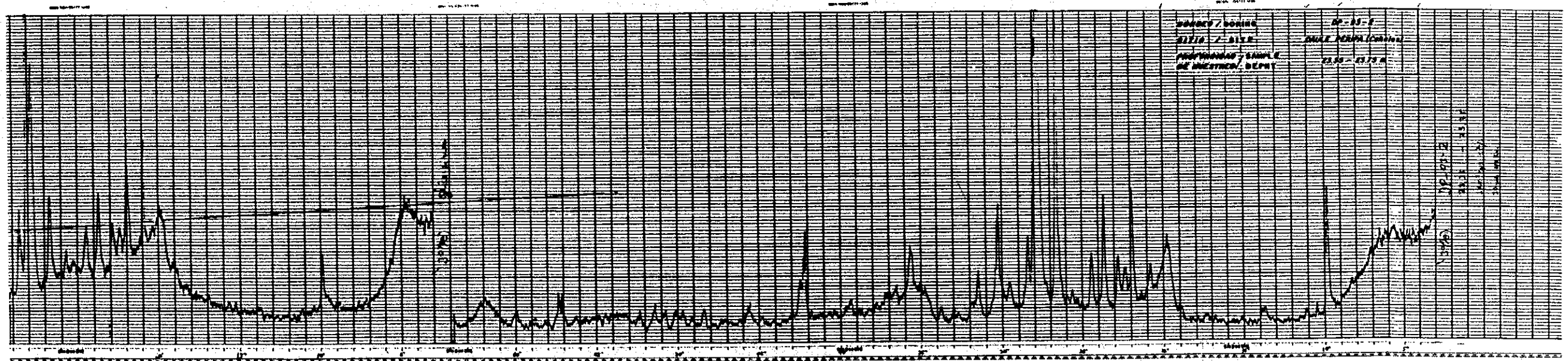
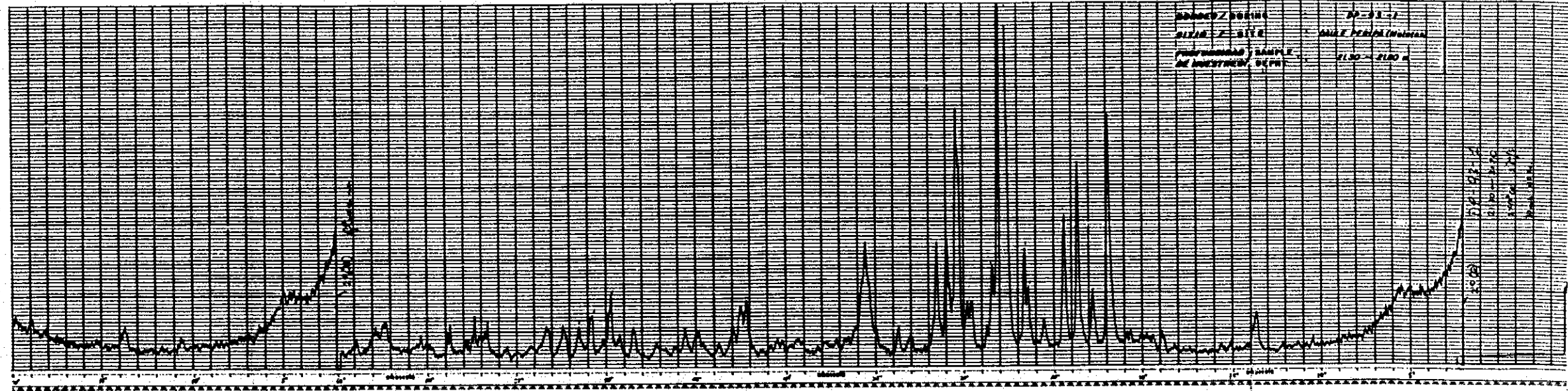


Appendix 3

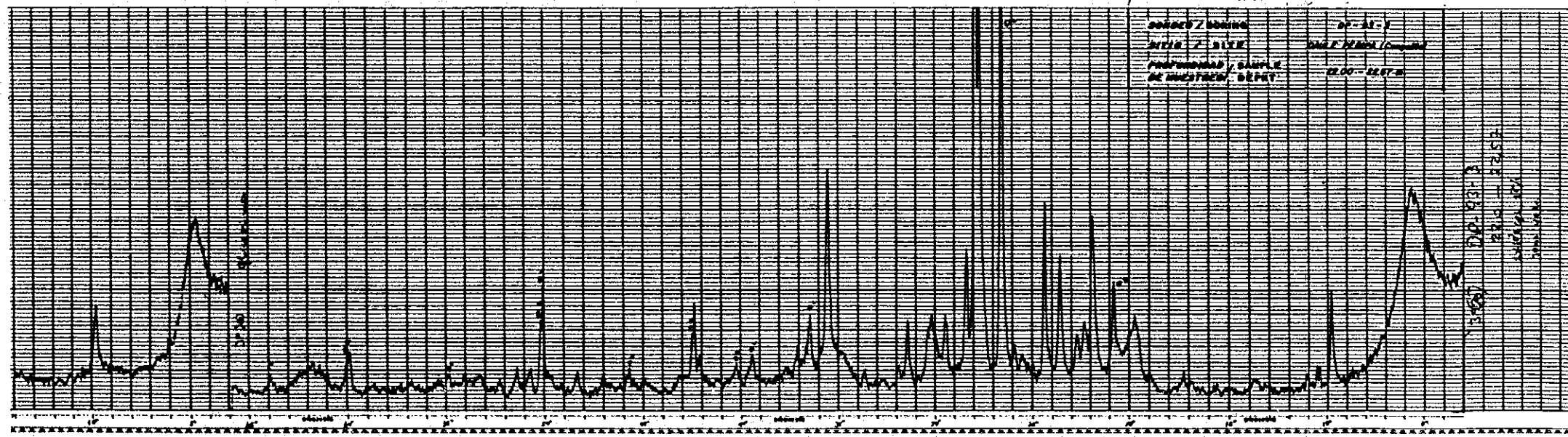
X-RAY DIFFRACTION ANALYSIS



GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE DETAILED DESIGN STUDY ON THE WATER TRANSBASIN
 SCHEMES FOR CHONE-PORTOVIEJO RIVER BASINS

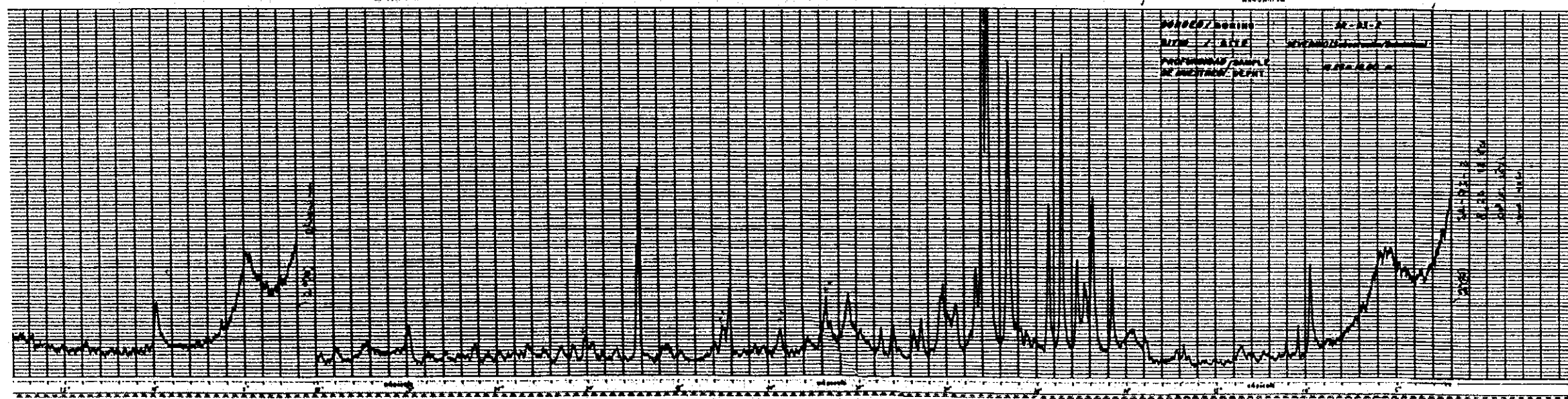
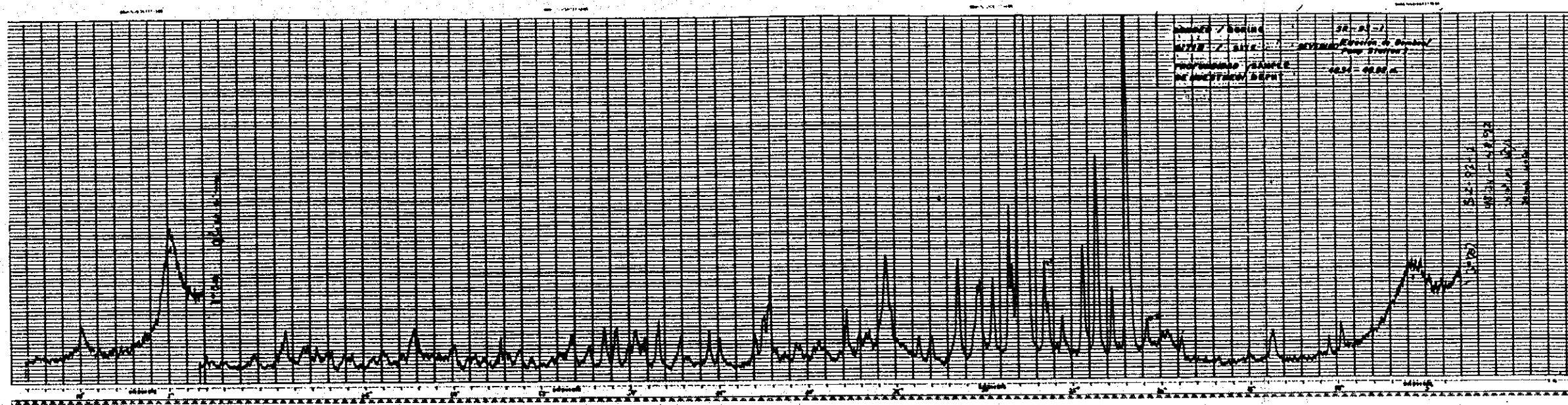
JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE X-Ray Diffraction Analysis
 DP93-1(21.30m-21.80m)
 DP93-2(23.35m-23.75m)



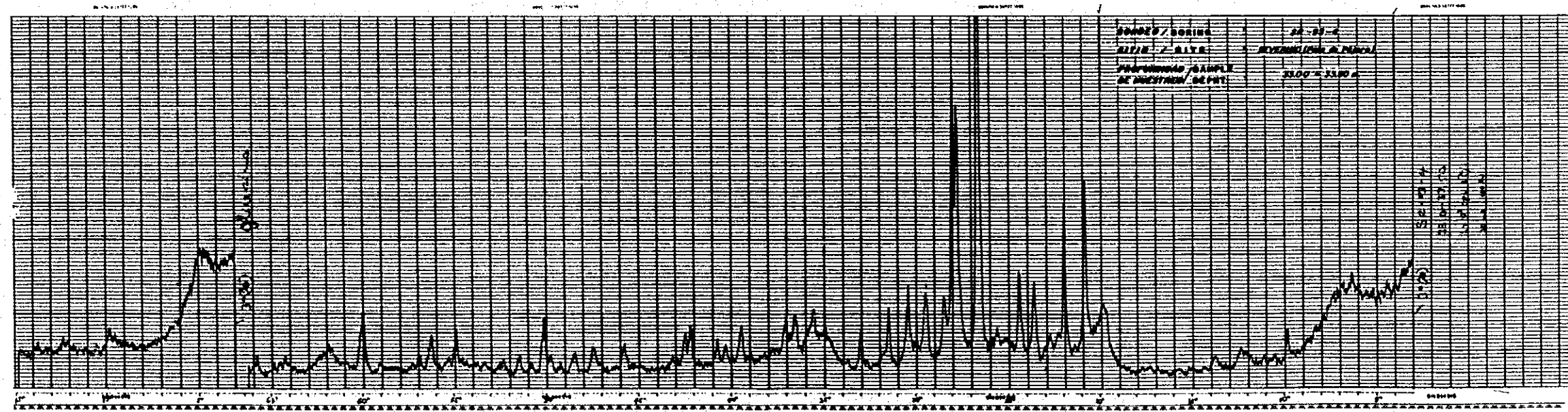
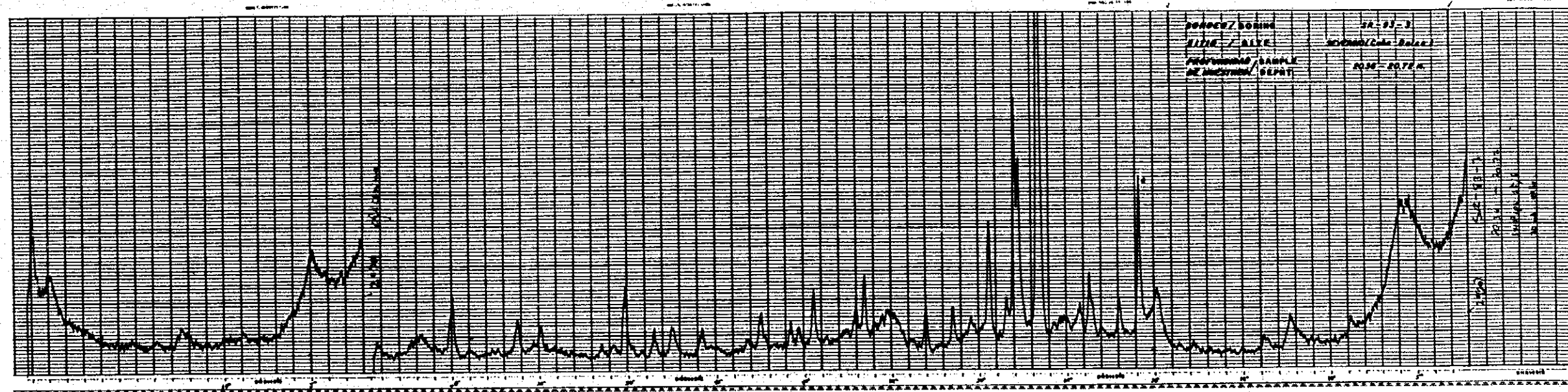
GOVERNMENT OF THE REPUBLIC OF ECUADOR
CENTRO DE REHABILITACION DE MANABI (CRM)
THE DETAILED DESIGN STUDY ON THE WATER TRANSBASIN
SCHEMES FOR CHONE-PORTOVIEJO RIVER BASINS
JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE
X-Ray Diffraction Analysis
DP93-3(22.00m-22.57m)



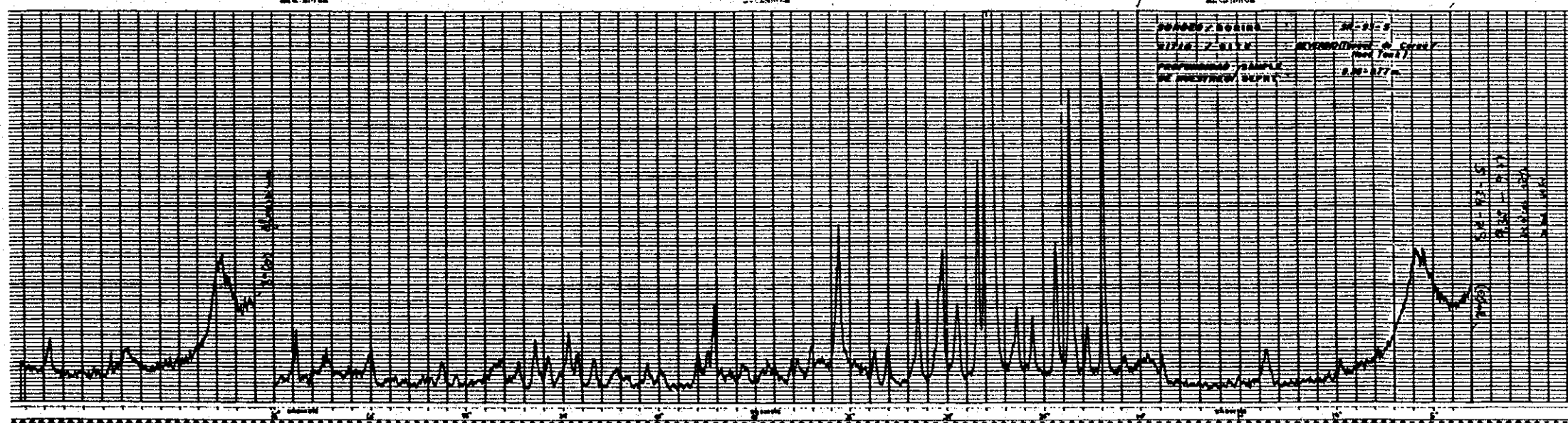
GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE DETAILED DESIGN STUDY ON THE WATER TRANSBASIN
 SCHEMES FOR CHONE-PORTOVIEJO RIVER BASINS
 JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE
 X-Ray Diffraction Analysis
 SR93-1(48.34m-48.92m)
 SR93-2(18.26m-18.80m)



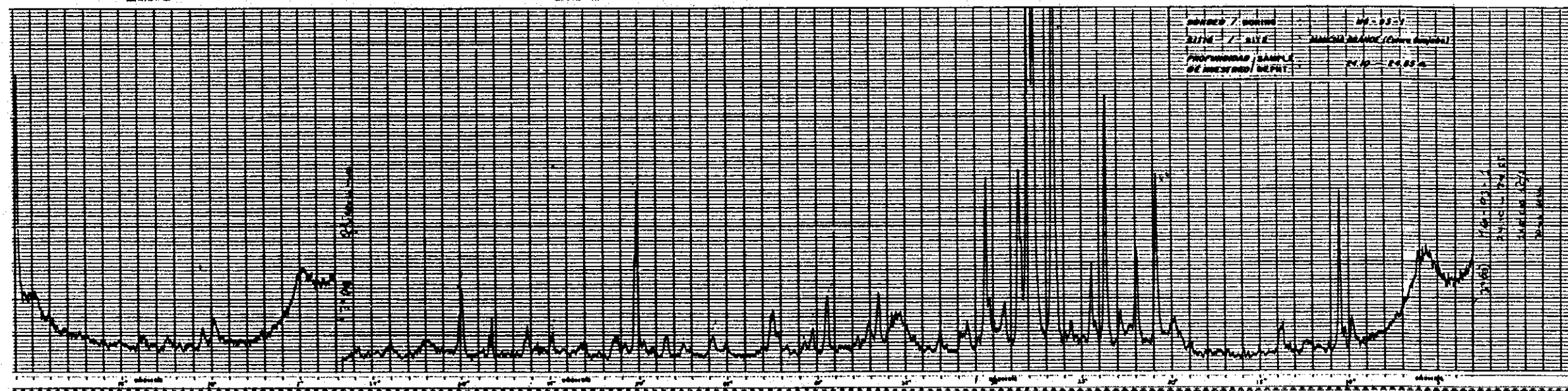
GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE DETAILED DESIGN STUDY ON THE WATER TRANSBASIN
 SCHEMES FOR CHONE-PORTOVIEJO RIVER BASINS
 JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE
 X-Ray Diffraction Analysis
 SR93-3(20.36m-20.72m)
 SR93-4(33.00m-33.50m)



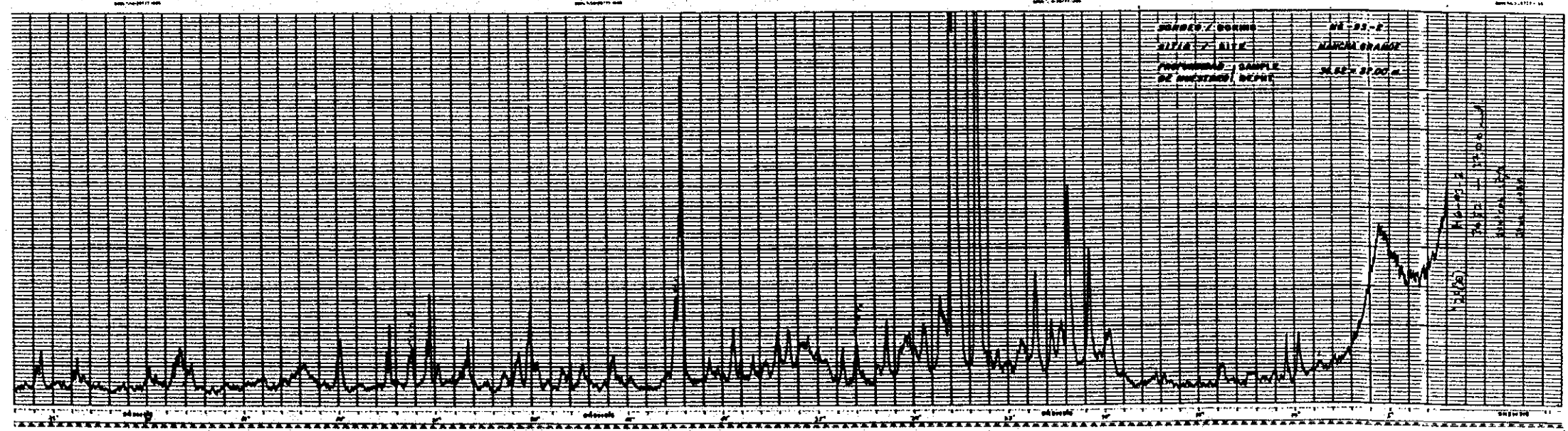
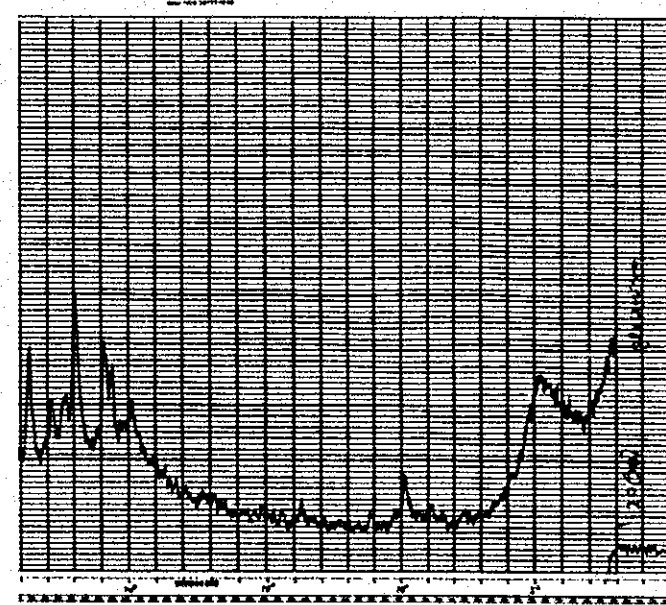
GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE DETAILED DESIGN STUDY ON THE WATER TRANSBASIN
 SCHEMES FOR CHONE-PORTOVIEJO RIVER BASINS
 JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE
 X-Ray Diffraction Analysis
 SR93-5(9.38m- 9.77m)



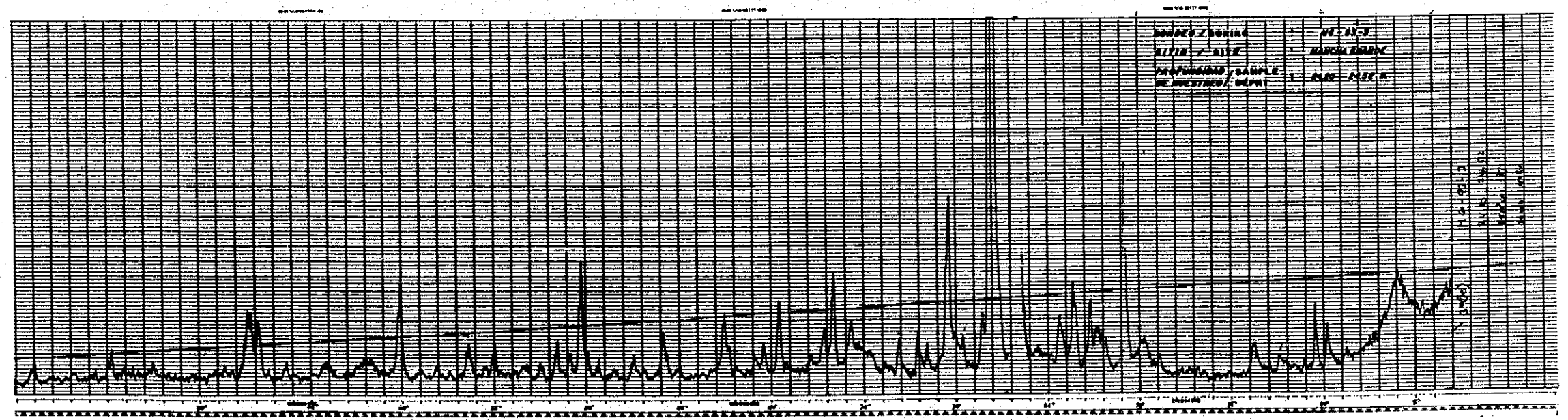
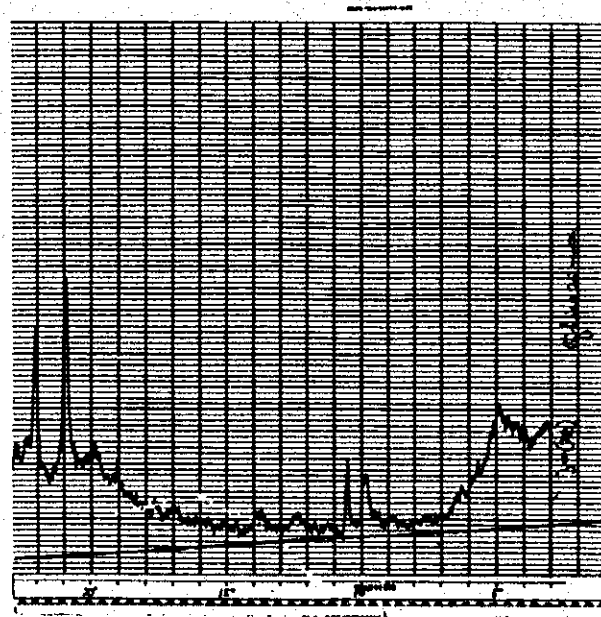
GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE DETAILED DESIGN STUDY ON THE WATER TRANSBASIN
 SCHEMES FOR CHONE-PORTOVIEJO RIVER BASINS
 JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE
 X-Ray Diffraction Analysis
 MG93-1(24.10m-24.55m)



GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE DETAILED DESIGN STUDY ON THE WATER TRANSBASIN
 SCHEMES FOR CHONE-PORTOVIEJO RIVER BASINS
 JAPAN INTERNATIONAL COOPERATION AGENCY.

TITLE
 X-Ray Diffraction Analysis
 MG93-2(36.52m-37.00m)



GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE DETAILED DESIGN STUDY ON THE WATER TRANSBASIN
 SCHEMES FOR CHONE-PORTOVIEJO RIVER BASINS
 JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE
 X-Ray Diffraction Analysis
 MG93-3(24.20m-24.52m)

Appendix 4

TEST PIT RECORD

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE--PORTOVIEJO BASIN										TEST PIT N ^o C - 10					DATE : 20-12-93													
SITE: OPEN CHANNEL										COORDINATE : N 9892630 E 607645																		
DEPTH m	DESCRIPTION	PROFILE	W %	S P E C I F I C I T Y	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAxIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS		
					#4	#200	2/1	WL	WP	IP		MOIST	SATUR		C'	φ ^o	Pp	Cc	Cv	Y _{max}	OMC %	P	V	Ws %			Ls %	Vc %
	BLACKISH VEGETAL SOIL, HARD DARK GRAY ORGANIC CLAY																											
1.0	WEATHERED DEBRIS OF SILTSTONE IN YELLOWISH BROWN SILT-CLAY MATRIX, HARD		31.2	2.768	100	96	21	59	37	22	MH	1.59	1.683	1.82	0.90	20	0.55	0.125	4.046	1.07	44.4	0.20	0.00		16.53	42.5	ND1	0.50 DISTURBED N 1
2.0	WEATHERED YELLOWISH BROWN MUDSTONE, VERY SOFT ROCK																											
3.0			34.3	2.727	100	98.7	18	55	37	18	MH	1.538	-	-	-	-	-	-	-	-	-	0.40	0.00	-	12.98	47.88	ND2	1.40 DISTURBED N 2
4.0	END : 3.0 m																											

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE- PORTOVIEJO BASIN TEST PIT N^o C - 11 DATE : 15-12-93

SITE: OPEN CHANNEL COORDINATE : N 9892440 E 607000

DEPTH m	DESCRIPTION	P ELECTOR P	W %	S P E C I F I C I T Y	G R A V I T Y	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAXIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS	
						#4	#200	2 μ	WL	WP	IP		MOIST	SATUR		C'	ϕ^o	Pp	Cc	Cv	Y _{max}	OMC	P	V	Ws			Ln
	BLACKISH VEGETAL SOIL, HARD																											
	GREYISH BROWN CLAYEY SILT WITH SOME OF WEATHERED CLASTICS, HARD																											
1.0	WEATHERED CLASTICS OF SILTSTONE IN YELLOWISH BROWN CLAYEY-SILT MATRIX, HARD																										0.55	
	CLAY WITH CLASTICS		37.7	2.606	100	86.9	20	80	54	26	MH	1.558	1.659	1.70	0.70	16	0.46	0.136	2.62	1.07	45.6	1.25	0.00		15.80	42.09	ND1	DISTURBED N ^o 1
	STIFF																											
2.0	END : 2.0 m																										2.00	
	END OF PIT BY WATER PRESENCE																											
3.0																												
4.0																												

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE-PORTOVIEJO BASIN										TEST PIT N ^o C - 12					DATE : 20-12-93													
SITE: OPEN CHANNEL										COORDINATE : N 9892440 E 606500																		
DEPTH m	DESCRIPTION	LITHOLOGY	W %	GRAVITY SPECIFIC	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		MOISTURE	SATURATED	TRIAXIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS
					#4	#200	2/1	WL	WP	IP		MOIST	SATUR				C'	ϕ^o	Pp	Cc	Cv	Ymax	OMC %	P	V	Ws %		
	BLACKISH VEGETAL SOIL, HARD																											
	DARK GRAY CLAY WITH TRACES OF OXIDIZED DEBRIS AND ORGANIC MATERIAL, HARD																											0.60
1.0	WEATHERED AND OXIDIZED DEBRIS OF SILT IN YELLOWISH BROWN SILTY-CLAY MATRIX, VERY STIFF		32.2	2.679	100	90	14	61	43	18	MH	1.58	1.708	-	-	-	-	-	-	1.13	41.60	1.60	0.00		25.19	35.15	ND2	DISTURBED N° 1
2.0	YELLOWISH BROWN CLAYEY SILT WITH NUMEROUS WEATHERED AND OXIDIZED DEBRIS, VERY STIFF																											1.60
3.0	STIFF		41.6	2.683	100	89	16	71	48	23	MH	1.54		2.18	0.85	20	1.05	0.126	4.752	1.09	42.60	1.60	0.00		21.53	41.19	ND2	DISTURBED N° 2
4.0	WEATHERED BLOCKS OF YELLOWISH BROWN SILTSTONE IN SILTY-CLAY MATRIX																											3.60

END : 4.0 m

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE-PORTOVIEJO BASIN										TEST PIT N ^o C - 13					DATE : 15-12-93														
SITE: OPEN CHANNEL										COORDINATE : N 9891540					E 606387														
DEPTH m	DESCRIPTION	FLUCTUATION	W %	GRAVITY SPECIFIC	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAxIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS			
					#4	#200	2/1	WL	WP	IP		MOIST	SATUR		Pp	Cc	Cv	Y _{max}	OMC	P	V	Ws	Ls	Vc					
	BLACKISH VEGETAL SOIL, HARD																												
	DARK GRAY CLAY WITH DEBRIS, HARD																												
	WEATHERED DEBRIS IN GRAYISH BROWN SILTY MATRIX, HARD																												
1.0	GRAYISH BROWN CLAY WITH TRACES OF OXIDIZED DEBRIS, HARD																								0.80				
	WITH SOME DEBRIS		35.7	2.743	100	97	53	92	47	45	MH	1.566	1.750	2.53	1.00	26	0.95	0.16	1.92	1.18	36.30	1.35	0.00		21.12	57.33	NDI	DISTURBED N 1	
2.0	YELLOWISH BROWN CLAY WITH NUMEROUS OXIDIZED DEBRIS, HARD																									2.00			
	WEATHERED YELLOWISH BROWN VERY SOFT MUDSTONE		33.3	2.622	100	99	8	78	42	36	MH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.99	40.11	NDI	DISTURBED N 2
3.0																													
4.0																													

END : 4.0 m

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE- PORTOVIEJO BASIN										TEST PIT N ^o C-14					DATE : 20-12-93													
SITE: OPEN CHANNEL										COORDINATE :					N 9891045 E 606183													
DEPTH m	DESCRIPTION	LITHOLOGY	W %	SPECIFIC GRAVITY	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAXIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS		
					#4	#200	2/1	WL	WP	IP		MOIST	SATUR		C'	ϕ^o	Pp	Cc	Cv	Y _{max}	OMC %	P	V	Ws %			Ls %	Vc %
													Kg/cm ²	Kg/cm ²	deg	Kg/cm ²		mm/mm	gr/cm ²	%	Kg/cm ²	%	%	%	%	%		
	BLACKISH VEGETAL SOIL WITH OXIDIZED DEBRIS, HARD																											
	BLACKISH GRAY CLAY WITH TRACES OF OXIDIZED DEBRIS AND ORGANIC MATERIAL, HARD																											
1.0	YELLOWISH BROWN WEATHERED AND OXIDIZED DEBRIS IN DARK GRAY SILTY-CLAY MATRIX, HARD		31.9	2.598	100	76	19	78	43	35	MH	1.518	1.714					1.16	37.8	0.60	0.00		32.95	28.24	NDI	DISTURBED N 1		
2.0	GRAYISH BROWN CLAY WITH NUMEROUS WEATHERED DEBRIS OF MUDSTONE, HARD																											
3.0			39.7	2.565	100	94	18	78	44	34	MH	1.523	1.708	1.01	1.60	14	0.72	0.145	5.494	1.16	40.2	0.10	0.00		31.07	31.17	NDI	DISTURBED N 2
	BLOCKS OF SILTSTONE																										3.50	
4.0	WEATHERED YELLOWISH BROWN MUDSTONE, VERY SOFT ROCK																											

END : 4.0 m

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE- PORTOVIEJO BASIN										TEST PIT N ^o C-15					DATE : 20-12-93														
SITE: OPEN CHANNEL										COORDINATE : N 9890440					E 605090														
DEPTH m	DESCRIPTION	PROFILE	W %	S P E C I F I C I T Y	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAXIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS			
					#4	#200	2/4	WL	WP	IP		MOIST	SATUR		C'	ϕ^o	Pp	Cc	Cv	Y _{max}	OMC	P	V	Ws			Ln	Vc	
	BLACKISH VEGETAL SOIL, VERY STIFF																								0.40				
	YELLOWISH BROWN CLAY WITH SOME OF WEATHERED DEBRIS, VERY STIFF																												
	LEVEL OF BLACKISH CLAY		27.5	2.658	100	76	48	91	39	52	CH	1.399	1.661	1.09	0.70	22	0.80	0.439	1.531	1.06	34.6	1.50	0.00		14.75	57.08	NDI	1.00	DISTURBED N 1
1.0	LEVEL OF BLACKISH CLAY																												
	WITH NUMEROUS DEBRIS, STIFF																												
			32.4	2.698	100	98	18	90	44	46	MH	1.400	-	-	-	-	-	-	-	-	-	1.60	0.00		12.33	57.74	NDI	1.20	DISTURBED N 2
	WEATHERED YELLOWISH BROWN MUDSTONE, VERY SOFT ROCK																												
2.0																													
3.0																													
	END : 3.0 m																												
4.0																													

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE-PORTOVIJO BASIN										TEST PIT N ^o C-16					DATE : 20-12-93															
SITE: OPEN CHANNEL										COORDINATE : N 9890110					E 605090															
DEPTH m	DESCRIPTION	PROFILE	W %	GRAVITY SPECIFIC	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAxIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS				
					#4	#200	2/4	WL	WP	IP		MOIST	SATUR		C'	ϕ^o	Pp	Cc	Cv	Y _{max}	OMC	P	V	Ws			Ls	Vc		
	BLACKISH VEGETAL SOIL, HARD																													
	DARK GRAY CLAY WITH SOME WEATHERED DEBRIS AND TRACES OF ORGANIC MATERIAL, HARD																													
1.0	WEATHERED DEBRIS OF SILTSTONE AND FINE GRAINED SANDSTONE IN YELLOWISH BROWN CLAY-SILTY MATRIX, LIGHT PLASTICITY VERY STIFF		30.1	2.636	100	78	28	62	36	26	MH	1.627	1.794	-	-	-	-	-	-	1.28	32.8	0.75	0.00			17.39	38.72	NDI	DISTURBED N 1	
2.0	GRAYISH BROWN CLAY WITH SOME OF WEATHERED DEBRIS, LIGHT PLASTICITY, VERY STIFF																													
3.0																														
	WEATHERED YELLOWISH BROWN MUDSTONE, VERY SOFT ROCK		32.7	2.456	100	95	30	63	34	29	MH	1.642	1.759	1.88	0.70	12	0.75	0.107	13.91	1.28	31.8	1.65	0.00			15.40	41.82	NDI	DISTURBED N 2	
4.0																														

END : 4.0 m

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE-PORTOVEJO BASIN										TEST PIT N ^o C-17					DATE : 20-12-93												
SITE: OPEN CHANNEL										COORDINATE : N 9889600					E 604670												
DEPTH m	DESCRIPTION	PROFILE	W %	S P E C I F I C I T Y	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAxIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS	
					#4	#200	2/1	WL	WP	IP		MOIST	SATUR		C'	ϕ^o	Pp	Cc	Cv	γ_{max}	OMC %	P	V	Ws %			Ls %
	BLACKISH VEGETAL SOIL, HARD																								0.40		
	YELLOWISH BROWN CLAY WITH SOME DEBRIS, HARD																										
1.0	WEATHERED DEBRIS OF MUDSTONE IN YELLOWISH BROWN SILTY-CLAY MATRIX, HARD		23.3	2.623	100	95	30	71	41	30	MH	1.498	1.718	1.66	1.50	11	0.80	0.243	10.58	1.16	32.3	1.15	0.00	16.02	44.96	ND1	DISTURBED N° 1
																									1.60		
2.0	WEATHERED YELLOWISH BROWN MUDSTONE, VERY SOFT ROCK																								2.00		
			28.6	2.680	100	99	43	73	44	29	MH	1.496										1.10	0.00	18.35	42.47	ND2	DISTURBED N° 2
3.0																									3.00		
	END : 3.0 m																										
4.0																											

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE-PORTOVEJO BASIN										TEST PIT N ^o C-18					DATE : 18-12-93														
SITE: OPEN CHANNEL										COORDINATE : N 9889155 E 604290																			
DEPTH m	DESCRIPTION	PROFILE	W %	S P E C I F I C I T Y	G R A V I T Y	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAXIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS		
						#4	#200	2 μ	WL	WP	IP		MOIST	SATUR		C'	ϕ^o	Pp	Cc	Cv	Y _{max}	OMC %	P	V	Ws %			Ls %	Vc %
	DARK GRAY VEGETAL SOIL, HARD																										0.30		
	YELLOWISH BROWN SILTY CLAY WITH WEATHERED DEBRIS OF MUDSTONE, VERY STIFF																												
1.0	WEATHERED WITHSH BROWN MUDSTONE WITH NUMEROUS SHELLS, VERY SOFT ROCK		21.7		2.726	100	95	24	65	35	30	MH	1.528	1.753	2.40	1.20	22	0.70	0.335	6.224	1.19	34.6	1.30	0.00		18.28	46.14	ND1	DISTURBED N 1
																											1.60		
2.0	WEATHERED SOFT BROWN MUDSTONE BEDDING - HORIZONTAL																											2.00	
			25.5		2.715	100	95	28	64	36	28	MH	1.527	1.707							1.12	41.6	1.50	0.00		11.55	53.59	ND2	DISTURBED N 2
3.0																												3.00	
	END : 3.0 m																												
4.0																													

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE-PORTOMEJO BASIN											TEST PIT N ^o C-19					DATE : 15-12-93												
SITE: CANAL ABIERTO OPEN CHANNEL											COORDINATE : N 9888780 E 603850																	
DEPTH m	DESCRIPTION	PROFILE	W %	GRAVITY SPECIFIC	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAXIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS		
					#4	#200	2/4	WL	WP	IP		MOIST	SATUR		C _c	σ ^o	P _p	C _c	C _v	Y _{max}	OMC	P	V	W _s			L _s	V _c
	GRAY VEGETAL SOIL, HARD																											
1.0	GRAY CLAY WITH SOME OF FINE GRAINED SANDSTONE AND NUMEROUS WEATHERED DEBRIS OF FINE GRAINED SANDSTONE, HARD																								1.00			
	GRAY CLAY, HIGH PLASTICITY		24.3	2.698	100	99	30	45	22	23	CL	1.423	1.831	-	-	-	-	-	1.32	29.6	0.30	0.00		13.83	39.02	NDI	DISTURBED N 1	
2.0	GRAY CLAY WITH TRACES OF SAND AND LARGE AMOUNT OF WEATHERED DEBRIS OF FINE GRAINED SANDSTONE, HARD																								1.70			
	STIFF AND VERY STIFF		23.5	2.607	100	58	20	40	21	19	CL	1.423	1.857	2.56	1.65	10	0.65	0.098	2.443	1.39	30.2	0.30	0.00	-	18.28	31.00	NDI	DISTURBED N 2
3.0																												
4.0	WEATHERED YELLOWISH BROWN CLAY, VERY SOFT																								3.60			

END : 4.0 m

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE-PORTOVIJO BASIN										TEST PIT N ^o C-21					DATE : 23-12-93													
SITE: TRANSMISSION LINE										COORDINATE : N 9892400 E 613400																		
DEPTH m	DESCRIPTION	PROFILE	W %	S P E C I F I C I T Y	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAXIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS		
					#4	#200	2/1	WL	WP	IP		MOIST	SATUR		C'	ϕ^o	Pp	Cc	Cv	Ymax	OMC	P	V	Ws			Ls	Vc
	DARK BROWN VEGETAL SOIL WITH SOME SAND AND ORGANIC MATERIAL, VERY STIFF																								0.40			
1.0	WEATHERED DEBRIS AND BLOCKS OF SILTSTONE AND FINE GRAINED SANDSTONE IN YELLOWISH BROWN SILTY-SANDY MATRIX, VERY STIFF		18.7	2.673	100	50	16	44	28	16	ML	1.668	1.826	0.83	0.40	20	0.74	0.134	6.18	1.32	31.00	1.10	0.00		19.99	26.61	NDI	DISTURBED N 1
2.0	VERY WEATHERED YELLOWISH BROWN SILTY FINE GRAINED SANDSTONE WITH OXIDIZED JOINTS, VERY SOFT ROCK		26.7	2.579	100	88	8	40	22	18	CL	1.670													1.00			DISTURBED N 2
3.0	VERY WEATHERED YELLOWISH BROWN SILTY FINE GRAINED SANDSTONE WITH OXIDIZED JOINTS, SOFT ROCK																								2.20			
4.0	END : 3.0 m																								3.00			

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE-PORTOVIJO BASIN										TEST PIT N° C-22					DATE : 23-12-93															
SITE: TRANSMISSION LINE ✓										COORDINATE :																				
DEPTH m	DESCRIPTION	P R O F I L E	W %	S P E C I F I C G R A V I T Y	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAxIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS				
					#4	#200	2/4	WL	WP	IP		MOIST	SATUR		Pp	Cc	Cv	Ymax	OMC	P	V	Ws	Ls	Vc						
	BLACKISH VEGETAL SOIL WITH SOME OF FINE GRAINED SAND AND ORGANIC MATERIAL, VERY STIFF	✓																												
	GRAYISH BROWN SILTY CLAY WITH SOME WEATHERED DEBRIS	---																							0.60					
1.0			39.64	2.832	100		50	106	58	48	CH	1.673	1.750	13.18	1.10	26	0.40	0.18	2.597	1.16	38.00	2.49	0.00		18.09	NDI	0.90			
	WEATHERED DEBRIS OF SILTSTONE AND FINE GRAINED SANDSTONE IN BROWN SILTY MATRIX	▽																							1.00					
2.0		▽	27.3	2.658	100	49	15	60	29	31	SC	1.660													1.25	0.00	19.89	39.94	NDI	2.25
	WEATHERED BROWN MUDSTONE WITH OXIDIZED ZONE, VERY SOFT ROCK	---																												
3.0																														
	END : 3.50 m																													
4.0																														

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE-PORTOVIJO BASIN TEST PIT N° C-23 DATE : 27-12-93

SITE: TRANSMISSION LINE COORDINATE : 9895874 627354


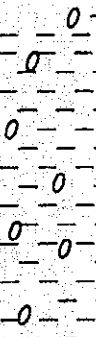
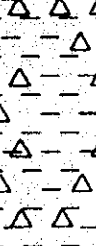

DEPTH m	DESCRIPTION	PROFILE	W %	GRAVITY SPECIFIC	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAXIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS			
					#4	#200	2/4	WL	WP	IP		MOIST	SATUR		C'	φ ^o	Pp	Cc	Cv	Y _{max}	OMC %	P Kg/cm ²	V %	Ws %			Ls %	Vc %	
	BLACKISH CLAY SILT WITH SOME FINE GRAINED SAND, HARD																												
	GRAYISH BROWN SILTY CLAY, WITH NUMEROUS WEATHERED DEBRIS OF SILTSTONE, HIGH PLASTICITY, HARD																												
1.0	GRAYISH BROWN SILTY CLAY, HIGH PLASTICITY, HARD		44.03	2.873	100	65	114	51	63	CH	1.719	1.757	8.38	2.60	14	0.60	0.18	2.575	1.16	46.00	1.36	0.00		27.26		NDI	1.20	DISTURBED N° 1	
2.0	REDISH BROWN SILTY CLAY, VERY STIFF																												
			37.7	2.733	100	98	50	74	30	44	CH	1.67	-	-	-	-	-	-	-	-	0.75	0.00		20.27	49.19	NDI	2.00	DISTURBED N° 2	
3.0	GRAYISH BROWN VERY WEATHERED SILTY FINE GRAINED SANDSTONE, SOFT ROCK																												
	END : 3.50 m																												
4.0																													

PROJECT : THE DETAILED DESIGN ON TRANSBASIN CHONE-PORTOMEJO BASIN											TEST PIT N° C-24				DATE : 27-12-93																
SITE: TRANSMISSION LINE											COORDINATE : 9897090				634780																
DEPTH m	DESCRIPTION	LITHOLOGY	W %	GRAVITY SPECIFIC	PARTICLE SIZE			LIMITES ATTERBERG			CLASIF UCCS	UNIT WEIGHT		TRIAXIAL	CONSOLIDATION			COMPACTION		SWELLING		SHRINKAGE			PIN HOLE	REMARKS					
					#4	#200	2/4	WL	WP	IP		MOIST	SATUR		C	φ	Pp	Cc	Cv	Ymax	OMC %	P	V	Ws %			Ls %	Vc %			
	BLACKISH VEGETAL SOIL WITH SOME OF SAND, HARD																														
	WEATHERED DEBRIS OF SANDSTONE AND SILTSTONE IN GRAY SILTY-CLAY MATRIX, HARD																														
1.0	GRAYISH BROWN CLAY WITH REDISH ZONE (OXIDIZED) HIGH PLASTICITY, VERY STIFF																														
			41.57	2.803	100		53	87	44	43	CH	1.655	1.843	1.97	0.80	14	0.50	0.15	2.404	1.31	36.00	0.51	0.00		24.87		ND1	1.50	DISTURBED N° 1		
2.0																															
	GRAYISH BROWN SILT WITH SOME OF FINE GRAINED SAND, MEDIUM PLASTICITY, STIFF																														
3.0			57.7	2.681	100	90	33	64	32	32	MH	1.66	-	-	-	-	-	-	-	-	-	-	-	-	0.76	0.00		16.36	44.57	ND2	DISTURBED N° 2
4.0																															

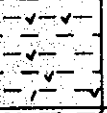
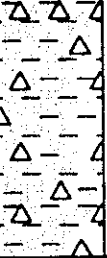
END : 4.00 m

Appendix 5

SOUNDING

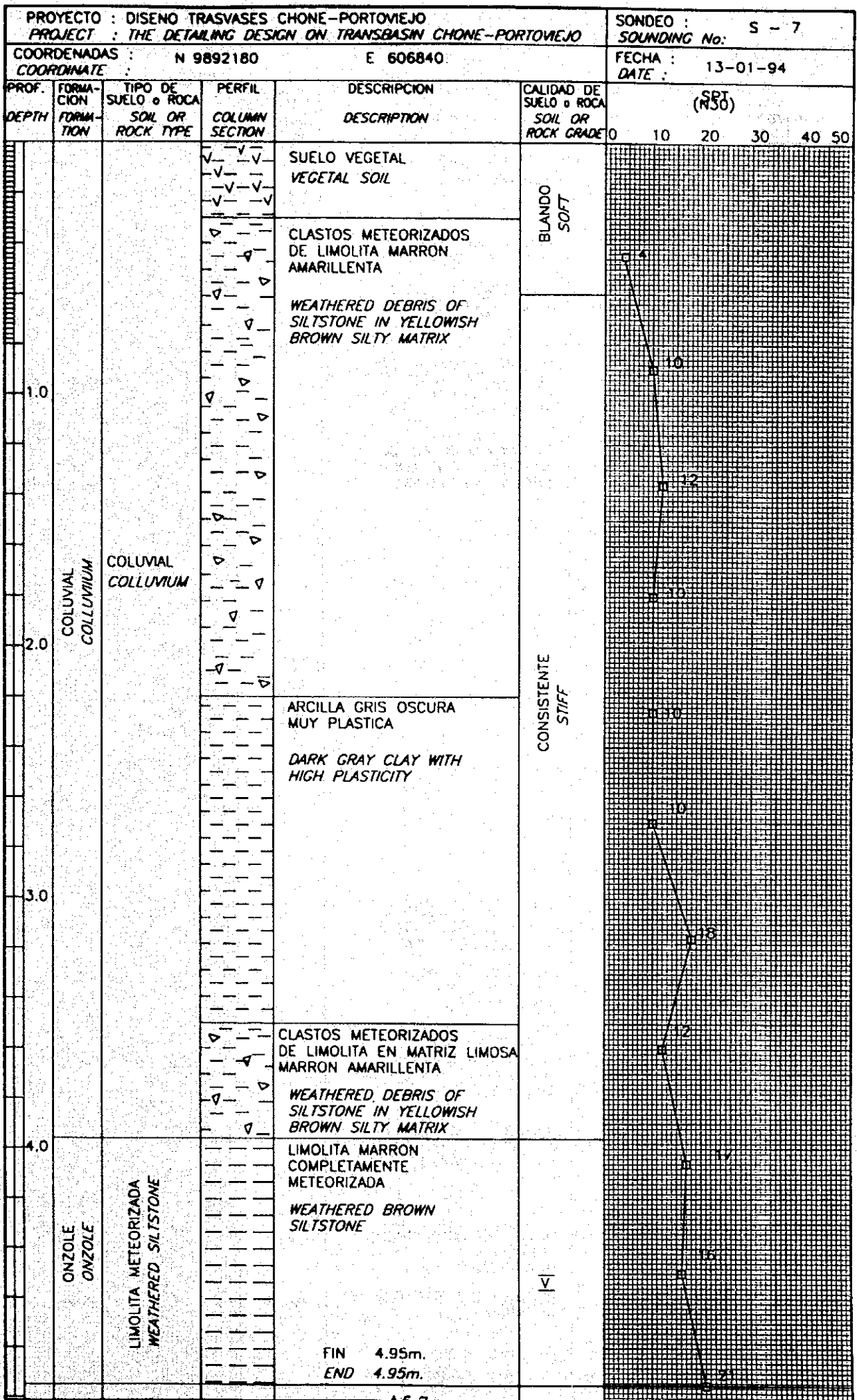
PROYECTO : DISEÑO TRASVASES CHONE-PORTOMIEJO PROJECT : THE DETAILING DESIGN ON TRANSBASIN CHONE-PORTOMIEJO						SONDEO : S - 2 SOUNDING No:	
COORDENADAS : N 9892380 E 607370				FECHA : 12-01-94 DATE :			
PROF. DEPTH	FORMA- CION FORMATION	TIPO DE SUELO o ROCA SOIL OR ROCK TYPE	PERFIL COLUMN SECTION	DESCRIPCION DESCRIPTION	CALIDAD DE SUELO o ROCA SOIL OR ROCK GRADE	SPT (N30)	
						0	10 20 30 40 50
0.0 - 0.5	COLLUVIAL COLLUVIUM	COLLUVIAL COLLUVIUM		COBERTURA VEGETAL VEGETAL SOIL	BLANDO SOFT	0	
0.5 - 1.5				LIMO ARCILLOSO GRIS BLANQUESINO CON CLASTOS DE LIMOLITA LIGHTGRAY CLAYEY SILT WITH DEBRIS OF SILTSTONE		2	
1.5 - 2.0	ONZOLE ONZOLE	LUTITA COMPLETAMENTE METEORIZADAS VERY WEATHERED MUDSTONE		CLASTOS METEORIZADOS DE LIMOLITA EN MATRIZ LIMO-ARCILLOSO MARRON AMARILLENTO WEATHERED DEBRIS OF SILTSTONE IN YELLOWISH BROWN CLAYEY SILTSTONE MATRIX	CONSISTENTE STIFF	3	
2.0 - 3.6				LUTITA MARRON AMARILLENTO COMPLETAMENTE METEORIZADA VERY WEATHERED YELLOWISH BROWN MUDSTONE		7	15
3.6 - 4.0				FIN : 3.60 m END : 3.60 m		20	25

PROYECTO : DISEÑO TRASVASES CHONE-PORTOVIEJO PROJECT : THE DETAILING DESIGN ON TRANSBASIN CHONE-PORTOVIEJO						SONDEO : S - 3 SOUNDING No:					
COORDENADAS : N 9892330 E 607370 COORDINATE						FECHA : 12-01-94 DATE :					
PROF. DEPTH	FORMA- CION FORMA- TION	TIPO DE SUELO o ROCA SOIL OR ROCK TYPE	PERFIL COLUMN SECTION	DESCRIPCION DESCRIPTION	CALIDAD DE SUELO o ROCA SOIL OR ROCK GRADE	SPT (N30)					
						0	10	20	30	40	50
1.0	COLUMIAL COLUMIUM	VEGETAL VEGETAL		SUELO VEGETAL VEGETAL SOIL	BLANDO SOFT						
		COLUMIAL COLUMIUM		ARCILLA GRIS AMARILLENTA CON ALGO DE CLASTOS METEORIZADOS YELLOWISH GRAY CLAY WITH WEATHERED DEBRIS							
				CLASTOS METEORIZADOS DE LIMOLITA EN MATRIZ LIMO-ARCILLOSO MARRON AMARILLENTA WEATHERED DEBRIS OF SILTSTONE IN YELLOWISH BROWN CLAYEY SILT MATRIX	CONSISTENTE STIFF						
2.0	ONZOLE ONZOLE	LIMONITA COMPLETAMENTE METEORIZADAS VERY WEATHERED SILTSTONE		LIMOLITA MARRON AMARILLENTA, COMPLETAMENTE METEORIZADA CON PLANOS OXIDADOS VERY WEATHERED YELLOWISH BROWN SILTSTONE WITH OXIDIZED JOINTS	IV						
			FIN : 3.60 m END : 3.60 m								
3.0											
4.0											

PROYECTO : DISEÑO TRASVASES CHONE-PORTOMEJO PROJECT : THE DETAILING DESIGN ON TRANSBASIN CHONE-PORTOMEJO						SONDEO : S - 4 SOUNDING No:					
COORDENADAS : N 9892240 E 607100 COORDINATE :				FECHA : 12-01-94 DATE :							
PROF. DEPTH	FORMA- CION FORMA- TION	TIPO DE SUELO o ROCA SOIL OR ROCK TYPE	PERFIL COLUMN SECTION	DESCRIPCION DESCRIPTION	CALIDAD DE SUELO o ROCA SOIL OR ROCK GRADE	SPT (N30)					
						0	10	20	30	40	50
		VEGETAL VEGETAL		SUELO VEGETAL VEGETAL SOIL	BLANDO SOFT						
		COLLUVIAL COLLUVIUM		CLASTOS METEORIZADOS DE ARENISCA FINA EN MATRIZ LIMO ARCILLOSA MARRON AMARILLA WEATHERED DEBRIS OF FINE GRAINED SANDSTONE IN CLAYEY SILT MATRIX IN YELLOWISH BROWN COLOR	CONSISTENTE STIFF						
1.0	ONZOLE ONZOLE	ARENISCA FINA METEORIZADA WEATHERED FINE GRAINED SANDSTONE		ARENISCA FINA LIMOSA AMARILLA, COMPLETAMENTE METEORIZADA VERY WEATHERED YELLOWISH SILTY FINE GRAINED SANDSTONE	1-1						
2.0				FIN : 2.20 m END : 2.20 m							
3.0											
4.0											

PROYECTO : DISEÑO TRASVASES CHONE-PORTOVIEJO PROJECT : THE DETAILING DESIGN ON TRANSBASIN CHONE-PORTOVIEJO						SONDEO : S - 5 SOUNDING No:					
COORDENADAS : N 9892210 E 607010 COORDINATE :						FECHA : 12-01-94 DATE :					
PROF. DEPTH	FORMACION FORMATION	TIPO DE SUELO o ROCA SOIL OR ROCK TYPE	PERFIL COLUMN SECTION	DESCRIPCION DESCRIPTION	CALIDAD DE SUELO o ROCA SOIL OR ROCK GRADE	SPT (N30)					
						0	10	20	30	40	50
0.0 - 0.5	COLUVIAL COLLUVIUM	VEGETAL VEGETAL		SUELO VEGETAL VEGETAL SOIL	BLANDO SOFT						
0.5 - 1.0		COLUVIAL COLLUVIUM		ARCILLA MARRON OSCURA CON ALGO DE CLASTOS DE LIMOLITA DARKBROWN CLAY WITH SILTSTONE DEBRIS	CONSISTENTE STIFF						
1.0 - 1.5				CLASTOS METEORIZADOS DE LIMOLITA EN MATRIZ LIMO- ARCILLOSA MARRON ARCILLOSA WEATHERED DEBRIS OF SILTSTONE IN CLAYEY-SILT MATRIX YELLOWISH BROWN COLOR							
1.5 - 3.15	ONZOLE ONZOLE	LIMOLITAS METEORIZADAS WEATHERED SILTSTONE		LIMOLITA MARRON COMPLETAMENTE METEORIZADA WEATHERED BROWN SILTSTONE	IV						
3.15 - 4.0				FIN : 3.15 m END : 3.15 m							

PROYECTO : DISEÑO TRASFASES CHONE-PORTOVIEJO PROJECT : THE DETAILING DESIGN ON TRANSBASIN CHONE-PORTOVIEJO						SONDEO : S - 6 SOUNDING No:					
COORDENADAS : N 9892180 E 607030 COORDINATE :						FECHA : 12-01-94 DATE :					
PROF. DEPTH	FORMA- CION FORMA- TION	TIPO DE SUELO o ROCA SOIL OR ROCK TYPE	PERFIL COLUMN SECTION	DESCRIPCION DESCRIPTION	CALIDAD DE SUELO o ROCA SOIL OR ROCK GRADE	SPT (N30)					
						0	10	20	30	40	50
1.0	COLUVIAL COLLUVIUM	VEGETAL VEGETAL		SUELO VEGETAL VEGETAL SOIL	CONSISTENTE STIFF						
		COLUVIAL COLLUVIUM		ARCILLA MARRON OSCURA CON ALGO DE CLASTOS METEORIZADOS DARKBROWN CLAY WITH WEATHERED DEBRIS							
			CLASTOS METEORIZADOS DE LIMOLITA EN MATRIZ LIMOSA MARRON AMARILLENTO WEATHERED DEBRIS OF SILTSTONE IN YELLOWISH BROWN SILTY MATRIX								
2.0	ONZOLE ONZOLE	LIMOLITAS METEORIZADAS WEATHERED SILTSTONE		LIMOLITA MARRON AMARILLA COMPLETAMENTE METEORIZADA VERY WEATHERED YELLOWISH BROWN SILTSTONE	IV						
				MUY METEORIZADA VERY WEATHERED	IV						
3.0				FIN : 2.50 m END : 2.50 m							
4.0											



PROYECTO : DISEÑO TRASVASES CHONE-PORTOVIJEJO PROJECT : THE DETAILING DESIGN ON TRANSBASIN CHONE-PORTOVIJEJO					SONDEO : S - 8 SOUNDING No:	
COORDENADAS : N 9892110 E 606865					FECHA : 13-01-94 DATE :	
PROF. FORMACION	TIPO DE SUELO o ROCA	PERFIL COLUMN SECTION	DESCRIPCION DESCRIPTION	CALIDAD DE SUELO o ROCA SOIL OR ROCK GRADE	SPT (N30)	
DEPTH	FORMATION	SOIL OR ROCK TYPE	DESCRIPTION		0	10 20 30 40 50
0.0 1.0 2.0 3.0 4.0	COLUVIAL COLLUVIUM	COLUVIAL COLLUVIUM	SUELO VEGETAL VEGETAL SOIL	BLANDO SOFT		
			ARCILLA GRIS OSCURA MUY PLASTICA DARK GRAY CLAY HIGHT PLASTICITY			
			CLASTOS METEORIZADOS DE LIMOLITA EN MATRIZ LIMOSA MARRON AMARILLENTO WEATHERED DEBRIS OF SILTSTONE IN YELLOWISH BROWN SILTY MATRIX	CONSISTENTE STIFF		
			ARCILLA GRIS OSCURA CON ALGO DE CLASTOS OXIDADOS, MUY PLASTICA DARK GRAY CLAY WITH OXIDIZED DEBRIS, HIGHT PLASTICITY			
			CLASTOS METEORIZADOS DE LIMOLITA EN MATRIZ LIMO ARCILLOSA MARRON AMARILLENTO WEATHERED DEBRIS OF SILTSTONE IN YELLOWISH BROWN CLAYEY-SILTY MATRIX			
ONZOLE ONZOLE	LIMOLITA METEORIZADA WEATHERED SILTSTONE	LIMOLITA MARRON GRISACEA COMPLETAMENTE METEORIZADA WEATHERED GRANISH BROWN SILTSTONE	V	FIN 4.95m. END 4.95m.		