

APPENDIX K-9

Results of Flotation Tests(9)

Results of the Cleaner Flotation Tests with SC-1

- ©pH :9.0(Rougher) & 11.0(Cleaner)
 ©Collector :SF-323, 30 g/t
 ©Frother :DF-250, 30 g/t
 ©Grinding :60% -200 mesh
 ©Regrinding :95% -325 mesh(Test No. 47)
 Without regrinding(Test No. 46)
 ©Rougher Flotation time: 12 min
 ©Conditioning time : 2 min

Test No.	Product	Concentrate		Cu Recovery (%)
		Weight (%)	Grade (%Cu)	
46	Feed	100.00	1.22	100.00
	Clean. Conc. 1'	2.25	22.90	42.34
	Clean. Conc. 3' (Cumul)	4.86	19.20	76.58
	Clean. Conc. 6' (Cumul)	6.78	16.43	91.44
	Clean. Conc. 10' (Cumul)	7.59	15.12	94.13
	Clean. Tail.	1.78	1.42	2.08
	Rough. Tail.	90.63	0.051	3.79
47	Feed	100.00	1.27	100.00
	Clean. Conc. 1'	1.20	33.20	31.36
	Clean. Conc. 3' (Cumul)	2.55	33.52	67.64
	Clean. Conc. 6' (Cumul)	3.66	31.46	90.89
	Clean. Conc. 10' (Cumul)	4.09	29.11	93.96
	Clean. Tail.	5.51	0.55	2.40
	Rough. Tail.	90.40	0.051	3.64

APPENDIX K-10

Results of Flotation Tests(10)

Results of the Cleaner Flotation Tests with SW-2

©pH :9.0(Rougher) & 11.0(Cleaner)

©Collector :SF-323, 30 g/t

©Frother :DF-250, 30 g/t

©Grinding :60% -200 mesh

©Regrinding :95% -325 mesh(Test No. 44)

Without regrinding(Test No. 43)

©Rougher Flotation time: 12 min

©Conditioning time : 2 min

Test No.	Product	Concentrate		Cu Recovery (%)
		Weight (%)	Grade (%Cu)	
43	Feed	100.00	0.65	100.00
	Clean. Conc. 1'	0.65	25.20	25.14
	Clean. Conc. 3' (Cumul)	1.78	22.28	61.01
	Clean. Conc. 6' (Cumul)	2.62	19.27	77.65
	Clean. Conc. 10' (Cumul)	3.19	17.50	85.80
	Clean. Tail.	2.30	1.50	5.47
	Rough. Tail.	94.51	0.060	8.73
44	Feed	100.00	0.64	100.00
	Clean. Conc. 1'	0.77	32.50	38.94
	Clean. Conc. 3' (Cumul)	1.54	31.45	75.36
	Clean. Conc. 6' (Cumul)	1.89	29.08	85.17
	Clean. Conc. 10' (Cumul)	2.05	27.55	87.67
	Clean. Tail.	3.22	0.70	3.50
	Rough. Tail.	94.73	0.060	8.83

APPENDIX K-11

Results of Flotation Tests(11)

Results of the Cleaner Flotation Tests with MC-1

- ◎pH :9.1(Rougher) & 11.0(Cleaner)
 ◎Collector(Rougher):AC-350, 30 g/t+15 g/t(at 5 min)
 (Scavenger):AC-350, 5 g/t+5 g/t(at 8 min)
 ◎NaSH (Rougher):200 g/t+100 g/t(at 5 min)
 (Scavenger):50 g/t+50 g/t(at 8 min)
 ◎Frother (Rougher):DF-250, 40 g/t+10 g/t(at 5 min)
 (Scavenger):DF-250, 10 g/t
 ◎Grinding :60% -200 mesh
 ◎Regrinding :95% -325 mesh(Test No. 57)
 Without regrinding(Test No. 58)
 ◎Flotation time :12 min(Rougher)+12 min(Scavenger)
 ◎Conditioning time :2 min

Test No.	Product	Concentrate		Cu Recovery (%)
		Weight (%)	Grade (%Cu)	
57	Feed	100.00	0.94	100.00
	Clean. Conc. 1'	0.76	32.40	25.55
	Clean. Conc. 3' (Cumul)	1.69	30.50	54.90
	Clean. Conc. 6' (Cumul)	2.46	27.26	71.46
	Clean. Conc. 10' (Cumul)	3.01	23.71	75.99
	Clean. Tail.	3.49	0.87	3.16
	Rough. Scav. Conc.	1.66	1.29	2.29
	Rough. Scav. Tail.	91.84	0.19	18.56
58	Feed	100.00	0.94	100.00
	Clean. Conc. 1'	0.41	19.30	8.33
	Clean. Conc. 3' (Cumul)	3.03	17.14	54.95
	Clean. Conc. 6' (Cumul)	4.25	16.69	75.26
	Clean. Conc. 10' (Cumul)	4.53	16.07	77.23
	Clean. Tail.	1.97	0.96	2.00
	Rough. Scav. Conc.	1.66	1.29	2.28
	Rough. Scav. Tail.	91.84	0.19	18.49

APPENDIX K-12

Results of Flotation Tests(12)

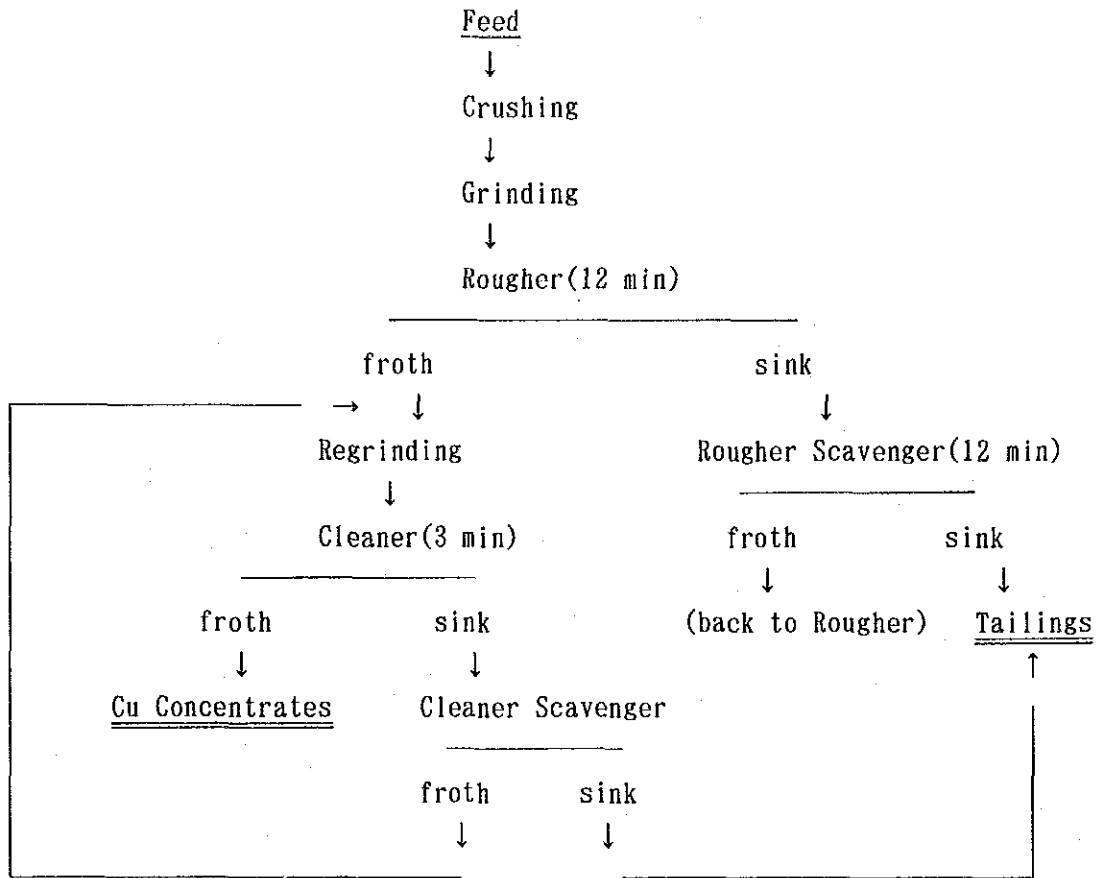
Results of the Cleaner Flotation Tests with MW-2

- ©pH :9.1(Rougher) & 11.0(Cleaner)
- ©Collector(Rougher):AC-350, 30 g/t+15 g/t(at 5 min)
(Scavenger):AC-350, 5 g/t+5 g/t(at 8 min)
- ©NaSH (Rougher):200 g/t+100 g/t(at 5 min)
(Scavenger):50 g/t+50 g/t(at 8 min)
- ©Frother (Rougher):DF-250, 40 g/t+10 g/t(at 5 min)
(Scavenger):DF-250, 10 g/t
- ©Grinding :60% -200 mesh
- ©Regrinding :95% -325 mesh(Test No. 60)
Without regrinding(Test No. 59)
- ©Flotation time :12 min(Rougher)+12 min(Scavenger)
- ©Conditioning time :2 min

Test No.	Product	Concentrate		Cu Recovery (%)
		Weight (%)	Grade (%Cu)	
60	Feed	100.00	1.14	100.00
	Clean. Conc. 1'	0.73	32.20	20.78
	Clean. Conc. 3' (Cumul)	1.78	27.90	43.76
	Clean. Conc. 6' (Cumul)	2.35	24.63	50.99
	Clean. Conc. 10' (Cumul)	2.66	22.67	53.12
	Clean. Tail.	4.43	1.28	4.99
	Rough. Scav. Conc.	4.40	1.56	6.05
	Rough. Scav. Tail.	88.51	0.46	35.84
59	Feed	100.00	1.13	100.00
	Clean. Conc. 1'	1.10	20.20	19.63
	Clean. Conc. 3' (Cumul)	2.70	19.08	46.00
	Clean. Conc. 6' (Cumul)	3.51	17.33	53.62
	Clean. Conc. 10' (Cumul)	3.80	16.44	55.12
	Clean. Tail.	3.28	1.00	2.90
	Rough. Scav. Conc.	4.40	1.56	6.07
	Rough. Scav. Tail.	88.52	0.46	35.91

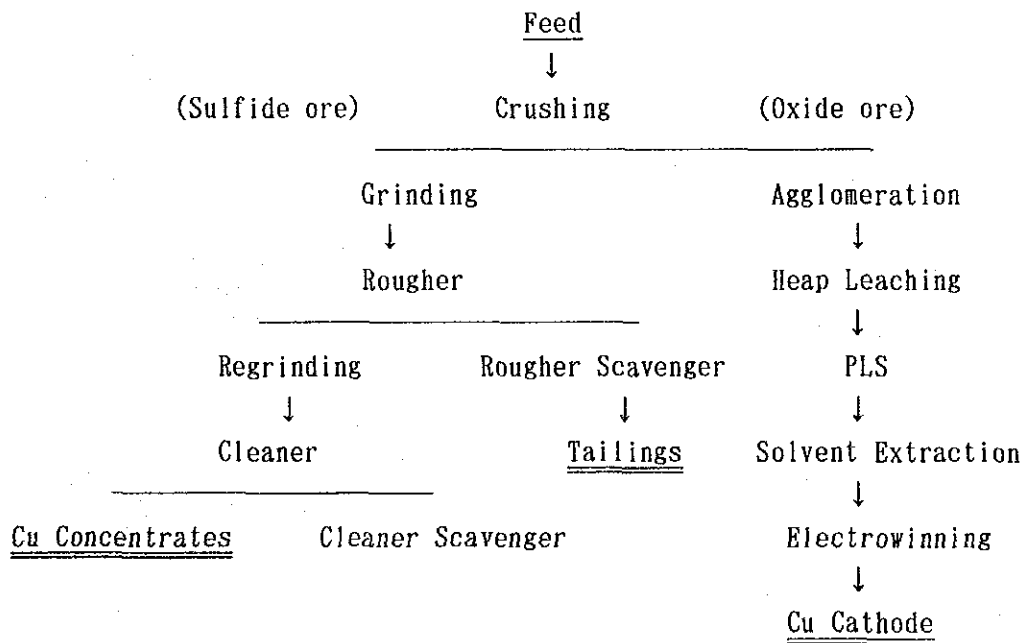
APPENDIX L

Recommended Flowsheet of Flotation



APPENDIX M

Recommended Flowsheet of Ore Treatment



APPENDIX N-1 Summary of the Metallurgical Results Obtained in Japan(1)
 Summary of the Metallurgical Results Obtained at
 Niihama Laboratories in Japan
 -Comparison with the results of CIMM-

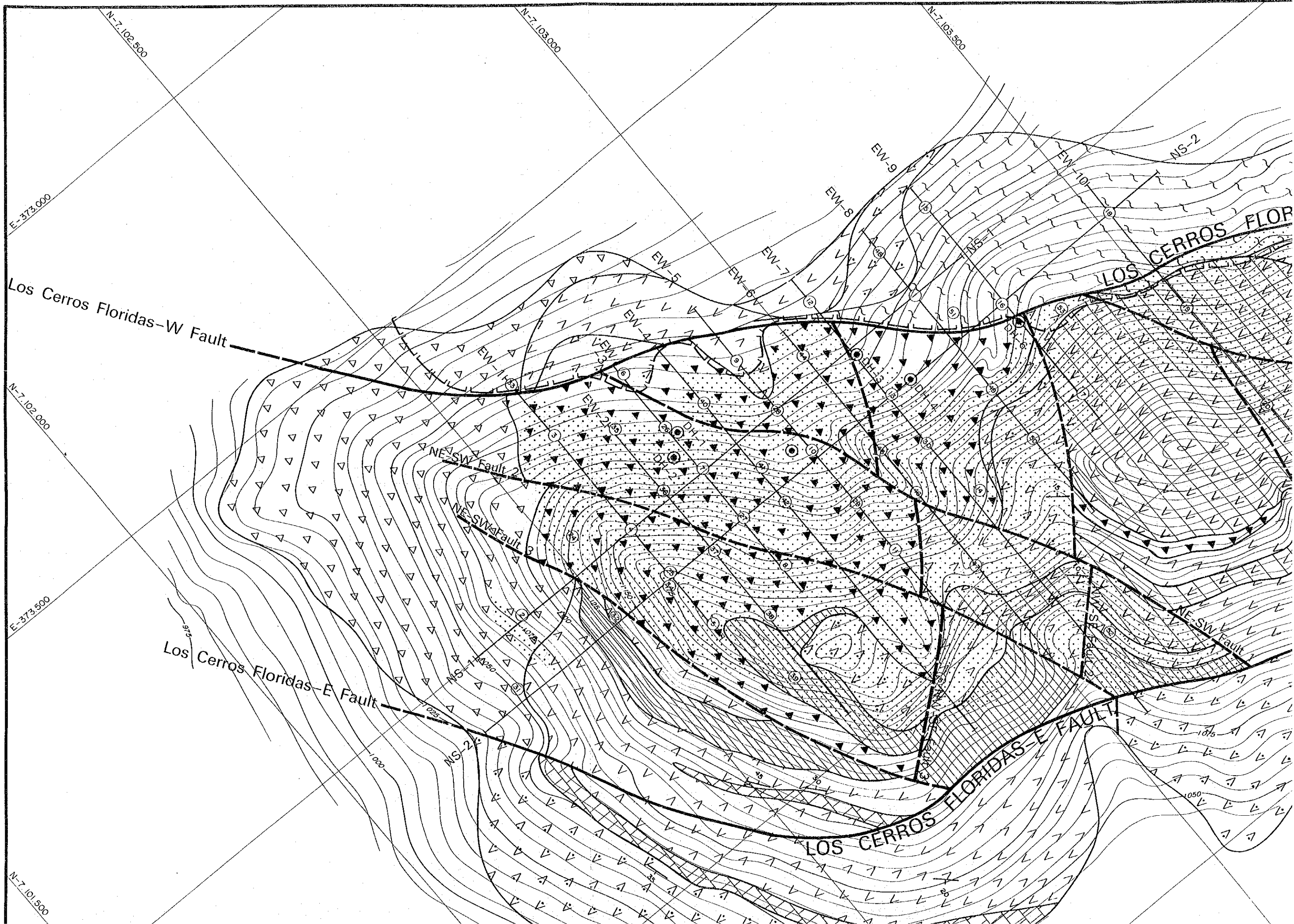
Laboratory	Japan	CIMM
Bond's Work Index		
SC-1(kWh/st)	12.6	13.62
SW-2(kWh/st)	14.8	17.65
Cu Recovery by Flotation		
SC-1(%)	92.04	90.89
SW-2(%)	88.44	85.17
Cu Grade of Concentrates		
SC-1(Cu%)	32.08	31.46
SW-2(Cu%)	30.96	29.08
Unit Area of Conc. Thickener		
SC-1(m ² /tpd)	0.163	0.117
SW-2(m ² /tpd)	0.22	0.202
Unit Area of Tail. Thickener		
SC-1(m ² /tpd)	0.38	0.106
SW-2(m ² /tpd)	0.92	1.084
Unit Area of Conc. Filter		
SC-1(m ² /tpd)	0.024	0.028
SW-2(m ² /tpd)	0.037	0.047
Specific Gravity		
SC-1	3.40	3.39
SW-2	2.80	2.78

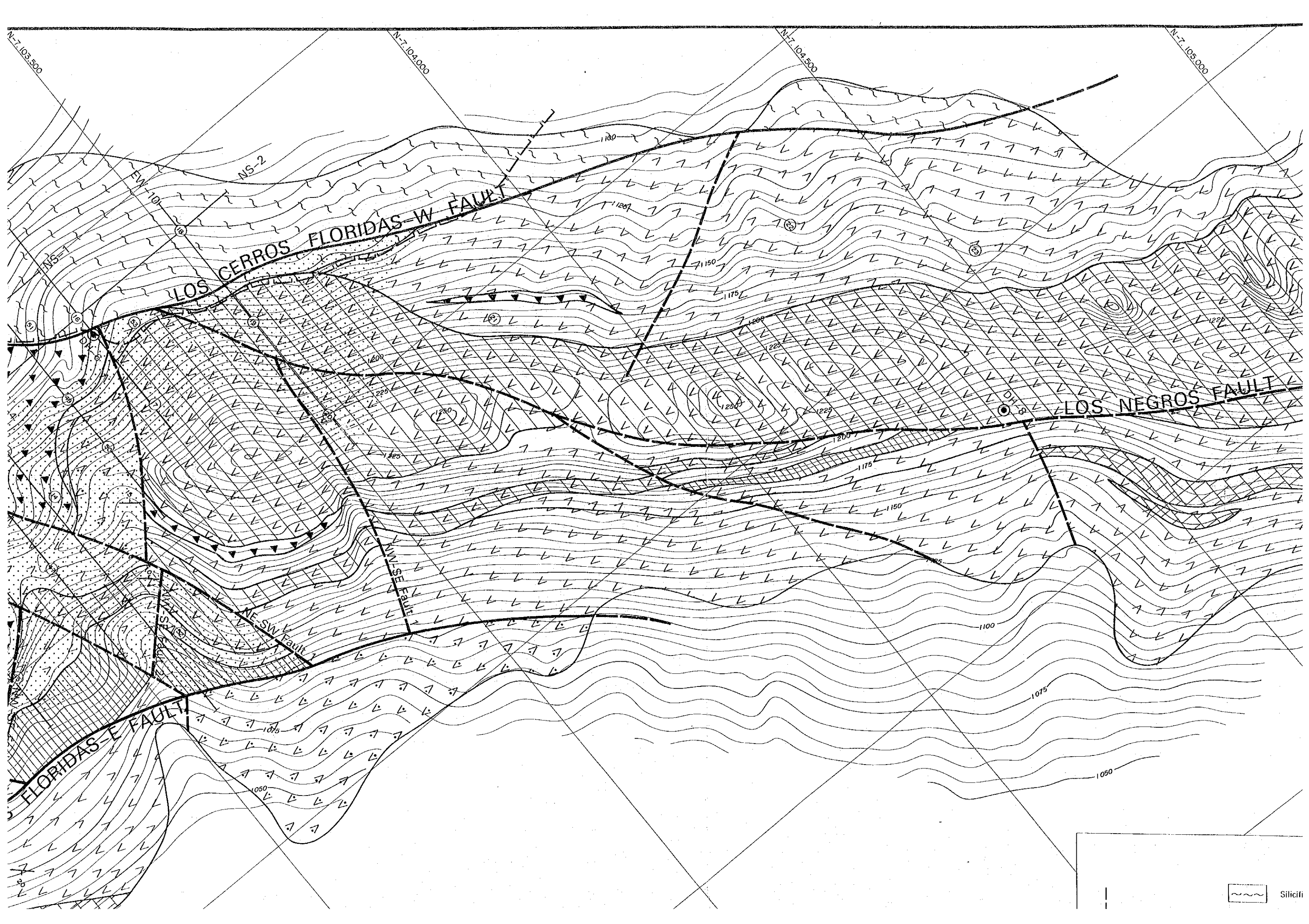
APPENDIX N-2 Summary of the Metallurgical Results Obtained in Japan(2)
 Head Assays of the Cerro Negro Sulfide Ores
 -Comparison with the results of CIMM-

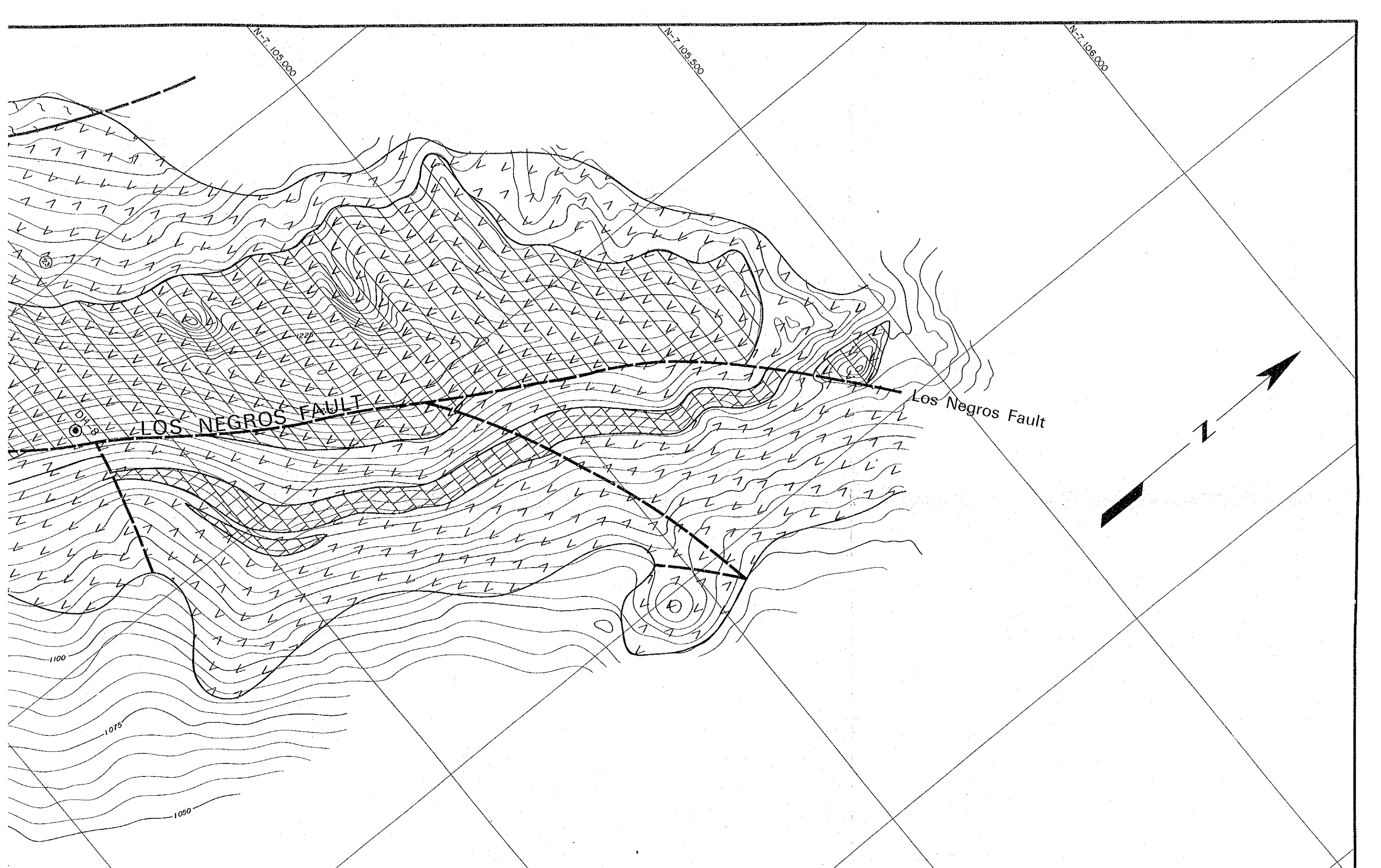
Sample	SC-1		SW-2	
	Japan	CIMM	Japan	CIMM
Component (%)				
Cu	1.17	1.19	0.68	0.66
*Citric Sol. Cu	0.02	0.045	0.007	0.013
*Sulfur. Sol. Cu	0.06	0.083	0.02	0.022
Fe	32.0	29.0	13.8	13.7
Al ₂ O ₃	8.39	9.16	11.7	13.1
S	3.05	3.36	1.12	1.03
Na ₂ O	0.12	0.26	1.37	1.55
K ₂ O	4.83	4.43	3.57	2.76
MgO	2.27	2.16	2.35	2.16
CaO	0.36	0.39	3.15	3.20
SiO ₂	32.9	32.7	49.8	49.6
Zn	0.005	0.003	0.003	0.006
Pb	0.005	<0.002	0.007	<0.002
Mo	<0.02	<0.004	<0.02	0.006
Mn	NA	0.042	NA	0.061
Co	0.05	0.050	<0.02	0.009
Ni	<0.02	0.005	<0.02	0.003
Cd	NA	<0.005	NA	<0.005
As	0.04	<0.005	0.06	0.005
Sb	<0.02	<0.005	<0.02	<0.005
Bi	<0.02	<0.005	<0.02	<0.005
Se	<0.02	<0.005	<0.02	<0.005
Te	<0.02	<0.005	<0.02	<0.005
F	0.03	<0.02	0.04	0.03
Cl	0.05	0.017	0.09	0.018
*Hg (ppm)	<0.1	NA	<0.1	NA
*Au (g/t)	0.2	0.2	0.2	0.2
*Ag (g/t)	1	2	2	<1
Total (Excl. *)	85.270	82.841	87.740	87.897

APPENDIX N-3 Summary of the Metallurgical Results Obtained in Japan(3)
 Analytical Results of Cu Concentrates
 -Comparison with the results of CIMM-

Sample	SC-1		SW-2	
Laboratory	Japan	CIMM	Japan	CIMM
Component (%)				
Cu	32.33	33.7	29.68	28.4
Fe	30.21	27.30	29.45	27.10
S	33.99	33.31	31.15	30.46
Pb	0.007	0.004	0.009	0.004
Zn	0.004	0.022	0.015	0.021
As	<0.01	<0.005	0.08	0.063
Sb	<0.01	<0.005	0.02	<0.005
Bi	<0.01	<0.005	<0.01	<0.005
Se	<0.01	<0.005	<0.01	<0.005
Te	<0.01	<0.005	<0.01	<0.005
Ni	0.019	0.007	0.009	0.003
Co	0.14	0.087	0.05	0.047
Mo	<0.01	0.005	0.14	0.12
F	0.02	NA	0.01	
Cl	<0.01	<0.05	0.01	<0.05
Hg (ppm)	0.5	<0.2	0.9	<0.2
SiO ₂	1.56	2.30	4.09	7.10
Al ₂ O ₃	0.39	0.81	1.22	0.42
MgO	0.15	0.33	0.41	0.56
CaO	0.10	0.07	0.47	0.48
K ₂ O	0.15	0.29	0.24	0.51
Na ₂ O	<0.01	0.01	0.06	0.15
Au (g/t)	4.8	4.0	6.4	4.7
Ag (g/t)	11	6	46	40
Total	99.070	94.545	97.113	95.328







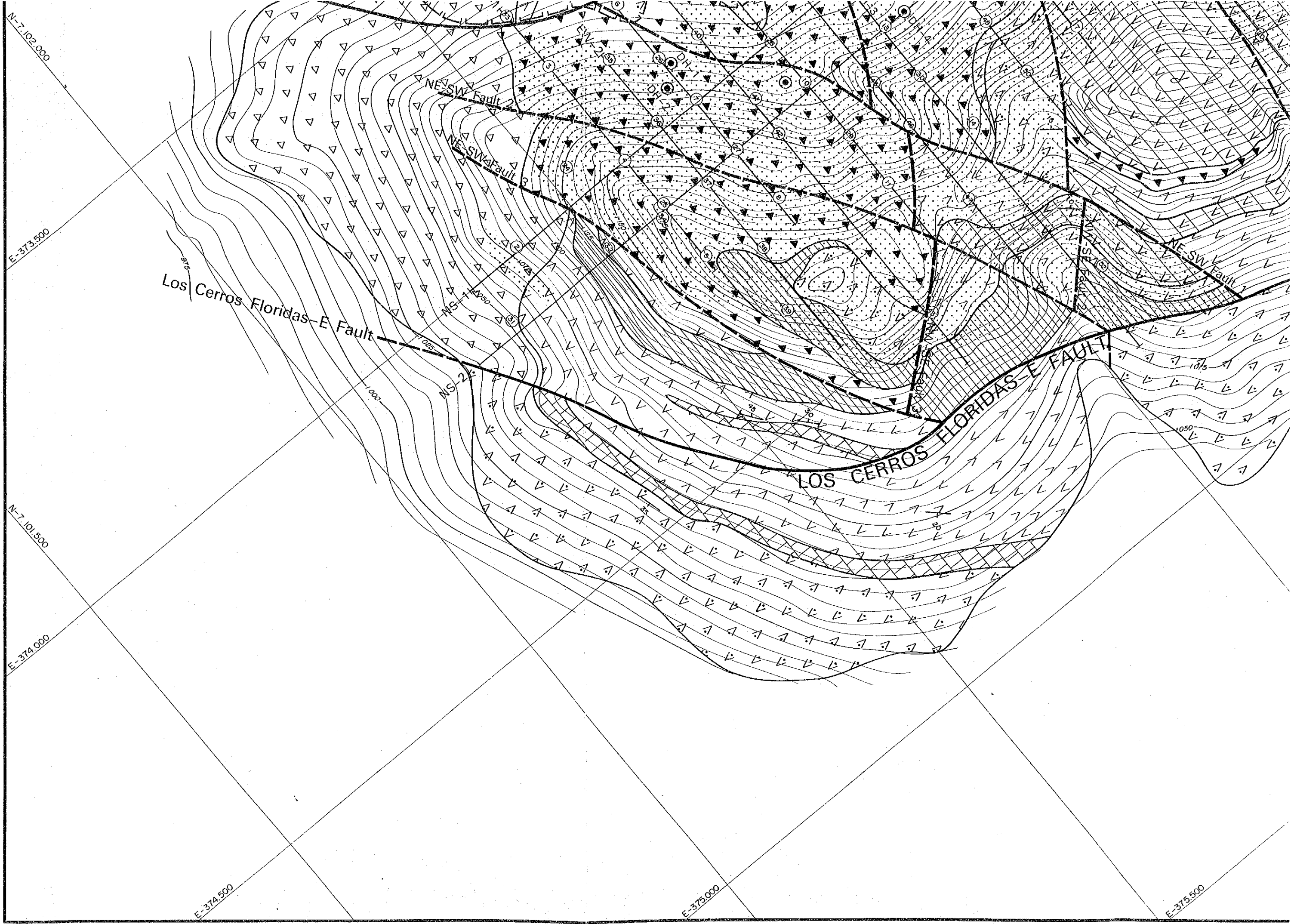
LEGEND

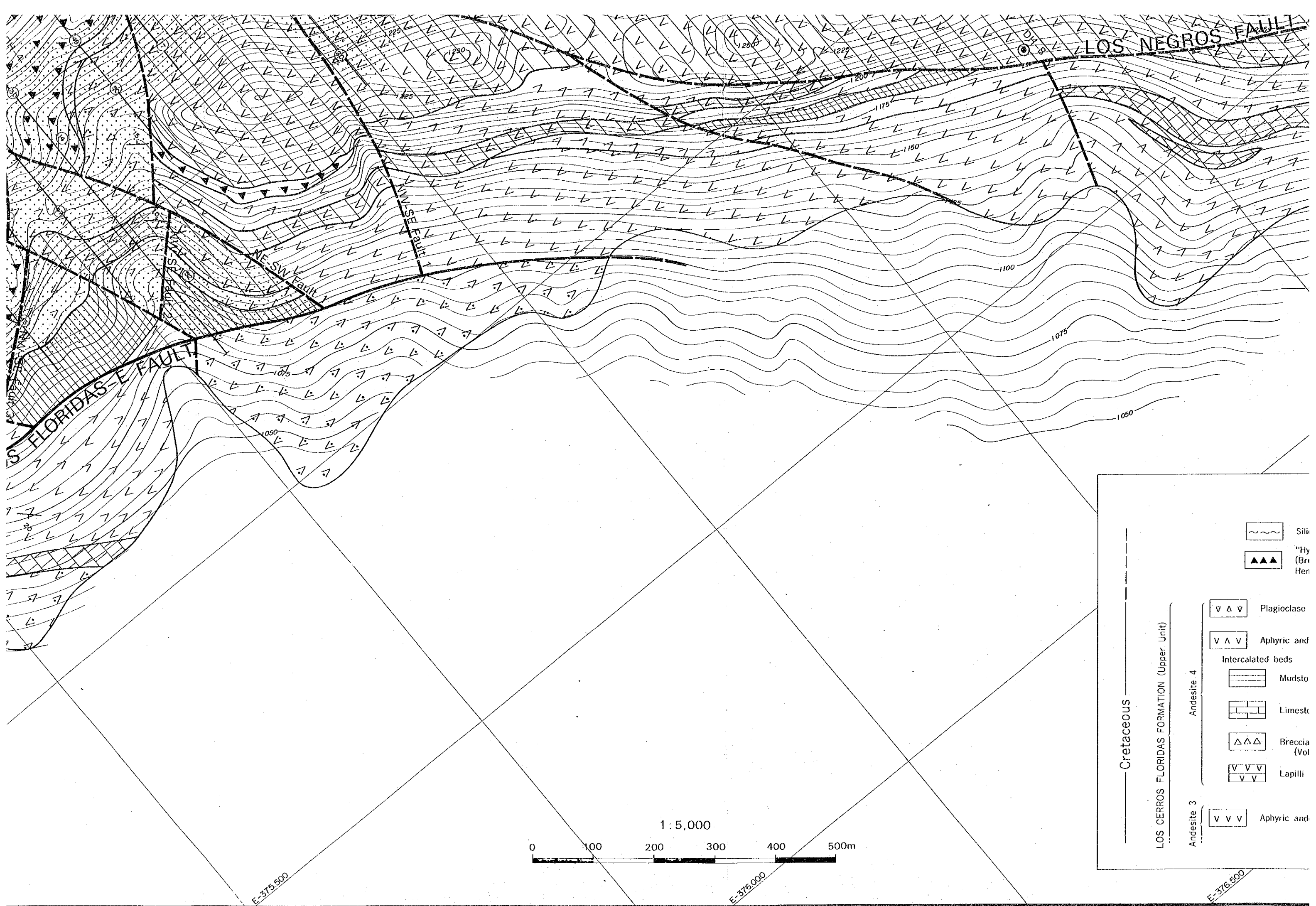
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-
-
-
- Silicified rock and Cataclasite

"Hydrothermal Breccia"
- Hydrothermal alteration Zone

PLATE I

MINERAL EXPLORATION



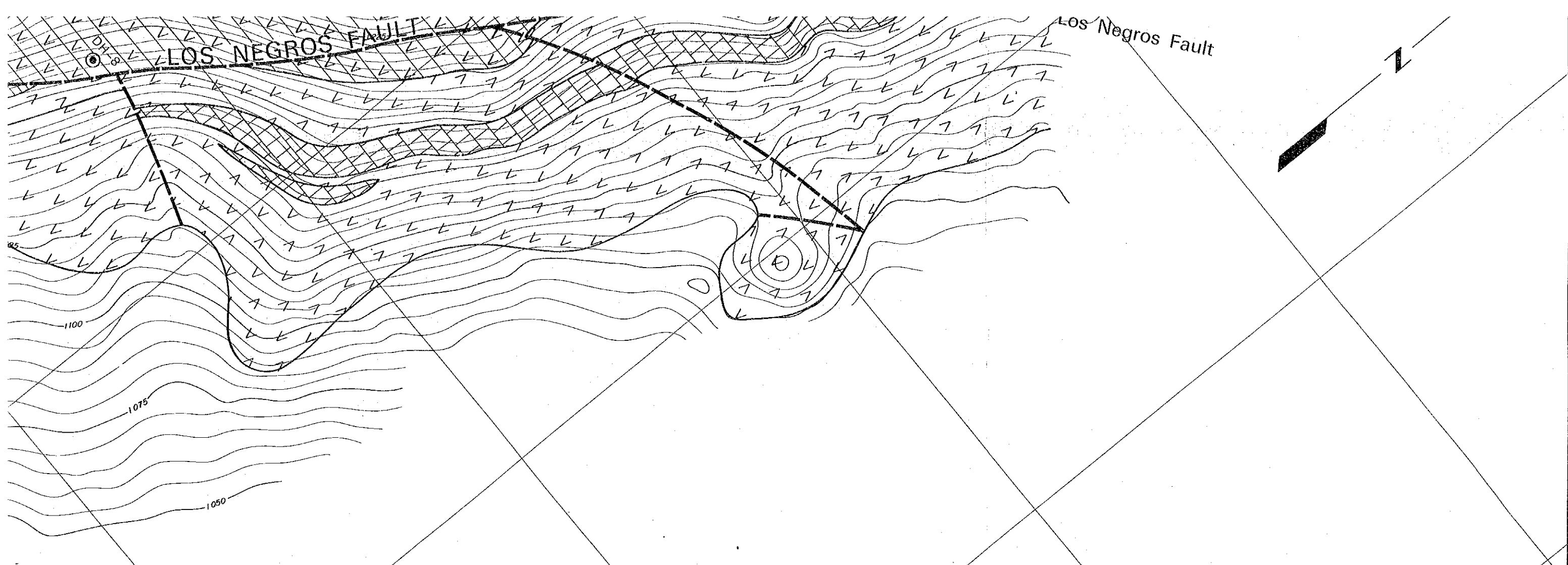


Legend:

- ~ ~ ~ Silic
- ▲ ▲ ▲ "Hy (Br Hen
- v ^ v Plagioclase
- v ^ v Aphyric and Intercalated beds
- — — Mudsto
- ▒ Limestc
- △ △ △ Breccia (Vol)
- v v v Lapilli
- v v v Aphyric and

Geological Units:

- Cretaceous
- LOS CERROS FLORIDAS FORMATION (Upper Unit)
- Andesite 3
- Andesite 4



LEGEND

	Silicified rock and Cataclasite		Hydrothermal alteration Zone
	"Hydrothermal Breccia" (Brecciated Andesite abundant in Magnetite Hematite and Specularite Ore)		Mineralized Zone (Cu Oxide Ore)
	Plagioclase phenocryst-rich andesite lava		Fault
	Aphyric andesite lava		EW-1 → Geological Section
Intercalated beds			Drilling site (this project)
	Mudstone, Sandstone and Tuff		Drilling site (ENAMI(1992))
	Limestone	DH-3	
	Brecciated andesite (Volcanic and Tuff Breccia)		
	Lapilli Tuff, Tuff Breccia and Andesite lava		
	Aphyric andesite lava		

Cretaceous

LOS CERROS FLORIDAS FORMATION (Upper Unit)

Andesite 4

Andesite 3

E-376.500

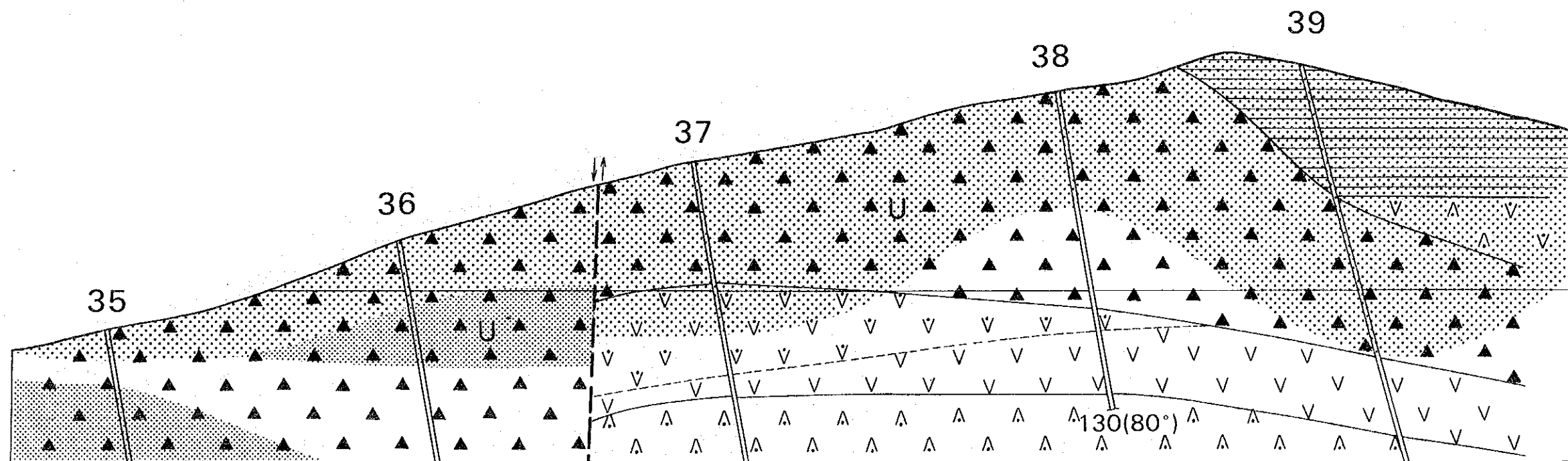
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PLATE I

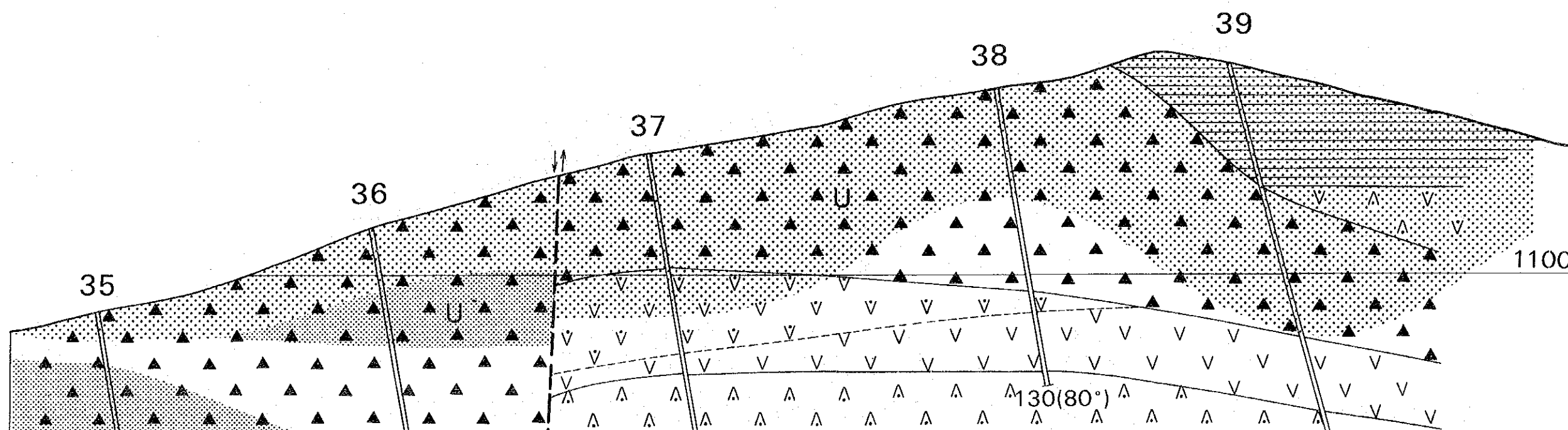
MINERAL EXPLORATION
IN THE CERRO NEGRO AREA
REPUBLIC OF CHILE
PHASE II

GEOLOGICAL MAP
(1:5,000)

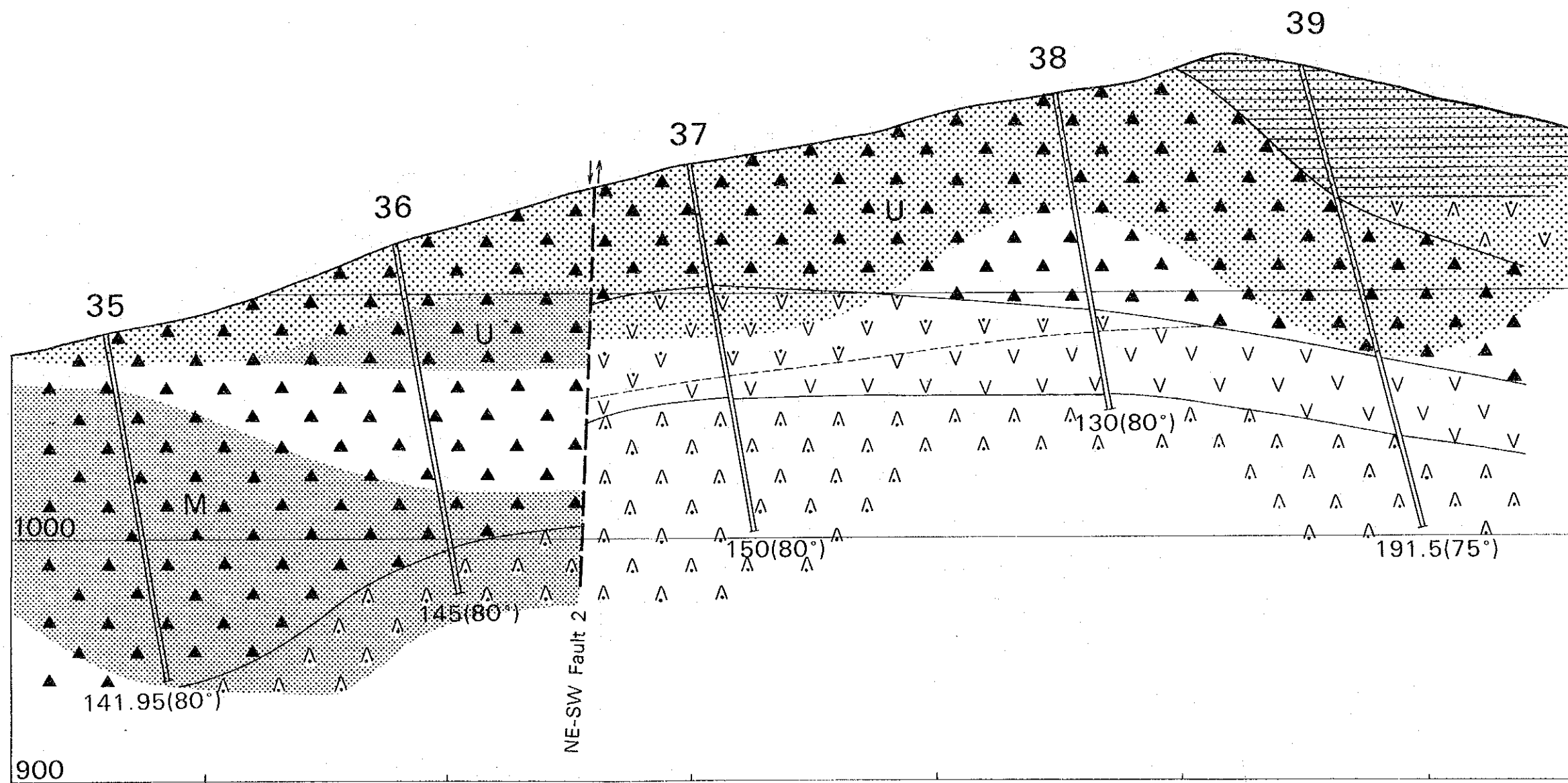
JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN
FEBRUARY 1994



EW-2

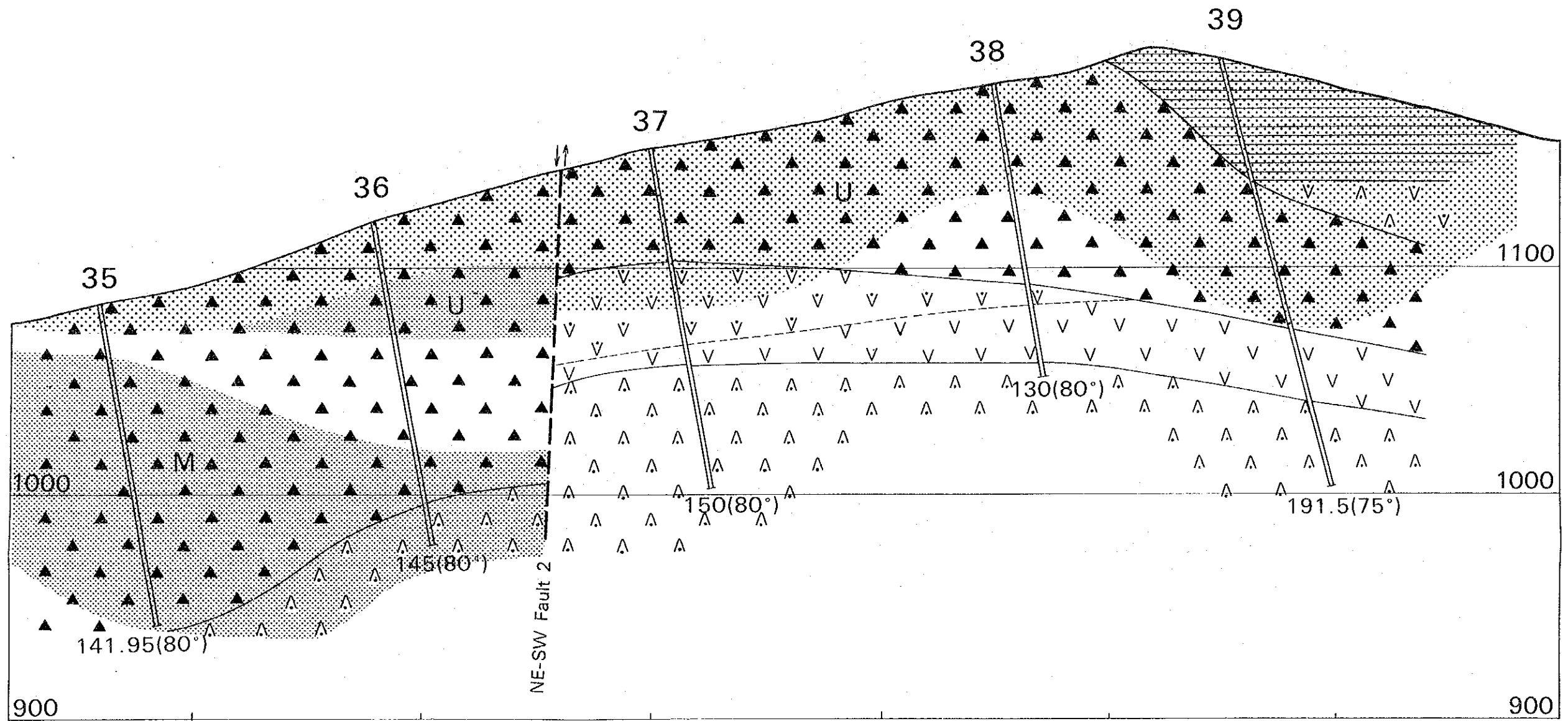


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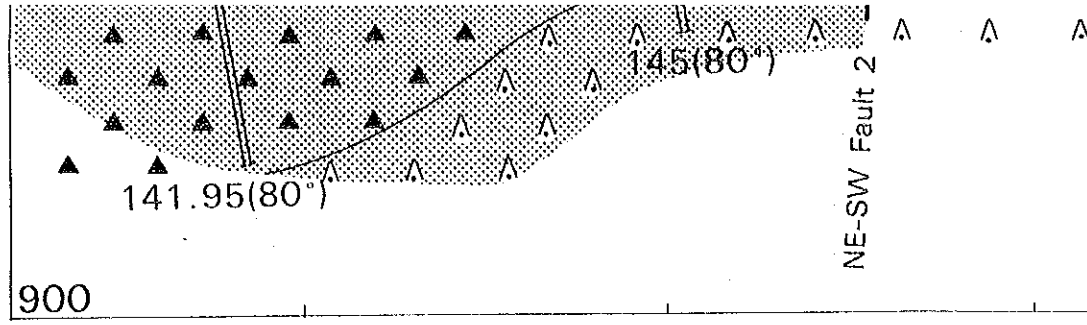


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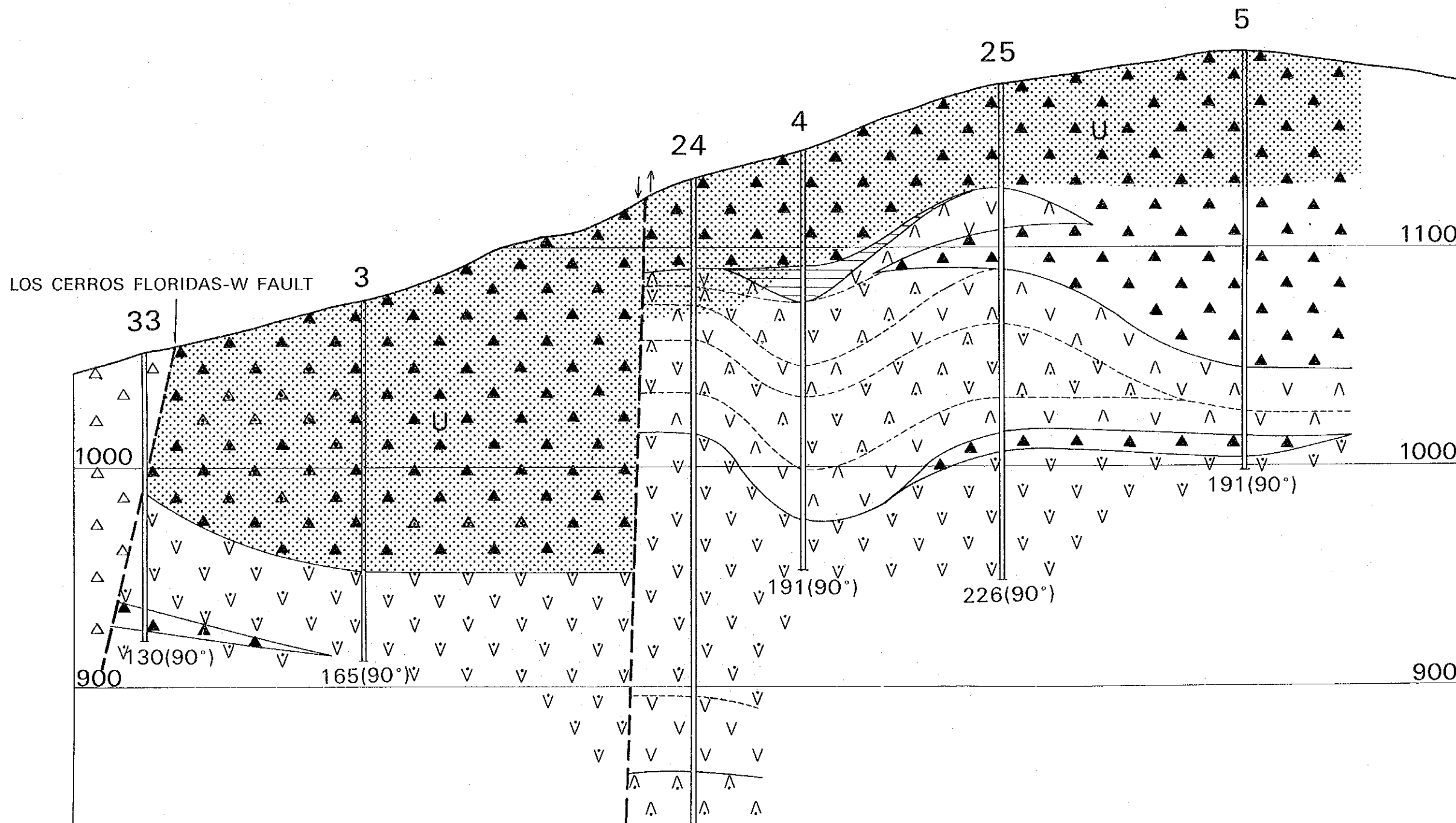
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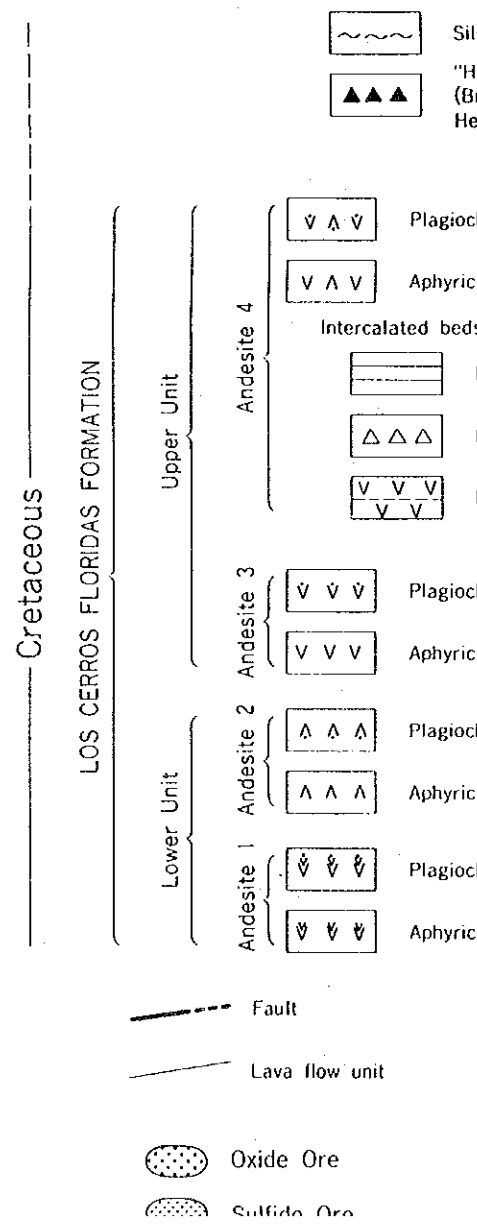
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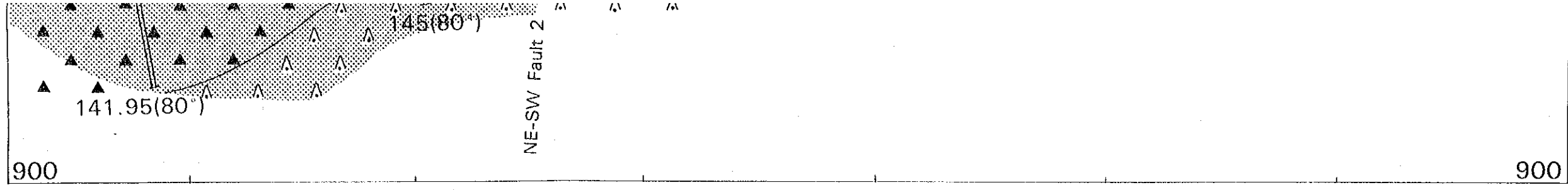


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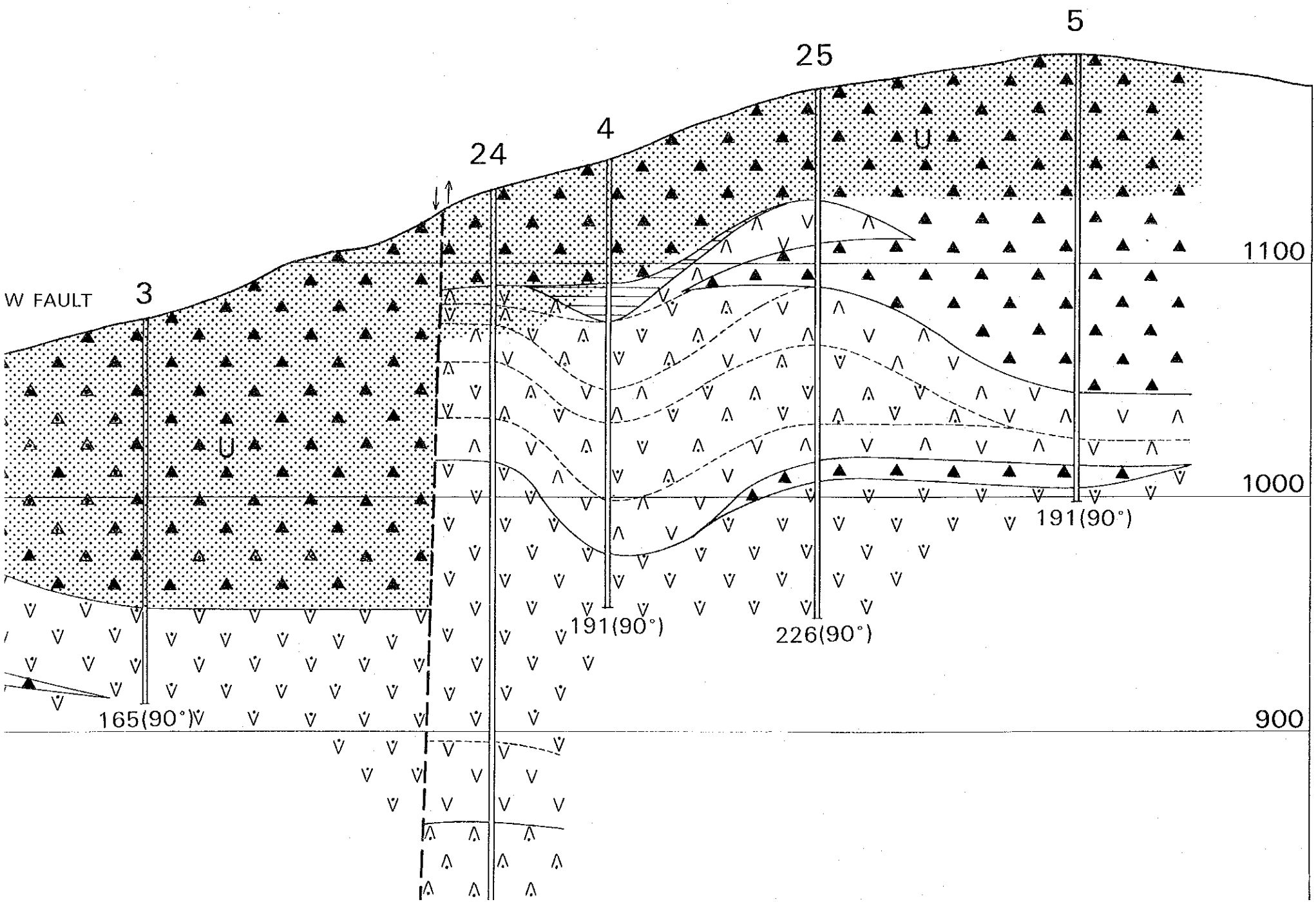


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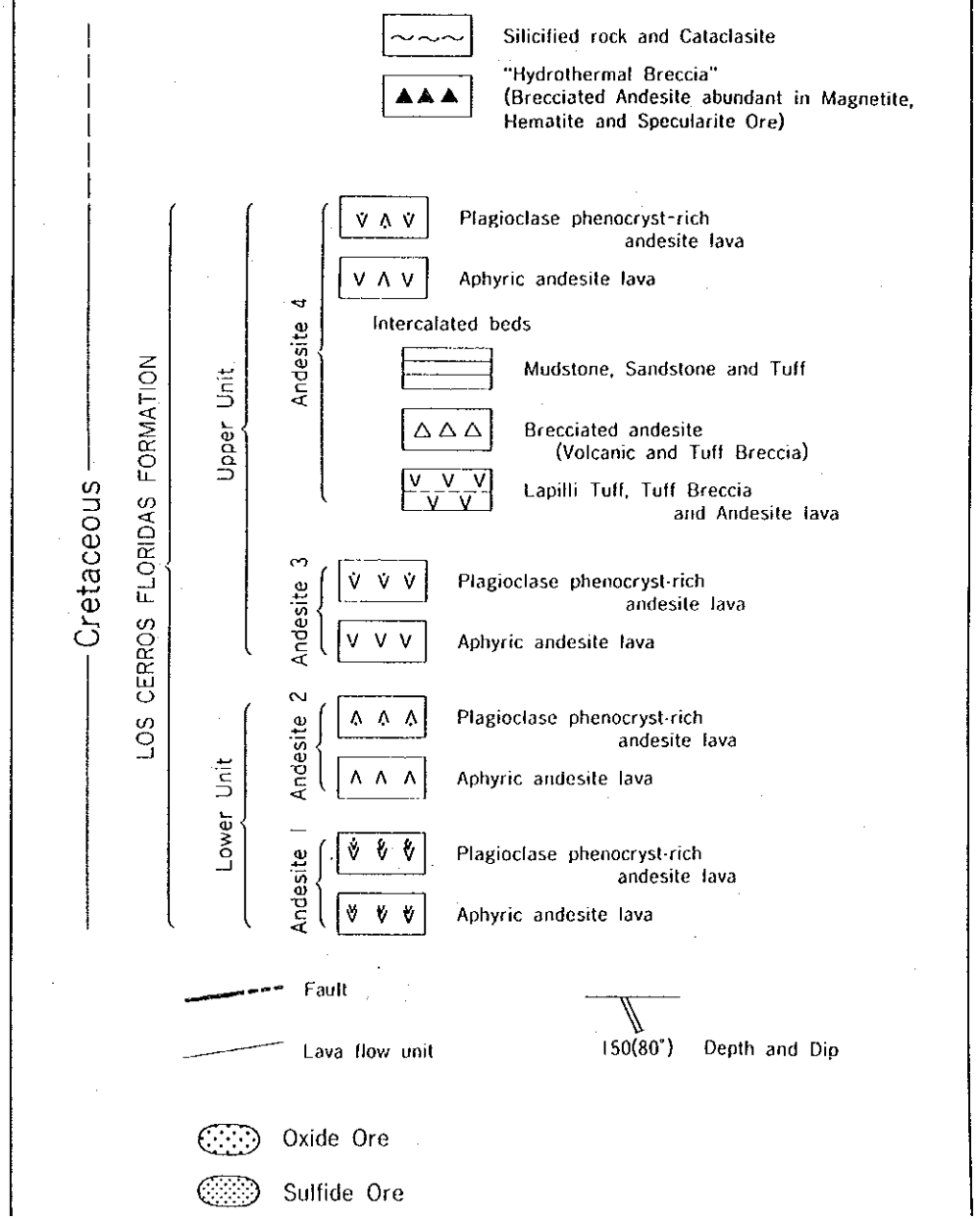


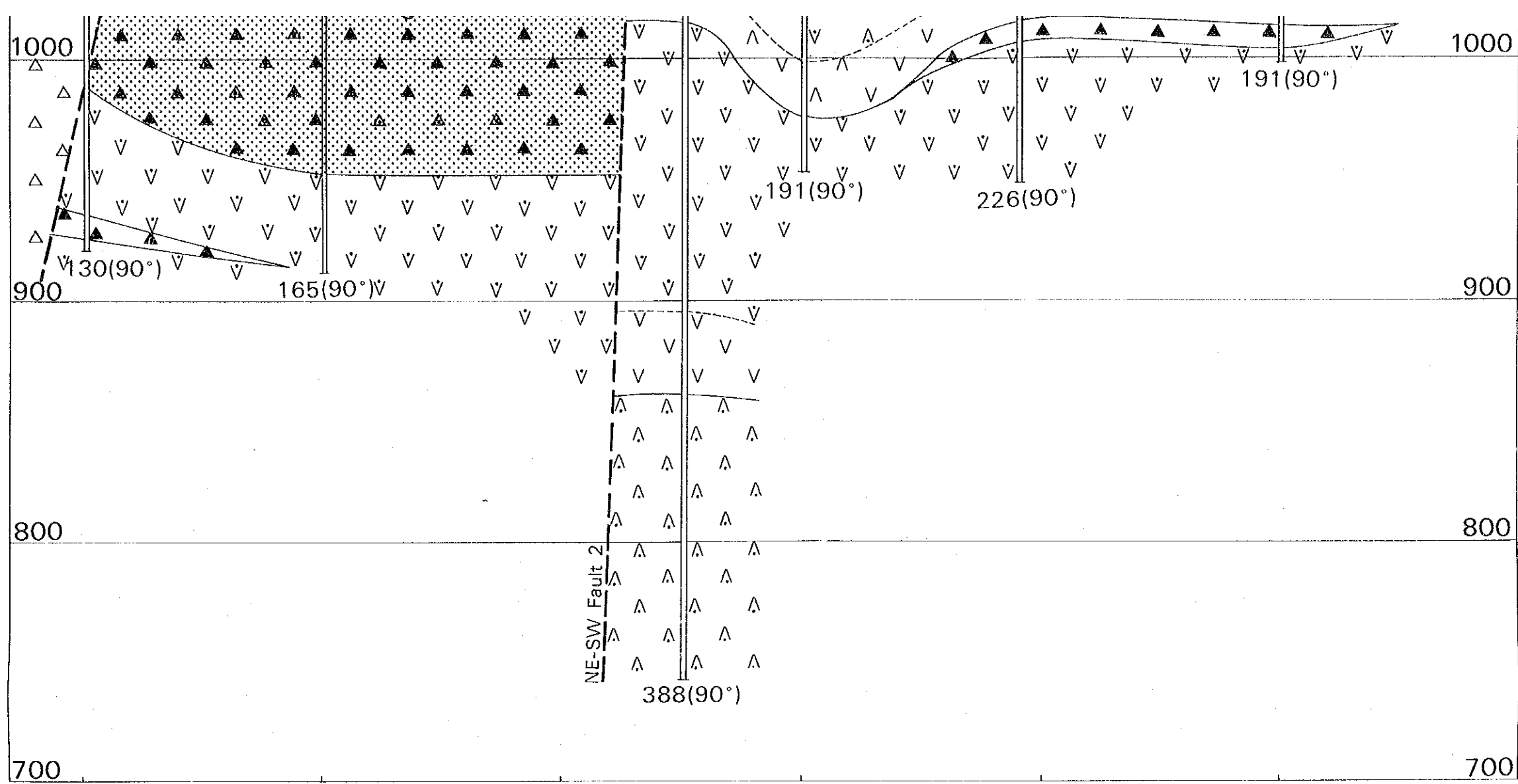


EW-1



LEGEND





Cretaceo
LOS CERROS FLORI

- | | | | |
|------------|------------|--|-------------|
| Lower Unit | Andesite 3 | | Plagioclase |
| | | | Aphyric and |
| | Andesite 2 | | Plagioclase |
| | | | Aphyric and |
| | Andesite 1 | | Plagioclase |
| | | | Aphyric and |

- Fault
- Lava flow unit
- Oxide Ore
- Sulfide Ore
- U : Upper Ore body
- M : Middle Ore body
- L : Lower Ore body
- W : West Ore body
- E : East Ore body

PLA

MINERAL EXPLORATION
IN THE CERRO NE
REPUBLIC OF
PHASE

GEOLOGICAL
(1:2,000)

JAPAN INTERNATIONAL COOPERATION
METAL MINING AGENCY
FEBRUARY 1961

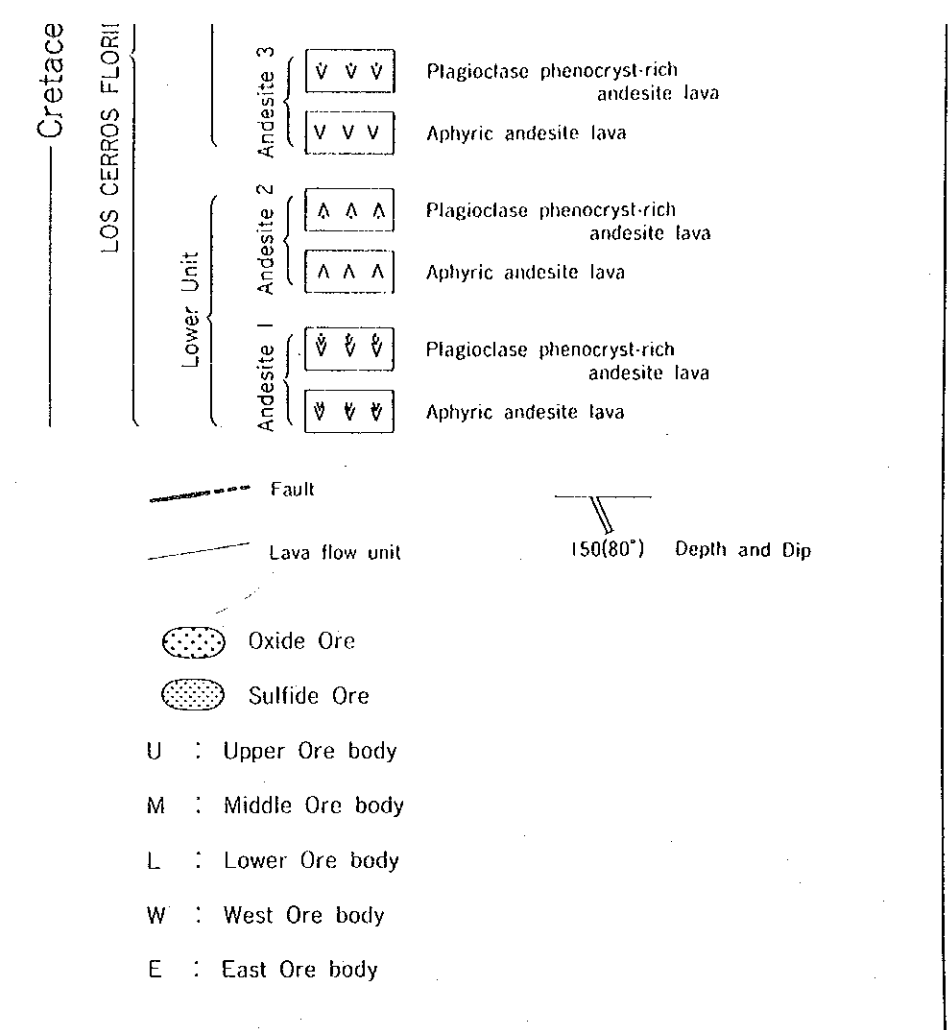
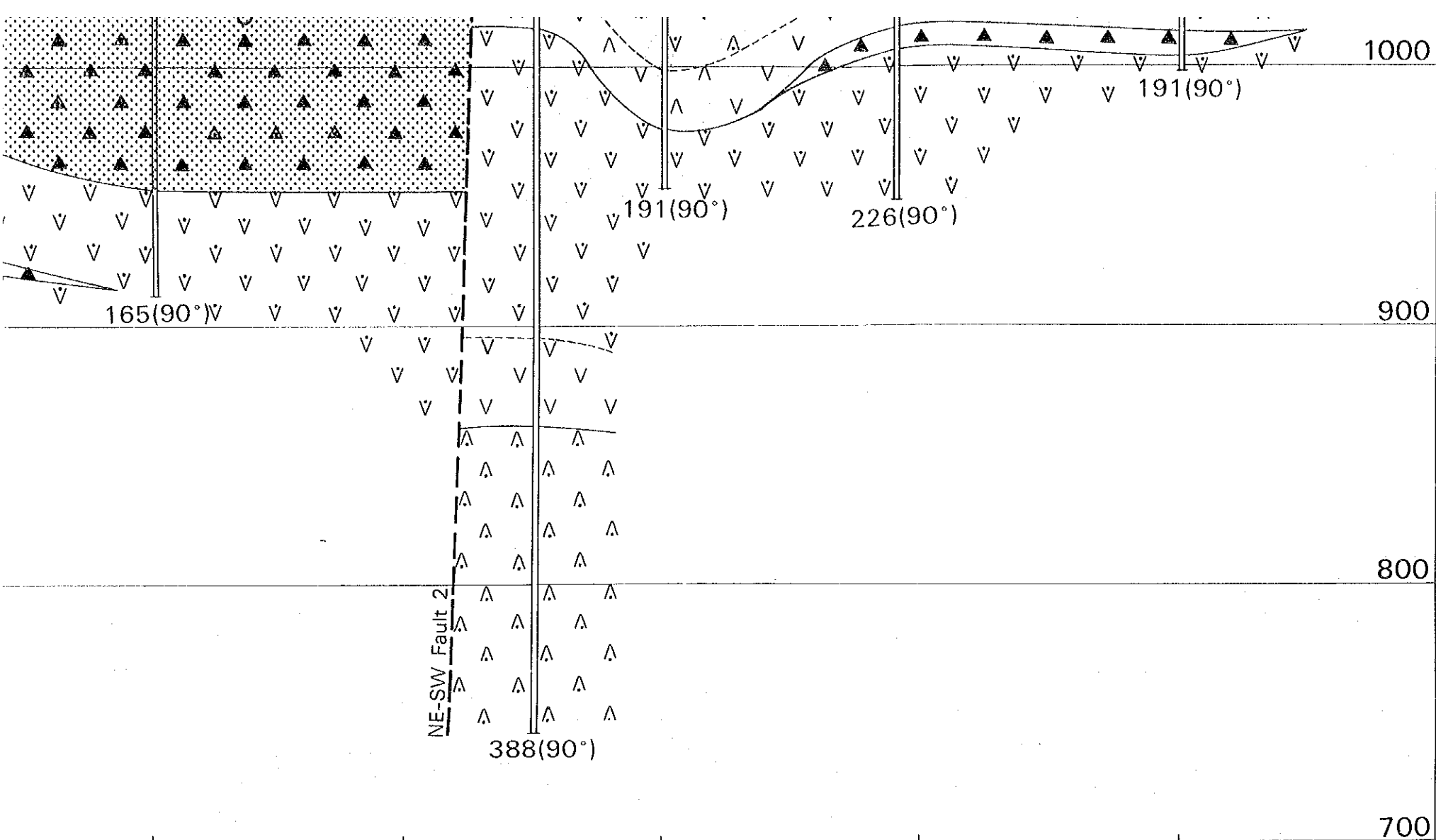
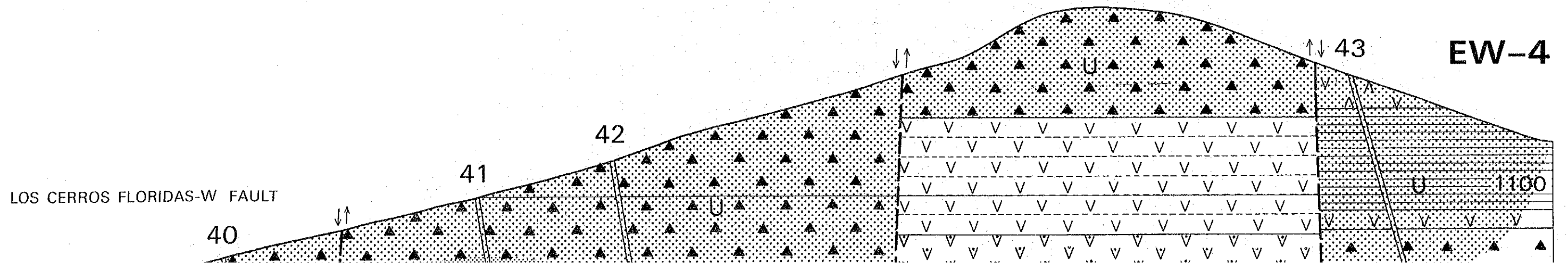
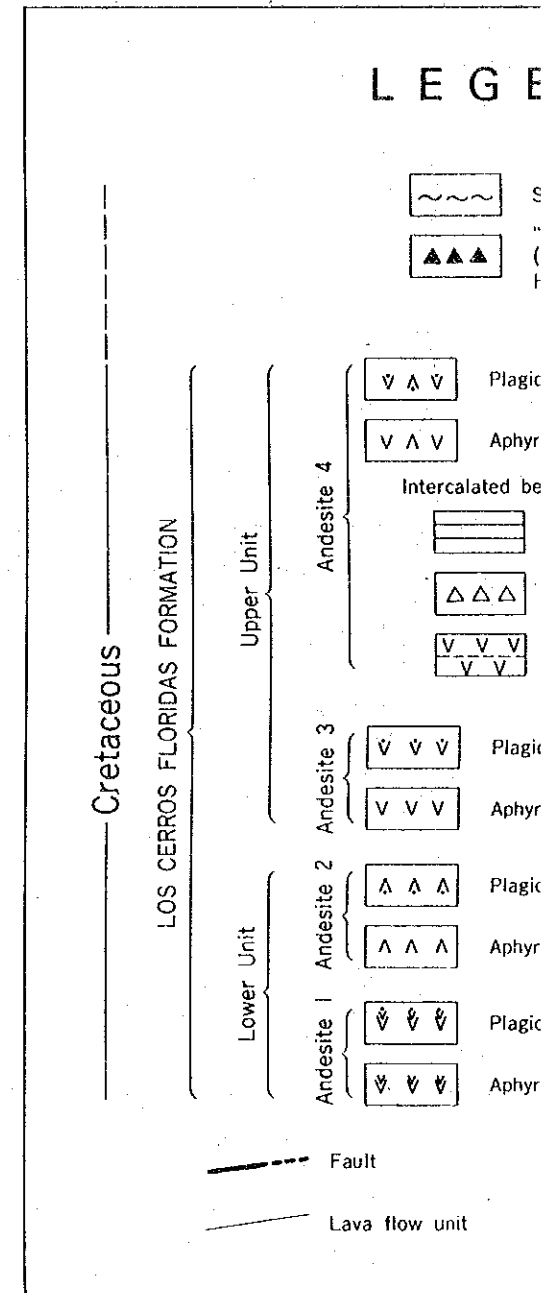
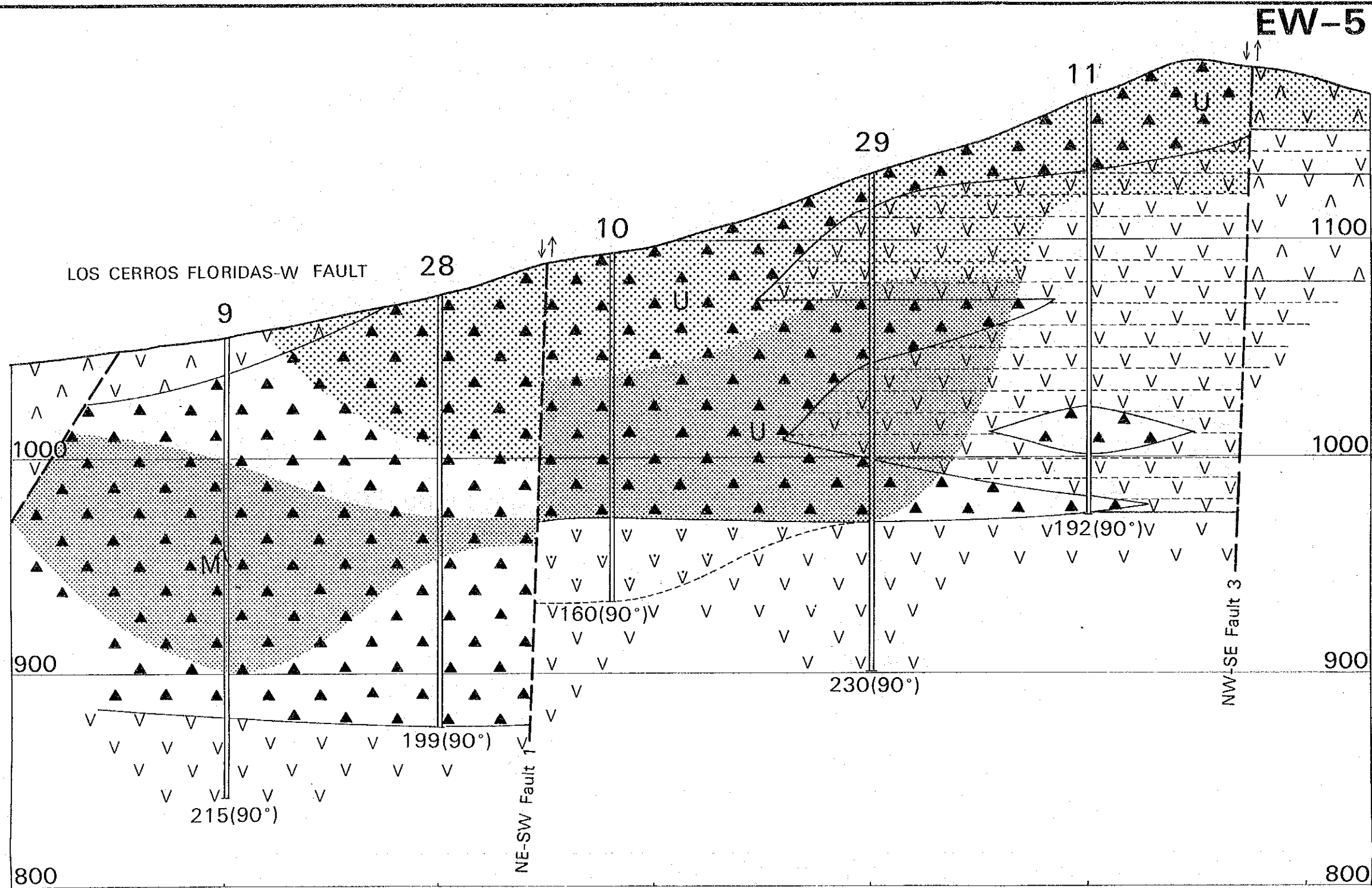
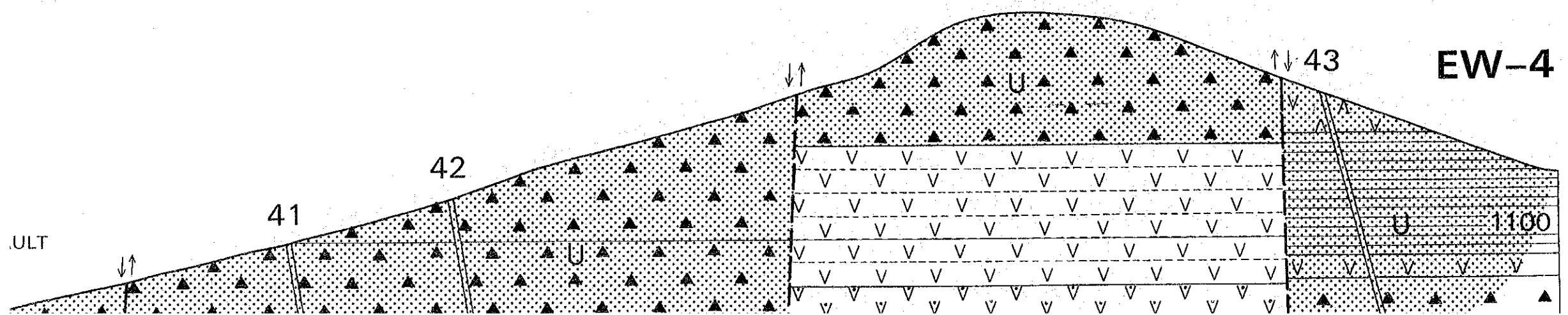
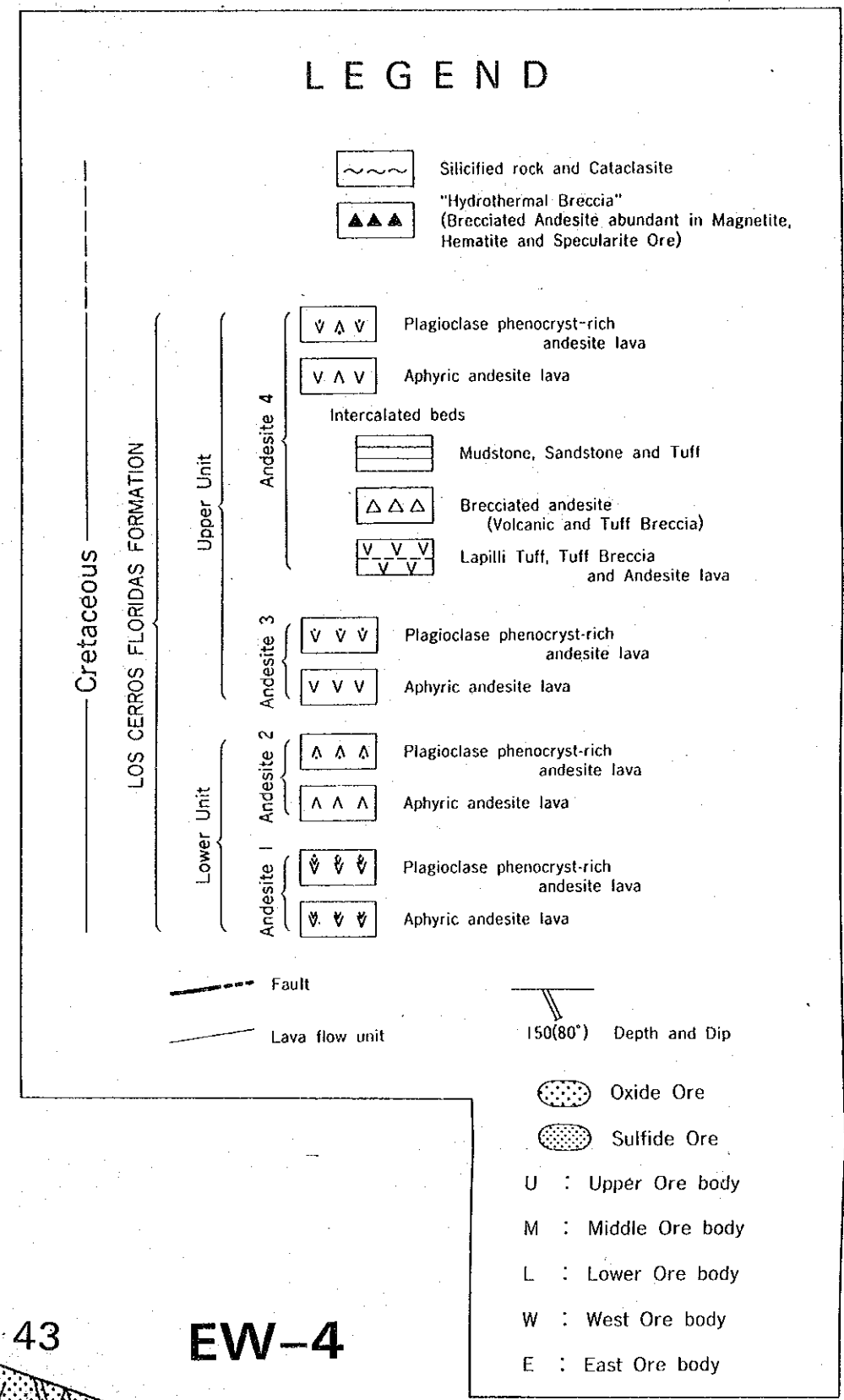
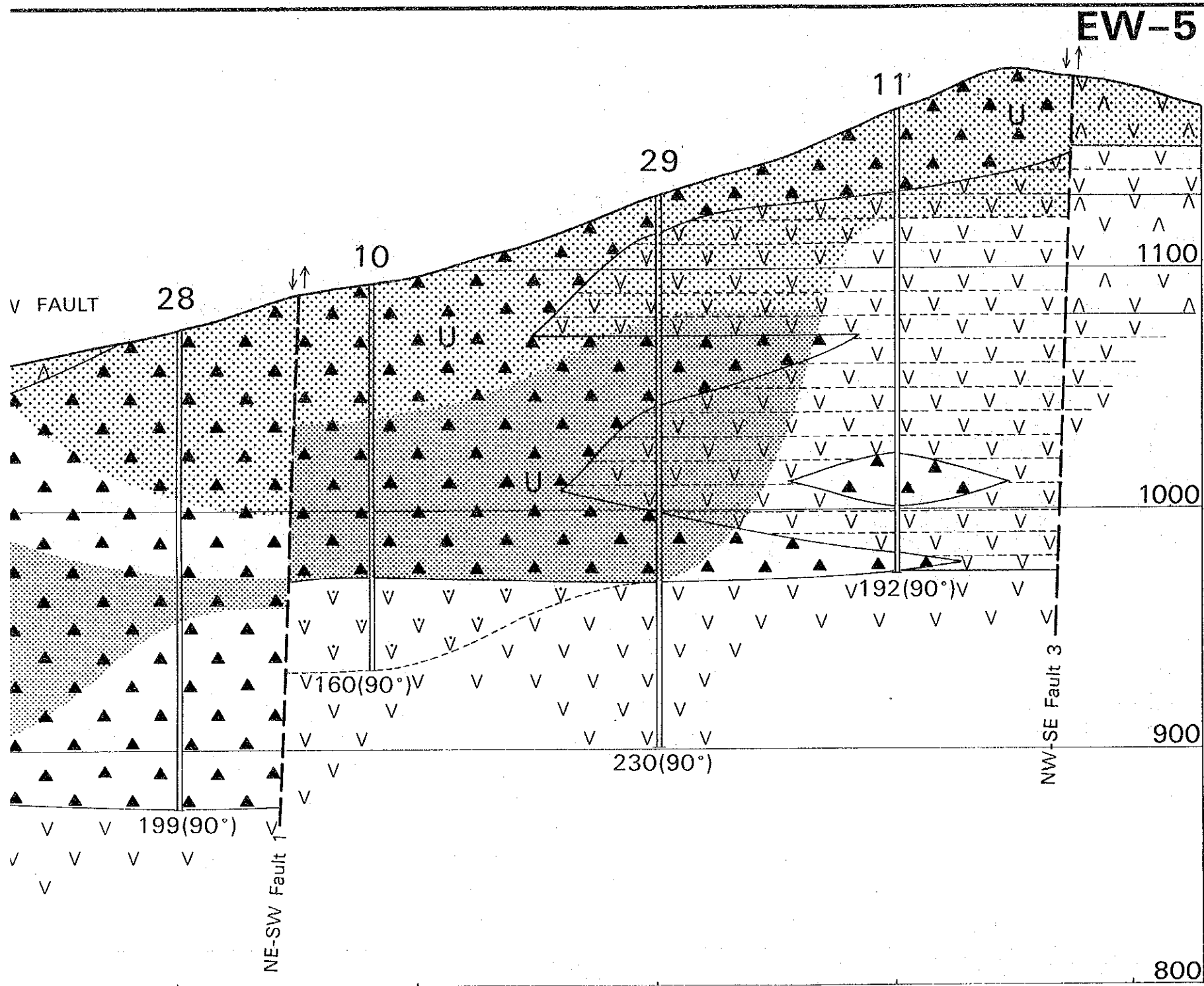


PLATE II - 1	
<p>MINERAL EXPLORATION IN THE CERRO NEGRO AREA REPUBLIC OF CHILE PHASE II</p>	
<p>GEOLOGICAL SECTION (1:2,000)</p>	
<p>JAPAN INTERNATIONAL COOPERATION AGENCY METAL MINING AGENCY OF JAPAN FEBRUARY 1994</p>	

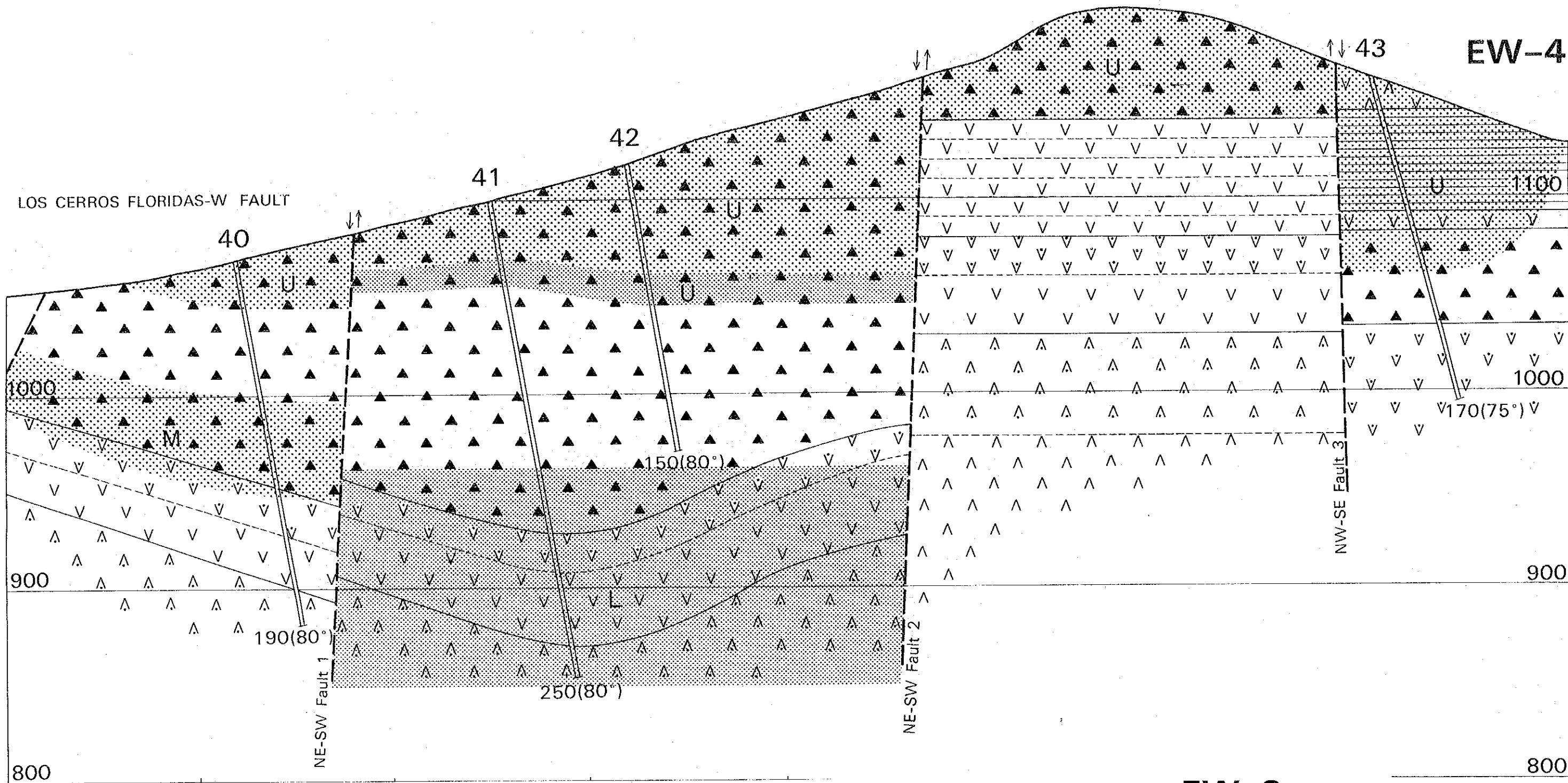




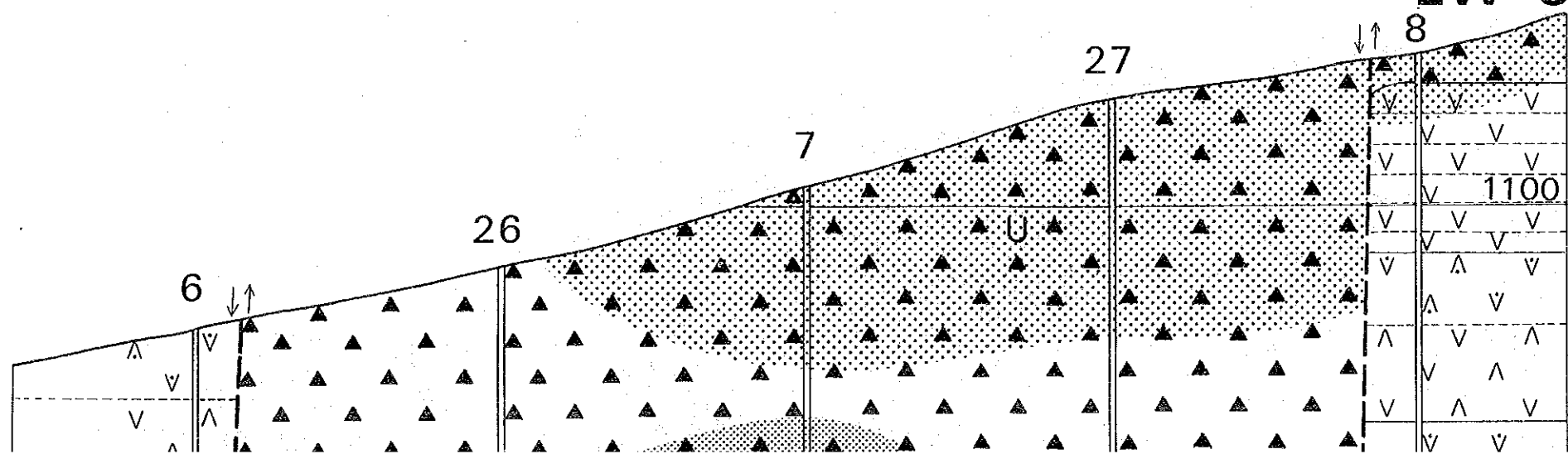
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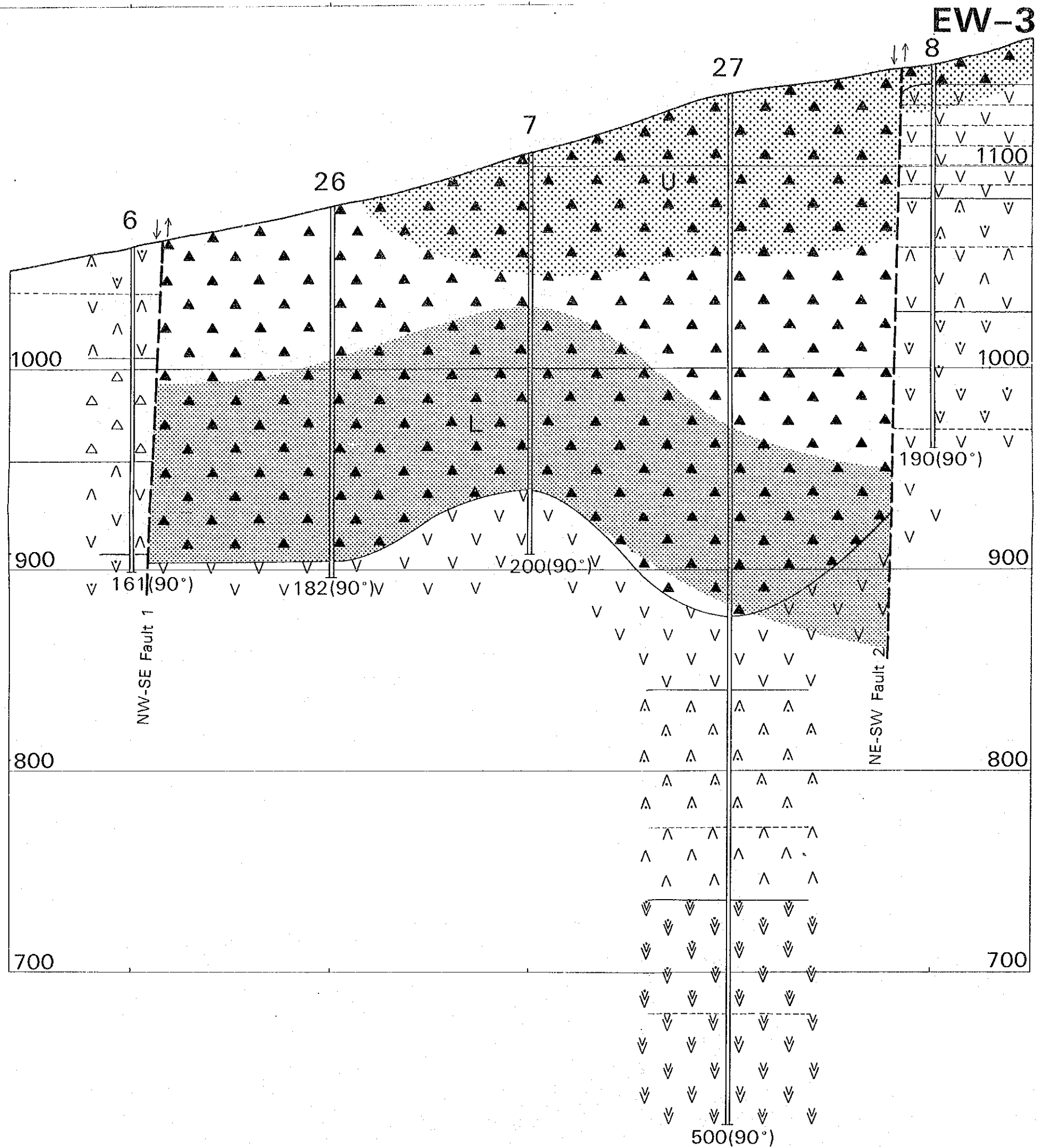
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EW-3





	PL/
MINERAL EXPL IN THE CERRO N REPUBLIC O PHASE	
GEOLOGICAL (1:2,00	
JAPAN INTERNATIONAL CO METAL MINING AGEN FEBRUARY	

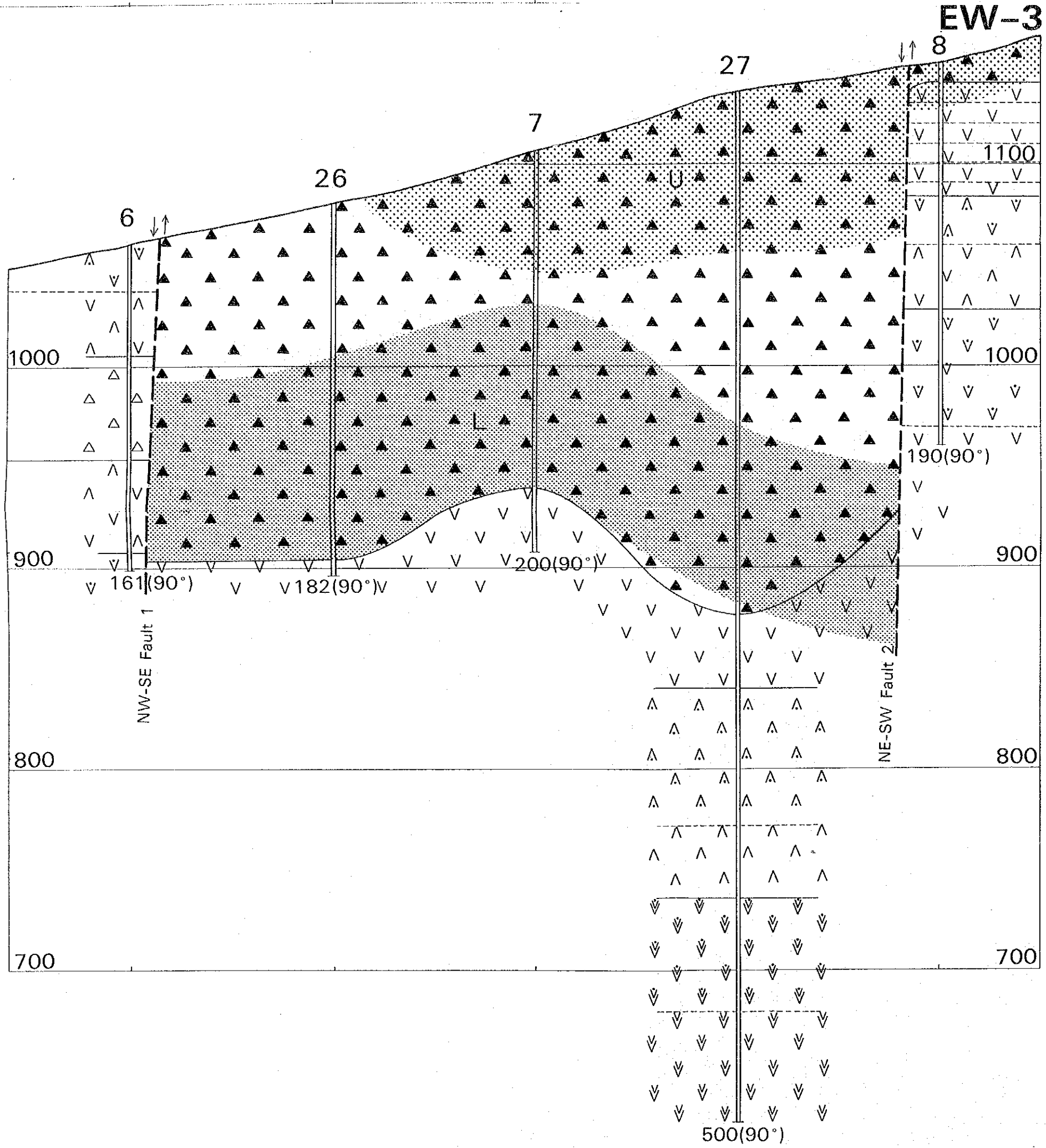
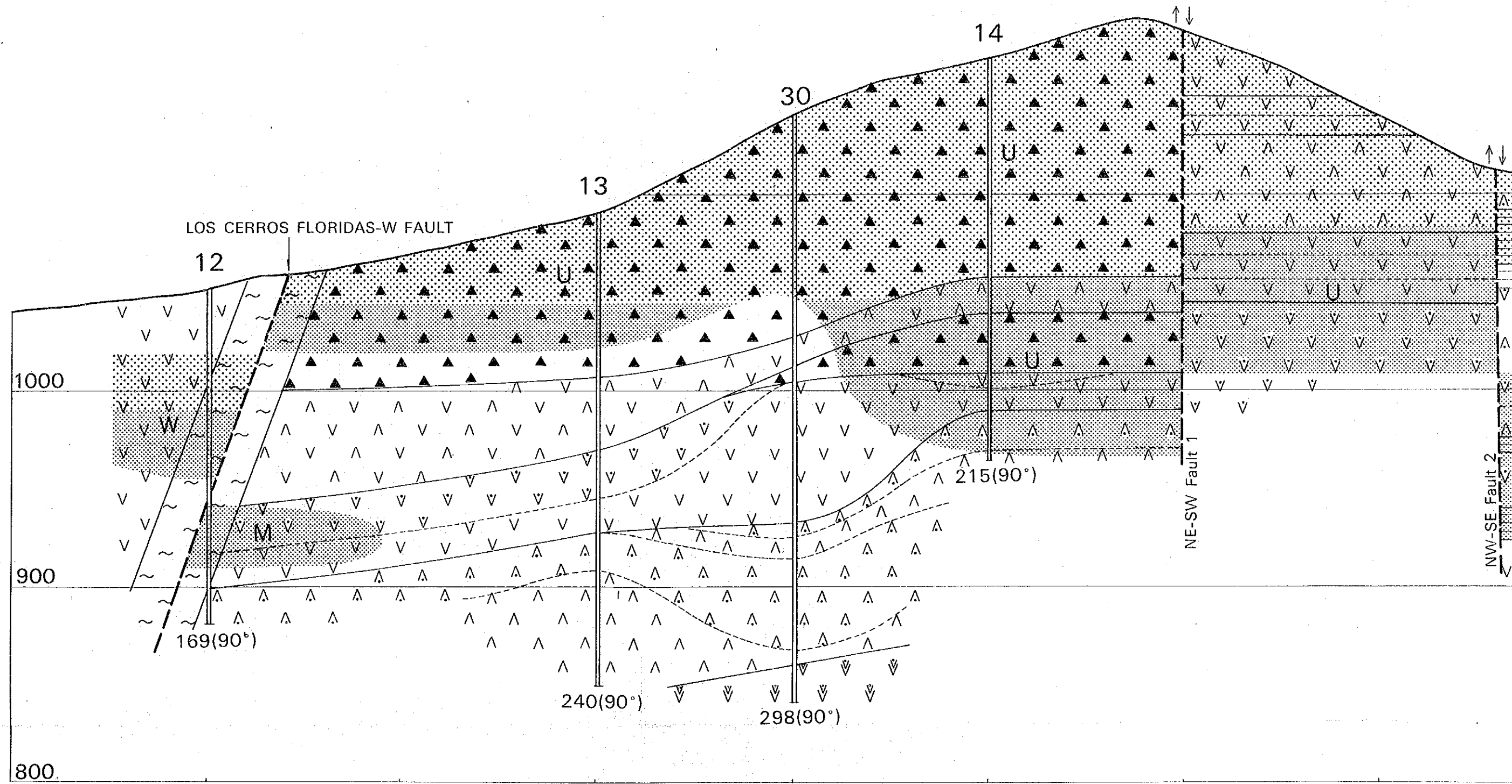
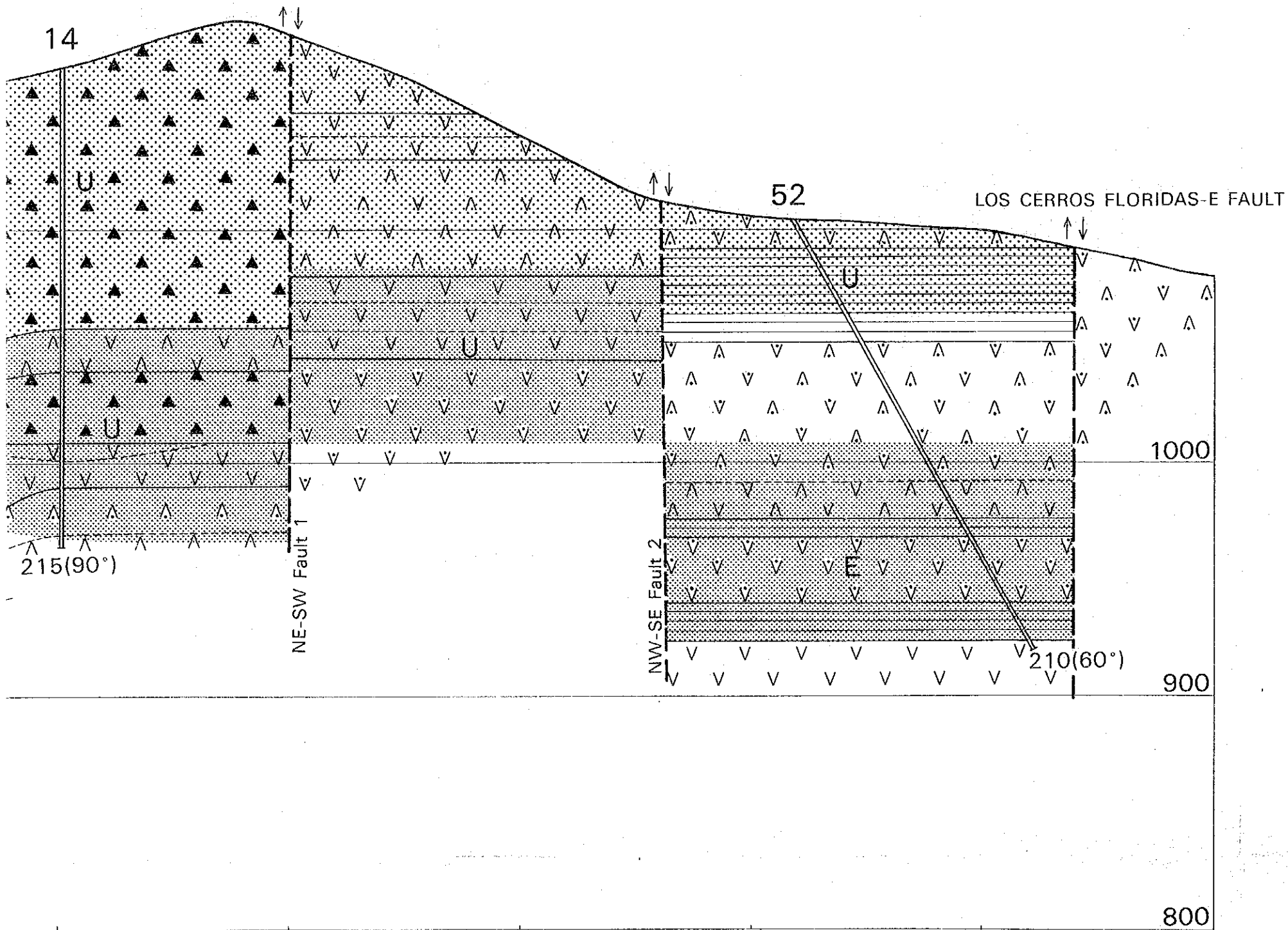


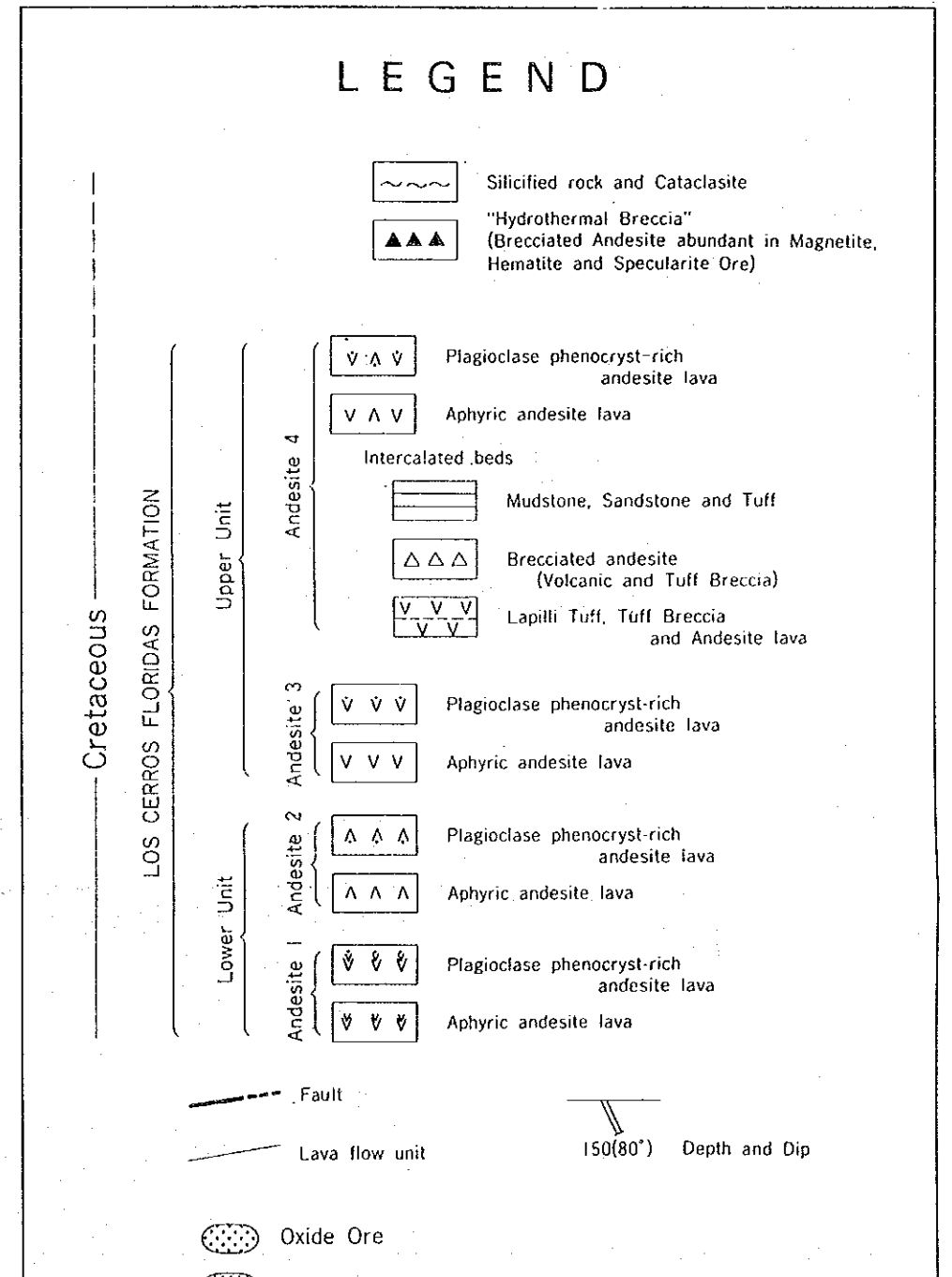
PLATE II - 2	
MINERAL EXPLORATION IN THE CERRO NEGRO AREA REPUBLIC OF CHILE PHASE II	
GEOLOGICAL SECTION (1:2,000)	
JAPAN INTERNATIONAL COOPERATION AGENCY METAL MINING AGENCY OF JAPAN FEBRUARY 1994	



EW-7

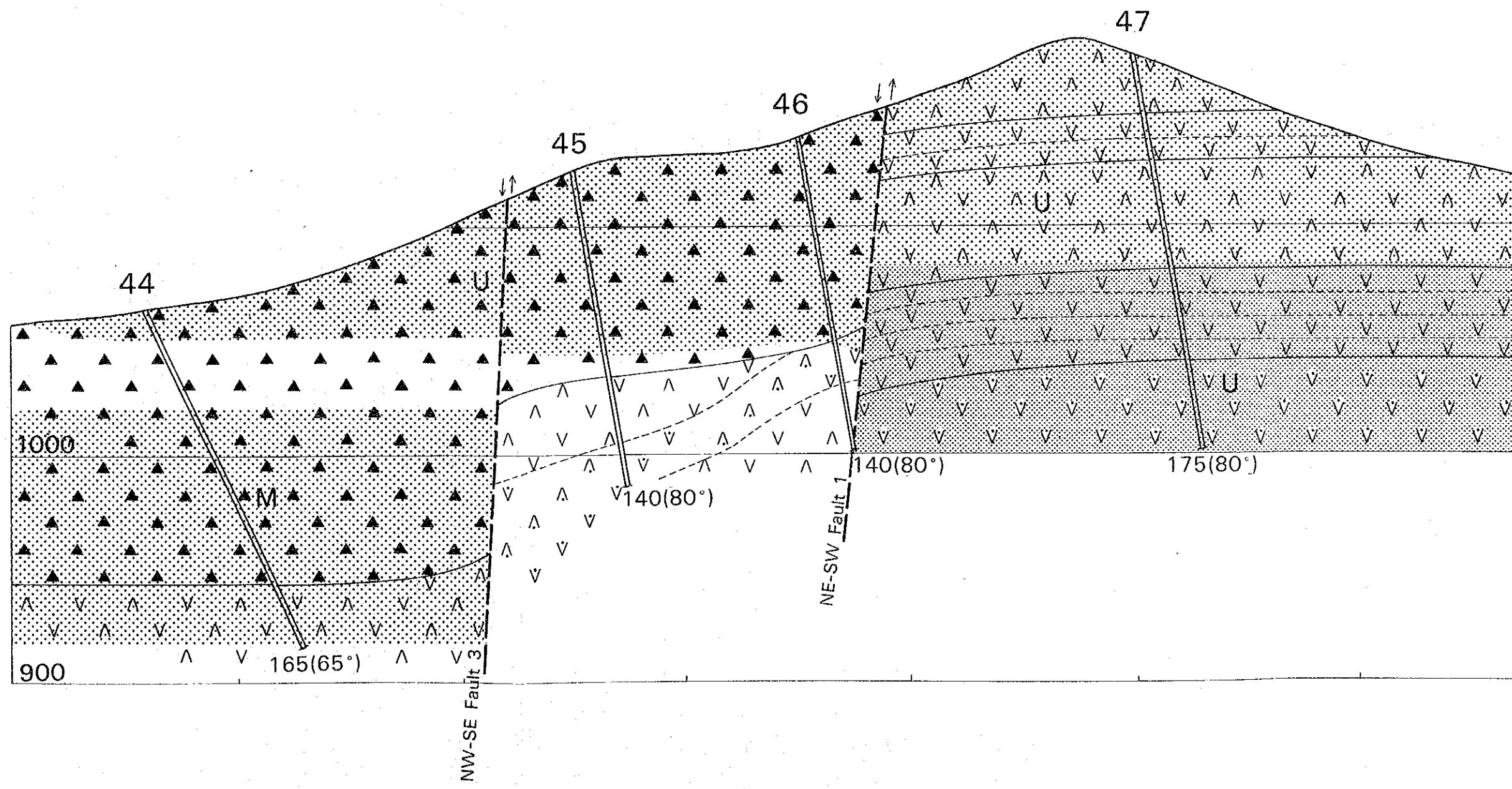
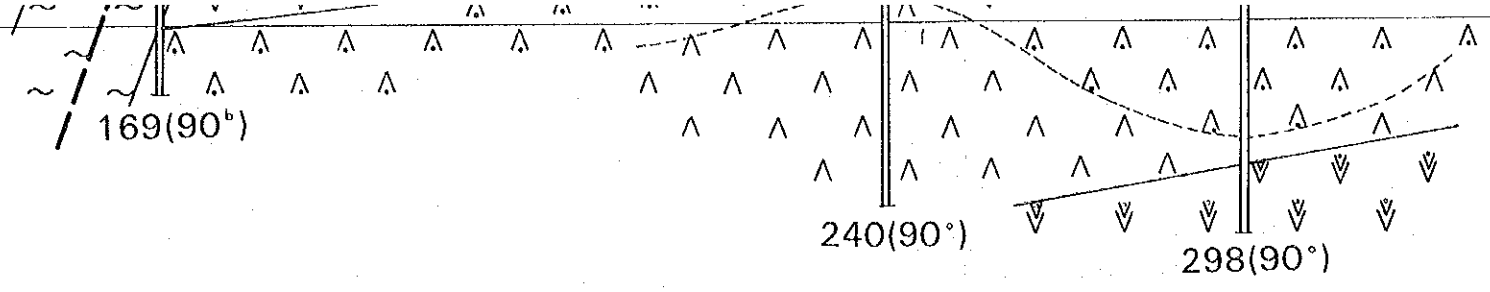


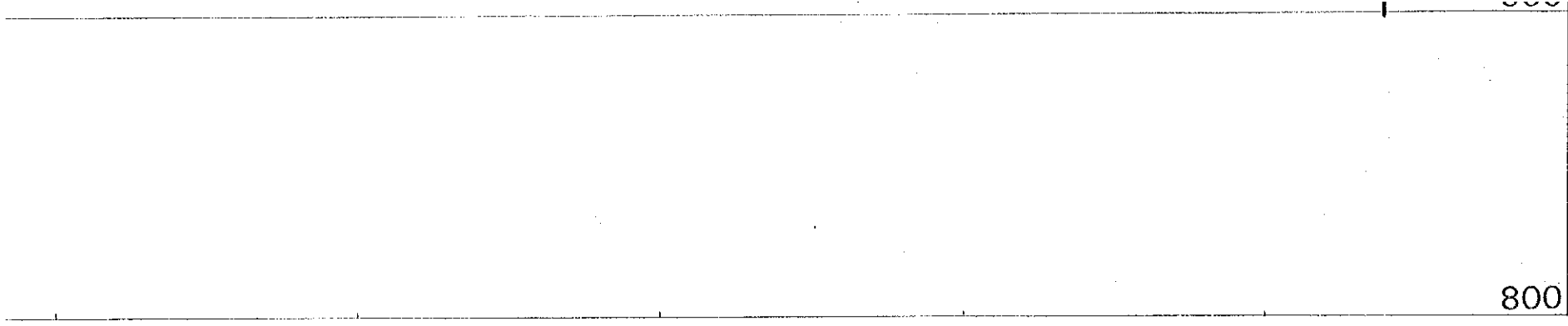
LEGEND



900

800





EW-6

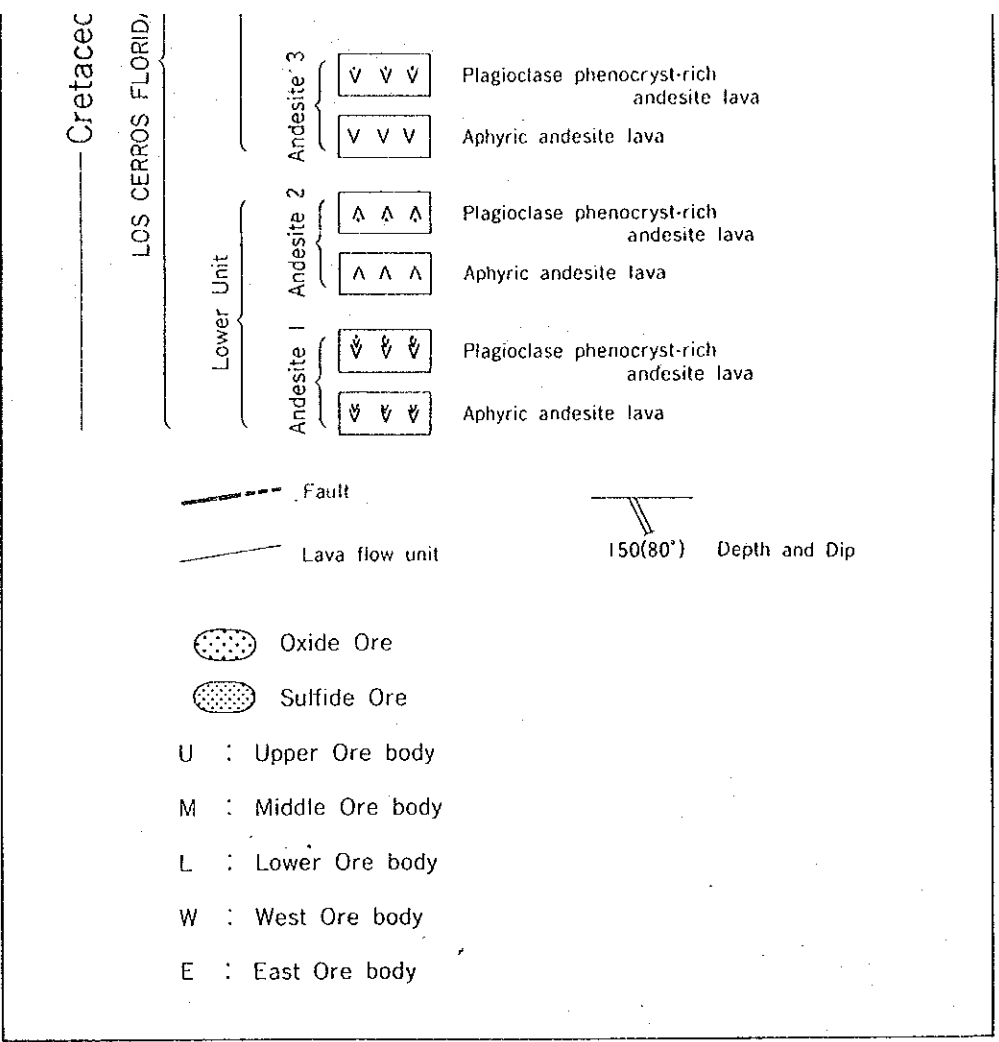
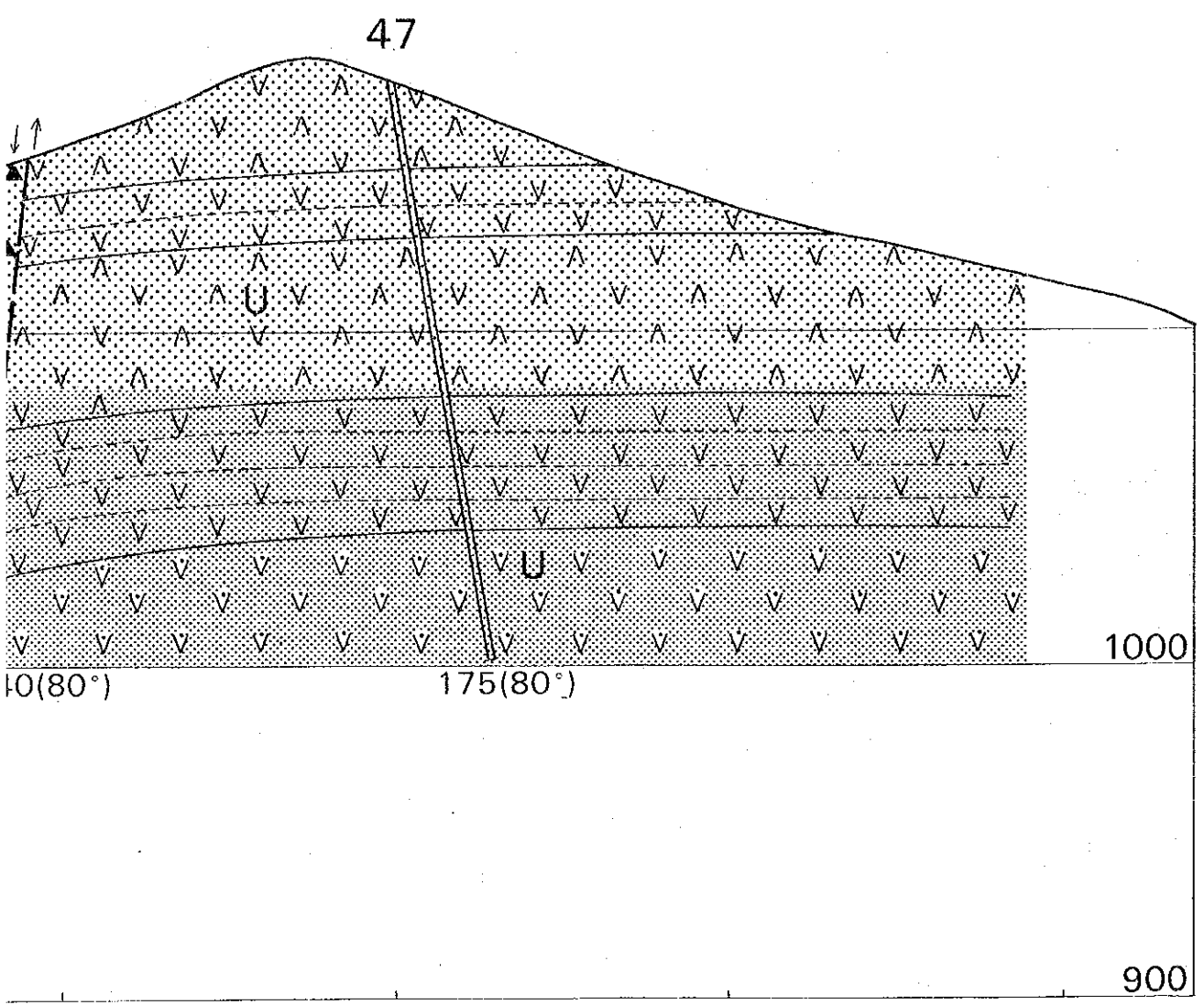
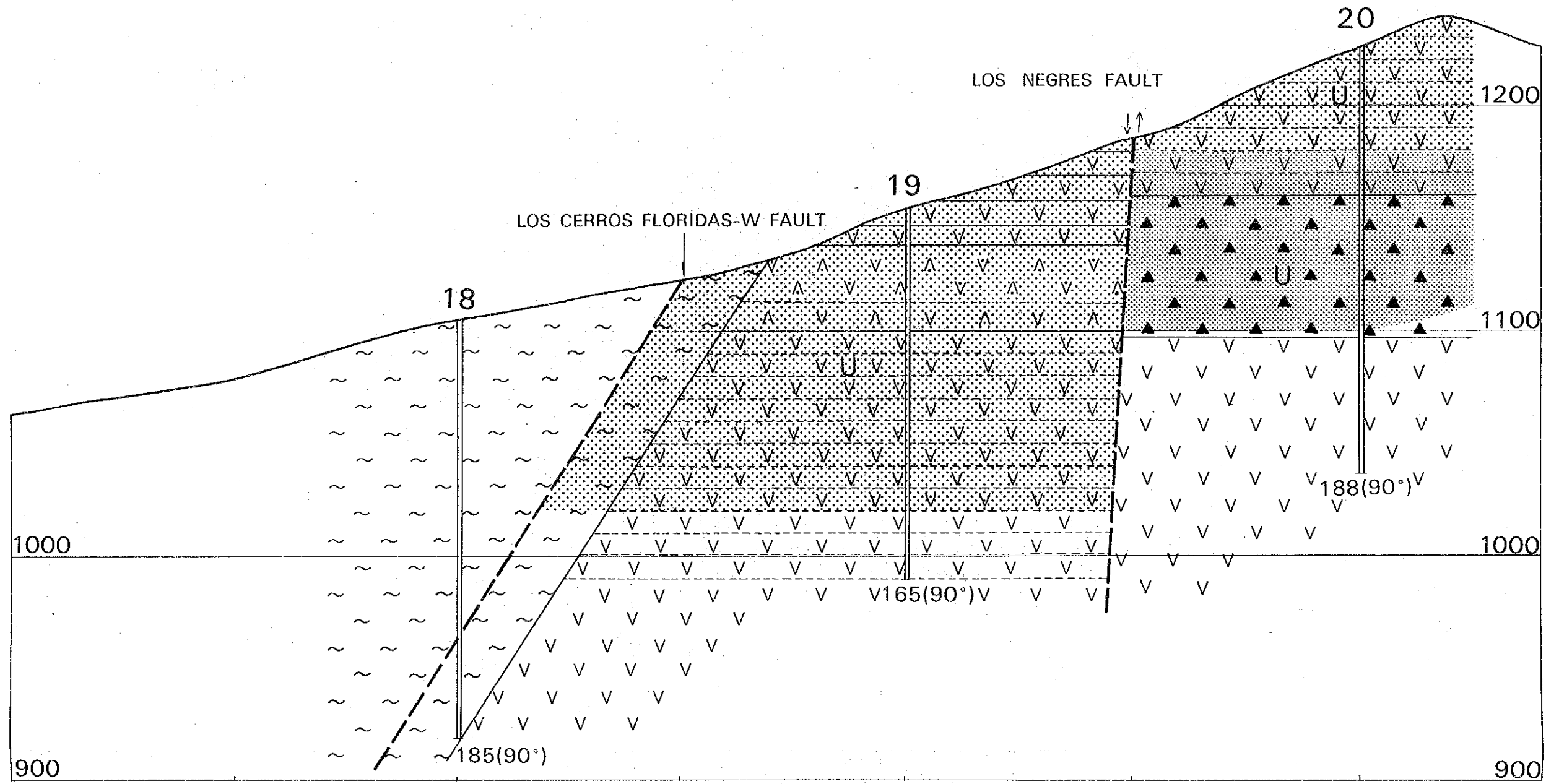
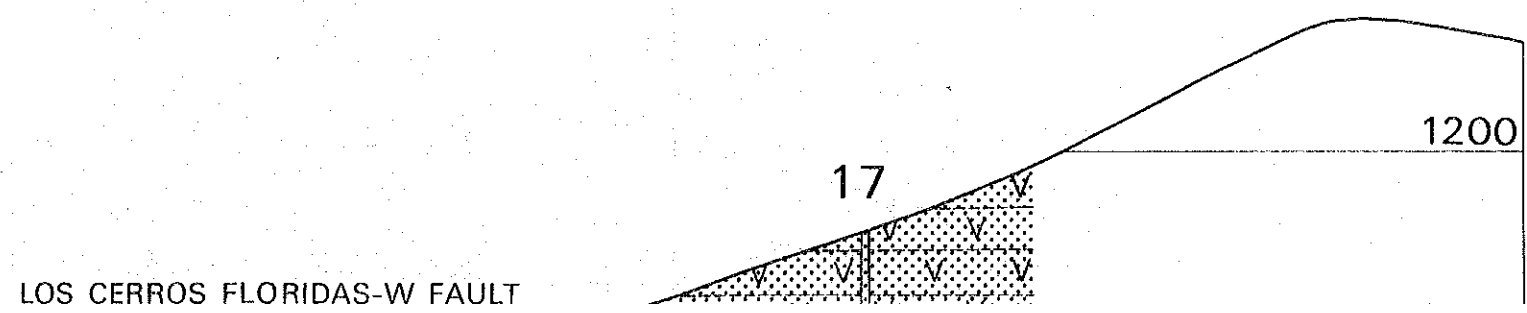


PLATE II - 3	
MINERAL EXPLORATION IN THE CERRO NEGRO AREA REPUBLIC OF CHILE PHASE II	
GEOLOGICAL SECTION (1:2,000)	
JAPAN INTERNATIONAL COOPERATION AGENCY METAL MINING AGENCY OF JAPAN FEBRUARY 1994	

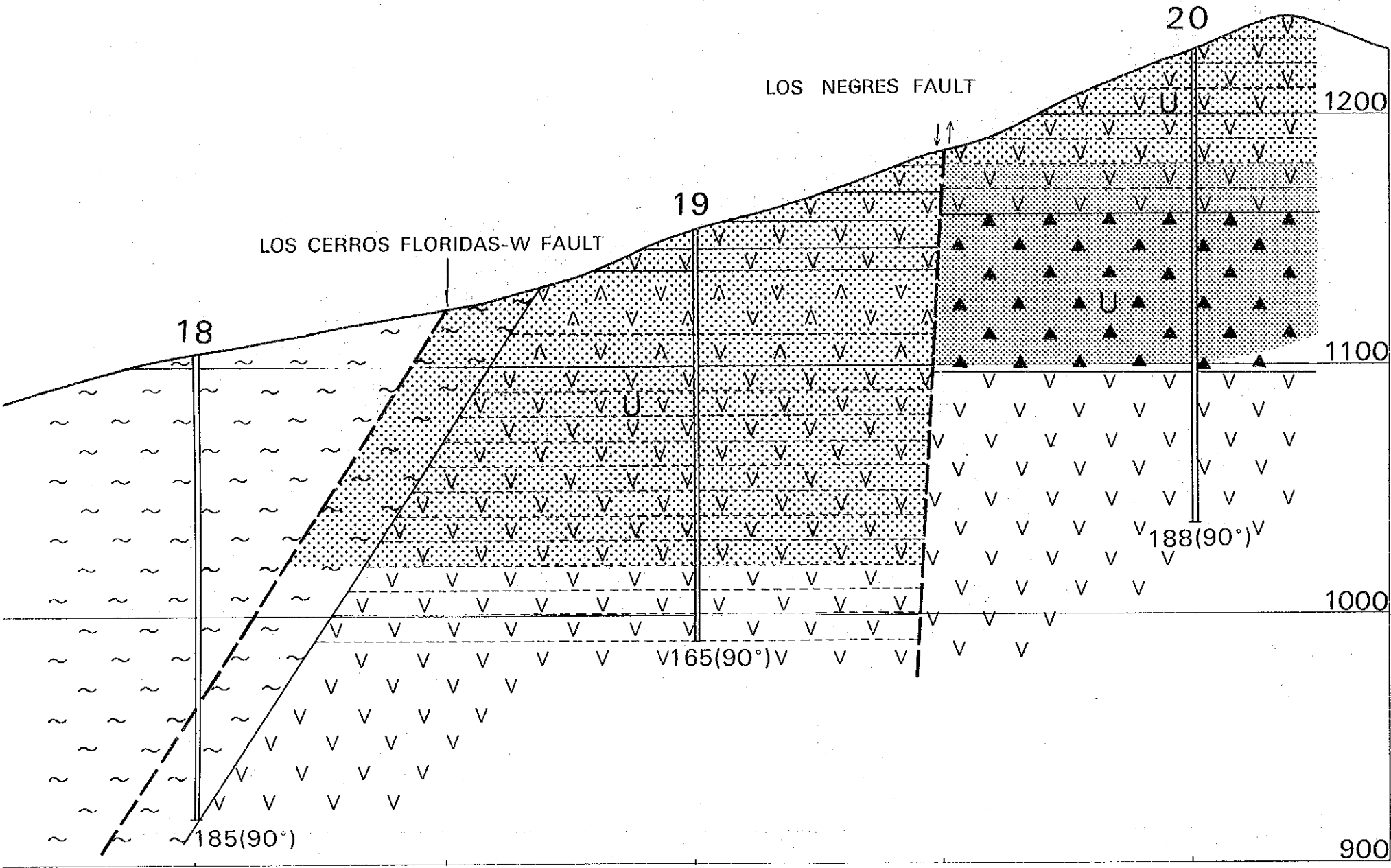
EW-10



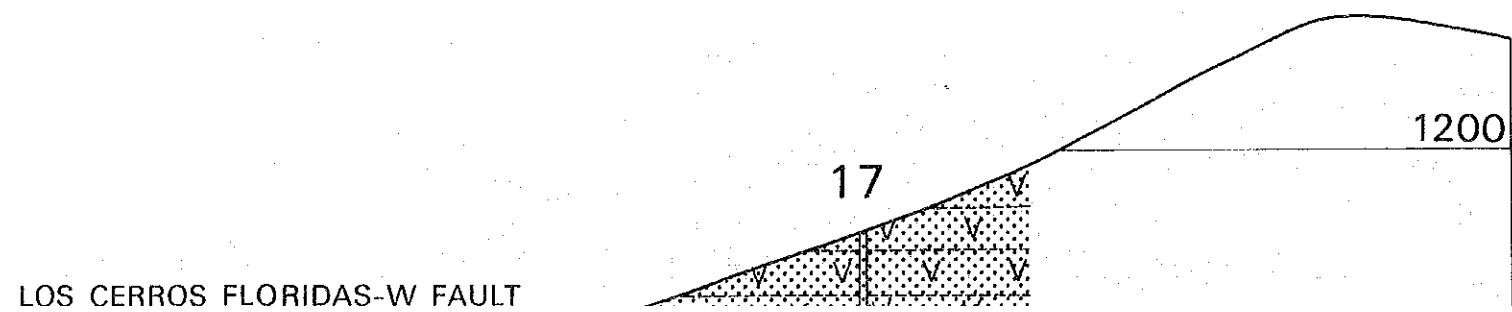
EW-9



EW-10



EW-9

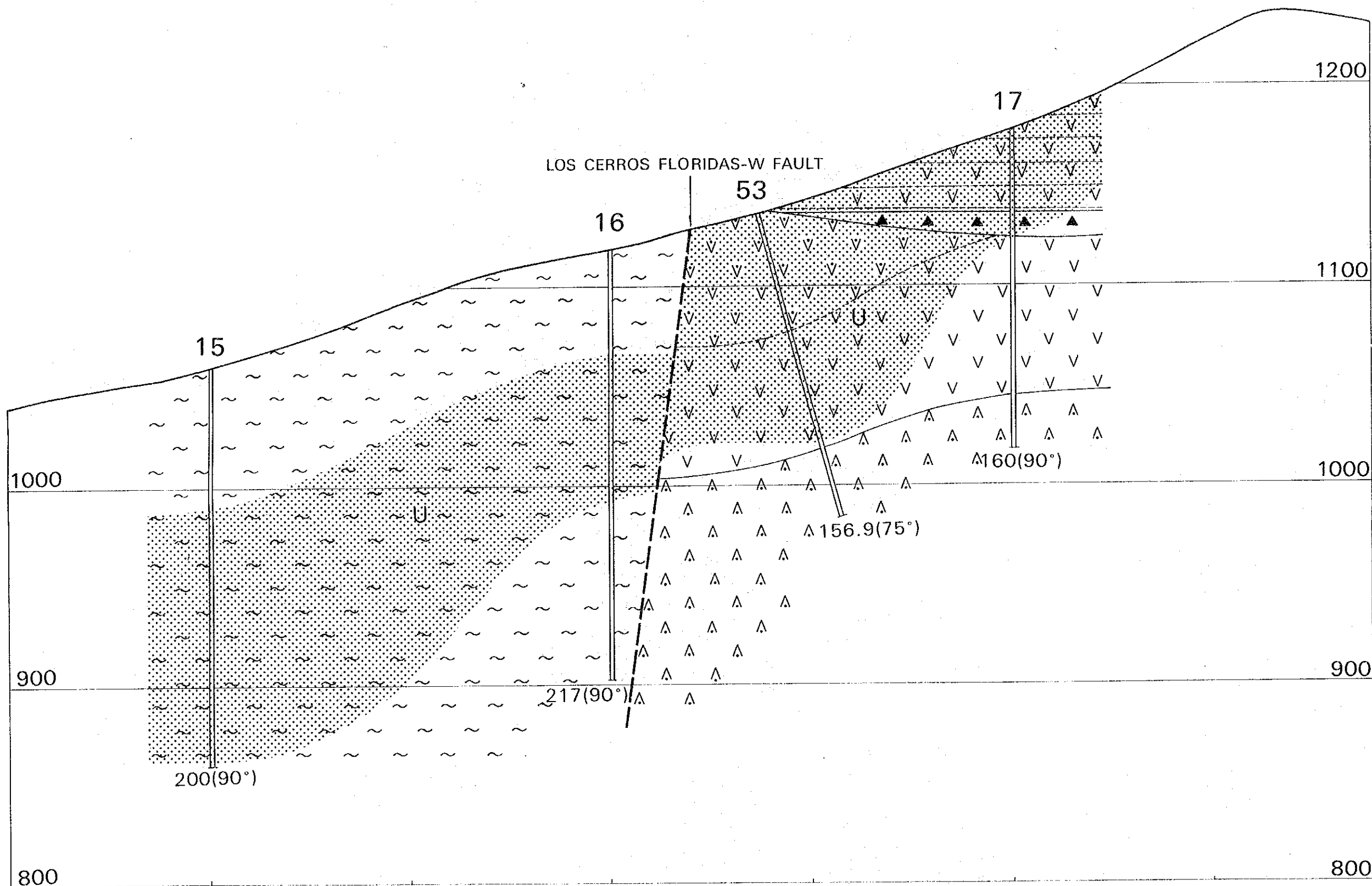


900

900

~ $\dot{\rho}$ $\sqrt{185(90^\circ)}$

EW-9



1000

1100

900

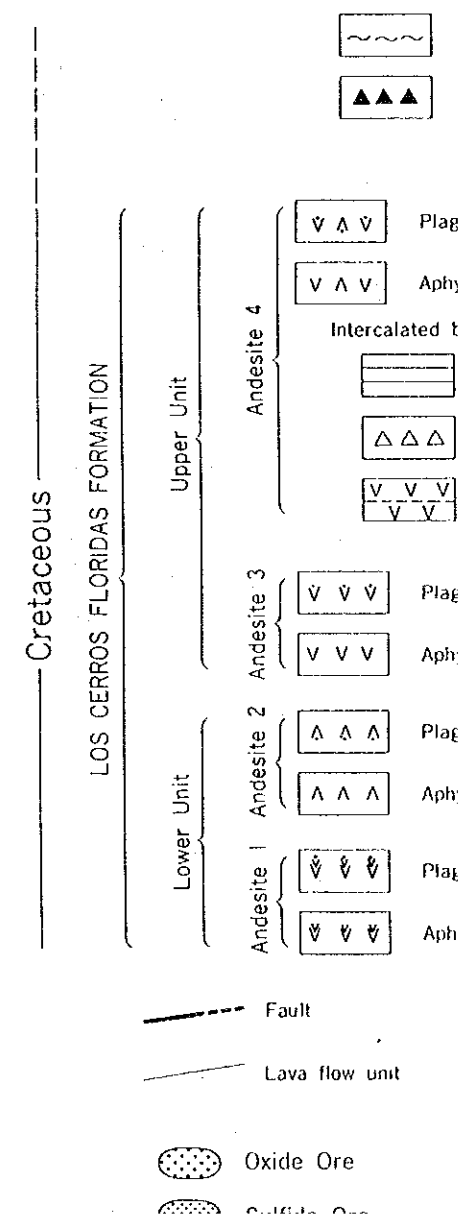
1000

800

900

EW-8

LEG



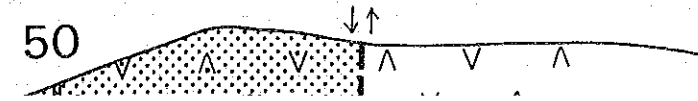
Cretaceous

LOS CERROS FLORIDAS FORMATION

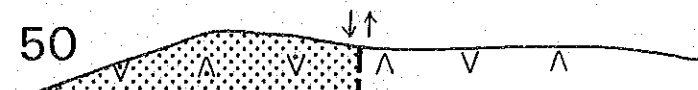
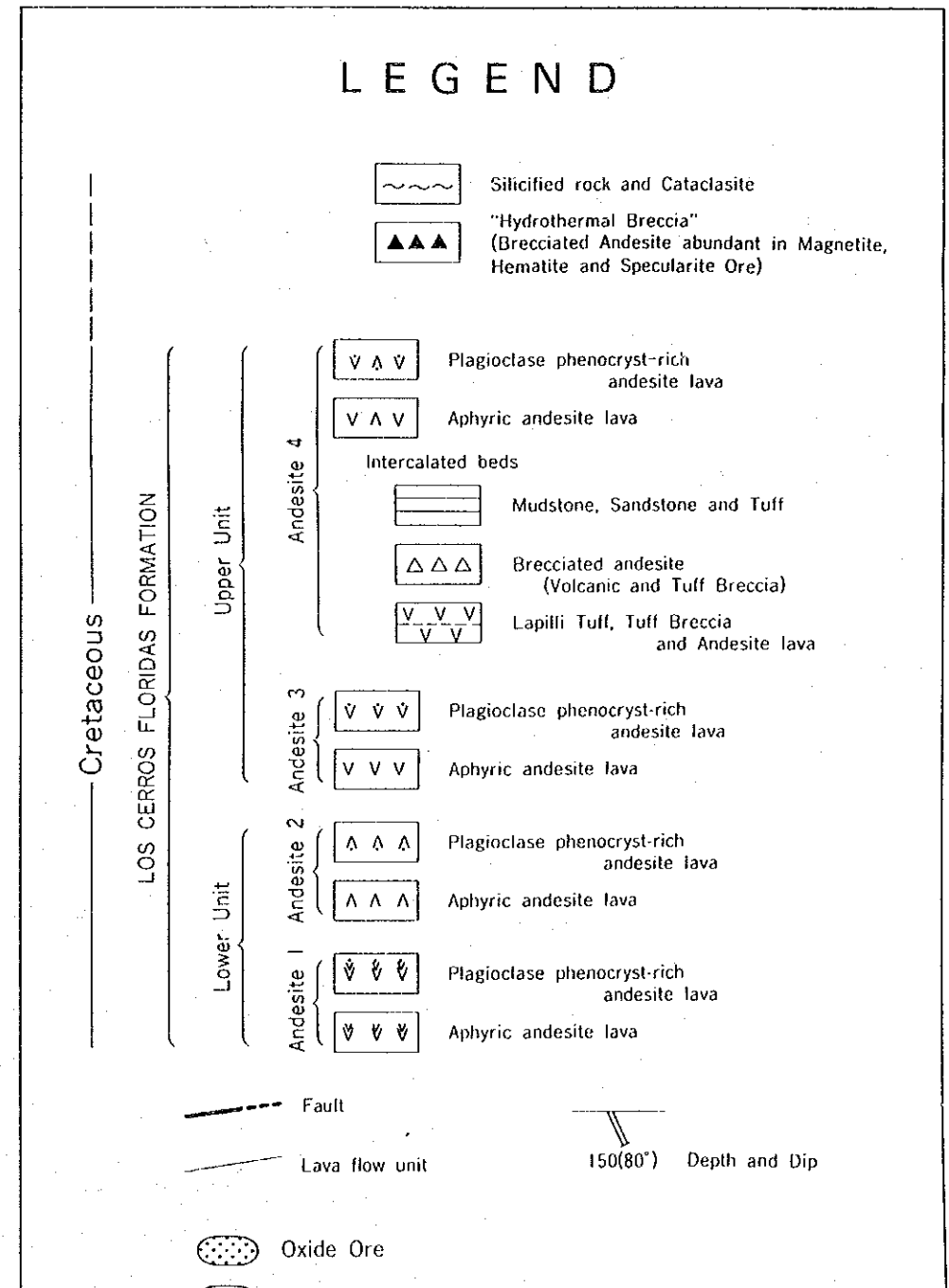
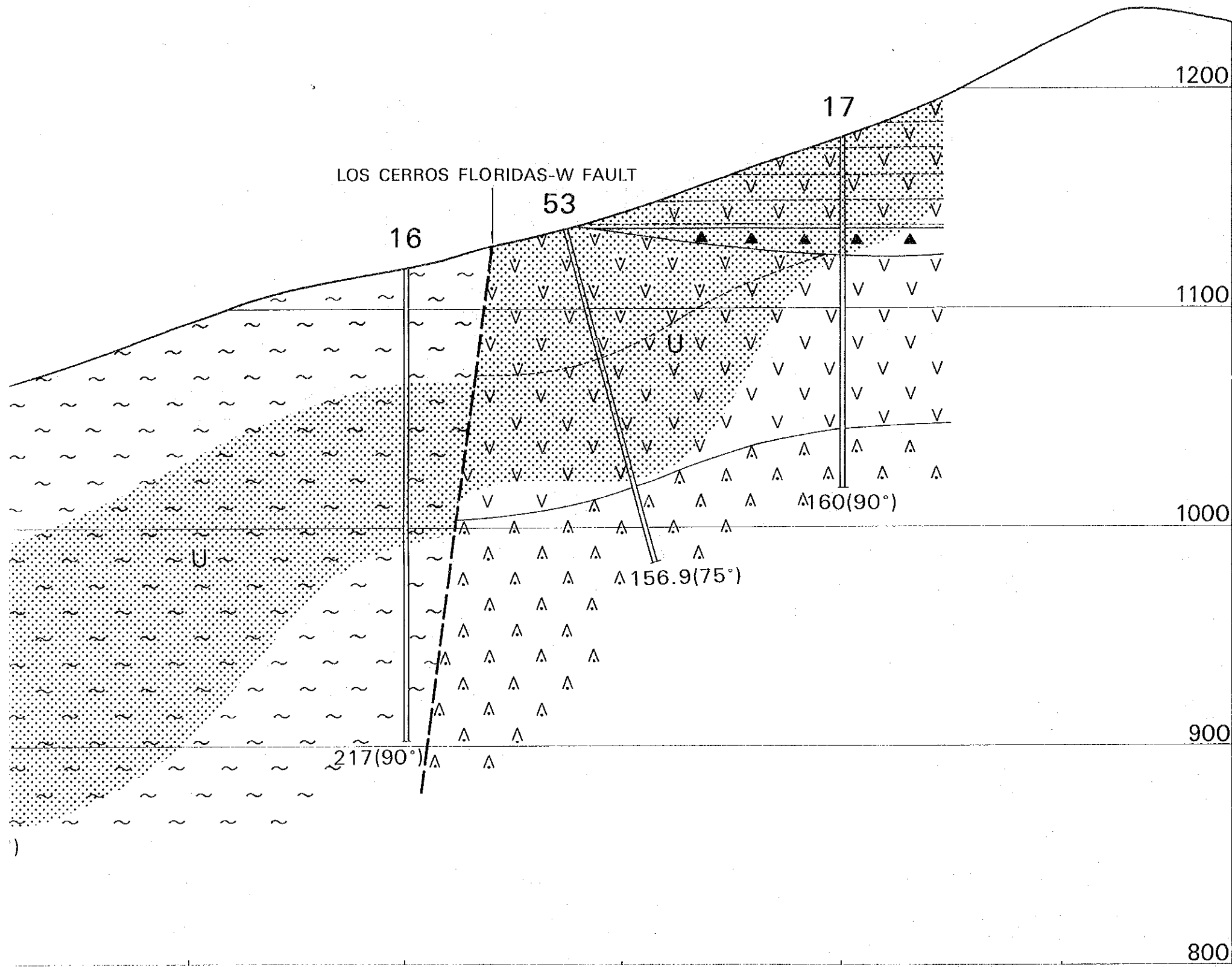
- Lower Unit
 - Andesite 1
 - Plag
 - Aph
 - Andesite 2
 - Plag
 - Aph
 - Andesite 3
 - Plag
 - Aph
 - Andesite 4
 - Plag
 - Aph
 - Intercalated t
- Upper Unit

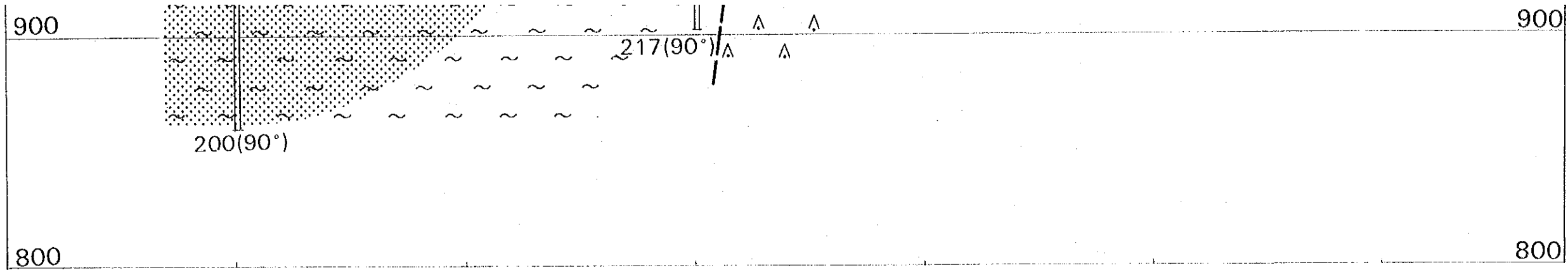
- Fault
- Lava flow unit
- Oxide Ore
- Sulfide Ore

50

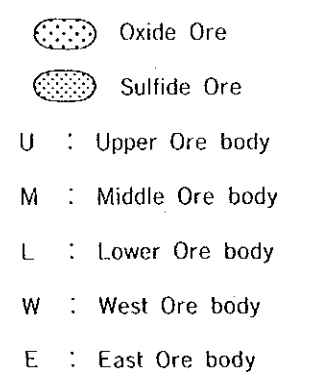
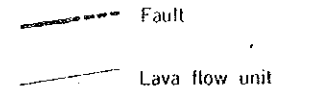
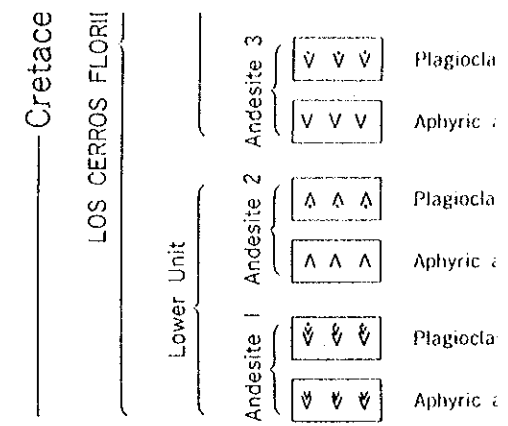
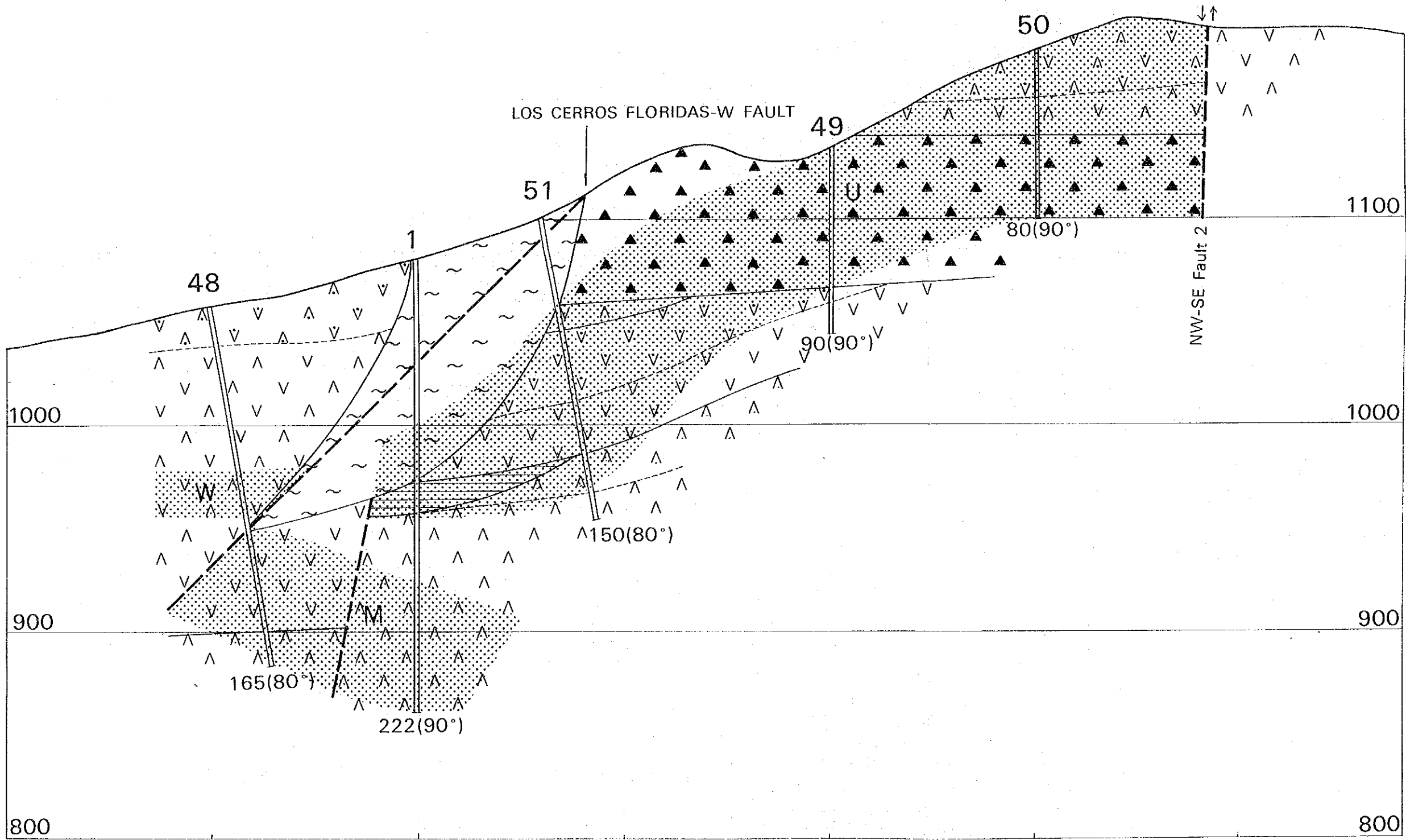


EW-9





EW-8



	PLA
MINERAL EXPL IN THE CERRO NE REPUBLIC OF PHASE	
GEOLOGICAL (1:2,000)	
JAPAN INTERNATIONAL COO METAL MINING AGEN FEBRUARY	

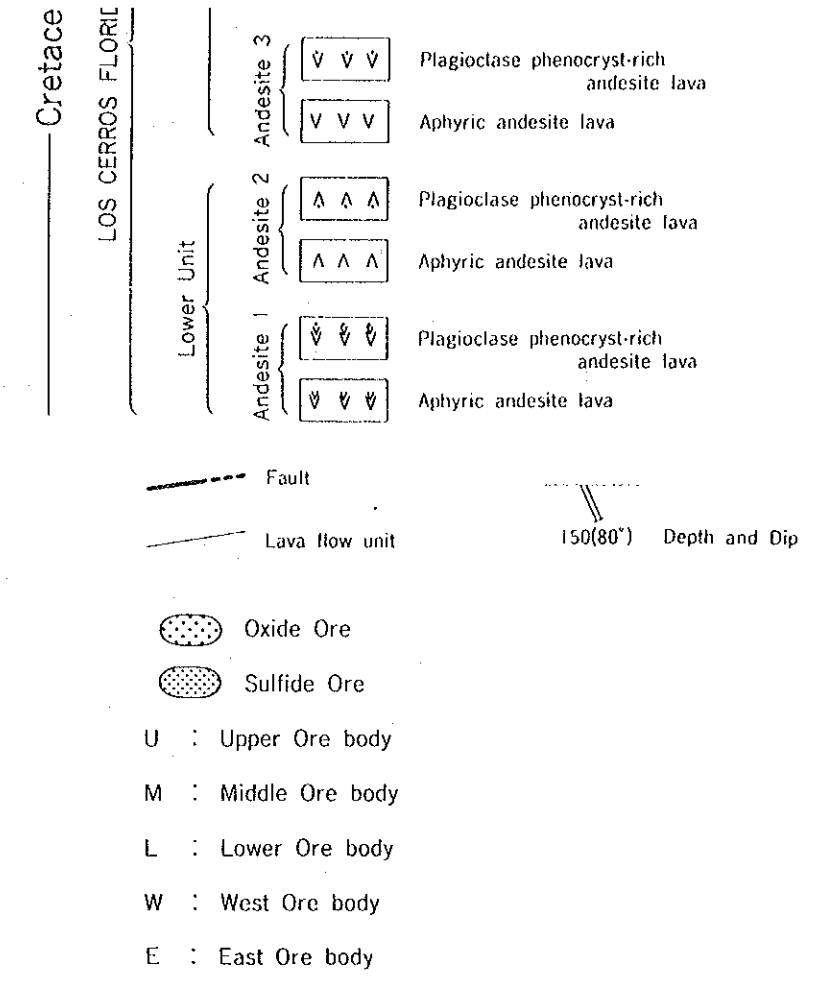
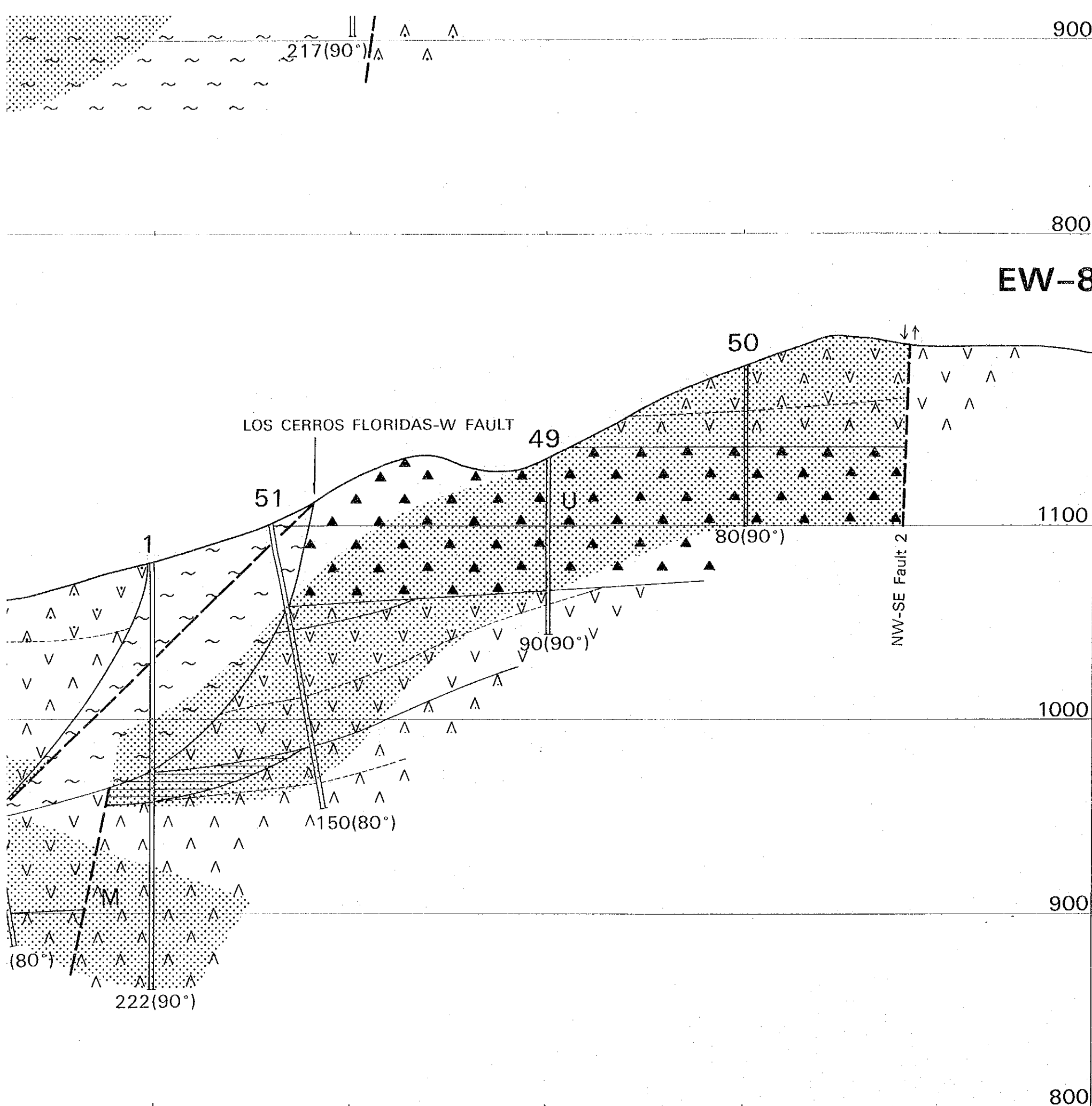


PLATE II - 4	
<p>MINERAL EXPLORATION IN THE CERRO NEGRO AREA REPUBLIC OF CHILE PHASE II</p>	
<p>GEOLOGICAL SECTION (1:2,000)</p>	
<p>JAPAN INTERNATIONAL COOPERATION AGENCY METAL MINING AGENCY OF JAPAN FEBRUARY 1994</p>	

