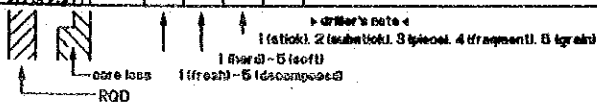


# GEOLOGIC LOG OF DRILL HOLE

Page

AYVALI PROJECT	HOLE No. SL-110	( SHEET 4 of 5 )
LOCATION DAM SITE(RIVER BED)	DEPTH OF HOLE 100.00 m	COMMENCED 91-05-25
ELEVATION 852.03 m	DIRECTION OF HOLE 90°	COMPLETED 91-08-07
COORDINATE X:4514465.24	CORE RECOVERY %	DRILLED BY S.Kaya
Y:493681.98	DRILLING MACHINE	LOGGED BY Sukru Bay

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (0pt.H)	DEPTH	
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEDN	Pmax	Pc							DEPTH RESULT
	60m			0 → 100%								Kgf/cm					%	60m		
792.03	1	Rhyolite								Stick core. Flow structure is pre-dominant. 62.6-62.7m Cracky	Lu=50	7.2						42.00m (62.00m)	1	
	2										Lu=9.5	14.7							2	
	3										Lu=14	7.1							3	
	4																		4	
	5										Crack surface is oxidated	Lu=8.6							14.2	5
	6										Core length is 5 to 10cm.	Lu=50							7.1	6
	7											Lu=0							14.2	7
	8											Lu=10							14	8
	9											Lu=8.9							14.2	9
	70											Lu=94							5.2	70
	1	Light Greenish Grey-Grey								Crack surfaces are brown. Cracky	Lu=14	14.3						42.00m (76.00m)	1	
	2																		2	
	3																		3	
	4																		4	
	5																		5	
	6																		6	
	7																		7	
	8																		8	
	9																		9	
	80																		80	
772.03	80									79.2-79.3m Fragments								80		



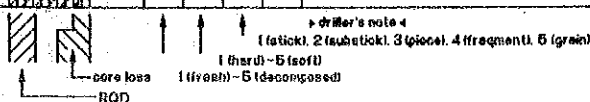
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# GEOLOGIC LOG OF DRILL HOLE

Page \_\_\_\_\_

AYVALI PROJECT	HOLE No.	SL-110	( SHEET 5 of 5 )
LOCATION DAM SITE (RIVER BED)	DEPTH OF HOLE	100.00 m	COMMENCED 91-05-25
ELEVATION 852.03 m	DIRECTION OF HOLE	90°	COMPLETED 91-08-07
COORDINATE X:4514465.24	CORE RECOVERY	%	DRILLED BY S.Kaya
Y:493681.98	DRILLING MACHINE		LOGGED BY Sukru Day

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.10)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc	DEPTH RESULT					
772.03	80m			0 → 100%								Kgf/cm					%		80m
	1									80.5-80.9m C=3	Lu=7.1	14.3							1
	2					2	2			Vertical Joints, partially fragments	Lu=32	10.2						42.00m (82.00m)	2
	3							2											3
	4							3											4
	5									Fresh and hard stick core Core length is more than 1m. Crack surfaces are not oxidated.	Lu=10	14.2							5
	6																	42.00m (82.00m)	6
	7					1	1												7
	8																		8
	9					1	1												9
	90																	42.40m (80.00m)	90
	1					2	2												1
	2																	42.00m (82.00m)	2
	3																		3
	4																		4
	5									Chloritization in some places. Crack surface is not oxidated.	---	---							5
	6																	42.50m (82.00m)	6
	7					2	2												7
	8																		8
	9									99.0-99.2m Cracky, C=3-4	Lu=6.4	14.2						42.45m (80.20m)	9
752.03	100									End of the Borehole									100



# GEOLOGIC LOG OF DRILL HOLE

Page


AYVALI PROJECT

HOLE No. SL-111

( SHEET 1 of 5 )

LOCATION DAM SITE (LEFT BANK) DEPTH OF HOLE 100.00 m COMMENCED  
ELEVATION 926.12 m DIRECTION OF HOLE 90° COMPLETED  
COORDINATE X: CORE RECOVERY % DRILLED BY  
Y: DRILLING MACHINE LOGGED BY

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	C.W.L (Opt. II)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Pmax	Pc	DEPTH RESULT						
926.12	0m			0 → 100%						Open excavation										0m
	1	Volcanic Breccia	X		Greenish Grey			3		Oxidized joint surfaces : hard and sound.										1
	2		X					3	2											2
	3		X					3	2											3
	4		X					3	2											4
	5	Rhyolite	L		Grey			3	4	Fractured zone										5
	6		L					3	3											6
	7		L					3	2											7
	8		L					3	2											8
	9		L					3	2											9
	10		L					3	2											10
	1	Volcanic Breccia	X		Greenish Grey			3	2	Oxidized joint surfaces : occasional chloritization in the rock.										1
	2		X					3	2											2
	3		X					3	2											3
	4		X					3	2											4
	5		X					3	2											5
	6		X					3	2											6
	7	Rhyolite	L		Grey			3	2	Oxidized joint surfaces : hard and sound.										7
	8		L					3	2											8
	9		L					3	2											9
906.12	20																			20


 1 (fresh) - 5 (disintegrated)  
 1 (hard) - 5 (soft)  
 1 (block) - 5 (fragments)  
 1 (gravel) - 5 (gravel)  
 1 (fresh) - 5 (disintegrated)  
 1 (hard) - 5 (soft)  
 1 (block) - 5 (fragments)  
 1 (gravel) - 5 (gravel)

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# GEOLOGIC LOG OF DRILL HOLE

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AYVALI PROJECT	HOLE No. SL-111	( SHEET 2 of 5 )
LOCATION DAM SITE (LEFT BANK)	DEPTH OF HOLE 100.00 m	COMMENCED _____
ELEVATION 926.12 m	DIRECTION OF HOLE 90°	COMPLETED _____
COORDINATE X: _____	CORE RECOVERY _____ %	DRILLED BY _____
Y: _____	DRILLING MACHINE _____	LOGGED BY _____

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHER- ING	HARD- NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEDON	Pmax	Pc						
	20m			0 → 100%								Kgf/cm					%		20m
906.12	1	Rhyolite	L		Grey	2	1	2	1			Lu=6.8	10						1
	2		L			3	2	1	2			Lu=9.3	10						2
	3		X			2	1	2				Lu=9.3	10						3
	4		X			3	2	3		Fractured zone: oxidized joint surfaces		Lu=29.2	10				24.00m (24.00m)		4
	5		X				2	3				Lu=29.2	10						5
	6		X				1	2				Lu=10.2	10						6
	7		X				2	3		Hard and sound		Lu=10.2	10						7
	8	Volcanic Breccia	X		Greenish Grey	2	1	1				Lu=8.5	10				27.50m (28.00m)		8
	9		X				2	2				Lu=8.5	10						9
	30		X				2	2		Oxidized joint surfaces		Lu=4.9	10						30
	1		X				1					Lu=4.9	10						1
	2		X			3	2					Lu=4.4	10						2
	3		X				2	2				Lu=4.4	10						3
	4		X				1	1				Lu=5.4	10				32.35m (34.50m)		4
	5		X				2	2		Oxidized joint surfaces		Lu=5.4	10						5
	6		X				2	3				Lu=3.2	10						6
	7	Rhyolite	L		Grey	3	1	1		Oxidized and occasionally pyritized (2-3mm) joint surfaces; hard and sound.		Lu=3.2	10						7
	8		L				2	2				Lu=2.1	10				32.00m (38.00m)		8
	9		L			2	1	1											9
886.12	40		L				2	2											40

\* driller's note \*  
 1 (etch), 2 (subetich), 3 (place), 4 (frequent), 5 (grain)  
 1 (hard) - 5 (soft)  
 1 (fresh) - 5 (decomposed)  
 core loss  
 RQD

# GEOLOGIC LOG OF DRILL HOLE

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AYVALI PROJECT

HOLE No. SL-111

( SHEET 3 of 5 )

LOCATION	DAM SITE (LEFT BANK)	DEPTH OF HOLE	100.00 m	COMMENCED	
ELEVATION	926.12 m	DIRECTION OF HOLE	90°	COMPLETED	
COORDINATE	X: _____	CORE RECOVERY	%	DRILLED BY	
	Y: _____	DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH	
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGON	Pmax	Pc							DEPTH RESULT
866.12	40m			0 → 100%									Kgf/cm				%		40m	
	1	Ry	X		Grey	2	1-2	1				Lu=4.0	10						1	
	2	Volcanic Breccia	X		Greenish Grey	2	1	2		41.50m Fault: 1-2mm gouge	Lu=1.6	10						32.75m (42.00m)	2	
	3		X			1	1	1		Some of the joint sur- faces are oxidized; occasional chloritization in the rock; hard and sound.	Lu=11.6	10							3	
	4		X			3	2	1				Lu=4.9	10							4
	5		X					2				Lu=4.9	10							5
	6	Rhyolite	L							Hard and sound	Lu=2.8	10							6	
	7		L		Grey	1	1	1				Lu=7.4	10						32.25m (46.80m)	7
	8		L			1	1					Lu=2.4	10							8
	9		L			2	2					Lu=7.4	10							9
	50		X			3	3-4	3		Oxidized joint surfaces	Lu=2.4	10						49m (Final)	50	
	1		X					1		Occasional chloritization in the rock	Lu=1.8	10							1	
	2		X									Lu=0.9	10							2
	3		X									Lu=2.6	10							3
	4	Volcanic Breccia	X		Greenish Grey	1	1					Lu=1.8	10						20.40m (54.00m)	4
	5		X								Lu=0.9	10							5	
	6		X								Lu=2.6	10							6	
	7		X				2	1			Lu=0.9	10							7	
	8		X					1			Lu=2.6	10							8	
	9		X					2			Lu=2.6	10						34.25m (58.00m)	9	
866.12	60		X					1			Lu=2.6	10							60	


 Driller's note: 1 (stick), 2 (substick), 3 (piece), 4 (fragment), 5 (grain)  
 1 (hard) - 5 (soft)  
 1 (fresh) - 5 (decomposed)  
 core loss  
 ROD

# GEOLOGIC LOG OF DRILL HOLE

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AYVALI PROJECT

HOLE No. SL-111

( SHEET 4 of 5 )

LOCATION <u>DAM SITE (LEFT BANK)</u>	DEPTH OF HOLE <u>100.00</u> m	COMMENCED _____
ELEVATION <u>926.12</u> m	DIRECTION OF HOLE <u>90°</u>	COMPLETED _____
COORDINATE X: _____	CORE RECOVERY _____ %	DRILLED BY _____
Y: _____	DRILLING MACHINE _____	LOGGED BY _____

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH				
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc							DEPTH RESULT			
	60m			0-100%								Kgf/cm <sup>2</sup>					%		60m				
866.12	1	Volcanic Breccia	X			1	1 1/2	1				Lu=6.2	10						1				
	2						1	2			Lu=21.9	10									52.00m (62.00m)	2	
	3						2	2	1			Lu=13.4	10									3	
	4						1															4	
	5						3	2	3			Lu=33	6									60.00m (66.40m)	5
	6											Lu=20	10										6
	7						1	2	1			Lu=6.1	10										7
	8						2	2	3			Lu=0.2	10										8
	9						2	2	1			Lu=0.3	10										9
	70						1	2	3			Lu=1.1	10										70
	1		2	3	4			Lu=1.6	10										1				
	2				2														2				
	3				1														3				
	4				2														4				
	5				1														5				
	6				1														6				
	7																		7				
	8																		8				
	9																		9				
846.12	80																		80				


 1 (solid), 2 (subsolid), 3 (piece), 4 (fragment), 5 (grain)  
 6 (hard), 7 (soft), 8 (fresh), 9 (decomposed), 10 (core loss), 11 (RQD)

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# GEOLOGIC LOG OF DRILL HOLE


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AYVALI PROJECT

HOLE No. SL-111

( SHEET 5 of 5 )

LOCATION <u>DAM SITE (LEFT BANK)</u>	DEPTH OF HOLE <u>100.00</u> m	COMMENCED _____
ELEVATION <u>926.12</u> m	DIRECTION OF HOLE <u>90°</u>	COMPLETED _____
COORDINATE X: _____	CORE RECOVERY _____ %	DRILLED BY _____
Y: _____	DRILLING MACHINE _____	LOGGED BY _____

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH	
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION		LUCEON	Pmax	Pc	DEPTH RESULT							
846.12	80m			0 → 100%							Kgf/cm						%		80m		
	1	Volcanic Breccia	X					1			Lu=33.2	3							1		
	2									Lu=2.2	10									2	
	3									1				Lu=7.3	10						3
	4													Lu=4.4	10						4
	5									1				Lu=4.1	10						5
	6									1				Lu=9.1	10						6
	7									1				Lu=31.5	10						7
	8									1				Lu=4.4	10						8
	9									1				Lu=14.3	10						9
	10									1				Lu=4.1	10						10
	11									2											11
	12									3											12
	13									3											13
	14									1											14
	15									1											15
	16									2											16
	17									1											17
	18									2											18
	19									2											19
	20									2											20
	21						3											21			
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	92						1											92			
	93						2											93			
	94						2											94			
	95						3											95			
	96						3											96			
	97						1											97			
	98						1											98			
	99						2											99			
	100						2											100			


 1 (tick), 2 (sub-tick), 3 (space), 4 (fragment), 5 (grain)  
 6 (thin), 7 (thick), 8 (fresh), 9 (decomposed), 10 (core loss), 11 (RQD)

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# GEOLOGIC LOG OF DRILL HOLE

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AYVALI PROJECT	HOLE No. SL-103	( SHEET 1 of 10 )
LOCATION <u>DAM SITE (RIGHT BANK)</u>	DEPTH OF HOLE <u>185.20</u> m	COMMENCED <u>82-06-28</u>
ELEVATION <u>997.41</u> m	DIRECTION OF HOLE <u>90°</u>	COMPLETED <u>82-11-20</u>
COORDINATE <u>X:4514286.44</u>	CORE RECOVERY _____ %	DRILLED BY <u>C.Taskir</u>
<u>Y:493454.63</u>	DRILLING MACHINE _____	LOGGED BY <u>Sukru Day</u>

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEDON	Pmax	Pc	DEPTH RESULT					
	0m			0 → 100%								Kgf/cm <sup>2</sup>					%		0m
997.41					Greenish Grey	4	4	5		Highly weathered									
	1																		1
	2							4		Fragments Crack surface is oxidized									2
	3					3													3
	4					4	3												4
	5																		5
	6							4											6
	7									Crack surface is strongly oxidized									7
	8						2	3											8
	9									Some vertical joints									9
	10						3	4											10
	1				Greenish Grey	3													1
	2						2	3											2
	3									Fragments and pieces	Lu=44		6						3
	4						3	4											4
	5						2	3											5
	6						3	4		Fragment only									6
	7						2			Crack surface is oxidized	Lu>25		10						7
	8				Brownish Grey	3													8
	9						2	3		Piece and large fragments	Lu>25		10						9
997.41	20						3												20

core loss 1m  
 core recovery 1m  
 RQD

> driller's note <  
 1 (stick), 2 (soft), 3 (pieces), 4 (fragments), 5 (grain)  
 1 (hard) - 5 (soft)  
 1 (fresh) - 5 (decomposed)



## GEOLOGIC LOG OF DRILL HOLE

Page

AYVALI PROJECT

HOLE No. SL-103

( SHEET 2 of 10 )

LOCATION DAM SITE (RIGHT BANK)  
 ELEVATION 997.41 m  
 COORDINATE X:4514286.44  
Y:493454.63

DEPTH OF HOLE 185.20 m COMMENCED 82-06-28  
 DIRECTION OF HOLE 90° COMPLETED 82-11-20  
 CORE RECOVERY \_\_\_\_\_ % DRILLED BY C.Taskir  
 DRILLING MACHINE \_\_\_\_\_ LOGGED BY Sukru Bay

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Pmax	Pc	DEPTH RESULT					
997.41	20m			0-100%								Kgt/cm					%		20m
	1						2	2			Lu<1	10							1
	2							5											2
	3				Brownish Grey	3				22.25-22.40 Sheared zone Core surface and cracks are brown.	Lu>25	10							3
	4						2	2											4
	5									22.00-23.00 Vertical joint	Lu=20	10							5
	6							3											6
	7					2					Lu=9	10							7
	8					1	2	2			Lu=4.5	10							8
	9					3													9
	30				Grey to Brownish Grey						Lu=18.5	10						28.00m (30.00m)	30
	1					3	2	3		Many brownish hair cracks									1
	2						3												2
	3				Light Grey to Brownish Grey			1										23.40m (22.90m)	3
	4					2	1			Generally crack surface is oxidized.									4
	5						2	2			Lu=13	10							5
	6						3	4										28.10m (36.00m)	6
	7						1	2			Lu=11.5	10							7
	8						2											28.40m (33.00m)	8
	9				Grey	3	3	1		37.60-38.00 Small fragment, silt and small grains along crack surface.	Lu=2	10							9
957.41	40							3											40

→ Driller's note →  
 1 (stick), 2 (substick), 3 (piece), 4 (fragment), 5 (grain)  
 1 (hard) - 5 (soft)  
 1 (fresh) - 5 (decomposed)  
 core loss  
 RQD

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 ELECTRIC POWER DEVELOPMENT CO., LTD.

# GEOLOGIC LOG OF DRILL HOLE

Page \_\_\_\_\_

AYVALI PROJECT	HOLE No. SL-103	( SHEET 3 of 10 )
LOCATION <u>DAM SITE (RIGHT BANK)</u>	DEPTH OF HOLE <u>185.20</u> m	COMMENCED <u>82-06-28</u>
ELEVATION <u>997.41</u> m	DIRECTION OF HOLE <u>90°</u>	COMPLETED <u>82-11-20</u>
COORDINATE <u>X:4514286.44</u>	CORE RECOVERY _____ %	DRILLED BY <u>C.Taskir</u>
<u>Y:493454.63</u>	DRILLING MACHINE _____	LOGGED BY <u>Sukru Bay</u>

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	Pmax	Pc	DEPTH RESULT					
	40m			0 → 100%								Kgf/cm <sup>2</sup>					%		40m
957.41										Sheared zone									
	1							4		Mainly small fragments	Lu<1	10							1
	2							5		Easily broken into small grains	Lu<1	10							2
	3										Lu<1	10						26.00m (43.30m)	3
	4				Grey	4	3	3			Lu<1	10							4
	5							4			Lu<1	10							5
	6						4	5			Lu=1.6	10						25.00m (46.00m)	6
	7							4				10							7
	8									Many brownish hair cracks								25.00m (48.00m)	8
	9							2											9
	50							3											50
	1							3											1
	2							4			Lu>25	10						50.00m (52.00m)	2
	3							2		Crack surface is oxidized	Lu>25	10							3
	4							3			Lu>25	10							4
	5										Lu>25	10							5
	6							2			Lu<1	10						32.00m (56.00m)	6
	7							2		Crack surface is slightly weathered.	Lu<1	10							7
	8							1			Lu<1	10							8
	9							3											9
937.41	60							3										35.00m	60

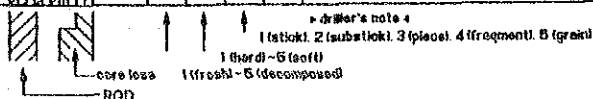
> driller's note <  
 1 (tick), 2 (subtick), 3 (piece), 4 (fragment), 5 (grain)  
 1 (hard) - 5 (soft)  
 1 (fresh) - 5 (discomposed)  
 core loss  
 RQD

# GEOLOGIC LOG OF DRILL HOLE

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AYVALI PROJECT	HOLE No. SL-103	( SHEET 4 of 10 )
LOCATION DAM SITE (RIGHT BANK)	DEPTH OF HOLE 185.20 m	COMMENCED 82-06-28
ELEVATION 997.41 m	DIRECTION OF HOLE 90°	COMPLETED 82-11-20
COORDINATE X: 4514286.44	CORE RECOVERY %	DRILLED BY C.Taskir
Y: 493454.63	DRILLING MACHINE	LOGGED BY Sukru Bay

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt. II)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc	DEPTH RESULT					
	60m			0-100%								Kgf/cm <sup>2</sup>					%		60m
937.41	1		L					2		61.20-61.60m Cracky	Lu=20	10							1
	2		L			2	2	2											2
	3		L															36.00m (63.00m)	3
	4		L				3	4		Cracky	Lu<1	10						36.00m (61.45m)	4
	5	Rhyolite	L					2											5
	6		L					2		Crack surface is not oxidized.									6
	7		L					1											7
	8		L					3										36.00m (63.00m)	8
	9		L			1													9
	70		L																70
	1		L			1	2												1
	2	Vb	X							Contact is adherent. Volcanic breccia	Lu<1	10						36.00m (72.00m)	2
	3		L			2		2											3
	4		L																4
	5	Rhyolite	L																5
	6		L																6
	7		L																7
	8		L				3	3	4	Fragments	Lu=3	10							8
	9		L				2	2	2										9
	80	Vb	X			2	1	2	3										80



# GEOLOGIC LOG OF DRILL HOLE

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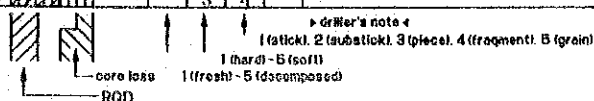
AYVALI PROJECT

HOLE No. SL-103

( SHEET 5 of 10 )

LOCATION	DAM SITE (RIGHT BANK)	DEPTH OF HOLE	185.20 m	COMMENCED	82-06-28
ELEVATION	997.41 m	DIRECTION OF HOLE	90°	COMPLETED	82-11-20
COORDINATE	X:4514286.44	CORE RECOVERY	%	DRILLED BY	C.Taskir
	Y:493454.63	DRILLING MACHINE		LOGGED BY	Sukru Bay

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Pmax	Pc	DEPTH RESULT					
	80m			0 + 100%															80m
917.41																			
	1		X				3	4											1
	2		X			2				82.00-82.20m Fragments 83.30-83.50m Fragments	Lu=13.5	10							2
	3		X			3	2	3			Lu=10	10							3
	4		X																4
	5		X			3	3	4		Crack surface is oxidized	Lu=23	10							5
	6		X			2	2	3											6
	7		X			3					Lu=19	10							7
	8		X							Many sulphur spots in core. Some pyrite									8
	9		X					1			Lu=0	10							9
	90		X																90
	1	Volcanic Breccia	X		Greenish Grey						Lu<1	10							1
	2		X			2	3	2			Lu<1	10							2
	3		X								Lu<1	10							3
	4		X																4
	5		X					2			Lu<1	10							5
	6		X			3													6
	7		X				3	4			Lu<1	10							7
	8		X																8
	9		X				3	2			Lu=2	10							9
897.41	100		X				3	4											100



# GEOLOGIC LOG OF DRILL HOLE

Page

AYVALI PROJECT

HOLE No. SL-103

( SHEET 6 of 10 )

LOCATION DAM SITE (RIGHT BANK) DEPTH OF HOLE 185.20 m COMMENCED 82-06-28  
ELEVATION 997.41 m DIRECTION OF HOLE 90° COMPLETED 82-11-20  
COORDINATE X:4514286.44 CORE RECOVERY % DRILLED BY C.Taskir  
Y:493454.63 DRILLING MACHINE LOGGED BY Sukru Bay

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Dpt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc	DEPTH RESULT					
	100m			0 + 100%								Kgf/cm					%		100m
897.41	1	Volcanic Breccia	X		Greenish Grey			4		Sulphur in many spots	Lu<1	10						49.00m (101.00m)	1
	2		X			3	3	3			Lu<1	10						49.60m (102.00m)	2
	3		X					2			Lu<1	10							3
	4		X		Light Grey					No sulphur	Lu<1	10						48.50m (104.00m)	4
	5		X								Lu<1	10							5
	6		X			2	2	1			Lu<1	10						49.00m (106.00m)	6
	7		X							Sulphur spots in many places	Lu<1	10							7
	8		X								Lu<1	10							8
	9		X								Lu<1	10							9
110	110		X								Lu<1	10						49.00m (110.00m)	110
	1	Volcanic Breccia	X		Greenish Grey			2		Sulphur spots in many places	Lu=2.4	10							1
	2		X			3	3	2			Lu<1	10							2
	3		X								Lu<1	10							3
	4		X		Greenish Grey					Sulphur spots in many places	Lu<1	10						49.00m (114.00m)	4
	5		X			3	3	3			Lu<1	10							5
	6		X			4	4	4			Lu<1	10							6
	7		X			3	3	3			Lu=1.2	10						48.50m (117.00m)	7
	8		X								Lu<1	10							8
877.41	120		X			2	2	2			Lu<1	10						51.00m (119.00m)	9

Driller's note  
1 (solid), 2 (subsolid), 3 (piece), 4 (fragment), 5 (grain)  
1 (hard) - 5 (soft)  
1 (fresh) - 5 (decomposed)  
core loss  
RQD


EPDC | 40  
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# GEOLOGIC LOG OF DRILL HOLE

Page

AYVALI PROJECT	HOLE No. SL-103	( SHEET 7 of 10 )
LOCATION DAM SITE (RIGHT BANK)	DEPTH OF HOLE 185.20 m	COMMENCED 82-06-28
ELEVATION 997.41 m	DIRECTION OF HOLE 90°	COMPLETED 82-11-20
COORDINATE X:4514286.44	CORE RECOVERY %	DRILLED BY C.Taskir
Y:493454.63	DRILLING MACHINE	LOGGED BY Sukru Bay

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.II)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc	DEPTH RESULT					
	120m			0 → 100%								Kgf/cm						%	120m
877.41	1	Volcanic Breccia	X			2	2			Crack surface is slightly oxidized, sulphur in some places	Lu=2.1	10			ø 76mm			51.00m (120.30m)	1
	2					3	3	2											2
	3					3	3												3
	4																		4
	5							2		Crack surface is oxidized	Lu=1.2	10							5
	6					3	3	3										51.00m (120.00m)	6
	7																		7
	8							1		Crack surface is oxidized	Lu=1.2	10							8
	9					3	3	3											9
	10							2											10
	11	Greenish Grey	X												ø 76mm			51.00m (130.00m)	11
	12					3	3	3		132.00-132.50 Fragments	Lu<1	10							12
	13																		13
	14					3	3	2		Cracks are oxidized.	Lu<1	10						51.50m (132.00m)	14
	15																		15
	16																		16
	17																	59.00m (134.00m)	17
	18																		18
	19																		19
	20					2	2	1										53.70m (136.00m)	20
	21	Greenish Grey	X												ø 76mm				21
	22																		22
	23																		23
	24																		24
	25																		25
	26																		26
	27																		27
	28																		28
	29																		29
	30																	55.00m (138.00m)	30
857.41	140																		140


 > driller's note <  
 1 (stick), 2 (substick), 3 (piece), 4 (fragment), 5 (grain)  
 1 (hard) - 5 (soft)  
 1 (fresh) - 5 (decomposed)

# GEOLOGIC LOG OF DRILL HOLE

Page \_\_\_\_\_

AYVALI PROJECT	HOLE No. SL-103	( SHEET 8 of 10 )
LOCATION <u>DAM SITE (RIGHT BANK)</u>	DEPTH OF HOLE <u>185.20</u> m	COMMENCED <u>82-06-28</u>
ELEVATION <u>997.41</u> m	DIRECTION OF HOLE <u>90°</u>	COMPLETED <u>82-11-20</u>
COORDINATE <u>X:4514286.44</u>	CORE RECOVERY _____ %	DRILLED BY <u>C.Taskir</u>
<u>Y:493454.63</u>	DRILLING MACHINE _____	LOGGED BY <u>Sukru Bay</u>

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc	DEPTH RESULT					
	140m			0 → 100%								Kgf/cml					%		140m
857.41	1	Volcanic Breccia	△		Greenish Grey		2	2	1	Pyrite along crack surfaces, but no sulphur	Lu<1	10			ø 76mm			62.50m (149.00m) (Final)	1
	2		△								Lu=11.5	10							2
	3		△				2	2	3		Lu=11.5	10						98.30m (143.00m)	3
	4		△				1	1											4
	5		△				3	3	2		Lu<1	10							5
	6		△						3										6
	7		△								Lu=15.5	10						94.10m (147.00m)	7
	8		△				2	2			Lu=10.2	10						128.50m (148.00m)	8
	9		△				1	1			Lu=10.2	10							9
150	1		△				3	3			Lu=7	10						136.50m (150.00m)	150
	2		△																1
	3		△			2	3	3		Fragments 152.50m Sheared	Lu<1	10							2
	4		△																3
	5		△				2				Lu=1.7	10						79.90m (155.00m)	5
	6		△																6
	7		△				1	2		154.00-154.20m Cracky	Lu=3	10			ø 66mm				7
	8		△				3												8
	9		△								Lu=3.3	10							9
837.41	160		△																160

core loss  
 RQD  
 Driller's note:  
 1 (faint), 2 (subfaint), 3 (piece), 4 (fragment), 5 (grain)  
 1 (hard) - 5 (soft)  
 1 (fresh) - 5 (decomposed)

# GEOLOGIC LOG OF DRILL HOLE

Page

AYVALI PROJECT HOLE No. SL-103 (SHEET 9 of 10)

LOCATION DAM SITE (RIGHT BANK) DEPTH OF HOLE 185.20 m COMMENCED 82-06-28

ELEVATION 997.41 m DIRECTION OF HOLE 90° COMPLETED 82-11-20

COORDINATE X:4514286.44 CORE RECOVERY % DRILLED BY C.Taskir

Y:493454.63 DRILLING MACHINE LOGGED BY Sukru Bay

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	PC	DEPTH RESULT					
837.41	160m			0 → 100%								Kgf/cm <sup>2</sup>					%		160m
	1		X			2	2	2		Sheared zone Fragment	Lu<1	10							1
	2		X			3	3	4			Lu=2.8	10							2
	3		X			2	1				Lu=3.2	10							3
	4		X			3	3				Lu=2.4	10							4
	5		X			2	2				Lu=1.3	10							5
	6		X			3	2				Lu=1.3	10							6
	7		X								Lu=1.3	10							7
	8		X								Lu=1.3	10							8
	9		X								Lu=1.3	10							9
	170		X			2	1				Lu<1	10							170
	1		X			2					Lu=1.2	10							1
	2		X								Lu=2.8	10							2
	3		X			2	4				Lu=2.8	10							3
	4		X			3	3				Lu<1	10							4
	5		X								Lu<1	10							5
	6		X								Lu<1	10							6
	7		X			2	2				Lu<1	10							7
	8		X			2					Lu<1	10							8
	9		X								Lu<1	10							9
817.41	180		X								Lu<1	10							180

Driller's note:  
 1 (fatick) 2 (subatick) 3 (piece) 4 (fragment) 5 (grain)  
 1 (hard) - 5 (soft)  
 1 (fresh) - 5 (decomposed)  
 core loss  
 RQD




# GEOLOGIC LOG OF DRILL HOLE

Page \_\_\_\_\_

AYVALI PROJECT		HOLE No. SL-103		( SHEET 10 of 10 )
LOCATION DAM SITE (RIGHT BANK)	DEPTH OF HOLE 185.20 m	COMMENCED 82-06-28		
ELEVATION 997.41 m	DIRECTION OF HOLE 90°	COMPLETED 82-11-20		
COORDINATE X: 4514286.44	CORE RECOVERY %	DRILLED BY C.Taskir		
Y: 493454.63	DRILLING MACHINE	LOGGED BY Sukru Bay		

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEN	Pmax	Pc	DEPTH RESULT					
817.41	180m			0 → 100%								Kgf/cm							180m
	1	Rhyolite	L					1			Lu<1	10							1
	2		L																2
	3	Volcanic Breccia	X		Greenish Grey	2	2				Lu<1	10			ø 68mm				3
	4		X					2											4
	5		X															124.00m (184.00m)	5
812.21			X							End of Borehole									
	6																		6
	7																		7
	8																		8
	9																		9
	190																		190
	1																		1
	2																		2
	3																		3
	4																		4
	5																		5
	6																		6
	7																		7
	8																		8
	9																		9
797.41	200																		200


 > driller's note <  
 1 (at tick) 2 (sub tick) 3 (piece) 4 (fragment) 5 (grain)  
 1 (hard) - 5 (soft)  
 1 (fresh) - 5 (decomposed)  
 core loss  
 RQD


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# GEOLOGIC LOG OF DRILL HOLE

Page

ATVALI PROJECT	HOLE No. SL-112	( SHEET 1 of 4 )
LOCATION ANZAV DERE	DEPTH OF HOLE 70.00 m	COMMENCED 91-07-08
ELEVATION 769.15 m	DIRECTION OF HOLE 90°	COMPLETED 91-09-18
COORDINATE X:4512776.30	CORE RECOVERY %	DRILLED BY Y.Yilma
Y:486316.89	DRILLING MACHINE	LOGGED BY Sukru Bay

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Pmax	Pc	DEPTH RESULT						
	0m			0 → 100%								Kgf/cm <sup>2</sup>					%		0m	
769.15		Alluvial Deposit									0.00-36.00 Alluvium : It is composed only of various sized gravels and blocks; fines are completely washed away; blocks and gravels are originated from limestone sandstone and volcanic rocks; gravels are medium and coarse and angular and subangular; the sizes of blocks generally vary from 9cm to 12cm; maximum block size is 24cm.  Fines : 10% Gravel : 70% Block : 20%									
	1																		1	
	2																	0.50m (2.50m)	2	
	3																		3	
	4																		4	
	5																	0.60m (5.60m)	5	
	6																		6	
	7																		7	
	8																	0.70m (8.00m)	8	
	9																		9	
	10																	0.80m (10.00m)	10	
	11																		11	
	12																		12	
	13																	0.90m (12.50m)	13	
	14																		14	
	15																	5.50m (14.50m)	15	
	16																		16	
	17																	5.10m (17.00m)	17	
	18																		18	
	19																	4.80m (19.00m)	19	
749.15	20																	20		

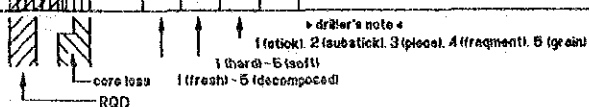

 Driller's note  
 1 (stick), 2 (substick), 3 (piece), 4 (fragment), 5 (grain)  
 1 (fresh) - 5 (decomposed)  
 RQD

# GEOLOGIC LOG OF DRILL HOLE

Page \_\_\_\_\_

AVVALI PROJECT	HOLE No. SI-112	( SHEET 2 of 4 )
LOCATION ANZAV DERE	DEPTH OF HOLE 70.00 m	COMMENCED 91-07-08
ELEVATION 769.15 m	DIRECTION OF HOLE 90°	COMPLETED 91-09-18
COORDINATE X:4512776.30	CORE RECOVERY %	DRILLED BY Y.Yilma
Y:486316.89	DRILLING MACHINE	LOGGED BY Sukru Bay

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGION	Pmax	Pc	DEPTH RESULT						
	20m			0 → 100%								Kgf/cin						%		20m
749.15	1	Alluvial Deposit													ø 56mm				4.50m (20.50m)	1
	2																		5.00m (21.80m)	2
	3																		4.60m (21.00m)	3
	4																			4
	5																		4.50m (25.00m)	5
	6																			6
	7																		4.80m (27.00m)	7
	8																			8
	9																			9
	30																			30
	1									36.0-70.0m : Clayey Limestone (Pugey Formation) Grey in colour; fine grained; fresh; generally highly strong; moderately strong in clayey levels; regular joints are conformable with the bedding; joints are without infilling; their spacing varies between 20-60cm and their aperture is between 1-2mm; joint surfaces are slightly rough and occasionally polished. Claystone is grey in colour and represented by generally 1-2cm thick beds whose maximum thickness reaches up to 4cm in place.									4.60m (31.00m)	1
	2																		4.25m (32.50m)	2
	3																			3
	4																		4.00m (34.50m)	4
	5																			5
	6																			6
	7																			7
	8				Grey	to	2	1		Oxidization on some joint surfaces; generally highly strong.									4.00m (37.70m)	8
	9																			9
	40																			40



## Page \_\_\_\_\_

( SHEET 3 of 4 )

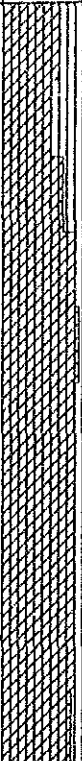
[illegible]


**EPDC**   
ELECTRIC POWER DEVELOPMENT CO., LTD.

# GEOLOGIC LOG OF DRILL HOLE

Page \_\_\_\_\_

AVVALI PROJECT	HOLE No. SL-112	( SHEET 4 of 4 )
LOCATION ANZAV DERE	DEPTH OF HOLE 70.00 m	COMMENCED 91-07-08
ELEVATION 769.15 m	DIRECTION OF HOLE 90°	COMPLETED 91-09-18
COORDINATE X: 4512776.30	CORE RECOVERY %	DRILLED BY Y.Yilma
Y: 486316.89	DRILLING MACHINE	LOGGED BY Sukru Bay

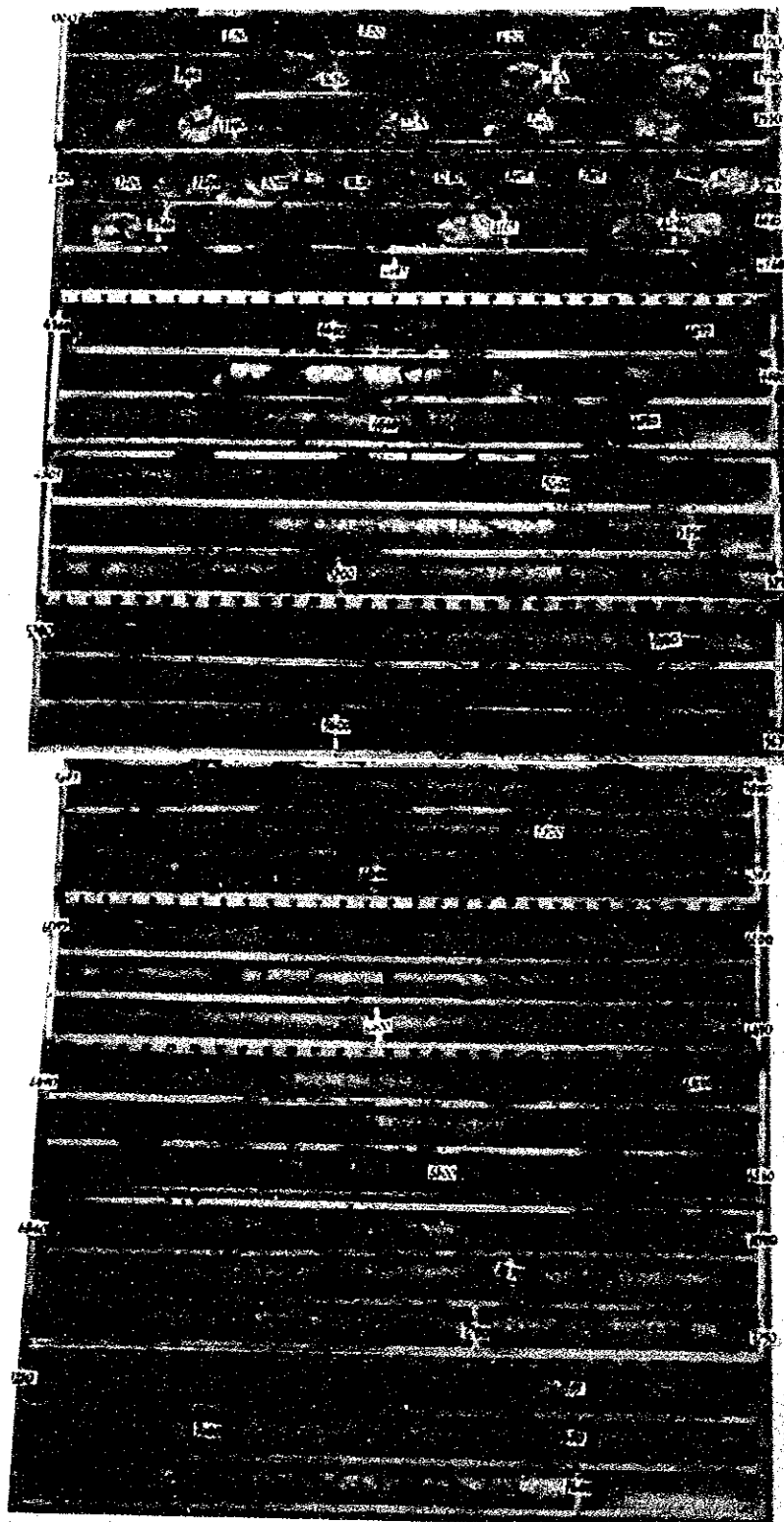
ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Dpt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Pmax	Pc	DEPTH RESULT						
	60m			0 → 100%									Kgf/cm <sup>2</sup>					%		60m
709.15	1	Clayey Limestone (Pugey Formation)			Grey	1	2	2		Several thin calcite veins  1-2cm thick claystone beds; joint surfaces are slightly rough and some of them are polished; highly strong.					ø 76mm				3.00m (60.80m)	1
	2					2	3	2												
	3																		3	
	4							1											4	
	5																		5	
	6					1	2	1											6	
	7							2											7	
	8																		8	
	9																		9	
	10																		10	
699.15	70																		70	
	1																		1	
	2																		2	
	3																		3	
	4																		4	
	5																		5	
	6																		6	
	7																		7	
	8																		8	
	9																		9	
689.15	80																		80	


  
 > driller's note <
   
 1 (retick), 2 (subtick), 3 (piece), 4 (fragment), 5 (grain)
   
 1 (hard) - 5 (soft)
   
 1 (fresh) - 5 (decomposed)
   
 core loss
   
 ROD

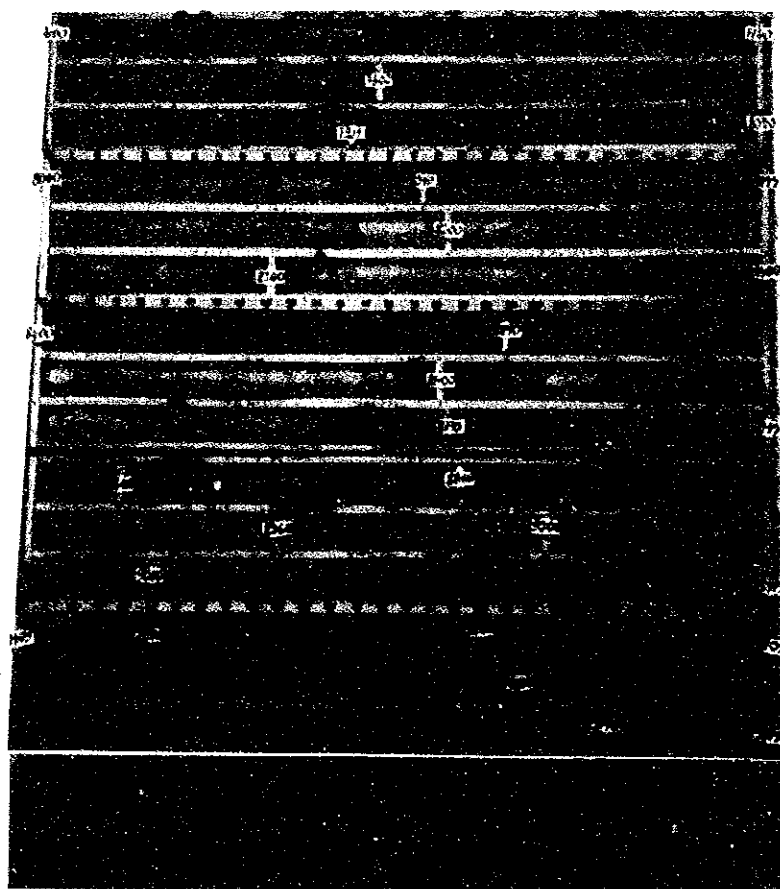
SK-214 ( L= 99.5 m, BL. 1025.08 m)

Olur Damsite, river bed

SK-214 ( 0 ~ 76 m )



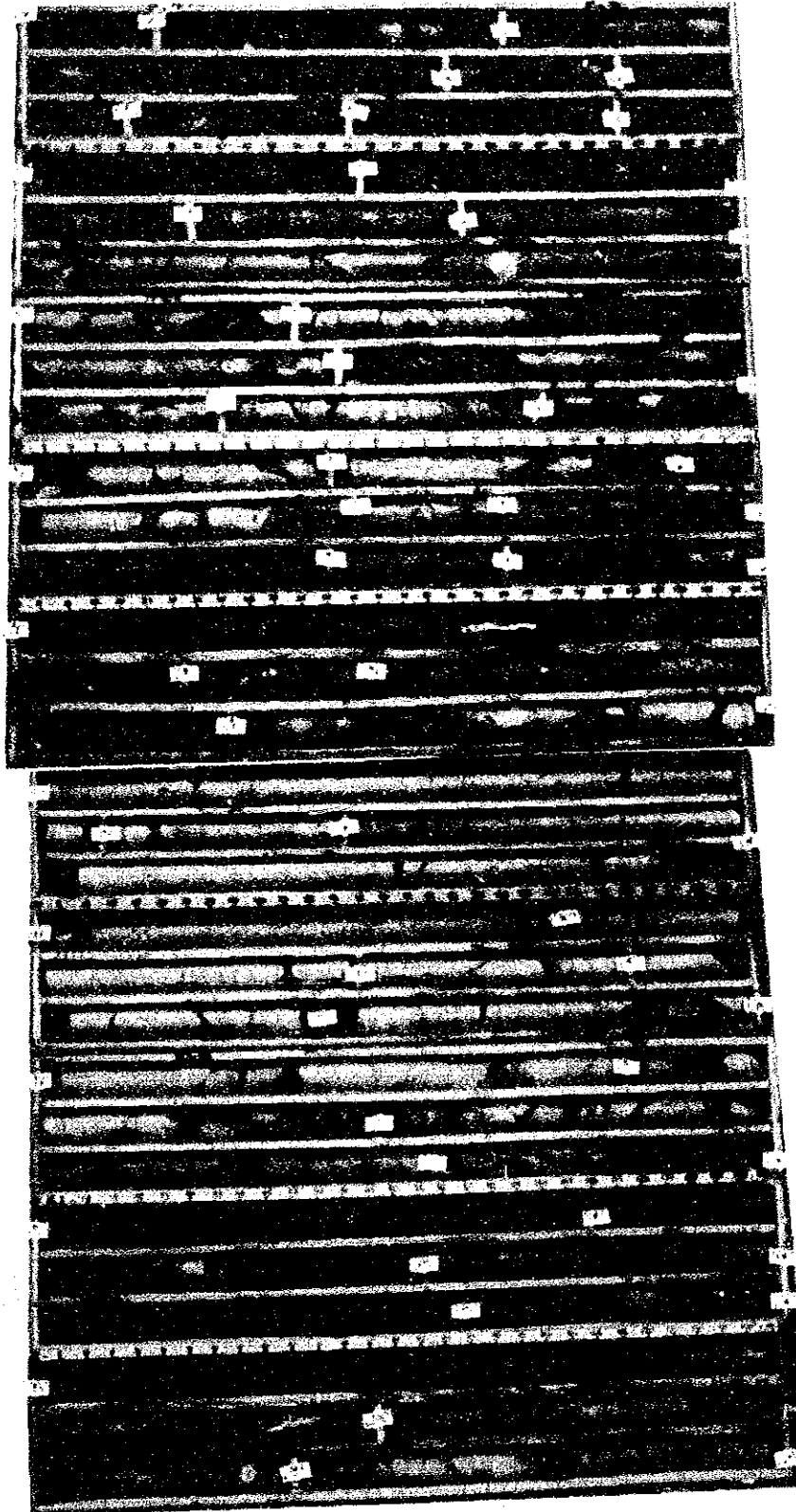
SK-214 ( 76 ~ 99.5 m )



SK-210 ( L= 127 m, EL. 1085. 22 m)

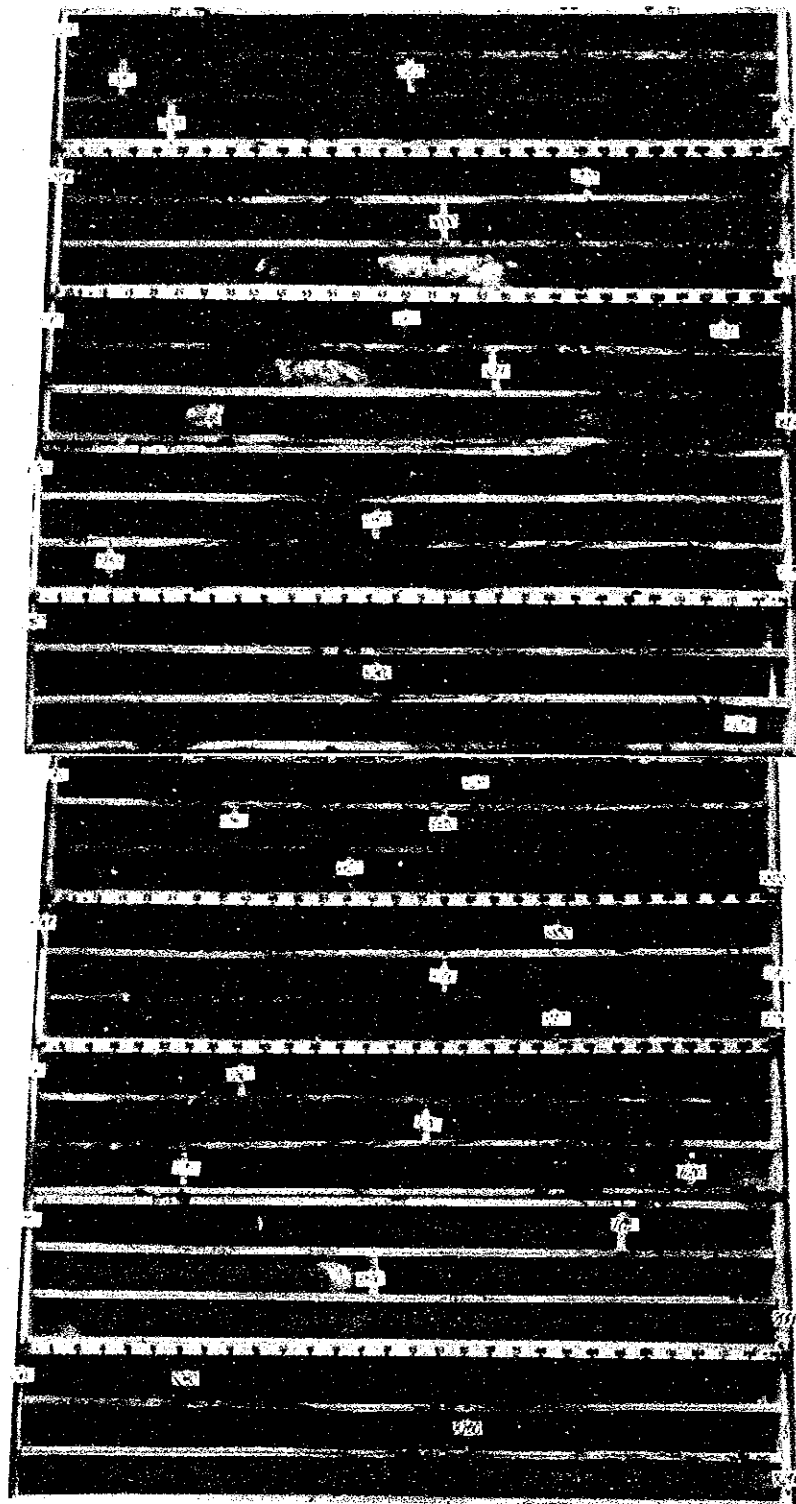
Olur Damsite, left bank

SK-210 ( 0 ~ 44 m )



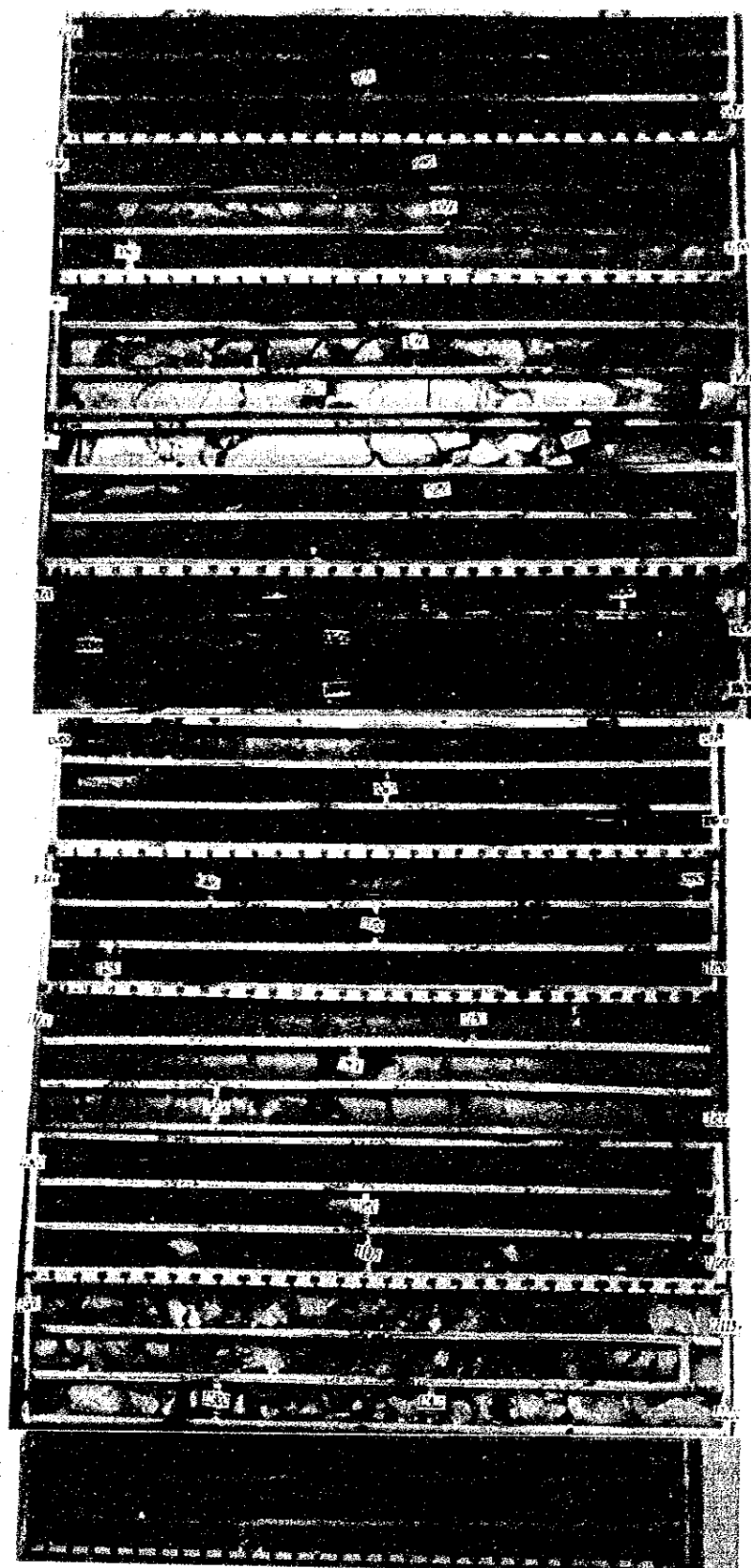


SK-210 ( 44 ~ 84 m )



AP-3-125

SK-210 ( 84 ~ 127 m )

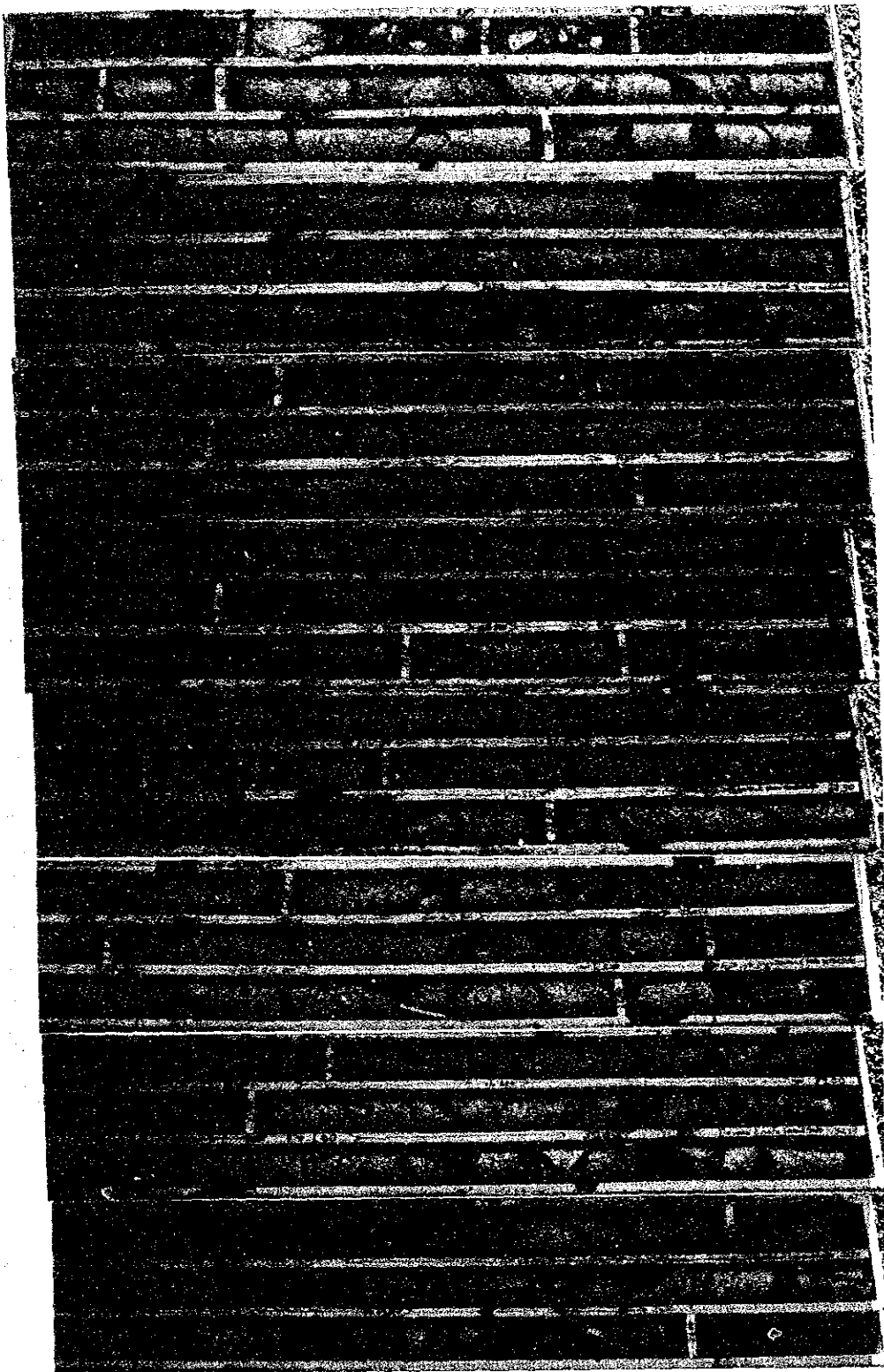


AP-3-126

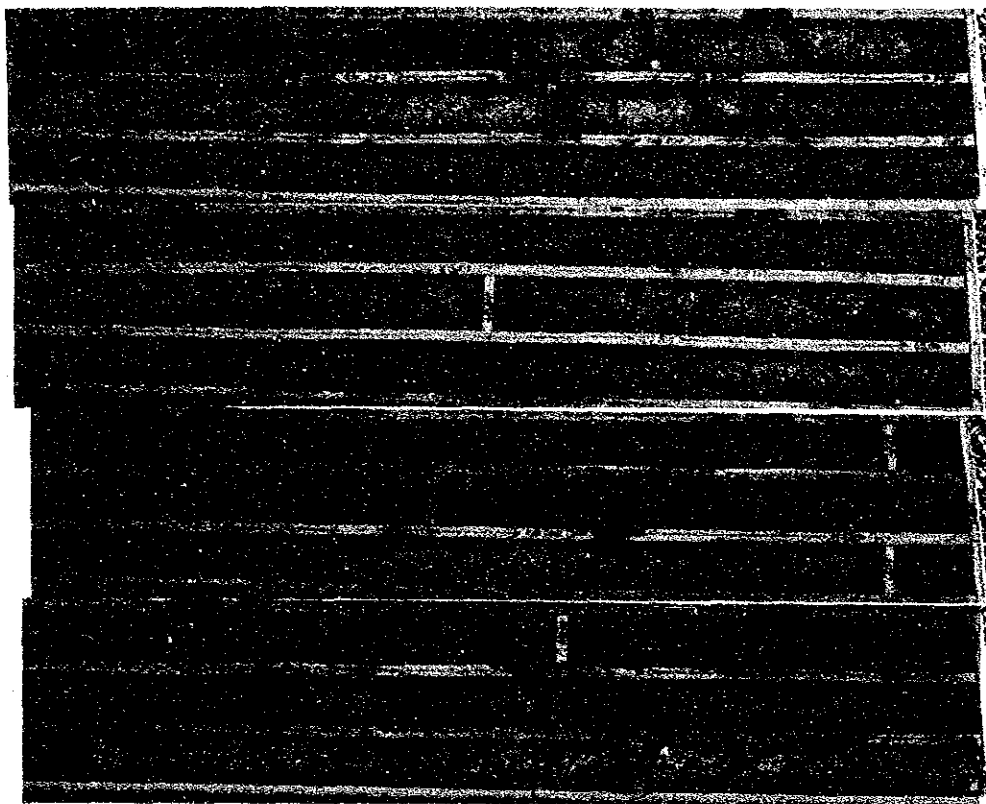
SKE-213 ( L= 50 m, EL. 1069.72 m )

Olur Damsite, right bank

SKE-213 ( 0 ~ 34 m )



SKE-213 ( 34~ 50 m )



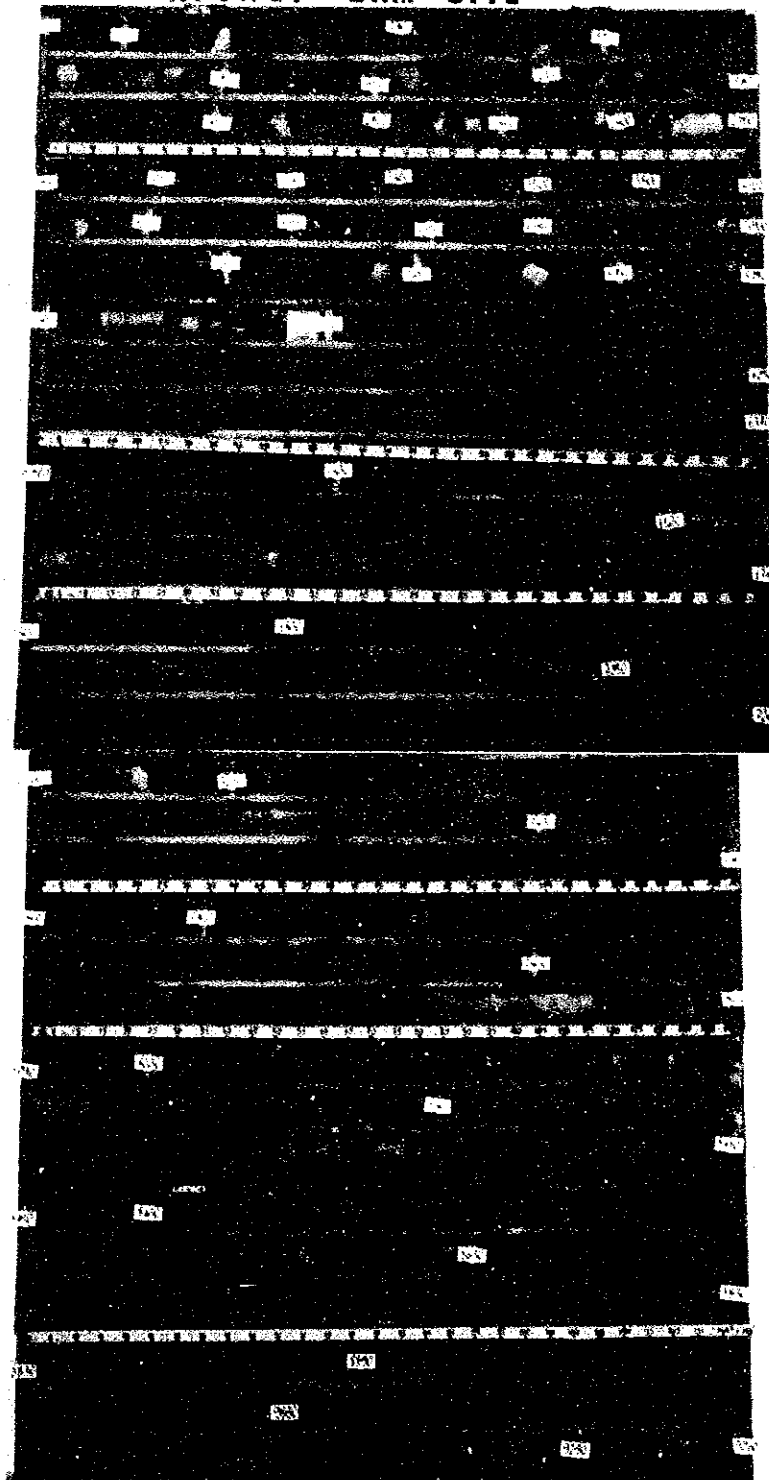
AP-3-128

Ni-101 ( L= 160 m, EL. 810.4 m)

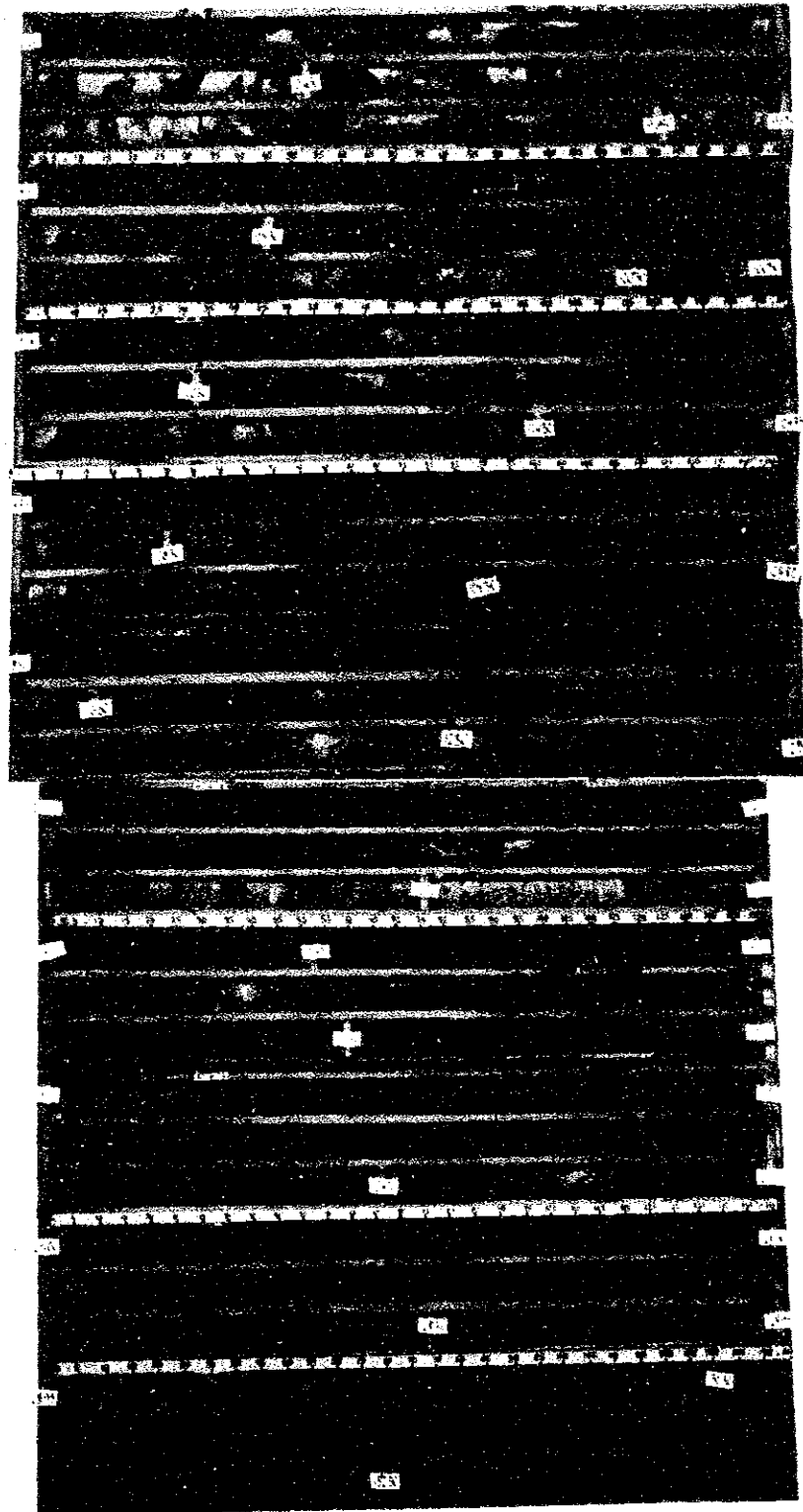
Ayvali Damsite, river bed

Ni-101 ( 0 ~ 92.6 m )

OLTU—AYVALI BARAJ YERİ  
OLTU—AYVALI DAM SITE Ni-101

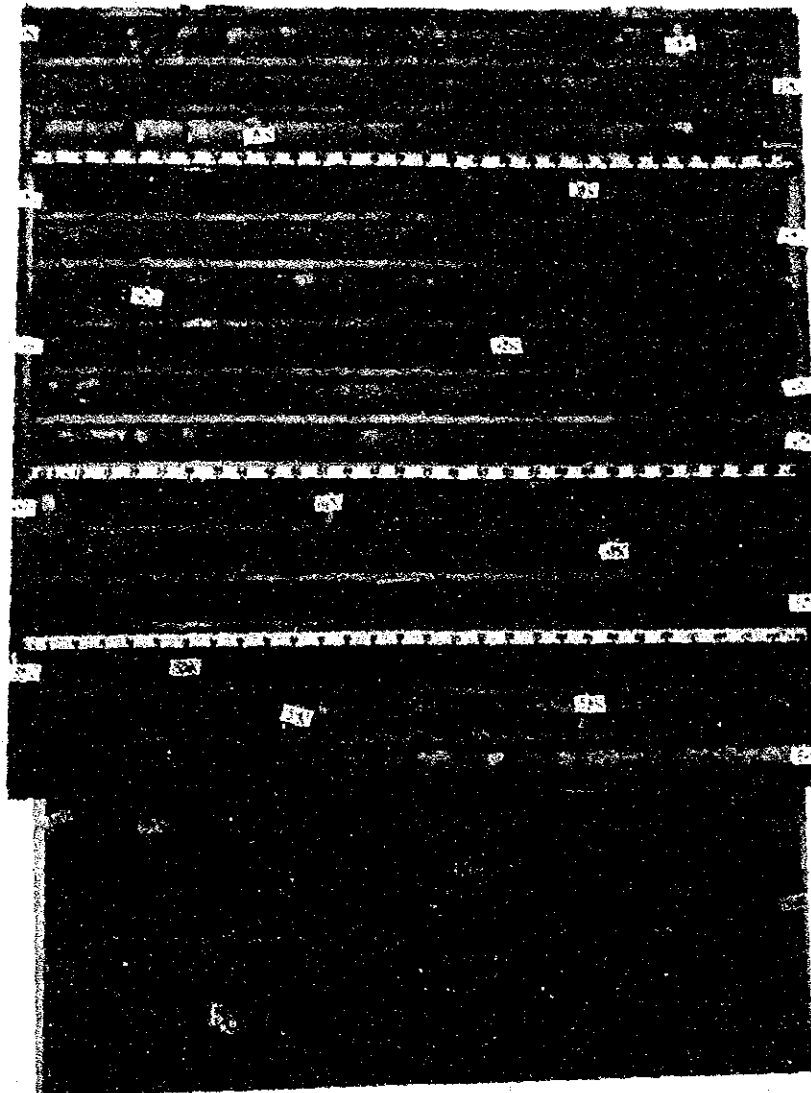


Ni-101 ( 92.6 ~ 133.5 m )



AP-3-130

Ni-101 ( 133.5 ~160 m )

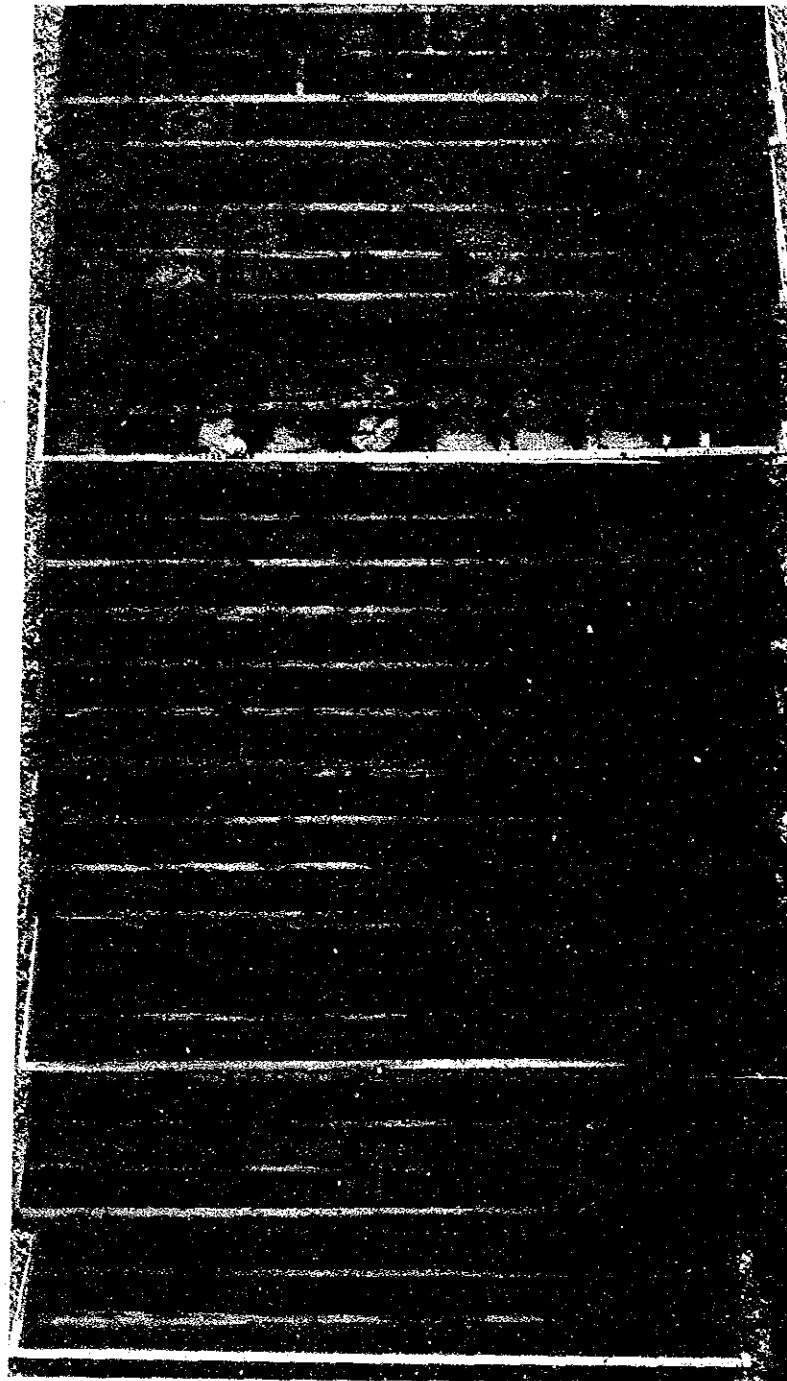


AP-3-131

Ni-109 ( L= 70 m, EL. 811.52 m )

Ayvali Damsite, river bed

Ni-109 ( 3 ~ 70 m )

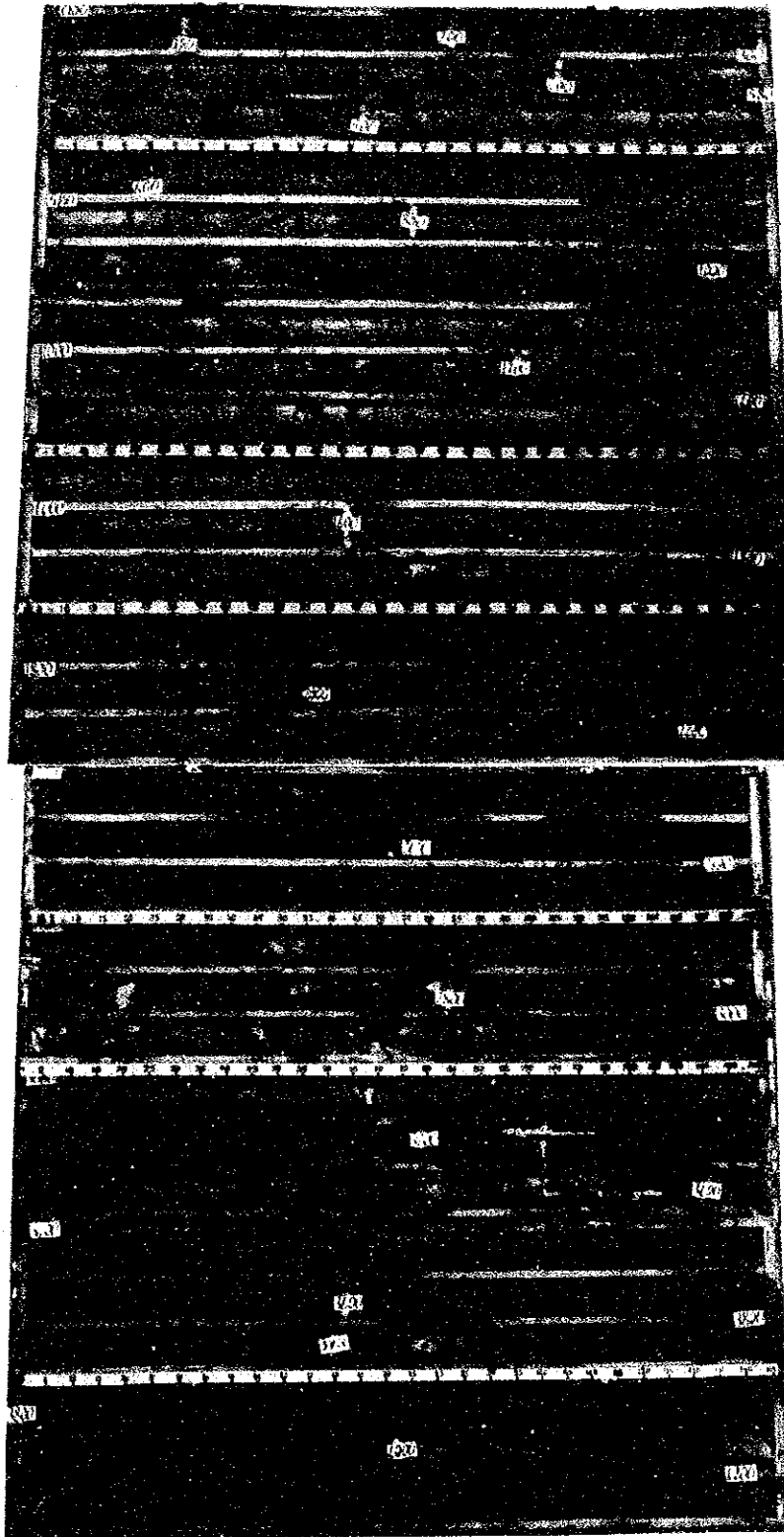




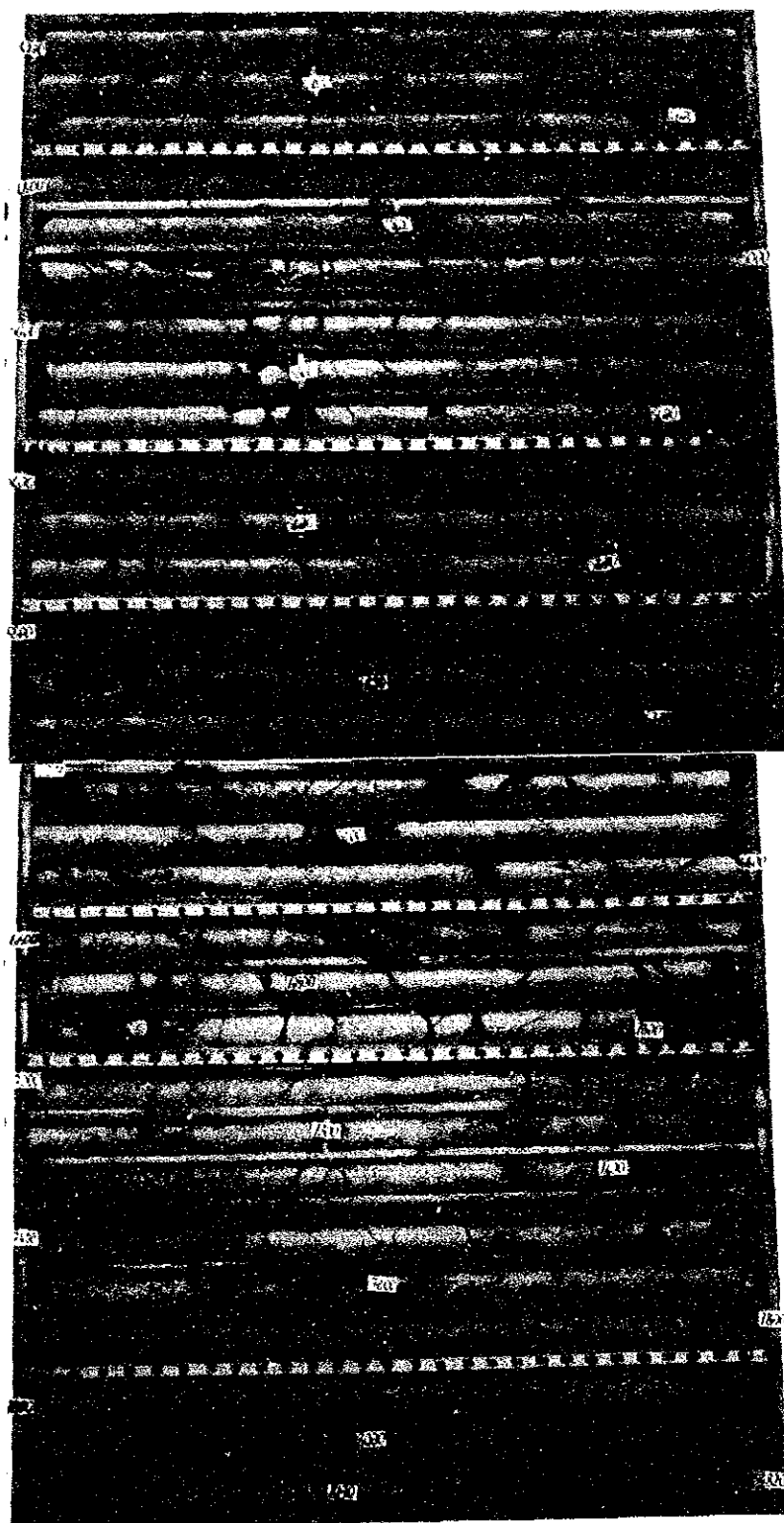
SG-102 ( L= 200 m, EL. 928.37 m)

Ayvali Damsite, right bank

SG-102 ( 0 ~ 42 m )

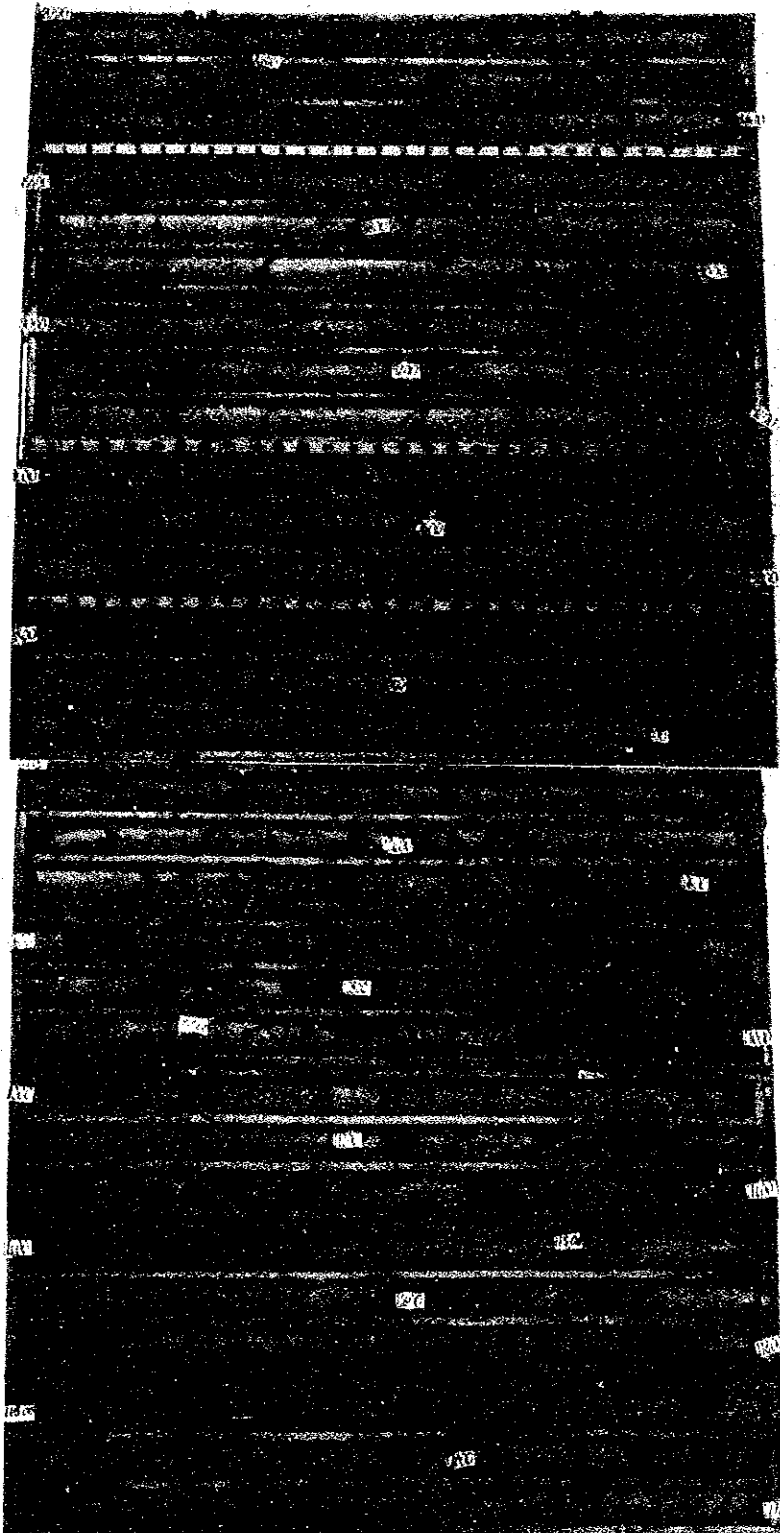


SG-102 ( 42 ~ 82 m )



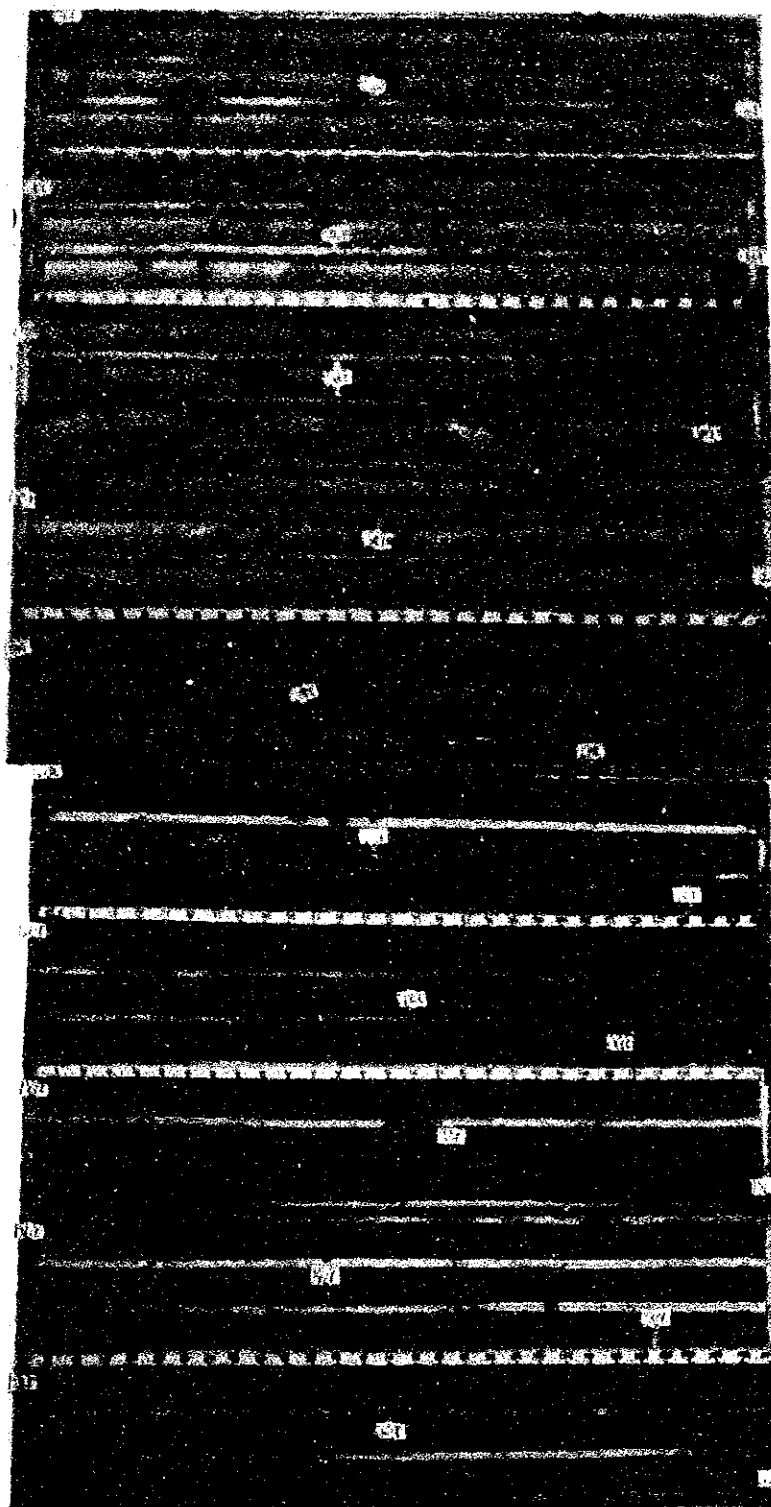
AP-3-134

SG-102 ( 82 ~ 122 m )

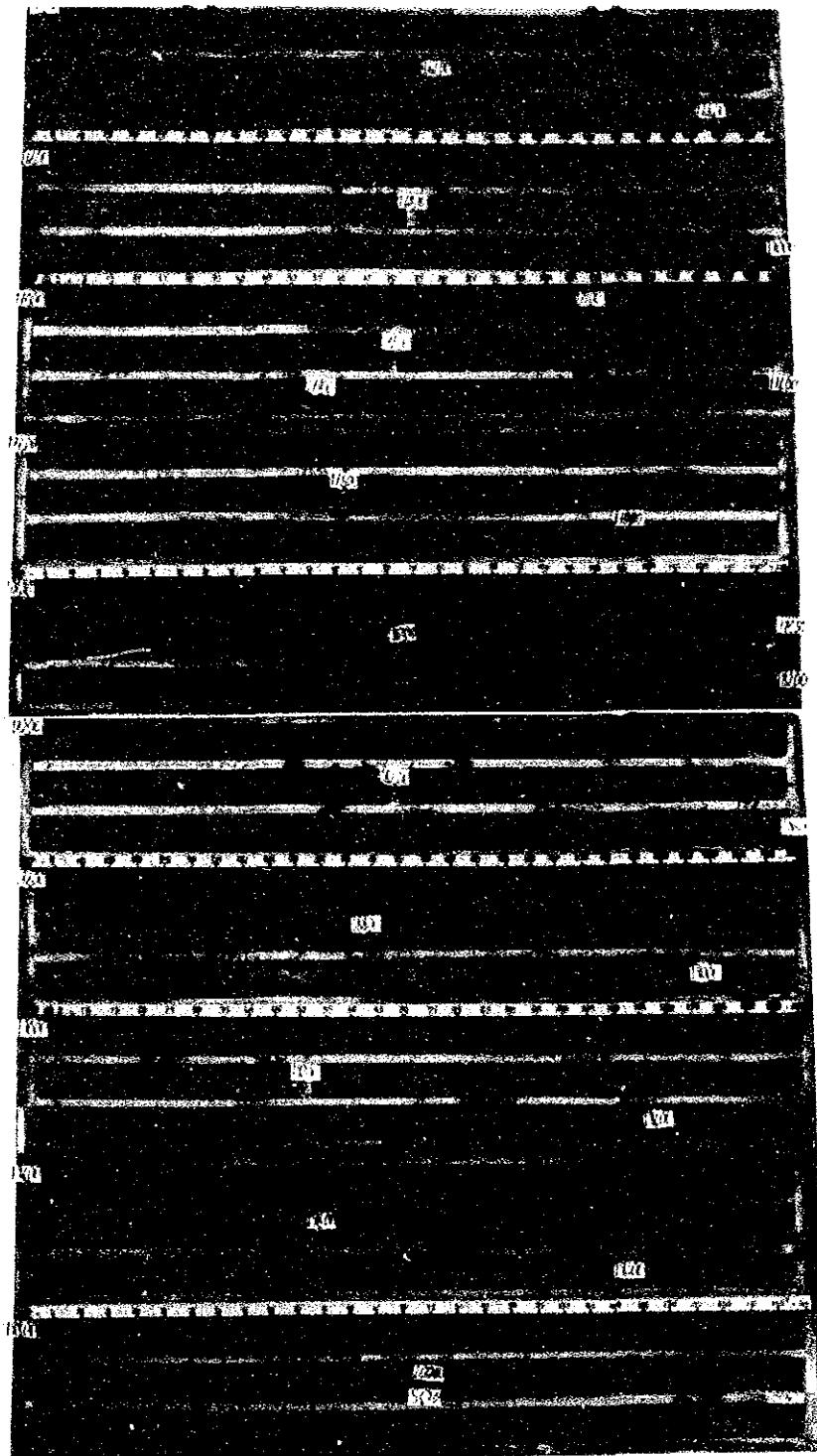


AP-3-135

SG-102 ( 122 m ~162 m )



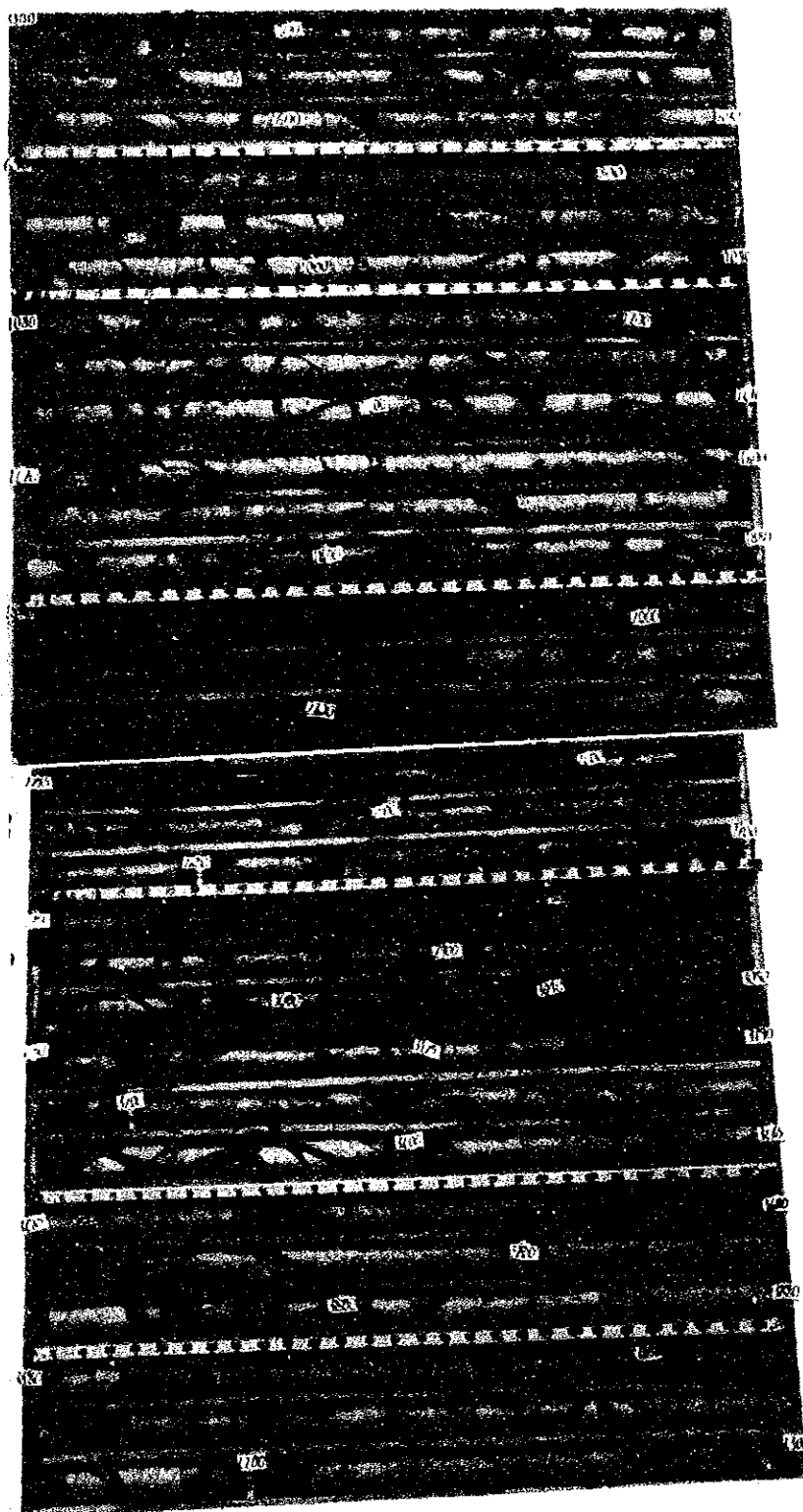
SG-102 ( 162 ~ 200 m )



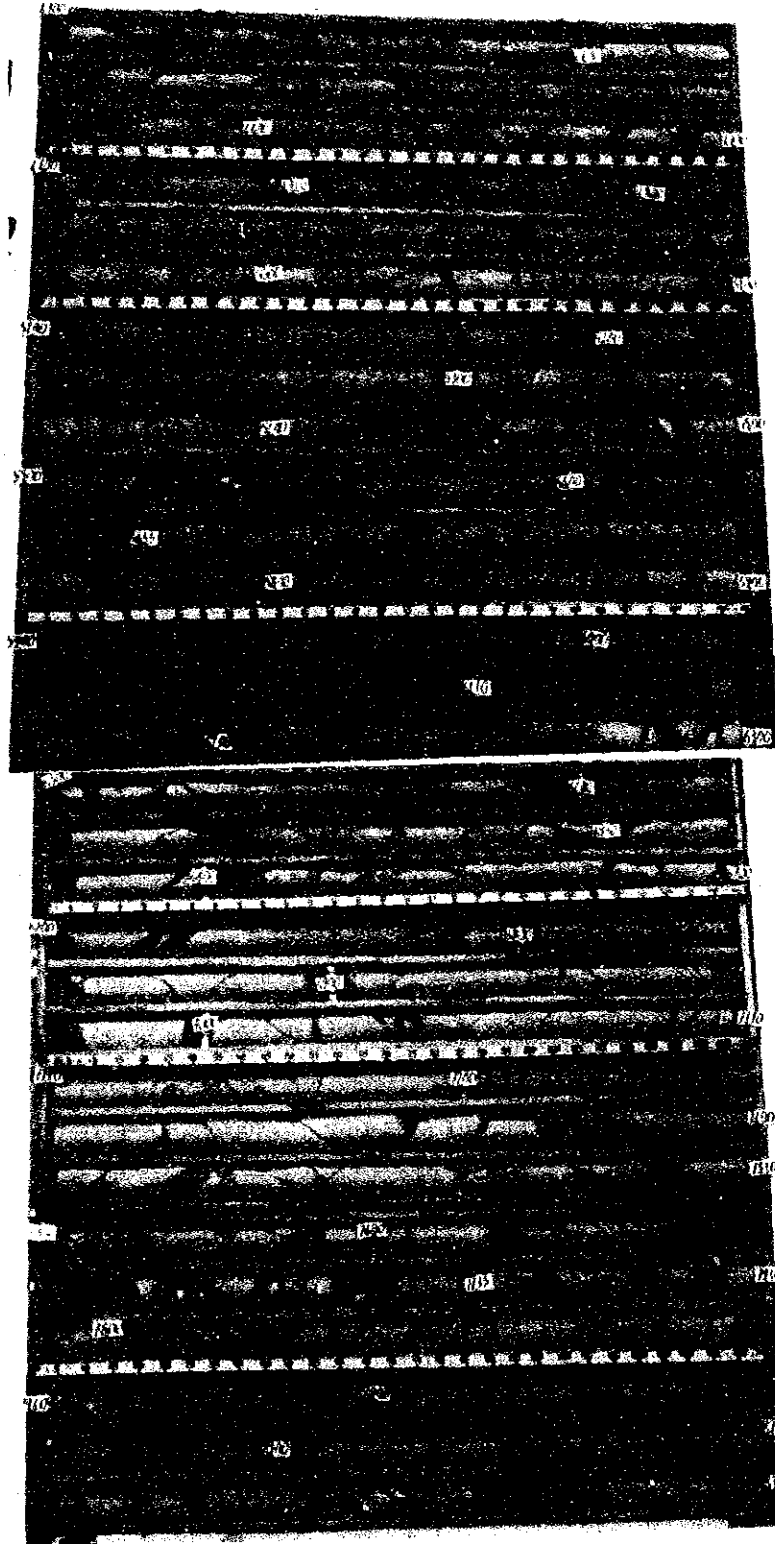
SGE-106 ( L= 125 m, EL. 868.2 m)

Ayvali Damsite, right bank

SGE-106 ( 0 ~ 43 m )



SGE-106 ( 43 ~ 83.4 m )

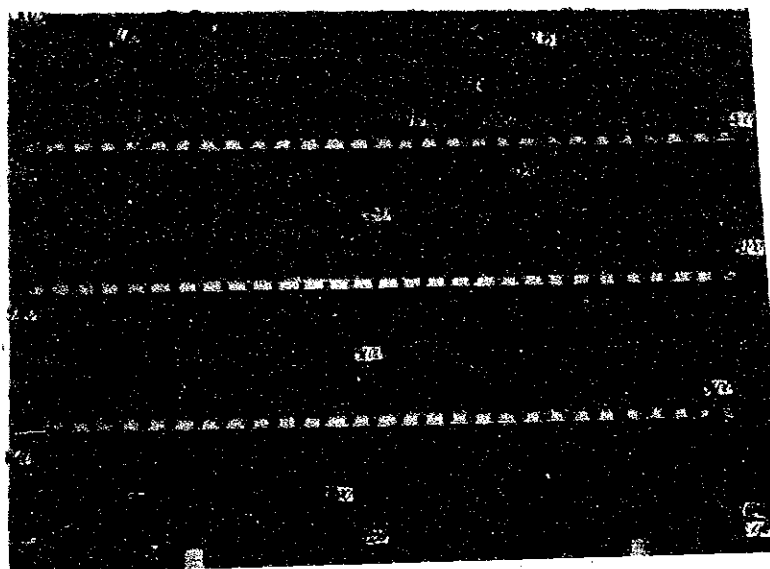


AP-3-139





SGE-106 ( 83.4 ~ 100 m )



AP-3-140

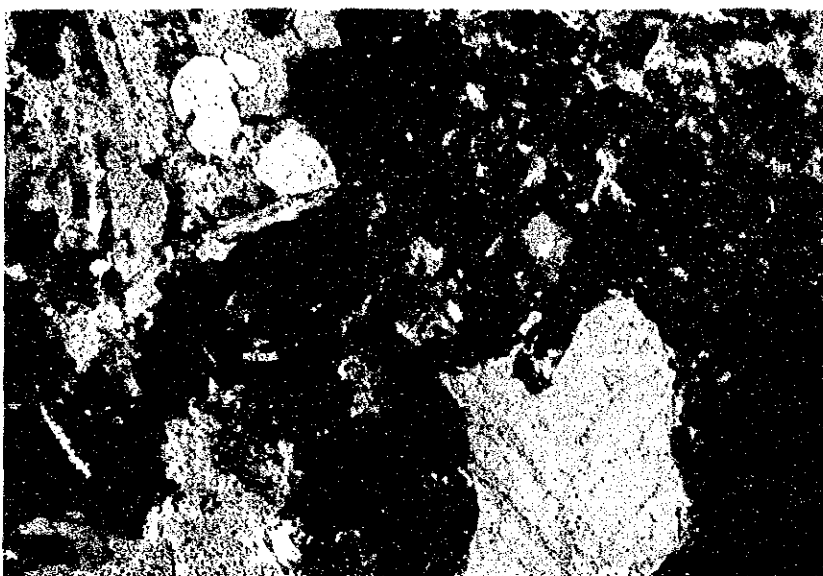
## Micrograph and Petrographic Description of Rock ( 1-3 )

### Locality:

Olur Damsite, Right bank  
Drill Hole SK-211,  
Depth 62.9 m

### Rock Name:

Granite porphyry



0 0.5 1mm

( Crossed nicols )

### Petrographic Description:

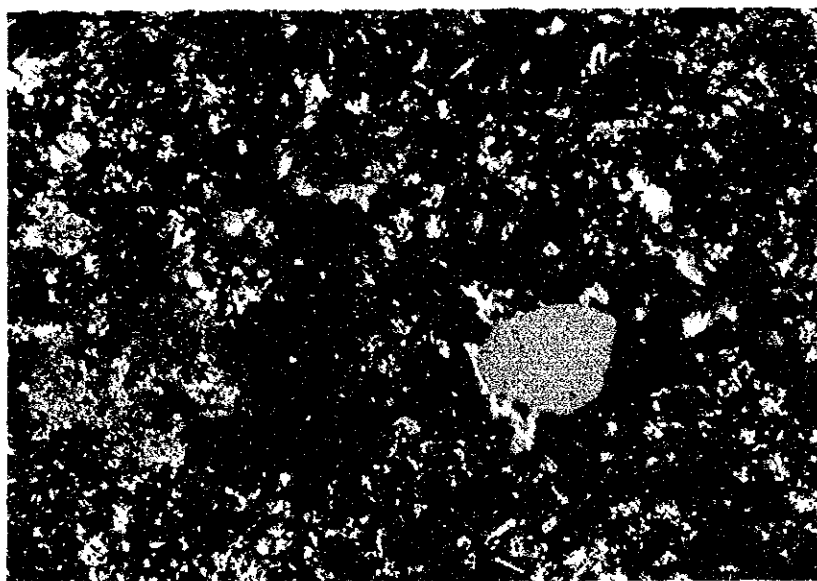
Chief consisting minerals are plagioclase, quartz and potassium feldspar.  
Holocrystalline—porphyritic texture.

### Locality:

Olur Damsite, Left bank  
Drill Hole SK-212,  
Depth 21.5 m

### Rock Name:

Rhyolite



0 0.5 1mm

( Crossed nicols )

### Petrographic Description:

Chief consisting minerals are plagioclase, potassium feldspar and quartz.  
Small amount of cericite are observed.  
Spherulitic texture and Porphyritic texture.

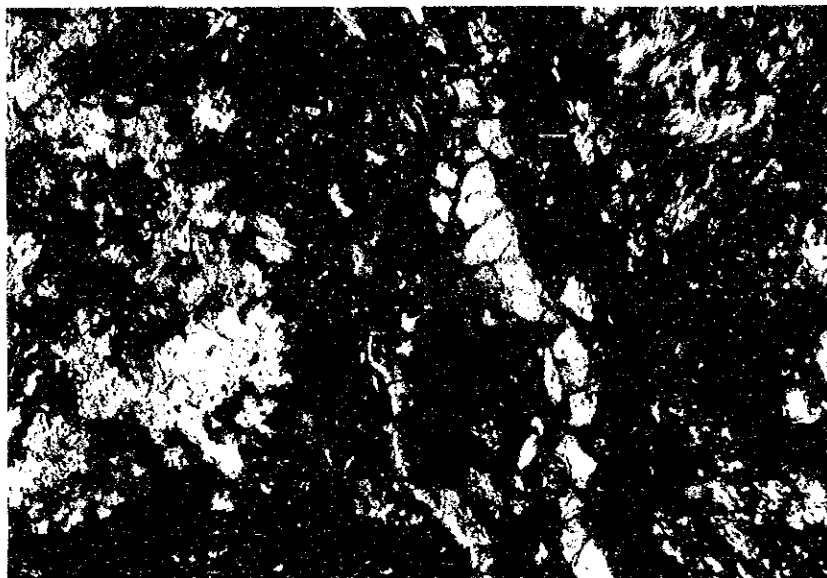
## Micrograph and Petrographic Description of Rock ( 2-3 )

### Locality:

Olur Damsite, Left bank  
Drill Hole SK-212,  
Depth 72.0 m

### Rock Name:

Diabase



0 0.5 1mm ( Crossed nicols )

### Petrographic Description:

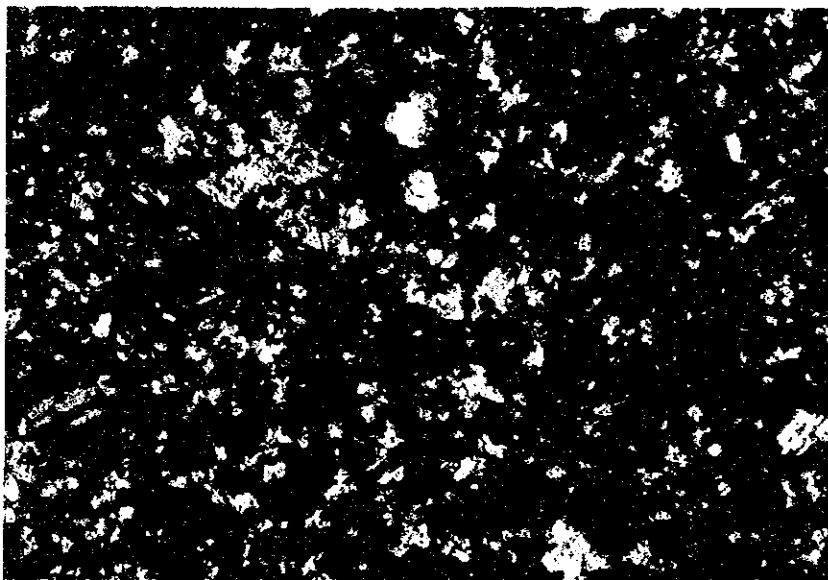
Original texture does not remain because of replacement by chlorite and cericite. Some thin gypsum and carbonate veins are observed.

### Locality:

Olur Powerhouse Site

### Rock Name:

Altered Andesite



0 0.5 1mm ( Crossed nicols )

### Petrographic Description:

Chief consisting minerals are plagioclase. Hyalopilitic texture is remarkable. Some rock forming minerals are replaced by kaoline, albite, quartz and carbonate minerals.

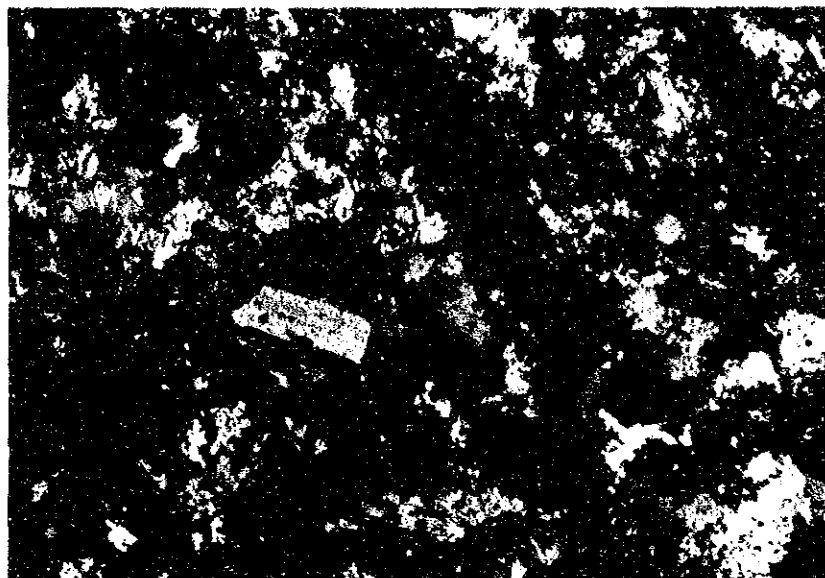
## Micrograph and Petrographic Description of Rock ( 3-3 )

### Locality:

Ayvali Damsite, Right bank  
Drill Hole SG-105,  
Depth 70.0 m

### Rock Name:

Altered Lapilli Tuff



0 0.5 1mm

( Crossed nicols )

### Petrographic Description:

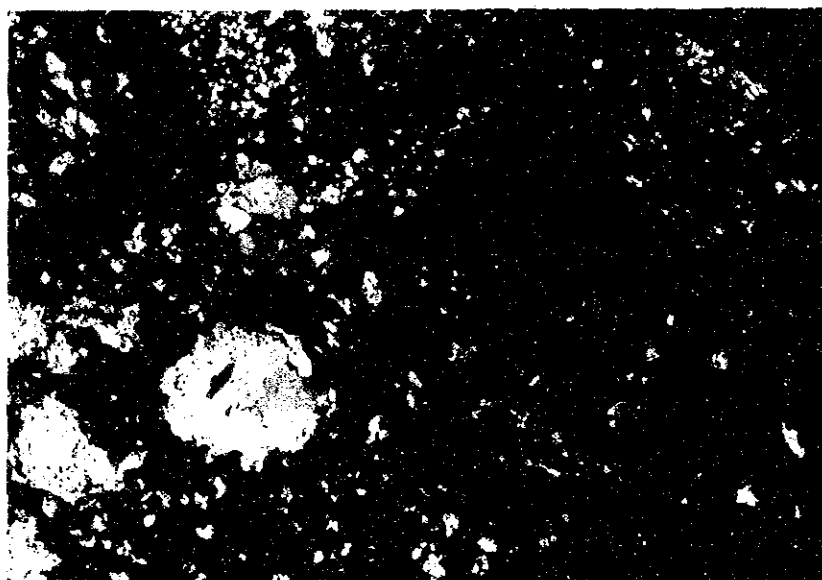
This rock shows pyroclastic texture with mineral fragments of plagioclase and rock fragments suffered chloritization and albitization.

### Locality:

Ayvali Damsite, Left bank  
Drill Hole SL-103,  
Depth 87.8 m

### Rock Name:

Altered tuff breccia



0 0.5 1mm

( Crossed nicols )

### Petrographic Description:

This rock shows pyroclastic texture with fragments of siltstone, silicified rock and chloritization rock. Small amount of pyrite are observed.

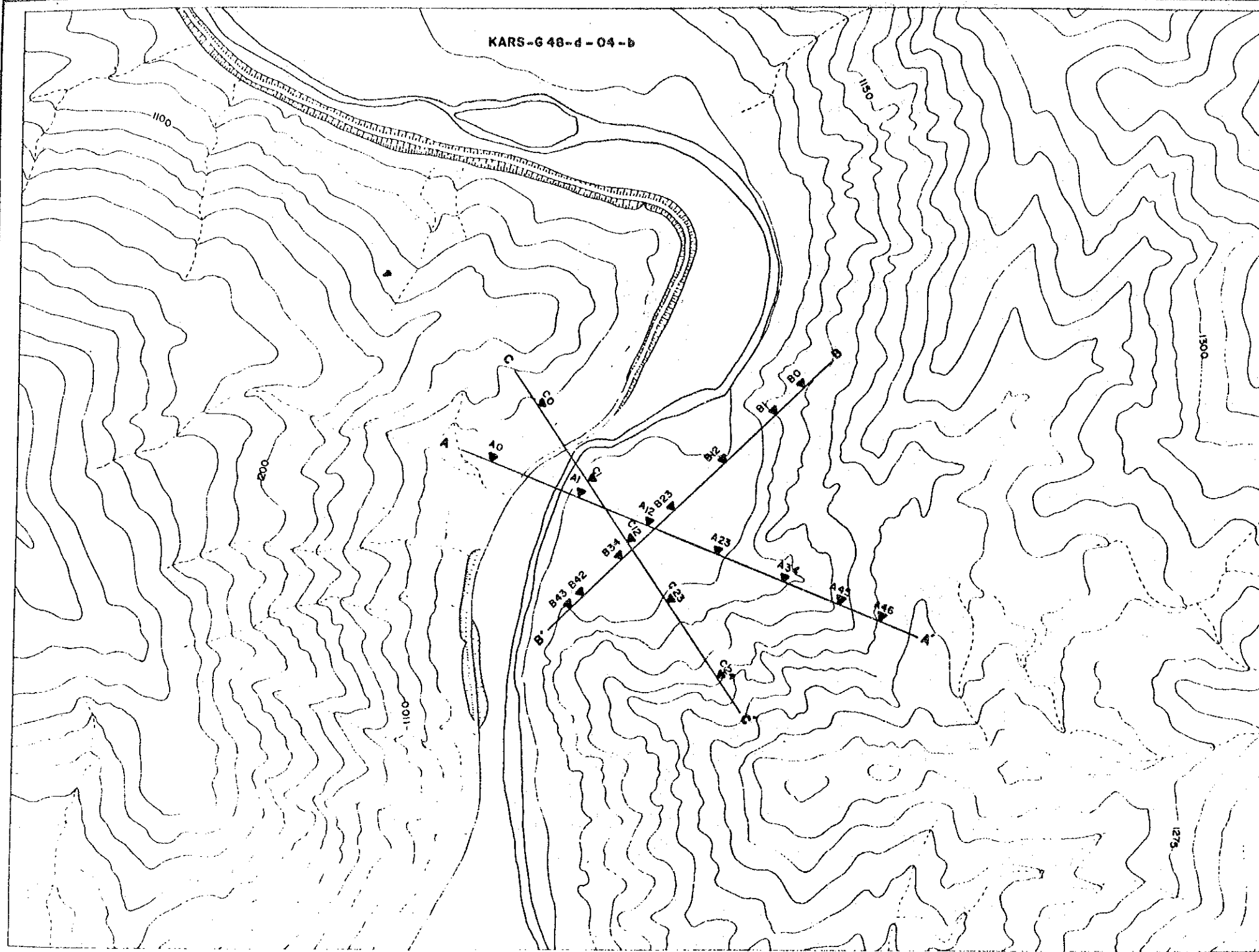
#### A-3-4 Geophysical Prospecting Data

	<u>Page</u>
a) Seismic Prospecting Data of Olur Spillway Site . .	AP-3-144
b) Seismic Prospecting Data of Olur Powerhouse Site .	AP-3-147
c) Seismic Prospecting Data of Bahcecik Area . . . .	AP-3-151
d) Seismic Prospecting Data of Anzav Valley . . . . .	AP-3-156
e) Seismic Prospecting Data of Ayvali Powerhouse Access Tunnel . . . . .	AP-3-160
f) Electrical Prospecting Data of Tkeli Borrow Area (Olur) . . . . .	AP-3-164

#### Note:

Details of each data are described in the following reports.

- a) and e) : "Coruh-Oltu-Olur Dam and Powerhouse Site, Olur Spillway and Ayvali Access Tunnel Sites Geophysical Preliminary Study Report." by EIE, 1992
- b) and d) : "Coruh-Oltu-Olur Dam and Powerhouse Site, and Ayvali Dam and Powerhouse Site, Tunnel Route Geophysical Preliminary Study Report." by EIE, 1991
- c) : "Coruh-Oltu-Olur Project, Bahcecik Landslide Area Geophysical Preliminary Study Report" by EIE, 1992
- f) and g) : "Coruh-Oltu-Ayvali Project Bulanik and Tekeli Borrow Areas Geophysical Preliminary Study Report." by EIE, 1992

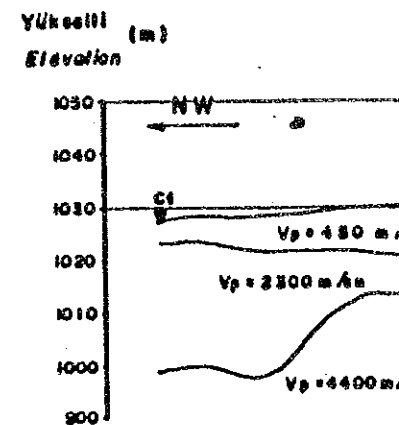
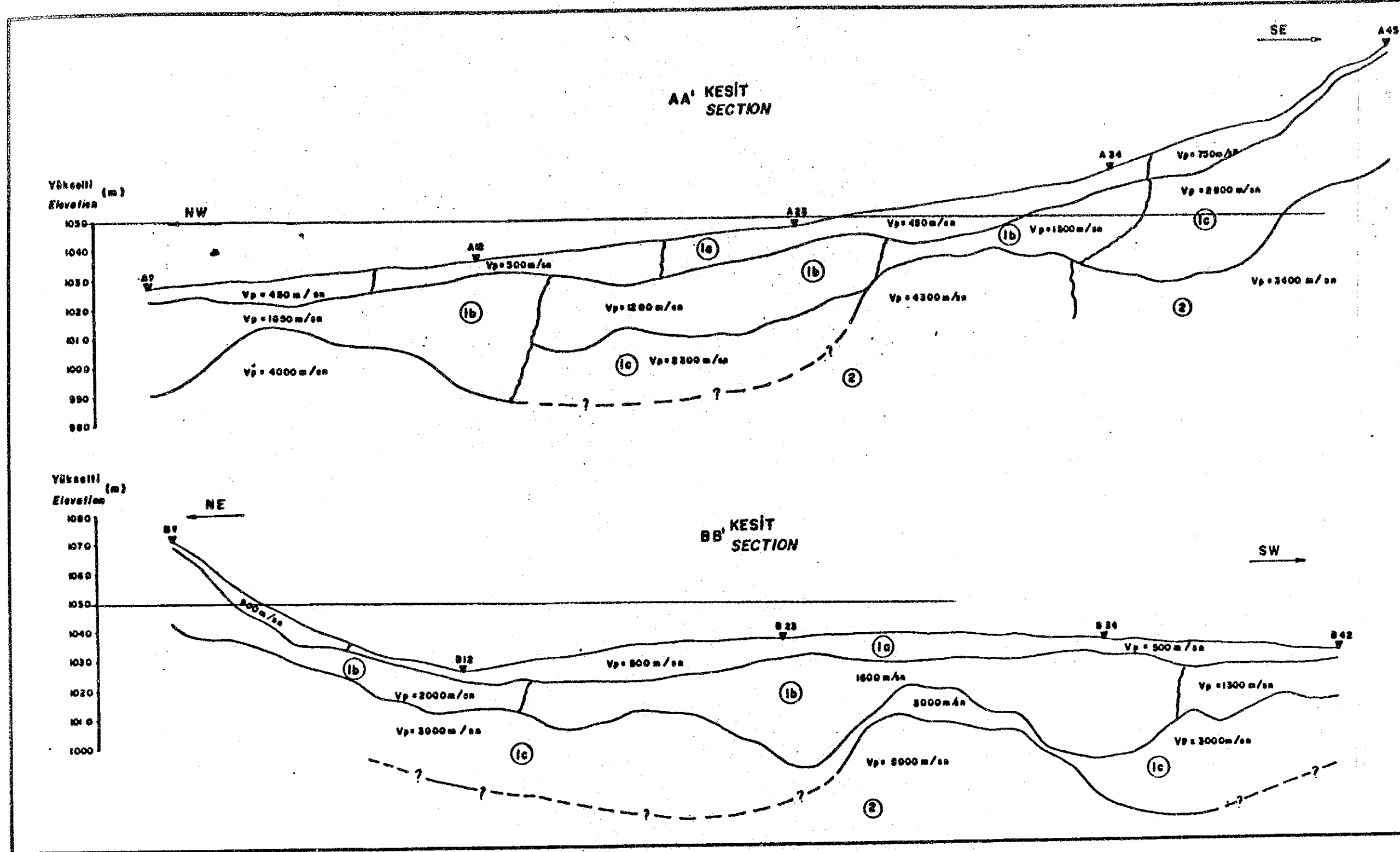


# AÇIKLAMA — EXPLANATION

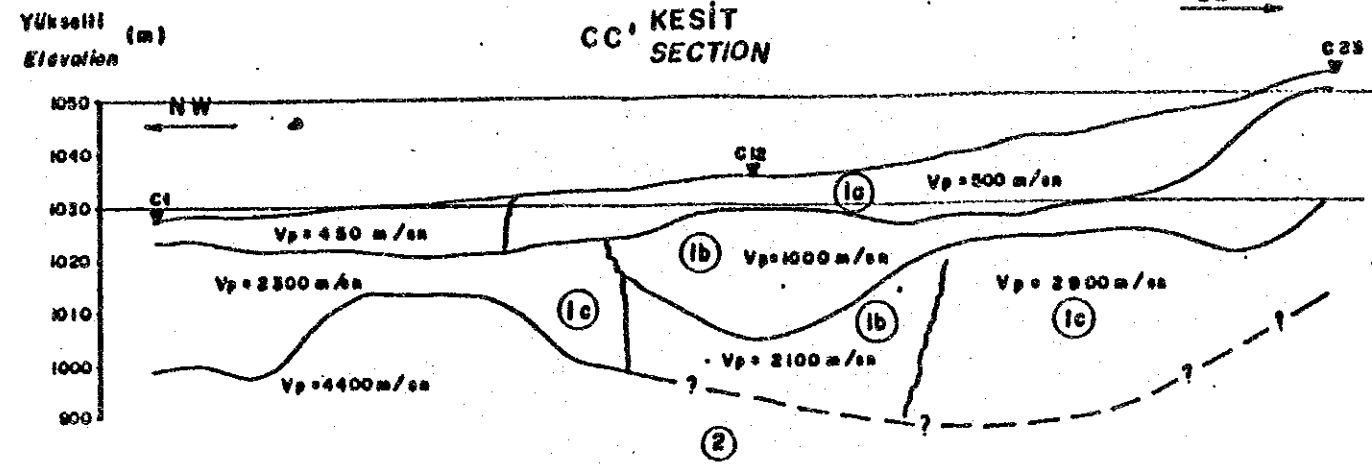
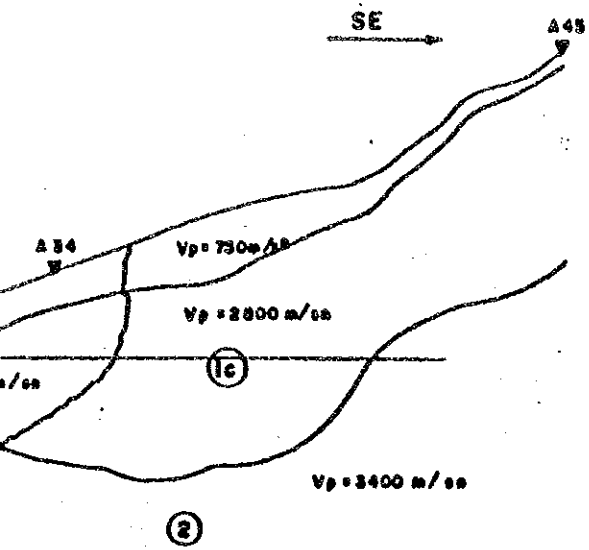
A — A' SİSMİK PROFİL  
SEISMIC PROFILE

B I SİSMİK ATIS NOKTASI  
SEISMIC SHOT POINT

ELEKTRİK İŞLERİ ETÜT İDARESİ GENEL MÜDÜRLÜĞÜ GENERAL DIRECTORATE OF ELECTRICAL POWER RESOURCES SURVEY AND DEVELOPMENT ADMINISTRATION			
ÇORUH - OLTU KOLU OLUR BARAJ VE HES PROJESİ DOLUSAVAK SAHASI JEOFİZİK ÇALIŞMA LOKASYON HARİTASI ÇORUH - OLTU - OLUR DAM AND HPP PROJECT GEOPHYSICAL SURVEY LOCATION MAP OF SPILLWAY SITE			
YAPAN DESIGNED BY: N. SARAC F. ÇAKAN O. TEKELİ		DAİRE BAŞKANI HEAD OF DEPT. <i>[Signature]</i>	
ÇİZEN DRAWN BY: Serhat ARAYANCAN		<i>[Signature]</i>	
KONTROL CHECKED BY: <i>[Signature]</i>		GENEL MÜDÜR GENERAL DIRECTOR <i>[Signature]</i>	
SÜRE MD. CH. OF DIVIS: <i>[Signature]</i>			
No No	ÖLÇEK SCALE		EK App
Tarih Date: 19. 3. 1992	1/5000		1

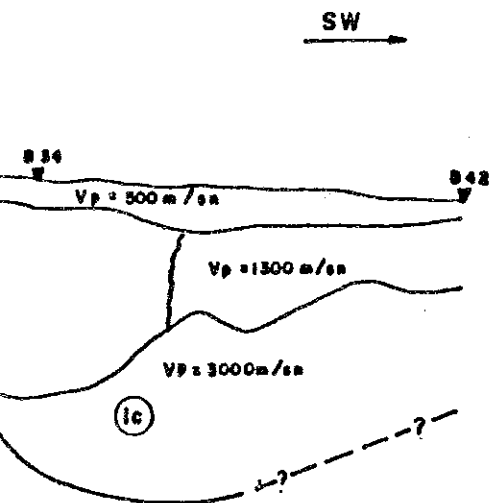


7/2/2012



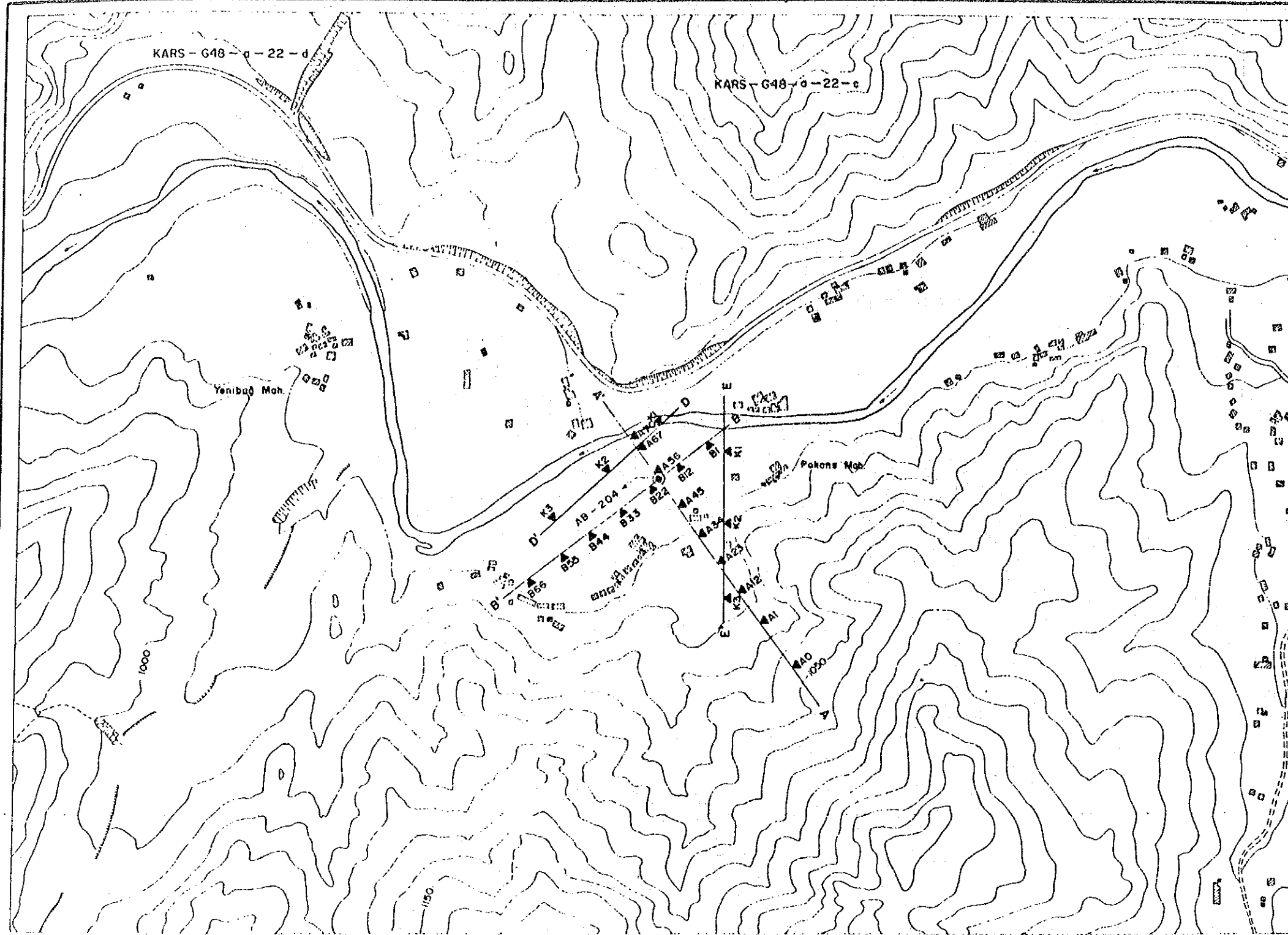
# AÇIKLAMALAR — EXPLANATION

- A34  
▼  
SİSMİK ATIŞ NOKTASI  
SHOT POINT
- Vp = 2100 m/s  
BOYUNA DALGA HIZI  
LONGITUDINAL WAVE VELOCITY
- OLASI TABAKA SINIRI  
PROBABLE CON: T
- (1a) (1b) (1c)  
YAMAÇ MOLOZU  
SLOPE WASH
- (2)  
TABANKAYA (AYVALI VOLKANİTLERİ)  
BEDROCK (AYVALI VOLCANICS)



ELEKTRİK İŞLERİ ETÜT İDARESİ GENEL MÜDÜRLÜĞÜ GENERAL DIRECTORATE OF ELECTRICAL POWER RESOURCES SURVEY AND DEVELOPMENT ADMINISTRATION			
ÇORUH-OLTU KOLU OLUR BARAJ ve HES PROJESİ DOLUSAVAK SAHASI JEOFİZİK KESİTLERİ ÇORUH-OLTU-OLUR DAM AND HPP PROJECT GEOPHYSICAL SECTION OF SPILLWAY SITE			
YAPAN DESIGNED BY : MSARAC, ÇAKAN ÖTEKELİ		DARE BAŞKANI HEAD OF DEPART	
ÇİZEN DRAWN BY : Melice ALTIN		İmza	
KONTROL CHECKED BY : uşulu		İmza	
SUBE MD CH. OF DIVS : Balta		GENEL MÜDÜR GENERAL DIRECTOR	
No No :	ÖLÇEK SCALE		EK App : 2
Tarih Date : 16/3/1992	1 / 1000		

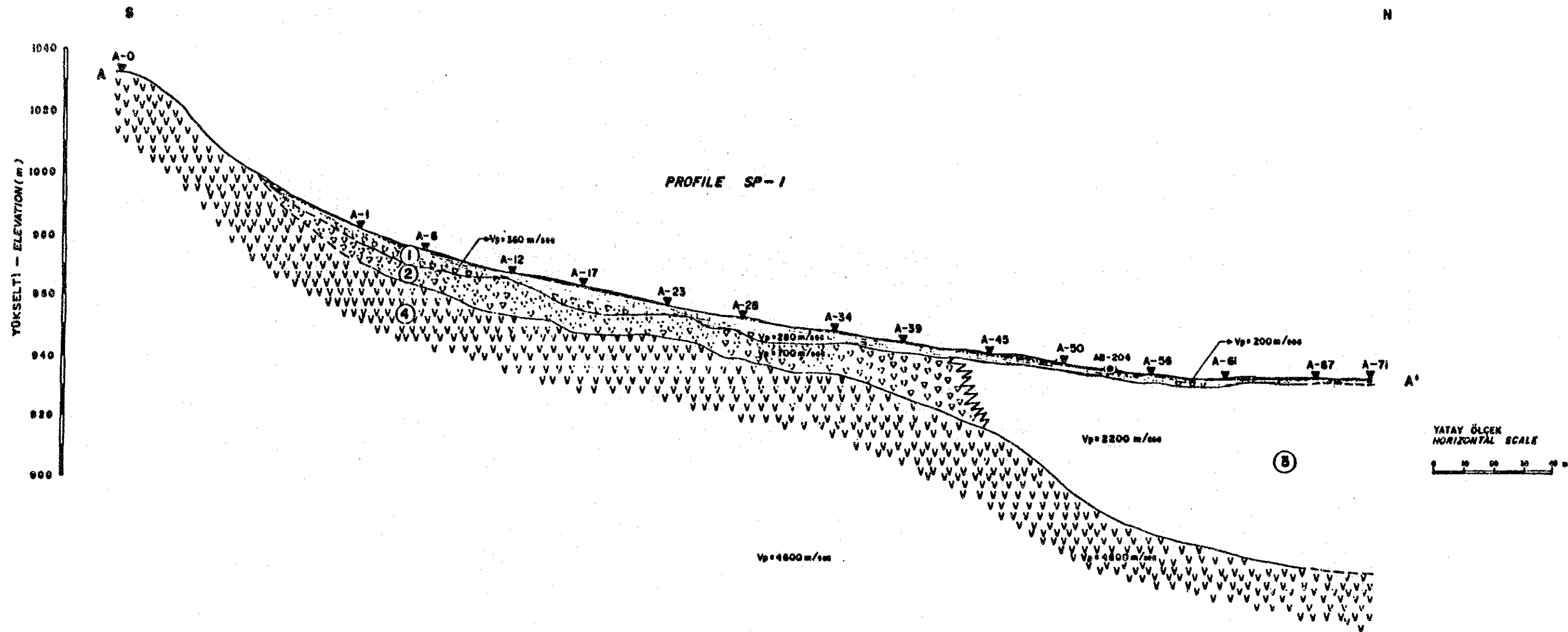




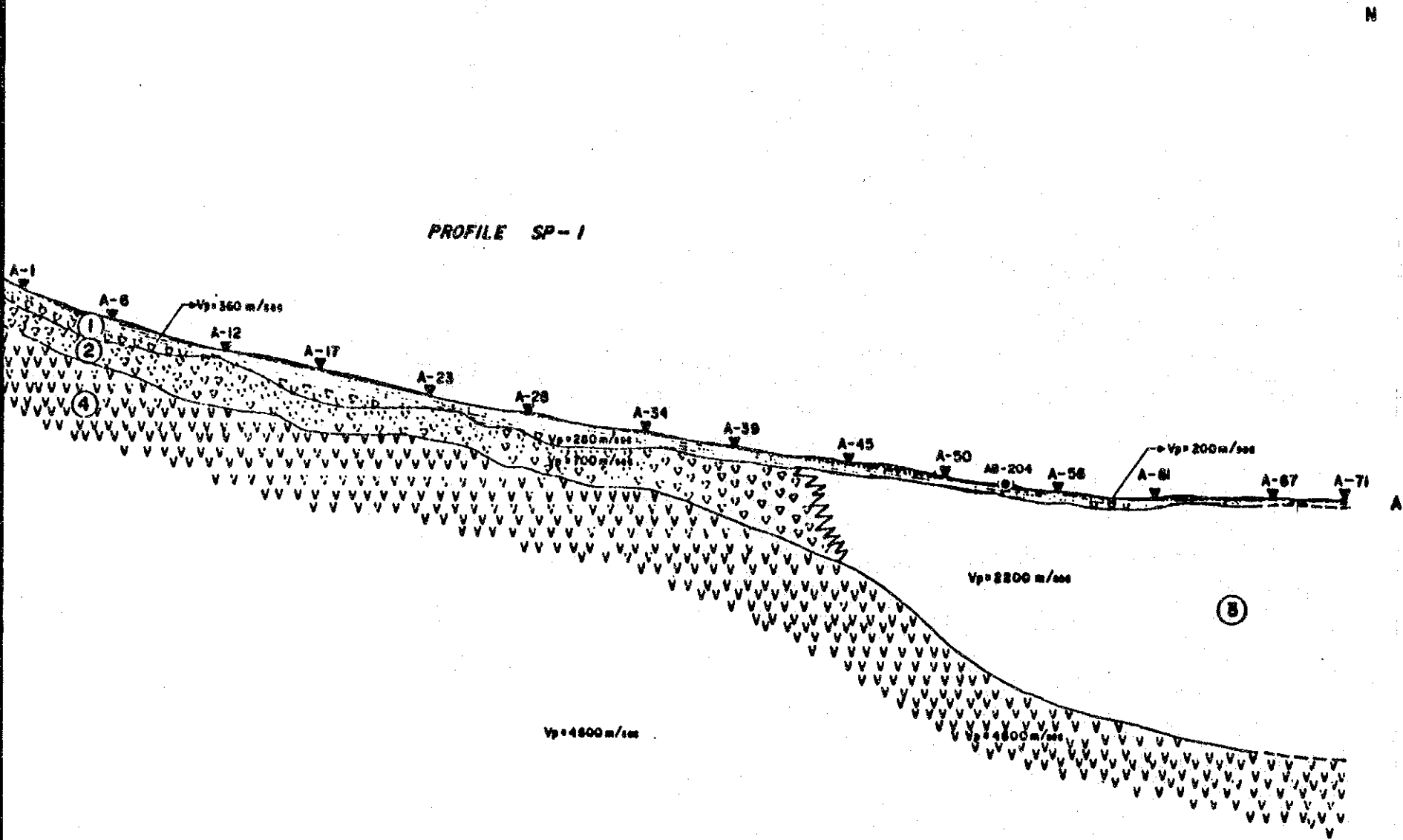
# AÇIKLAMA - EXPLANATION

- A — A' SİSMİK PROFİL  
SEISMIC PROFILE
- AS Kİ SİSMİK ATIS NOKTASI  
SHOT POINT
- ⊙ MEKANİK SONDAJ  
DRILL HOLE (PROPOSED)

ELEKTRİK İŞLERİ ETÜT İDARESİ GENEL MÜDÜRLÜĞÜ GENERAL DIRECTORATE OF ELECTRICAL POWER RESOURCES SURVEY AND DEVELOPMENT ADMINISTRATION			
ÇORUH-OLTU KOLU OLUR BARAJ VE HES PROJESİ SANTRAL SAHASI JEOFİZİK ÇALIŞMA LOKASYON HARİTASI OLTU-OLUR HPP PROJECT GEOPHYSICAL SURVEY LOCATION MAP FOR POWERHOUSE AREA			
YAPAN DESIGNED BY : N. SARAÇ		Q TEKELİ S. ERTAN	
ÇİZEN DRAWN BY : Sibel GÖÇER		DAİRE BAŞKANI HEAD OF DEPART. <i>[Signature]</i>	
KONTROL CHECKED : <i>[Signature]</i>			
SÜBE MD. CHIEF OF DIVISION : <i>[Signature]</i>		GENEL MÜDÜR GENERAL DIRECTOR <i>[Signature]</i>	
No. : No : 17. 9. 1991	ÖLÇEK SCALE : 1 / 5000		Ek App : 1



EL	621
CO	
GEOPH	
YAPAN	
DESIGNED BY	
ÇİZEN	
BAKIM BY	
KONTROL	
ÇİĞER	
KUBE NO.	
CHIEF OF BIL	
No.	1
Tarih	13. 0.
Date	



# ACIKLAMA -- EXPLANATION

A-1 BİSMİN ATİŞ NOKTASI  
SHOT POINT

Vp = 2200 m/sec BOYUNA DALGA HIZI  
LONGITUDINAL WAVE VELOCITY

OLASI TABAKA SINIRI  
PROBABLE CONTACT

YANAL DEĞİŞİM SINIRI  
LATERAL CHANGING BOUNDARIES

① DİTKİSEL TOPRAK  
AGRICULTURAL SOIL

② YAMAĞ MOLOZU  
SLOPE MASH

③ ALÜVYON  
ALLUVIUM

④ TABANKAYA (AYVALI VOLKANİTLERİ)  
BEDROCK (AYVALI VOLCANICS)

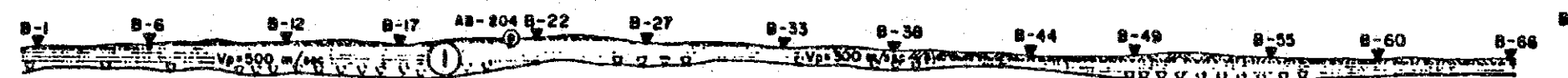
ELEKTRİKİŞLERİ ETÜT İDARESİ GENEL MÜDÜRLÜĞÜ GENERAL DIRECTORATE OF ELECTRICAL POWER RESOURCES SURVEY AND DEVELOPMENT ADMINISTRATION			
CORUH-OLTU KOLU OLUR BARAJ VE HES PROJESİ SANTRAL SAHASI JEOFİZİK KESİTİ CORUH-OLTU - OLUR HPP PROJECT GEOPHYSICAL SECTIONS AT POWERHOUSE SITE			
YAPAN DESIGNED BY : N. BARAÇ O. TEKELİ	DAİRE BAŞKANI HEAD OF DEPART.		
CİZEN DRAWN BY : B. GÖÇER	GENEL MÜDÜR GENERAL DIRECTOR		
KONTROL CHECKED : M. YILMAZ	No : 1		
SUBE MD. CHIEF OF DIVISION : M. YILMAZ	Tarih : 10. 9. 1991		
	ÖLÇEK SCALE : 1 / 1000		Ek : 2

YÜSELTİ - ELEVATION (m)



E

B



PROFILE SP-1

W

$V_p = 2000 \text{ m/sec}$

$V_p = 2000 \text{ m/sec}$

$V_p = 4000 \text{ m/sec}$

$V_p = 4400 \text{ m/sec}$

YATAY ÖLÇEK  
HORIZONTAL SCALE



AÇIKLAMA - EXP

B-6 GİSMİK ATIŞ  
SHOT POINT

$V_p = 4400 \text{ m/sec}$  BOYUNA DAL  
LONGITUDINAL

① BİTKİSEL TO  
AGRICULTURAL

② ALÜVİYON  
ALLUVIUM

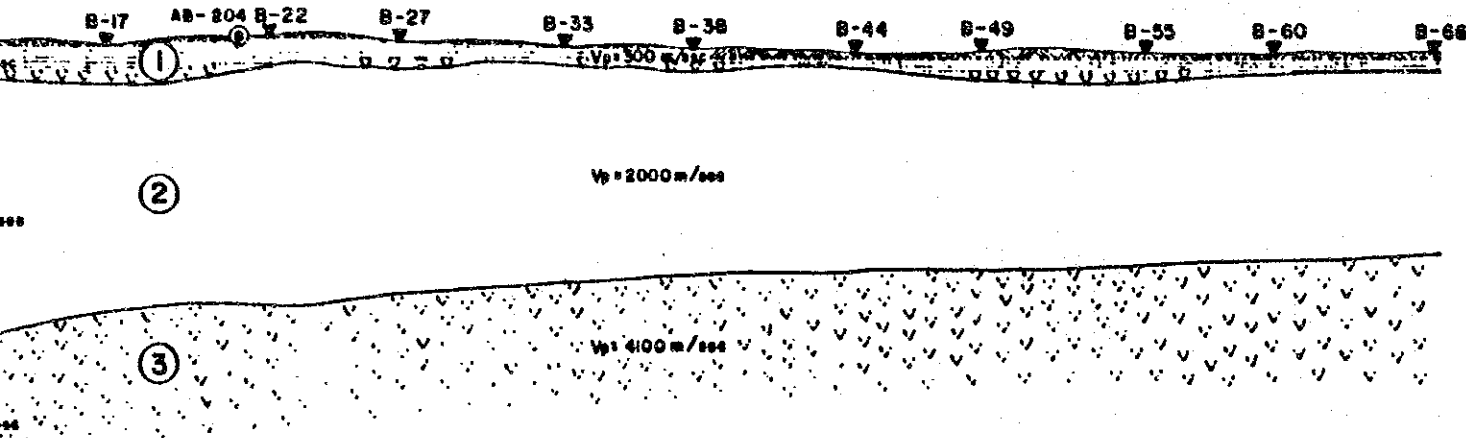
③ TAŞKAYA  
BEDROCK

ELEKTRİK İŞLERİ ETÜT İDARESİ  
GENERAL DIRECTORATE OF ELECTRICITY  
SURVEY AND DEVELOPMENT

ÇORUH - OLTU KOLU OLUP  
PROJESİ  
SANTRAL SAHASI  
ÇORUH - OLTU - OLUP  
GEOPHYSICAL SECTIONS AT

YAPAN DESIGNED BY	N. SARAC	O. TEKELİ	DİREKTÖR DIRECTOR
ÇİZEN DRAWN BY	S. GÖÇER	S. ERTAN	BAŞ MÜHÜR CHIEF OF DIVISION
KONTROL CHECKED	U. KILIÇ		GENEL MÜDÜR GENERAL MANAGER
YERİ PLACE	20.8.1991	1/1000	

PROFILE SP-II



W

YATAY ÖLÇEK  
HORIZONTAL SCALE



AÇIKLAMA - EXPLANATION

- B-6 İSMİK ATIŞ NOKTASI  
SHOT POINT
- Vp=4400 m/sec BOYUNA DALGA HIZI  
LONGITUDINAL WAVE VELOCITY
- (1) BİTKİSEL TOPRAK + ALÜVYON  
AGRICULTURAL SOIL + ALLUVIUM
- (2) ALÜVYON  
ALLUVIUM
- (3) TABANKAYA  
BEDROCK

ELEKTRİK İŞLERİ ETÜT İDARESİ GENEL MÜDÜRLÜĞÜ GENERAL DIRECTORATE OF ELECTRICAL POWER RESOURCES SURVEY AND DEVELOPMENT ADMINISTRATION			
ÇORUH-OLTU KOLU OLUR BARAJ VE HES PROJESİ SANTRAL SAHASI JEOFİZİK KESİTİ ÇORUH-OLTU-OLUR HPP PROJECT GEOPHYSICAL SECTIONS AT POWERHOUSE SITE			
YAPAN DESIGNED BY : N. SARAÇ	Ö. TEKELİ S. ERTAN	DAİRE BAŞKANI HEAD OF DEPART.	
ÇİZEN DRAWN BY : S. M. GÖÇER			
KONTROL CHECKED : M. H. H.			
SÜBE MD. CHIEF OF DIVISION : M. H. H.	GENEL MÜDÜR GENERAL DIRECTOR		
No : No	ÖLÇEK SCALE		Ek : 3 App
Tarih : 29.8.1991 Date	1 / 1000		

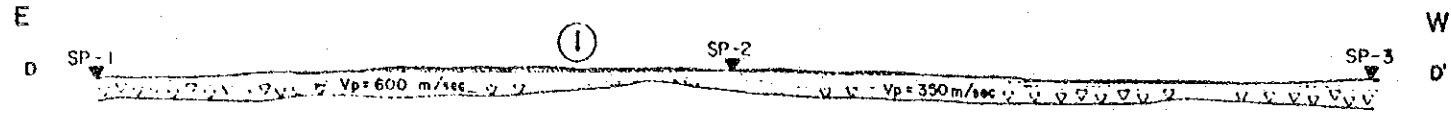
YÜKSELTİ-ELEVATION (m)

940

920

900

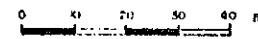
### PROFILE SP-III



Vp = 2000 m/sec

Vp = 2000 m/sec

YATAY ÖLÇEK  
HORIZONTAL SCALE



### AÇIKLAMA - EXPLANATION

SP-1 SİSMİK ATIŞ NOKTASI  
SHOT POINT

Vp = 2000 m/sec BOYUNA DALGA HIZI  
LONGITUDINAL WAVE VELOCITY

① BİTKİSEL TOPRAK + ALÜVYON  
AGRICULTURAL SOIL + ALLUVIUM

② ALÜVYON  
ALLUVIUM

③ TABANKAYA  
BEDROCK

YÜKSELTİ-ELEVATION (m)

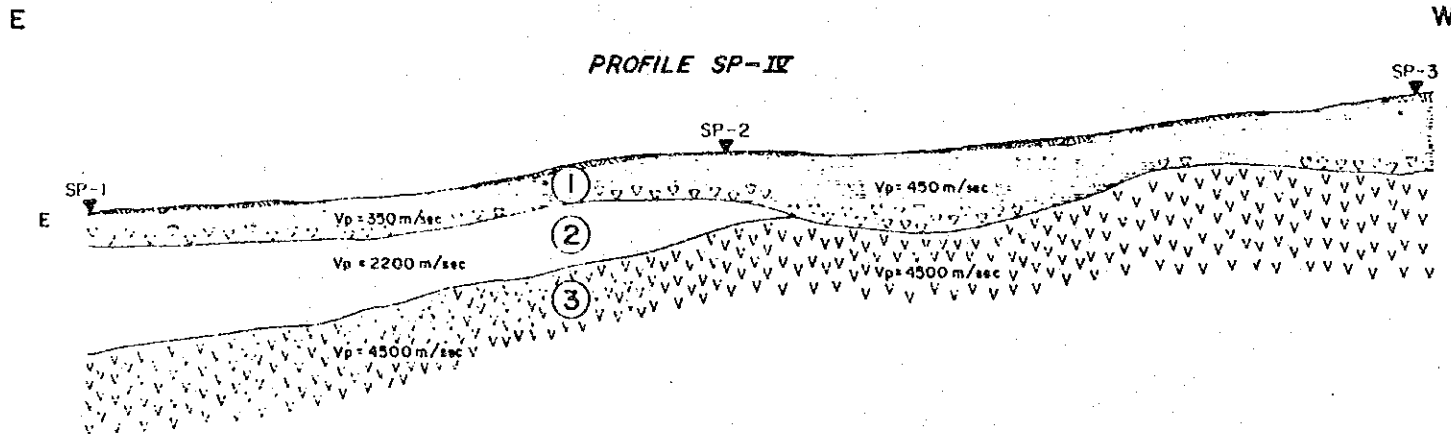
960

940

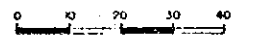
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900

### PROFILE SP-IV

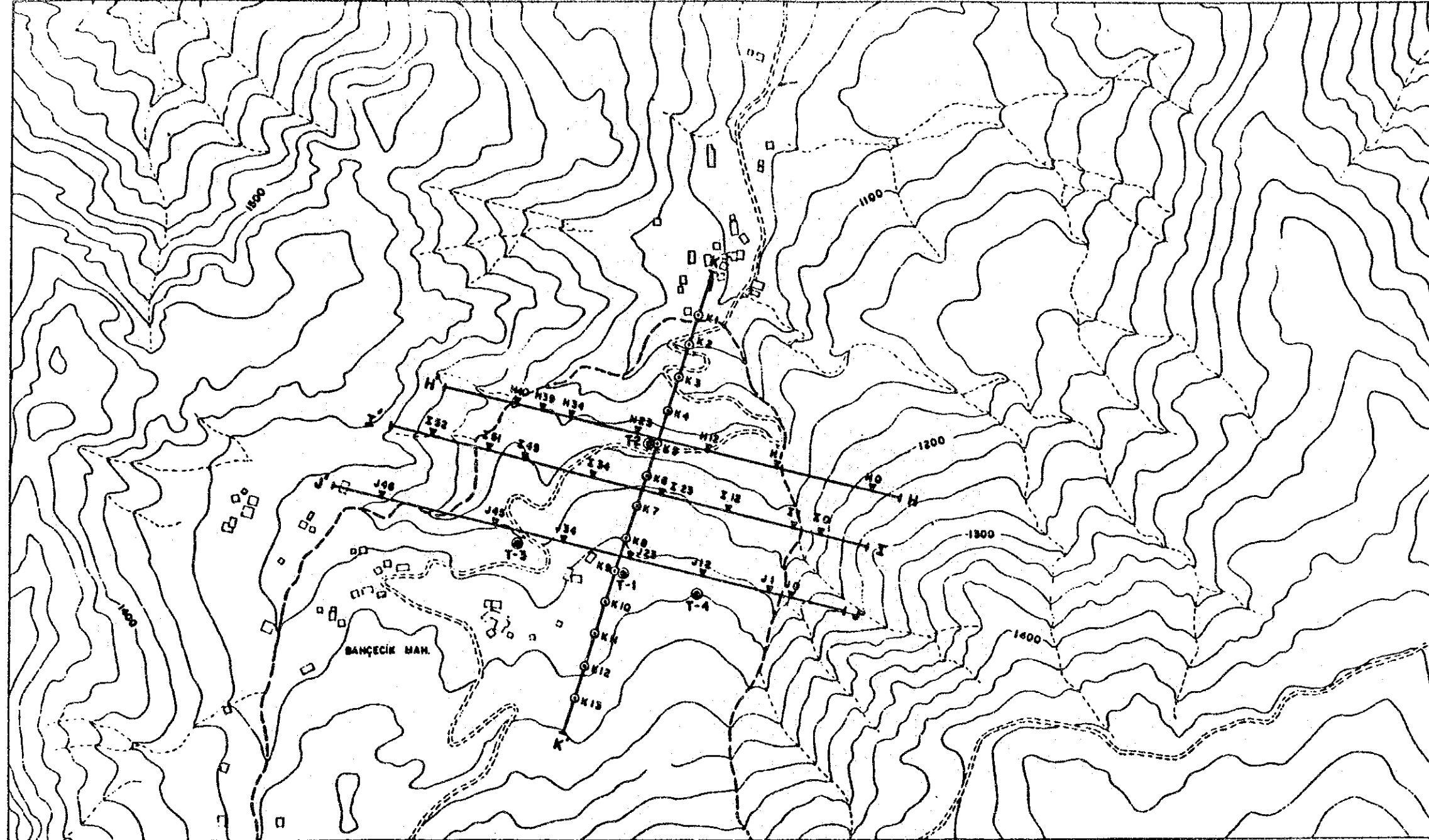


YATAY ÖLÇEK  
HORIZONTAL SCALE



ELEKTRİK İŞLERİ ETÜT İDARESİ GENEL MÜDÜRLÜĞÜ GENERAL DIRECTORATE OF ELECTRICAL POWER RESOURCES SURVEY AND DEVELOPMENT ADMINISTRATION			
ÇORUH-OLTU KOLU OLUR BARAJ VE HES PROJESİ SANTRAL SAHASI JEOPİZİK KESİTİ ÇORUH-OLTU-OLUR HPP PROJECT GEOPHYSICAL SECTIONS AT POWERHOUSE SITE			
YAPAN DESIGNED BY	N. SARAC	Ö. TEKELİ	DAİRE BAŞKANI HEAD OF DEPT.
CİZEN DRAWN BY	Sibel GÖÇER		
KONTROL CHECKED			
SUBE MD CHIEF OF DIVISION			GENEL MÜDÜR Y. GENERAL DIRECTOR
No No	ÖLÇEK SCALE		Ek App
Tarih Date	9.9.1991	1/1000	4

KARS - G48-a-22-c

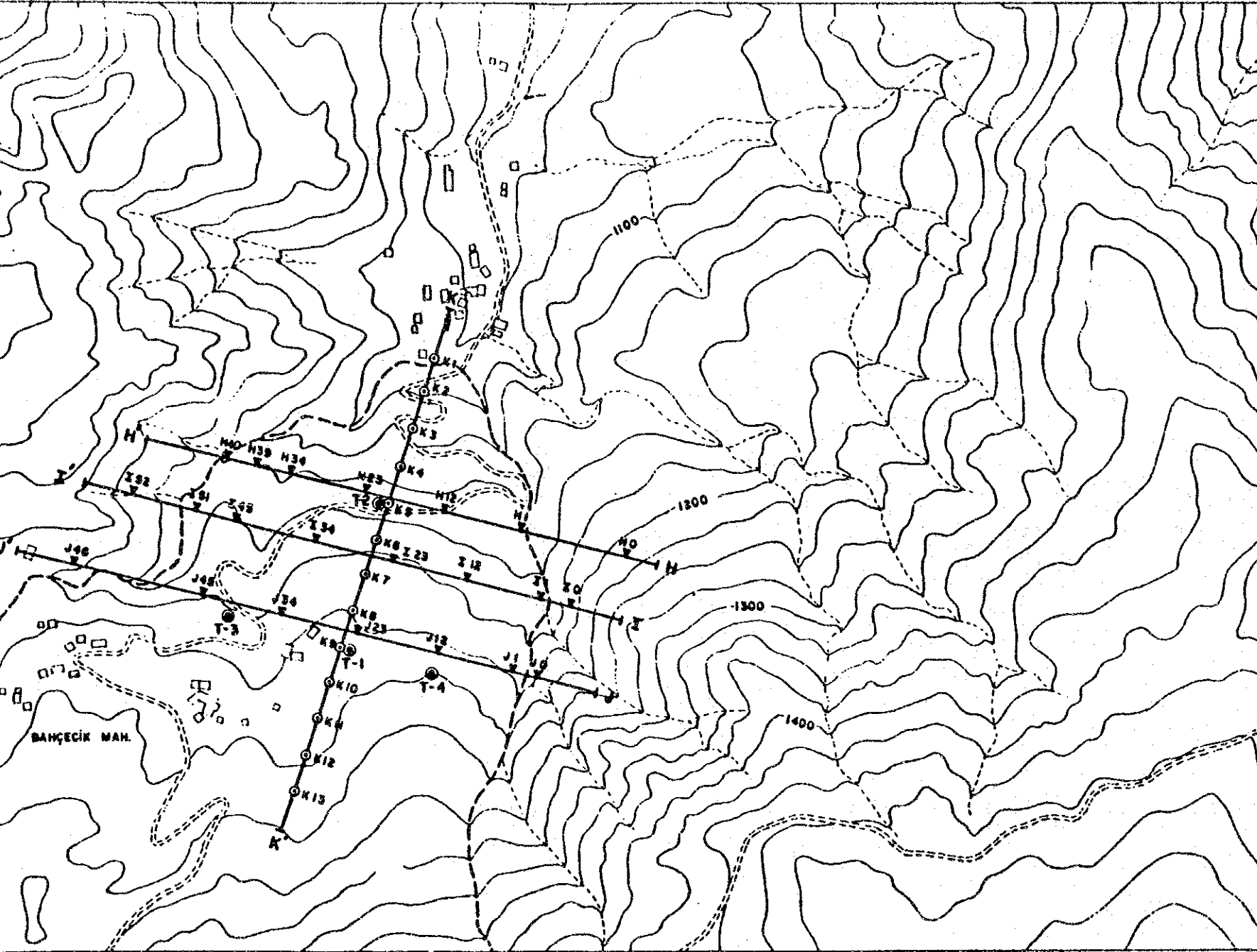


AÇIKLAMA - EXPLANATION

- H — H' SİSMİK PROFİL  
SEISMIC PROFILE
- K — K' REZİSTİVİTE PROFİLİ  
RESISTIVITY PROFILE
- J 23  
▼ SİSMİK ATIŞ NOKTASI  
SHOT POINT
- K 4  
⊙ DÜŞEY ELEKTRİK SONDAJ  
VERTICAL ELECTRICAL SOUNDING
- T-2  
● MEKANİK SONDAJ  
DRILL HOLE

ELEKTRİK İŞLERİ ETÜT İDARESİ GENEL MÜDÜRLÜĞÜ GENERAL DIRECTORATE OF ELECTRICAL POWER SURVEY AND DEVELOPMENT ADMINISTRATION	
ÇORUH-OLTU KOLU OLUR BARAJI BAHÇECİK HEYELANI JEOFİZİK ÇALIŞMA LİSTESİ LOCATION MAP FOR BAHÇECİK	
YAPAN DESIGNED BY : N. SARAÇ - H. GÖRMÜŞ	DAİRE BAŞKANI HEAD OF DEPARTMENT
ÇİZEN DRAWN BY : Mehmet PEKDEMİR	
KONTROL CHECKED : <i>Ufuk</i>	
ŞUBE MÜDÜRÜ CHIEF OF DIVISION : <i>Osman Demirel</i>	GENEL MÜDÜR GENERAL DIRECTOR
No. No.	ÖLÇEK SCALE
Tarih Date : 24. 6. 1992	1/ 5000

KARS - 048-a-22-c



**AÇIKLAMA - EXPLANATION**

- H — H' SİSMİK PROFİL  
SEISMIC PROFILE
- K — K' REZİSTİVİTE PROFİLİ  
RESISTIVITY PROFILE
- J23  
v SİMİK ATIŞ NOKTASI  
SHOT POINT
- K4  
o DÜŞEY ELEKTRİK SONDAJ  
VERTICAL ELECTRICAL SOUNDING
- T-2  
o MEKANİK SONDAJ  
DRILL HOLE

ELEKTRİK İŞLERİ ETÜT İDARESİ GENEL MÜDÜRLÜĞÜ GENERAL DIRECTORATE OF ELECTRICAL POWER RESOURCES SURVEY AND DEVELOPMENT ADMINISTRATION			
ÇORUH-OLTU KOLU OLUR BARAJ ve HES PROJESİ BAHÇECİK HEYELAN JEOfİZİK ÇALIŞMA LOKASYON HARİTASI LOCATION MAP FOR BAHÇECİK LANDSLIDE			
YAPAN DESIGNED BY : H. SARAÇ - H. GÖRMÜŞ		DAİRE BAŞKANI HEAD OF DEPT. <i>[Signature]</i>	
ÇİZEN DRAWN BY : Mehmet PEKDEMİR		GENEL MÜDÜR GENERAL DIRECTOR <i>[Signature]</i>	
KONTROL CHECKED : <i>[Signature]</i>		ŞUBE MD. CHIEF OF DIVISION : <i>[Signature]</i>	
No. No.	ÖLÇEK SCALE		K1 App. : 1
Tarih Date : 24.6.1992	1/ 5000		