126							1.169	109.2		
8	26.8		580	"	26	101							2.266	217.8		
9	37.3		530	30uV	11.2	92							4.370	429.2		
10	51.8		575	10uV	6.7	98	10	580	100uV	70	100		8.429	836.1		
11	72	10	630	100uV	47	121							16.290	1.621		
12	100		600	"	26.2	137							31.420	3.134		
13	139		360	10uV	7.5	126							60.700	6.062	1.175	
14	193		460	"	5.6	142								11.690	2.301	
15	268		300	"	2.55	192								22.560	4.474	
16	373													43.700	8.702	4.292
17	518													84.290	16.820	8.361
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.690														451.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA: *23-01-91*



Departamento de Geodesia

Estudio *Bullos - Murcia*

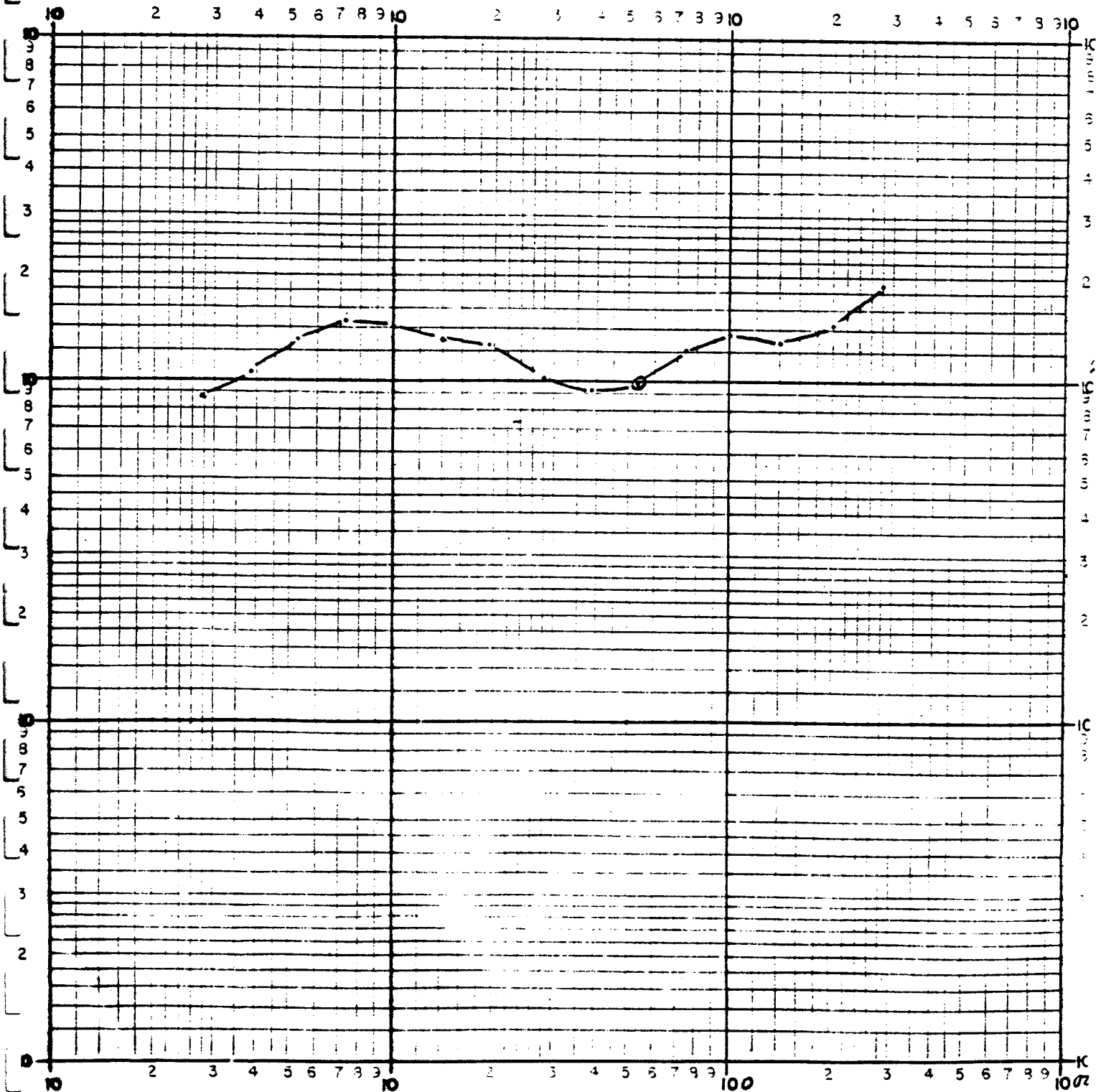
S.E.V. *15*

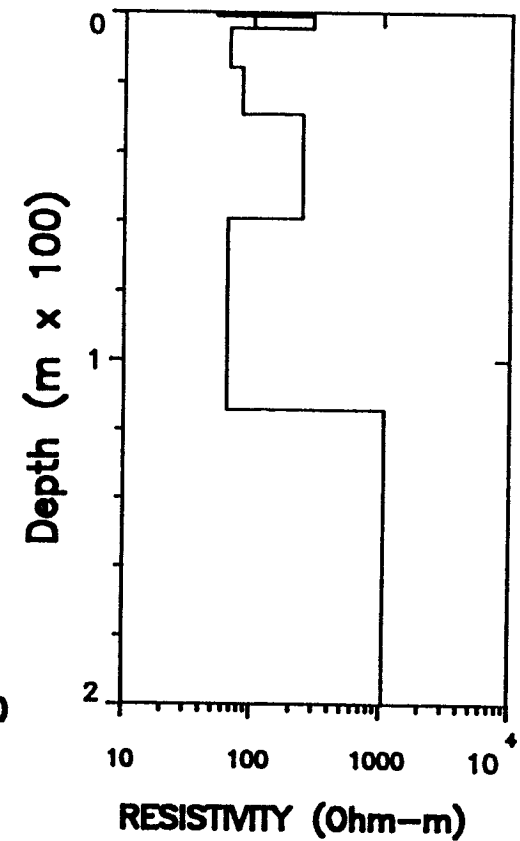
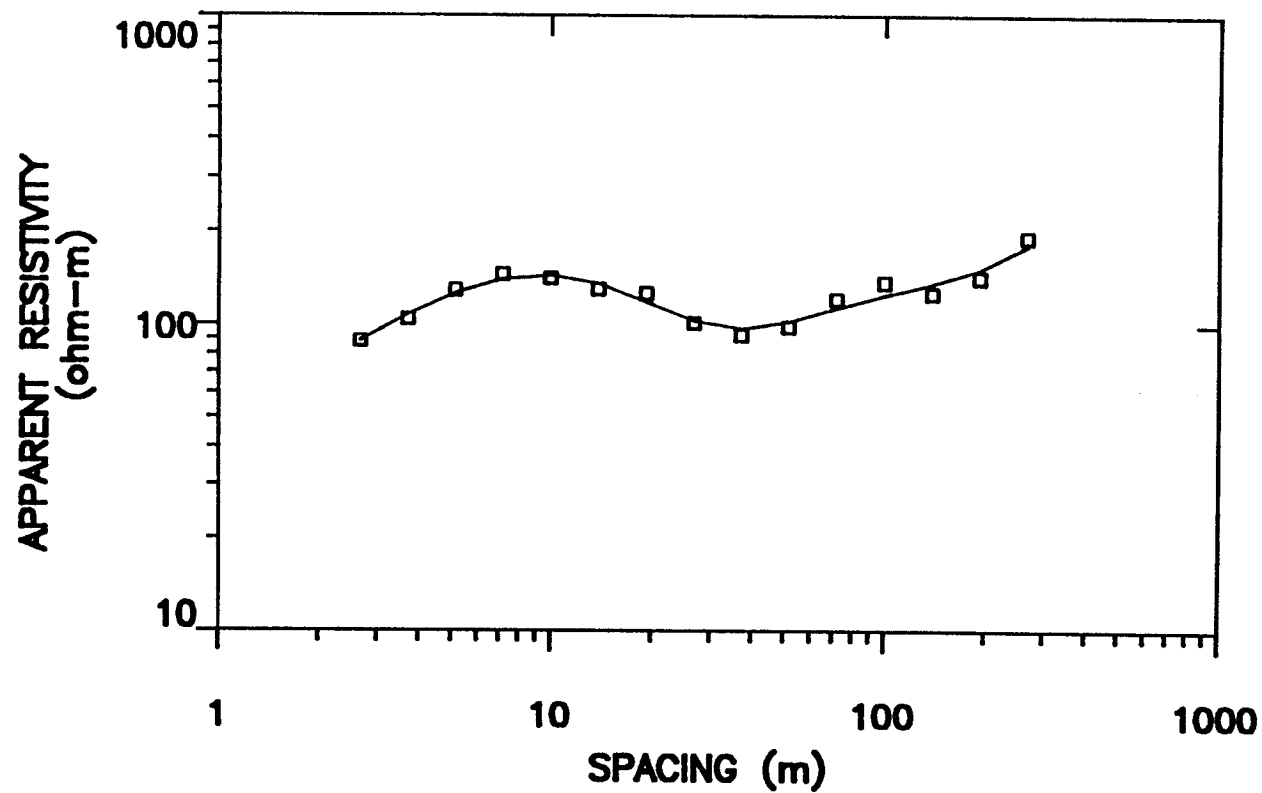
Fecha *23-01-91* Rumbo AB *E-W*

PERFIL *V*

Interpretación

Observaciones:





for: ITGE		SEGURA
by: ADARO		
Data Set: 15V	Date: 91	BULLAS (MU)
Equipment: ADARO	Sounding: 15V	
		Azimuth: E-W

DATA SET: 15V

CLIENT: ITGE DATE: 91
 LOCATION: BULLAS SOUNDING: 15V
 COUNTY: (MU) AZIMUTH: N-60-E
 PROJECT: SEGURA EQUIPMENT: ADARO
 ELEVATION: 700.00
 SOUNDING COORDINATES: X: 612750.0000 Y: 4207715.0000

Schlumberger Configuration

FITTING ERROR: 2.521 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				700.0	
1	88.90		1.97	698.0	0.0221
2	86.51		3.37	694.6	0.0390
3	389.6		10.09	684.5	0.0259
4	27.26		34.76	649.7	1.27
5	24.35		95.02	554.7	3.90
6	39.68				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	DATA	FA (ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	92.00	90.17	1.97
2	3.73	89.00	92.29	-3.70
3	5.18	98.00	97.29	0.721
4	7.20	110.0	107.4	2.30
5	10.00	124.0	124.0	-0.0201
6	13.90	140.0	144.2	-3.04
7	19.30	157.0	160.6	-2.30
8	26.80	169.0	163.7	3.12
9	37.30	154.0	146.7	4.73
10	51.80	107.0	111.8	-4.53
11	72.00	72.00	72.47	-0.658
12	100.0	45.00	44.43	1.24
13	139.0	32.00	31.99	0.0255
14	193.0	29.00	29.15	-0.549
15	268.0	30.00	29.93	0.215

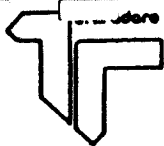
* ADARO *

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

P 1	1.00												
P 2	0.01	0.97											
P 3	0.01	-0.04	0.76										
P 4	0.00	0.00	-0.10	0.86									
P 5	0.00	0.00	0.03	0.07	0.94								
P 6	0.00	0.00	-0.02	-0.02	0.01	0.79							
T 1	0.01	0.02	-0.06	-0.03	0.01	0.00	0.28						
T 2	0.00	-0.07	-0.12	-0.02	0.01	0.00	0.41	0.63					
T 3	-0.01	0.05	0.29	0.13	-0.05	0.02	0.07	0.14	0.66				
T 4	0.00	0.00	0.01	0.11	0.02	-0.15	0.00	0.00	-0.03	0.06			
T 5	0.00	0.00	0.01	0.07	-0.11	-0.29	0.00	0.00	-0.02	0.08			
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4			

SECOND PART OF RESOLUTION MATRIX:

T 5	0.14
	T 5



Proyecto:
 Zona: Bullay - Murcia
 Observador: Juan C. Quintana
 Situación:

COORDENADA
 X 612750
 Y 4207715
 Z 700

mV: Sclero-01
 mA: 550 N=328
 S.E.V. 16

Ibo A
N-60°-E
 Perfil: V

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN			
													1 m	10 m	50 m	100 m
1	2.68	1	120	1V	505	92							21.78			
2	3.73		200	"	417	89							42.92			
3	5.18		200	300uV	235	98							83.51			
4	7.2		245	"	166	110							182.1			
5	10		385	"	152	124							313.4			
6	13.9		400	100uV	92.5	140							606.2			
7	19.3		390	"	52.5	157							1.189	109.2		
8	26.8		400	"	30	169							2.256	217.8		
9	37.3		290	30uV	10.2	154	10	290	100uV	95	141		4.370	429.2		
10	51.8		475	10uV	6.05	107		480	"	55	96		8.429	836.1		
11	72		410	"	1.8	72		405	"	17	68		16.290	1.621		
12	100	10	560	"	8.1	45							31.420	3.134		
13	139		490	"	2.55	32							60.700	6.062	1.175	
14	193		580	30uV	1.45	29								11.690	2.301	
15	268		540	"	0.72	30								22.560	4.474	
16	373													43.700	8.702	4.292
17	518													84.290	16.820	8.351
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.680														451.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA: 29-01-91

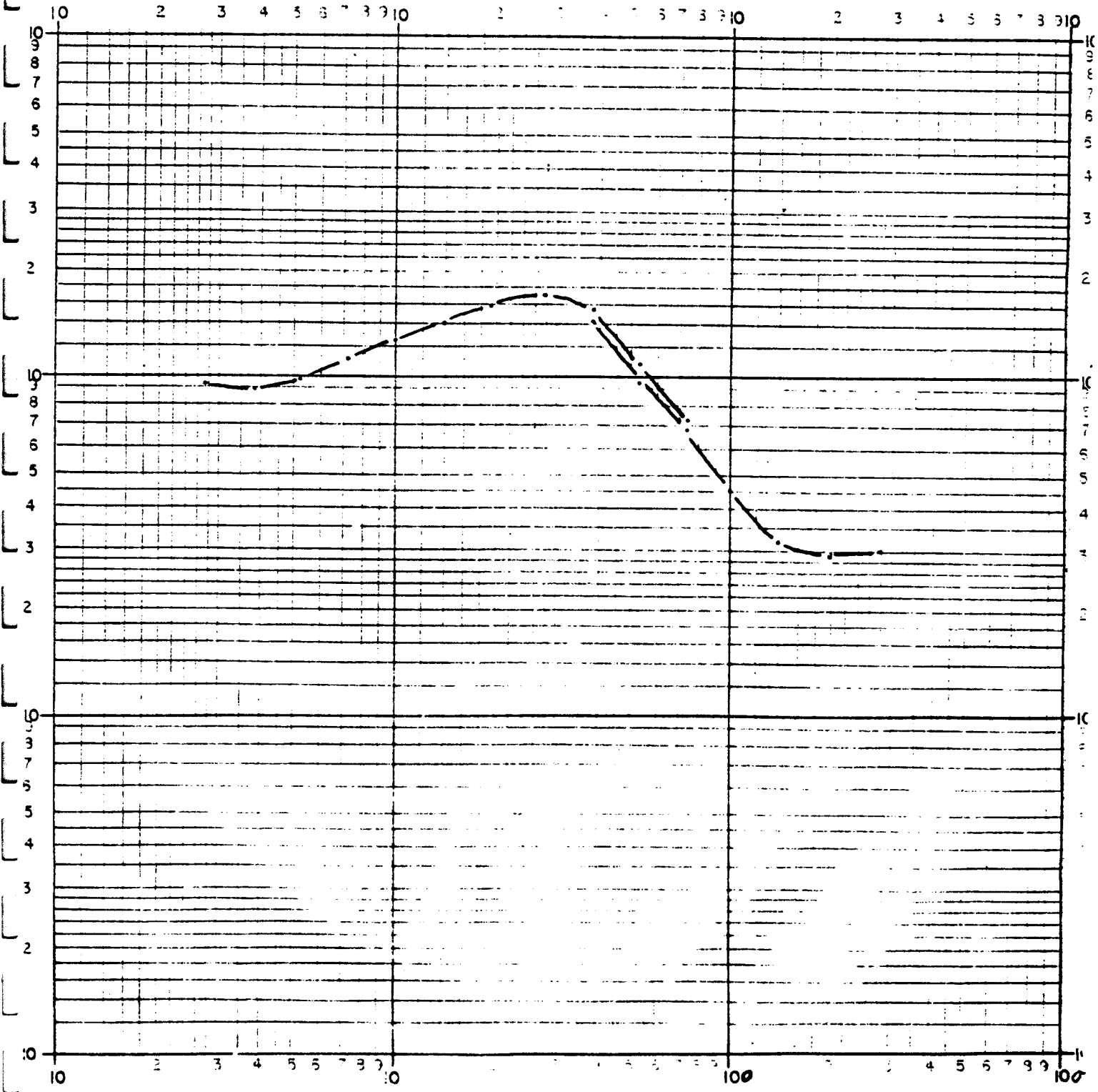


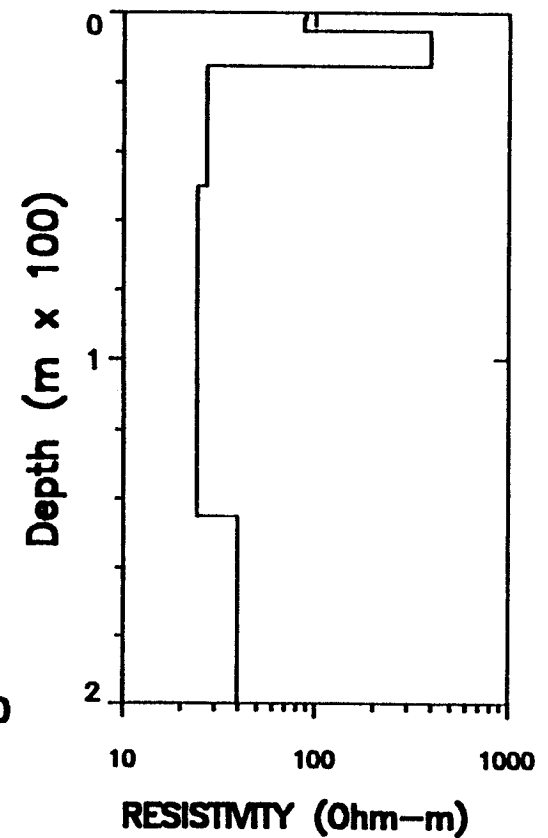
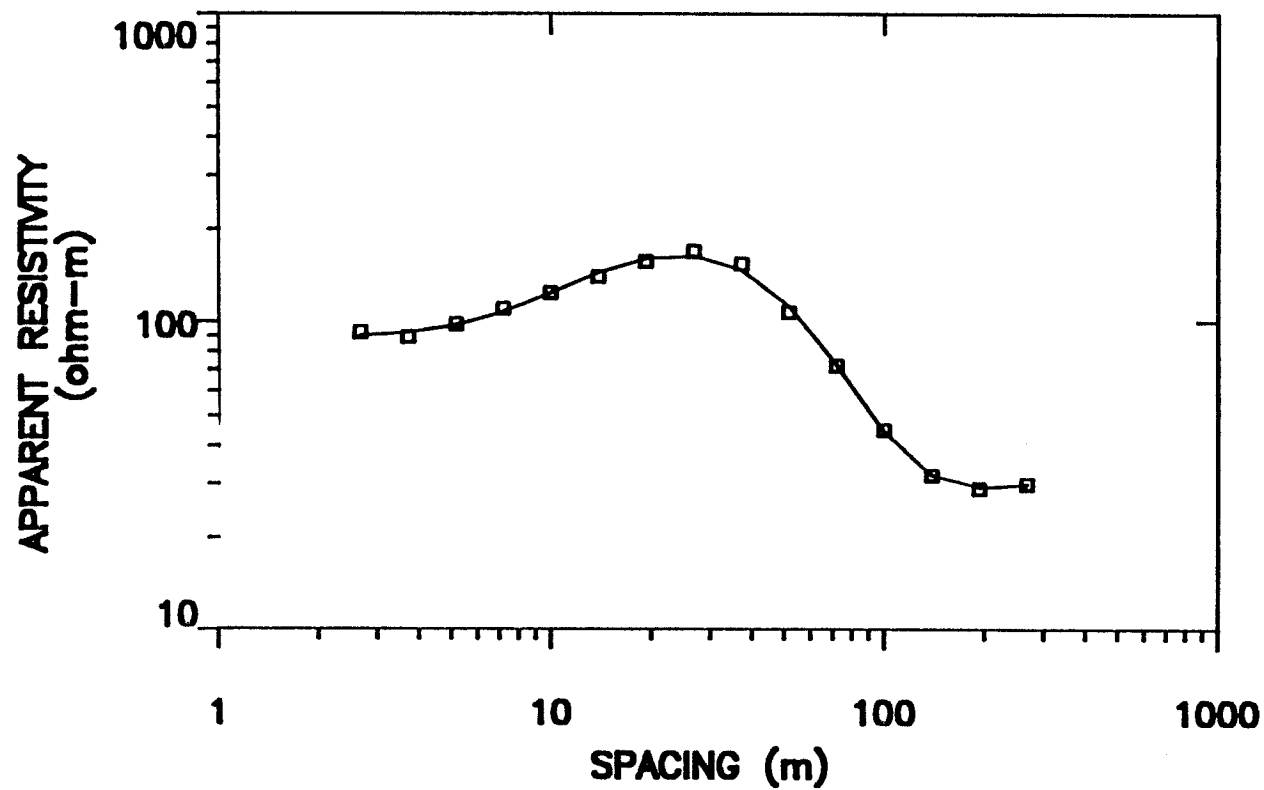
Departamento de Georísica

Estudio Bullay - Murcia S.E.V. 16

Fecha 29-01-91 Rumbo AB N-60'-E PERFIL V

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		
Data Set: 16V	Date: 91	BULLAS (MU)
Equipment: ADARO	Sounding: 16V	
		Azimuth: N-60-E

DATA SET: 17V

CLIENT: ITGE	DATE: 91
LOCATION: BULLAS	SOUNDING: 17V
COUNTY: (MU)	AZIMUTH: E-W
PROJECT: SEGURA	EQUIPMENT: ADARO
ELEVATION: 720.00	
SOUNDING COORDINATES: X: 612750.0000 Y: 4207275.0000	

Schlumberger Configuration

FITTING ERROR: 5.016 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				720.0	
1	585.9		0.969	719.0	0.00166
2	182.3		9.08	709.9	0.0498
3	52.20		11.25	698.6	0.215
4	118.7		37.06	661.6	0.312
5	46.28		53.88	607.7	1.16
6	211.1				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	311.4	307.4	1.29
2	3.73	236.3	241.2	-2.07
3	5.18	205.1	204.4	0.304
4	7.20	165.6	185.1	0.289
5	10.00	164.5	169.2	-2.86
6	13.90	148.5	148.9	-0.295
7	19.30	138.4	123.8	10.50
8	26.80	91.15	101.2	-11.02
9	37.30	89.46	89.18	0.317
10	51.80	89.00	87.59	1.57
11	72.00	92.00	89.20	3.04
12	100.0	92.00	89.06	3.19
13	139.0	83.00	88.31	-6.39
14	193.0	88.00	91.84	-4.37
15	268.0	109.0	102.8	5.60

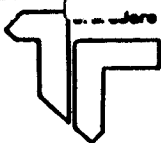
* ADARO *

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

P 1	0.24												
P 2	-0.02	0.89											
P 3	0.00	0.00	0.39										
P 4	0.00	0.00	0.20	0.56									
P 5	0.00	0.00	-0.04	0.18	0.36								
P 6	0.00	0.00	-0.01	0.01	0.19	0.14							
T 1	0.31	0.12	0.00	0.00	0.00	0.00	0.60						
T 2	-0.02	0.11	0.24	-0.04	-0.01	0.00	-0.08	0.61					
T 3	0.00	0.01	-0.21	-0.14	0.02	0.00	-0.01	-0.04	0.13				
T 4	0.00	0.00	0.01	0.20	0.05	-0.03	0.00	-0.02	0.00	0.11			
T 5	0.00	0.00	0.03	-0.07	-0.27	-0.17	0.00	0.00	-0.01	0.00			
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4			

SECOND PART OF RESOLUTION MATRIX:

T 5	0.23
	T 5



Proyecto:
 Zona: *Bullas - Murcia*
 Observador: *Juan Cu. Cuatrecasas*
 Situación:

COORDENADAS
 X *612.750*
 Y *4207.245*
 Z *720*

m V: *Adaro-01*
 m A: *GE0 n° 328*
 S.E.V. *17*

bo AC
E-W
 Perfil: *IV*

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN			
													1 m	10 m	50 m	100 m
1	2,68	<i>1</i>	<i>83</i>	<i>3V</i>	<i>1405</i>	<i>369</i>							21,78			
2	3,73		<i>105</i>	<i>1V</i>	<i>685</i>	<i>280</i>							42,92			
3	5,18		<i>230</i>	<i>"</i>	<i>670</i>	<i>243</i>							83,51			
4	7,2		<i>240</i>	<i>"</i>	<i>325</i>	<i>220</i>							182,1			
5	10		<i>370</i>	<i>"</i>	<i>230</i>	<i>195</i>							313,4			
6	13,9		<i>395</i>	<i>300uV</i>	<i>115</i>	<i>176</i>							606,2			
7	19,3		<i>250</i>	<i>100uV</i>	<i>35</i>	<i>164</i>							1.169	109,2		
8	26,8		<i>350</i>	<i>30uV</i>	<i>16.7</i>	<i>108</i>							2.256	217,8		
9	37,3		<i>310</i>	<i>10uV</i>	<i>7.5</i>	<i>106</i>	<i>10</i>	<i>310</i>	<i>100uV</i>	<i>62.5</i>	<i>87</i>		4.370	429,2		
10	51,8		<i>295</i>	<i>"</i>	<i>3.7</i>	<i>106</i>		<i>290</i>	<i>"</i>	<i>31</i>	<i>89</i>		8.429	836,1		
11	72		<i>330</i>	<i>"</i>	<i>2.2</i>	<i>109</i>		<i>325</i>	<i>30uV</i>	<i>18.5</i>	<i>92</i>		18.290	1.621		
12	100	<i>10</i>	<i>520</i>	<i>30uV</i>	<i>15.2</i>	<i>92</i>							31.420	3.134		
13	139		<i>550</i>	<i>"</i>	<i>7.5</i>	<i>83</i>							60.700	6.062	1.175	
14	193		<i>480</i>	<i>10uV</i>	<i>3.6</i>	<i>88</i>								11.690	2.301	
15	268		<i>465</i>	<i>"</i>	<i>2.25</i>	<i>109</i>								22.560	4.474	
16	373															
17	518													43.700	8.702	4.292
18	720													84.290	16.820	8.351
19	1.000													162.900	32.530	16.210
20	1.390														62.790	31.340
21	1.930														121.400	60.620
22	2.680														234.000	116.900
23	3.730														451.200	225.600
24	5.180															437.000
26	7.200															842.880
28	10.000															1.628.520
																3.141.510

OBSERVACIONES:

FECHA: *29-01-91*

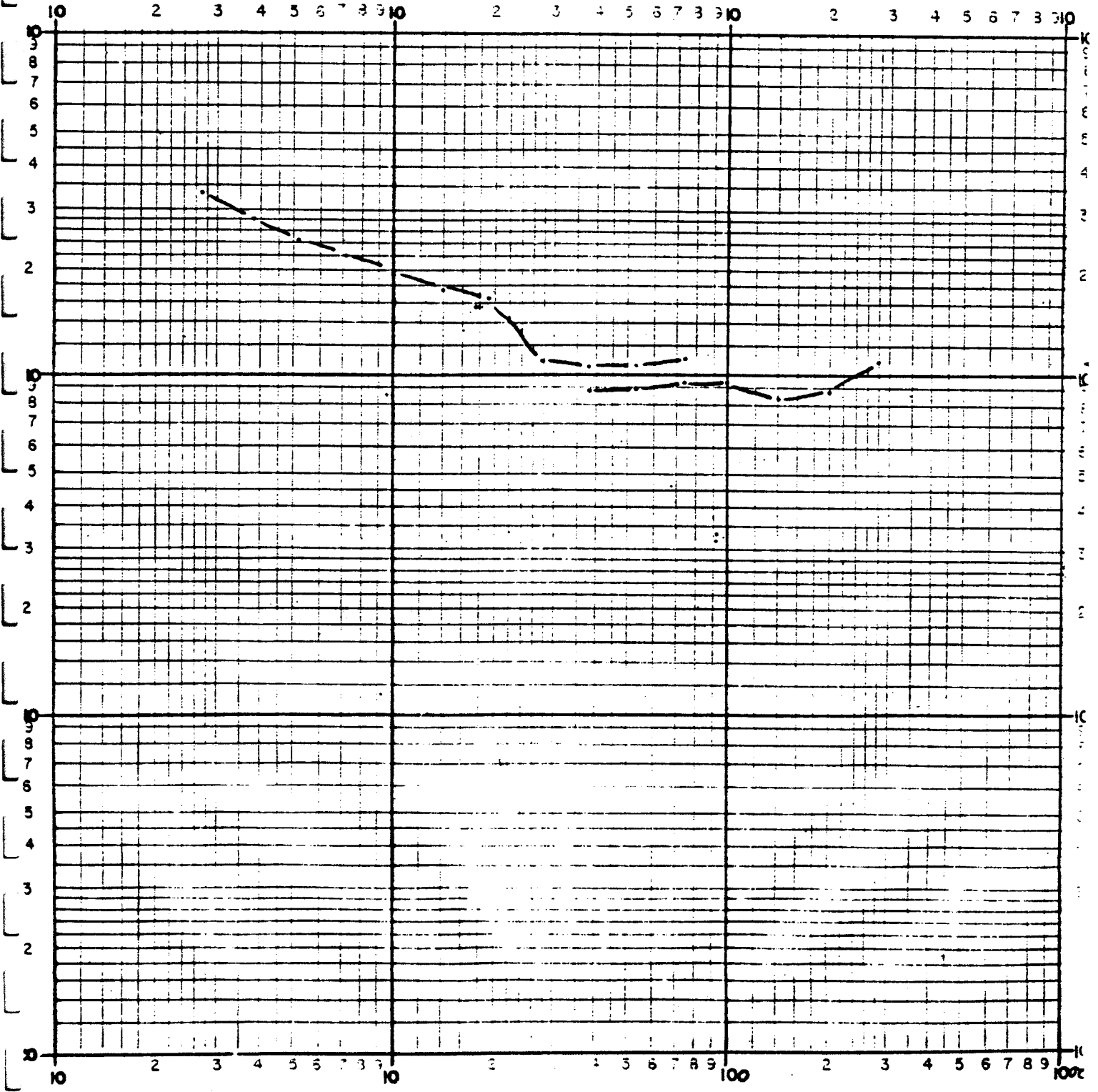


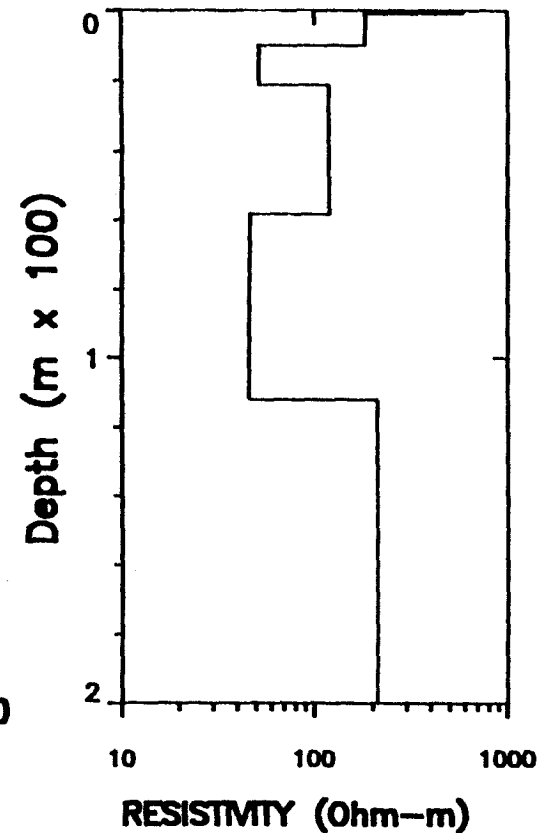
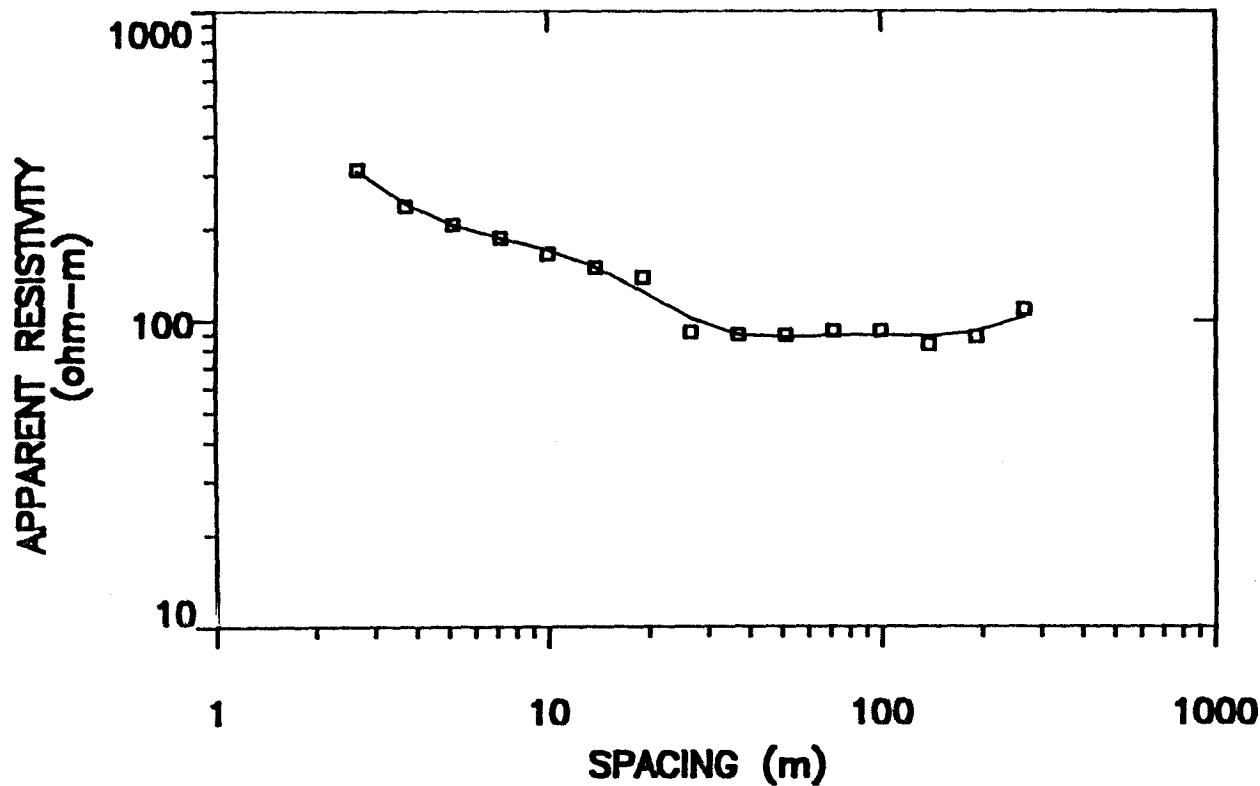
Departamento de Geofísica

Estudio Bullay - Murcia S.E.V. 17

Fecha 29-01-91 Rumbo AB E-W PERFIL V

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 17V	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 17V	

DATA SET: 18VI

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 700.00
 SOUNDING COORDINATES: X: 613800.0000 Y: 4209550.0000

DATE: 91
 SOUNDING: 18VI
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 3.642 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				700.0	
1	270.5		2.04	697.9	0.00754
2	96.67		3.45	694.5	0.0357
3	292.9		6.90	687.5	0.0235
4	111.0		24.20	663.3	0.217
5	263.1		100.3	563.0	0.381
6	246.6				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA (ohm-m)		DIFFERENCE (percent)
		DATA	SYNTHETIC	
1	2.68	228.0	233.4	-2.40
2	3.73	216.0	204.5	5.32
3	5.18	165.5	173.8	-5.05
4	7.20	157.0	154.7	1.43
5	10.00	156.0	153.7	1.46
6	13.90	160.0	163.5	-2.19
7	19.30	173.0	171.6	0.765
8	26.80	172.0	171.4	0.292
9	37.30	167.0	165.0	1.14
10	51.80	156.0	160.9	-3.14
11	72.00	172.0	166.3	3.28
12	100.0	178.0	181.2	-1.84
13	139.0	201.0	199.9	0.519
14	193.0	217.0	216.9	0.0341

PARAMETER RESOLUTION MATRIX:

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ADARO

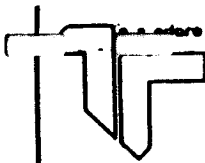
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"F" INDICATES FIXED PARAMETER

P 1	0.99											
P 2	-0.03	0.76										
P 3	0.01	0.03	0.70									
P 4	-0.01	0.01	0.06	0.83								
P 5	0.00	-0.01	0.02	-0.01	0.85							
P 6	0.00	0.01	0.00	-0.04	0.25	0.35						
T 1	0.03	0.15	-0.04	0.01	0.00	0.00	0.88					
T 2	-0.03	-0.34	-0.12	0.07	-0.02	0.04	0.19	0.41				
T 3	-0.01	-0.04	0.37	0.11	-0.04	0.07	0.03	0.11	0.32			
T 4	-0.01	0.01	0.07	-0.28	-0.17	0.15	0.01	0.08	0.16	0.36		
T 5	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.01	0.01		
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4		

SECOND PART OF RESOLUTION MATRIX:

T 5	0.00
	T 5



Proyecto:
 Zona: Bulla - Murcia
 Observador:
 Situación:

COORDENADAS
 X 613.800
 Y 4209.550
 Z 700 m

mV 100
 mA: 650 N° 228
 S.E.V. 18

Rumbo AB
E-W
 Perfil: VI

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	$\rho(\Omega m)$	MN	I (mA)	Esc. Volt.	V (mV)	$\rho(\Omega m)$	OBSERVACIONES	1 m	10 m	50 m	100 m
1	2.68	1	205	3V	2150	228							21.78			
2	3.73		155	1V	780	216							42.92			
3	5.18		116	"	230	165.5							83.51			
4	7.2		192	300mv	186	157							182.1			
5	10		217	"	108	156							313.4			
6	13.9		360	100mv	95	160							606.2			
7	19.3		250	"	37	173							1.169	109.2		
8	26.8		262	30mv	20	172	10	180	300mv	150	181		2.268	217.8		
9	37.3		275	"	10.5	167		285	"	100 101	157		4.370	429.2		
10	51.8		270	10mv	5.08	156		263	100mv	50	159		8.429	835.1		
11	72	10	330	100mv	35	172							16.290	1.621		
12	100		620	"	34	172							31.420	3.134		
13	139		375	30mv	11	178							60.700	6.062	1.175	
14	193		610	"	10.5	201								11.690	2.301	
15	268		540	10mv	5.2	217								22.580	4.474	
16	373													43.700	8.702	4.292
17	518													84.290	16.820	8.351
18	720													162.900	32.530	16.210
19	1.000														62.780	31.340
20	1.300														121.400	60.620
21	1.930														234.000	116.900
22	2.680														461.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA: 23-01-91

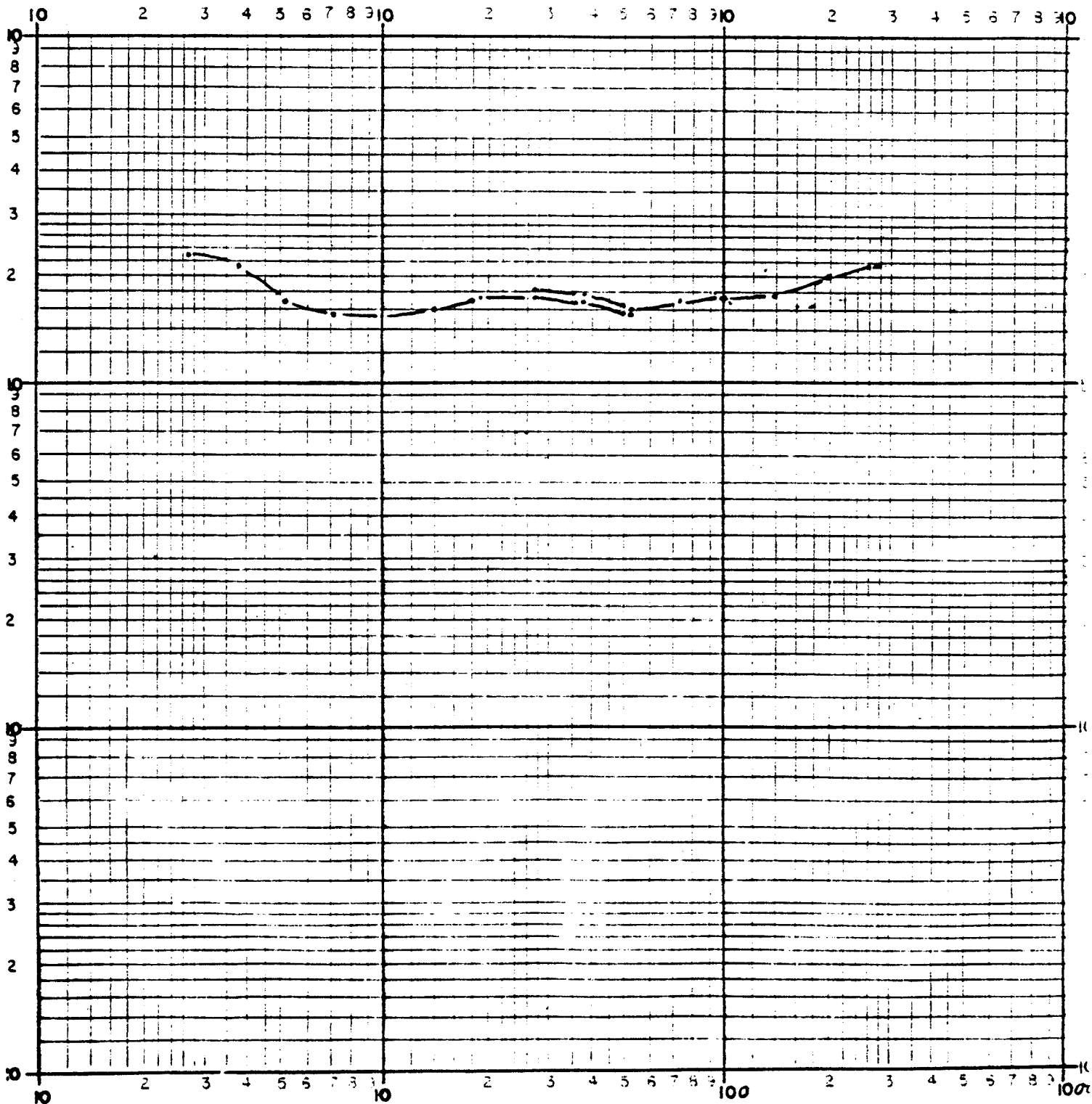


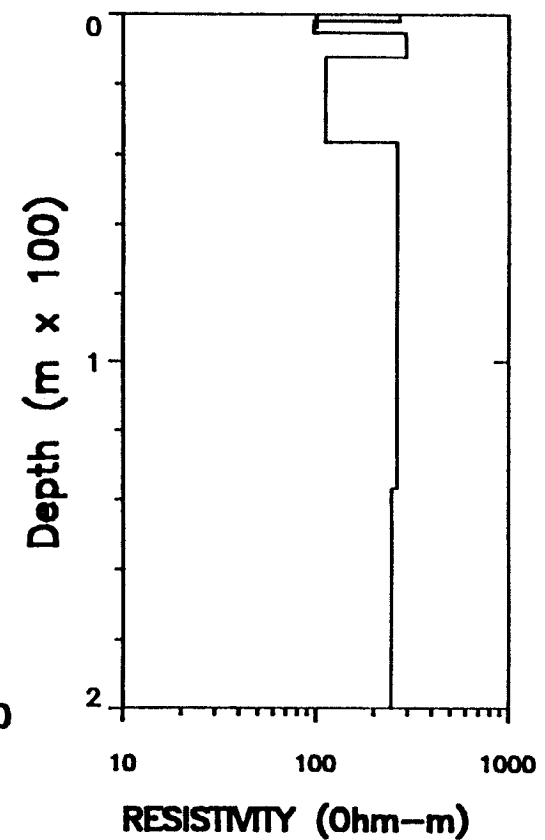
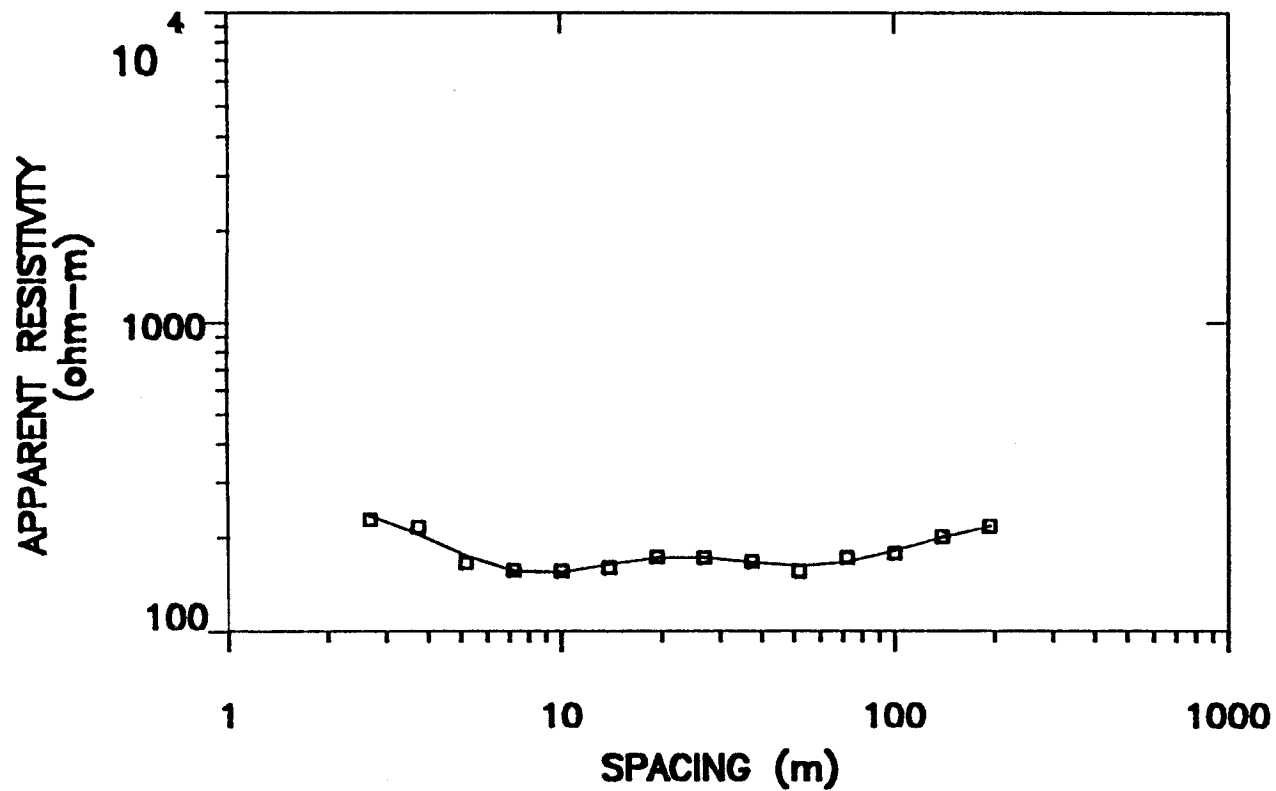
Departamento de Geofísico

Estudio Bulla - Murcia S.E.V. 18

Fecha 23-01-91 Rumbo AB E-W PERFIL V1

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 18VI	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 18VI	

DATA SET: 19VI

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 680.00
 SOUNDING COORDINATES: X: 613625.0000 Y: 4208825.0000

DATE: 91
 SOUNDING: 19VI
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 1.516 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				680.0	
1	302.6		2.21	677.7	0.00732
2	39.92		7.20	670.5	0.180
3	140.5		17.81	652.7	0.126
4	41.45				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	245.0	245.5	-0.235
2	3.73	198.0	196.0	1.00
3	5.18	135.0	136.3	-1.00
4	7.20	87.00	86.96	0.0385
5	10.00	63.00	62.45	0.864
6	13.90	58.50	59.06	-0.962
7	19.30	66.00	65.54	0.693
8	26.80	74.00	73.85	0.192
9	37.30	78.00	79.40	-1.80
10	51.80	79.00	79.10	-0.129
11	72.00	74.00	72.40	2.15
12	100.0	63.00	62.13	1.37
13	139.0	51.00	52.68	-3.30
14	193.0	46.00	46.72	-1.58
15	268.0	45.00	43.84	2.56

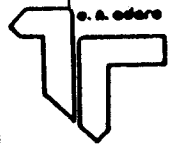
PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

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ADARO

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P 1	0.99							
P 2	-0.02	0.89						
P 3	0.00	-0.04	0.75					
P 4	0.00	0.00	-0.01	0.99				
T 1	0.01	0.04	0.01	0.00	0.98			
T 2	-0.03	-0.17	-0.17	0.00	0.06	0.68		
T 3	0.00	0.05	0.33	0.02	-0.01	0.22	0.54	
	P 1	P 2	P 3	P 4	T 1	T 2	T 3	



Proyecto: Bullas - Unruica
 Zona: Bullas
 Observador: Juan Cu. Cuartinez
 Situación:

COORDENADAS
 X 613625
 Y 420825
 Z 680

mV: 1000-01
 mA: 600 N=328

Combo AL
E-W

S.E.V. 19

Perfil: VI

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN			
													1 m	10 m	50 m	100 m
1	2.68	/	160	3V	1800	245							21,78			
2	3.73		180	1V	830	198							42,92			
3	5.18		142	300mv	230	135							83,51			
4	7.2		97	100mv	52	87							182,1			
5	10		77	30 mv	15.5	63							313,4			
6	13.9		145	"	14	58.5							606,2			
7	19.3		212	"	12	66	10	210	300mv	125	65		1.169	109,2		
8	26.8		242	10mv	7.9	74		240	100mv	81	73.5		2.256	217,8		
9	37.3		292	"	5.2	78		292	"	55	81		4.370	429,2		
10	51.8	10	400	200mv	38	79							8.429	835,1		
11	72		460	30mv	21	74							16.290	1.621		
12	100		385	10mv	7.8	63							31.420	3.134		
13	139		390	"	3.3	51							60.700	6.062	1.175	
14	193		320	3mv	1.26	46								11.690	2.301	
15	268		270	1mv	0.54	45								22.560	4.474	
16	373													43.700	8.702	4.292
17	518													84.290	16.820	8.351
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.680														451.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA: 29-01-91



Departamento de Geofísica

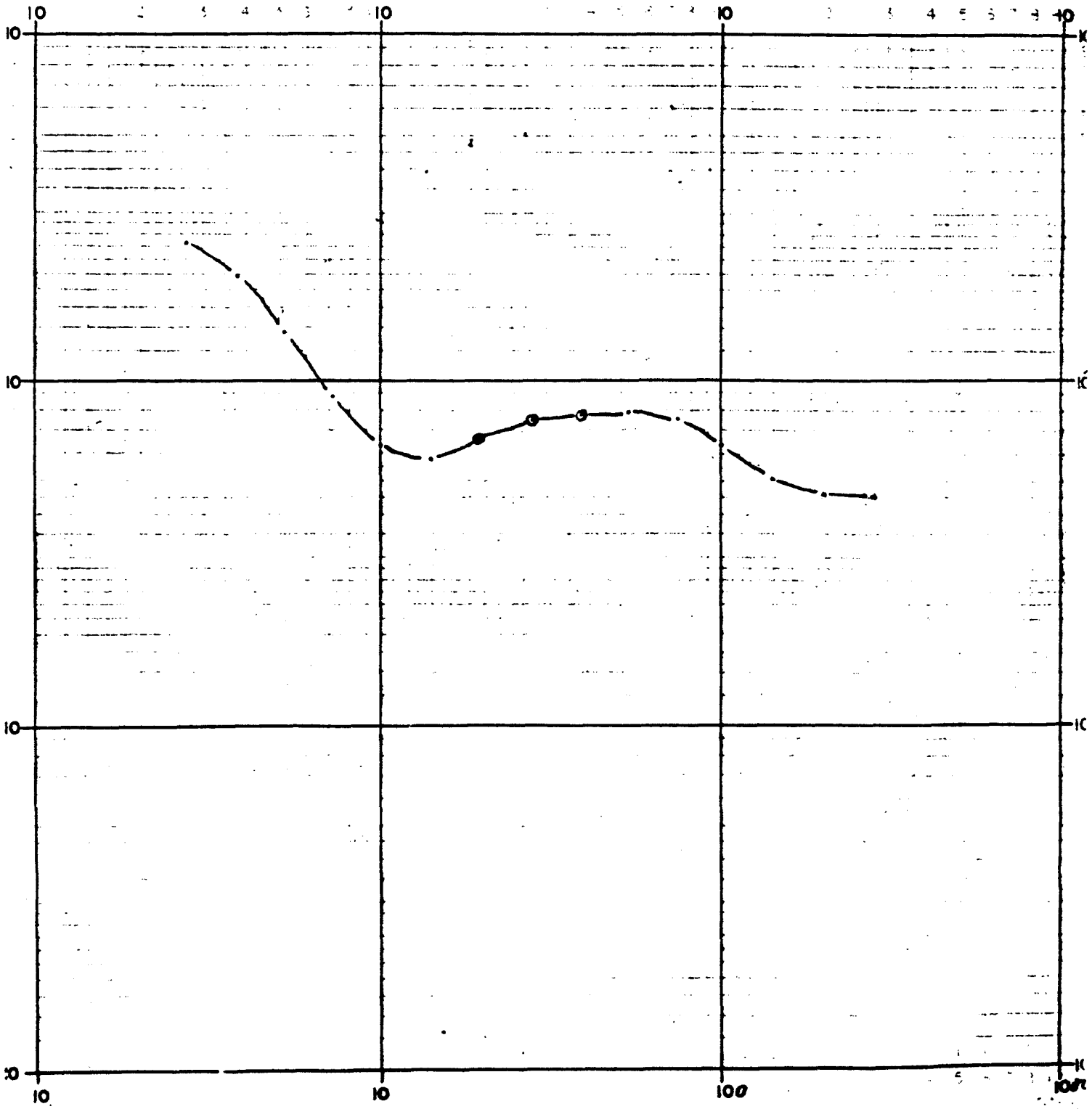
Estudio *Bellas - Murcia*

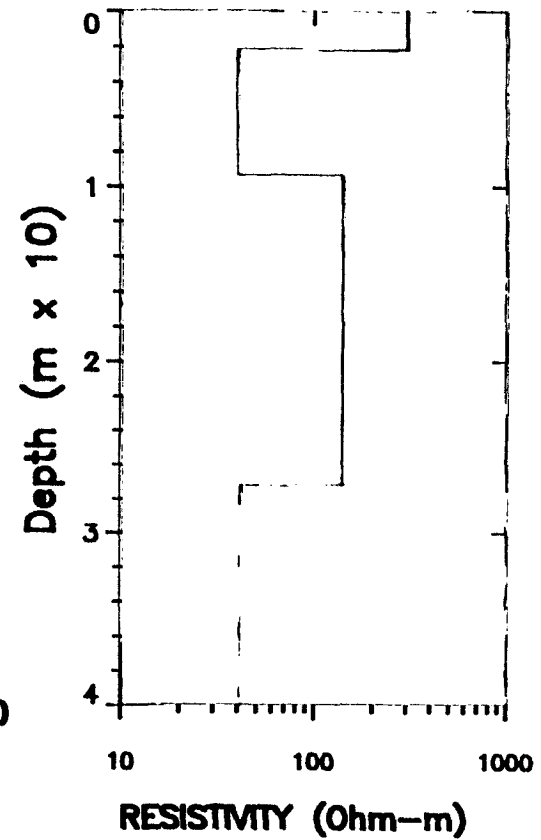
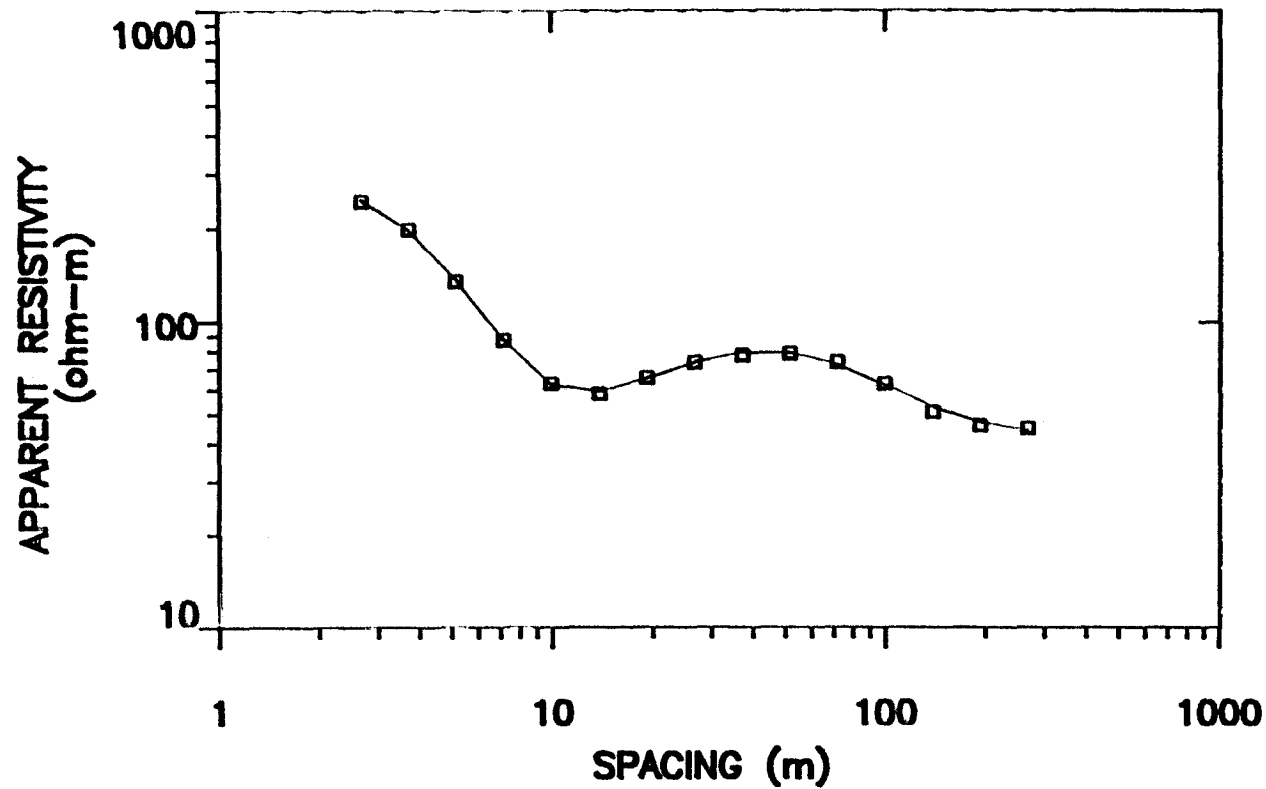
S.E.V. *19*

Fecha *29-01-91* Rumbo AB. *E-W*

PERFIL *VI*

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 19VI	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 19VI	

DATA SET: 20VI

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (NU)
 PROJECT: SEGURA
 ELEVATION: 690.00
 SOUNDING COORDINATES: X: 613910.0000 Y: 4208400.0000

DATE: 91
 SOUNDING: 20VI
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 3.576 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				690.0	
1	287.7		1.35	688.6	0.00472
2	90.00		4.63	684.0	0.0515
3	354.8		9.94	674.0	0.0260
4	30.30		92.54	581.5	3.05
5	34.21				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	DATA	PA (ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	196.0	196.5	-0.273
2	3.73	157.0	156.3	0.388
3	5.18	129.0	129.6	-0.475
4	7.20	124.0	122.7	1.00
5	10.00	131.0	132.2	-0.960
6	13.90	147.0	149.0	-1.36
7	19.30	161.0	161.8	-0.525
8	26.80	168.0	160.5	4.42
9	37.30	143.0	139.4	2.45
10	51.80	97.00	103.6	-6.82
11	72.00	67.00	67.52	-0.783
12	100.0	48.00	44.54	7.19
13	139.0	33.00	35.37	-7.20
14	193.0	34.00	33.20	2.34
15	268.0	33.00	33.04	-0.130

PARAMETER RESOLUTION MATRIX:

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ADARO

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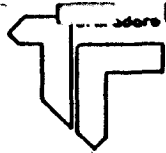
"F" INDICATES FIXED PARAMETER

P 1	0.90																	
P 2	-0.06	0.91																
P 3	0.00	-0.03	0.56															
P 4	0.01	0.01	-0.02	0.98														
P 5	-0.01	-0.01	0.02	0.03	0.94													
T 1	0.11	0.11	0.01	-0.01	0.01	0.01	0.95											
T 2	-0.09	-0.15	-0.17	0.01	-0.01	-0.01	0.16	0.71										
T 3	0.00	0.04	0.38	0.03	-0.03	-0.03	-0.02	0.21	0.56									
T 4	0.00	0.01	-0.01	-0.03	-0.09	-0.01	-0.01	0.01	0.02	0.02								
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4									

ADPRD

*

*



Proyecto:
 Zona: *Bullas Murcia*
 Observador: *Juan R. Martínez*
 Situación:

COORDENADAS

X *613.910*
 Y *4208.400*
 Z *690*

mV: *Scervo 5x*

mA: *6E0-328*

S.E.V.

20

Trabajo No.

E.-W.

Perfil:

VI

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
SIMETRICO
MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN			
													1 m	10 m	50 m	100 m
1	2.68	1	85	1V	765	196							21.78			
2	3.73		150	"	550	157							42.92			
3	5.18		170	300uV	262	127							83.51			
4	7.2		170	"	130	124							182.1			
5	10		180	100uV	75.5	131							313.4			
6	13.9		185	"	45	147							606.2			
7	19.3		290	"	40	161							1.169	109.2		
8	26.8		335	"	25	168							2.256	217.8		
9	37.3		335	30uV	11	143							4.370	429.2		
10	51.8		330	100uV	3.8	97	10	330	100uV	36.5	92		8.429	836.1		
11	72		315	30uV	1.3	67		315	30uV	12.2	63		16.290	1.621		
12	100		335	"	0.51	48		335	10uV	4.9	46		31.420	3.134		
13	139	10	400	10uV	2.2	33							60.700	6.062	1.175	
14	193		415	30uV	1.22	34								11.690	2.301	
15	268		675	"	1.0	33								22.560	4.474	
16	373													43.700	8.702	4.292
17	518													84.290	16.820	8.351
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.680														451.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA:

29-01-91

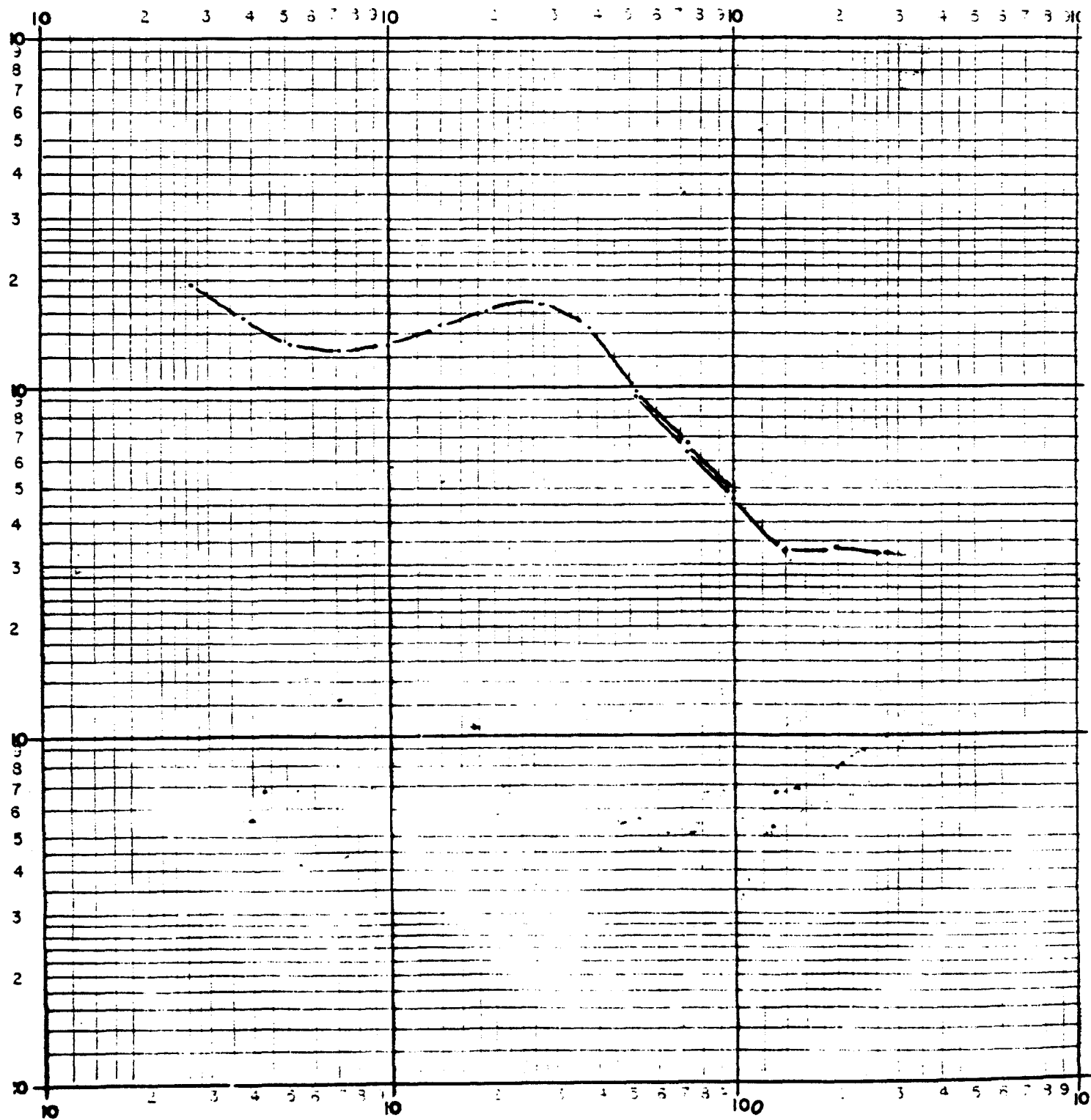


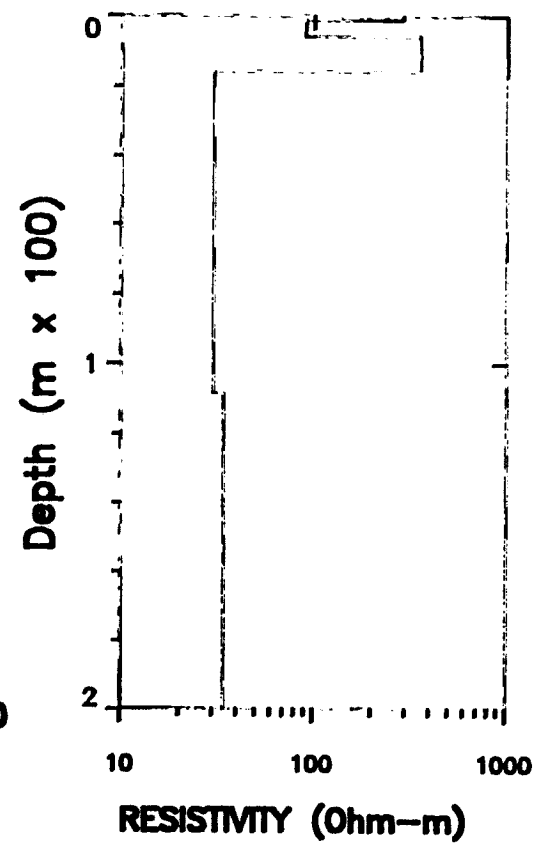
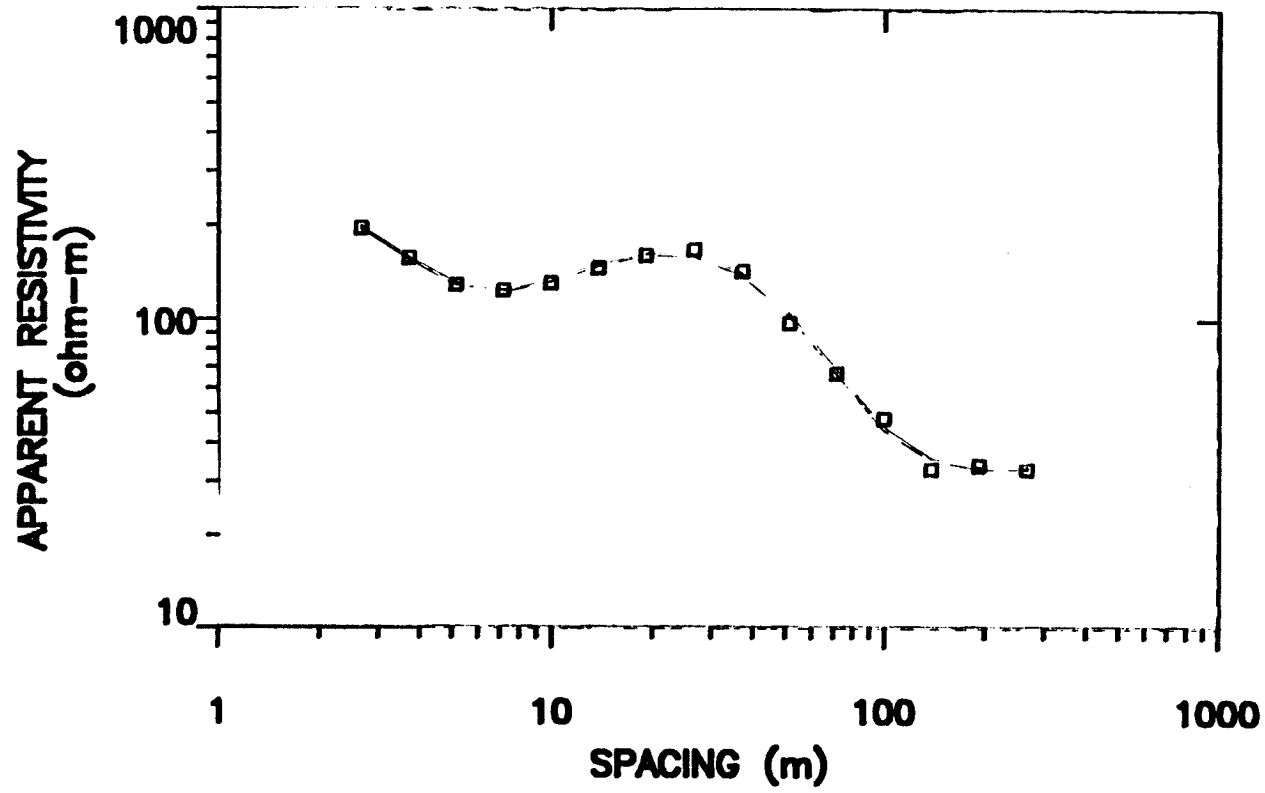
Departamento de Geofísica

Estudio Bulky - Murcia S.E.V. 20

Fecha 29-11-91 Rumbo AB E-W PERFIL VI

Interpretación	Observaciones:
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for: ITGE		SEGURA BULLAS (MU)
by: ADARO		
Data Set: 20VI	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 20VI	

DATA SET: 21VII

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 680.00

DATE: 91
 SOUNDING: 21VII
 AZIMUTH: N-80-E
 EQUIPMENT: ADARO

SOUNDING COORDINATES: X: 614770.0000 Y: 4209500.0000

Schlumberger Configuration

FITTING ERROR: 7.914 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				680.0	
1	110.8		1.35	678.6	0.0122
2	432.5		4.12	674.5	0.00955
3	234.1		13.36	660.6	0.0592
4	43.86		10.92	649.7	0.249
5	597.7		11.75	637.9	0.0196
6	19.28		56.71	581.2	2.94
7	117.8				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	167.8	163.9	2.35
2	3.73	196.1	195.8	0.168
3	5.18	223.4	229.8	-2.84
4	7.20	260.1	259.5	0.231
5	10.00	279.0	277.7	0.465
6	13.90	271.7	278.4	-2.46
7	19.30	253.9	260.0	-2.41
8	26.80	233.9	226.3	3.25
9	37.30	203.5	185.0	9.10
10	51.80	139.5	149.1	-6.89
11	72.00	111.0	127.0	-14.45
12	100.0	128.0	112.4	12.12
13	139.0	104.0	94.74	8.90
14	193.0	65.00	75.71	-16.43
15	268.0	69.00	65.38	5.23

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ADARO

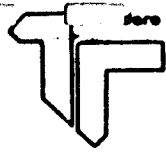
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PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

P 1	0.55											
P 2	0.10	0.51										
P 3	-0.04	0.20	0.53									
P 4	0.01	-0.05	0.10	0.28								
P 5	0.00	-0.01	-0.01	0.07	0.40							
P 6	0.00	0.00	-0.01	-0.07	0.13	0.25						
P 7	0.00	0.00	0.00	-0.04	0.02	0.13	0.07					
T 1	-0.40	-0.16	0.07	0.00	0.00	0.00	0.00	0.35				
T 2	-0.02	0.19	0.22	0.00	0.00	0.01	0.00	0.02	0.13			
T 3	0.00	-0.03	0.25	0.13	0.06	0.03	0.01	0.03	0.06	0.24		
T 4	-0.01	0.04	-0.07	-0.25	-0.04	0.08	0.04	0.00	0.01	-0.09		
T 5	0.00	0.00	-0.02	0.05	0.40	0.13	0.03	0.00	0.00	0.05		
T 6	0.00	0.00	0.00	0.07	-0.08	-0.22	-0.12	0.00	-0.01	-0.03		
	F 1	F 2	F 3	F 4	F 5	F 6	F 7	T 1	T 2	T 3		

SECOND PART OF RESOLUTION MATRIX:

T 4	0.22		
T 5	-0.02	0.39	
T 6	-0.08	-0.08	0.20
	T 4	T 5	T 6



Proyecto:
 Zona: *Bullis - Murcia*
 Observador: *Juan W. Cuartines*
 Situación:

OOR ADA
 X *614770*
 Y *4209500*
 Z *680*

mV: *Adaro-01*
 mA: *650 N° 228*

bo A
N-80°-~~15~~

S.E.V. *21*

Perfil: *VII*

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN			
													1 m	10 m	50 m	100 m
1	2.68	1	60	1V	440	160							21.78			
2	3.73		180	"	785	187							42.92			
3	5.18		270	"	690	213							83.51			
4	7.2		350	"	535	248							182.1			
5	10		500	"	425	266							313.4			
6	13.9		480	30uW	205	259							606.2			
7	19.3		580	"	120	242							1.169	109.2		
8	26.8		410	100uW	40.5	223							2.256	217.8		
9	37.3		360	30uW	16	194							4.370	429.2		
10	51.8		600	10uW	9.5	133	10	600	30uW	102	142		8.429	835.1		
11	72		525	"	3.3	102		520	100uW	35.5	111		16.290	1.621		
12	100		470	"	1.82	122		470	30uW	19.2	128		31.420	3.134		
13	139	10	195	"	3.35	104							60.700	6.062	1.175	
14	193		700	"	3.9	65								11.690	2.301	
15	268		625	"	1.9	69								22.560	4.474	
16	373													43.700	8.702	4.292
17	518													84.280	16.820	8.351
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.680														451.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.620
26	10.000															3.141.510

OBSERVACIONES:

FECHA: *22-01-91*



Departamento de Geología

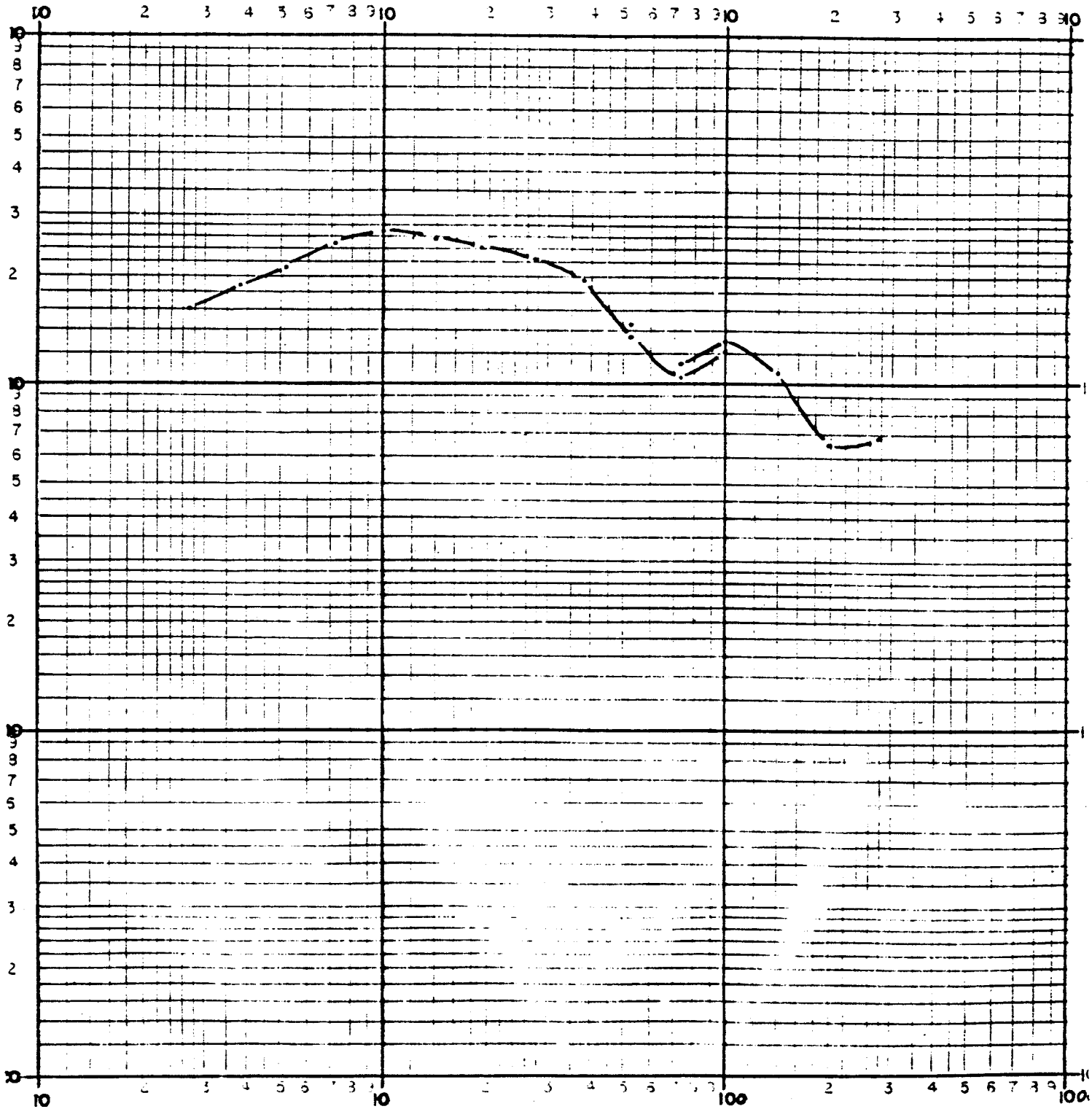
Estudio *Bulla - Murcia*

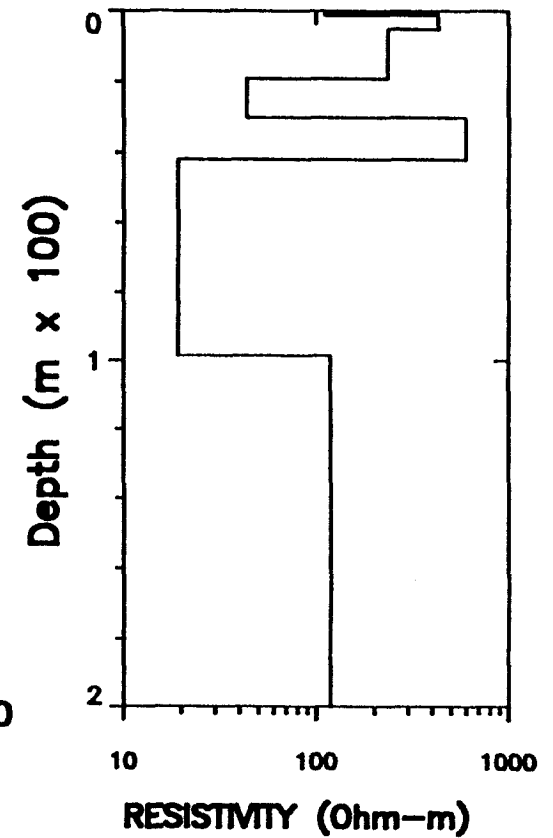
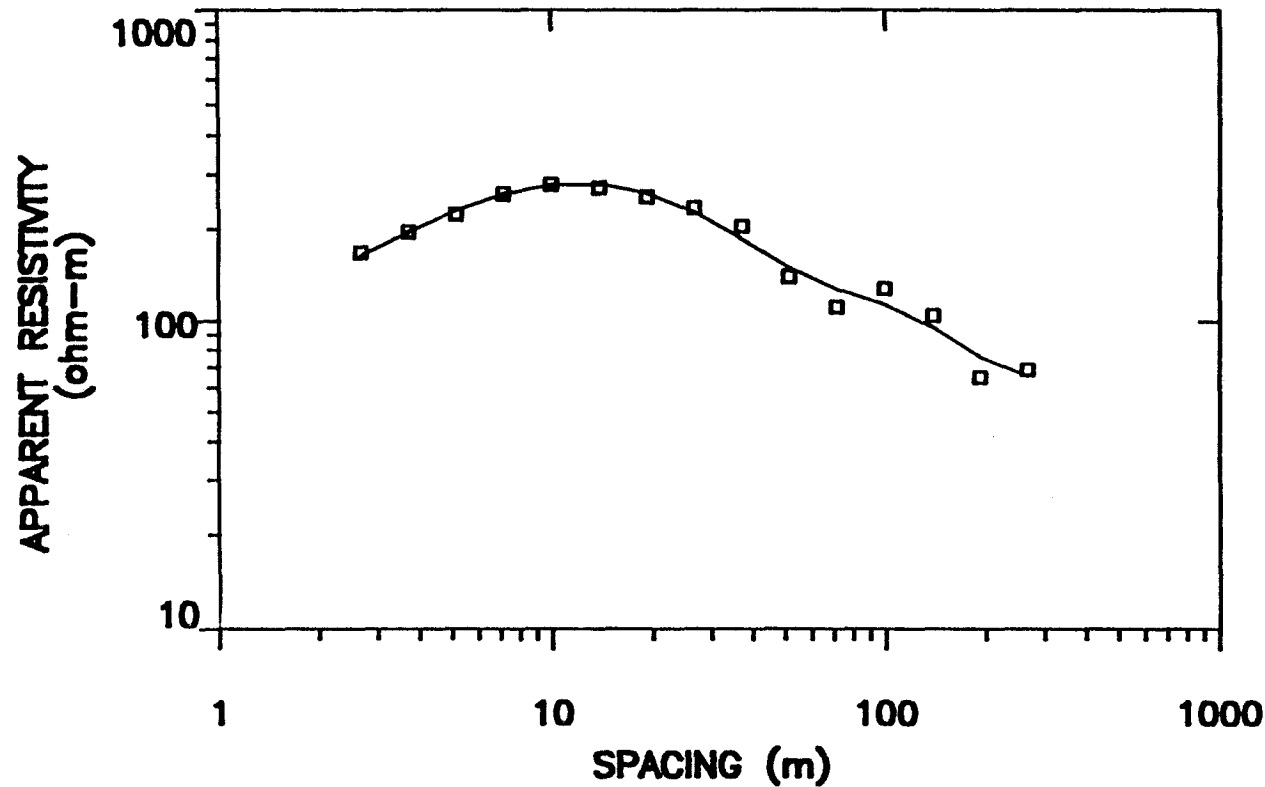
S.E.V. *21*

Fecha *22-01-91* Rumbo AB *N-80°-E*

PERFIL *VII*

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 21VI	Date: 91	
Equipment: ADARO	Sounding: 21VI	Azimuth: N-80-E

DATA SET: 22VII

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 680.00
 SOUNDING COORDINATES: X: 615100.0000 Y: 4208750.0000

DATE: 91
 SOUNDING: 22VII
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 2.120 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				680.0	
1	73.92		1.23	678.7	0.0166
2	17.94		5.55	673.2	0.309
3	39.68		161.4	511.7	4.06
4	223.9				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	43.00	43.10	-0.237
2	3.73	32.00	31.67	1.01
3	5.18	24.00	24.56	-2.36
4	7.20	23.00	22.13	3.74
5	10.00	22.00	22.80	-3.65
6	13.90	25.50	25.13	1.45
7	19.30	28.00	28.15	-0.570
8	26.80	31.00	31.21	-0.688
9	37.30	34.00	33.91	0.244
10	51.80	37.00	36.10	2.41
11	72.00	38.00	37.90	0.258
12	100.0	40.00	39.66	0.831
13	139.0	41.50	42.16	-1.60
14	193.0	45.00	46.60	-3.55
15	268.0	56.00	54.48	2.69

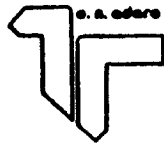
PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

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ADARO

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P 1	0.91						
P 2	-0.04	0.96					
P 3	0.00	0.00	1.00				
P 4	0.00	0.00	-0.01	0.08			
T 1	0.07	0.04	0.00	0.00	0.93		
T 2	-0.08	-0.07	-0.02	-0.01	0.08	0.83	
T 3	0.00	-0.01	-0.01	-0.24	0.01	-0.03	0.90
	P 1	P 2	P 3	P 4	T 1	T 2	T 3



Proyecto:
 Zona: Bulla - Oruro
 Observador: Juan C. Cuatrecasas
 Situación:

COORDENADAS
 X 615100
 Y 4208750
 Z 680

mV: Adno-01
 mA: GE n° 328

Rumbo AB

S.E.V. 22

Perfil: VII

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	OBSERVACIONES	SIMETRICO MN			
													1 m	10 m	50 m	100 m
1	2.88	1	106	100	106	43						232-460	21.78			
2	3.73		228	300	440	32						249-185	42.92			
3	5.18		251	100	22	24							83.51			
4	7.2		208	"	290	23							182.1			
5	10		240	30	172	22							313.4			
6	13.9		225	"	9.5	25.5							606.2			
7	19.3		250	10	6.0	28							1.169	109.2		
8	26.8		200	"	2.8	31	10	320	100	46	31		2.256	217.8		
9	37.3		285	"	2.2	34		285	30	225	34		4.370	429.2		
10	51.8		420	100	420	31		150	10	6.6	37		8.429	836.1		
11	72	10	320	10	7	38							16.290	1.621		
12	100		245	"	3.1	40							31.420	3.134		
13	139		380	"	2.6	41.5							60.700	6.062	1.175	
14	193		470	3	1.8	45								11.690	2.301	
15	268		520	"	1.3	56								22.560	4.474	
16	373													43.700	8.702	4.292
17	518													84.290	16.820	8.351
18	720													162.900	32.530	18.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.880														461.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA: 29-01-91



Departamento de Geofísica

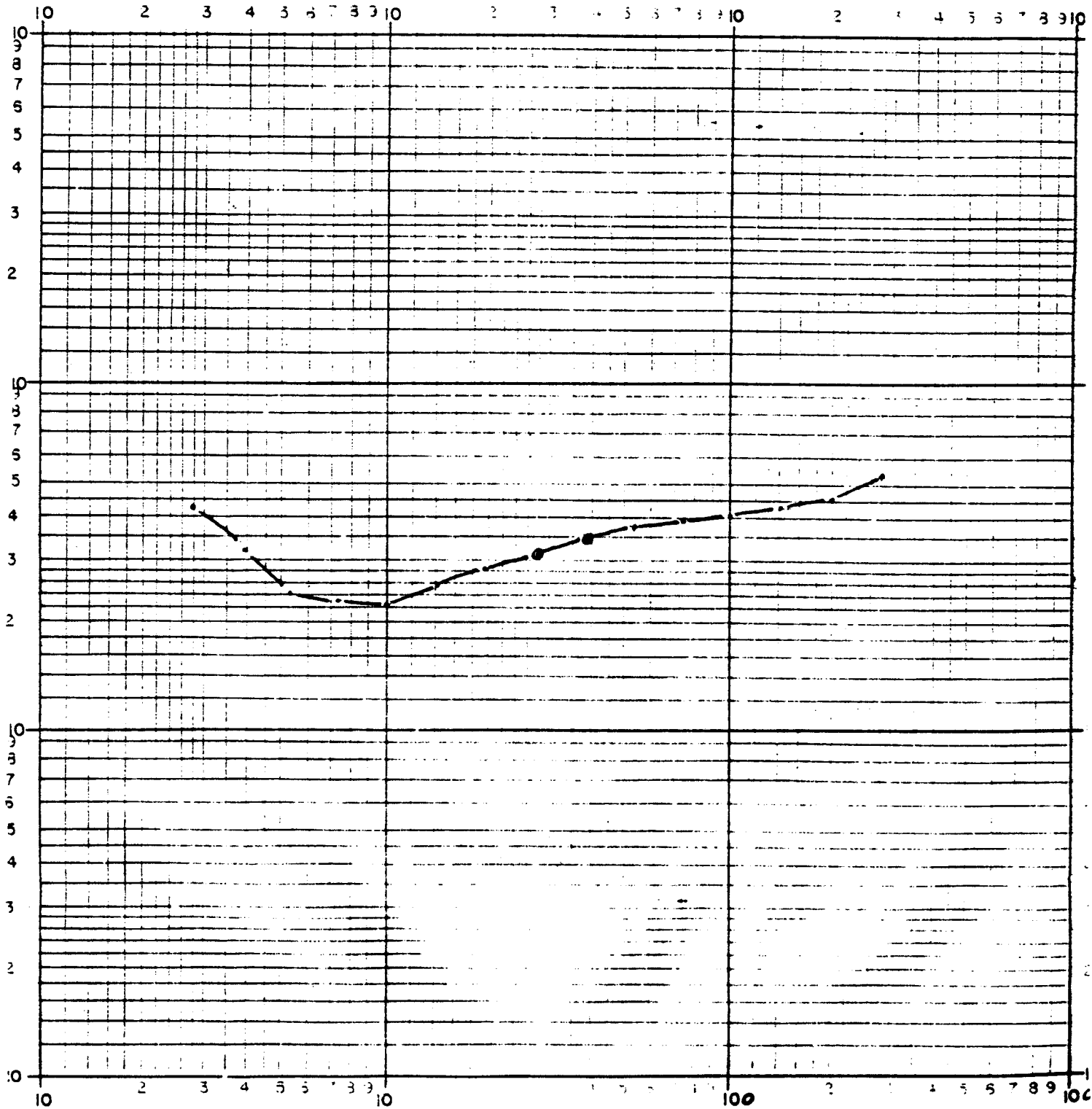
Estudio *Bullón - Murcia*

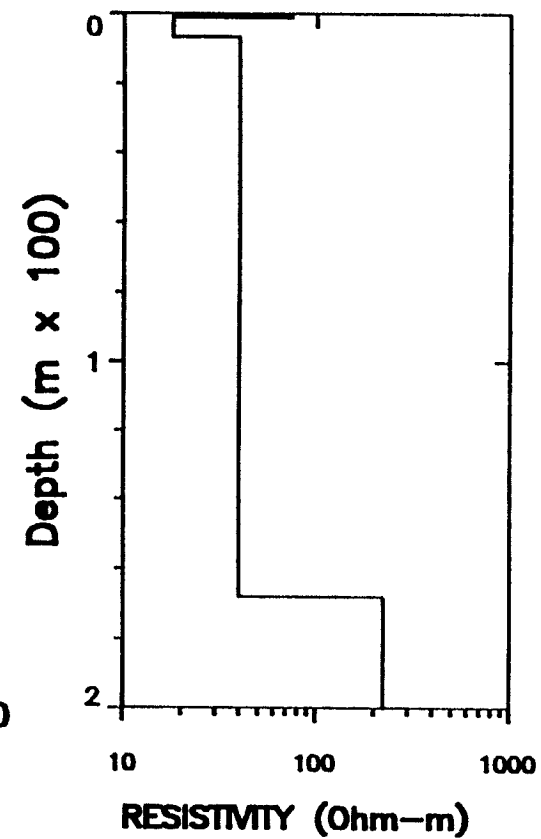
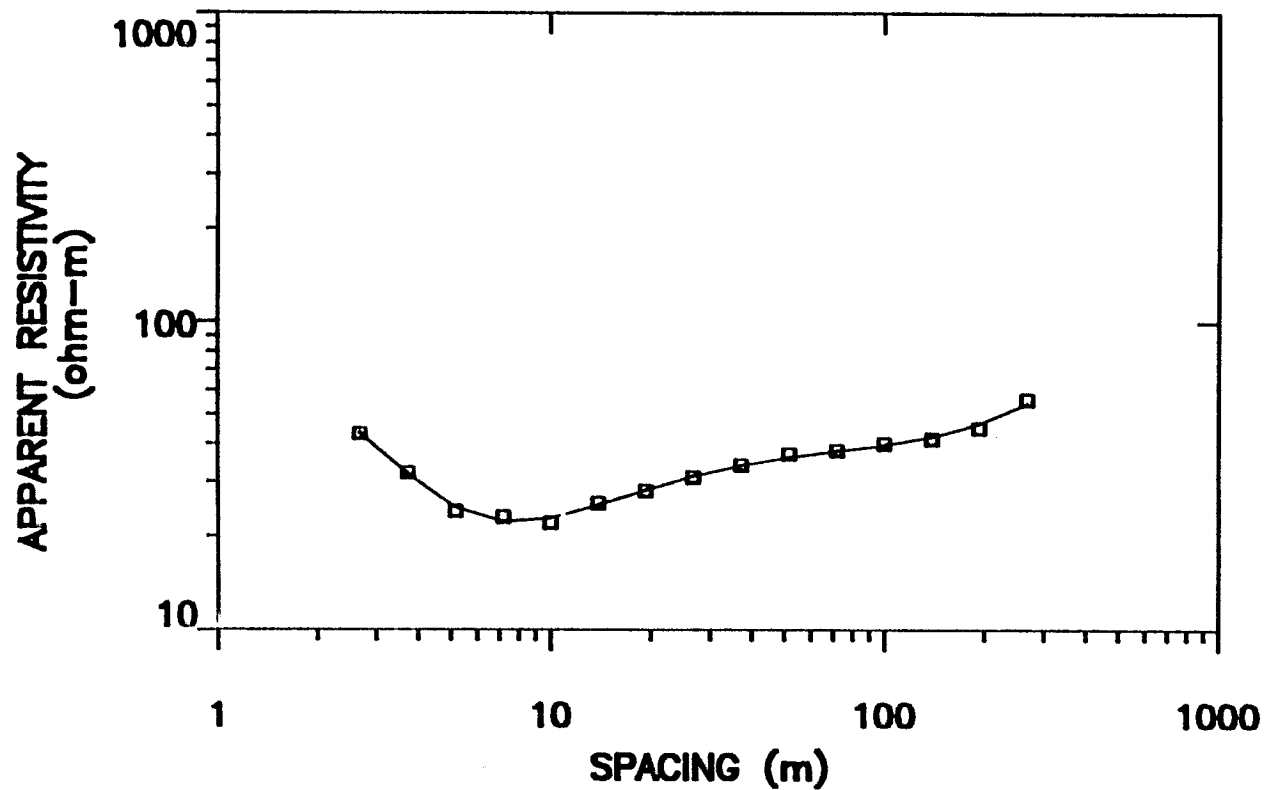
S.E.V. *22*

Fecha *29-01-91* Rumbo AB

PERFIL *VII*

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 22VII	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 22VII	

DATA SET: 23VIII

CLIENT: IT&E
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 670.00

DATE: 91
 SOUNDING: 23-8
 AZIMUTH: N-80-E
 EQUIPMENT: ADARO

SOUNDING COORDINATES: X: 615950.0000 Y: 4210300.0000

Schlumberger Configuration

FITTING ERROR: 3.076 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
1	152.6		0.968	670.0	
2	254.8		4.26	669.0	0.00635
3	43.03		34.19	664.7	0.0167
4	33.33		36.86	630.5	0.794
5	197.7		78.95	593.7	1.10
6	26.66			514.7	0.399

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	192.2	193.3	-0.544
2	3.73	206.4	203.3	1.45
3	5.18	200.5	203.6	-1.57
4	7.20	191.0	188.2	1.45
5	10.00	154.5	155.3	-0.543
6	13.90	110.8	112.6	-1.58
7	19.30	77.84	76.10	2.23
8	26.80	55.00	55.29	-0.543
9	37.30	46.00	47.19	-2.60
10	51.80	46.00	44.84	2.50
11	72.00	45.00	45.03	-0.0852
12	100.0	49.00	48.01	2.01
13	139.0	50.00	54.11	-8.23
14	193.0	66.00	61.50	6.80
15	268.0	66.00	66.50	-0.771
16	373.0	65.00	65.77	-1.18

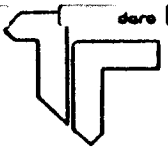
* ADARO *

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

P 1	0.83												
P 2	0.00	0.96											
P 3	0.00	-0.01	0.99										
P 4	-0.01	0.02	0.03	0.75									
P 5	0.00	0.00	0.00	0.02	0.50								
P 6	0.00	0.00	0.00	0.01	0.20	0.17							
T 1	-0.31	-0.07	-0.01	0.02	0.00	0.00	0.23						
T 2	0.04	0.06	0.02	-0.04	0.00	0.00	0.21	0.89					
T 3	-0.01	0.02	0.04	0.03	-0.09	0.09	0.02	-0.05	0.45				
T 4	0.00	0.00	0.01	-0.31	-0.07	0.07	0.00	-0.01	0.32	0.38			
T 5	0.00	0.00	0.00	-0.02	0.43	0.21	0.00	0.00	0.02	0.03			
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4			

SECOND PART OF RESOLUTION MATRIX:

T 5	0.39
	T 5



dato

Proyecto:
 Zona: *Bulky - Purcia*
 Observador:
 Situación:

COORDENADAS
 X *615.950*
 Y *4210300*
 Z *670*

mV:
 mA:
 S.E.V. *23*

BOA *N-80°-E*
 Perfil: *VIII*

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN					
													1 m	10 m	50 m	100 m		
1	2.68	1	160	3V	1200	163												
2	3.73		102	1V	415	175												
3	5.18		152	"	310	170												
4	7.2		145	300uA	145	162												
5	10		162	100uA	68	131												
6	13.9		320	"	51	94												
7	19.3		590	"	33.5	66	10	595	1V	81								
8	26.8		565	30uA	11.5	46		570	300uA	55								
9	37.3		820	10uA	7.3	39		820	100uA	46								
10	51.8		575	100uA	3.2	46												
11	72		590	30uA	16.5	45												
12	100		620	10uA	9.7	49												
13	139		610	"	5	50												
14	193		360	3uA	2.05	66												
15	268		720	"	2.1	66												
16	373		535	1uA	0.8	65												
17	518																	
18	720																	
19	1.000																	
20	1.390																	
21	1.930																	
22	2.680																	
23	3.730																	
24	5.180																	
25	7.200																	
26	10.000																	

OBSERVACIONES:

FECHA: *28-01-91*



Departamento de Geofísica

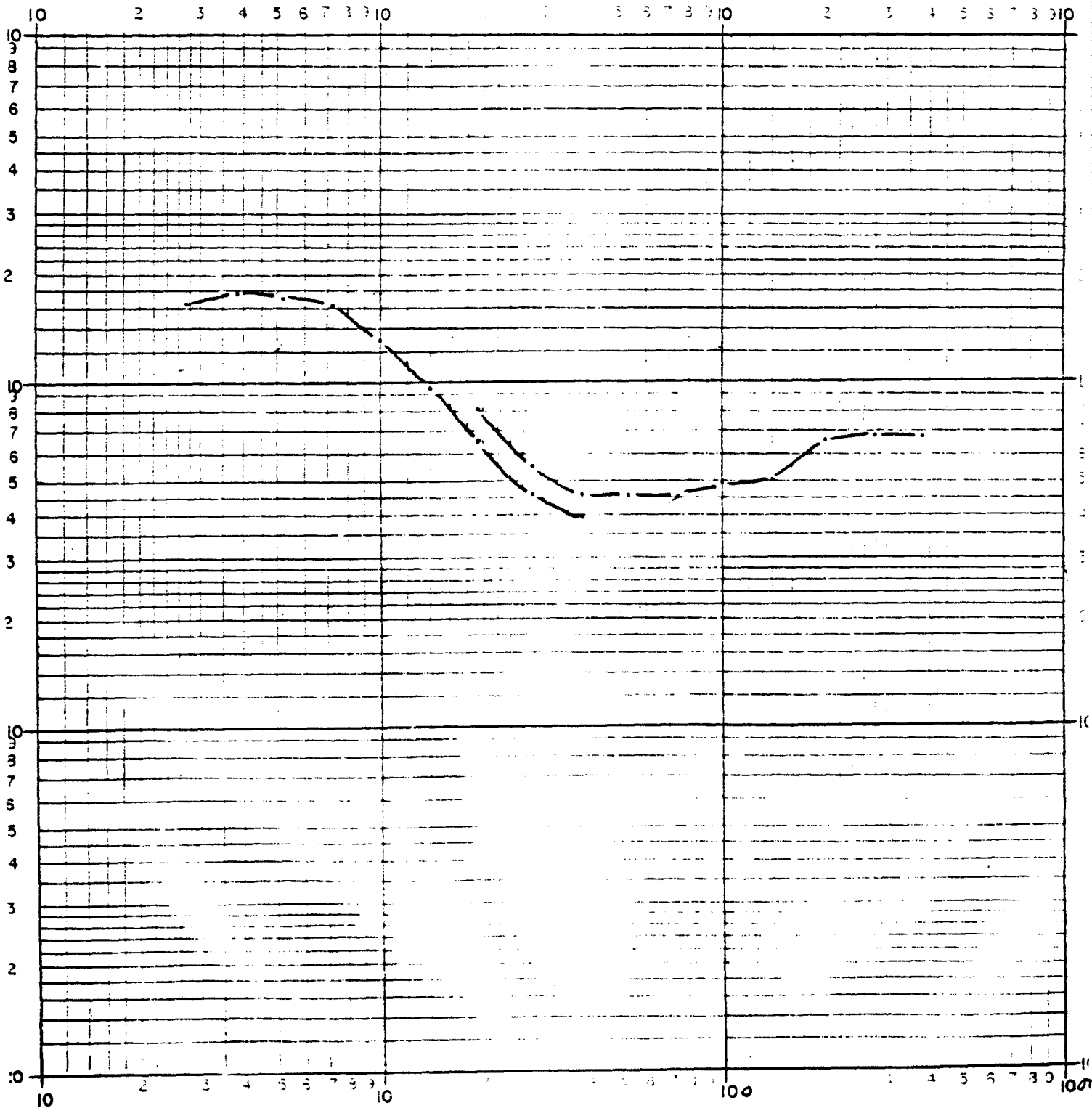
Estudio *Bullay - Murcia*

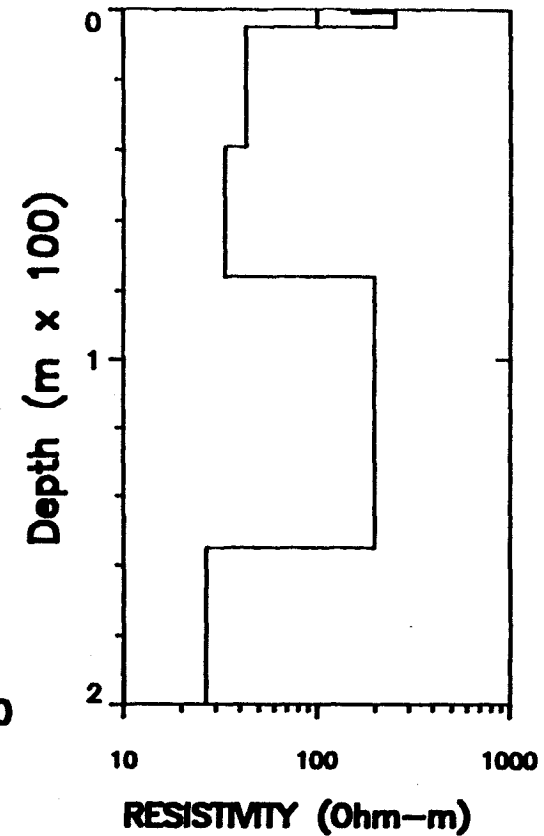
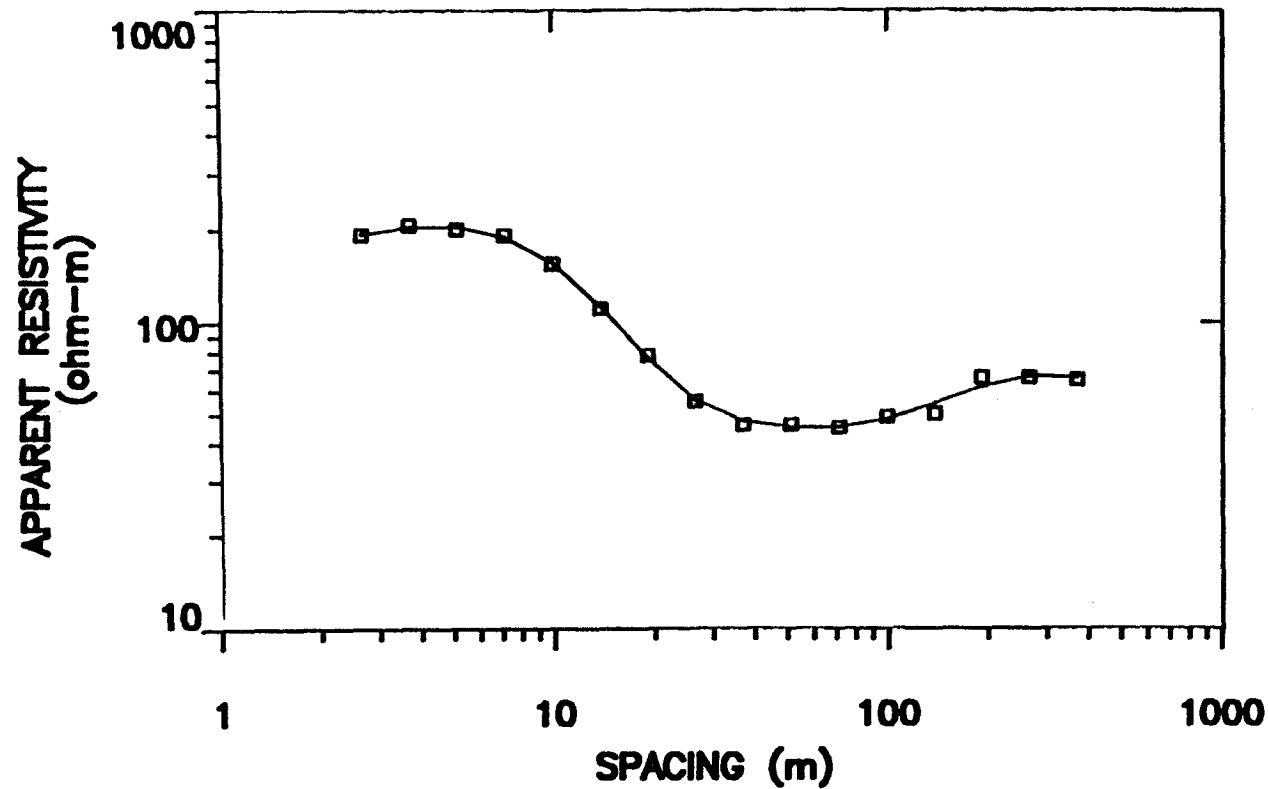
S.E.V. *23*

Fecha *28-01-91* Rumbo AB *N-80°-E*

PERFIL *VIII*

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 23VII	Date: 91	Azimuth: N-80-E
Equipment: ADARO	Sounding: 23-8	

DATA SET: 24VIII

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 650.00

DATE: 91
 SOUNDING: 24-8
 AZIMUTH: N-80-E
 EQUIPMENT: ADARO

SOUNDING COORDINATES: X: 616000.0000 Y: 4209580.0000

Schlumberger Configuration

FITTING ERROR: 3.021 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				650.0	
1	67.23		1.08	648.9	0.0161
2	61.34		3.32	645.5	0.0542
3	572.0		10.08	635.4	0.0176
4	44.06				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	66.25	67.24	-1.49
2	3.73	73.13	70.24	3.95
3	5.18	75.72	77.83	-2.78
4	7.20	92.06	92.49	-0.466
5	10.00	111.8	114.3	-2.64
6	13.90	142.8	142.2	0.411
7	19.30	175.5	168.9	3.75
8	26.80	195.0	186.8	4.18
9	37.30	185.0	186.9	-1.03
10	51.80	157.0	164.3	-4.69
11	72.00	121.0	125.0	-3.34
12	100.0	89.00	85.59	3.82
13	139.0	62.00	60.11	3.03
14	193.0	48.00	49.44	-3.01
15	268.0	46.00	46.13	-0.293

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

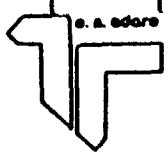
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ADARO

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F 1	0.89	0.92	0.61	1.00	0.12	0.81
F 2	0.07	-0.05	-0.01	0.00	0.29	0.12
F 3	0.03	0.00	-0.03	0.00	0.03	0.58
F 4	0.00	0.01	-0.12	0.01	0.12	
T 1	0.09	-0.08	0.40	0.01		
T 2	0.03	0.05				
T 3	-0.04					
F 1						
F 2						
F 3						
F 4						
T 1						
T 2						
T 3						

* ADARO *



Proyecto:
 Zona: Bullas - Murcia
 Observador: Alfredo Carrasco Martínez
 Situación:

COORDENADAS
 X 616.000
 Y 4209.580
 Z 680 m

m V:
m A:

Rumbo AB
N-80-E

S.E.V.

~~24~~ 24

Perfil: VIII

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
SIMETRICO
MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m
1	2.68	1	288	3V	1025	77							21.78			
2	3.73		403	1V	800	85							42.92			
3	5.18		462	"	490	88							83.51			
4	7.2		440	"	290	107							182.1			
5	10		390	300mv	162	130							313.4			
6	13.9		362	100mv	99	166							606.2			
7	19.3		390	"	68	204	10	395	1V	610	169		1.169	109.2		
8	26.8		378	"	38	227		380	"	340	195		2.256	217.8		
9	37.3		330	30 mv	16.25	215		330	300mv	142	185		4.370	429.2		
10	51.8	10	340	100mv	64	157							8.429	835.1		
11	72		405	10 mv	7.85	121							16.290	1.621		
12	100		580	30 mv	16.5	89							31.420	3.134		
13	139		545	40 mv	5.6	62							60.700	6.062	1.175	
14	193		535	3mv	2.2	48							11.690	2.301		
15	268		462	"	490	88	10	1125	3mv	2.3	46	1125 - 2.9 / $\rho(\Omega m) = 46$	22.560	4.474		
16	373												43.700	8.702	4.292	
17	518												84.290	16.820	8.351	
18	720												162.900	32.530	16.210	
19	1.000													62.790	31.340	
20	1.390													121.400	60.620	
21	1.930													234.000	116.900	
22	2.680													451.200	225.600	
23	3.730														437.000	
24	5.180														842.880	
25	7.200														1.628.520	
26	10.000														3.141.510	

OBSERVACIONES:

FECHA:

28-01-91



Departamento de Geofísica

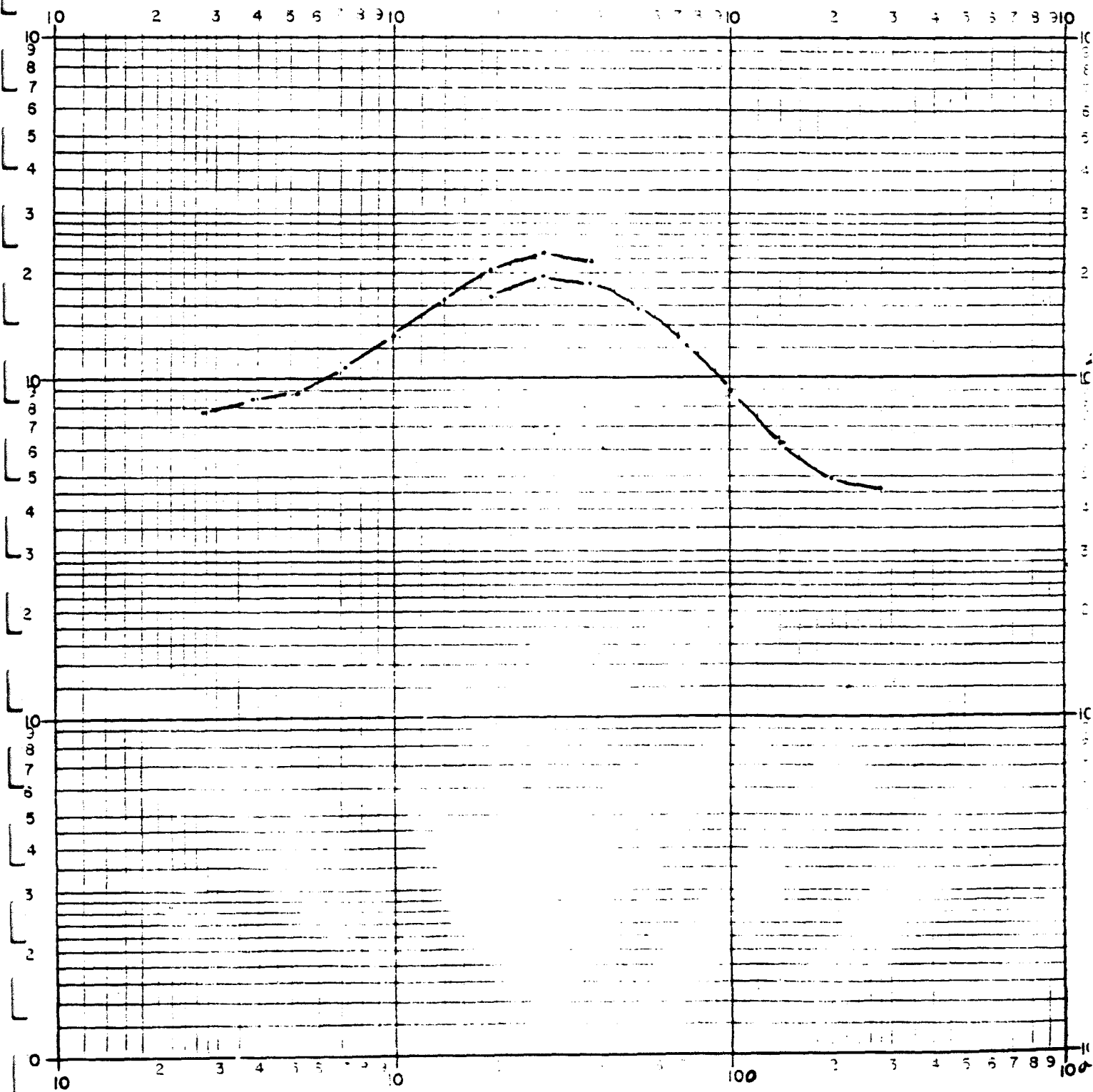
Estudio Bullaf - Murcia

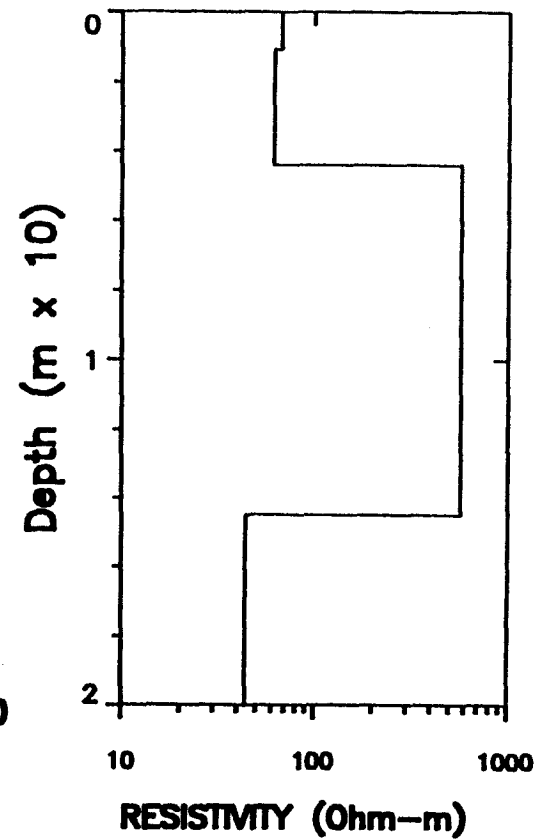
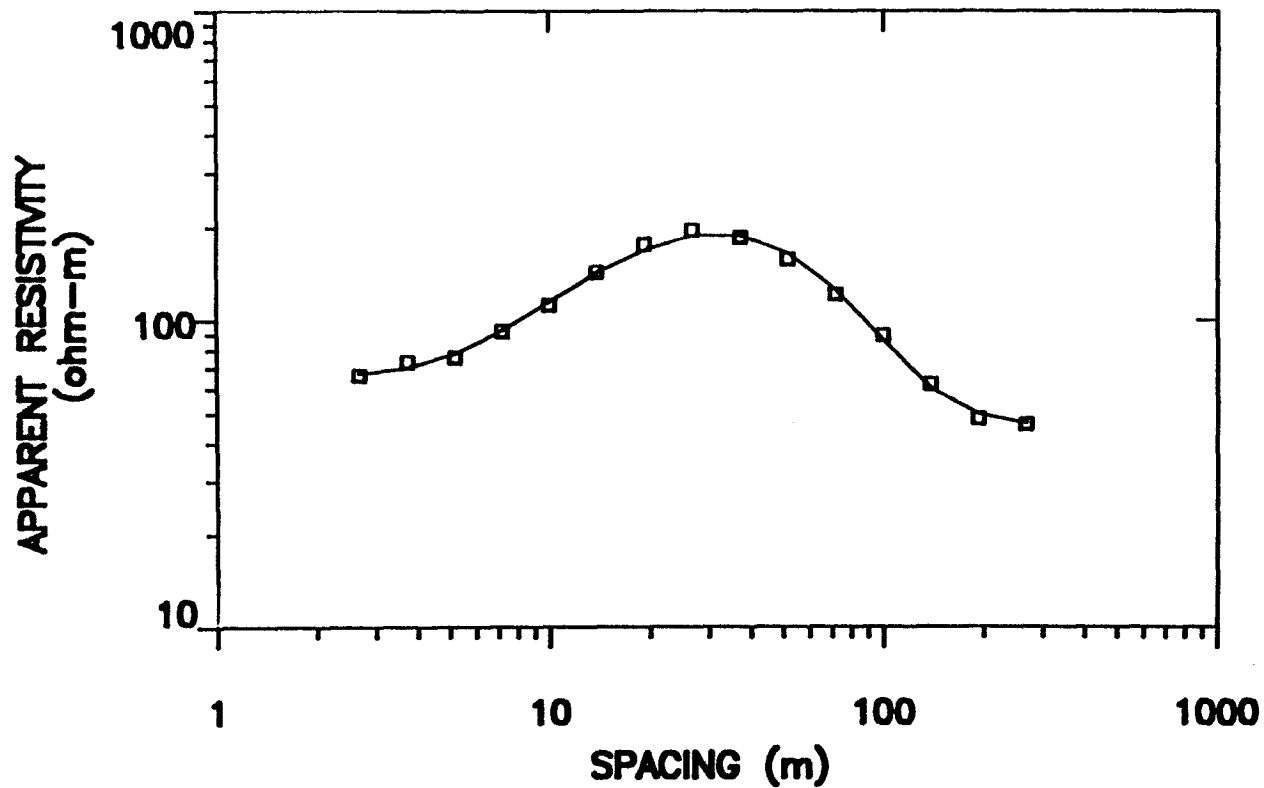
S.E.V. 24

Fecha 28-01-91 Rumbo AB N-80°-E

PERFIL VIII

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 24VIII	Date: 91	Azimuth: N-80-E
Equipment: ADARO	Sounding: 24-8	

DATA SET: 25IX

CLIENT: ITGE	DATE: 91
LOCATION: BULLAS	SOUNDING: 25IX
COUNTY: (MU)	AZIMUTH: N-63-E
PROJECT: SEGURA	EQUIPMENT: ADARO
ELEVATION: 645.00	
SOUNDING COORDINATES: X: 616975.0000 Y: 4211000.0000	

Schlumberger Configuration

FITTING ERROR: 2.583 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				645.0	
1	49.67		0.783	644.2	0.0157
2	227.2		26.31	617.9	0.115
3	53.25		45.75	572.1	0.859
4	38.75		274.8	297.3	7.09
5	4.70				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	109.0	106.7	2.09
2	3.73	127.0	127.9	-0.745
3	5.18	146.0	149.2	-2.20
4	7.20	164.0	169.0	-3.07
5	10.00	186.0	185.7	0.158
6	13.90	208.0	197.7	4.94
7	19.30	206.0	203.1	1.39
8	26.80	194.0	199.3	-2.75
9	37.30	184.0	182.9	0.596
10	51.80	148.0	152.6	-3.11
11	72.00	115.0	114.2	0.689
12	100.0	83.00	80.06	3.53
13	139.0	56.00	57.99	-3.57
14	193.0	47.00	46.44	1.18

PARAMETER RESOLUTION MATRIX:
"F" INDICATES FIXED PARAMETER

*

ADARO

*

P 1	0.64								
P 2	-0.01	1.00							
P 3	-0.03	0.00	0.92						
P 4	0.01	0.00	0.01	0.94					
P 5	0.00	0.00	-0.01	0.02	0.00				
T 1	-0.38	-0.01	-0.03	0.01	0.00	0.59			
T 2	0.02	0.00	0.03	-0.01	0.00	0.03	0.99		
T 3	0.01	0.00	0.14	0.16	0.00	0.02	-0.04	0.07	
T 4	-0.01	0.00	-0.07	0.14	0.01	-0.01	0.02	-0.01	0.05
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4

*

ADARO

*

DATA SET: 25IX

CLIENT: ITGE DATE: 91
LOCATION: BULLAS SOUNDING: 25IX
COUNTY: (MU) AZIMUTH: N-63-E
PROJECT: SEGURA EQUIPMENT: ADARO
ELEVATION: 645.00
SOUNDING COORDINATES: X: 616975.0000 Y: 4211000.0000

Schlumberger Configuration

FITTING ERROR: 6.450 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				645.0	
1	39.42		0.651	644.3	0.0165
2	241.3		17.24	627.1	0.0714
3	96.22		54.65	572.4	0.568
4	23.35		112.1	460.2	4.80
5	4.44				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	DATA	PA (ohm-m)	DIFFERENCE (percent)
			SYNTHETIC	
1	2.68	109.0	104.6	4.03
2	3.73	127.0	126.9	0.0396
3	5.18	146.0	149.7	-2.54
4	7.20	164.0	171.3	-4.47
5	10.00	186.0	189.3	-1.92
6	13.90	208.0	201.9	2.90
7	19.30	206.0	205.5	0.222
8	26.80	194.0	197.4	-1.75
9	37.30	184.0	176.2	4.21
10	51.80	148.0	146.2	1.17
11	72.00	115.0	114.9	0.0635
12	100.0	83.00	86.77	-4.54
13	139.0	56.00	61.23	-9.34
14	193.0	47.00	39.16	16.66
15	268.0	21.00	22.91	-9.13

PARAMETER RESOLUTION MATRIX:

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ADARO

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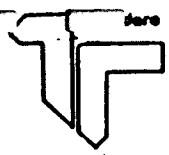
"F" INDICATES FIXED PARAMETER

P 1	0.42																			
P 2	0.07	0.85																		
P 3	-0.01	0.02	0.58																	
P 4	0.00	-0.01	-0.02	0.25																
P 5	0.00	0.00	-0.02	0.05	0.02															
T 1	-0.41	-0.08	0.02	-0.01	0.00	0.40														
T 2	-0.06	0.15	0.30	0.01	0.00	0.07	0.34													
T 3	0.02	-0.05	0.18	0.22	0.04	-0.02	0.03	0.58												
T 4	0.00	0.00	-0.07	0.17	0.05	0.00	0.01	0.15	0.15											
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4											

ADARO

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Proyecto:
 Zona: *Bullas - Murcia*
 Observador: *Juan C. Cuartinez*
 Situación:

OOR ADA
 X *616975*
 Y *4211000*
 Z *645*

m: *1 de -05*
 mA: *6E0-32P*

bo A
N-63°-E

S.E.V. *25*

Perfil: *IX*

(25)

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	$\rho(\Omega m)$	MN	I (mA)	Esc. Volt.	V (mV)	$\rho(\Omega m)$	OBSERVACIONES	1 m	10 m	50 m	100 m
1	2.68	1	300	2V	1500	109							21.78			
2	3.73		355	"	1050	127							42.92			
3	6.18		380	1V	665	146							83.51			
4	7.2		355	"	360	164							182.1			
6	10		640	"	380	186							313.4			
8	13.9		390	300mV	134	208							606.2			
7	19.3		460	100mV	81	206							1.189	109.2		
8	28.8		360	"	31	194							2.256	217.8		
9	37.3		350	30mV	14.7	184							4.370	429.2		
10	51.8		500	10mV	8.8	148	10	500	100mV	87	145		8.429	835.1		
11	72	10	480	100mV	34.2	115							16.290	1.821		
12	100		780	30mV	20.7	83							31.420	3.134		
13	139		780	"	7.25	56							60.700	6.062	1.175	
14	193		840	10mV	3.4	47								11.890	2.301	
15	268		505	3mV	0.475	21								22.560	4.474	
16	373													43.700	8.702	4.292
17	618													84.290	16.820	8.351
18	720													182.900	32.530	16.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.690														451.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA: *22-01-91*

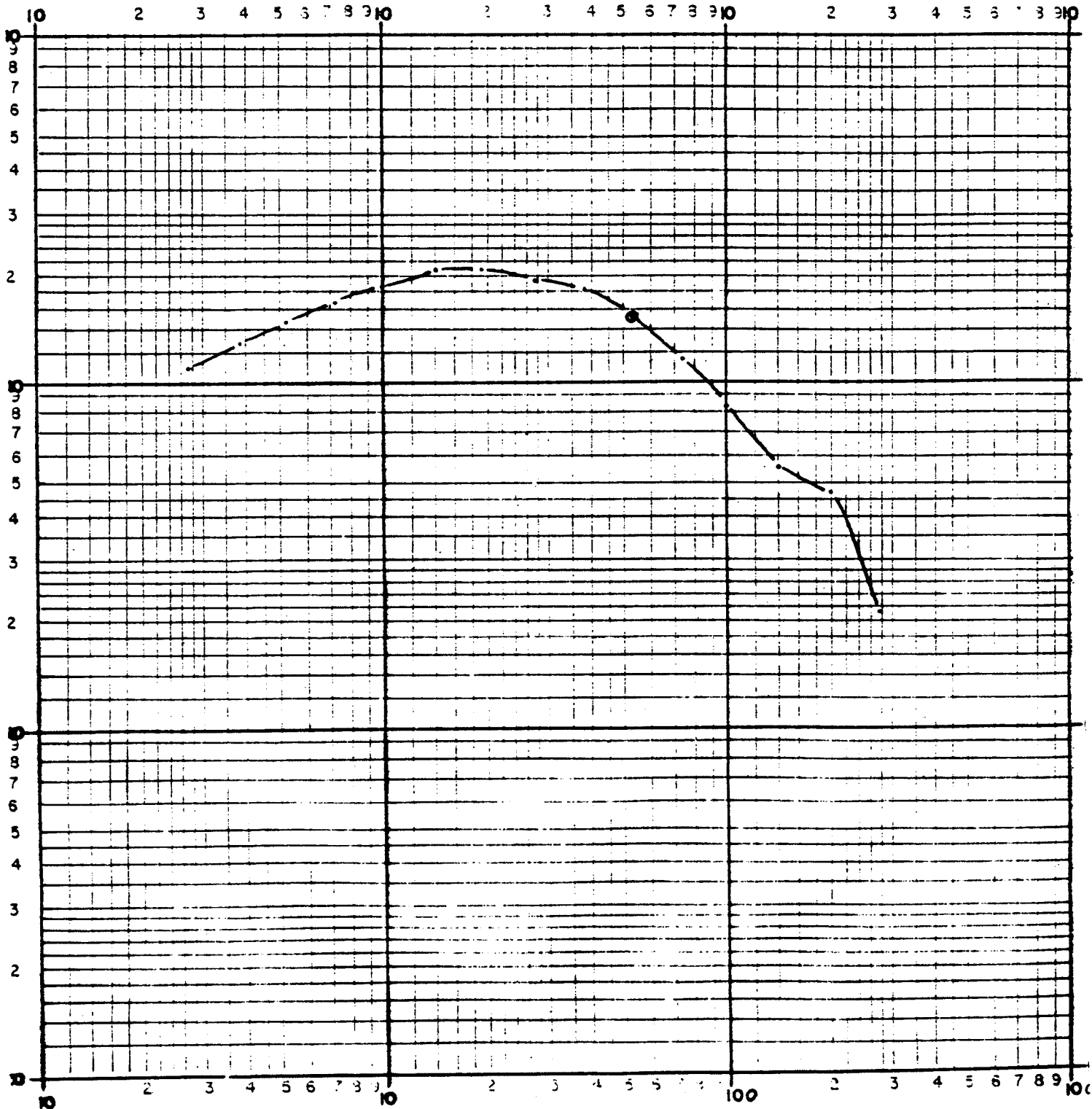


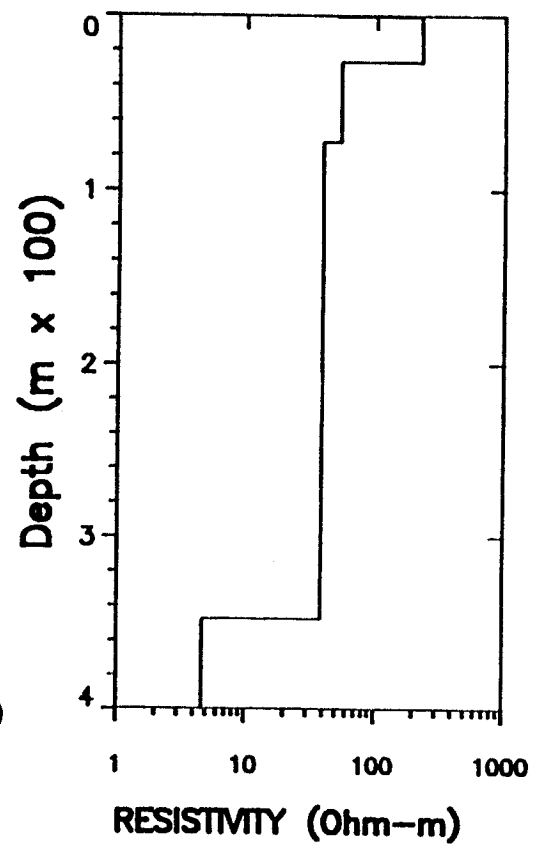
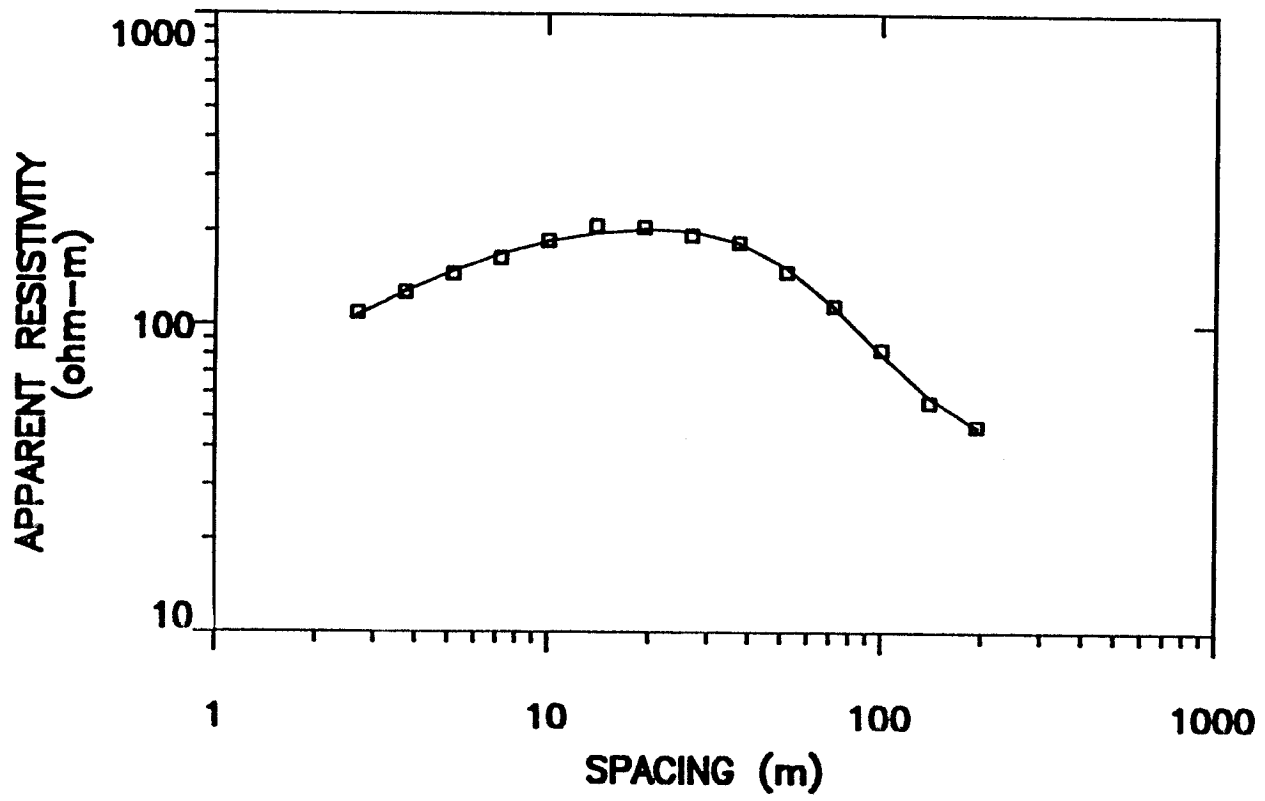
Departamento de Geofísica

Estudio *Bullay - Murcia* S.E.V. *25*

Fecha *22-01-91* Rumbo AB *N-63-E* PERFIL *IX*

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 25IX	Date: 91	
Equipment: ADARO	Sounding: 25IX	Azimuth: N-63-E

DATA SET: 26IX

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 640.00
 SOUNDING COORDINATES: X: 616925.0000 Y: 4210200.0000

DATE: 91
 SOUNDING: 26IX
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 4.195 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
1	150.9		3.47	640.0	
2	31.03		1.90	636.5	0.0229
3	572.2		3.40	634.6	0.0615
4	72.04		44.43	631.2	0.00596
5	173.9		46.67	586.7	0.616
6	3.15			540.0	0.268

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	138.0	144.6	-4.79
2	3.73	137.0	137.1	-0.117
3	5.18	137.0	125.4	8.42
4	7.20	112.0	112.9	-0.820
5	10.00	100.0	107.5	-7.58
6	13.90	115.0	112.9	1.74
7	26.80	129.0	125.9	2.38
8	37.30	125.0	120.0	3.96
9	51.80	105.0	108.0	-2.87
10	72.00	92.00	96.38	-4.76
11	100.0	91.00	88.75	2.47
12	139.0	83.00	81.44	1.87
13	193.0	67.00	67.67	-1.00

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

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ADARO

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P 1	0.38										
P 2	0.03	0.39									
P 3	0.00	0.09	0.32								
P 4	-0.01	-0.05	0.18	0.66							
P 5	0.00	0.00	-0.05	0.15	0.43						
P 6	0.00	0.00	0.00	0.00	0.02	0.00					
T 1	0.15	0.10	-0.04	0.04	0.01	0.00	0.45				
T 2	-0.01	-0.37	-0.09	0.05	0.00	0.00	-0.05	0.36			
T 3	0.00	0.06	0.30	0.18	-0.04	0.00	-0.04	-0.06	0.29		
T 4	0.00	0.01	0.02	-0.16	0.06	0.01	-0.01	-0.01	0.02	0.11	
T 5	0.00	0.00	-0.03	0.08	0.38	0.02	0.00	0.00	-0.03	0.08	
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4	

SECOND PART OF RESOLUTION MATRIX:

T 5	0.35
	T 5

DATA SET: 261X

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 640.00
 SOUNDING COORDINATES: X: 616925.0000 Y: 4210200.0000

DATE: 91
 SOUNDING: 261X
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 12.701 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
1	144.9		2.65	640.0	
2	96.94		6.10	637.3	0.0183
3	248.9		4.21	631.2	0.0630
4	106.5		84.10	627.0	0.0169
5	4.29			542.9	0.789

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	138.0	140.1	-1.53
2	3.73	137.0	135.1	1.36
3	5.18	137.0	129.0	6.53
4	7.20	112.0	121.0	-8.10
5	10.00	114.0	117.6	-3.19
6	13.90	115.0	119.4	-3.82
7	19.30	141.0	123.9	12.10
8	26.80	129.0	126.3	2.03
9	37.30	125.0	123.8	0.888
10	51.80	105.0	117.1	-11.55
11	72.00	92.00	107.3	-16.69
12	100.0	91.00	93.94	-3.23
13	139.0	83.00	74.55	10.18
14	193.0	67.00	49.69	25.82
15	268.0	21.00	26.03	-23.99

PARAMETER RESOLUTION MATRIX:

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ADARO

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"F" INDICATES FIXED PARAMETER

P 1	0.82																			
P 2	0.09	0.68																		
P 3	-0.02	0.14	0.16																	
P 4	-0.01	0.01	0.14	0.82																
P 5	0.00	0.00	0.00	-0.01	0.02															
T 1	0.12	0.09	-0.04	0.01	0.00	0.10														
T 2	0.02	-0.20	-0.08	0.04	0.00	0.03	0.10													
T 3	-0.01	0.07	0.10	0.11	0.00	-0.02	-0.04	0.07												
T 4	0.00	-0.02	-0.06	0.12	0.09	0.03	0.05	-0.02	0.35											
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4											



Proyecto:

Zona: Bullay - Murcia

Observador: Juan Cu. Cuatrecasas

Situación:

COORDENADAS
 X 616925
 Y 4210200
 Z 640

mV: Adaro - 01
 mA: GE0 N: 328

munibo Aa
E-W

S.E.V. 26

Perfil: IX

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	OBSERVACIONES	1 m	10 m	50 m	100 m
1	2.68	1	300	3V	1900	138							21.78			
2	3.73		180	1V	575	137							42.92			
3	5.18		210	"	345	137							83.51			
4	7.2		275	"	190	112							182.1			
5	10		372	300mv	135	114							313.4			
6	13.9		310	100mv	70	115							606.2			
7	19.3		238	"	29	141							1.189	109.2		
8	26.8		455	"	26	129							2.256	217.8		
9	37.3		440	300mv	12.6	125							4.370	429.2		
10	51.8		380	100mv	4.6	102	10	380	100mv	49	108		8.429	836.1		
11	72		360	"	2.0	90		355	"	20.5	94		16.290	1.621		
12	100	10	450	300mv	13.1	91							31.420	3.134		
13	139		695	"	9.5	83							60.700	6.062	1.175	
14	193		300	300mv	1.71	67								11.890	2.301	
16	268		590	"	0.55	21								22.560	4.474	
18	373													43.700	8.702	4.292
17	518													84.290	16.820	8.351
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.680														461.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA: 22-01-91



Departamento de Geofísica

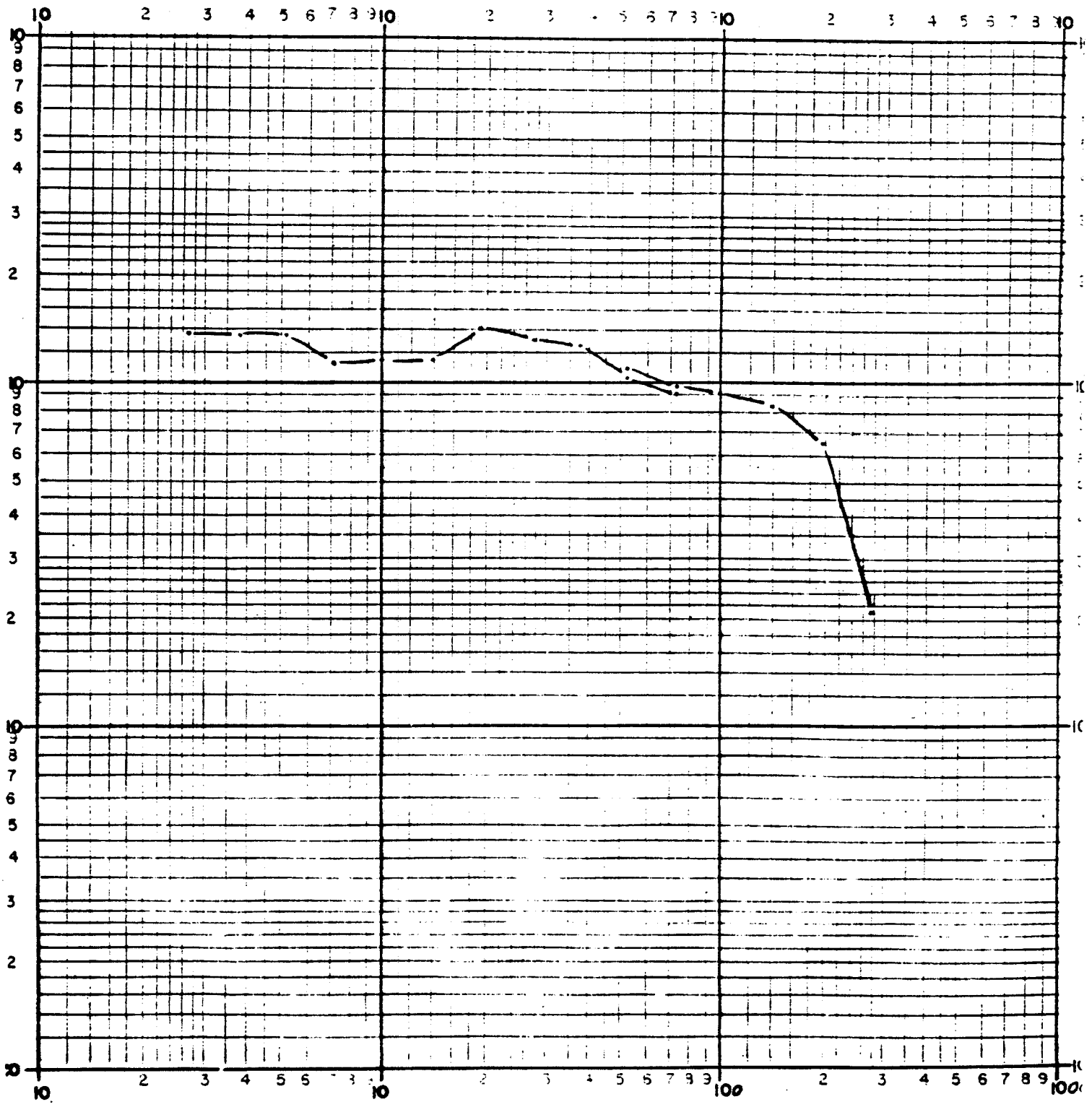
Estudio *Bullaf - Murcia*

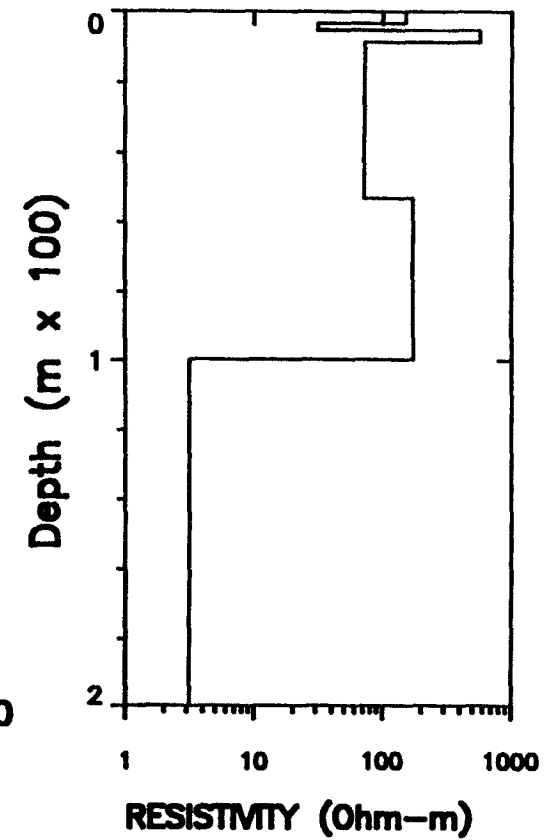
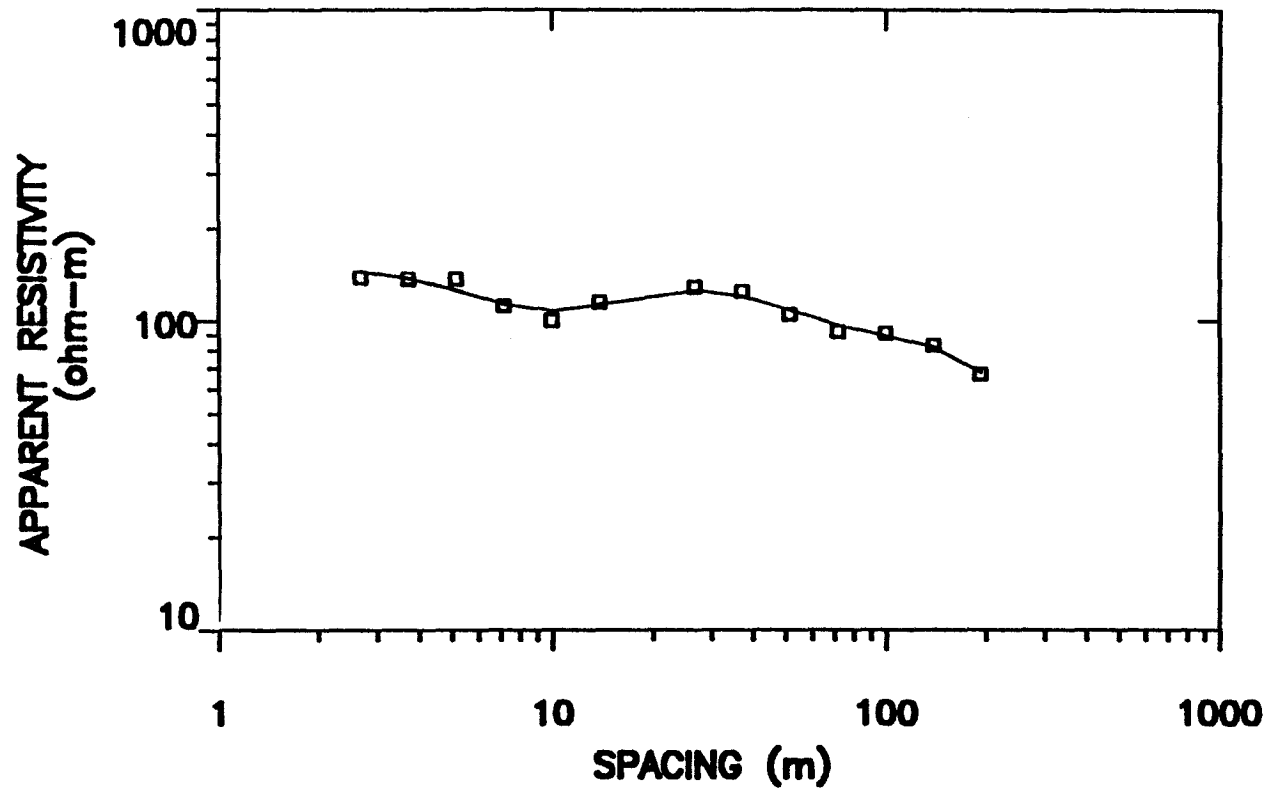
S.E.V. *26*

Fecha *22-01-91* Rumbo AB *E-W*

PERFIL *1X*

<p>Interpretación</p>	<p>Observaciones:</p>
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 26IX	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 26IX	

DATA SET: 27X

CLIENT: ITGE DATE: 91
LOCATION: BULLAS SOUNDING: 27X
COUNTY: (MU) AZIMUTH: E-W
PROJECT: SEGURA EQUIPMENT: ADARO
ELEVATION: 615.00
SOUNDING COORDINATES: X: 617900.0000 Y: 4210200.0000

Schlumberger Configuration

FITTING ERROR: 2.248 PERCENT

#	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
1	84.88		1.69	615.0	
2	26.20		12.45	613.3	0.0199
3	41.38			600.8	0.475

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	65.00	65.43	-0.668
2	3.73	53.00	52.94	0.0950
3	5.18	42.00	41.08	2.17
4	7.20	32.50	33.15	-2.00
5	10.00	29.00	29.55	-1.92
6	13.90	29.00	29.69	1.06
7	19.30	30.00	29.37	2.09
8	26.80	31.50	31.10	1.26
9	37.30	33.00	33.42	-1.28
10	51.80	34.00	35.73	-5.10
11	72.00	39.50	37.66	4.63
12	100.0	39.00	39.09	-0.240
13	139.0	40.00	40.04	-0.123
14	193.0	40.50	40.63	-0.338

PARAMETER RESOLUTION MATRIX:

"F" INDICATES FIXED PARAMETER

P 1 1.00

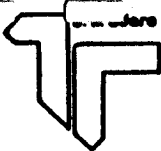
P 2 0.00 1.00

P 3	0.00	0.00	1.00		
T 1	0.00	0.00	0.00	1.00	
T 2	0.00	0.00	0.00	0.00	1.00
	P 1	P 2	P 3	T 1	T 2

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ADARO

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Proyecto:
 Zona: *Bullas Murcia*
 Observador:
 Situación:

COORDENADAS
 X *617.900*
 Y *4212.400*
 Z *615 m*

m V:
m A:

Combo AL

E-W

S.E.V.

27

Perfil:

X

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
SIMETRICO
MN

Estación	AB/2	MN	I (mA)	Exc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Exc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m	
1	2.68	<i>1</i>	<i>110</i>	<i>100mv</i>	<i>330</i>	<i>65</i>							21.78				
2	3.73		<i>105</i>	<i>200mv</i>	<i>130</i>	<i>53</i>							42.92				
3	5.18		<i>110</i>	<i>100mv</i>	<i>80.55</i>	<i>42</i>							83.51				
4	7.2		<i>115</i>	<i>"</i>	<i>23</i>	<i>32.5</i>							182.1				
5	10		<i>97</i>	<i>20mv</i>	<i>9</i>	<i>29</i>							313.4				
6	13.9		<i>105</i>	<i>10mv</i>	<i>5</i>	<i>29</i>							606.2				
7	19.3		<i>115</i>	<i>"</i>	<i>3</i>	<i>30</i>	<i>10</i>	<i>115</i>	<i>100mv</i>	<i>31</i>	<i>29</i>		1.189	109.2			
8	26.8		<i>100</i>	<i>3mv</i>	<i>1.4</i>	<i>31.5</i>		<i>100</i>	<i>"</i>	<i>14</i>	<i>30.5</i>		2.258	217.8			
9	37.3		<i>100</i>	<i>"</i>	<i>0.75</i>	<i>32.0</i>		<i>113</i>	<i>10mv</i>	<i>8.6</i>	<i>133</i>		4.370	429.2			
10	51.8	<i>10</i>	<i>112</i>	<i>10mv</i>	<i>4.6</i>	<i>34.0</i>							8.429	836.1			
11	72		<i>115</i>	<i>"</i>	<i>2.8</i>	<i>39.5</i>							16.290	1.621			
12	100		<i>105</i>	<i>3mv</i>	<i>1.3</i>	<i>39</i>							31.420	3.134			
13	139		<i>120</i>	<i>"</i>	<i>0.8</i>	<i>40</i>							60.700	6.062	1.175		
14	193		<i>130</i>	<i>1mv</i>	<i>0.45</i>	<i>40.5</i>								11.690	2.301		
15	268													22.560	4.474		
16	373													43.700	8.702	4.292	
17	518													84.290	16.820	8.361	
18	720													162.900	32.530	16.210	
19	1.000														62.790	31.340	
20	1.390														121.400	60.620	
21	1.930														234.000	116.900	
22	2.680														451.200	225.800	
23	3.730															437.000	
24	5.180															842.890	
25	7.200															1.628.520	
26	10.000															3.141.510	

OBSERVACIONES:

FECHA:

18-1-91



Departamento de Geofísico

Estudio *Bullos - Brucia*

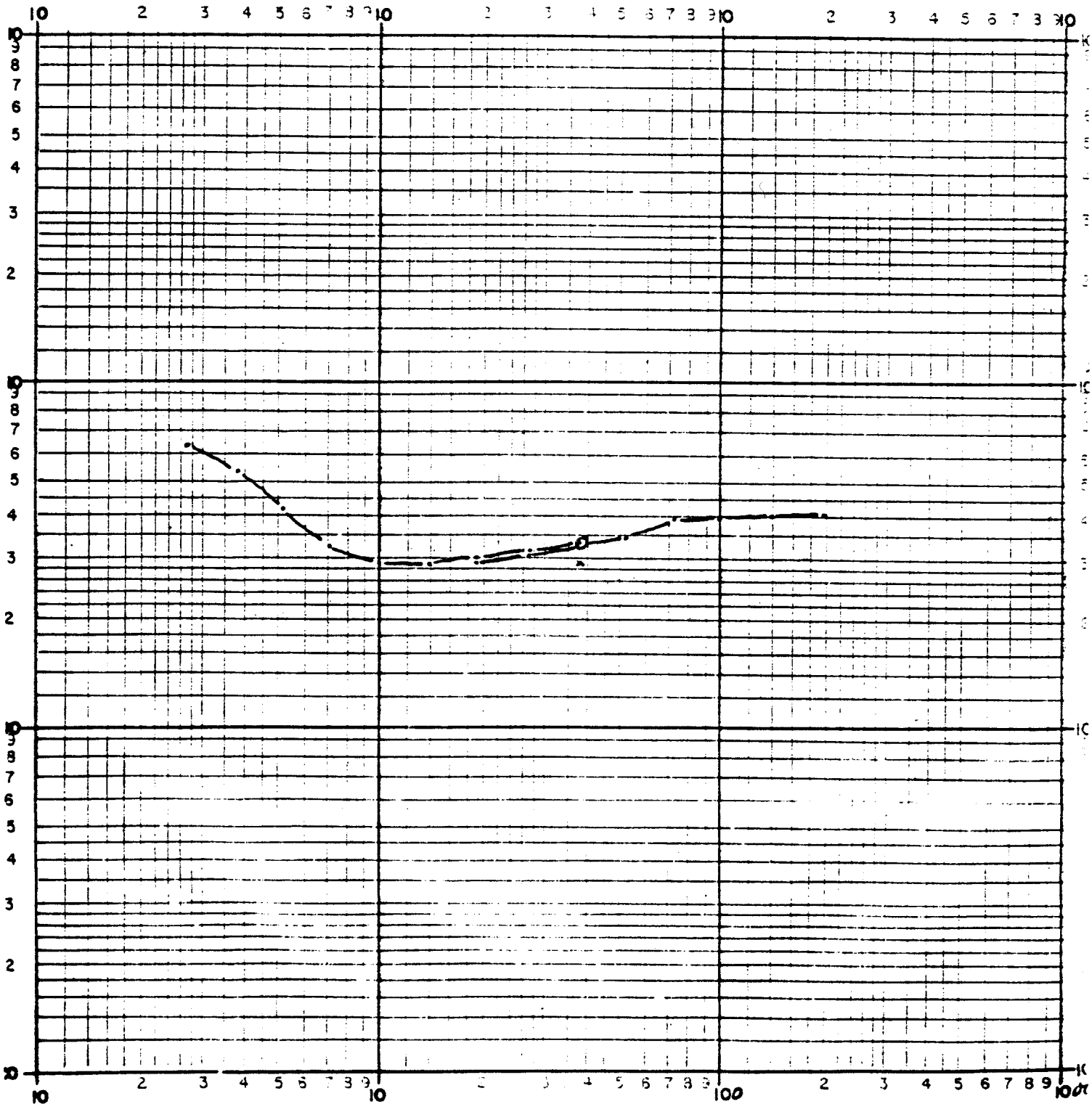
S.E.V. *27*

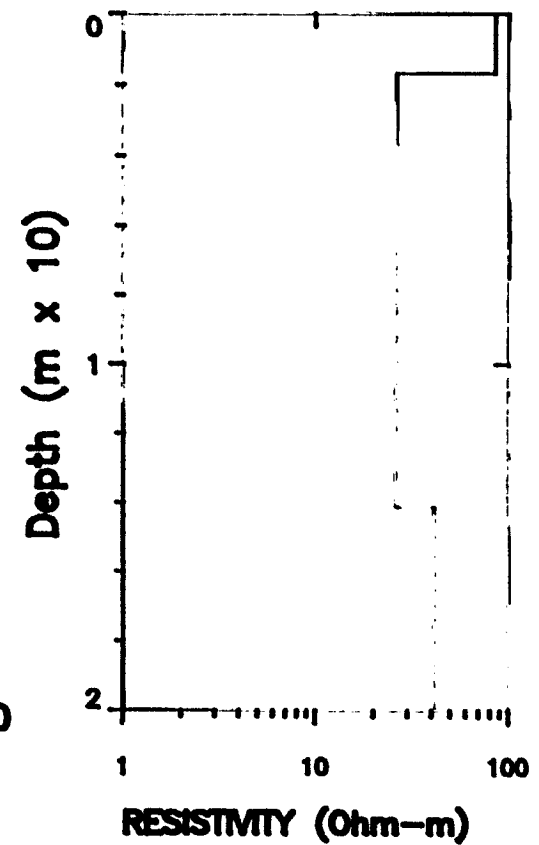
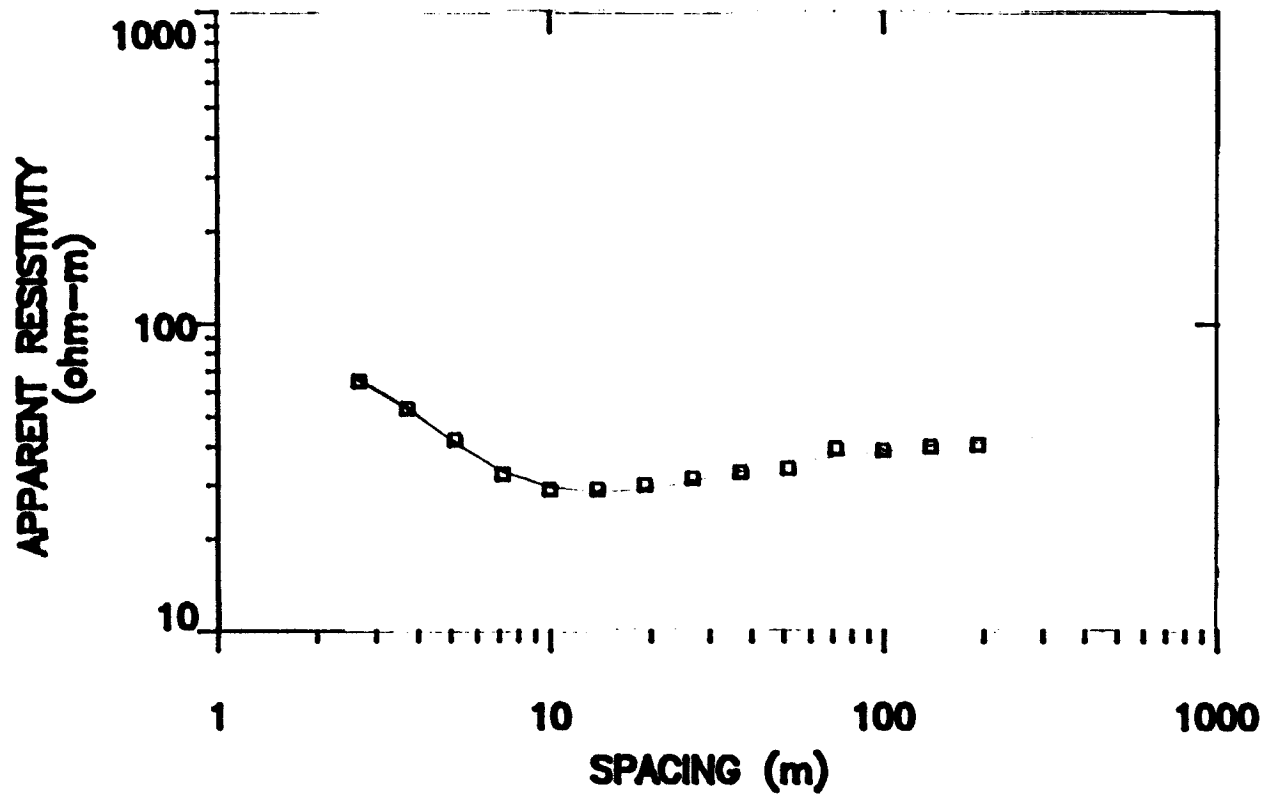
Fecha *18-01-91* Rumbo AB *E-W*

PERFIL *X*

Interpretación

Observaciones:





for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 27X	Date: 91	
Equipment: ADARO	Soundings: 27X	Azimuth: E-W

DATA SET: 28X

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA

DATE: 91
 SOUNDING: 28X
 AZIMUTH: E-W
 EQUIPMENT: ADARO

ELEVATION: 610.00

SOUNDING COORDINATES: X: 618300.0000 Y: 4211000.0000

Schlumberger Configuration

FITTING ERROR: 4.200 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				610.0	
1	40.75		1.24	608.7	0.0306
2	16.65		17.18	591.5	1.03
3	72.33		10.94	580.6	0.151
4	16.88		8.41	572.2	0.498
5	3.37		114.3	457.8	33.86
6	7.28				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	29.00	28.66	1.14
2	3.73	23.00	23.76	-3.31
3	5.18	21.00	20.24	3.59
4	7.20	18.00	18.39	-2.19
5	10.00	18.00	17.71	1.55
6	13.90	18.00	17.78	1.20
7	26.80	19.00	19.89	-4.71
8	37.30	21.00	21.42	-2.02
9	51.80	22.00	21.82	0.807
10	72.00	21.00	19.83	5.53
11	100.0	16.00	15.44	3.46
12	139.0	9.30	10.30	-10.76
13	193.0	7.00	6.65	4.95
14	268.0	5.20	5.26	-1.32

PARAMETER RESOLUTION MATRIX:

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ADARO

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"F" INDICATES FIXED PARAMETER

P 1	0.92										
P 2	-0.01	0.99									
P 3	0.00	0.00	0.52								
P 4	0.00	0.00	0.10	0.02							
P 5	0.01	0.01	0.01	0.00	0.81						
P 6	-0.01	0.00	-0.01	0.00	0.19	0.30					
T 1	0.08	0.02	0.00	0.00	-0.01	0.01	0.91				
T 2	-0.03	-0.01	-0.07	0.01	0.04	-0.04	0.03	0.95			
T 3	0.00	0.00	0.47	0.09	0.03	-0.03	0.00	0.06	0.45		
T 4	0.00	0.00	0.08	0.02	0.01	-0.02	0.00	0.03	0.08	0.02	
T 5	0.01	0.00	0.02	0.00	-0.22	-0.23	-0.01	0.03	0.03	0.01	
	P 1	P 2	P 3	P 4	P 5	P 6	T 1	T 2	T 3	T 4	

SECOND PART OF RESOLUTION MATRIX:

T 5	0.20
	T 5



Proyecto:
 Zona: Bullas - Murcia
 Observador: Juan de Cuatrecasas
 Situación:

COORDENADA
 X 618300
 Y 4211000
 Z 610

mV: Activo - at
 mA: 660 N° 528
 S.E.V. 28

abo E-W
 Perfil: X'

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	OBSERVACIONES	1 m	10 m	50 m	100 m	
1	2.68	1	270	10	360	29							21.78				
2	3.73		470	3000	255	23							42.92				
3	6.18		470	"	117	21							83.51				
4	7.2		360	1000	40	18							182.1				
5	10		395	"	22	18							313.4				
6	13.9		380	3000	11	18							606.2				
7	19.3		sobre la carretera de asfalto.										1.189	109.2			
8	26.8		660	1000	5.2	18	10	650	1000	59	20		2.256	217.8			
9	37.3		595	"	3.7	20		600	"	30.5	22		4.370	429.2			
10	51.8	10	295	"	7.8	22							8.429	836.1			
11	72		270	"	3.5	21							16.290	1.621			
12	100		570	"	3.0	16							31.420	3.134			
13	138		750	3000	1.15	9.3							60.700	6.062	1.175		
14	193		665	"	0.40	7								11.690	2.301		
15	268		650	"	0.15	5.2								22.560	4.474		
16	373													43.700	8.702	4.292	
17	518													84.290	16.820	8.361	
18	720													162.900	32.530	16.210	
19	1.000														62.790	31.340	
20	1.390														121.400	60.620	
21	1.930														234.000	116.900	
22	2.680														451.200	225.600	
23	3.730															437.000	
24	5.180															842.880	
25	7.200															1.628.520	
26	10.000															3.141.510	

OBSERVACIONES:

FECHA: 28-01-91

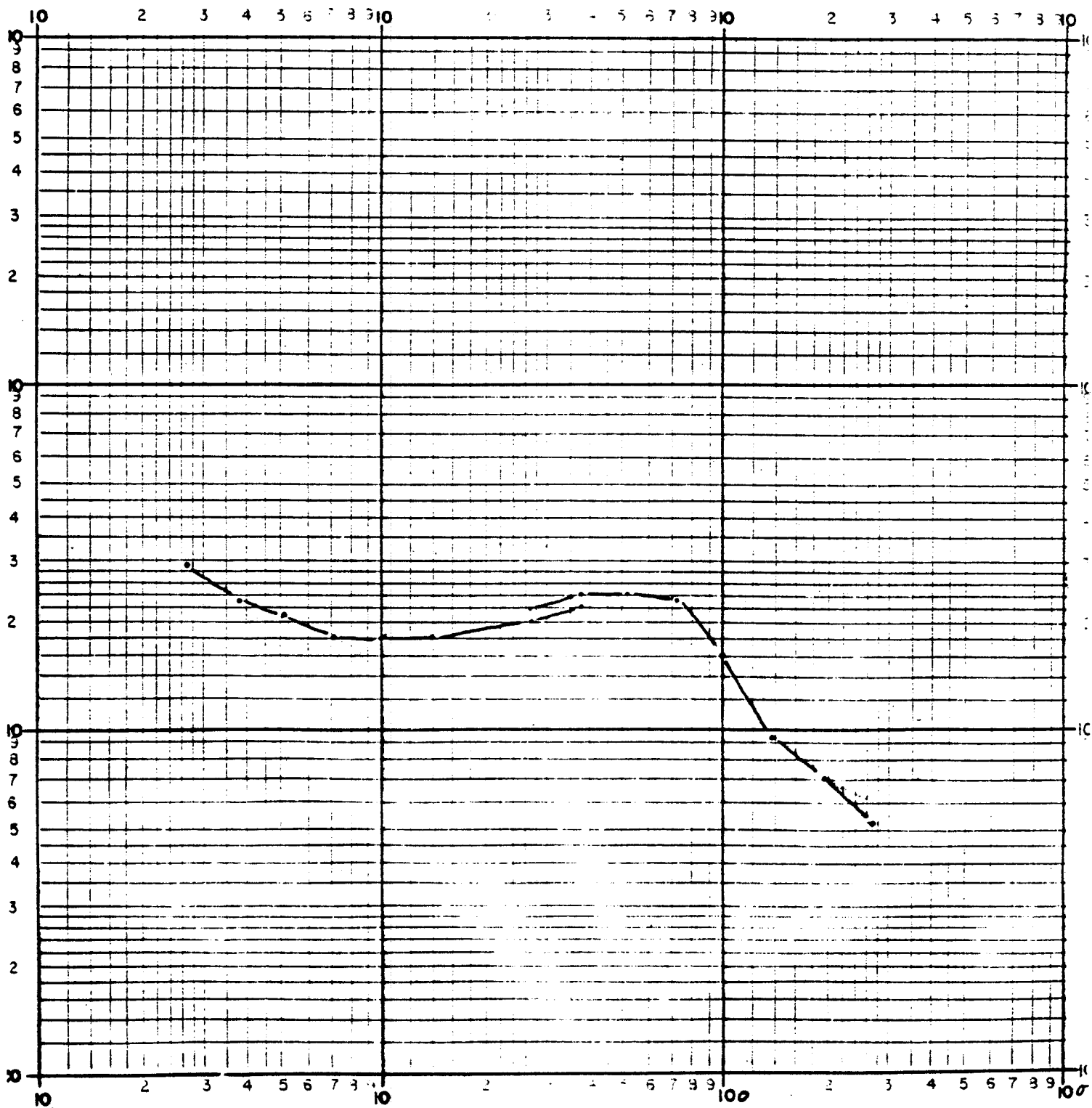


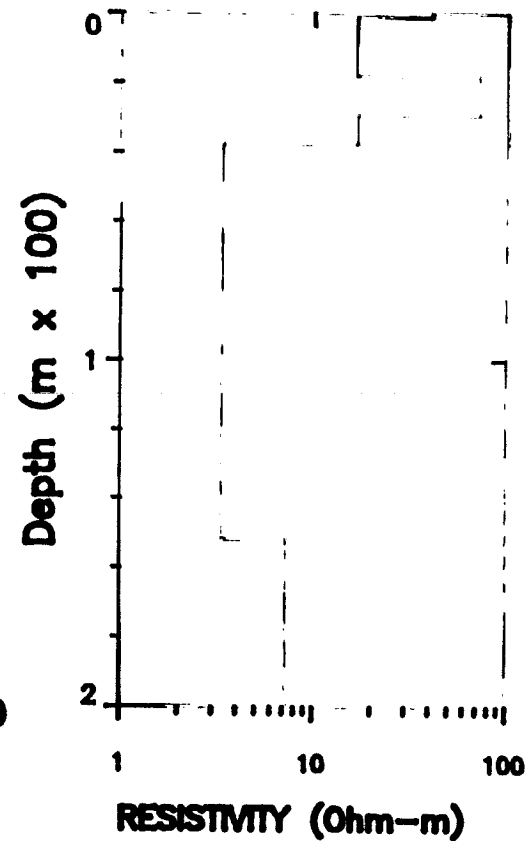
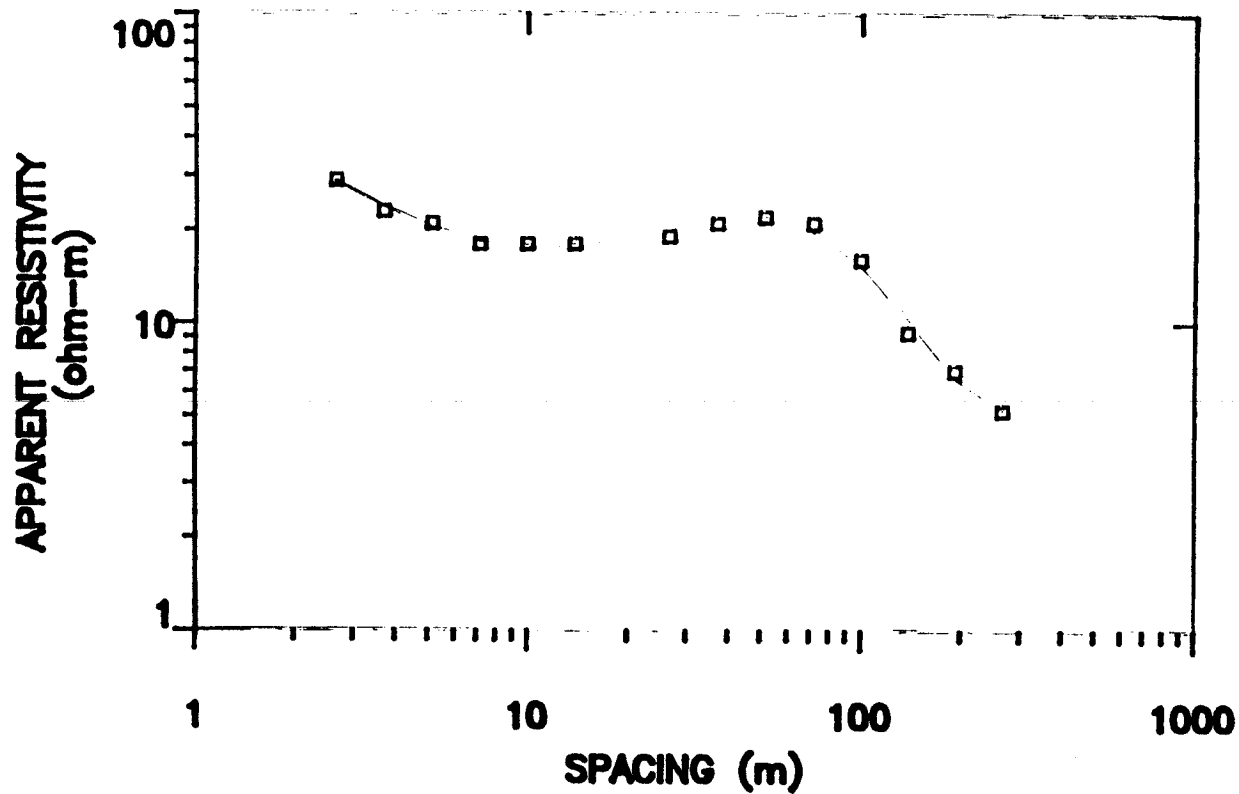
Departamento de Geofísica

Estudio *Bullay - Murcia* S.E.V. *28*

Fecha *22-01-91* Rumbo AB *E-W* PERFIL *X*

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		
Date Set: 28X	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 28X	

DATA SET: 29X

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 603.00
 SOUNDING COORDINATES: X: 618150.0000 Y: 4210125.0000

DATE: 91
 SOUNDING: 29X
 AZIMUTH: N-30-E
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 3.178 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
1	122.6		1.38	603.0	
2	22.99		7.20	601.6	0.0112
3	32.94		6.17	593.8	0.339
4	24.63		111.4	587.6	0.187
5	6.69			476.1	4.52

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	74.00	73.76	0.319
2	3.73	52.00	51.56	0.839
3	5.18	34.00	35.54	-4.53
4	7.20	30.00	27.87	7.09
5	10.00	25.00	25.59	-2.38
6	13.90	24.00	25.45	-6.07
7	19.30	27.00	25.95	3.37
8	26.80	27.00	26.33	2.45
9	37.30	26.00	26.23	-0.908
10	51.80	25.00	25.71	-2.85
11	72.00	25.00	24.92	0.297
12	100.0	24.00	23.79	0.872
13	139.0	22.00	21.93	0.282
14	193.0	19.00	18.98	0.0768
15	268.0	15.00	15.09	-0.641

PARAMETER RESOLUTION MATRIX:

* ADARO *

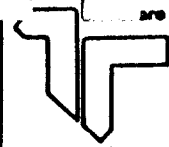
"F" INDICATES FIXED PARAMETER

P 1	0.96									
P 2	-0.02	0.98								
P 3	0.01	0.01	0.85							
P 4	0.00	0.00	0.02	0.99						
P 5	0.00	0.00	0.05	-0.03	0.38					
T 1	0.03	0.02	-0.01	0.00	0.00	0.98				
T 2	-0.05	-0.07	-0.17	0.04	0.07	0.05	0.29			
T 3	-0.01	-0.01	0.18	0.02	0.05	0.01	0.03	0.06		
T 4	0.01	0.01	-0.05	0.03	0.33	-0.01	-0.03	0.00	0.50	
	P 1	P 2	P 3	P 4	P 5	T 1	T 2	T 3	T 4	

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ADARO

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Proyecto:
 Zona: *Bullos - Prunía*
 Observador: *Juan La Martínez*
 Situación:

ORIGEN DAS
 X *618150*
 Y *4210125*
 Z *603*

mV. *dat. 01*
 mA: *GEO N° 328*

AP *N-30°E*

S.E.V. *29*

Perfil: *X*

CONSTANTES PARA DISPOSITIVO SCHULMBERGEN
 SIMETRICO
 MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ω m)	OBSERVACIONES	1 m	10 m	50 m	100 m
1	2,68	1	25	100uV	85	74							21,78			
2	3,73		34	"	41	52							42,92			
3	5,18		170	"	70	34							83,51			
4	7,2		215	"	40	30							182,1			
5	10		370	"	30	25							313,4			
6	13,9		480	30uV	19	24							606,2			
7	19,3		330	10uV	7,45	26	10	330	100uV	85	28		1,169	109,2		
8	26,8		340	"	5,9	28		340	"	44	28		2,256	217,8		
9	37,3	10	420	100uV	26,5	26							4,370	429,2		
10	51,8		335	30uV	10,2	25							8,429	836,1		
11	72		430	10uV	6,5	25							18,290	1,621		
12	100		585	"	4,4	24							31,420	3,134		
13	139		530	3uV	1,9	22							60,700	6,082	1,175	
14	193		590	"	0,95	19								11,690	2,301	
15	268		700	"	0,45	15								22,560	4,474	
16	373													43,700	8,702	4,292
17	518													84,290	16,820	8,351
18	720													182,900	32,530	16,210
19	1.000														62,790	31,340
20	1.390														121,400	60,620
21	1.930														234,000	116,900
22	2.680														461,200	226,600
23	3.730															437,000
24	5.180															842,880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA: *22-01-91*



Departamento de Geofísico

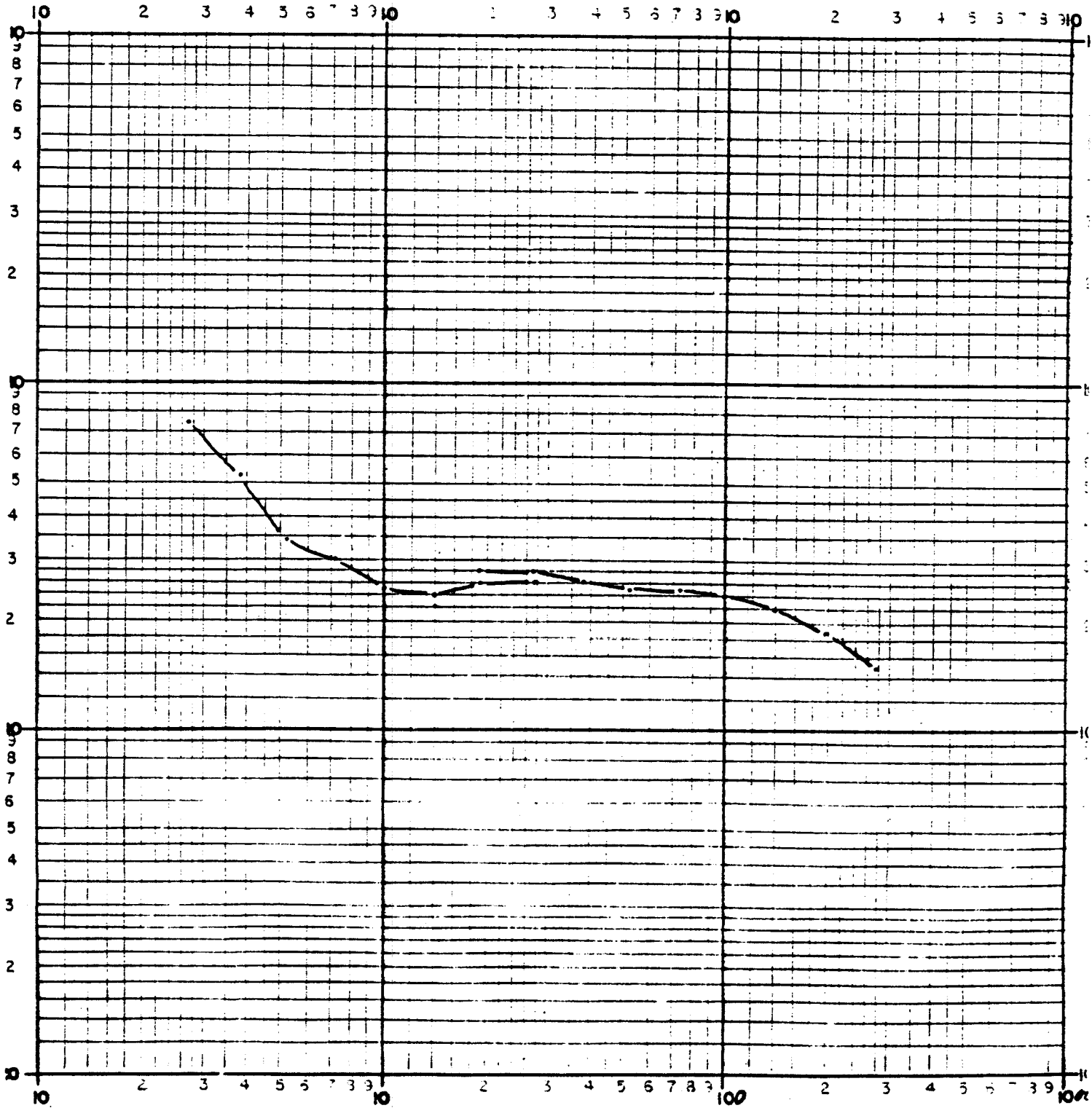
Estudio *Bulley - Murcia*

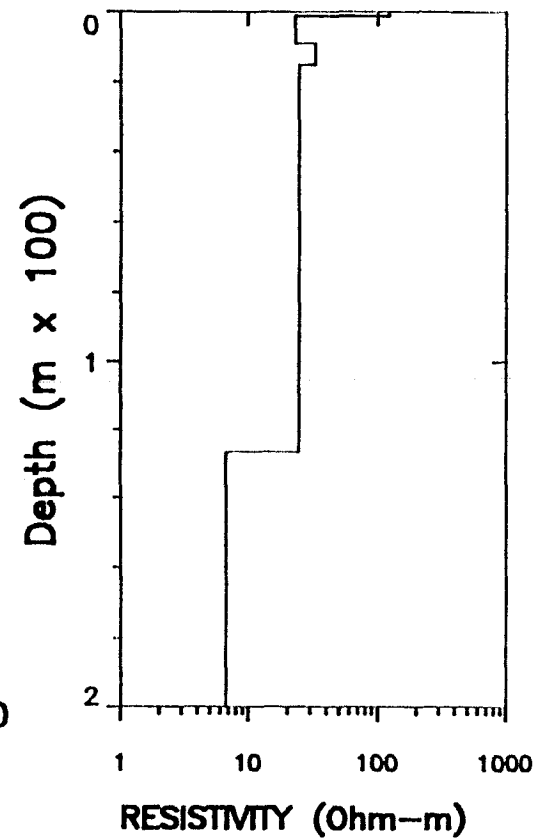
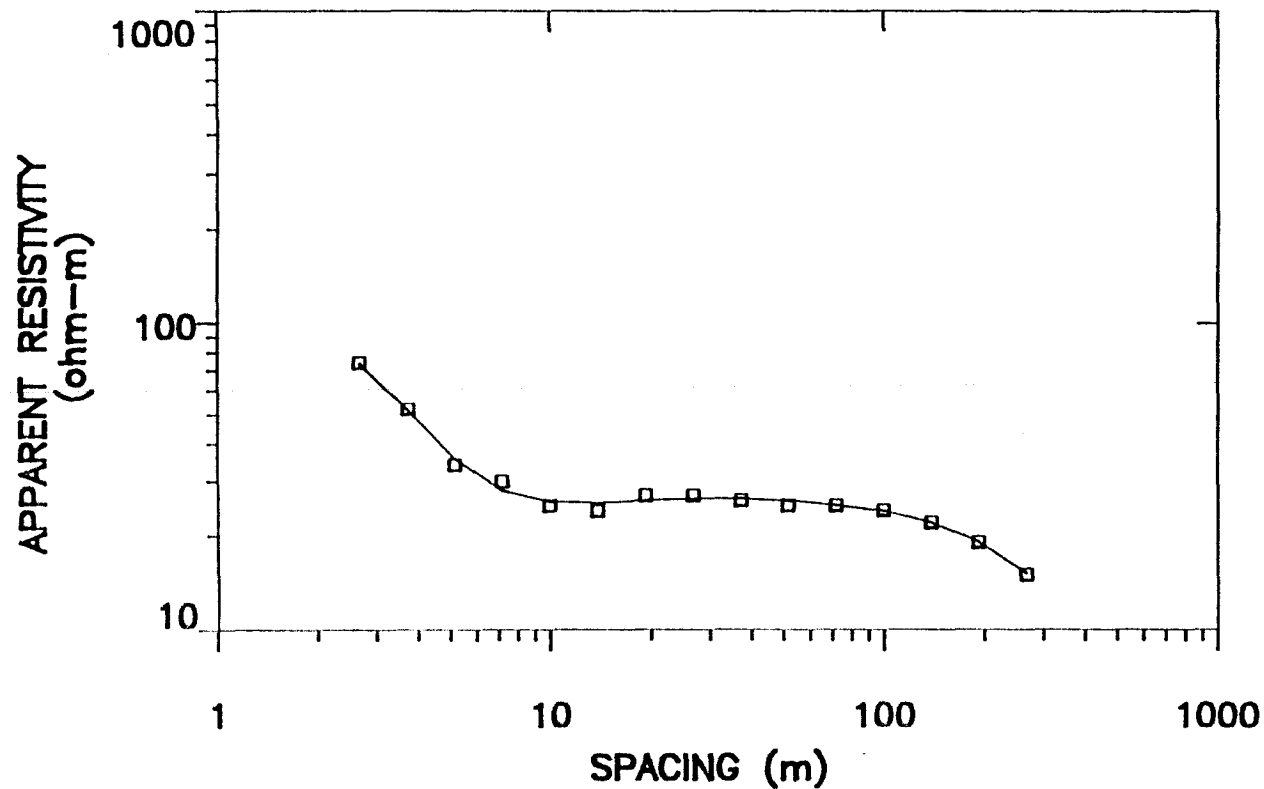
S.E.V. *29*

Fecha *22-11-91* Rumbo AB *N-30°-E*

PERFIL *X*

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 29X	Date: 91	
Equipment: ADARO	Sounding: 29X	Azimuth: N-30-E

DATA SET: 30XI

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 600.00
 SOUNDING COORDINATES: X: 618500.0000 Y: 4212440.0000

DATE: 91
 SOUNDING: 30XI
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 2.886 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				600.0	
1	53.41		1.36	598.6	0.0255
2	16.74		10.05	588.5	0.600
3	25.99		24.63	563.9	0.947
4	7.12				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	36.00	36.35	-0.977
2	3.73	29.00	28.47	1.82
3	5.18	22.50	22.52	-0.0900
4	7.20	19.00	19.37	-1.99
5	10.00	18.00	18.29	-1.65
6	13.90	19.00	18.31	3.59
7	19.30	19.50	18.93	2.88
8	26.80	19.00	19.68	-3.62
9	37.30	19.00	19.88	-4.64
10	51.80	19.50	18.81	3.49
11	72.00	17.00	16.27	4.24
12	100.0	12.50	12.96	-3.71
13	139.0	10.00	10.09	-0.984
14	193.0	8.50	8.40	1.15

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER
 P 1 1.00

RES	0.00	1.00							
RES	0.00	0.00	0.99						
RES	0.00	0.00	0.00	1.00					
RES	0.00	0.00	0.00	0.00	1.00				
RES	0.00	0.00	-0.01	0.00	0.00	0.97			
RES	0.00	0.00	0.01	0.00	0.00	0.03	0.98		
	P 1	P 2	P 3	P 4	T 1	T 2	T 3		

ADDED

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Proyecto:
 Zona: *Bullas Murcia*
 Observador:
 Situación:

COORDENADAS
 X 618.500
 Y 4212.440
 Z 600 m

mV:
 mA:

Radio de

E-W

S.E.V.

30

Perfil:

XI

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER
SIMETRICO
MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	P (Ωm)	OBSERVACIONES	1 m	10 m	50 m	100 m	
1	2.68	<i>1</i>	<i>110</i>	<i>30 mV</i>	<i>180</i>	<i>36</i>							21.78				
2	3.73		<i>105</i>	<i>100 mV</i>	<i>70</i>	<i>29</i>							42.92				
3	5.18		<i>115</i>	<i>"</i>	<i>31</i>	<i>22.5</i>							83.51				
4	7.2		<i>110</i>	<i>30 mV</i>	<i>13</i>	<i>19</i>							162.1				
5	10		<i>120</i>	<i>10 mV</i>	<i>7.1</i>	<i>18</i>							313.4				
6	13.9		<i>110</i>	<i>"</i>	<i>3.5</i>	<i>19</i>							606.2				
7	19.3		<i>120</i>	<i>"</i>	<i>2.0</i>	<i>19.5</i>	<i>10</i>	<i>120</i>	<i>100 mV</i>	<i>20.2</i>	<i>18</i>		1.169	109.2			
8	26.8		<i>115</i>	<i>3 mV</i>	<i>0.95</i>	<i>19.0</i>		<i>110</i>	<i>30 mV</i>	<i>10</i>	<i>19.0</i>		2.256	217.8			
9	37.3	<i>10</i>	<i>130</i>	<i>10 mV</i>	<i>5.8</i>	<i>19</i>							4.370	429.2			
10	51.8		<i>99</i>	<i>"</i>	<i>2.3</i>	<i>19.5</i>							8.429	835.1			
11	72		<i>105</i>	<i>3 mV</i>	<i>1.1</i>	<i>17</i>							16.290	1.621			
12	100		<i>120</i>	<i>"</i>	<i>0.475</i>	<i>12.5</i>							31.420	3.134			
13	139		<i>110</i>	<i>1 mV</i>	<i>0.18</i>	<i>10</i>							60.700	6.062	1.175		
14	193		<i>135</i>	<i>"</i>	<i>0.1</i>	<i>8.5</i>								11.690	2.301		
15	268													22.580	4.474		
16	373													43.700	8.702	4.292	
17	518													84.290	16.820	8.351	
18	720													162.900	32.530	16.210	
19	1.000														62.790	31.340	
20	1.300														121.400	60.620	
21	1.930														234.000	116.900	
22	2.680														451.200	226.600	
23	3.730															437.000	
24	5.180															842.880	
25	7.200															1.628.520	
26	10.000															3.141.510	

OBSERVACIONES:

FECHA:

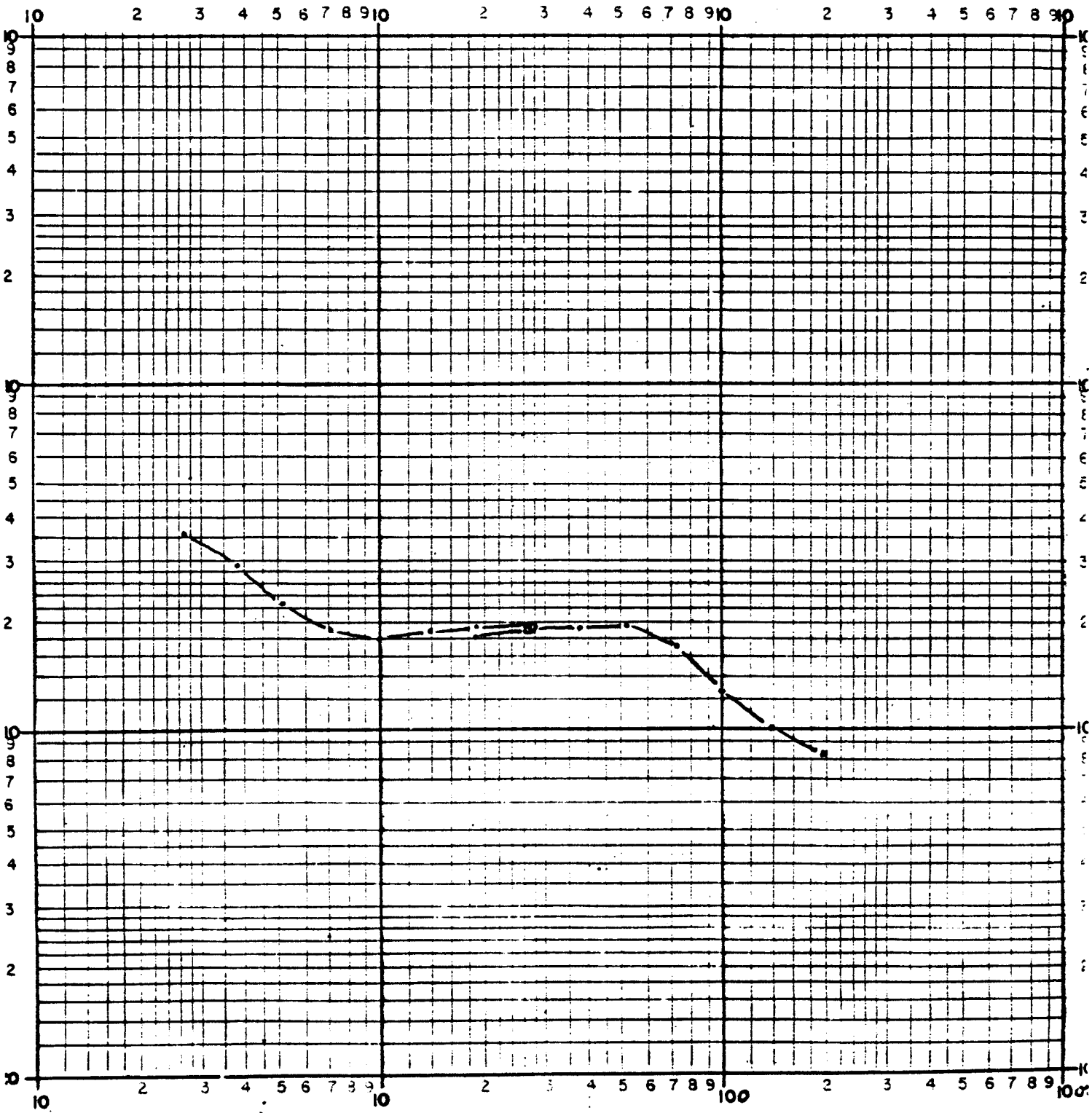


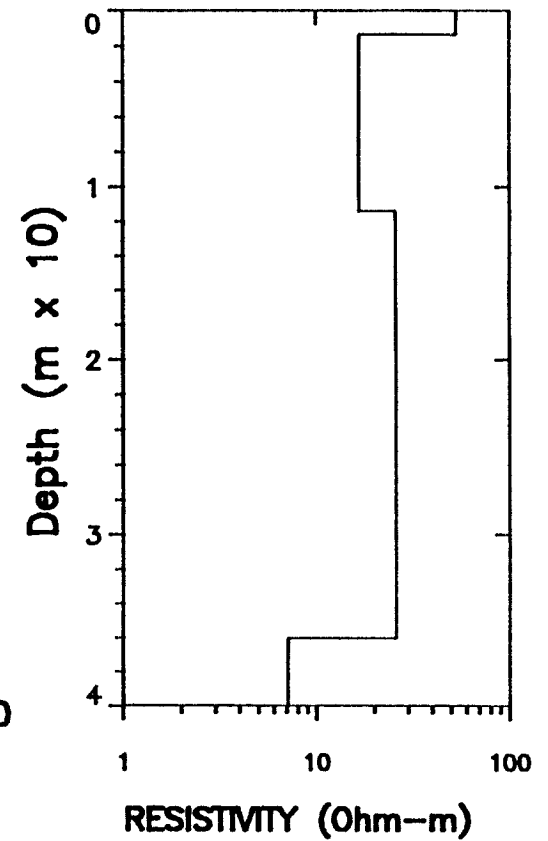
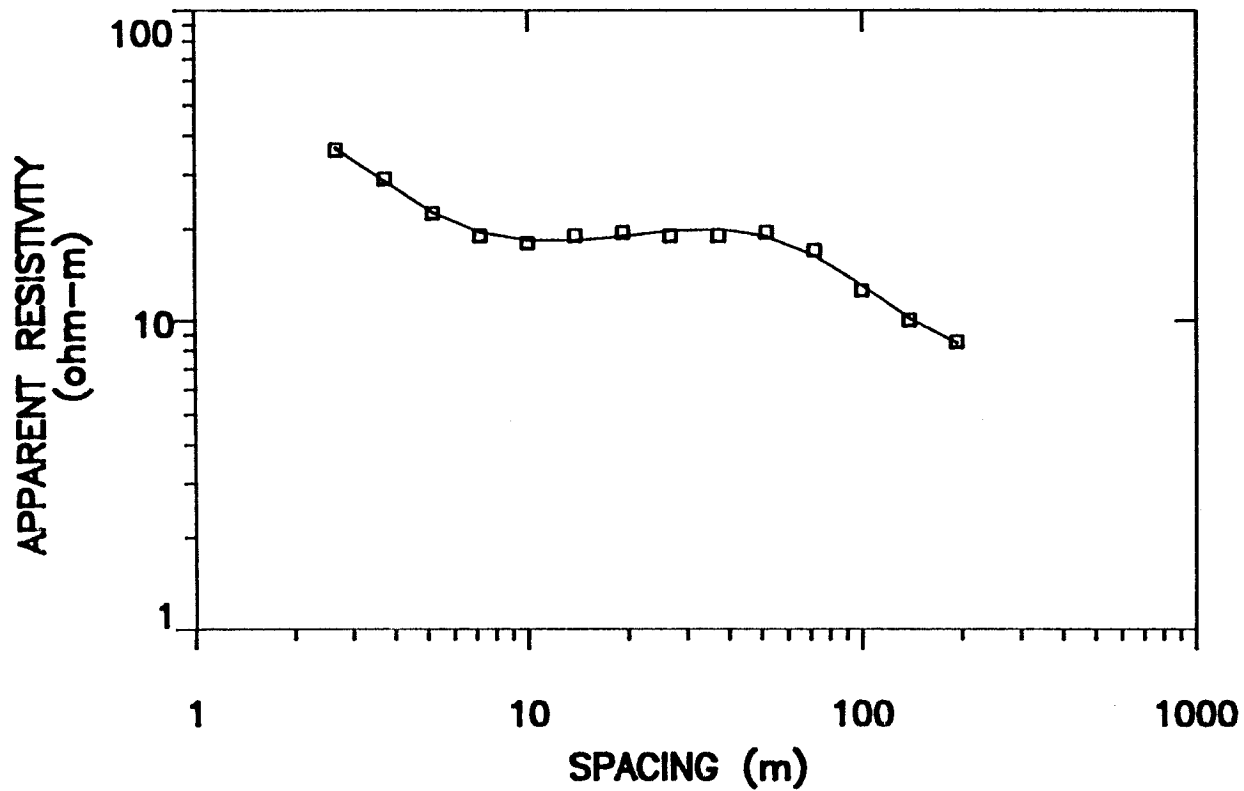
Departamento de Geofísica

Estudio Bullaf - Murcia S.E.V. 30

Fecha Rumbo AB E-W PERFIL XI

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 30XI	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 30XI	

DATA SET: 31XI

CLIENT: ITGE	DATE: 91
LOCATION: BULLAS	SOUNDING: 31XI
COUNTY: (MU)	AZIMUTH: E-W
PROJECT: SEGURA	EQUIPMENT: ADARO
ELEVATION: 590.00	
SOUNDING COORDINATES: X: 618810.0000 Y: 4211390.0000	

Schlumberger Configuration

FITTING ERROR: 2.912 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
				590.0	
1	60.67		4.01	585.9	0.0661
2	14.29		18.54	567.4	1.29
3	30.67		14.69	552.7	0.478
4	5.29				

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	58.00	58.48	-0.833
2	3.73	54.00	55.52	-2.82
3	5.18	50.00	49.86	0.270
4	7.20	42.00	41.02	2.32
5	10.00	32.00	30.75	3.87
6	13.90	22.00	22.41	-1.86
7	19.30	17.00	17.92	-5.44
8	26.80	16.00	16.42	-2.68
9	37.30	17.00	16.12	5.16
10	51.80	16.00	15.56	2.71
11	72.00	14.00	13.88	0.793
12	100.0	11.00	11.19	-1.76
13	139.0	8.30	8.48	-2.19
14	193.0	6.80	6.68	1.72

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER
 P 1 0.89

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ADARO

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P 2	-0.03	0.80			
P 3	0.01	0.12	0.38		
P 4	-0.01	-0.03	0.13	0.61	
T 1	0.09	0.13	-0.05	0.03	0.77
T 2	-0.01	-0.15	0.09	0.19	0.07
T 3	0.00	0.05	0.32	0.17	-0.03
	P 1	P 2	P 3	P 4	T 1
					T 2
					T 3

ADARD

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Proyecto:
 Zona: *Bullay - Murcia*
 Observador: *Juan C. Quintana*
 Situación:

COORDENADAS
 X *618810*
 Y *4211390*
 Z *590*

mV: *Adar-01*
 mA: *GE0-328*
 S.E.V. ~~31~~ *31*

Perfil: *XI*

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN				
													1 m	10 m	50 m	100 m	
1	2.68	1	340	1V	900	58							21.78				
2	3.73		450	"	565	54							42.92				
3	5.18		430	"	255	50							83.51				
4	7.2		480	300uV	125	42							182.1				
5	10		440	100uV	45	32							313.4				
6	13.9		400	30uV	14.5	22							606.2				
7	19.3		450	10uV	6.6	17	10	450	100uV	78	19		1.189	109.2			
8	26.8		460	"	3.25	16		460	"	36	17		2.256	217.8			
9	37.3		675	"	2.55	17		670	"	27	17		4.370	429.2			
10	51.8	10	640	30uV	12.2	16							8.429	836.1			
11	72		590	10uV	5.05	14							16.290	1.621			
12	100		765	"	2.65	11							31.420	3.134			
13	139		835	3uV	1.15	8.3							60.700	6.062	1.175		
14	193		470	1uV	0.275	6.8								11.890	2.301		
15	268													22.560	4.474		
16	373													43.700	8.702	4.292	
17	518													84.290	16.820	8.351	
18	720													182.900	32.530	18.210	
19	1.000														62.790	31.340	
20	1.390															121.400	60.620
21	1.930															234.000	116.900
22	2.680															461.200	225.600
23	3.730																437.000
24	5.180																842.880
25	7.200																1.628.520
26	10.000																3.141.510

OBSERVACIONES:

FECHA: *22-01-91*

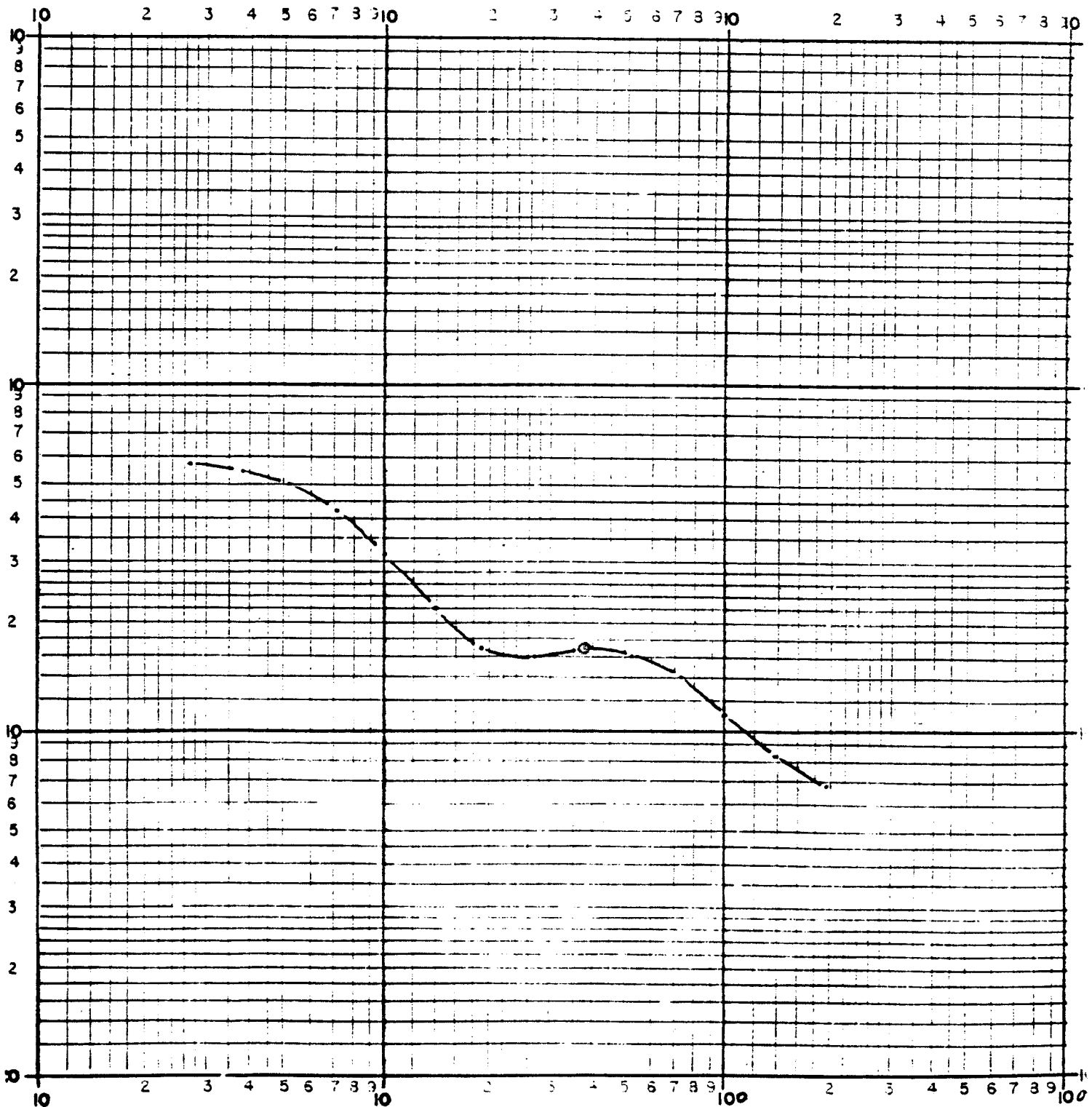


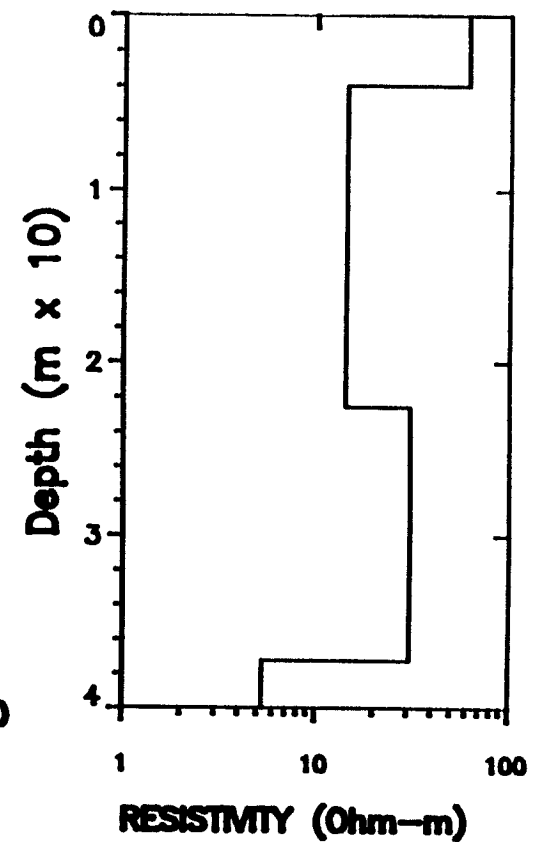
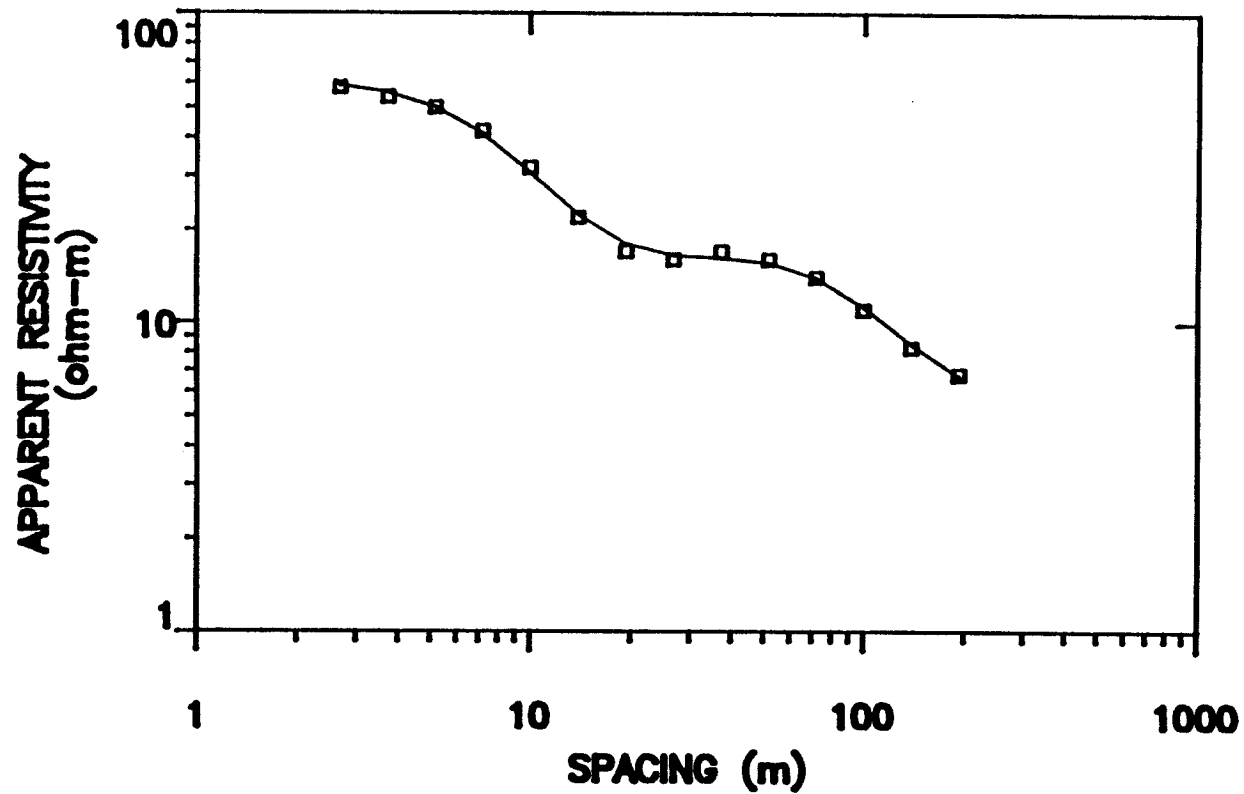
Departamento de Geofísico

Estudio Bulley - Murcia S.E.V. 31

Fecha 22-01-91 Rumbo AB E-W PERFIL X1

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		
Data Set: 31XI	Date: 91	BULLAS (MU)
Equipment: ADARO	Sounding: 31XI	
		Azimuth: E-W

DATA SET: 32XI

CLIENT: ITGE
 LOCATION: BULLAS
 COUNTY: (MU)
 PROJECT: SEGURA
 ELEVATION: 620.00
 SOUNDING COORDINATES: X: 619200.0000 Y: 4210700.0000

DATE: 91
 SOUNDING: 32XI
 AZIMUTH: E-W
 EQUIPMENT: ADARO

Schlumberger Configuration

FITTING ERROR: 1.151 PERCENT

L #	RESISTIVITY (ohm-m)	CHARGEABILITY (pfe)	THICKNESS (meters)	ELEVATION (meters)	CONDUCTANCE (Siemens)
1	210.3		1.68	620.0	
2	33.31		5.51	618.3	0.00800
3	15.40		63.02	612.7	0.165
4	9.66			549.7	4.09

ALL PARAMETERS ARE FREE

No.	Spacing (m)	PA DATA	(ohm-m) SYNTHETIC	DIFFERENCE (percent)
1	2.68	145.0	145.4	-0.339
2	3.73	106.0	104.9	0.985
3	5.18	67.00	67.73	-1.09
4	7.20	44.00	43.77	0.518
5	10.00	32.00	31.88	0.347
6	13.90	25.00	25.29	-1.19
7	19.30	21.00	20.75	1.17
8	26.80	18.00	17.92	0.419
9	37.30	16.00	16.45	-2.81
10	51.80	16.00	15.63	2.26
11	72.00	15.00	14.95	0.315
12	100.0	14.00	14.11	-0.800
13	139.0	13.00	13.03	-0.280
14	193.0	12.00	11.91	0.668
15	268.0	11.00	11.02	-0.271

PARAMETER RESOLUTION MATRIX:
 "F" INDICATES FIXED PARAMETER

*

ADARO

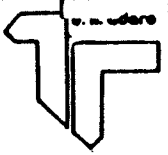
*

P 1	1.00						
P 2	0.00	1.00					
P 3	0.00	0.00	1.00				
P 4	0.00	0.00	0.00	1.00			
T 1	0.00	0.00	0.00	0.00	1.00		
T 2	0.00	0.00	0.00	0.00	0.00	1.00	
T 3	0.00	0.00	0.00	0.00	0.00	0.00	0.99
	P 1	P 2	P 3	P 4	T 1	T 2	T 3

ADARO

*

*



Proyecto:
 Zona: *Bully - Murcia*
 Observador: *Juan Ca. Cuartero*
 Situación:

COORDENADAS
 X *619 200*
 Y *4210 700*
 Z *620*

mV: *Schubert 04*
 mA: *GE0-328*
 S.E.V. *32*

bo A
E-W
 Perfil: *XI*

CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN

Estación	AB/2	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	MN	I (mA)	Esc. Volt.	V (mV)	ρ (Ωm)	OBSERVACIONES	CONSTANTES PARA DISPOSITIVO SCHULUMBERGER SIMETRICO MN			
													1 m	10 m	50 m	100 m
1	2.68	1	125	10	830	145							21.78			
2	3.73		170	"	420	106							42.92			
3	5.18		370	"	295	67							83.51			
4	7.2		320	10000	87	44							182.1			
5	10		330	"	34	32							313.4			
6	13.9		295	3000	12	25							606.2			
7	19.3		250	1000	4.5	21	10	250	10000	46.5	20		1.169	109.2		
8	26.8	10	280	3000	23	18							2.256	217.8		
9	37.3		280	"	10.7	16							4.370	429.2		
10	51.8		395	10000	7.5	16							8.429	836.1		
11	72		445	"	4.2	15							16.290	1.621		
12	100		620	"	2.8	14							31.420	3.134		
13	139		700	3000	1.5	13							60.700	6.062	1.175	
14	193		875	"	0.91	12								11.690	2.501	
15	268		730	"	0.35	11								22.560	4.474	
16	373													43.700	8.702	4.292
17	518													84.290	16.820	8.351
18	720													162.900	32.530	16.210
19	1.000														62.790	31.340
20	1.390														121.400	60.620
21	1.930														234.000	116.900
22	2.680														461.200	225.600
23	3.730															437.000
24	5.180															842.880
25	7.200															1.628.520
26	10.000															3.141.510

OBSERVACIONES:

FECHA: *22-01-91*



Departamento de Geofísico

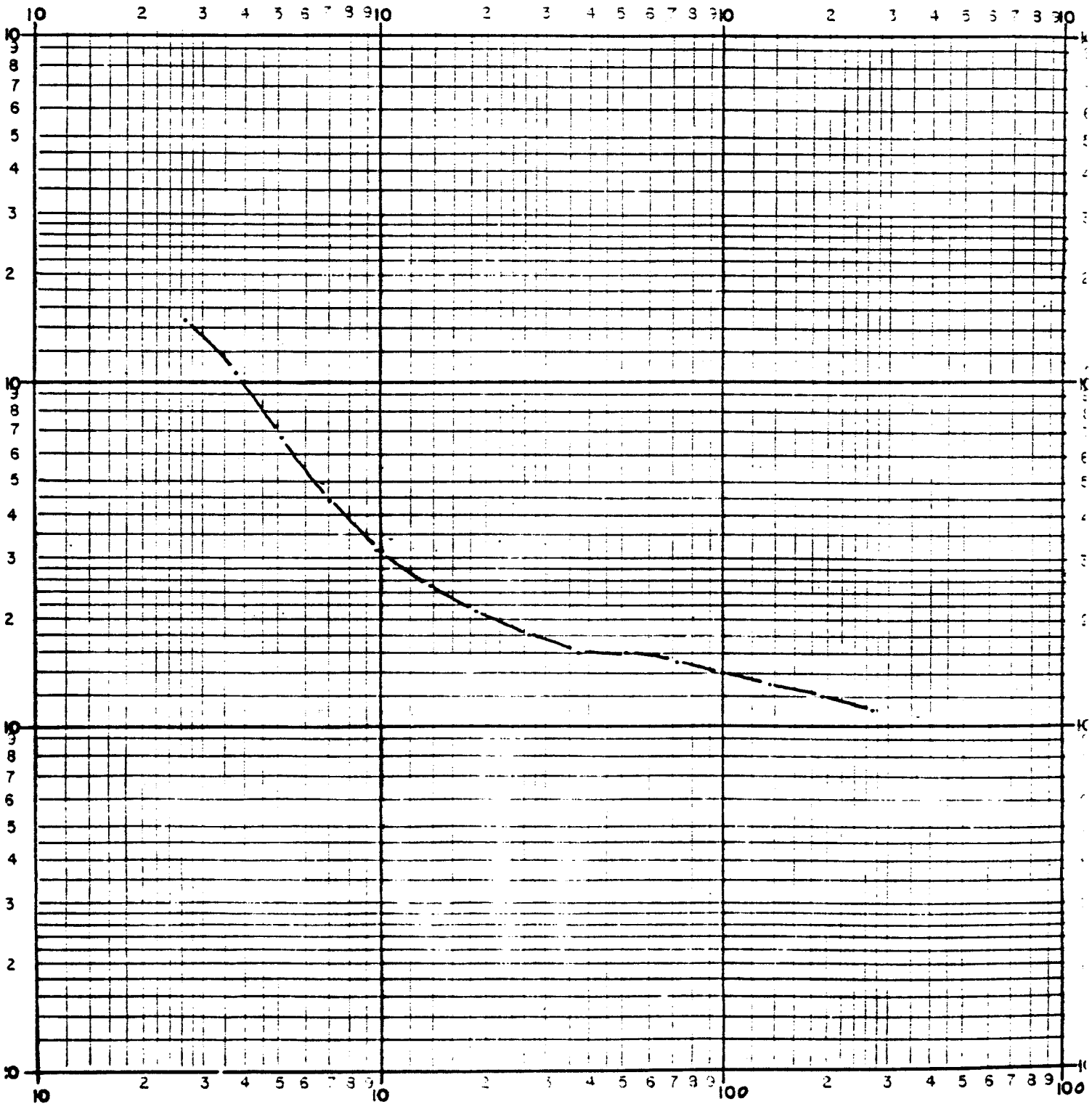
Estudio *Bullay - Murcia*

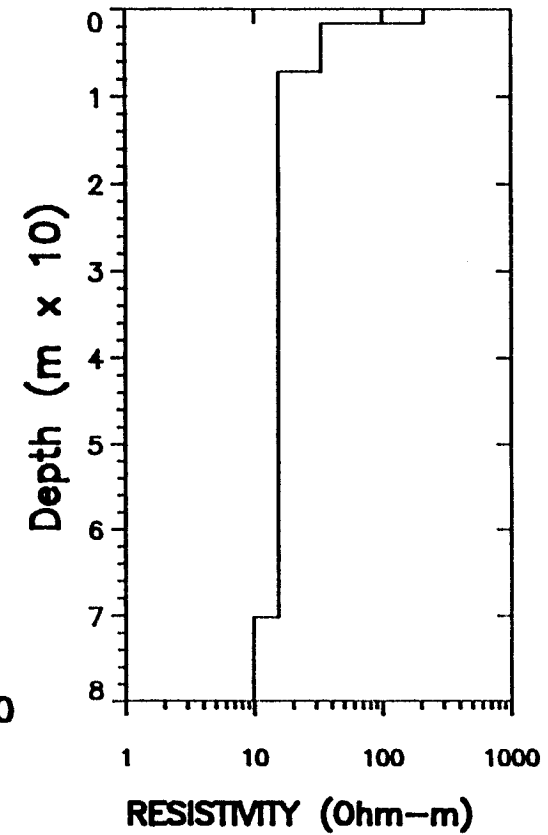
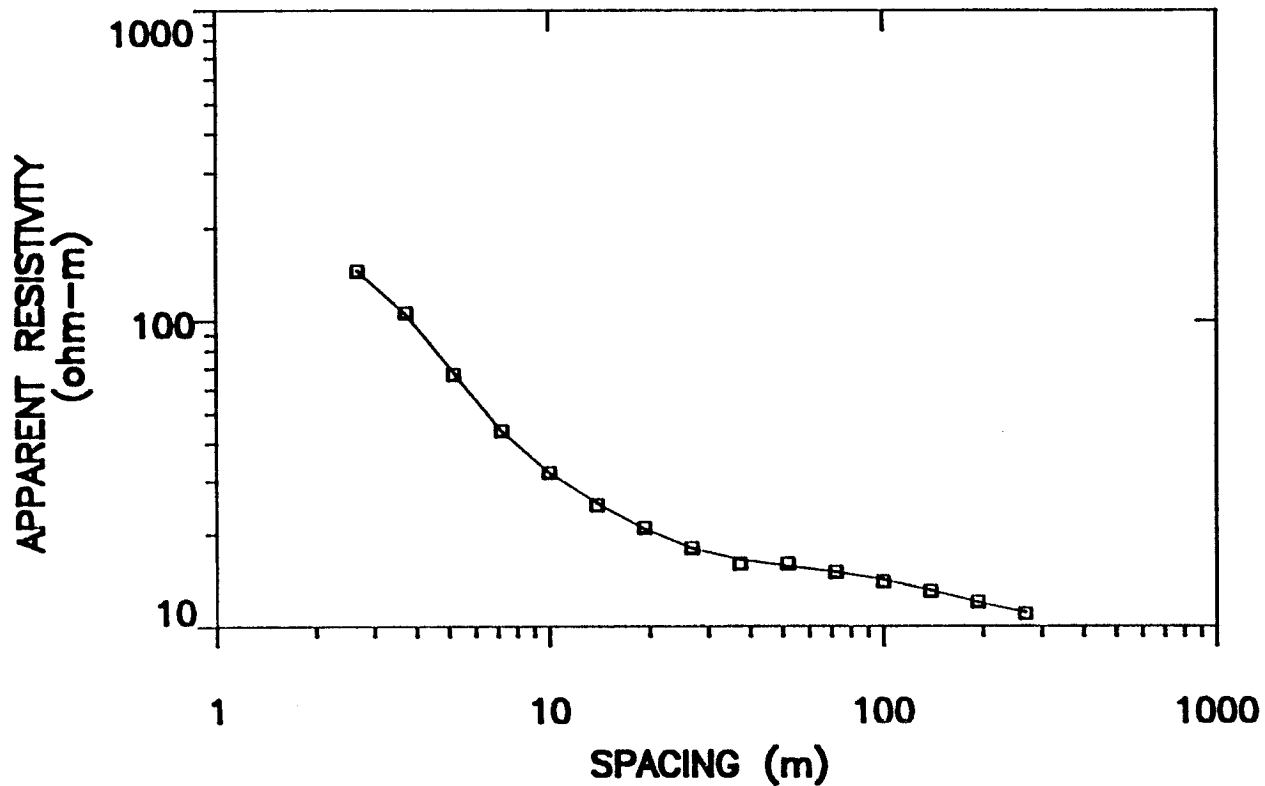
S.E.V. *32*

Fecha *22-01-91* Rumbo AB *E-W*

PERFIL *X1*

Interpretación	Observaciones:
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for: ITGE		SEGURA
by: ADARO		BULLAS (MU)
Data Set: 32XI	Date: 91	Azimuth: E-W
Equipment: ADARO	Sounding: 32XI	