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CORE LOG, DESCRIPTION and PHOTOGRAPHS CIROS 2 FERRAR FJORD, ANTARCTICA

A.R.Pyne, P.H.Robinson, P.J.Barrett

PUBLICATION OF
ANTARCTIC RESEARCH CENTRE
RESEARCH SCHOOL OF EARTH SCIENCES
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SEPTEMBER 1985

CIROS 2 CORE LOG, DESCRIPTION, PHOTOGRAPHS AND GRAIN SIZE ANALYSIS FERRAR FJORD, ANTARCTICA

A.R.PYNE*, P.H.ROBINSON+, P.J.BARRETT*

*ANTARCTIC RESEARCH CENTRE

+NZ GEOLOGICAL SURVEY

COMPILED BY A.R.PYNE AND B.L.WARD

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ABSTRACT

CIROS 2 was drilled between October 10 and November 9 1984 from sea ice 1 km offshore of Ferrar Glacier Snout in 211m of water. The total depth drilled was 168.09m with 67% core recovered and gneissic basement was encountered at 166.47m subsea floor.

This report presents lithologic logs, descriptions and photographs of CIROS 2 core.

KEY WORDS: Core descriptions, core photography, CIROS 2, Ferrar Fjord, Antarctica.

INTRODUCTION

The principle aim of the CIROS project (Cenozoic Investigations of the western Ross Sea) is to obtain an understanding of the Cenozoic (and possibly Cretaceous) geologic history of the South Victoria Land and the adjacent Ross Sea (Barrett 1982). The Cretaceous-Cenozoic period is of particular interest as it covers the growth of the Antarctic Ice Sheet and the rise of the Transantarctic Mountains. The CIROS project centres on the offshor sedimentary sequence in the Victoria Land Basin (Davey et al. 1982) because on-land rock outcrop is unknown between Jurassic age Ferrar Dolerite (180my) and the McMurdo Volcanic Group (erupted over the last 15my).

Unseasonally thin sea-ice postponed the drilling of CIROS 1. CIROS 2 hole was then drilled as far westward as the ice in Ferrar Fjord would permit (Figure 1). The objectives of CIROS-2 were to core the sedimentary sequence deposited on the glacially-cut valley floor and establish the valley's glacial history. A minimum age for the cutting of the valley would be obtained by dating the sediment above the basement. In addition, the drilling of CIROS-2 was expected to provide stratigraphic markers for correlation with the CIROS 1-MSSTS 1 area to the northeast. Such correlations would help to establish the timing and extent of vertical movement within the fault zone that separated the two sites. If encountered, the basement would provide samples for apatite fission-track dating, and thus give better age control through the younger part of the uplift curve (see Gleadow et al.1984) for the Transantarctic Mountains in South Victoria Land.

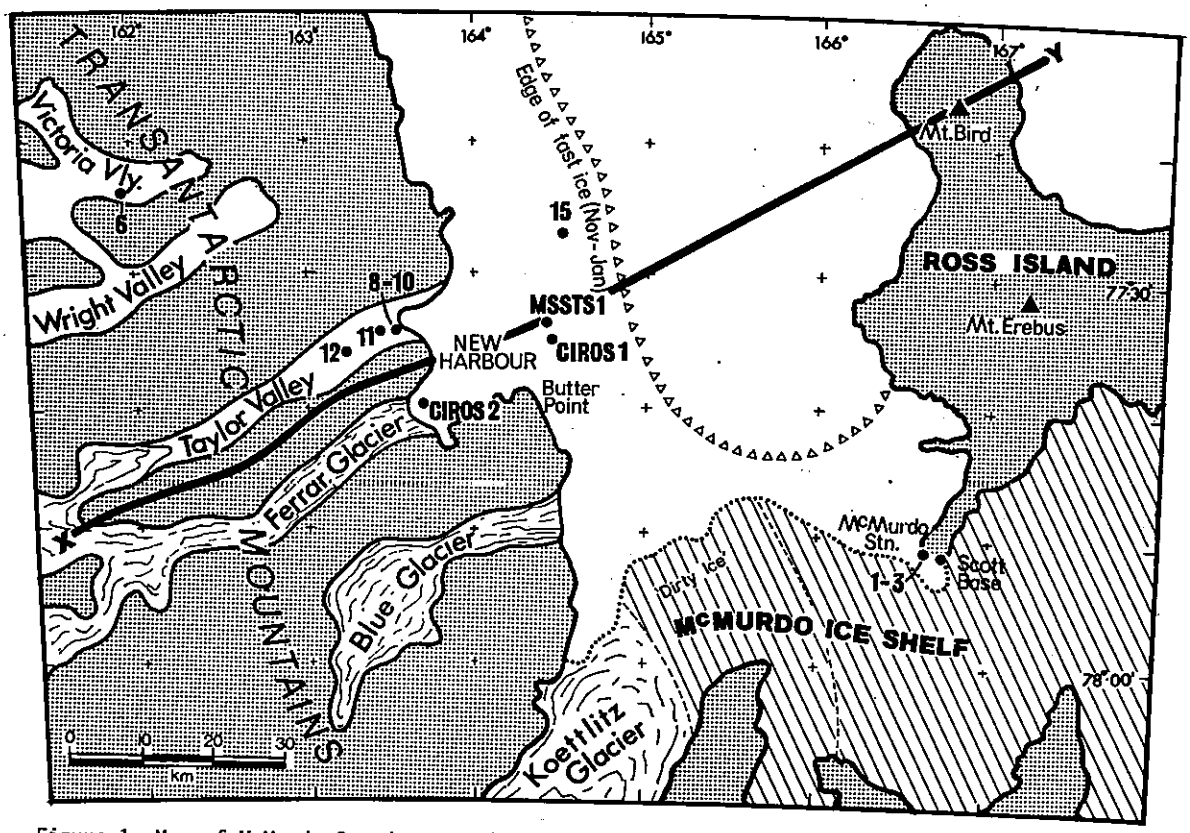
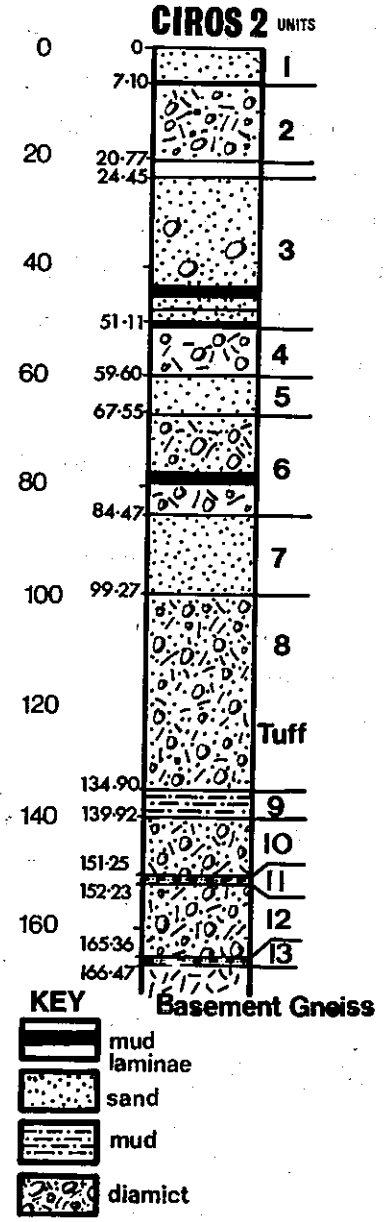


Figure 1. Map of McMurdo Sound area, showing the main physiographic features, the locations of MSSTS-1, CIROS-2, CIROS-1 (yet to be drilled) and deep DVDP drill holes (numbers).

CIROS 2 was drilled in 211m of water near the valley axis and 1km off shore of Ferrar Glacier snout in Ferrar Fjord (name unofficial), western McMurdo Sound. A sequence of sand and glacial debris was cored (67% recovery) to basement gneiss at 166.47m. A preliminary estimate of the age of the sequence, based on diatoms and the abundance of basaltic detritus, has it ranging from Early Pliocene (about 4my) to the present;an age equivalent to the upper 183m of DVDP 10 and the upper 240m of DVDP 11, both in adjacent Taylor Valley.



The core has been subdivided into 13 lithologic units, representing alternating "interglacial" and "glacial" conditions. The older interglacial units (13, 11 and 9) are diatomaceous mudstones, while the younger units (7, 5, 3 and 1) are largely black basaltic sand, similar to sediment on the floor in parts of modern McMurdo Sound. The oldest two glacial units (12 and 10) are lodgement tills with features indicating internal subhorizontal shearing and clasts (some striated) of basalt and basement rocks. The younger glacial units (8, 6, 4 and 2) also contain scattered striated clasts and bedding features indicating redeposition by traction currents and from suspension.

Figure 2. Summary lithologic log for CIROS-2. (after Barrett et al. 1985).

Table 1:

Basic data for CIROS 2, drilled between October 10 and November 9,1984

(From Barrett et al. 1985.)

Position:	Lat. 77°41'S
	Long. 163°32'E
	3.0km from north wall of Ferrar Valley
	1.2km east of snout of Ferrar Glacier Tongue
Water depth:	210.7m (measured by drill pipe from sea level).
Ice thickness:	2.5m
Tidal range:	1.03m
Total Depth (TD):	168.09m subsea floor (ssf)
Percent core recovered:	67%
Basement depth:	166.47m ssf
Basement lithology:	Gneiss
Sediment type:	Alternating sand (stone) and diamictite with occasional mudstone.
Age of oldest sediment:	Early Pliocene (diatoms)

DRILL SITE OPERATIONS

Core Depth

All core depths are recorded as metres subsea-floor (m ssf) after correction for a water depth of 210.7m and tide which ranged up to 1.03m. Tidal measurements (tabulated in Pyne 1985) were continuously recorded on a tide gauge and corrections for tide effect were made at the beginning and end of each coring run to give corrected sub-sea floor depths.

The assigning of depths for core within any given coring run were determined from a variety of core (recovery) features, such as percent recovery, continuity with previous run, spin and catcher marks and no recovery zones. The features are recorded in the Core Recovery and Remarks columns of each Core Description sheet (see sheets 1 through 43). The depths assigned from this procedure are "drilled depth" (dD). In the absence of other depth measurements such as electric logs, the drilled depth is considered the correct depth for CIROS 2 core.

Core Splitting

Much of CIROS 2 core was split lengthwise using either, a specially constructed diamond saw splitting table for hard core, or a knife for very soft core. The core splits were boxed separately; one split was cleaned ready for core photography, description, sampling and eventual shipment to New Zealand; the other split was packaged for shipment to the

United States. The core from -0.65 to 82.70m, 92.49 to 97.02m and 99.47 to 102.45m was split at the drill site. However, the very brittle nature of some cored lithologies prevented all the core being split onsite, before photography and description. The core from 82.70 to 92.49m, 97.13 to 99.47m and 102.45 to 165.98m was split later at the NZ Geological Survey Core Store in Lower Hutt.

Core Photography

The NZ core was photographed in black and white and colour under "colour-corrected" fluorescent light to record the "pristine" nature and colours of the core. Black and white photographs of the core are presented in Appendix 1. Colour photographs are available upon request.

Core Description

A preliminary lithologic description was undertaken at the drill site, together with a smear slide analysis. The onsite core description concentrated on gross lithology, textural and sedimentary features and core colours (using the revised Standard Soil Color Charts, Japan, 1967.

Core processing and onsite description was carried out by J.N.Ashby, P.J.Barrett, A.J.Macpherson, B.J.Pillans, A.R.Pyne, B.L.Ward and I.C.Wright.

DETAILED CORE DESCRIPTION

The detailed core logging (by A.R.Pyne and P.H.Robinson) was performed in NZ; both the onsite and NZ logging have been combined to produce the core description here. The description procedure is modified for core after Andrews (1982), Shell Standard Legend (1976) and Robinson and Jaegers (1984).

Core Recovery and Remarks Columns

The core recovery column is a graphical representation of the condition of the core immediately after recovery and prior to splitting. Additional features, such as joints are noted in the remarks column to the right. The term "fractures" is here restricted to core fractures as a result of the drilling process, and "joints" refer to features that were present in the rock prior to drilling. In some cases fractures occur subparallel to existing joints and/or stratification.

The remarks column also contains descriptions of clast features recognized from the core in the following order: lithology (b:basement, d:dolerite, v:volcanic, s:sedimentary), length of major axis, roundness (a:angular, sa:subangular, sr:subround, r:round), surface features (eg, stri:striations).

Depth Column

The depths listed are in metres subsea floor and marked at 0.05m intervals. Top and bottom of recovered core intervals are denoted, as are grain size sample sites.

Grain size column

1. Boundaries are marked to define intervals of similar grain size where bedding (single bed thickness >2cm) and sharp or gradational contacts occur.

2. The median grain size (50 percentile) is represented as a line downcore, and is a visual estimate for the sediment fraction 4mm and finer (2 phi= granule-fine pebble).

3. The percent gravel (coarser than 4mm) is a visual estimate for split and unsplit core, using comparison cards (1%,5%,10%,20%,25%,30%,50%). Gravel estimates for unsplit core is likely to be less accurate than the slit core estimates.

4. The degree of sorting of the core is shown in abbreviated notation in the grain size column [(srt) = poorly sorted, srt = moderately well sorted, srt = well sorted (after Andrews 1981)].

5. Laboratory grain size analyses and histograms are depicted for sediment finer than 2mm (1 phi), for 38 samples from the core; the median (m) grain size is also depicted for each graph. Grain size analysis, statistics and histogram for each sample are presented in Appendix 2.

Comparison of the laboratory determined median grain size and the visually estimated median grain size shows good agreement (within 1 phi) for well sorted, sand size sediment. However, for poorly sorted sediments, especially diamictites, the mud content tends to be visually underestimated and the median is about 4 phi coarser than the median derived from laboratory grain size analysis. We believe the median estimate is still useful in poorly sorted sediments, if only to show relative changes in grain size.

Lithology and Description Columns

The lithology column is divided into two parts, the left side graphically illustrates the gross lithology, modified where appropriate for admixtures and interbedding, as well as for the degree of induration and cementation. Sedimentary features, such as bedding type and their scale, joints and bed deformation and fossil types are plotted in the right hand column.

A summary description is presented for each lithologic unit with separate interval descriptions (parts of a unit) for units comprised of two or more distinctive lithologies.

Descriptions follow the format below:

-Textural name: Main texture (underlined) with grain size qualifier (for gravel and sand), other textural modifiers in order of decreasing proportion. The term diamicton or diamictite is used in addition to the textural name where appropriate, for unlithified or lithified (respectively) nonsorted terrigenous sediments that contain a wide range of particle sizes (Flint et al. 1969a,b).

Biogenic qualifiers such as diatomaceous are also used.

Examples:

Sandstone medium to fine, gravelly and slightly muddy.

Mudstone, sandy and slightly gravelly, Diamictite.

Mud, slightly sandy, diatomaceous.

The term mud or mudstone is used for mixtures of silt and clay, i.e. grain size of 4 phi and finer.

-Stratification: The degree (or intensity), the scale and the type of bedding features.

-Colour: Munsell notation and name (Revised Standard Color Charts, Japan 1967).

-Hardness and cement

-Additional texture and compositional notes, sedimentary structures, fossils and tectonic features.

ACKNOWLEDGEMENTS

CIROS 2 drilling was financed by Antarctic Division DSIR and the NZ University Grants Committee through Victoria University of Wellington Antarctic Expedition 29.

Logistic support was provided by Antarctic Division DSIR.

The success of CIROS 2 depended on many people, particularly the drilling team and co-ordinator Jack Hoffman (Geophysics Division DSIR), the Butter Point Camp personnel, Scott Base staff and the scientific support team, including Gary Neale, Anselm Haanen (NZ Lands & Survey) and Kasi Komura (JARE).

Core photographs were prepared by VUW Photographic Facility.

Grain size analyses were performed by F.Williams, Sedimentology Laboratory, RSES, VUW.

REFERENCES

ANDREWS, P.B. 1982 Revised guide to recording field observations in sedimentary sequences.N.Z. Geological Survey Report 102, 74p.

BARRETT, P.J. 1982. Proposal for Cenozoic Investigations in the western Ross Sea (CIROS). N.Z. Antarctic Record 4(2):32-39.

BARRETT, P.J. and Scientific Staff 1985. Plio-Pleistocene glacial sequence cored at CIROS 2, Ferrar Fjord, western McMurdo Sound. N.Z.Antarctic Record 6(2):8-19.

DAVEY, F.J., BENNETT, D.J., HOUTZ, R.E. 1982. Sedimentary basins of the Ross Sea, Antarctica. N.Z.Journal of Geology and Geophysics 25:245-255.

FLINT, R.F., SANDERS, J.E., RODGERS, J. 1960a. Symmictite: a name for nonsorted terrigenous sedimentary rocks that contain a wide range of particle sizes. Bulletin of the Geological Society of America, 71:507-510.

FLINT, R.F., SANDERS, J.E. RODGERS, J. 1960b. Diamictite: a substitute term for symmictite. Bulletin of the Geological Society of America, 71:1809-1810.

GLEADOW, A.J.W., MCKELVEY, B.C., FERGUSON, K.U. 1984. Uplift history of the Transantarctic Mountains in the Dry Valleys area, southern Victoria Land, Antarctica, from apatite fission track ages. N.Z.Journal of Geology and Geophysics 27(4):457-464.

PYNE, A.R. 1985. Immediate Report of Victoria University of Wellington Antarctic Expedition 29, 1984-85, 67p.

Revised Standard Soil Color Charts, Japan 1967.

ROBINSON, P.H.; JAEGERS,A. 1984. The lithologic logs of eastern Taylor Valley (ETV Cores 2-13), South Victoria Land, Antarctica. N.Z. Geological Survey Report G89, 34p.

SHELL COMPANY 1976. Standard Legend. The Hague, Exploration and Production Deparments, Shell Internationale Petroleum, Maatschappij, B.V., 192p.

LEGEND

CORE RECOVERY

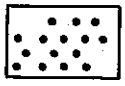

CORE SPIN

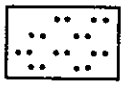

CORE CONTINUITY

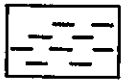

CATCHER MARKS

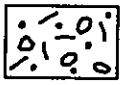
LITHOLOGY

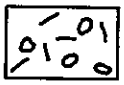

GRAVEL/CONGLOMERATE

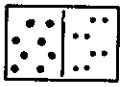

SAND-STONE

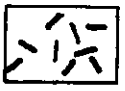

SILT-STONE


MUD-STONE


DIAMICTON-ITE
(Sandstone, muddy & gravelly)


DIAMICTON-ITE
(Mudstone, sandy & gravelly)


INTERBEDDED LITHOLOGIES
(eg. 50% sand, 50% silt.
bedding scale 20mm)


BASEMENT

HARD

VERY HARD

QUARTZ CEMENT

CALCITE CEMENT

BEDDING

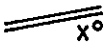
SLIGHTLY (POORLY) BEDDED

BEDDED


WELL BEDDED

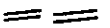
dm,cm,mm SCALE OF BEDDING

THE BASIC BEDDING SYMBOLS ARE MODIFIED TO SHOW:



INCLINED BY X°


WAVY BEDDING


DISJOINTED/FAULTED


PULL-APART BEDDING


CONVOLUTED

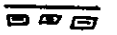

WAVY & DISCONTINUOUS


GRADED BEDDING


REVERSE GRADED


MUDSTONE CLASTS, ANGULAR


MUDSTONE CLASTS, ROUNDED


BEDDED MUDSTONE CLASTS, ANGULAR

MISCELLANEOUS SYMBOLS AND ABBREVIATIONS

slk SLICKENSIDE; Linear marks resulting from movement between surfaces, either mud-mud interfaces or mud "skins" plastered on clasts.

stri STRIATION; Linear mark scratched into a hard surface, eg clast.

jts JOINTS

cmt CEMENT-ED


SLUMP STRUCTURES

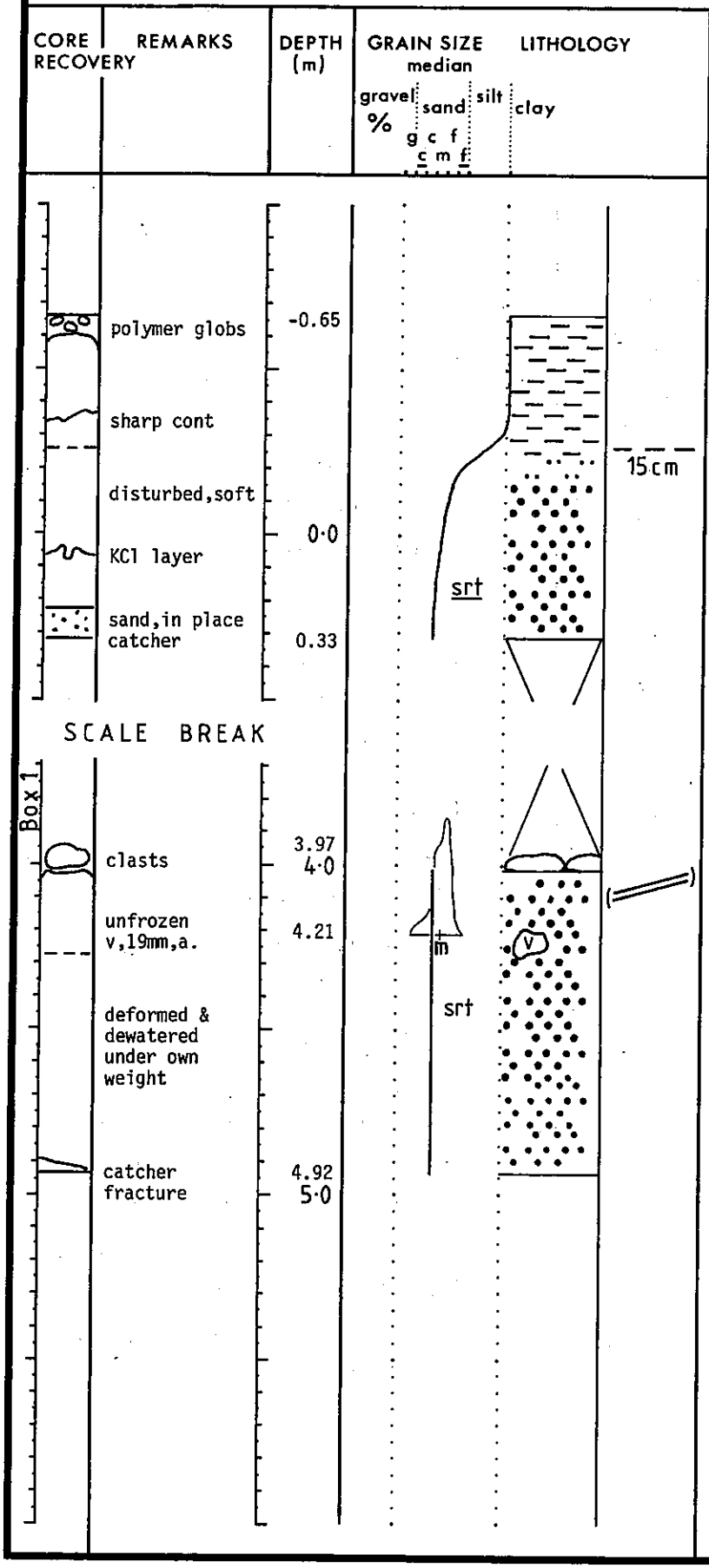

ALGAE-DIATOMS


SPONGE SPICULES

Fe IRON STAINING

SHEET # 1 of 43 PROJECT CIROS 2

SCALE 1:20



Note: Sediment forced into HW casing and cored. Core -0.65 to 0.24m was not considered "in situ".

-0.65 to -0.35m

Mud, slightly sandy. Unstratified. 5Y 4/2 to 3/2 grayish olive. Very soft and 'soupy' -0.65 to -0.60m. Little fine sand -0.60 to -0.35 and translucent polymer globs and sulphur granules from drill mud.

-0.35 to 0.33m

Sand very fine grades to medium, well sorted. Unstratified except 2mm KCL-sulphur layer at 0.07m and faint cm bedding 0.25 to 0.33m. 5Y 3/1 olive black grades to 5Y 3/2 grayish olive at -0.25m. Soft.

Unit 1. 0.24 to 7.10m

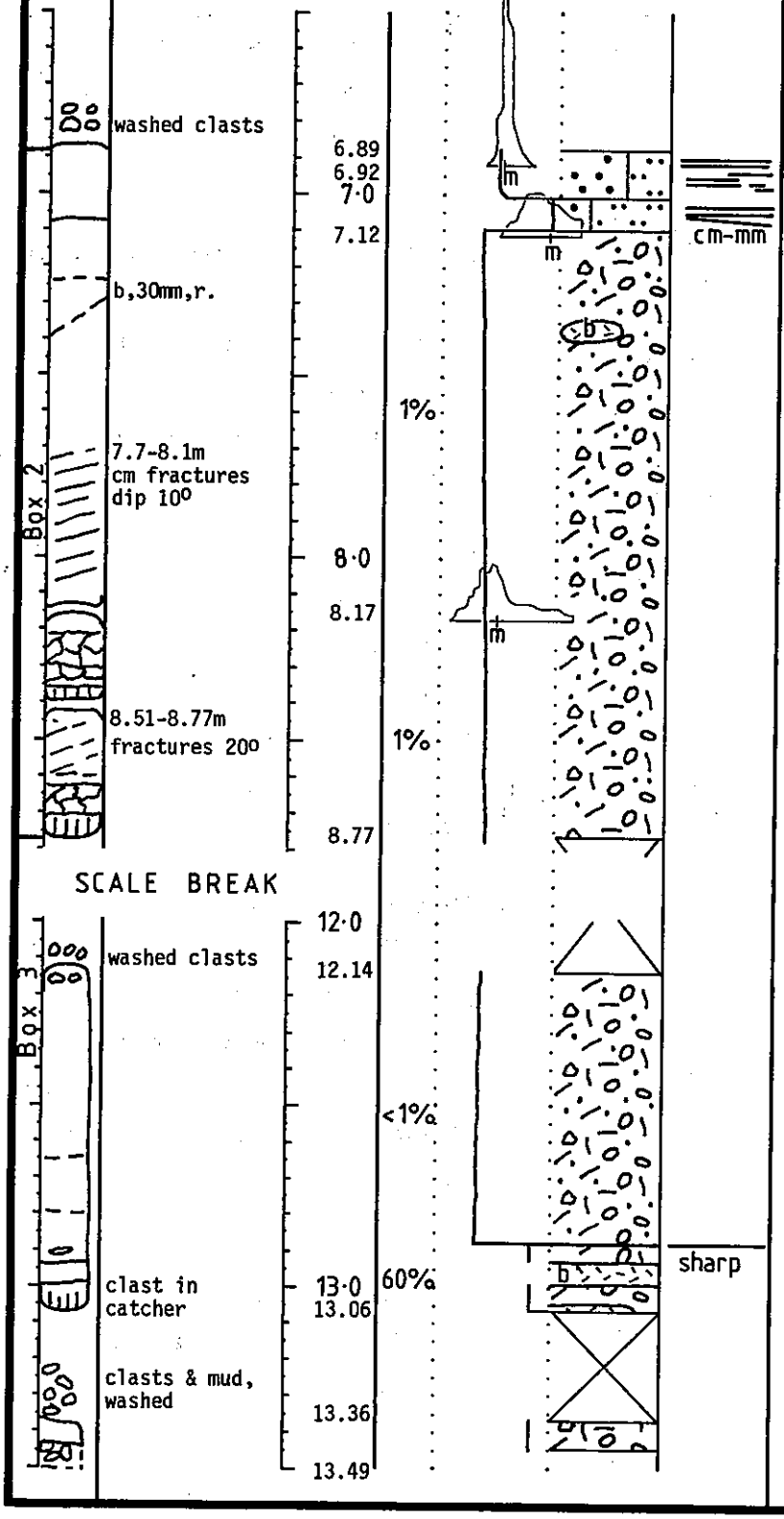
Sand medium to fine, well sorted, minor Mud. Unstratified except mm-cm sand-mud interbeds. Olive black-black sand and grayish olive mud. Soft. <1% clasts volcanic and basement, sand 30% volcanic.

4.02 to 4.92m

Sand medium, moderately sorted. Unstratified except mm bedding of mud fragments 4.02 to 4.07m. 5Y 2/1 black. Soft.

SHEET # 2 of 43 PROJECT CIROS 2

SCALE 1:20



6.89 to 7.10m

Sand very fine, well sorted alternating with Mud. Well stratified mm-cm interbedded sand and mud, disrupted mud beds injected with sand, sharp boundaries. 5Y 2/2 olive black sand, 5Y 4/2 grayish olive mud. Soft.

Unit 2. 7.10 to 20.77m

Sand-Sandstone coarse to medium, and Mud, gravelly (1% to 12.87m, 5-10% to 20.77m), Diamictite. Unstratified except slight stratification of sand to 7.25m. Olive black to grayish olive. Moderately hard calcite cemented sandstone 7.25 to 12.65m, soft mud 12.87 to 20.77m. Parallel fracture sets in sandstone dip up to 45 degrees.

7.10 to 12.87m

Sand-Sandstone coarse to medium, muddy and slightly gravelly, Diamictite. Unstratified except sand 7.10 to 7.25m, slightly stratified dipping 10 degrees. 5Y 3/2 olive black. Soft sand to 7.25m, moderately hard sandstone calcite cemented. Subparallel joint sets are calcite cemented and Fe stained and dip up to 45 degrees.

SHEET # 3 of 43 PROJECT CIROS 2

SCALE 1:20

CORE RECOVERY	REMARKS	DEPTH (m)	GRAIN SIZE median % gravel sand silt clay g c f c m f	LITHOLOGY
	0.15m washed black sand & gravel, disregarded b,49mm,sr.	16·0 16.20 16.69	10%	
	SCALE BREAK			
Box 3	19.2-20.0m washed clasts run to 22.17m	20·0 20.29 20.77 21·0	5%	m b
	SCALE BREAK			
	22.41-24.54m 3 clasts cored from hole wall 24.49-25.31m clasts, cored & overdrilled, washed core 25.22-26.79m collapse to 25.22m? black sand? washed black sand, collapse run to 28.65m	27.97 28·0 28.21		

12.87 to 20.77m

Mud sandy and gravelly, Diamicton. Unstratified. 5Y 3/2 olive black except 7.5Y 4/2 grayish olive down to 13.06m. Soft. Finer mud matrix to 16.60m. Clasts subangular to subround, unstriated, 90% granitic and other basement, 10% volcanic basalt.

Unit 3. 27.97 to 51.11m.

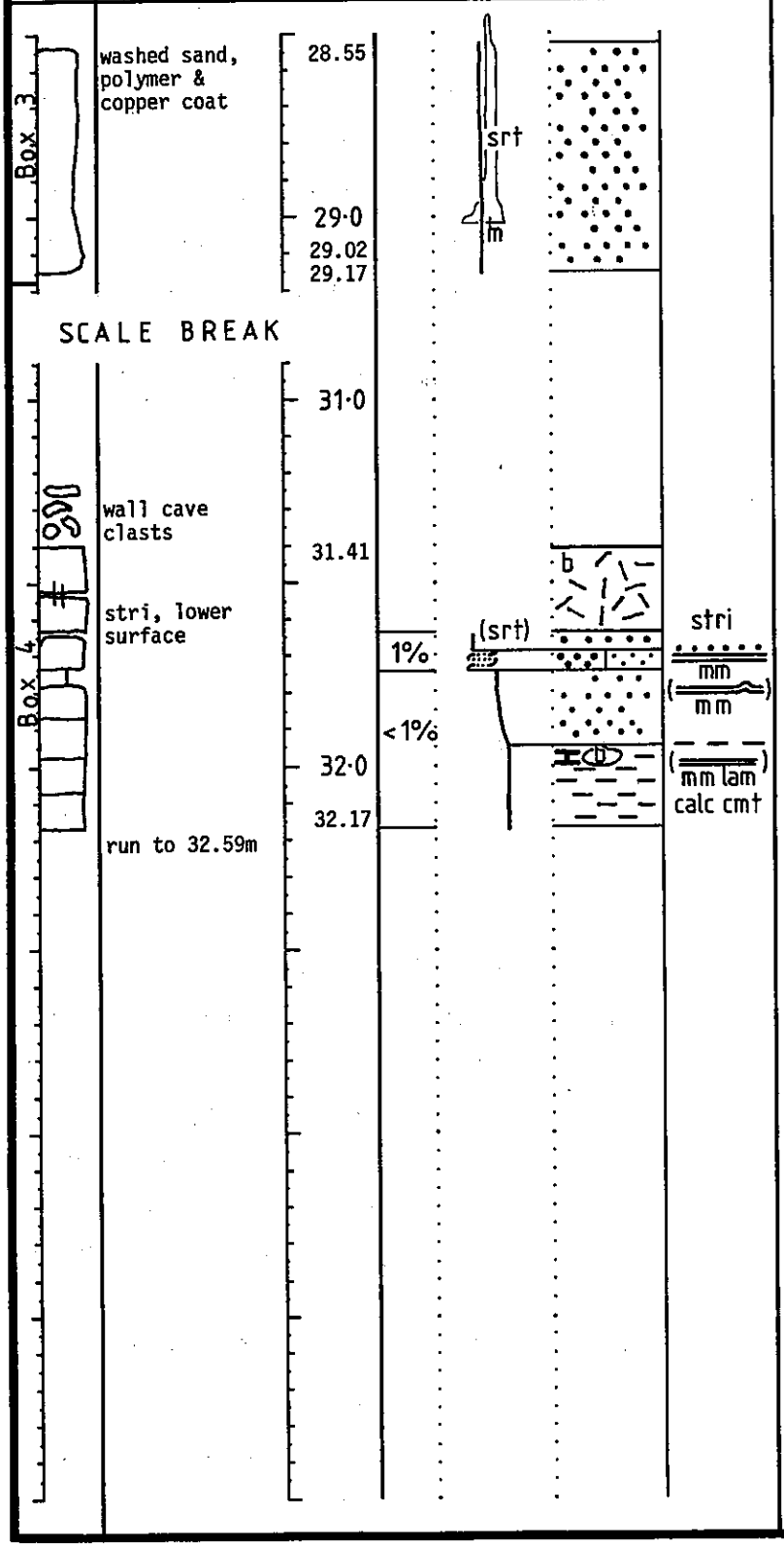
Sandstone coarse to fine, moderately to well sorted, alternating with Siltstone, Diamictite. Fining upwards cm bedded sand in places, mm bedded and laminated silt and fine sand, slightly stratified diamictite. Olive black sandstone and olive gray siltstone. Moderately soft (sandstone) and harder siltstone.

27.97 to 29.17m

Sand medium to fine, moderately sorted (washed). Greenish black to black.

SHEET # 4 of 43 PROJECT CIROS 2

SCALE 1:20



DESCRIPTION

31.41 to 31.95m

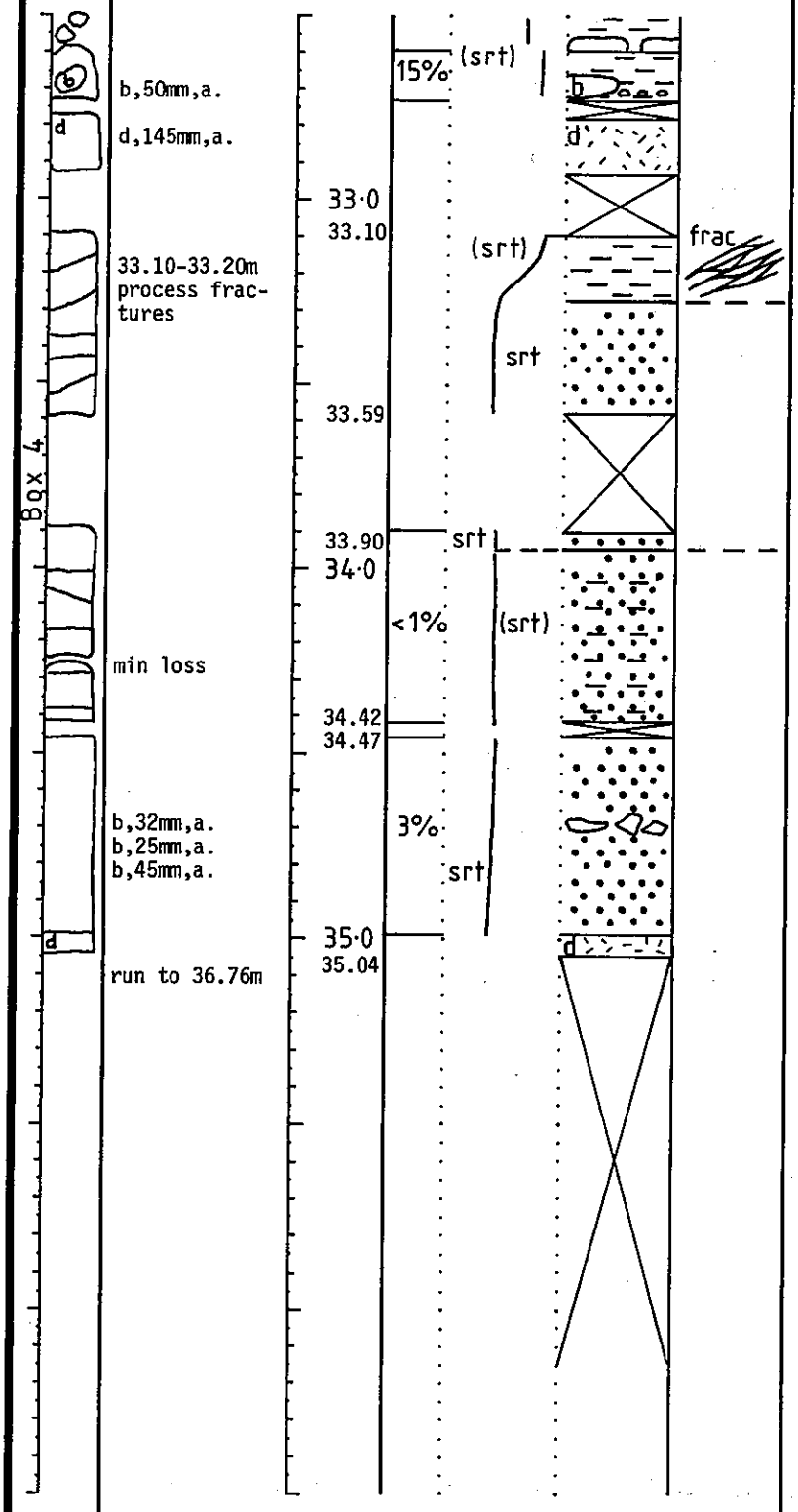
Sandstone coarse, poorly sorted grades to fine moderately sorted, muddy. Stratified, mm bedded alternating coarse and fine sand-silt laminae (slightly wavy in places). 7.5GY 2/1 greenish black to 7.5GY 3/1 dark greenish gray. Moderately soft and slightly calcareous. Coarse sand-grit subequal mafic and felsic grains.

31.95 to 33.28m

Mudstone, fine sandy and gravelly. Stratified with subhorizontal interbedded silt laminae to 32.15m, unstratified to 33.28m. 7.5GY 3/1 dark greenish gray and 5GY 3/1 dark olive gray. Moderately soft to soft and slightly calcareous.

SHEET # 5 of 43 PROJECT CIROS 2

SCALE 1:20



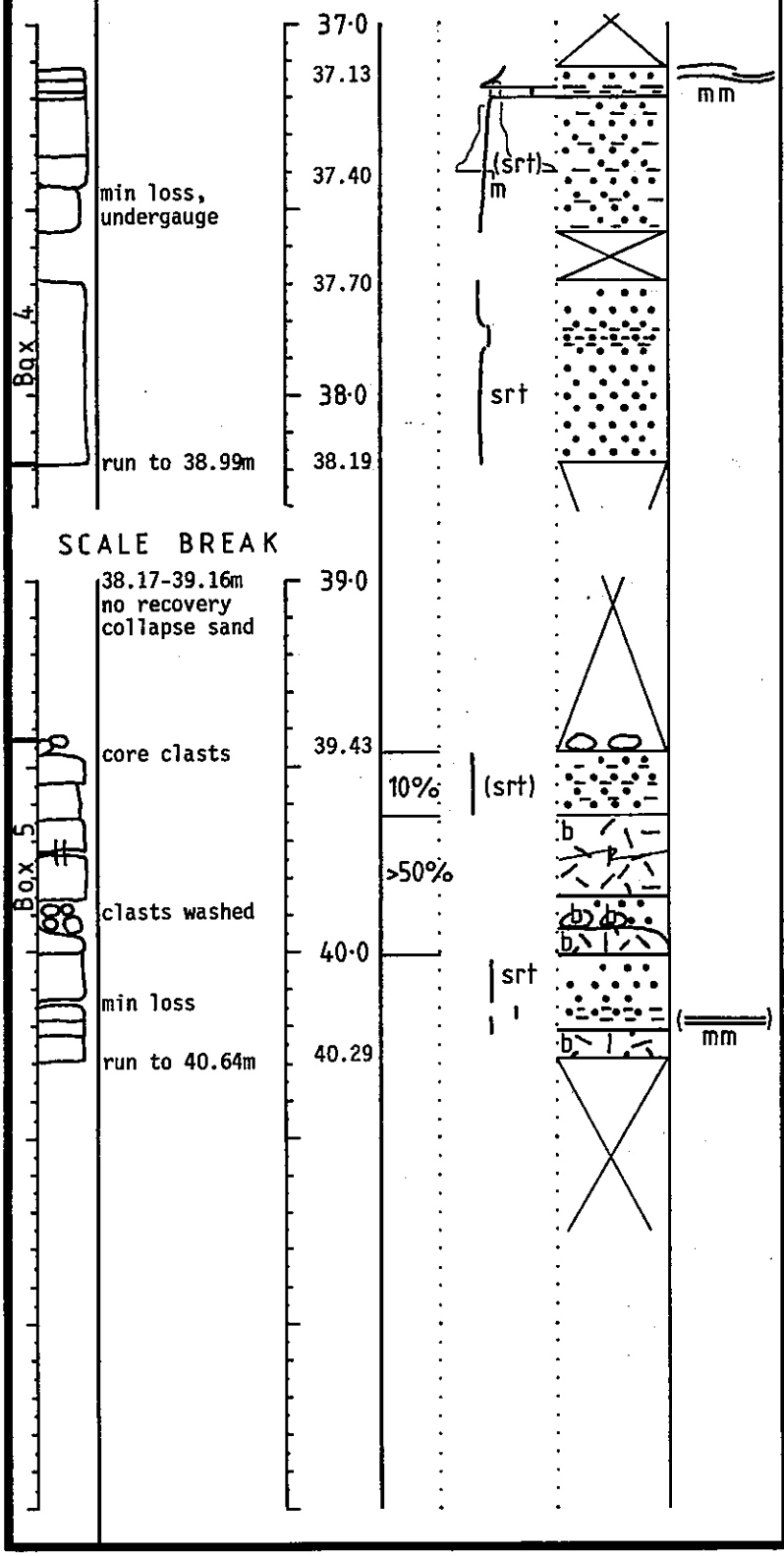
DESCRIPTION

33.28 to 38.19m

Sandstone fine, moderately to poorly sorted, muddy in places and slightly gravelly. Unstratified except mm bedded fine sand and silt 37.13 to 37.21m. 5GY 2/1 olive black. Soft and very soft below 37.78m, slightly calcite cemented harder layers. Lone stones at 34.70m, scattered grit throughout, subequal mafic and felsic grains.

SHEET # 6 of 43 PROJECT CIROS 2

SCALE 1:20

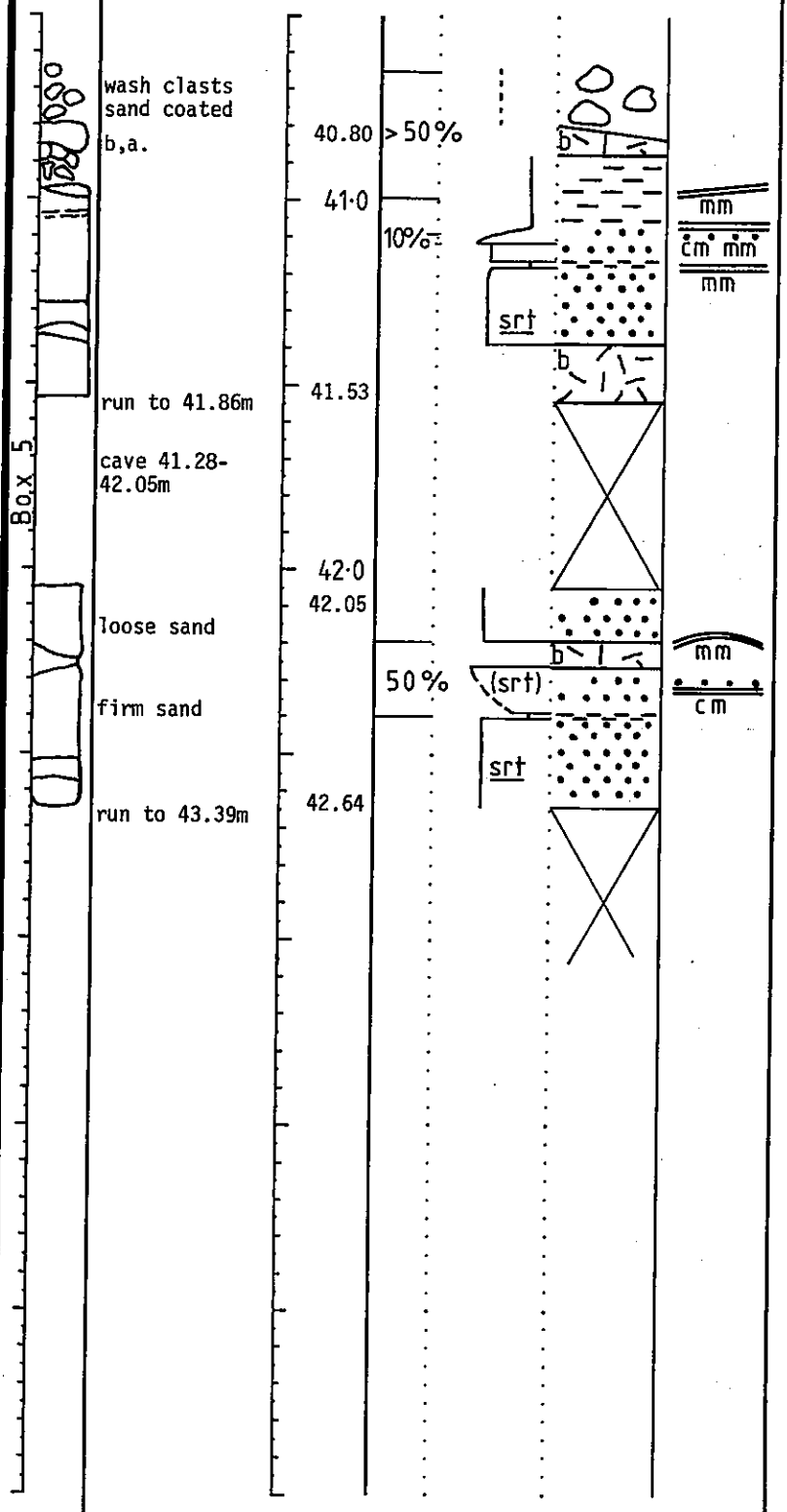


39.43 to 42.23m

Sand medium to fine, moderately to well sorted, very gravelly and slightly muddy. Slightly stratified, mm bedded silt at 40.18m and 41.00 to 41.18m. 7.5Y 3/2 - 2/2 olive black. Hard to moderately hard, calcite cemented to 42.05m, softer to 42.23m with concave down deformed bedding above basement clast.

SHEET # 7 of 43 PROJECT CIROS 2

SCALE 1:20



42.23 to 42.31m

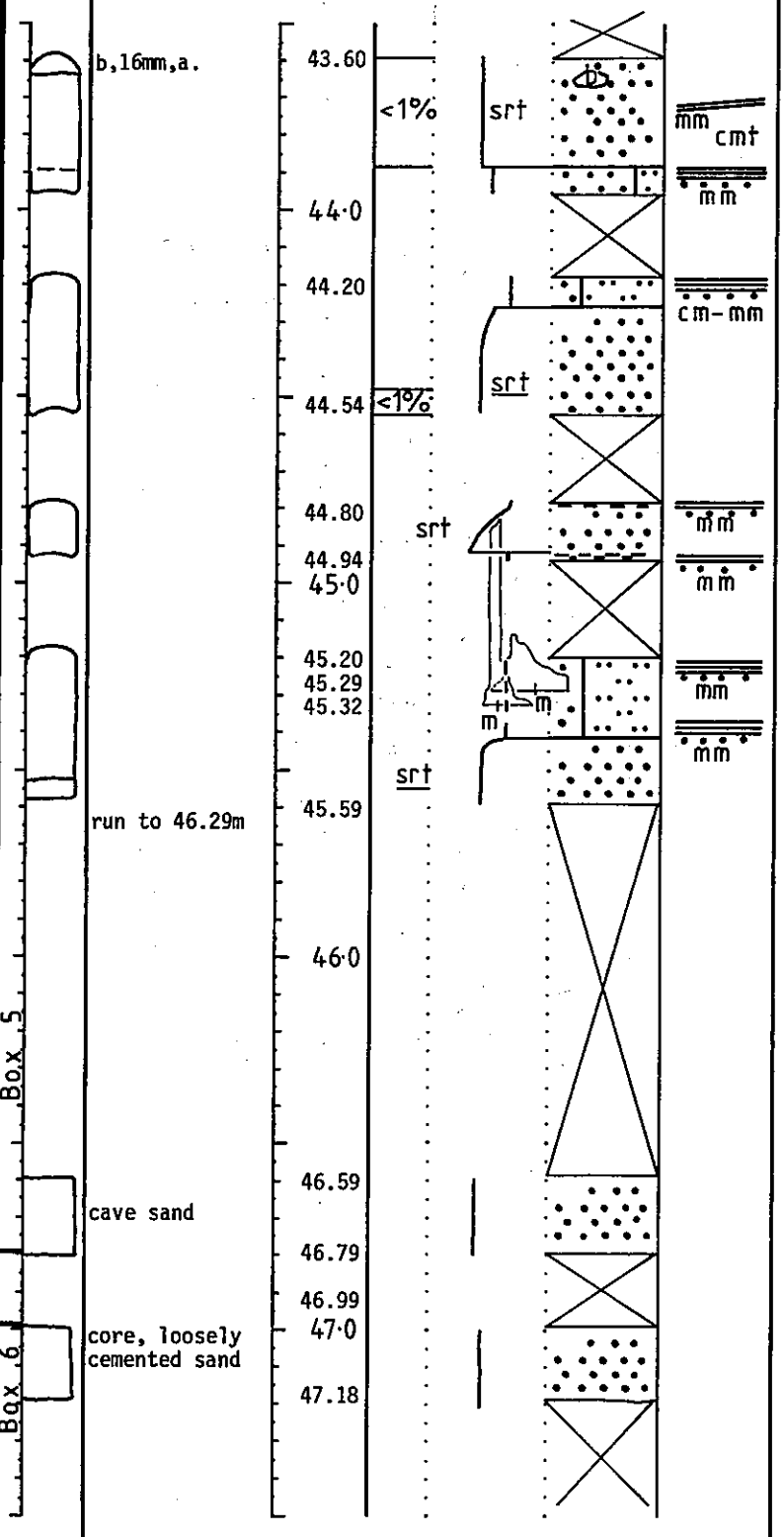
Mudstone, very gravelly and sandy, Diamictite. Unstratified except coarsening upward gravel content and mm bedded mudstone at base. 10Y 3/2 olive black grades down to 2.5GY 3/1 dark olive gray. Moderately hard. 80% of clasts subround.

42.31 to 49.25m

Sandstone coarse to fine, moderately well sorted, alternating with Siltstone. Well stratified in places with fining up cm bedded sand and mm bedded and laminated fine sand-silt. 7.5Y 3/1, 5GY 2/1 olive black sand, 2.5GY 5/1 olive gray silts. Moderately soft sandstone and hard siltstone beds, slightly calcite cemented silt.

SHEET # 8 of 43 PROJECT CIROS 2

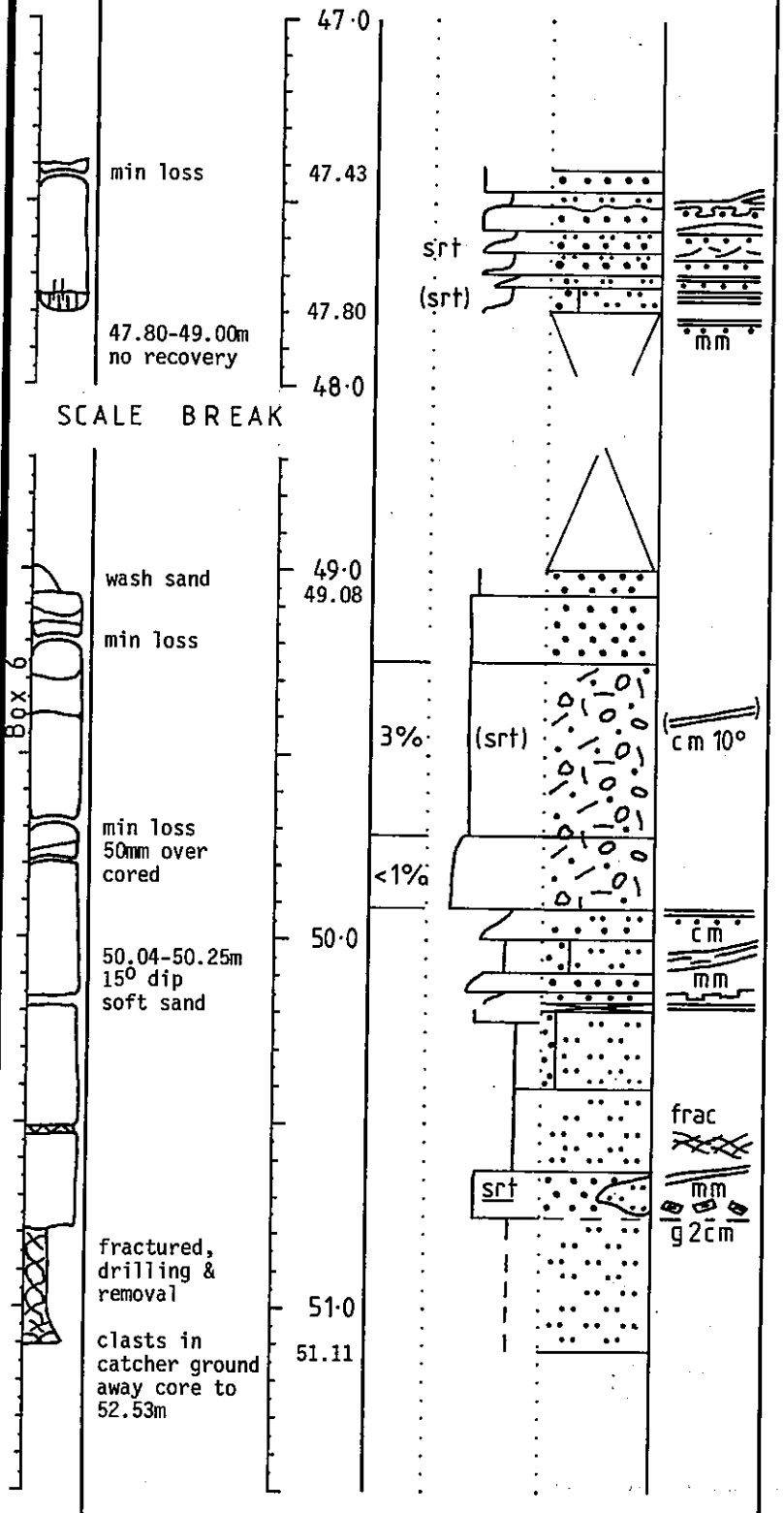
SCALE 1:20



SHEET # 9 of 43

SCALE 1:20

PROJECT CIROS 2



DESCRIPTION

49.25 to 49.92m

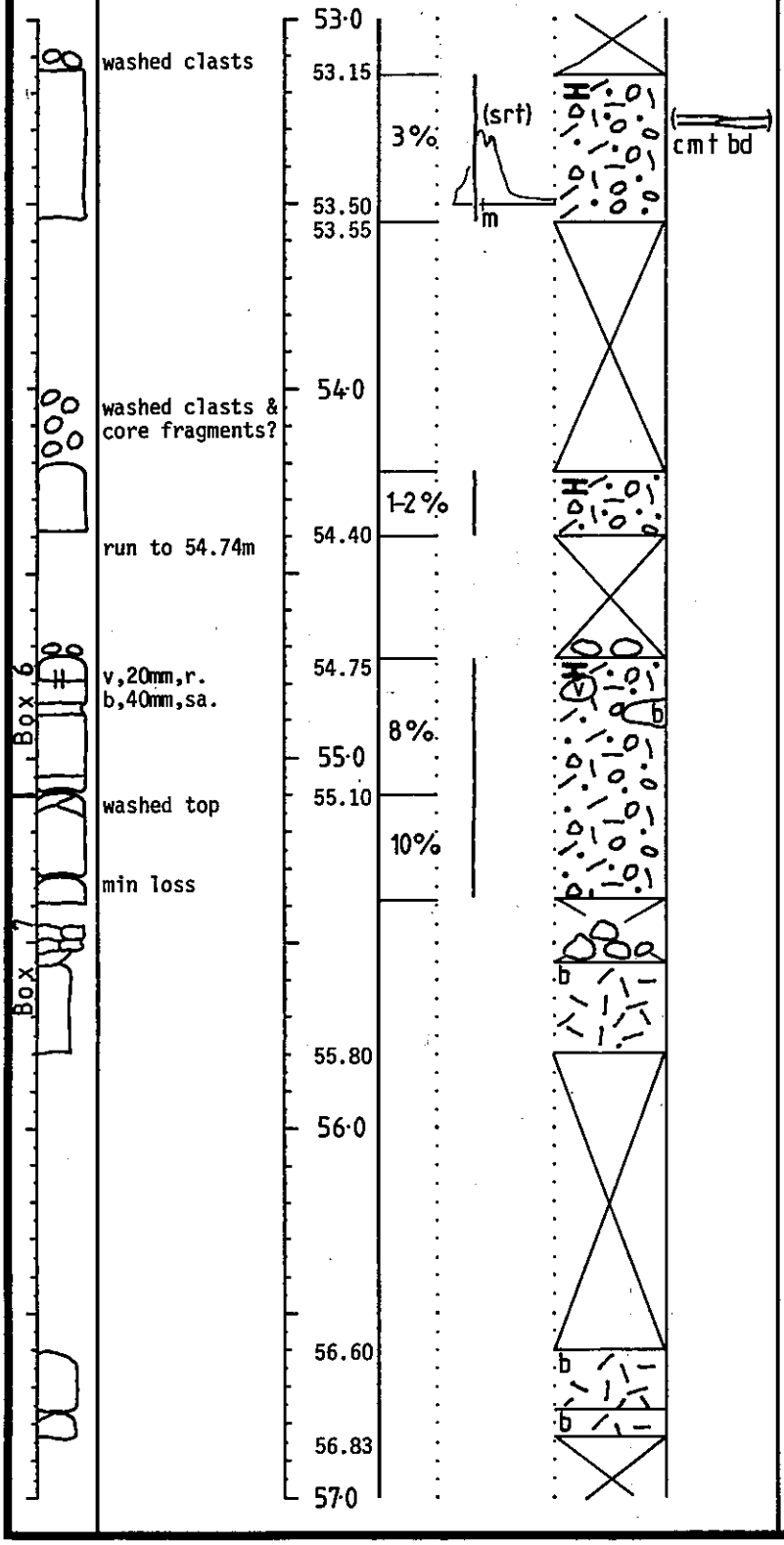
Sandstone, muddy and slightly gravelly, Diamictite. slightly stratified cm bedding dips 10 degrees and parallels fractures. 7.5GY 3/1 dark greenish gray. Moderately soft and slightly calcareous. Clasts 3% (70% granitic, 30% black-volcanic?).

49.92 to 51.11m

Sandstone coarse to fine, moderately to well sorted alternating with Siltstone. Well bedded and laminated. (As above 42.31 to 49.25m).

SHEET # 10 of 43 PROJECT CIROS 2

SCALE 1:20



DESCRIPTION

Unit 4. 53.15 to 59.60m

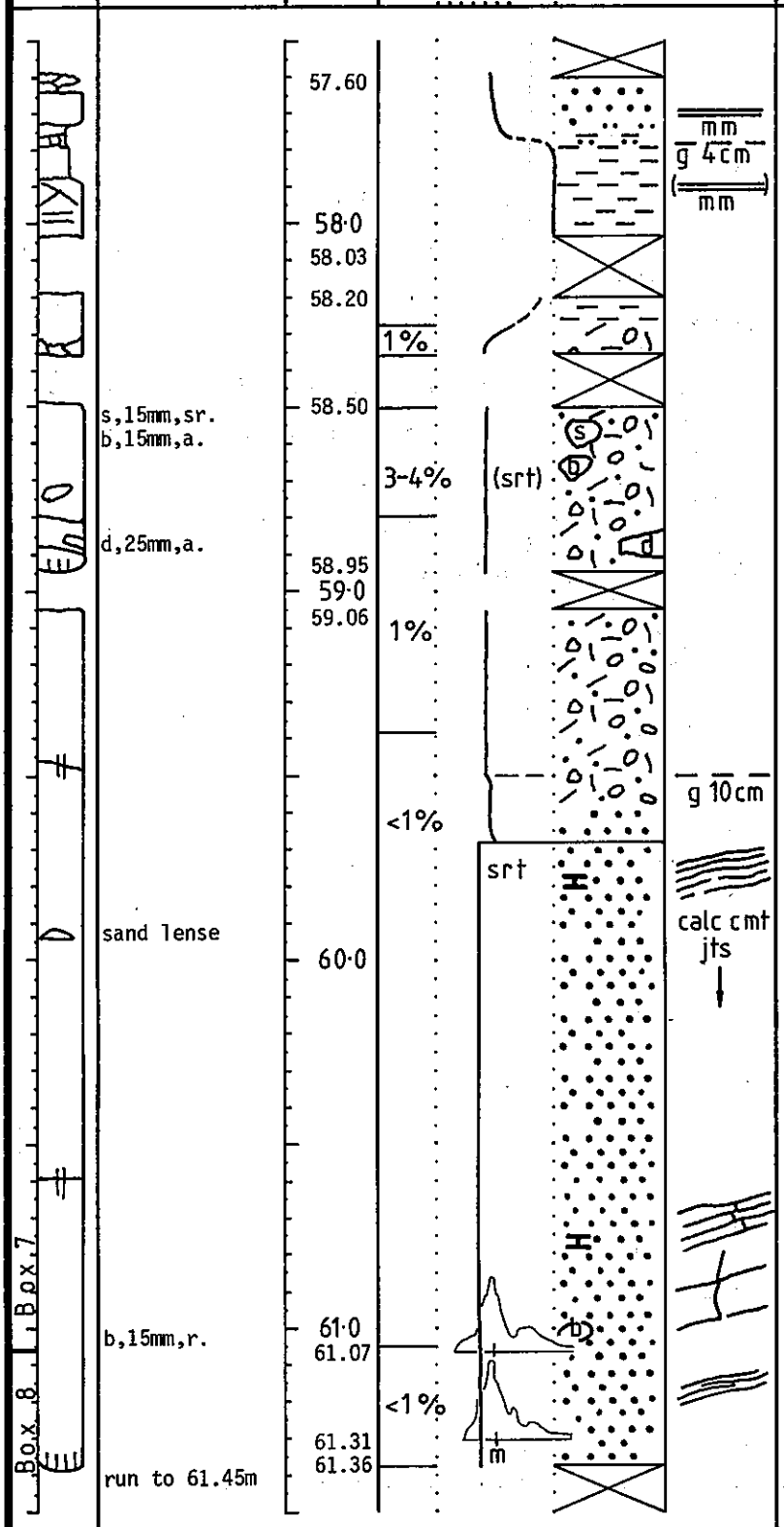
Sandstone coarse to medium, muddy and gravelly, Diamictite and Mudstone, sandy. mm bedded. Olive black. Moderately hard sandstone and softer mudstone, calcite cemented.

53.15 to 55.37m

Sandstone coarse, muddy and gravelly, Diamictite. Slightly stratified diffuse cm bedding. 7.5GY 3/1 dark greenish gray. Moderately hard and slightly calcite cemented.

SHEET # 11 of 43 PROJECT CIROS 2

SCALE 1:20



57.60 to 58.30m

Mudstone, sandy coarse to medium. mm bedded sandstone to 57.80m and slightly mm bedded mudstone below. 10Y 3/1-3/2 olive black. Soft to moderately soft and calcite cemented.

58.30 to 59.60m

Sandstone medium to fine, very muddy and gravelly, Diamictite. Unstratified. 7.5Y 3/2 olive black. Moderately hard and calcite cemented. Clasts decrease below 59.06m(1%).

Unit 5. 59.60 to 67.55m

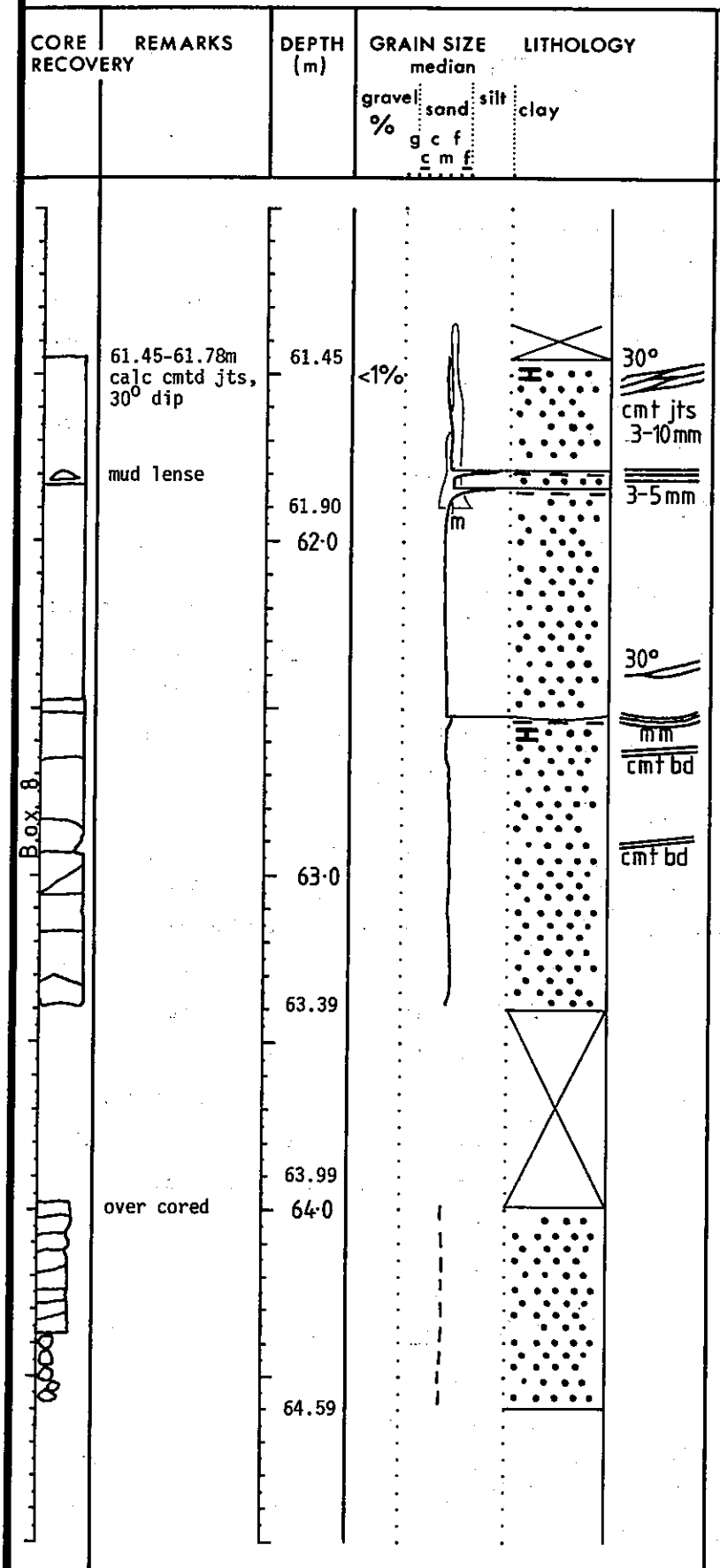
Sandstone coarse and medium, well sorted, muddy bedded and slightly gravelly. Unstratified sand, well bedded mudstone laminae 61.78 to 63.00 and 64.40 to 65.80m. Black sand and grayish olive mud. Hard calcite cemented sand with "flaggy" vein network to 61.78m, moderately soft and slight calcite cement to 67.55m.

59.60 to 61.78m

Sandstone coarse to medium, moderately to well sorted, slightly muddy and slightly gravelly. Flaggy mm to cm spaced calcite veins (fractures subparallel to bedding?). 10Y 2/1 black. Hard.

SHEET # 12 of 43 PROJECT CIROS 2

SCALE 1:20



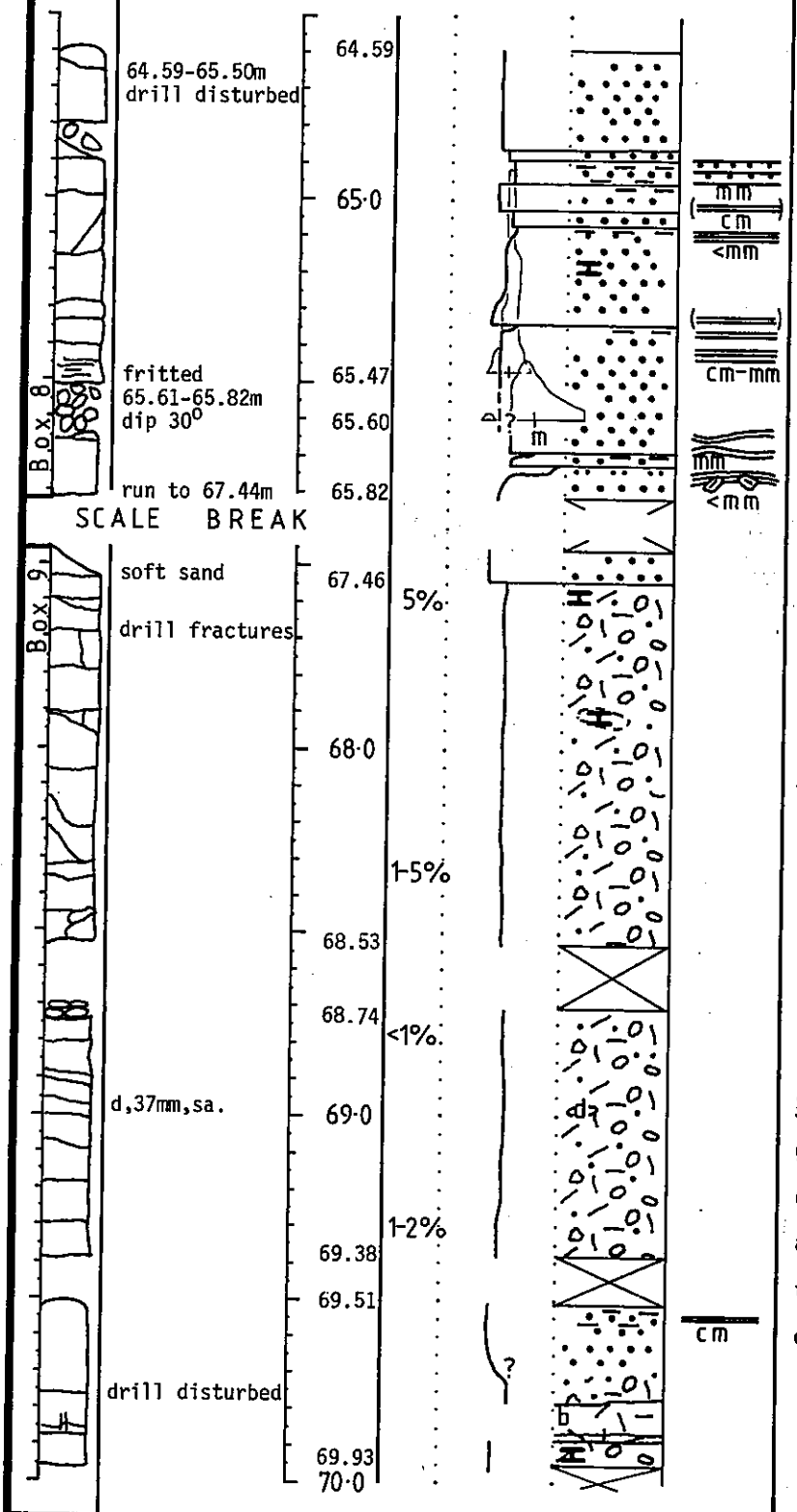
DESCRIPTION

61.78 to 67.55m

Sandstone medium, moderately to well sorted, muddy bedded in places. Faintly stratified sand, cm to mm bedded mudstone 61.78 to 63.00m and 64.40 to 65.80, bedding deformed, mudstone clasts in places. 5Y 2/1 black sand, 7.5Y 4/2 grayish olive mud. Moderately soft and slight calcite cement.

SHEET # 13 of 43 PROJECT CIROS 2

SCALE 1:20



DESCRIPTION

Unit 6. 67.55 to 84.15m

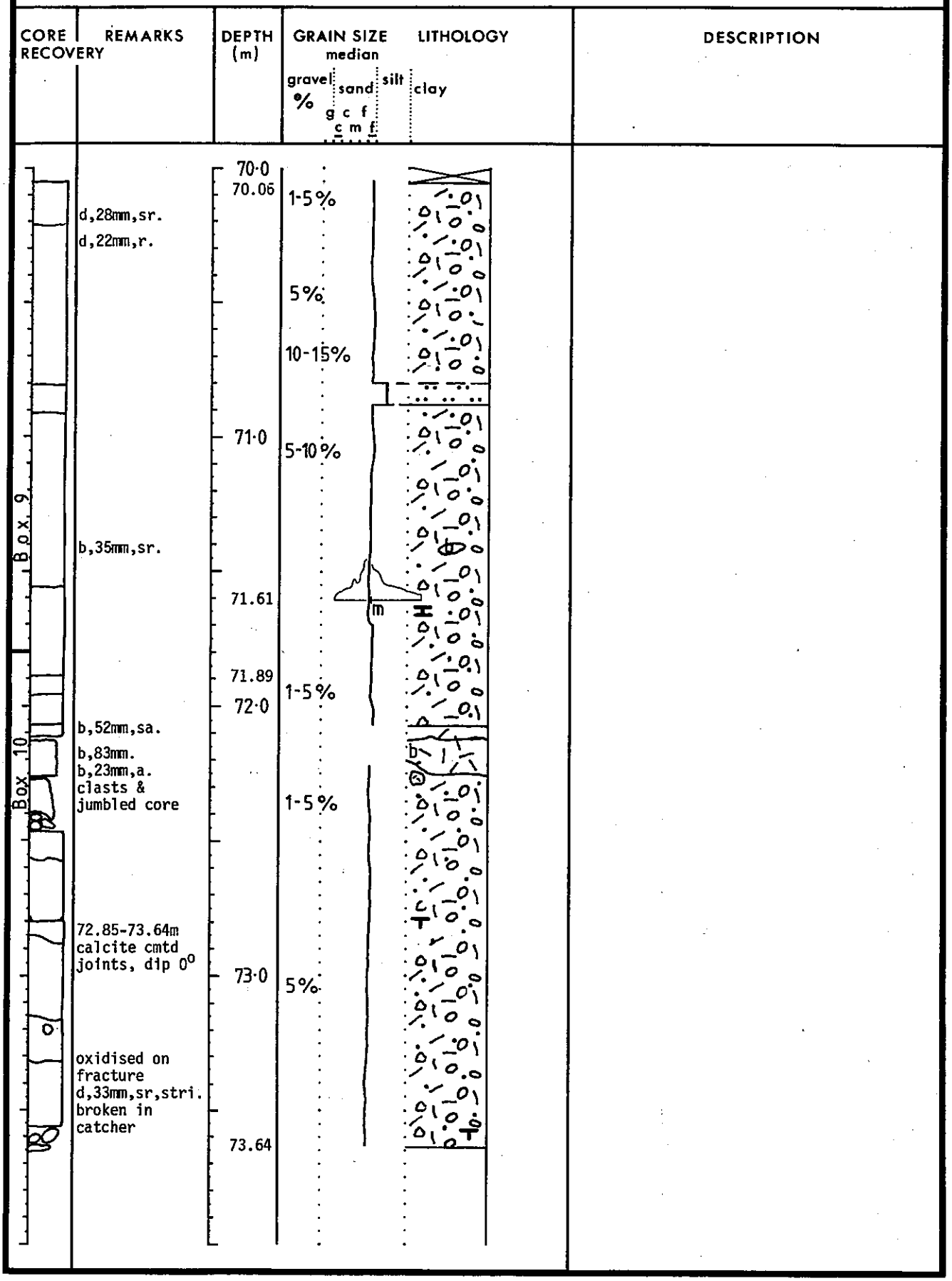
Sandstone medium to fine, muddy and gravelly, Diamictite and Mudstone, sandy and gravelly, Diamictite. Slightly stratified, cm-mm mudstone beds at 69.51m, 75.64 to 76.75m, and slump deformed sand with mudstone clasts 78.54 to 79.74m. Dark olive gray to olive black. Moderately hard except soft sand 78.54 to 79.74m.

67.55 to 75.64m

Sandstone medium to fine, very muddy and gravelly, Diamictite. Unstratified except cm bedded mudstone and sandstone at 69.51m. 7.5Y 3/2 olive black. Hard to moderately hard. Only slight calcite cement.

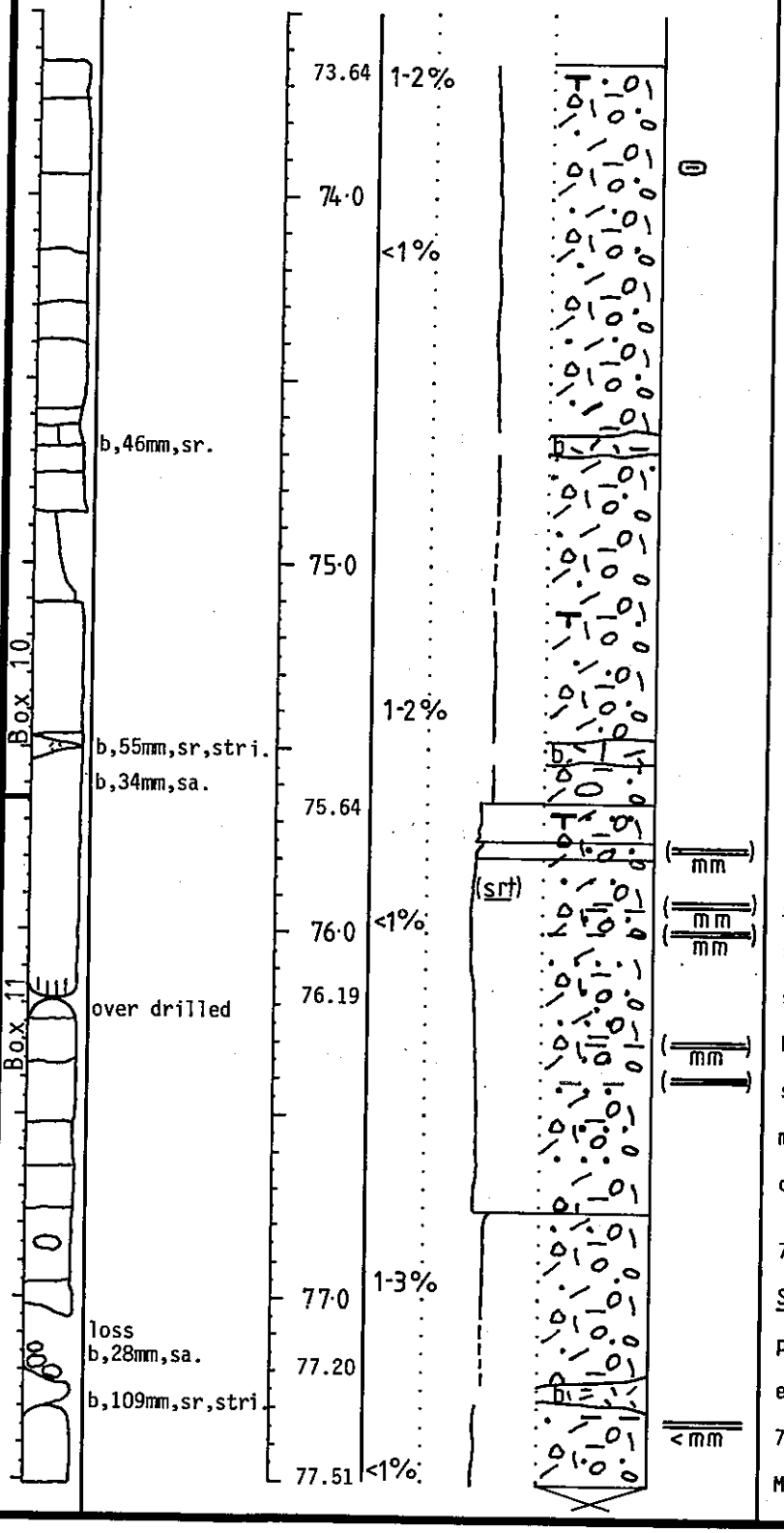
SHEET # 14 of 43 PROJECT CIROS 2

SCALE 1:20



SHEET # 15 of 43 PROJECT CIROS 2

SCALE 1:20



75.64 to 76.75m

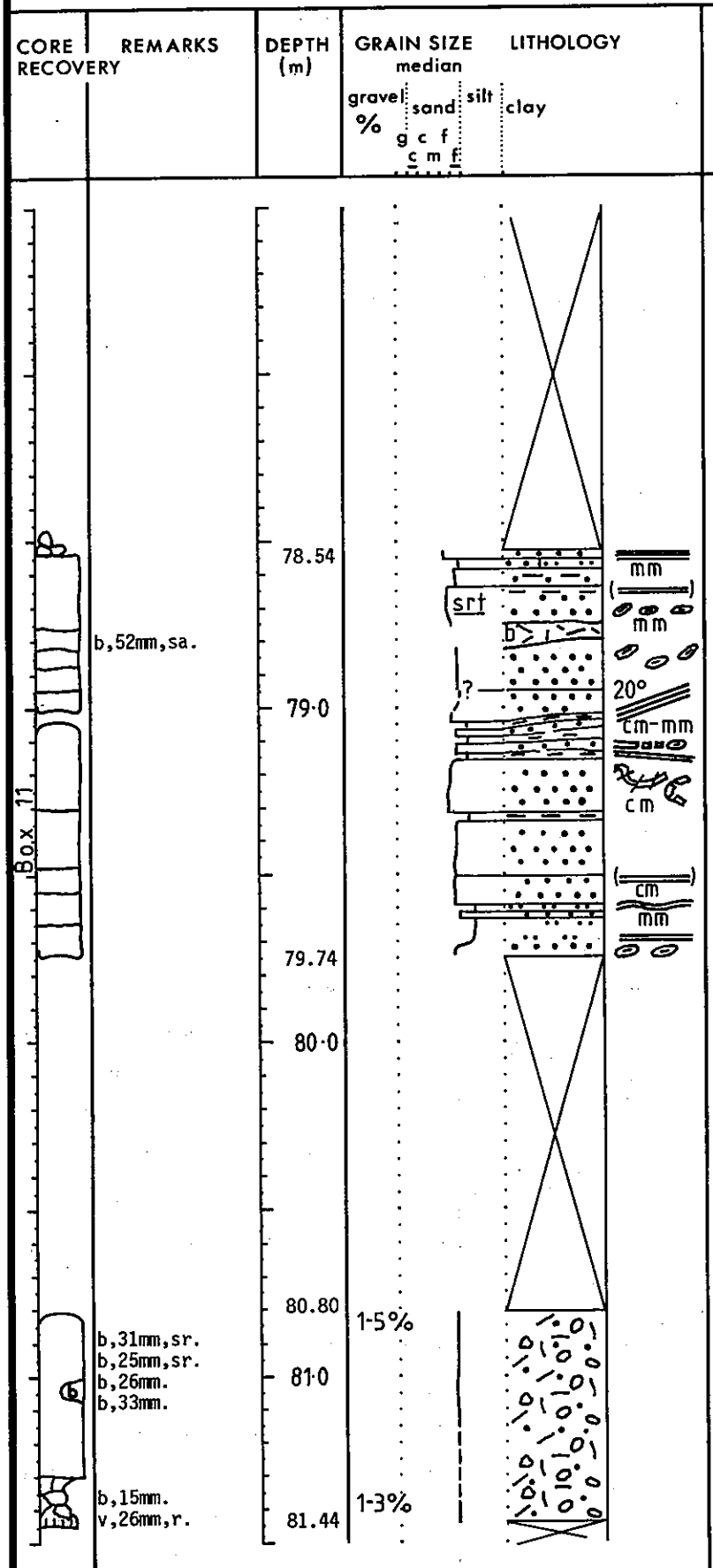
Sandstone medium to fine, muddy and slightly gravelly, very poorly sorted, sandy Diamictite. Stratified with mm bedded mudstone. 10Y 3/1 black sandstone, 5GY 4/I dark olive gray mudstone. Moderately hard and non-calcareous.

76.75 to 77.51m

Sandstone fine, muddy and gravelly, very poorly sorted, Diamictite. Unstratified except mm laminated mudstone at about 77.32m. 7.5Y 3/1 olive black. Moderately hard and brittle.

SHEET # 16 of 43 PROJECT CIROS 2

SCALE 1:20



78.54 to 79.74m

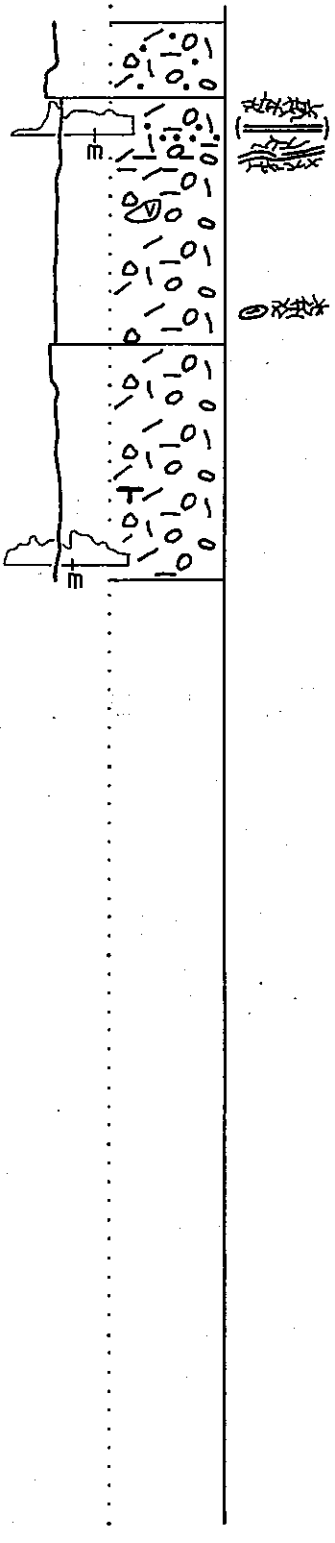
Sand fine, very muddy. Well stratified cm-mm bedded alternating sand and mud, slump deformation of some beds with disrupted mud laminae and rip-up clasts. 10GY 4/1 dark greenish gray and 7.5Y 3/1 olive black. Soft. Undeformed sand beds are well sorted.

80.80 to 84.15m

Mudstone, sand fine and gravelly, very poorly sorted, Diamictite. Slightly stratified deformed mudstone beds and microfractures 81.64 to 81.90m. 10Y 3/1-3/2 olive black, 7.5GY 4/1 dark greenish gray. Moderately soft.

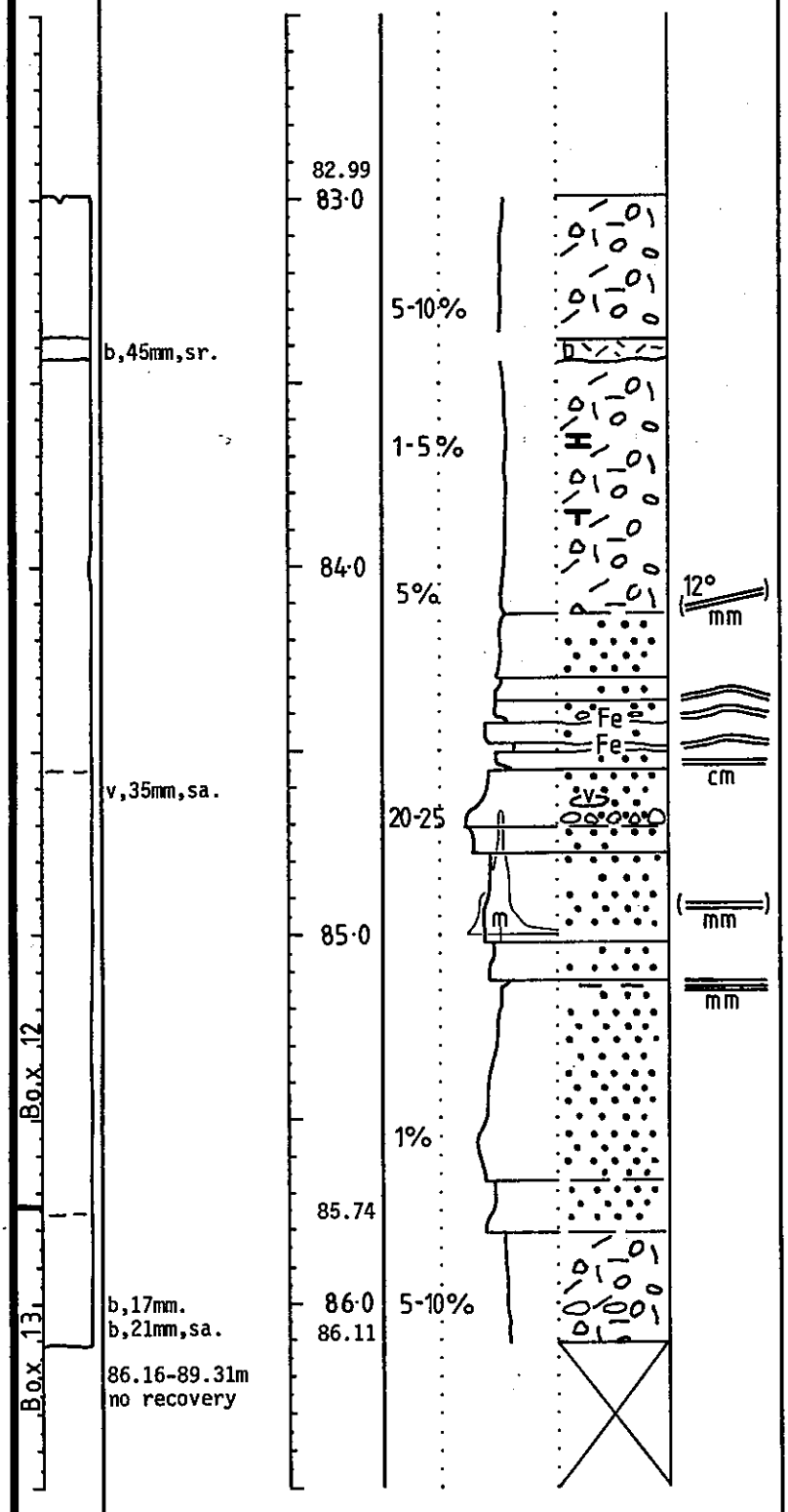
SHEET # 17 of 43 PROJECT CIROS 2

SCALE 1:20

CORE RECOVERY	REMARKS	DEPTH (m)	GRAIN SIZE median gravel % sand g c f c m f silt clay	LITHOLOGY	DESCRIPTION
	b,37mm,sr. v,41mm,sr,stri. b,23mm. b,24mm,sa.	81.54 81.67 81.83 82·0 82.97 83·0 83.01	1% 5%		

SHEET # 18 of 43 PROJECT CIROS 2

SCALE 1:20



DESCRIPTION

Unit 7. 84.15 to 99.27m

Sandstone medium to fine. dm-cm bedded, fining upwards with cm-mm bedded mudstone tops. Olive black. Soft. Diamictite. Slightly stratified from 85.80 to 89.52m. Siltstone and Sandstone fine, muddy. Slightly stratified. Greenish gray with diatoms and sponge spicules.

84.15 to 85.80m

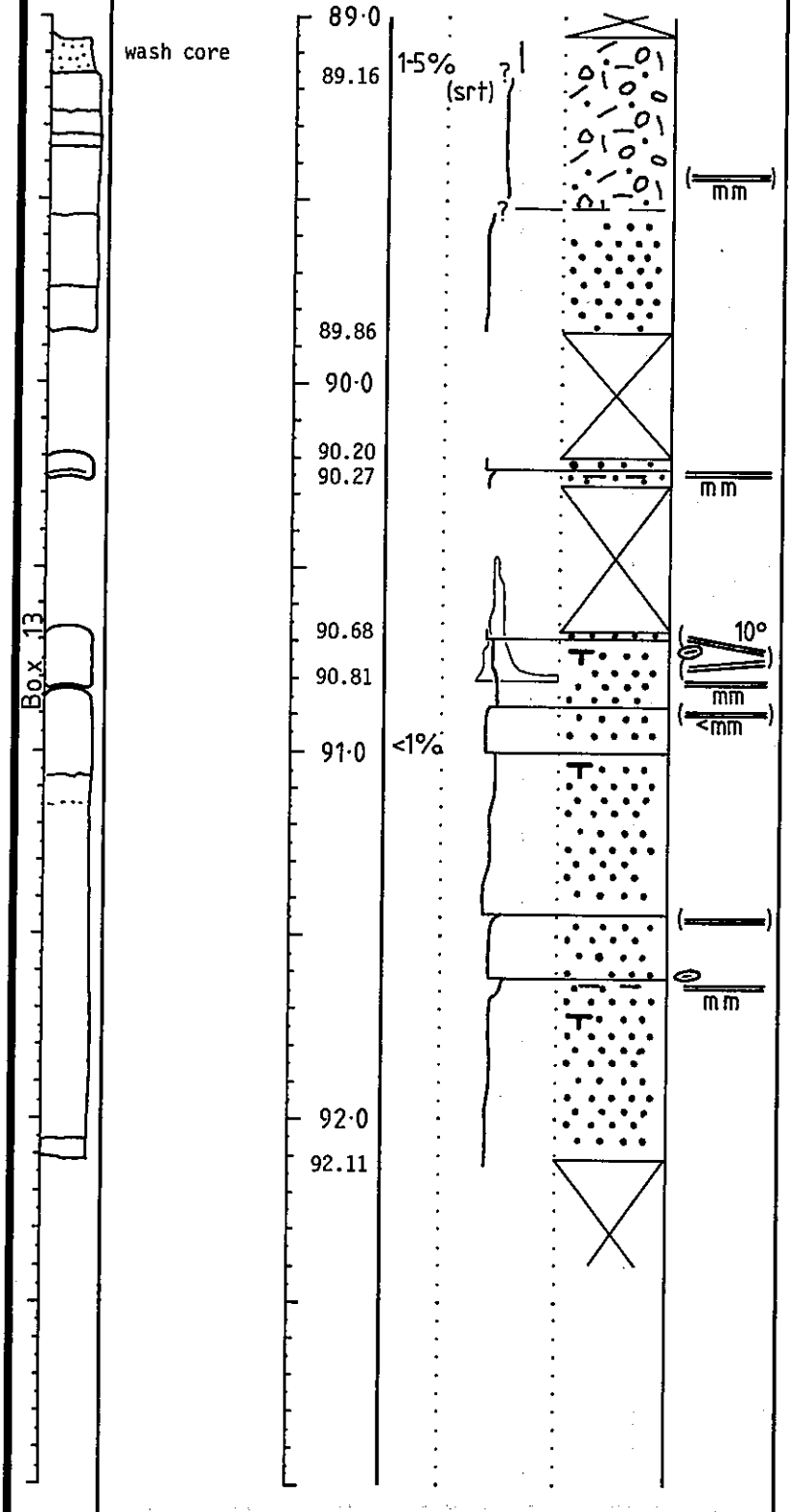
Sandstone coarse to fine, muddy, poorly to well sorted. Fining up dm-cm bedded sand with cm-mm bedded mudstone, slightly wavy in places. 10Y 4/1 gray mudstone, 7.5Y 3/1 olive black sandstone. Very soft to soft.

85.80 to 89.52m

Sandstone fine, muddy and gravelly, poorly sorted, Diamictite. Slightly stratified mm bedding at 89.45m. 10Y 3/2 olive black. Soft.

SHEET # 19 of 43 PROJECT CIROS 2

SCALE 1:20



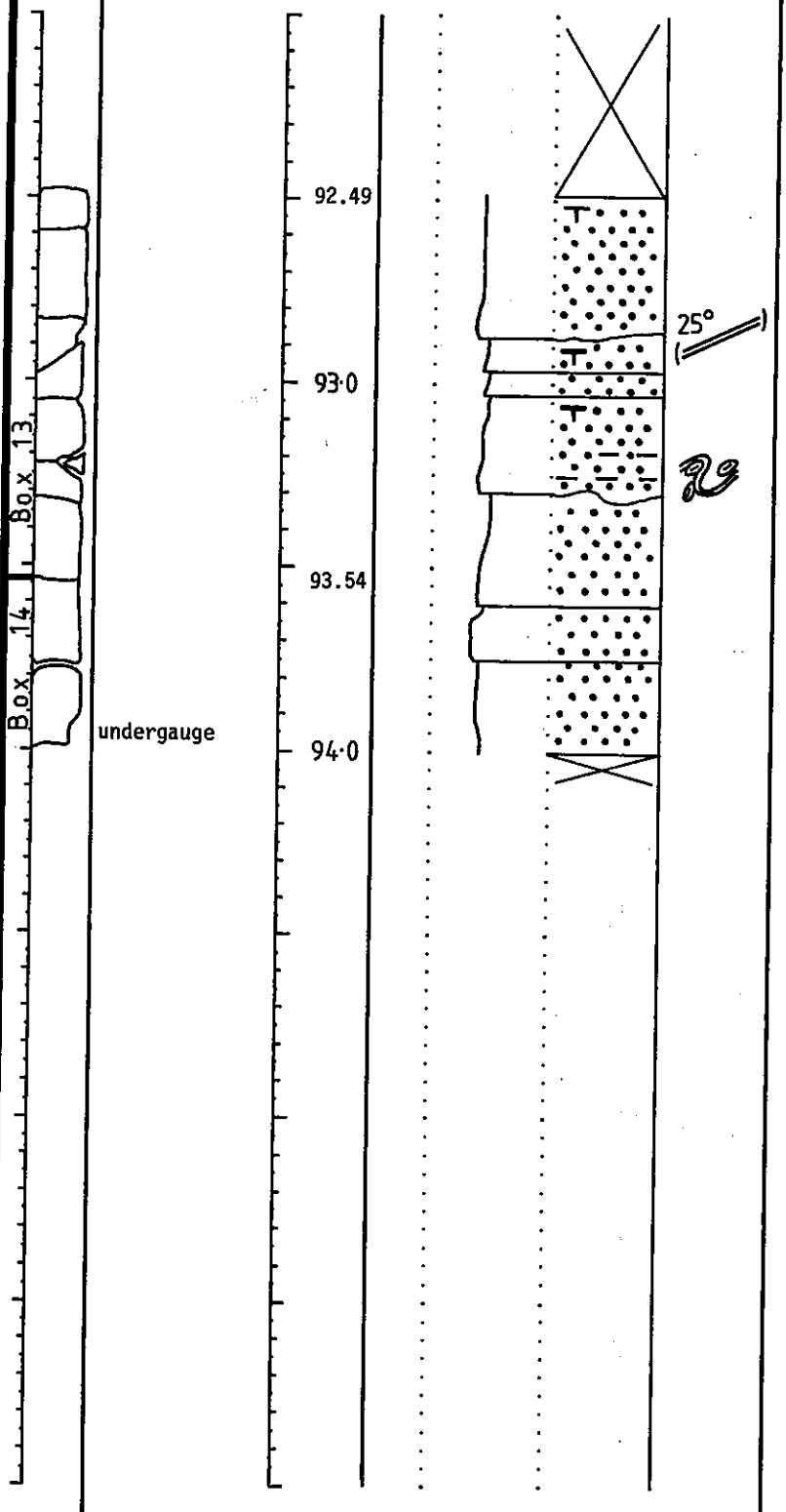
DESCRIPTION

89.52 to 98.73m

Sandstone medium, slightly muddy, moderately to well sorted. Unstratified except slightly mm bedded mudstone in sandstone 97.50 to 98.30m. 7.5Y 2/1, N 2/0 black sandstone, 7.5Y 5/1 gray mudstone. Soft to moderately soft.

SHEET # 20 of 43 PROJECT CIROS 2

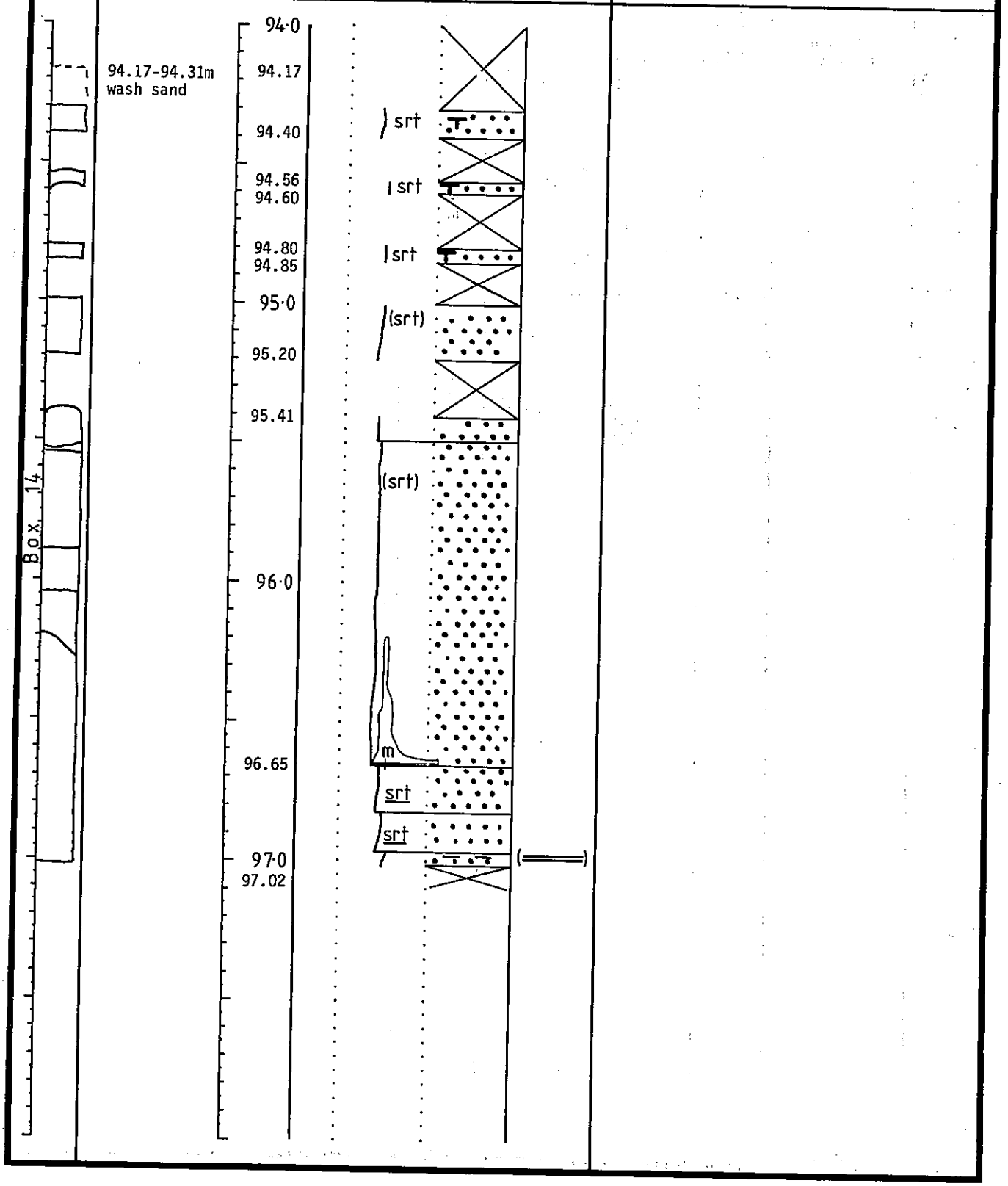
SCALE 1:20



SHEET # 21 of 43

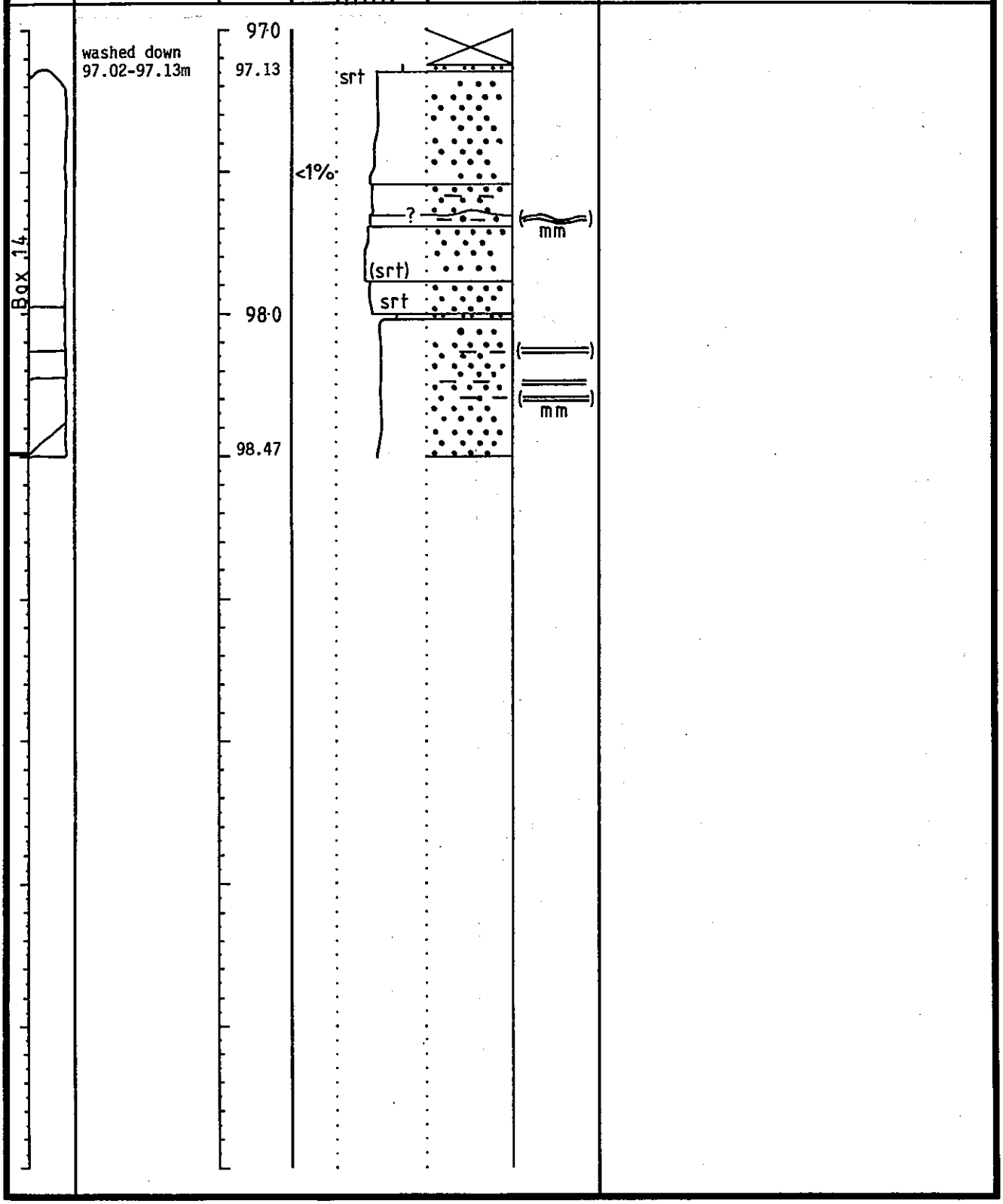
SCALE 1:20

PROJECT CIROS 2



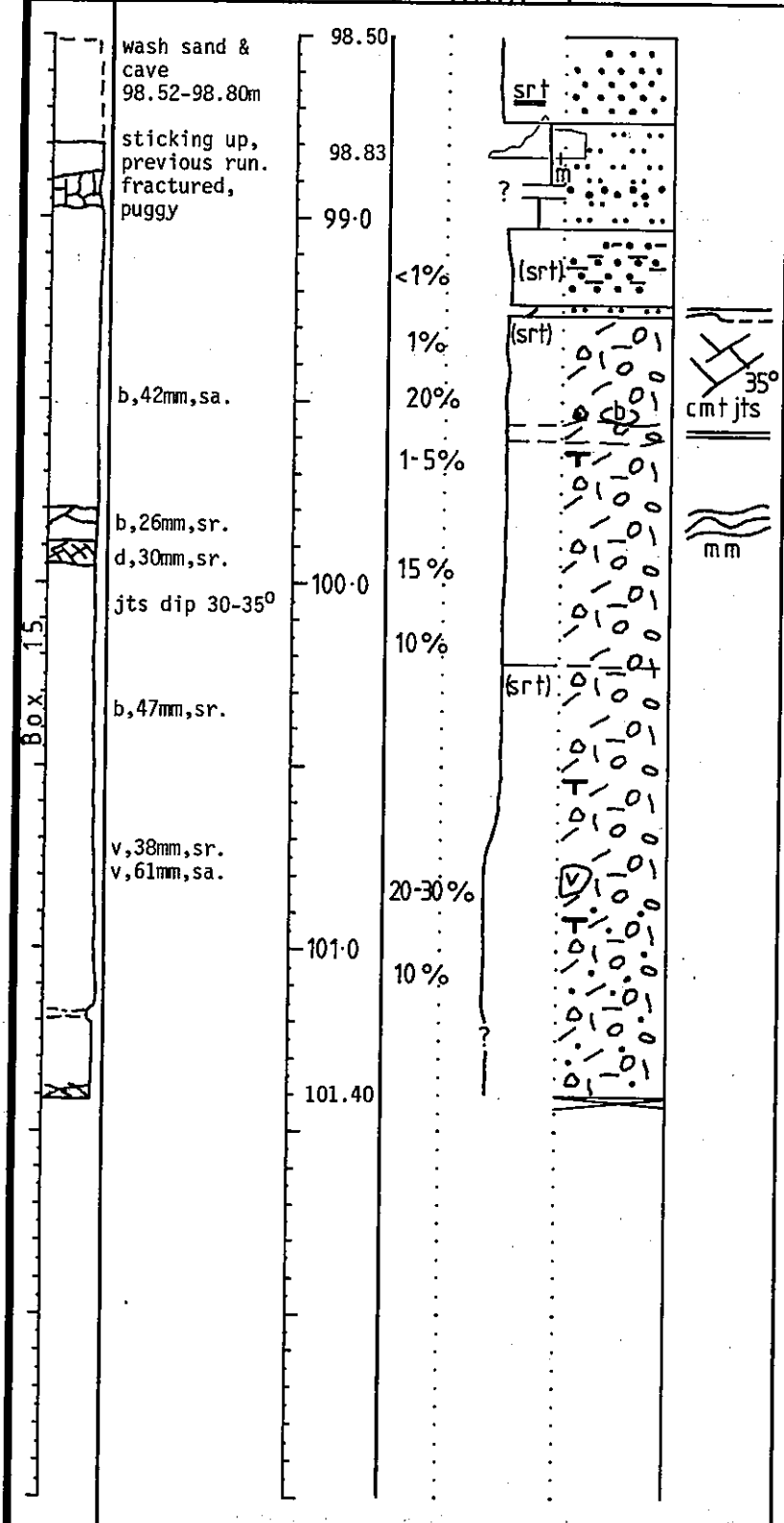
SHEET # 22 of 43 PROJECT CIROS 2

SCALE 1:20



SHEET # 23 of 43 PROJECT CIROS 2

SCALE 1:20



DESCRIPTION

98.73 to 99.27m

Siltstone and Sandstone fine, very muddy. Faintly stratified with deformed mm bedding at 99.25m (loading?). 5G 5/1-4/1 greenish gray. Soft to moderately soft. Siltstone well sorted with diatoms and sponge spicules.

Unit 8. 99.27 to 134.90m.

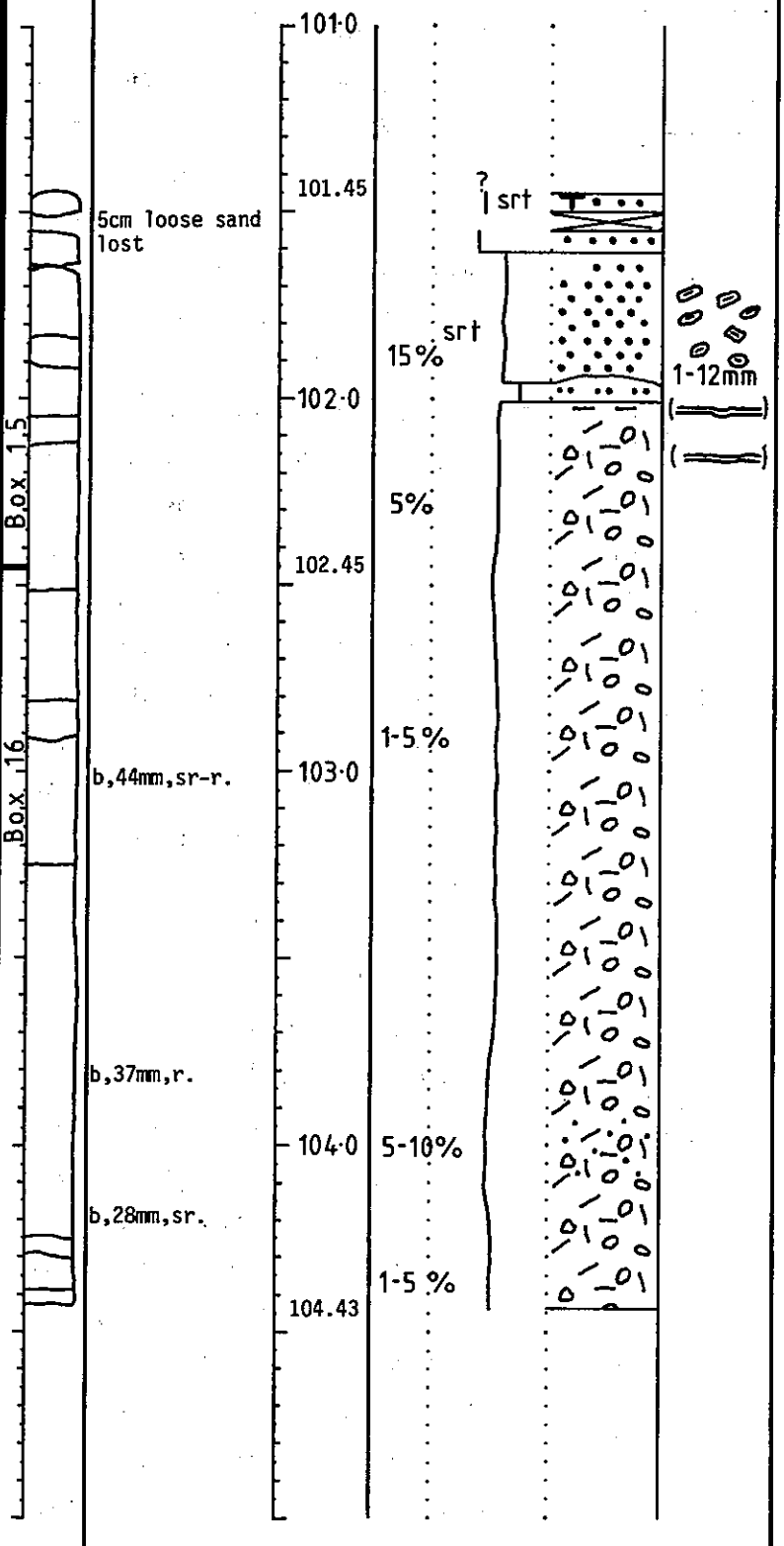
Mudstone, very sandy and gravelly, Diamictite, Sandstone medium to fine. Mudstone mm to cm beds 109.86 to 111.06m. Tuff, siltstone. Very glassy 124.65 to 124.94m. Slightly stratified mm bedded mud in diamictite, mm-cm bedded sandstone and tuff with mudstone clasts. Dark greenish gray diamictite, olive gray sandstone and brownish black tuff. Moderately hard to soft. Non-calcareous.

99.27 to 101.46m)
102.00 to 109.86m)
111.06 to 124.65m)
124.94 to 134.90m)

Mudstone, very sandy and gravelly, Diamictite. Slight mm-cm bedding throughout, moderately bedded with mudstone clasts 123.15 to 124.65m (above tuff). 10GY 4/1, 7.5GY 4/1 dark greenish gray, 2.5GY 4/1 dark olive gray 99.27 to 109.86m, 5G 4/1-5/1 dark greenish gray 111.06 to 134.90m. Moderately soft, some hard horizons. Non-calcareous.

SHEET # 24 of 43 PROJECT CIROS 2

SCALE 1:20



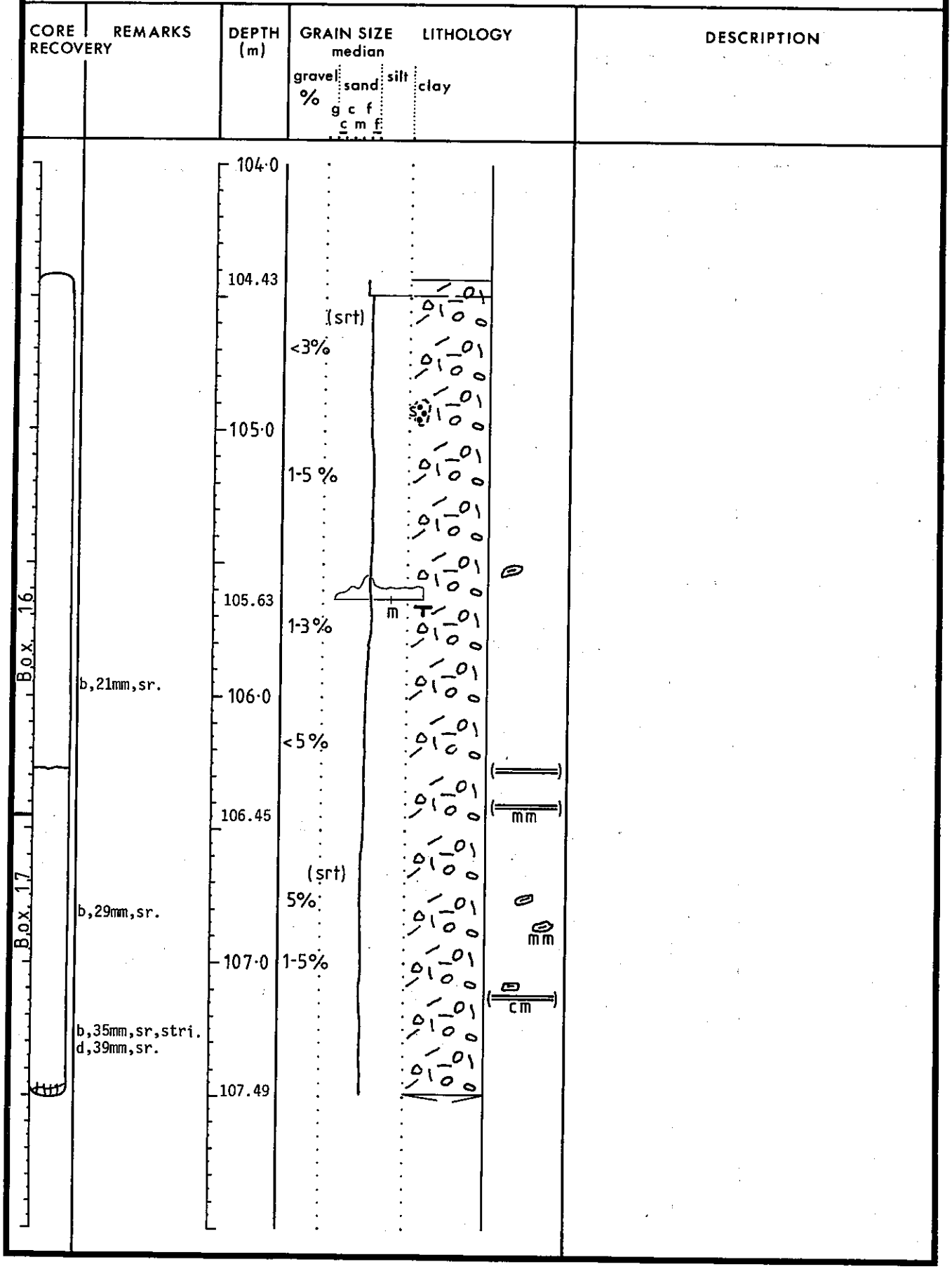
DESCRIPTION

101.46 to 102.00m

Sandstone, muddy and gravelly, Diamictite. Abundant angular to subround mudstone clasts. 7.5GY 4/1 dark greenish gray. Soft to moderately soft.

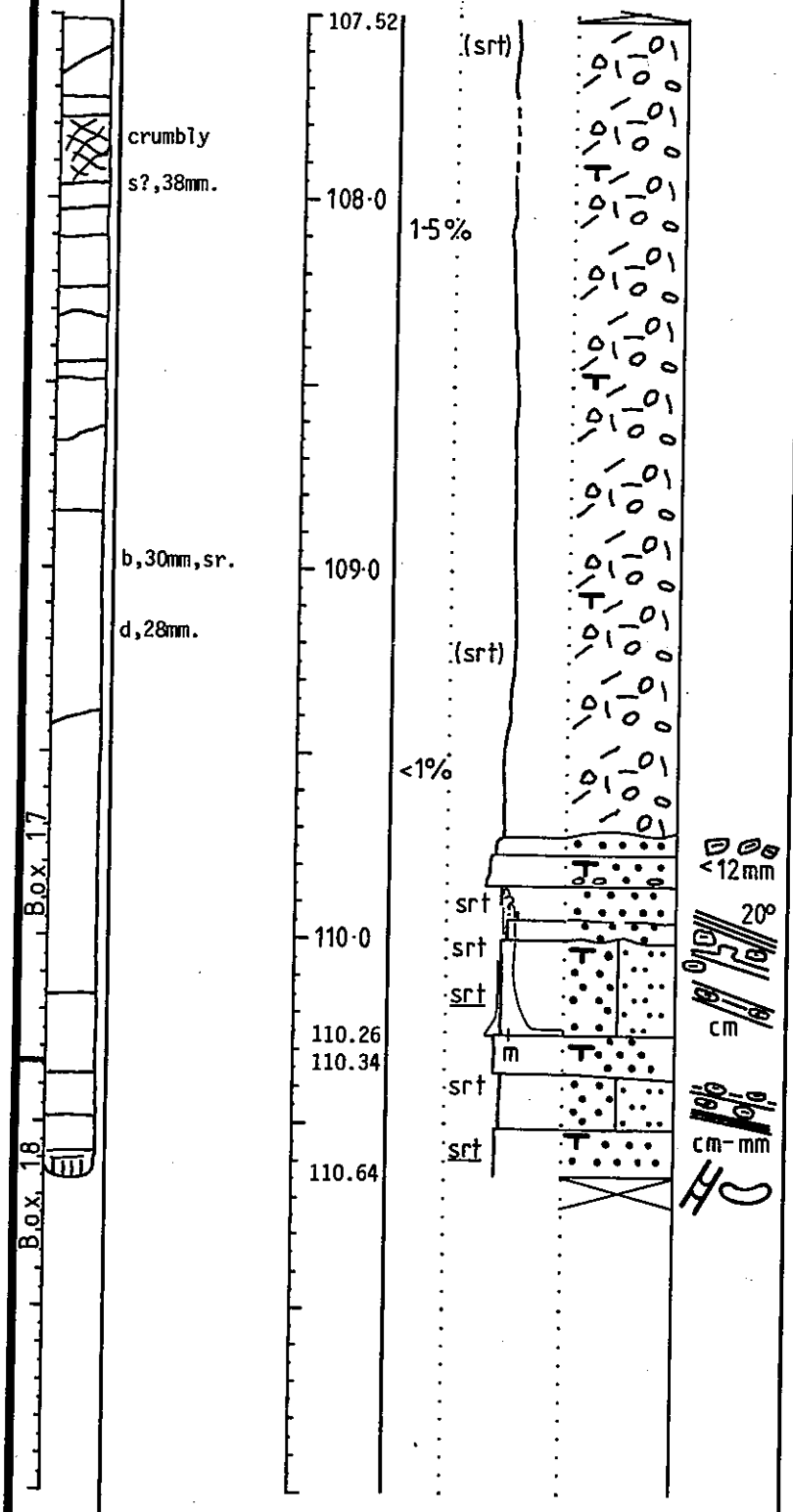
SHEET # 25 of 43 PROJECT CIROS 2

SCALE 1:20



SHEET # 26 of 43 PROJECT CIROS 2

SCALE 1:20



DESCRIPTION

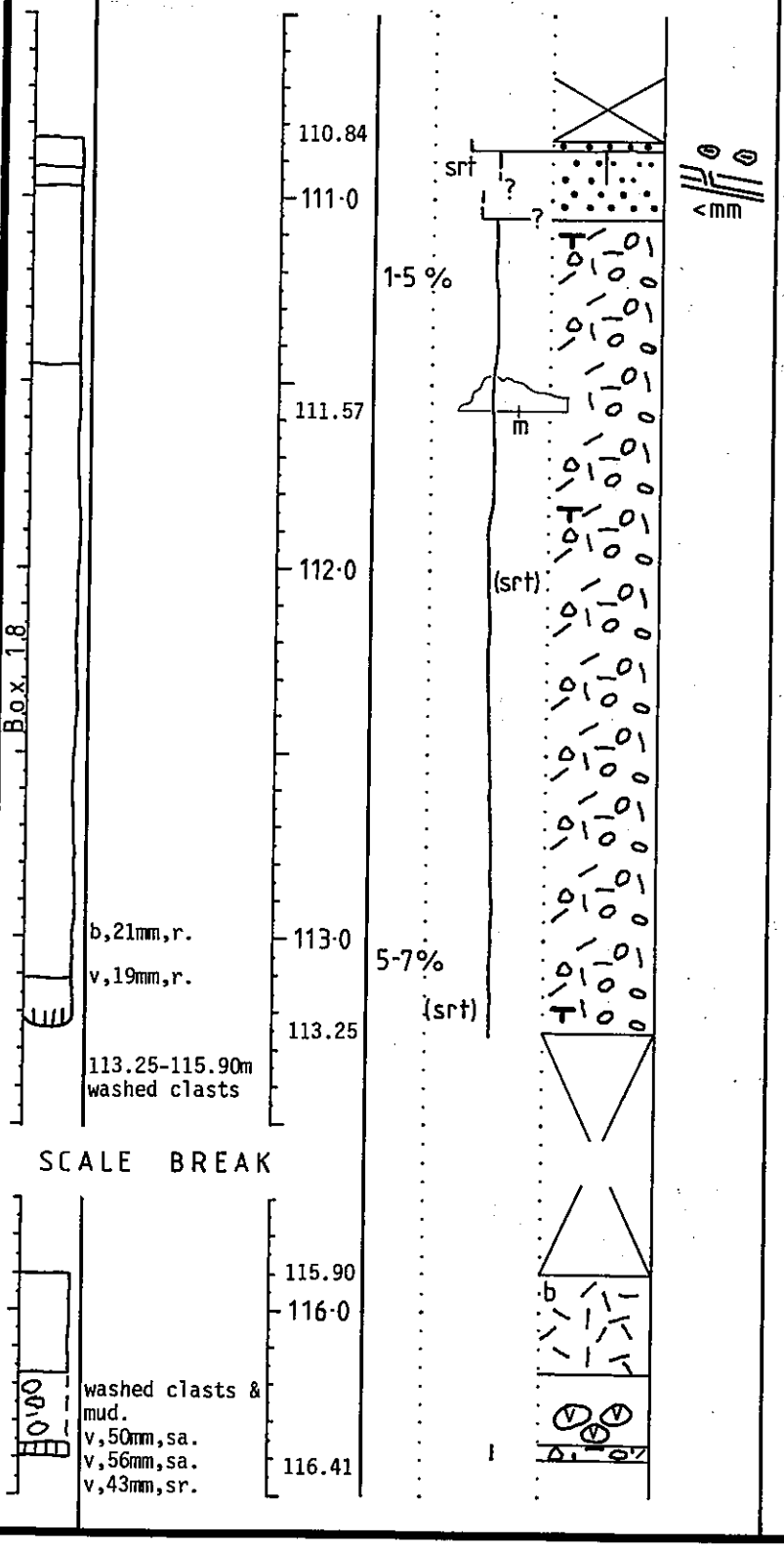
109.86 to 111.06m

Sandstone medium to fine, moderately well sorted with muddy interbeds. Well stratified cm-mm bedded with mudstone clasts dipping 20 degrees to 25 degrees. 5GY 4/1 dark greenish gray. Soft and non calcareous. Diatoms and well preserved spicules.

SHEET # 27 of 43

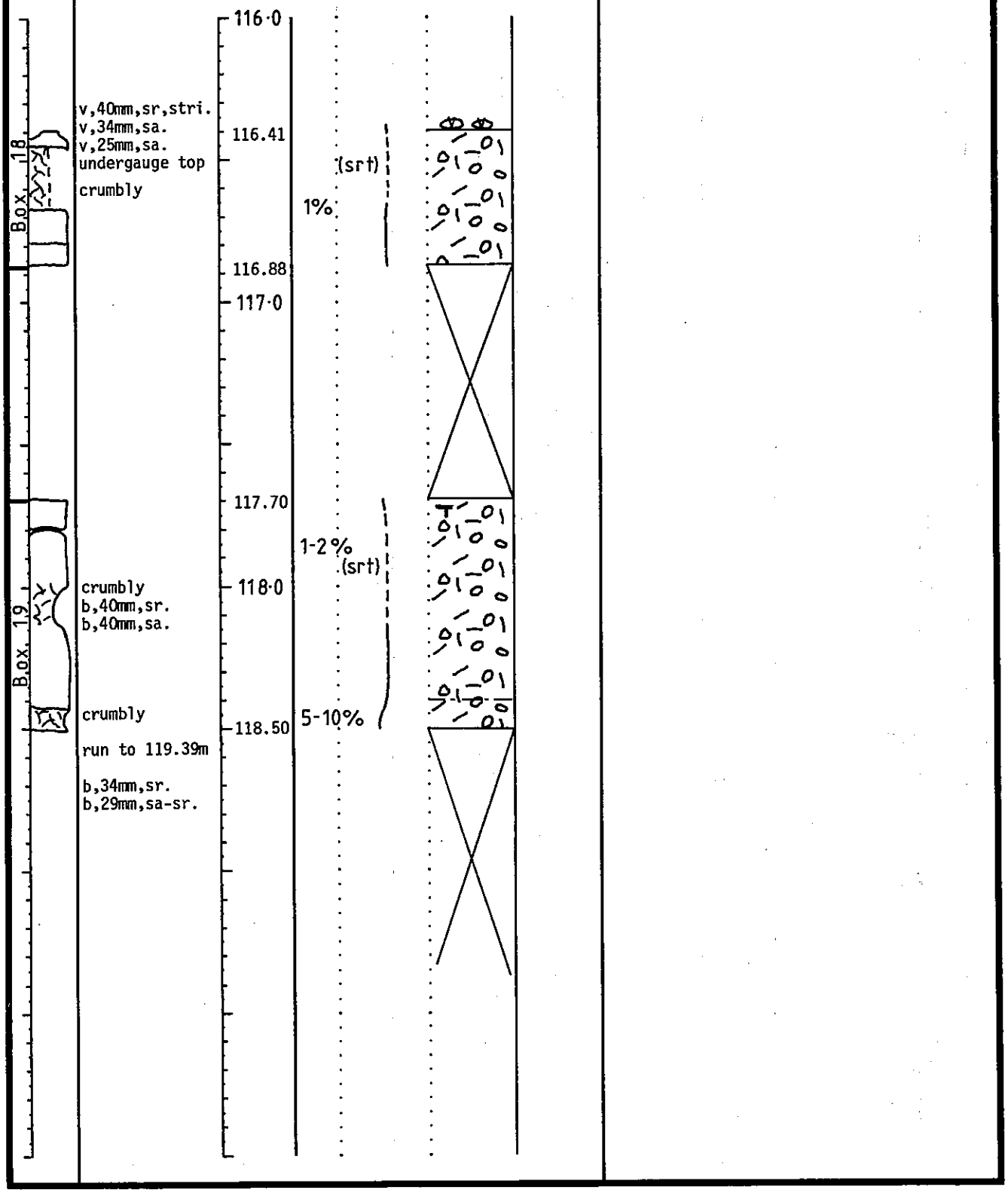
SCALE 1:20

PROJECT CIROS 2



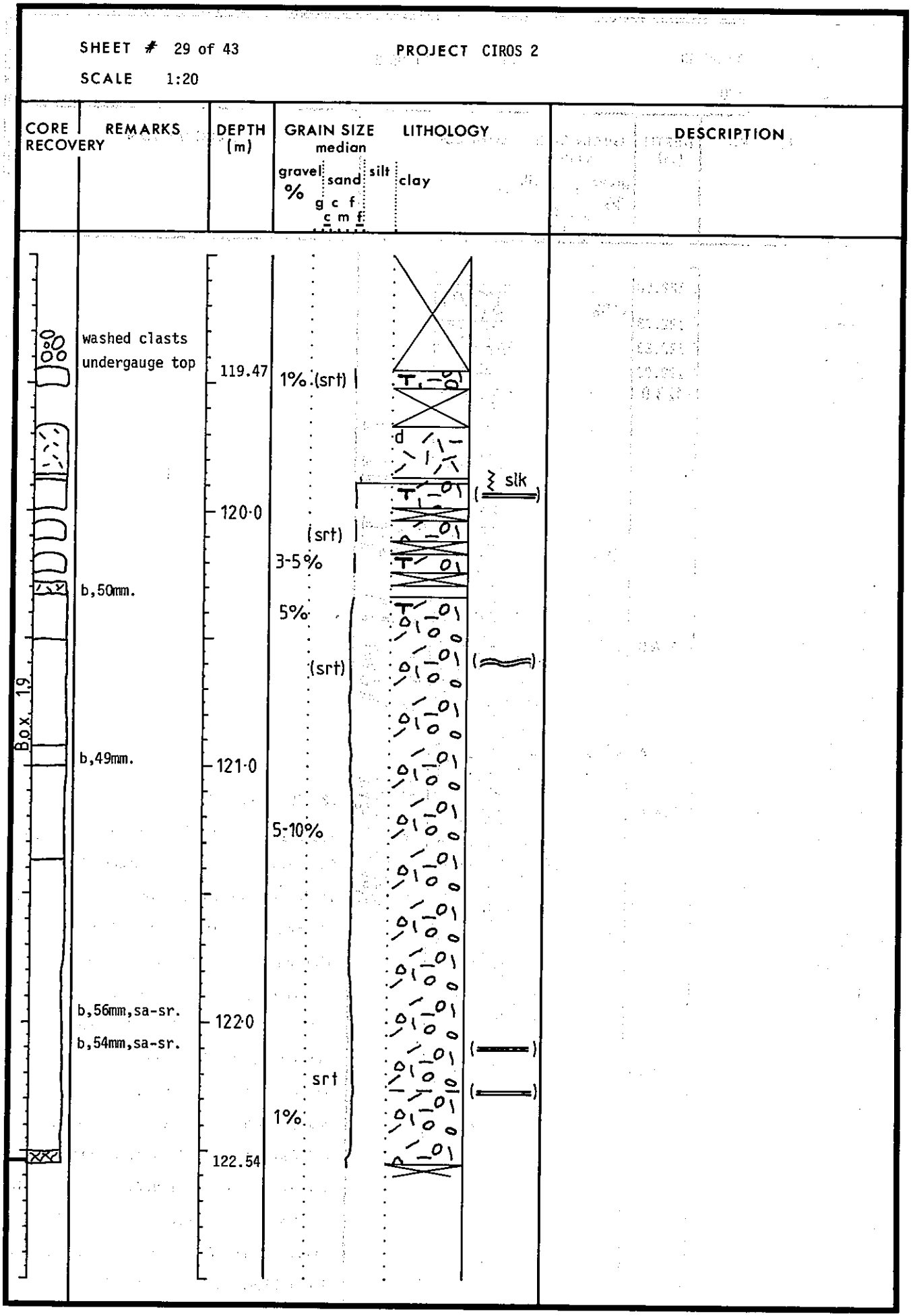
SHEET # 28 of 43 PROJECT CIROS 2

SCALE 1:20



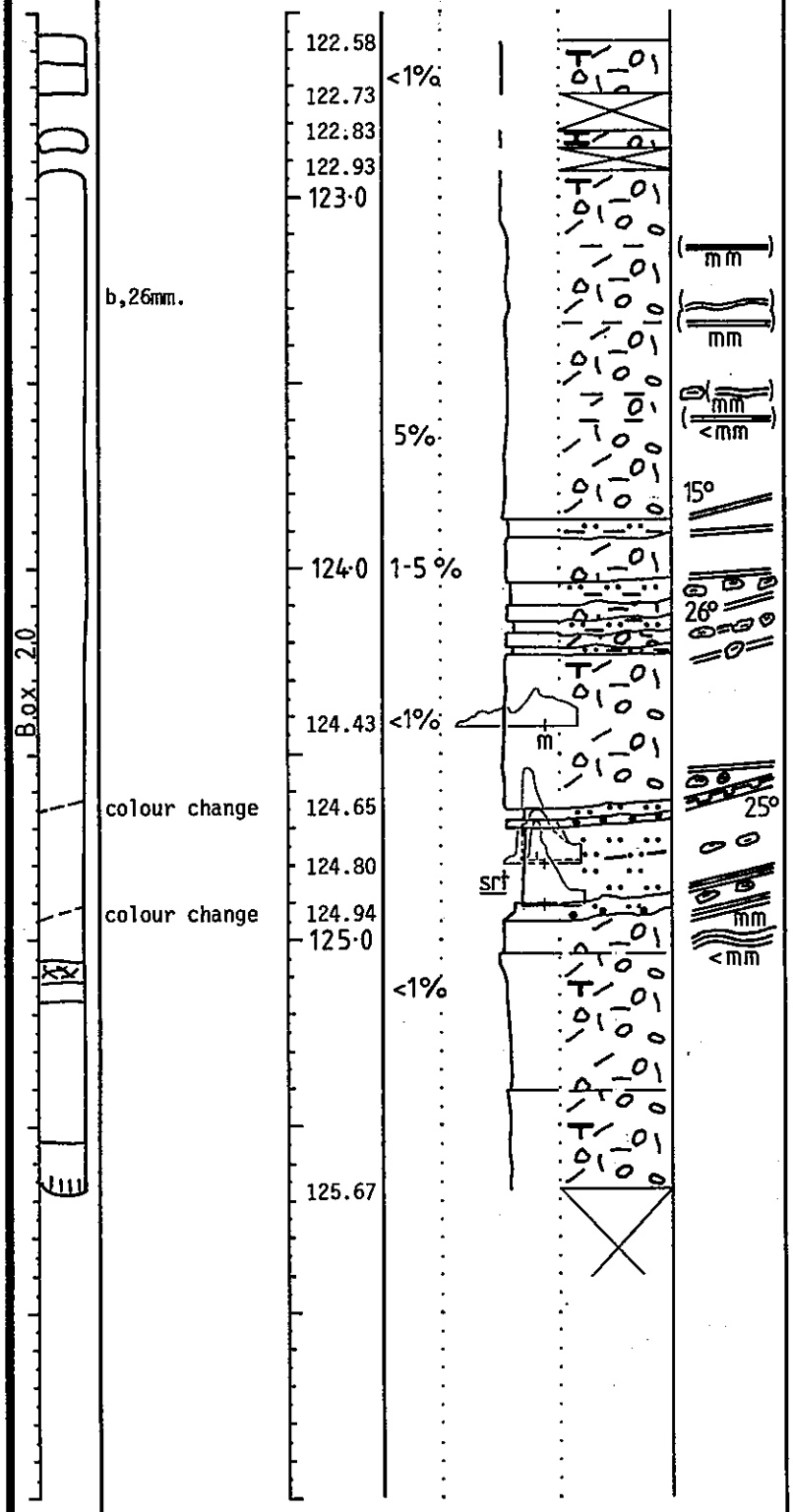
SHEET # 29 of 43 PROJECT CIROS 2

SCALE 1:20



SHEET # 30 of 43 PROJECT CIROS 2

SCALE 1:20



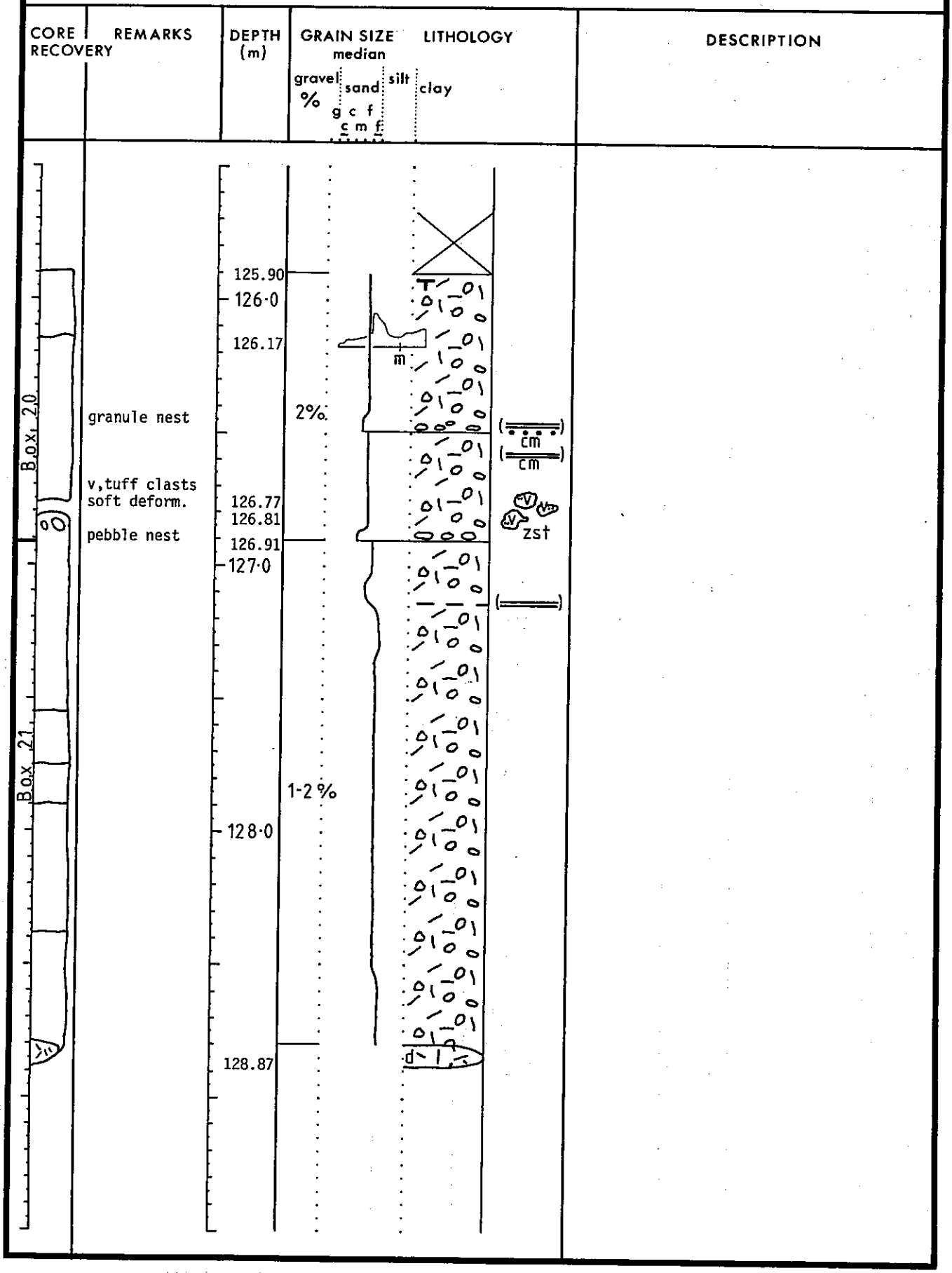
DESCRIPTION

124.65 to 124.94m

Siltstone, well sorted, Tuff. Stratified with mm mudstone beds and laminated mudstone clasts, mm beds alternating with siltstone (tuff) dipping to 25 degrees, convoluted top (loading?), diffuse wavy mm bedding in siltstone. 10YR 2/2 brownish black siltstone, 5G 5/1 "bright" greenish gray mudstone clasts and cm beds top and base, N 8/0 grayish white cm bed at 124.65m gradational to diamictite above. Diffuse siltstone (tuff) at 123.94 to 123.98m and 124.02 to 124.05m and siltstone (tuff) clasts at 126.81m in diamictite. Tuff estimate 90% glass.

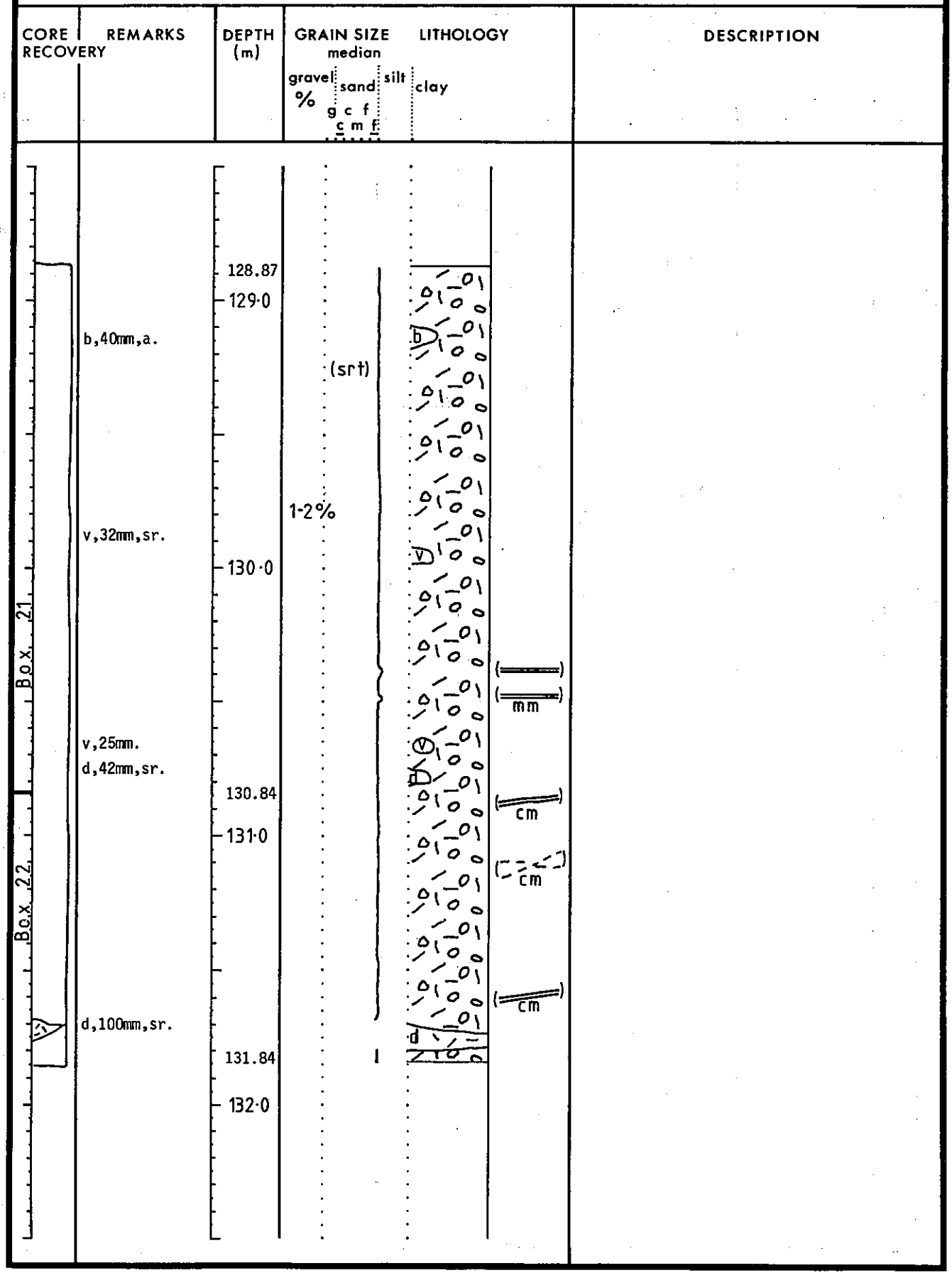
SHEET # 31 of 43 PROJECT CIROS 2

SCALE 1:20



SHEET # 32 of 43 PROJECT CIROS 2

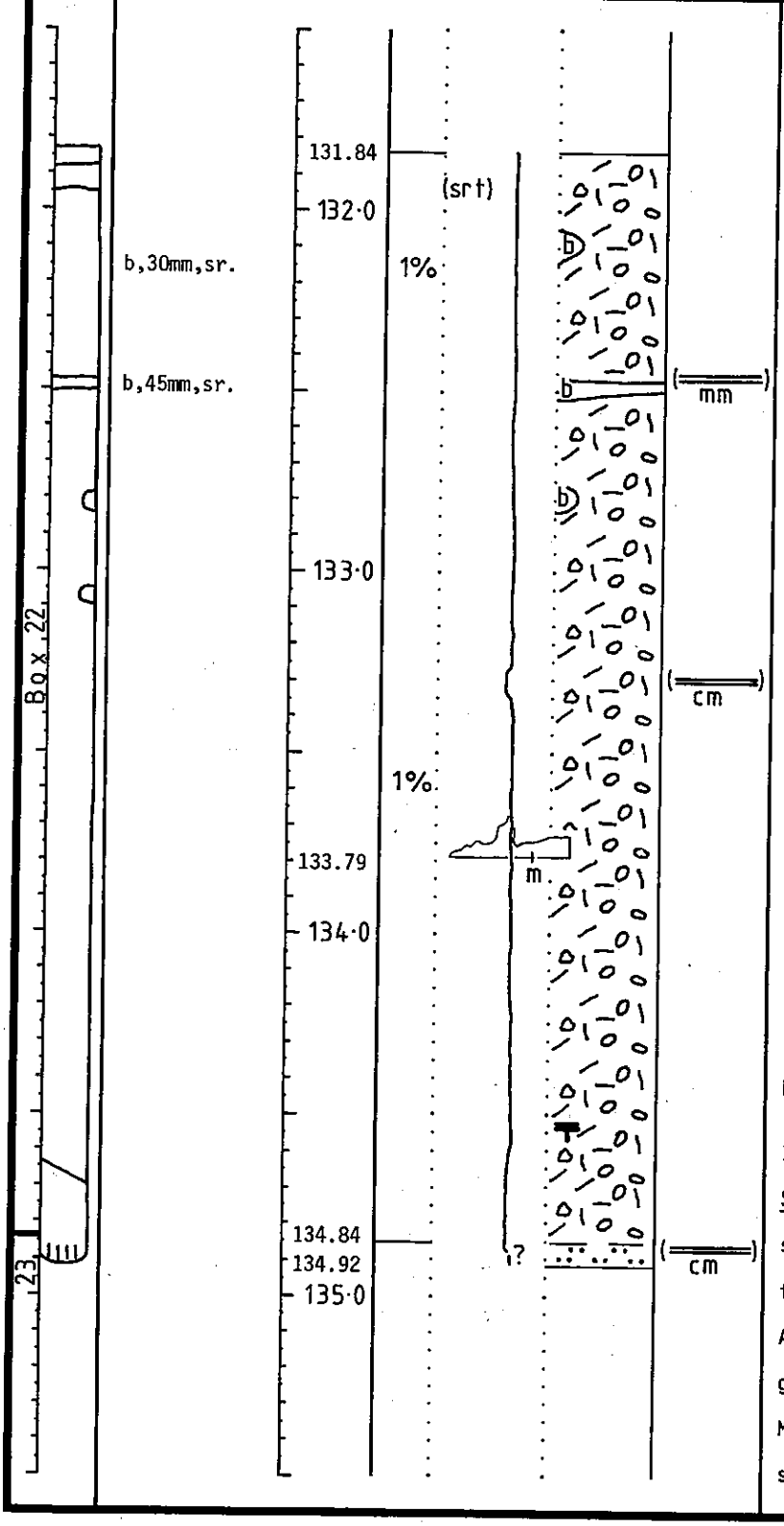
SCALE 1:20



SHEET # 33 of 43

SCALE 1:20

PROJECT CIROS 2



DESCRIPTION

Unit 9. 134.90 to 139.92m

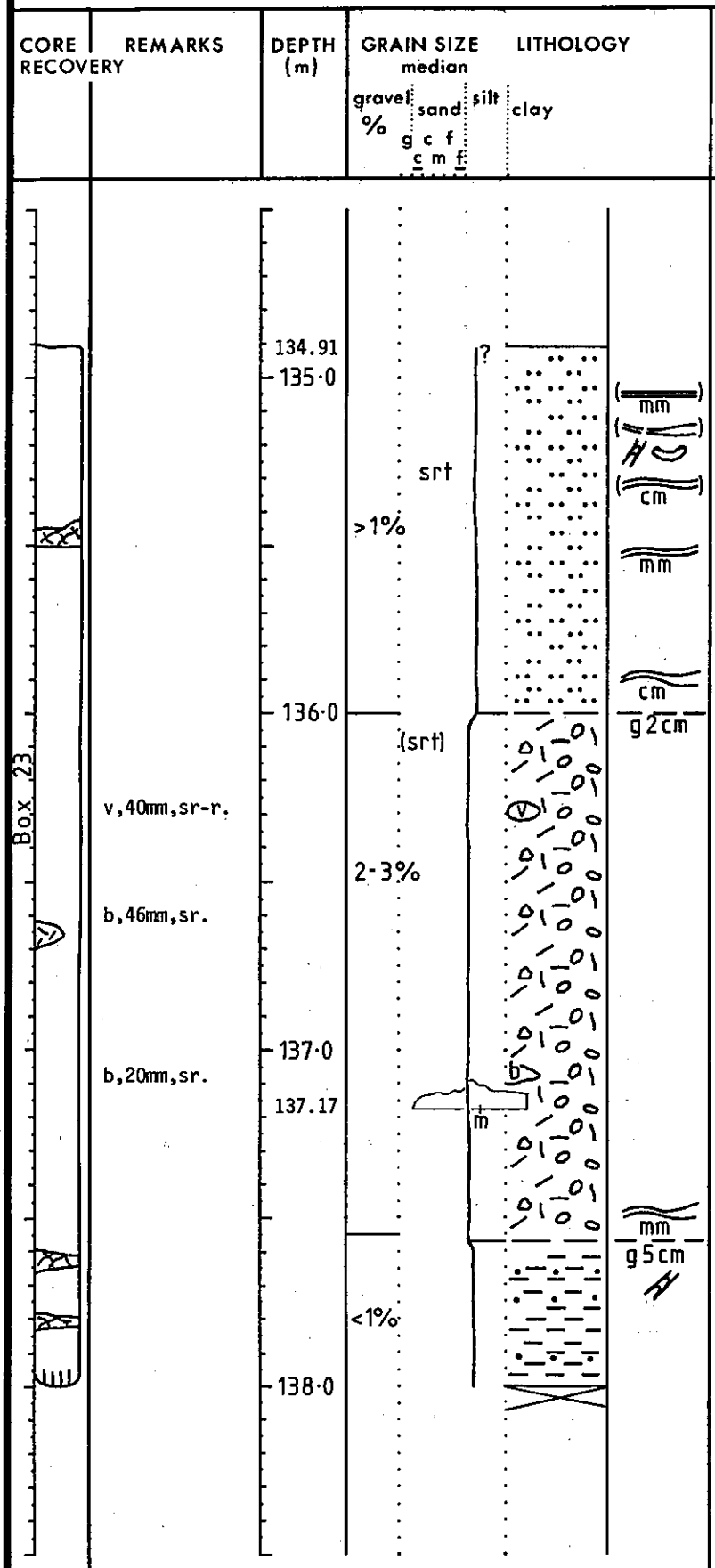
Siltstone, sandy, moderately sorted, Mudstone, sandy and gravelly, poorly sorted. Moderately stratified cm-mm bedding 134.90 to 136.00m and sandy cm bedding at 138.50m. Dark greenish gray and dark olive gray. Moderately hard to soft and crumbly. Diatoms abundant in places.

134.90 to 135.98m

Siltstone, sandy, moderately well sorted. cm and mm bedded, wavy, dipping from horizontal to 30 degrees. Alternating colours. 7.5GY 5/1 greenish gray and 7.5Y 5/2-4/2 grayish olive. Moderately hard. Diatoms abundant with spicules at 135.30m.

SHEET # 34 of 43 PROJECT CIROS 2

SCALE 1:20



135.98 to 137.56m

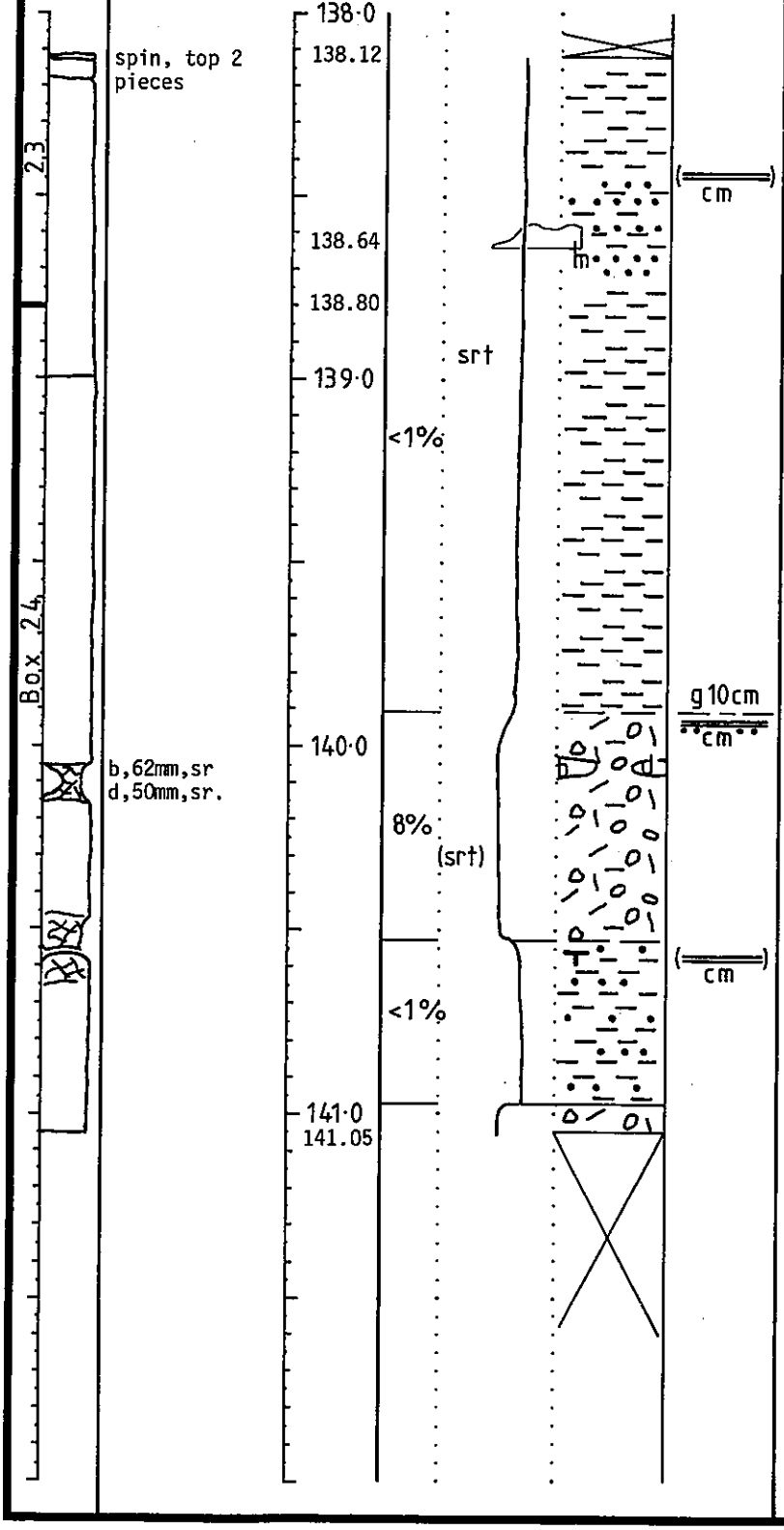
Mudstone, sandy and slightly gravelly, moderately poorly sorted, Diamictite. Poorly stratified. 5G 4/1 dark greenish gray. Moderately soft and crumbly. Gravel 2-3%.

137.56 to 139.92m

Mudstone, sandy, moderately well sorted. Slightly stratified with sandy cm bedding 138.50 to 138.75m. 10Y 4/2 olive gray to 10GY 4/1 dark greenish gray. Soft to moderately hard. Diatoms moderately abundant at 137.61m.

SHEET # 35 of 43 PROJECT CIROS 2

SCALE 1:20



DESCRIPTION

Unit 10. 139.92 to 151.25m

Mudstone, sandy and gravelly, very poorly sorted, Diamictite. Slightly stratified. Dark greenish gray. Moderately hard to hard with clay cemented crossed joints in places and non-calcareous.

139.92 to 140.52m)
140.97 to 151.25m)

Mudstone, sandy and gravelly, very poorly sorted, Diamictite. Rare cm-mm bedding. 7.5GY 4/1, 10GY 5/1 dark greenish gray. Moderately hard to hard with clay cemented crossed joints 148.80m to 150.13m. Non-calcareous.

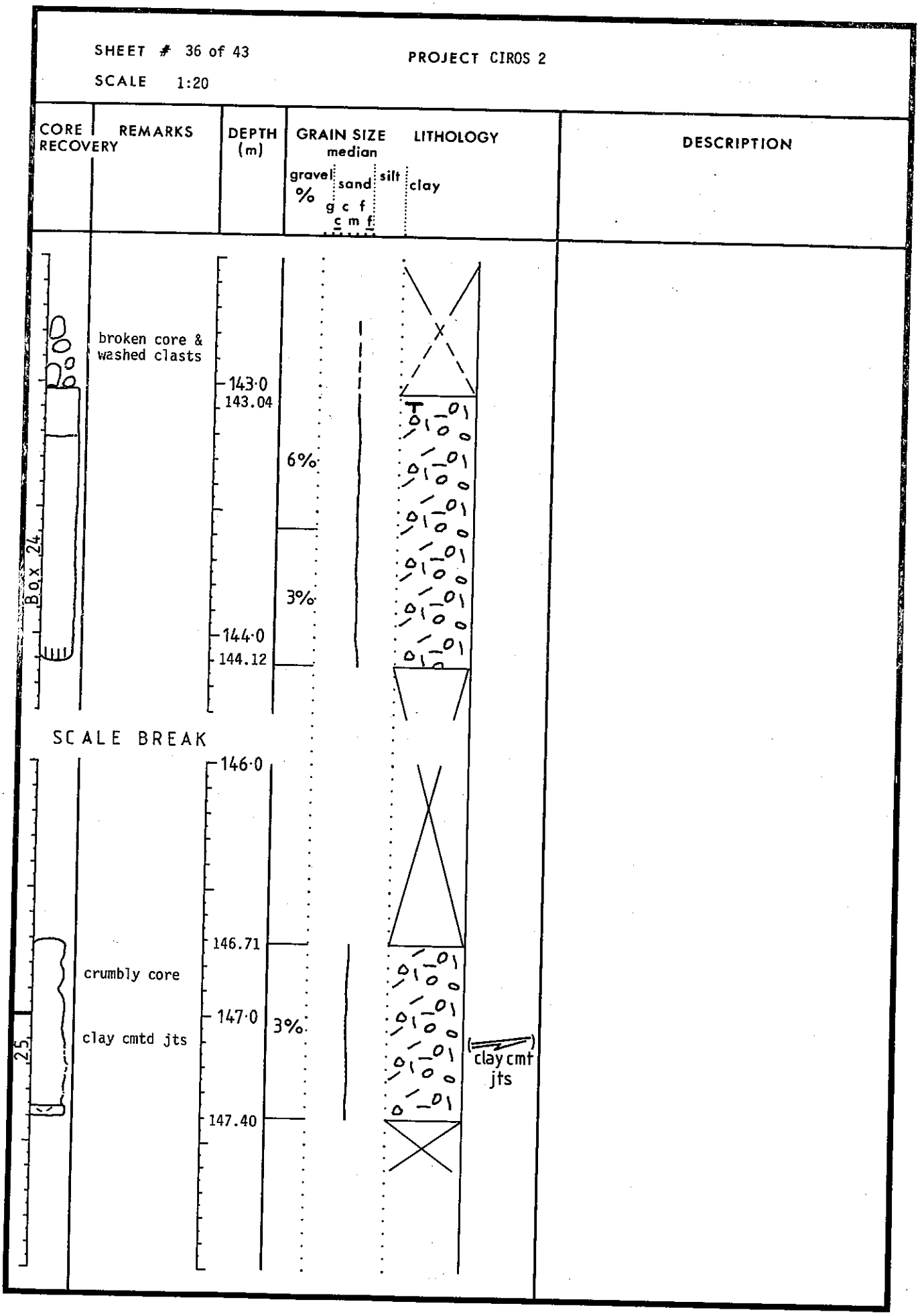
140.52 to 140.97m

Mudstone, sandy. Slight cm bedding. 10G 5/1 greenish gray. Soft to moderately soft and non-calcareous.

SHEET # 36 of 43

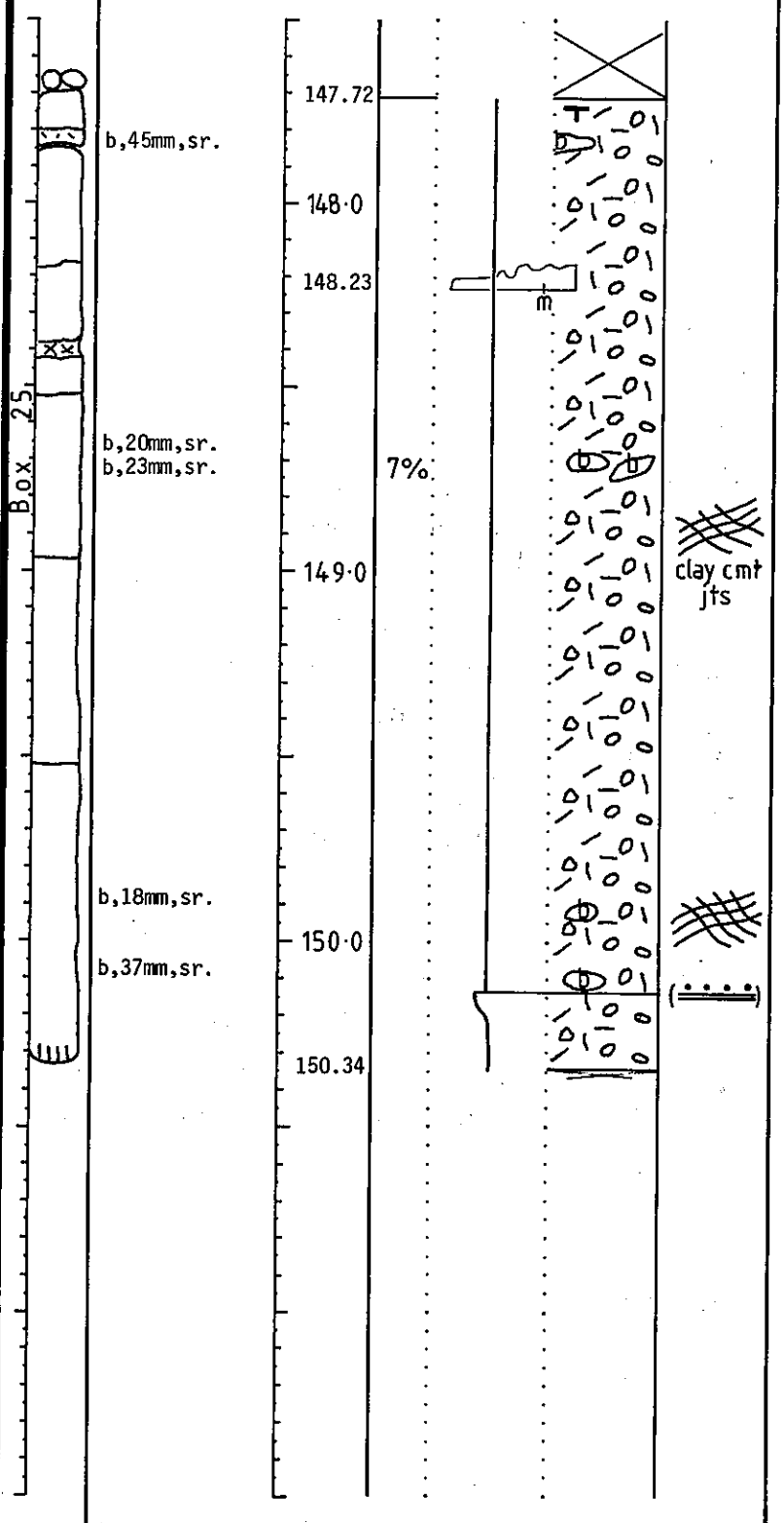
SCALE 1:20

PROJECT CIROS 2



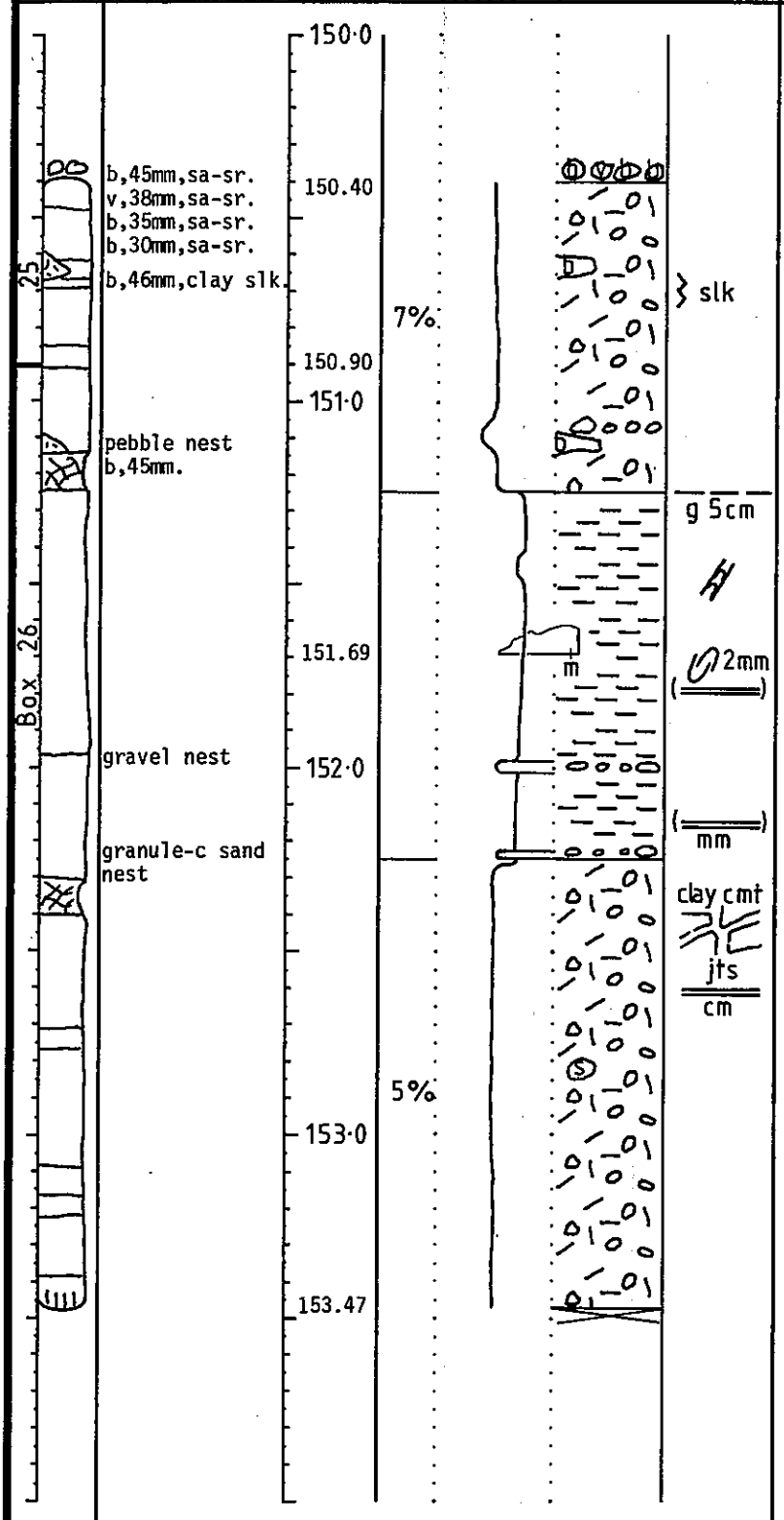
SHEET # 37 of 43 PROJECT CIROS 2

SCALE 1:20



SHEET # 38 of 43 PROJECT CIROS 2

SCALE 1:20



DESCRIPTION

Unit 11. 151.25 to 152.25m

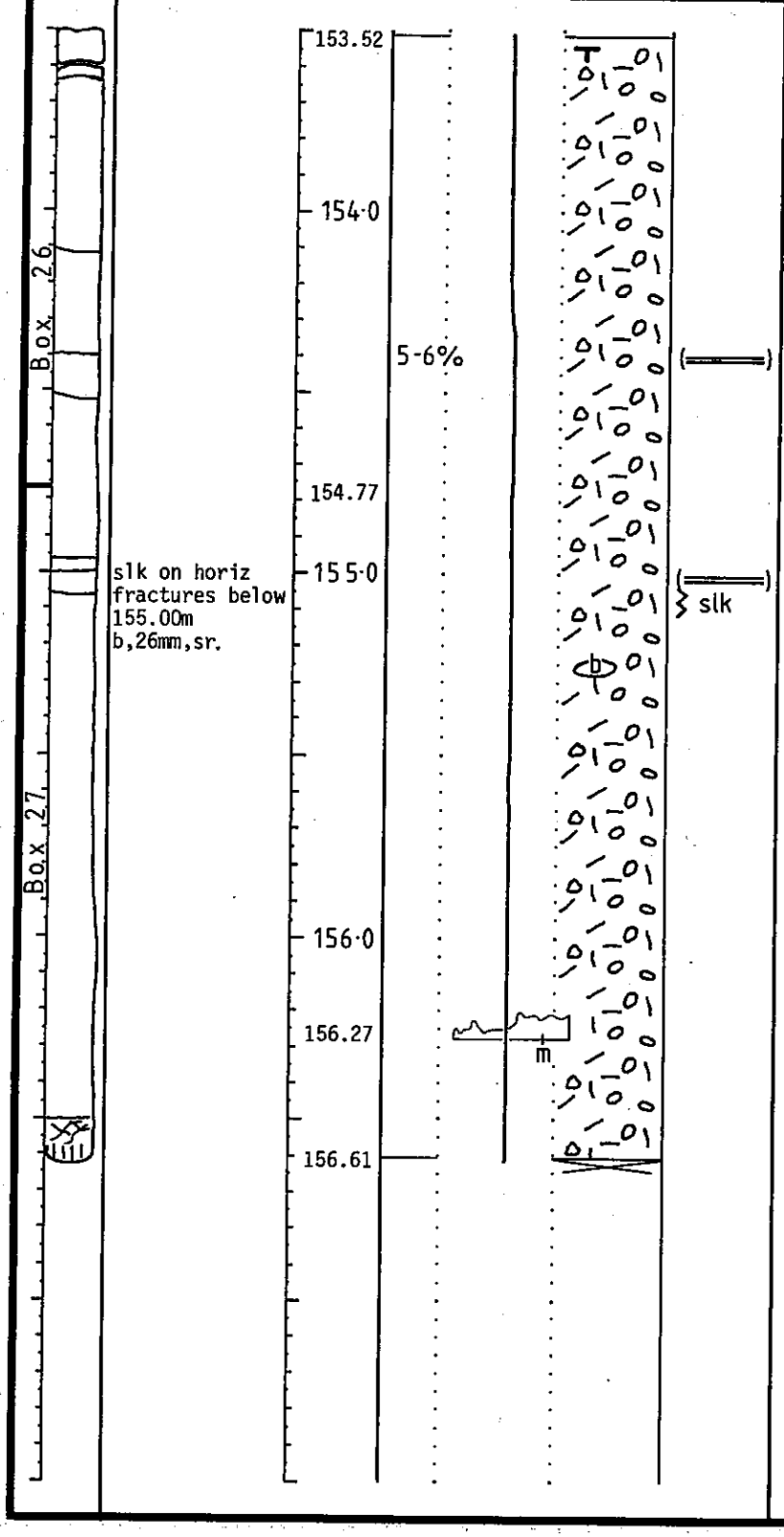
Mudstone, slightly sandy, diatomaceous. Slight mm bedding, gravel lenses and burrowed. Greenish gray (10GY 5/1). Soft to moderately soft. Diatoms abundant and spicules.

Unit 12. 152.25 to 165.37m

Mudstone, sandy and gravelly, Diamictite. Slightly bedded in places. Dark greenish gray (10GY 4/1) and greenish gray (5G 5/1). Moderately hard with subhorizontal clay slickenside surfaces on post drill fractures. Slightly calcareous to non-calcareous.

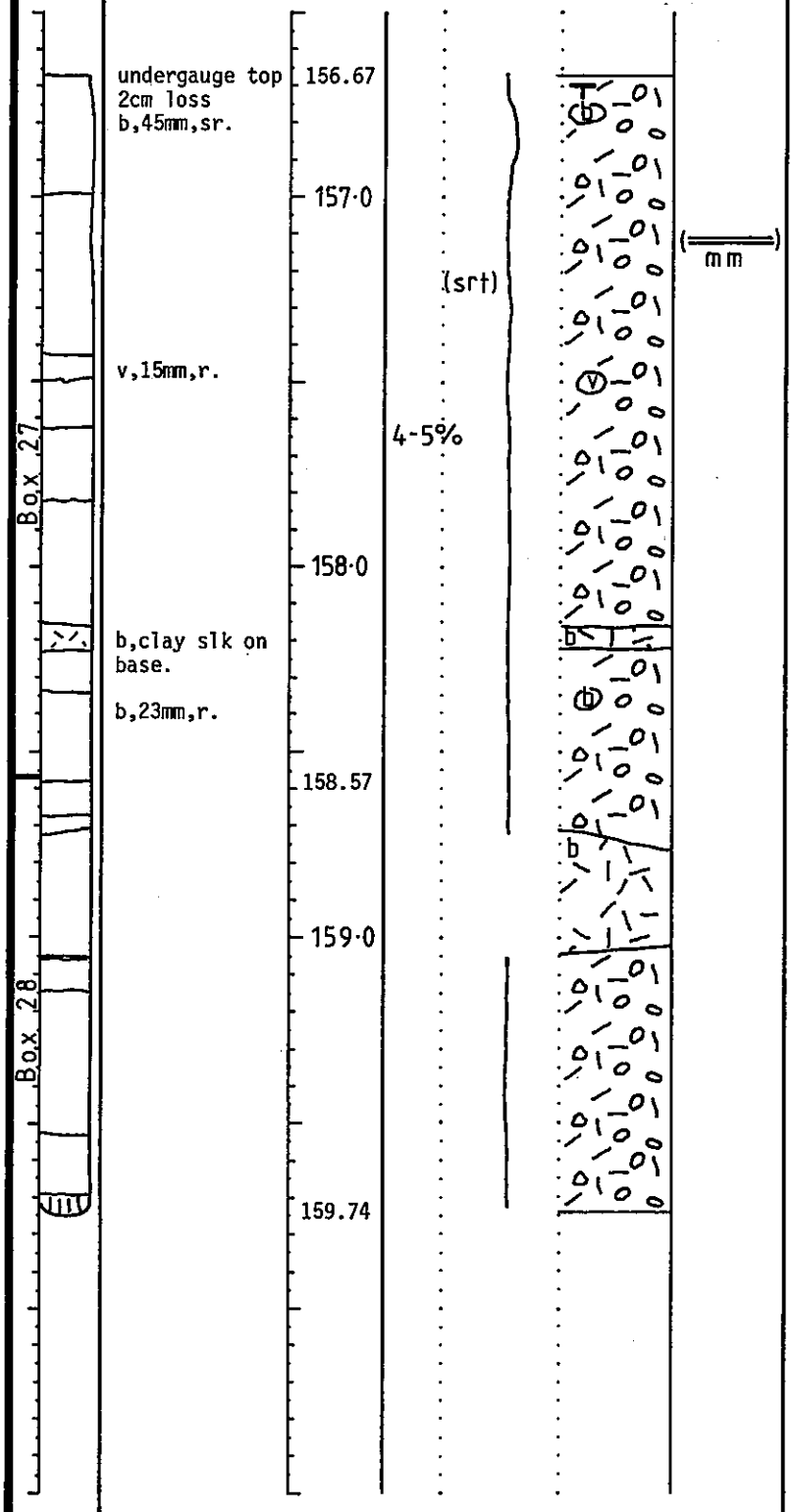
SHEET # 39 of 43 PROJECT CIROS 2

SCALE 1:20



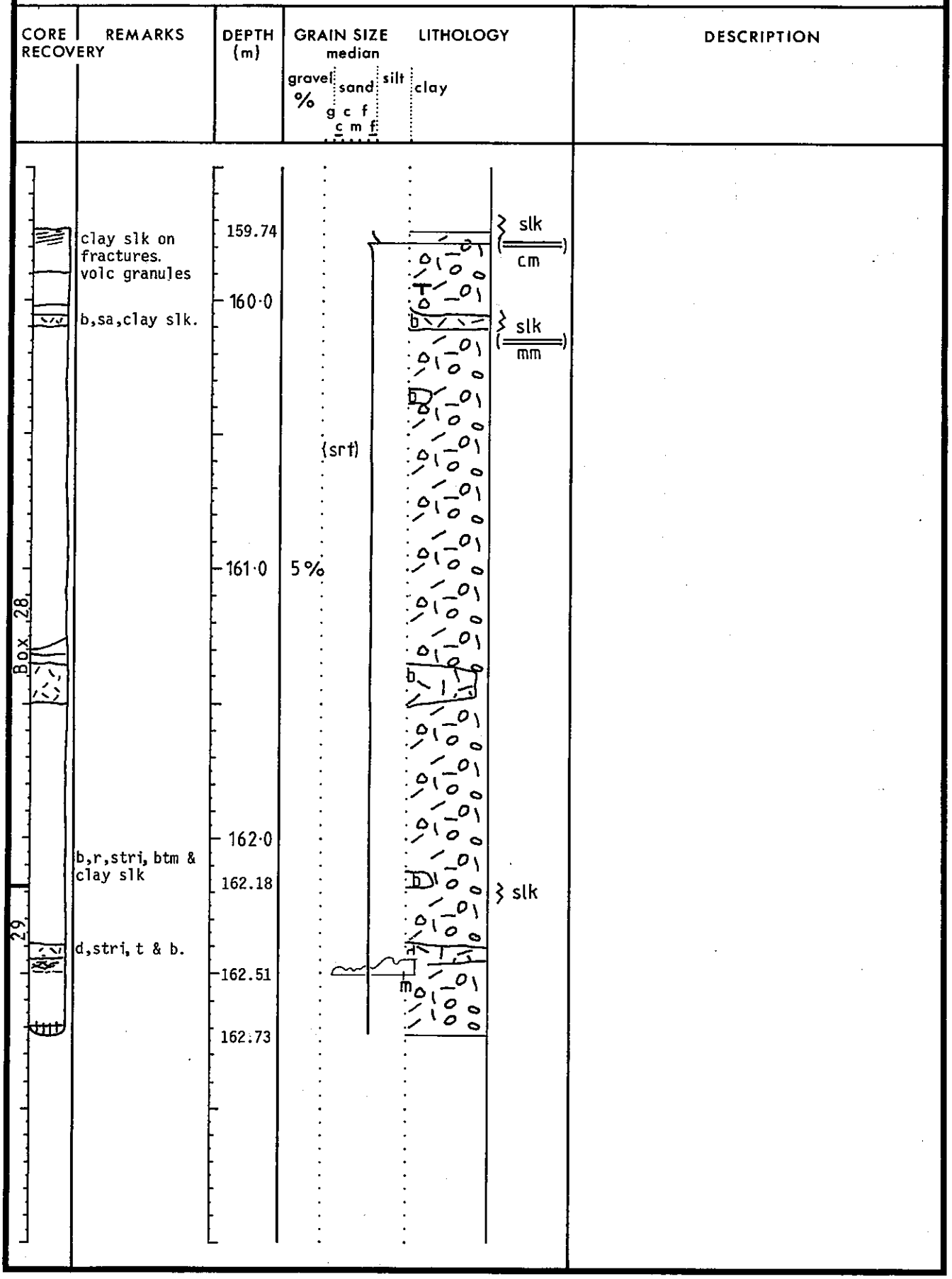
SHEET # 40 of 43 PROJECT CIROS 2

SCALE 1:20



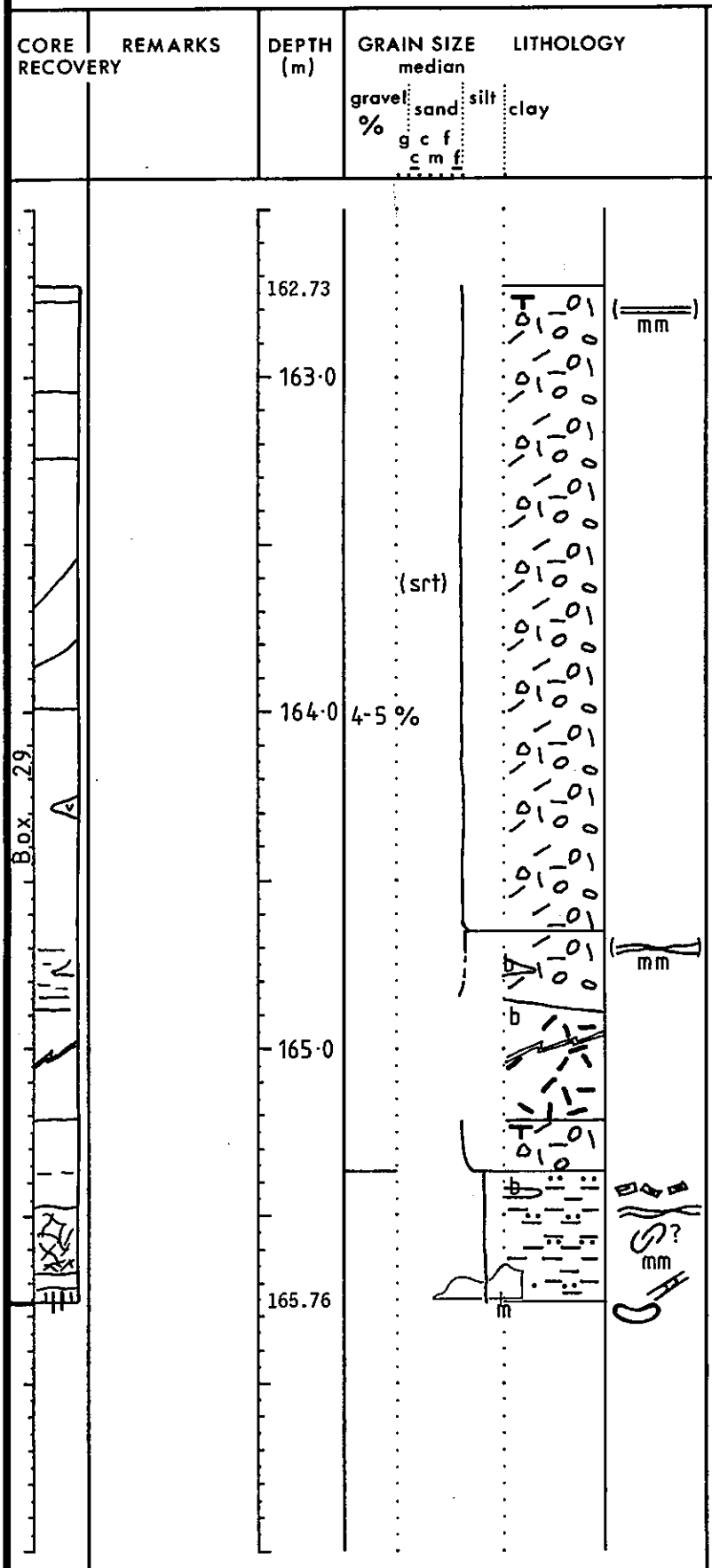
SHEET # 41 of 43 PROJECT CIROS 2

SCALE 1:20



SHEET # 42 of 43 PROJECT CIROS 2

SCALE 1:20

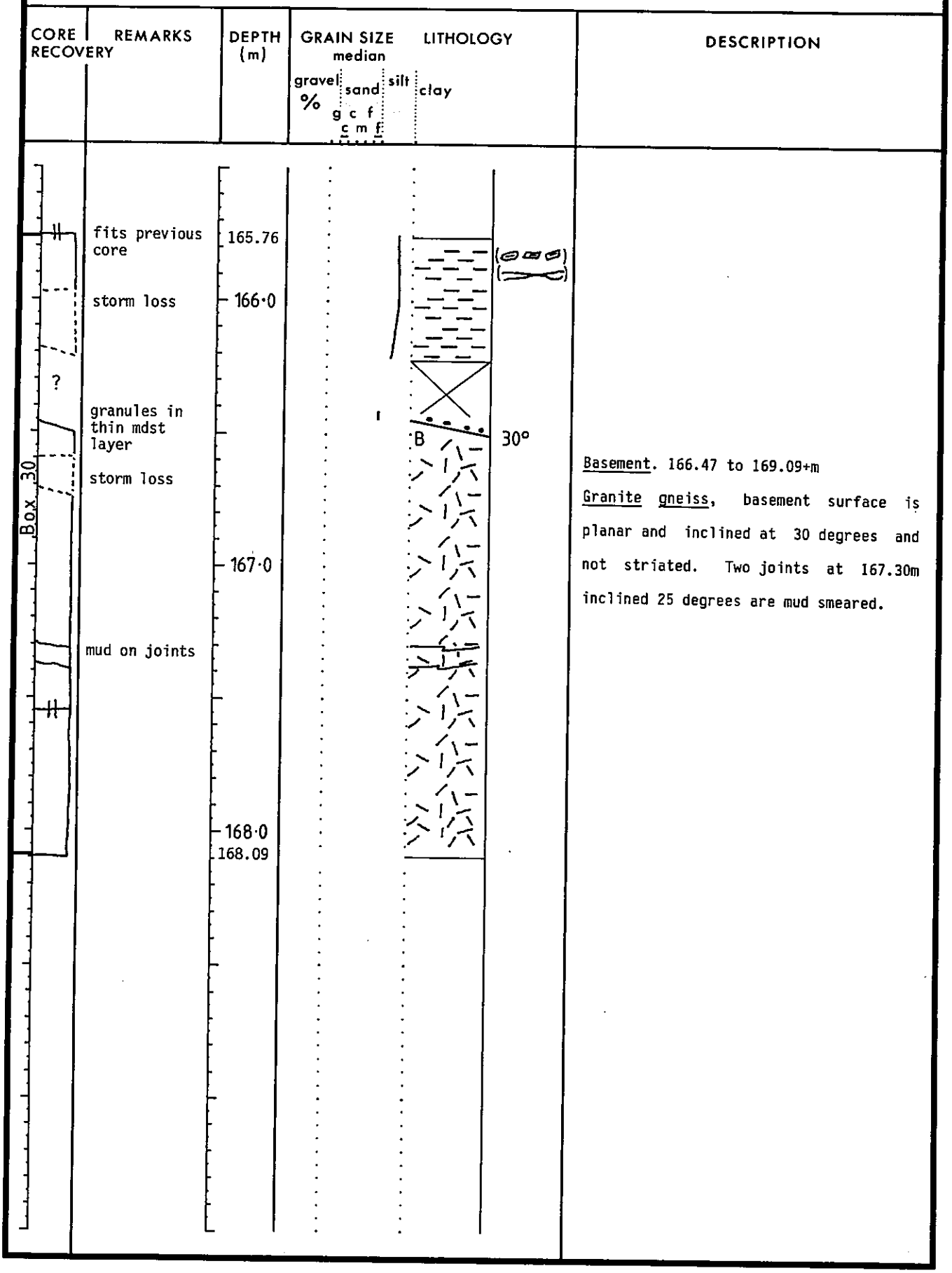


Unit 13. 165.37 to 166.47m

Mudstone, sandy and diatomaceous. Slightly wavy mm bedding with mudstone clasts and burrowing. Greenish gray (5G 5/1). Soft to moderately soft and slightly calcareous. Diatoms and spicules abundant. Granule layer in mudstone on basement surface.

SHEET # 43 of 43 PROJECT CIROS 2

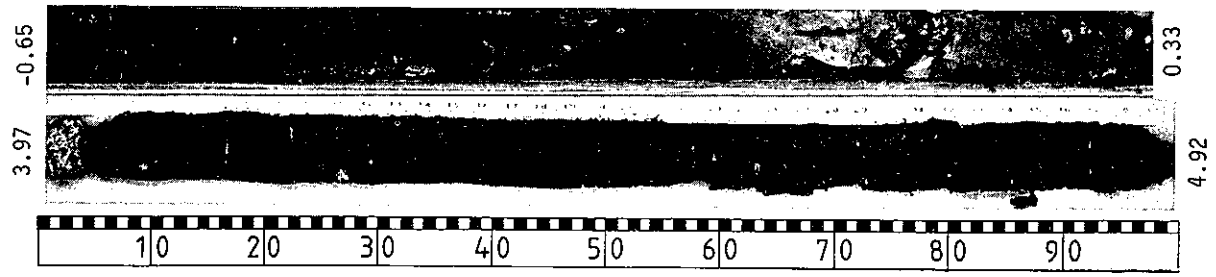
SCALE 1:20



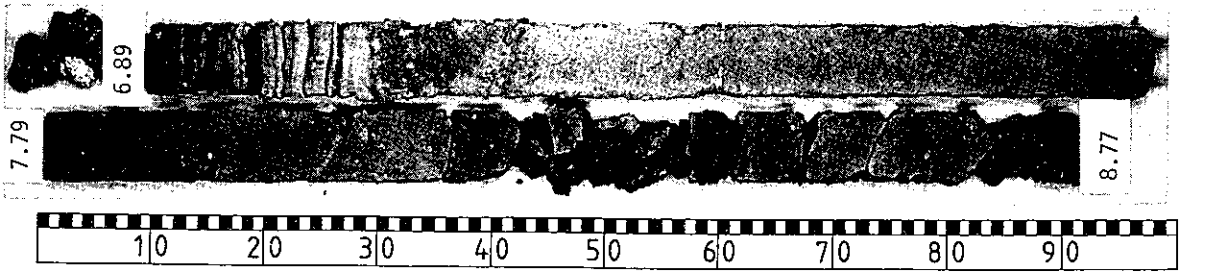
Basement. 166.47 to 169.09+m

Granite gneiss, basement surface is planar and inclined at 30 degrees and not striated. Two joints at 167.30m inclined 25 degrees are mud smeared.

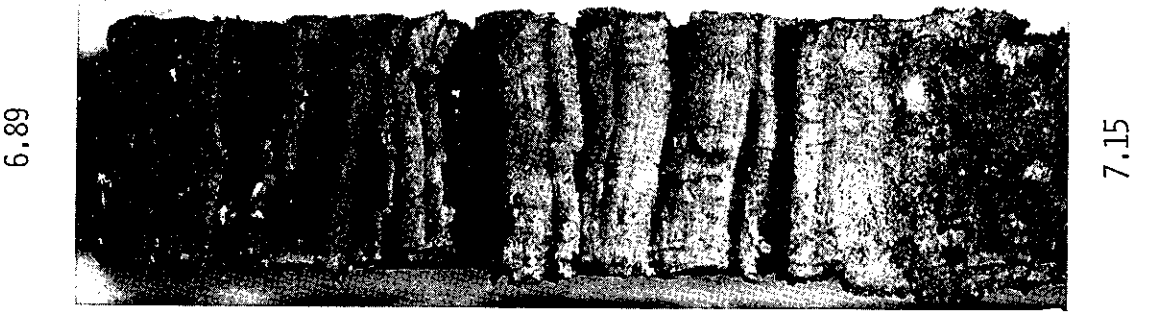
APPENDIX 1: CIROS 2 CORE PHOTOGRAPHS

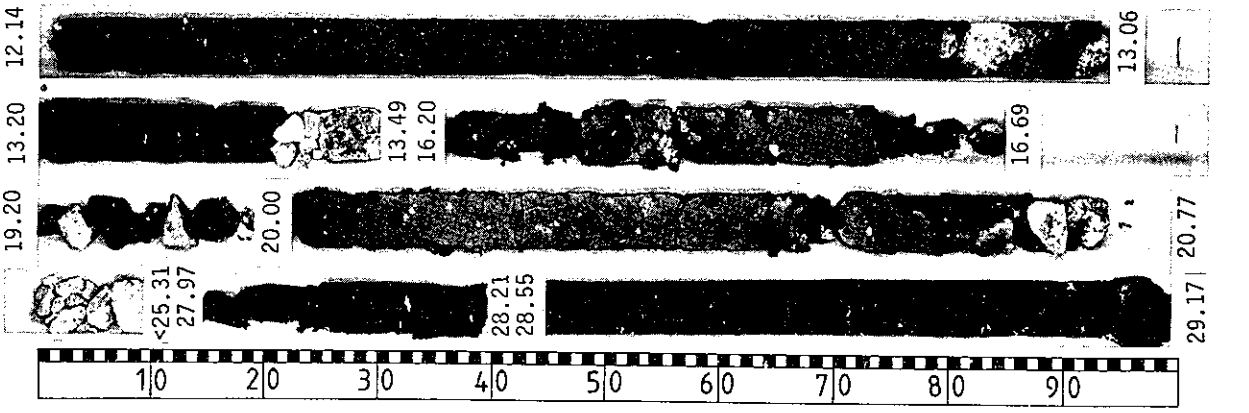


DEPTH -0.65 TO 4.92M. BOX 1

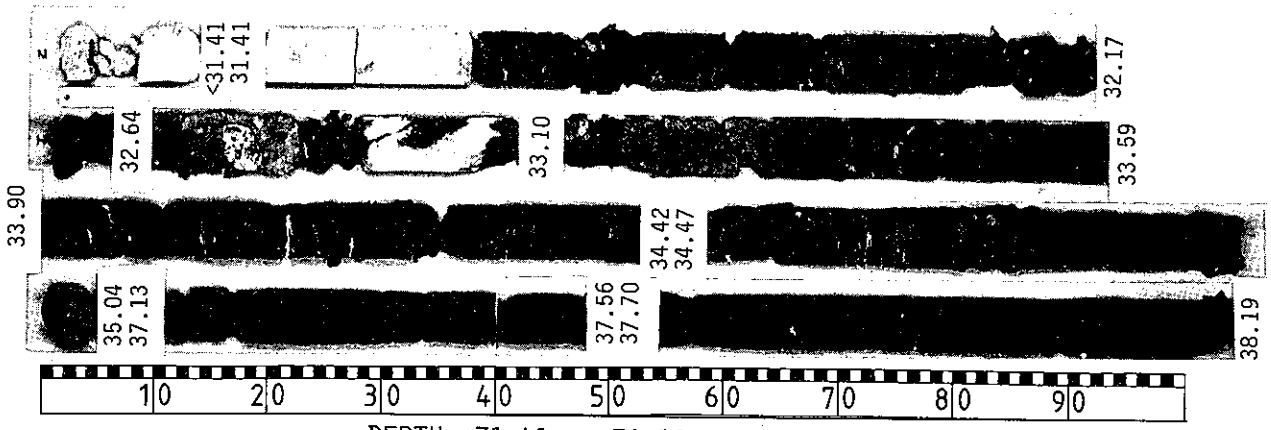


DEPTH 6.89 TO 8.77M. BOX 2

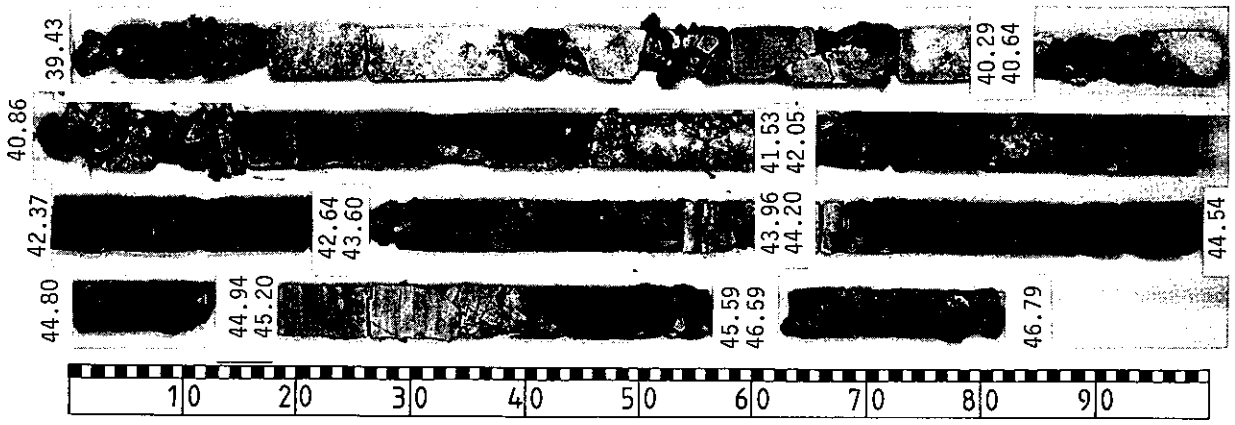




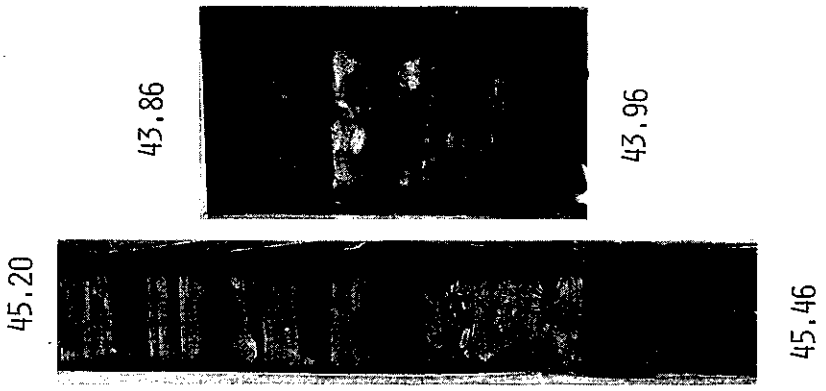
DEPTH 12.14 TO 29.17M. BOX 3

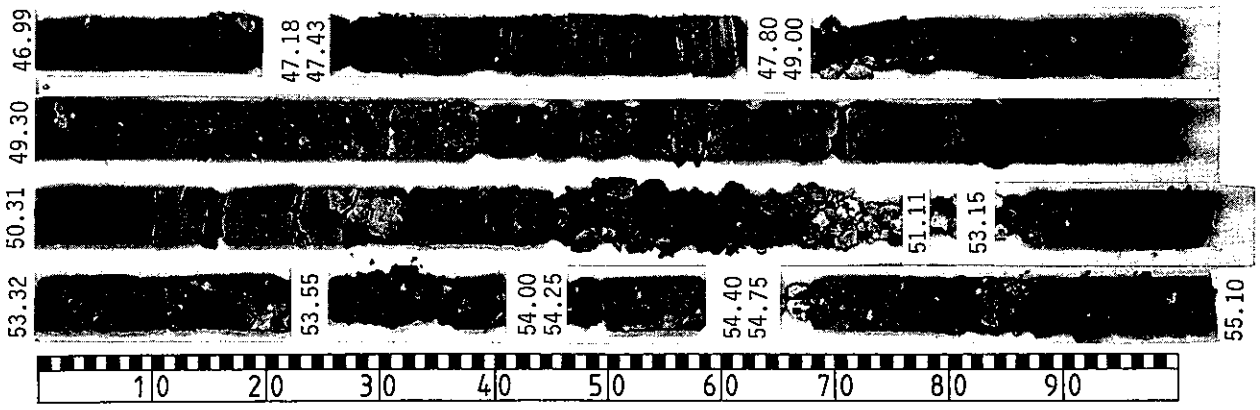


DEPTH <31.41 TO 38.19M. BOX 4

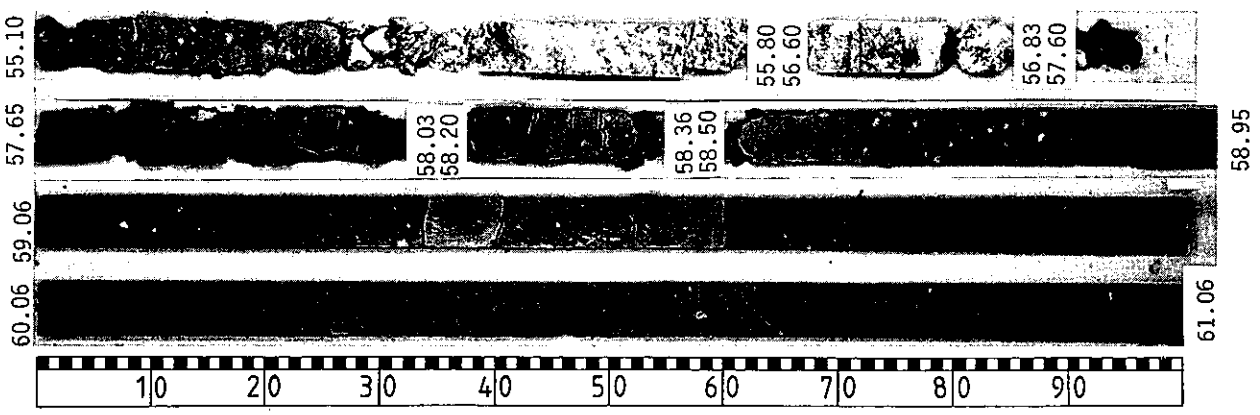


DEPTH 39.43 TO 46.79M. BOX 5

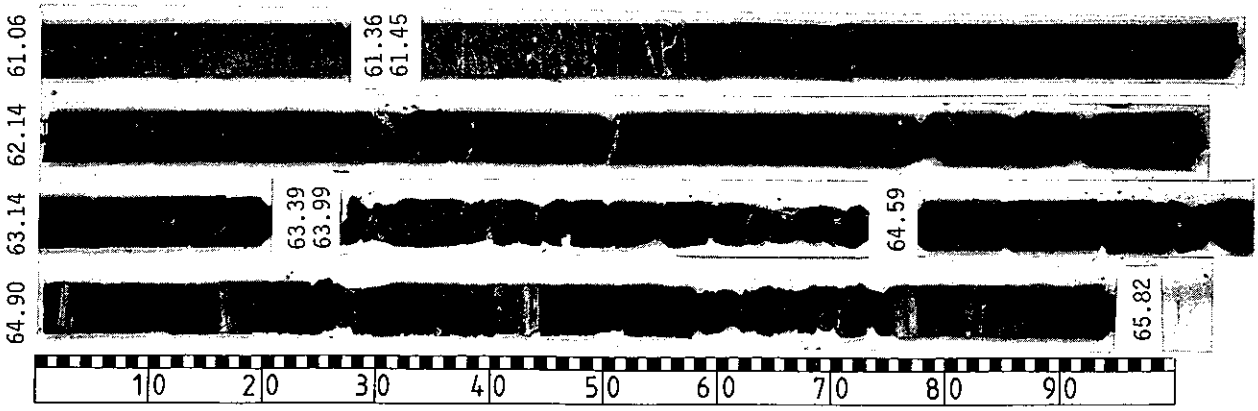




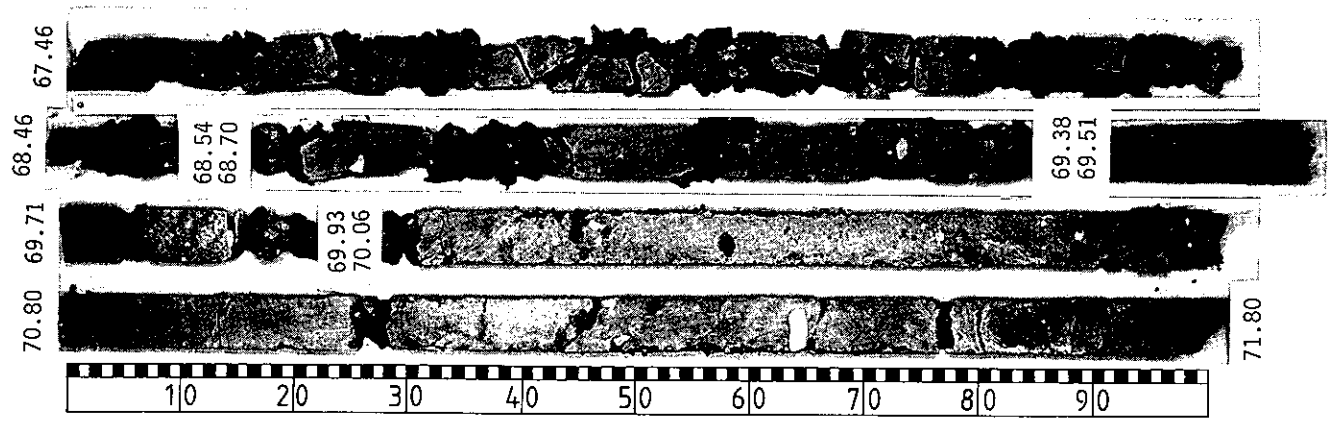
DEPTH 46.99 TO 55.10M. BOX 6



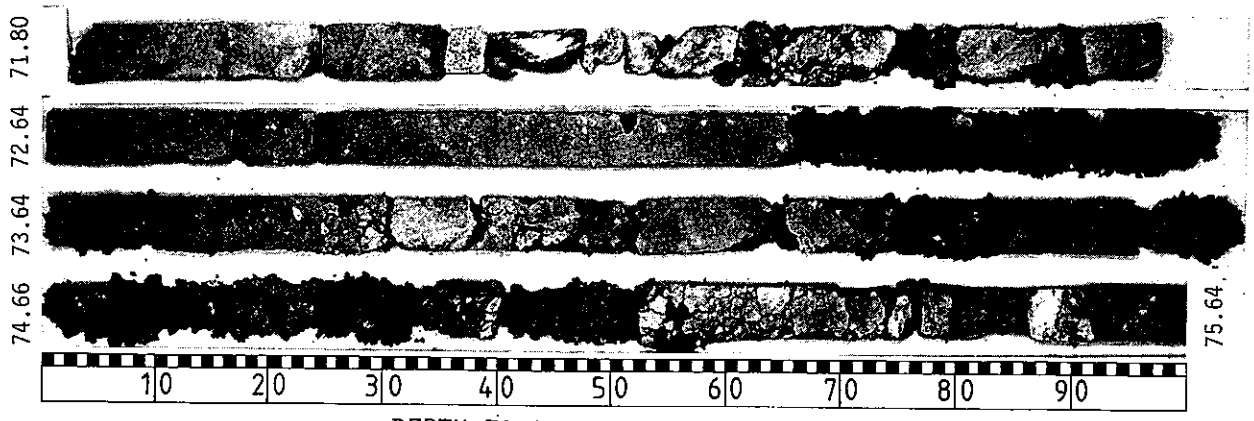
DEPTH 55.10 TO 61.06M. BOX 7



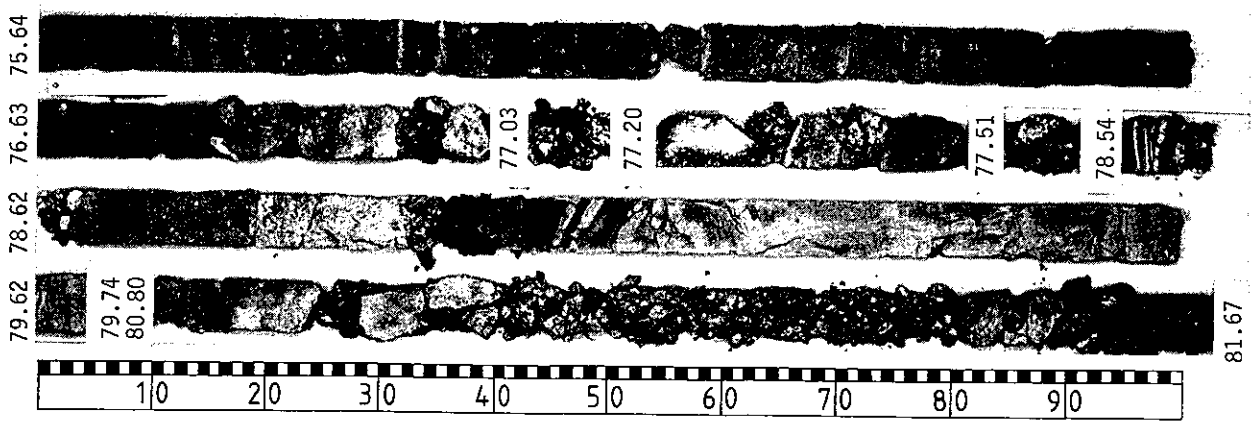
DEPTH 61.06 TO 65.82M. BOX 8



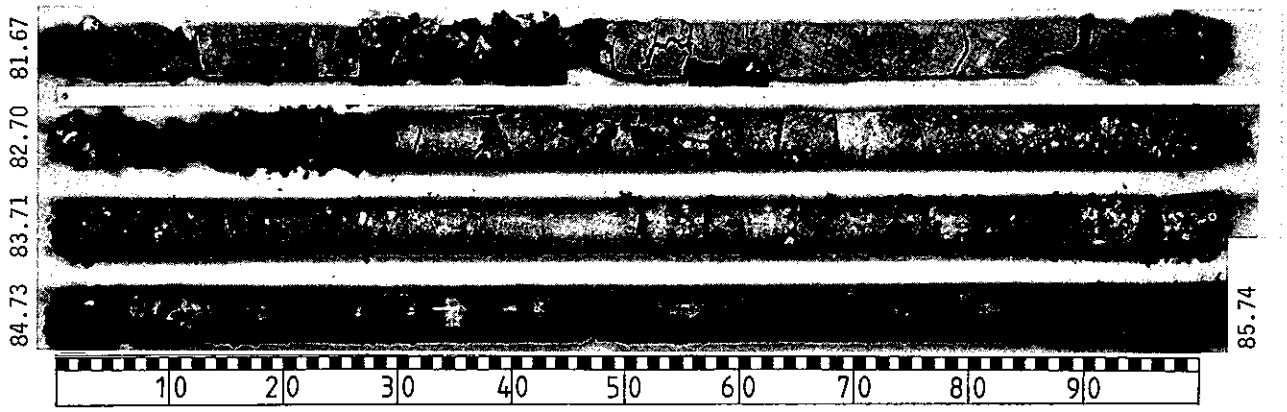
DEPTH 67.46 TO 71.80M. BOX 9



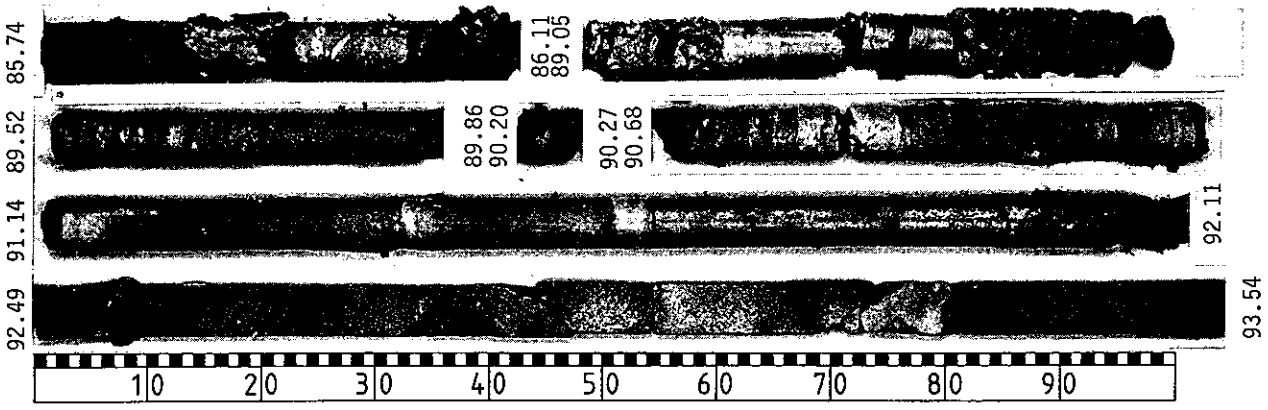
DEPTH 71.80 TO 75.64M. BOX 10



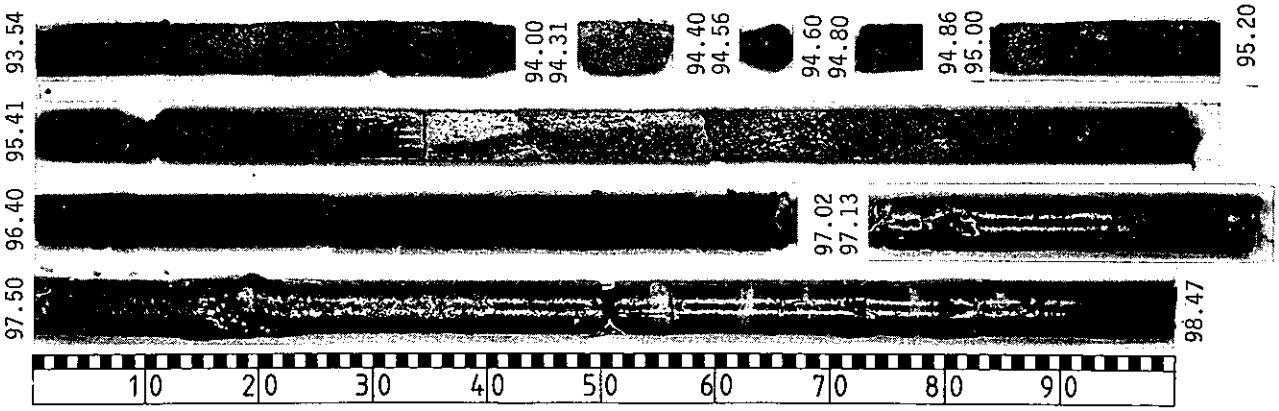
DEPTH 75.64 TO 81.67M. BOX 11



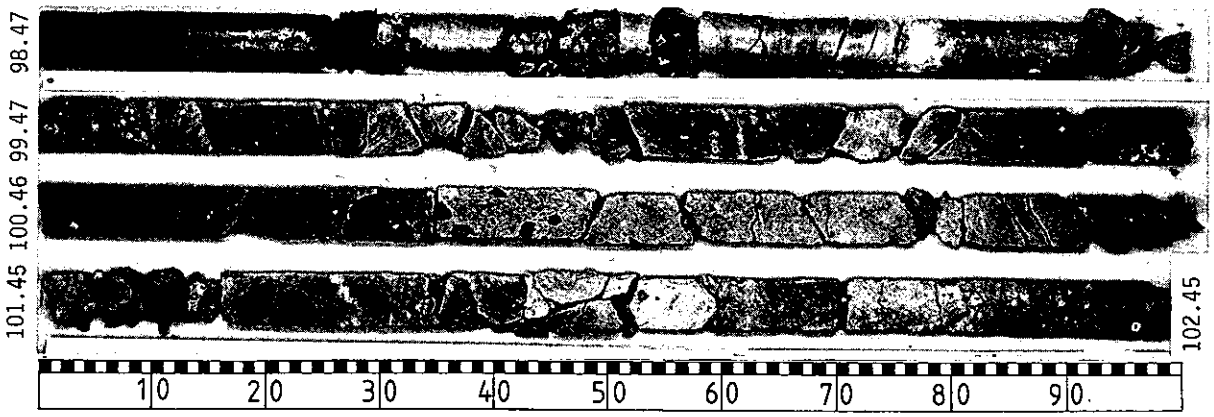
DEPTH 81.67 TO 85.74M. BOX 12



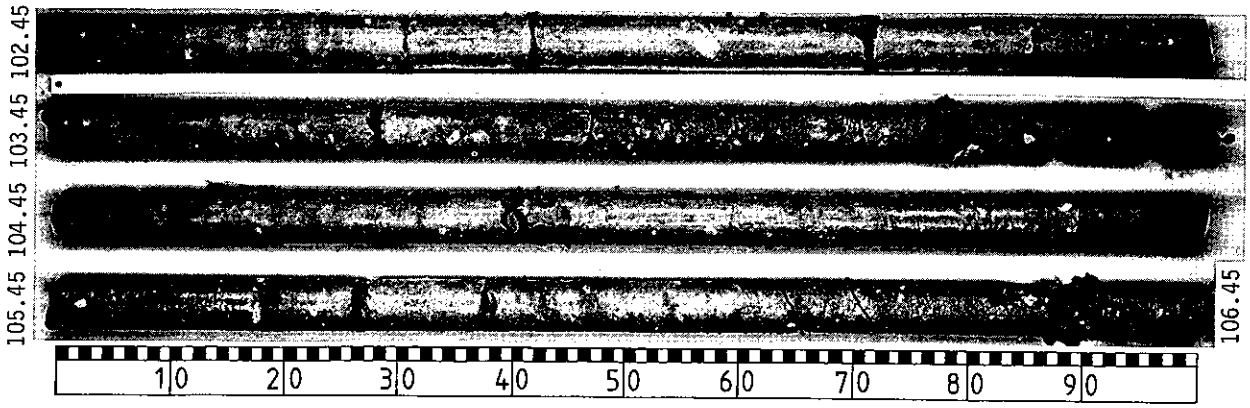
DEPTH 85.74 TO 93.54M. BOX 13



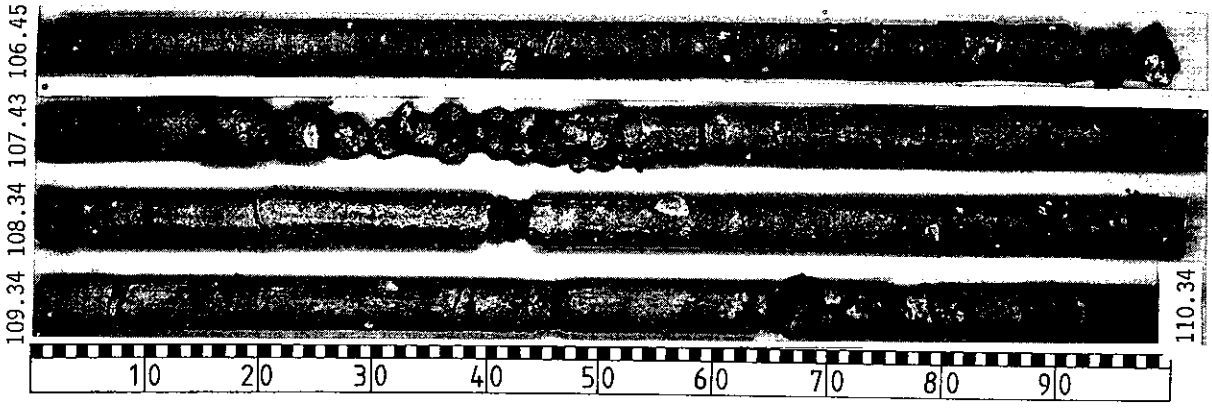
DEPTH 93.54 TO 98.47M. BOX 14



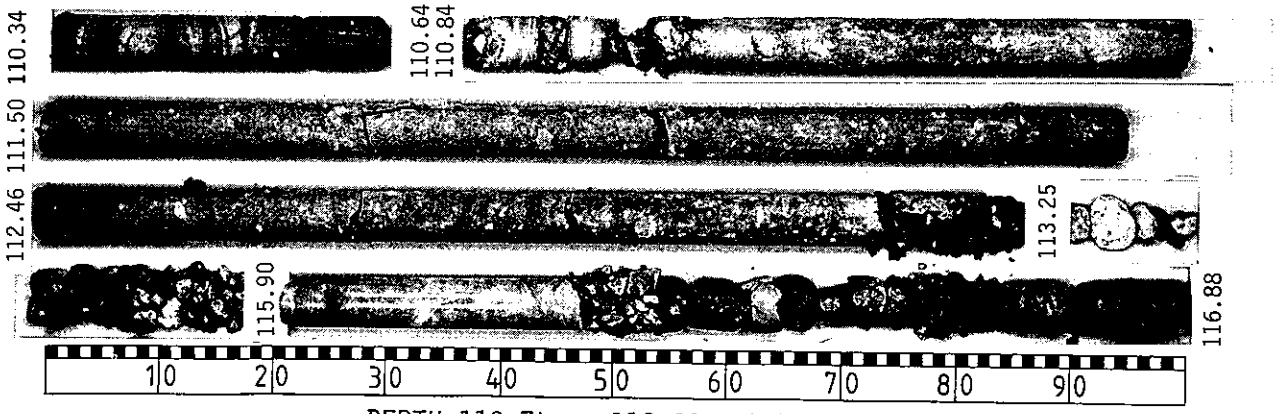
DEPTH 98.47 TO 102.45M. BOX 15



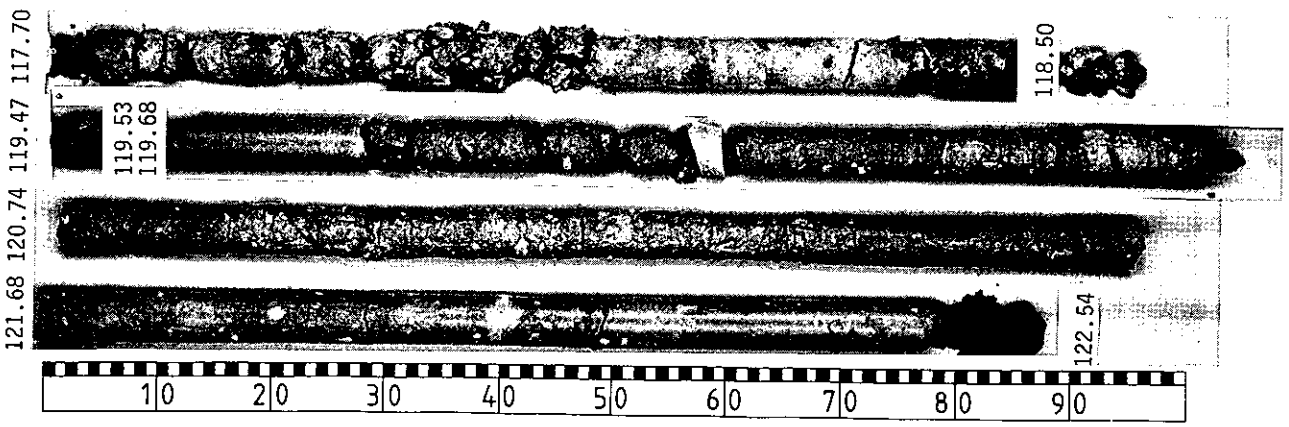
DEPTH 102.45 TO 106.45M. BOX 16



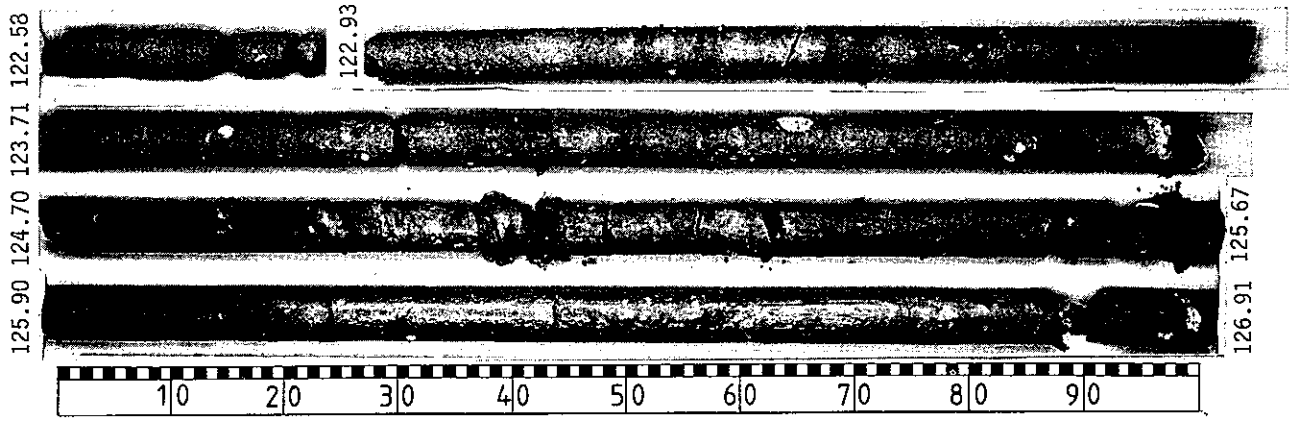
DEPTH 106.45 TO 110.34M. BOX 17



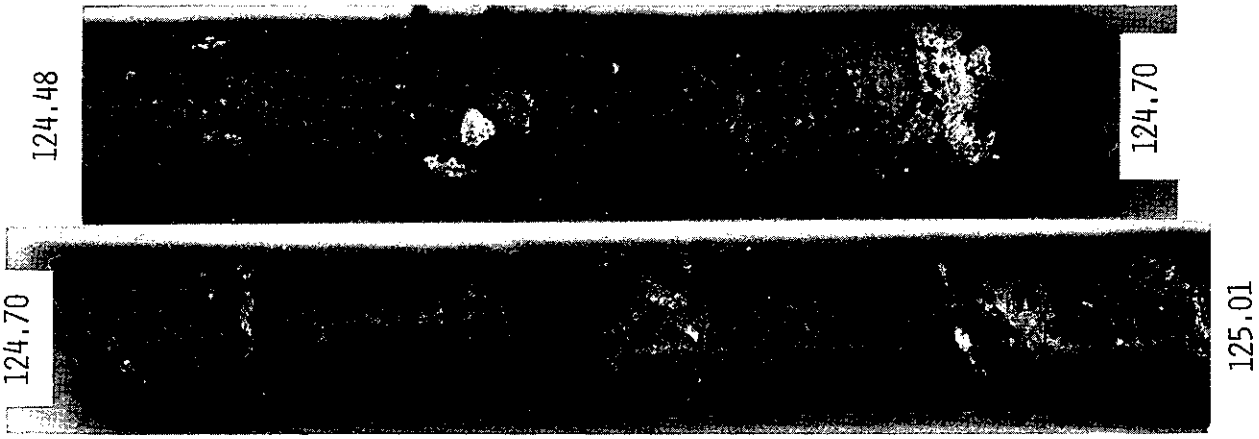
DEPTH 110.34 TO 116.88M. BOX 18

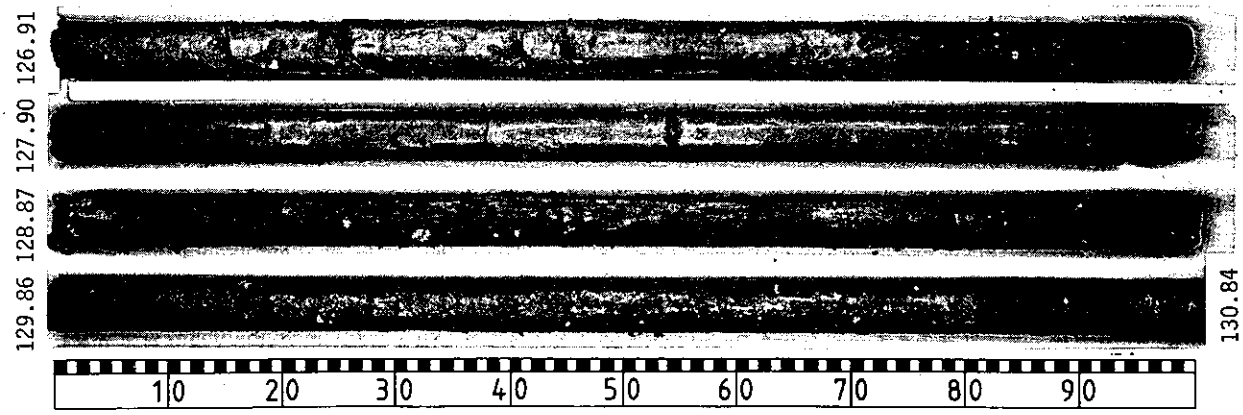


DEPTH 117.70 TO 122.54M. BOX 19

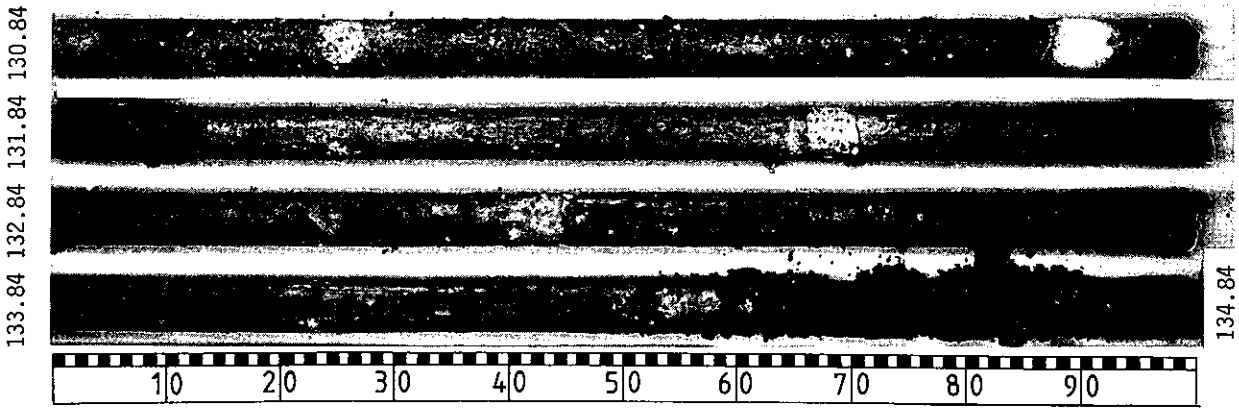


DEPTH 122.58 TO 126.91M. BOX 20

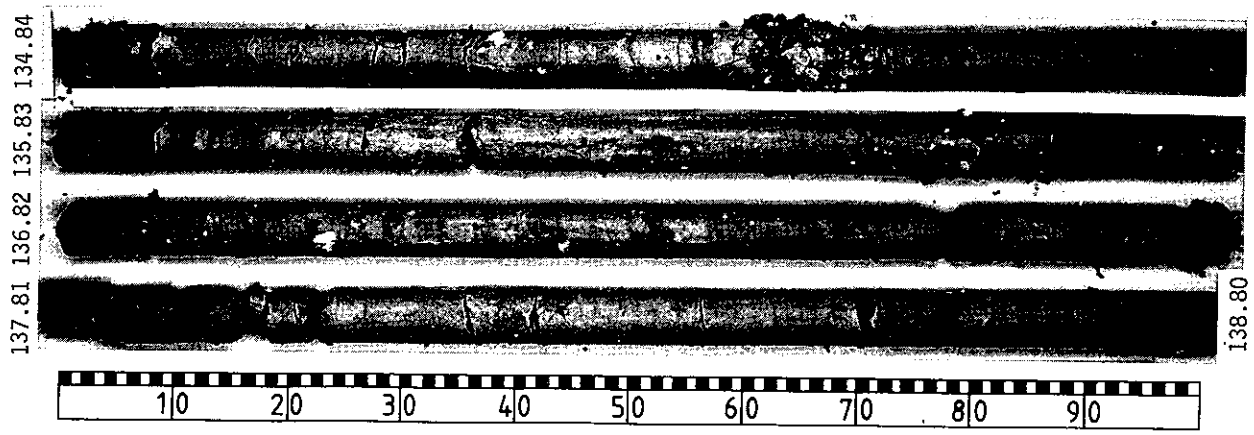




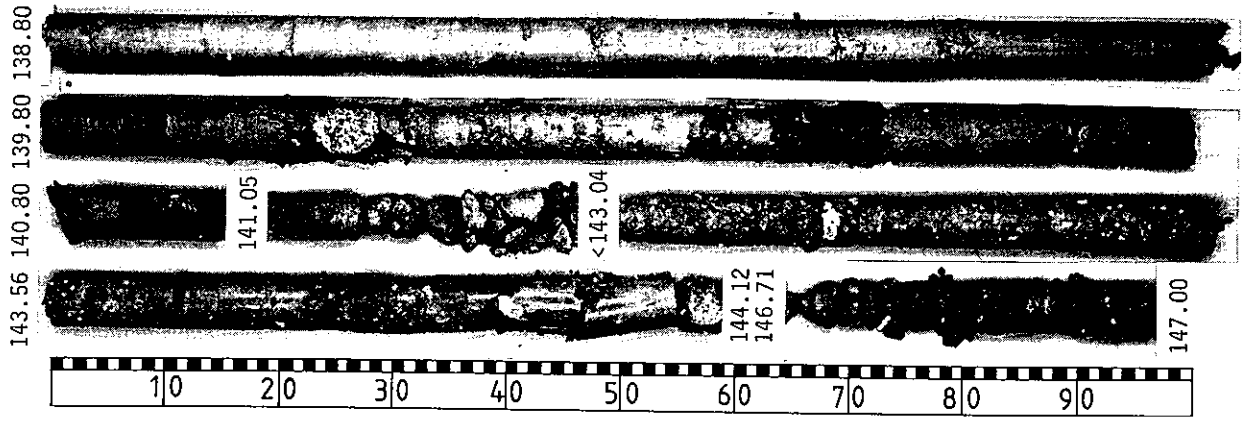
DEPTH 126.91 TO 130.84M. BOX 21



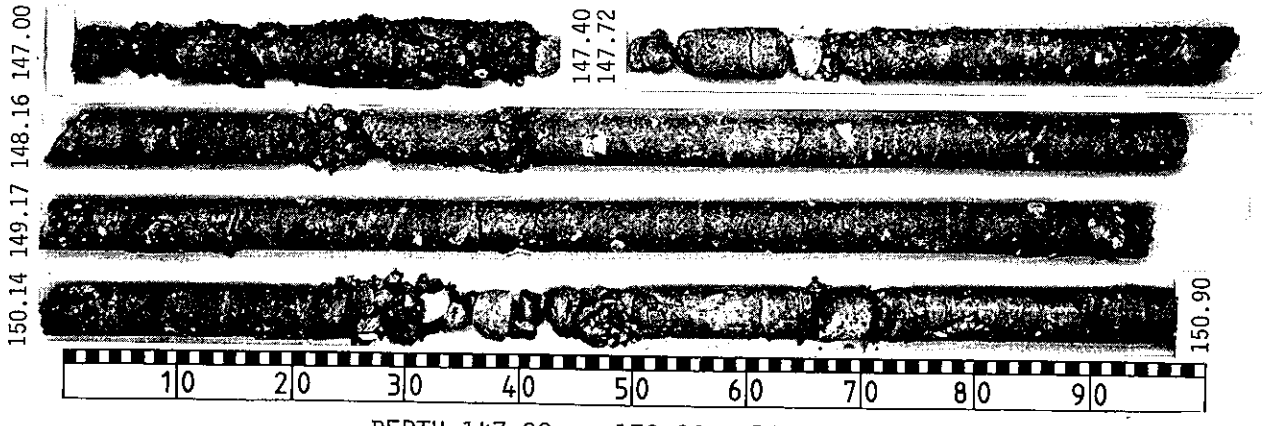
DEPTH 130.84 TO 134.84M. BOX 22



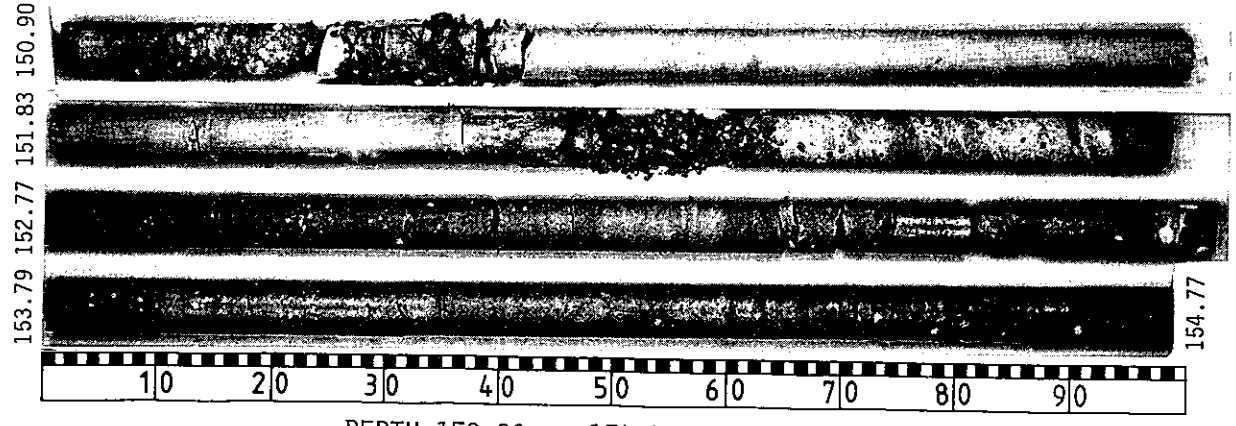
DEPTH 134.84 TO 138.80M. BOX 23



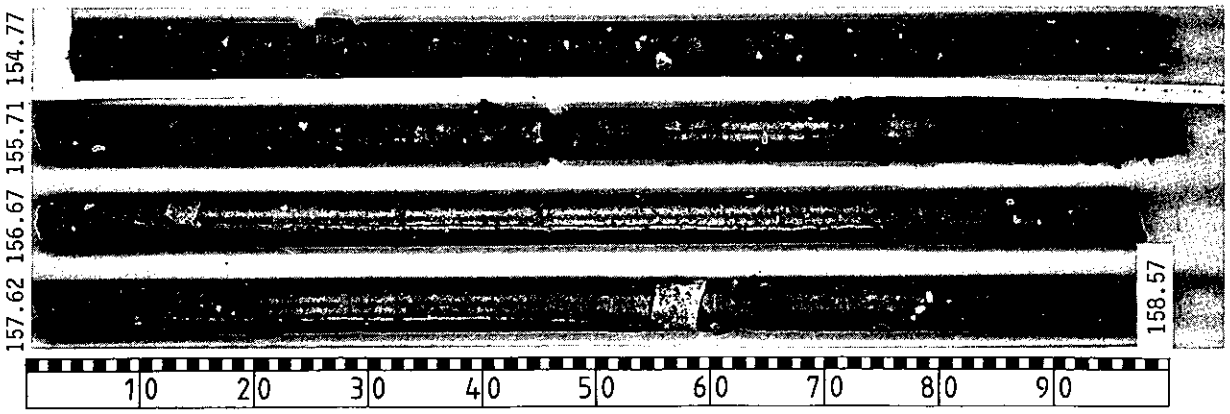
DEPTH 138.80 TO 147.00M. BOX 24



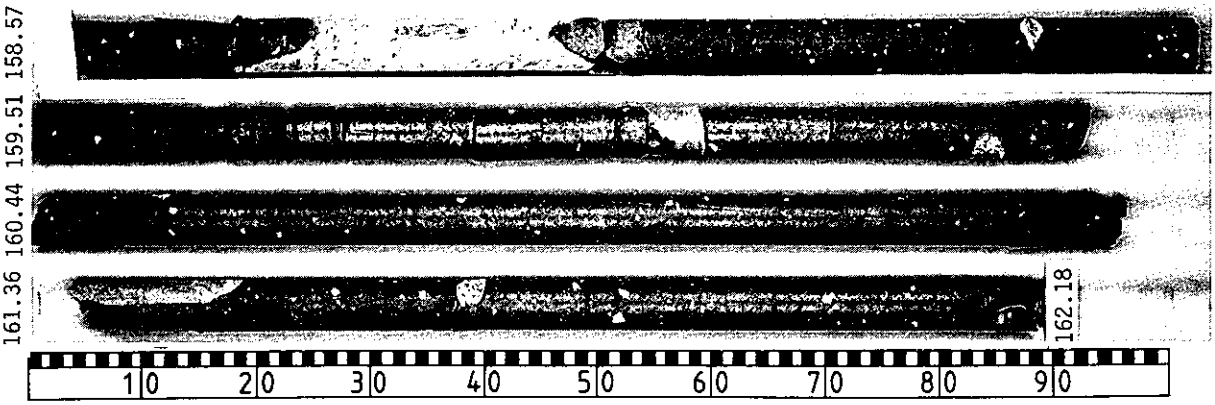
DEPTH 147.00 TO 150.90M. BOX 25



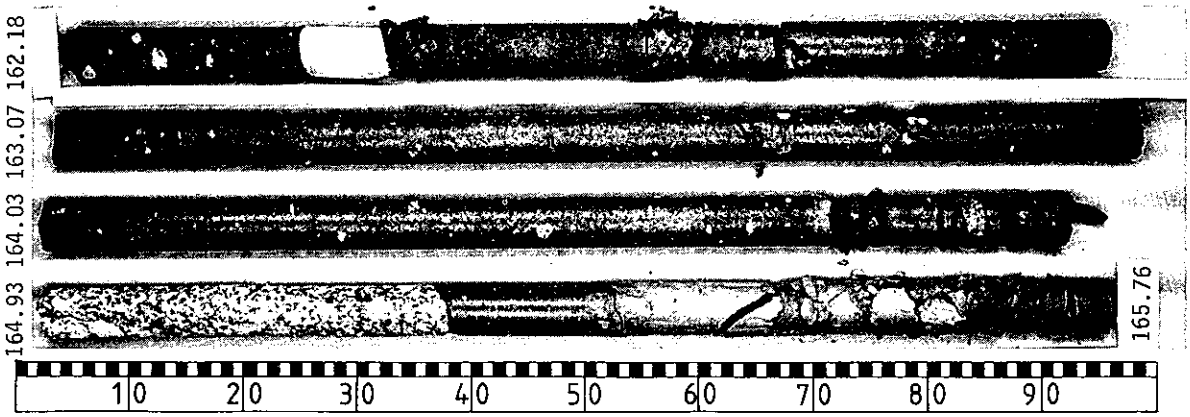
DEPTH 150.90 TO 154.77M. BOX 26



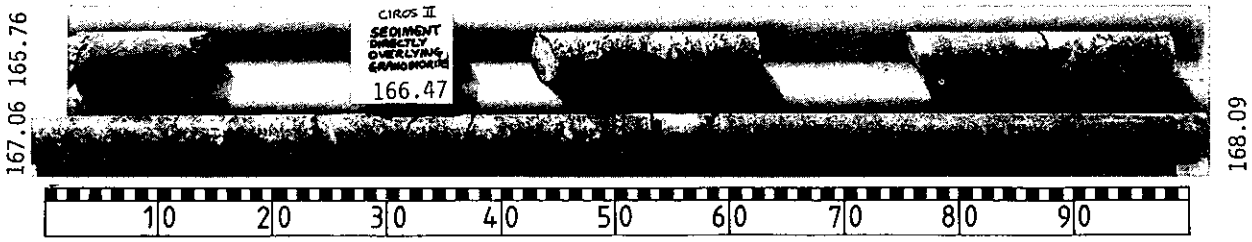
DEPTH 154.77 TO 158.57M. BOX 27



DEPTH 158.57 TO 162.18M. BOX 28



DEPTH 162.18 TO 165.76M. BOX 29



DEPTH 165.76 TO 168.09M. BOX 30

APPENDIX 2: GRAIN SIZE ANALYSES

ANALYTICAL PROCEDURE

Samples were disaggregated in a Calgon solution (1g/l) by an ultrasonic tank if necessary, and wet sieved through 30um (about 5 phi) nylon mesh. Calcite cemented samples were treated with HCl prior to wet sieving. The samples that were difficult to disaggregate are noted in the analyses (D= disaggregation problem).

The fraction coarser than 30um was dry sieved at 0.5 phi intervals from -1 phi to 5 phi (2mm to 31.3um).

The fraction finer than 30um was analysed by Sedigraph 5000 D.

			PERCENTILES						FOLK MEASURES			MOMENT MEASURES							
		1	5	16	25	50	75	84	95	MEAN	SDEV	SKEW	KURT	MEAN	SDEV	SKEW	KURT	GRVL	SAND	SILT	CLAY	
4.21	M	-0.74	0.22	1.36	1.72	2.29	2.70	2.88	3.29	2.18	0.84	-0.28	1.28	2.11	1.03	-1.64	8.25	0.0	99.1	0.9	0.0	4.21 M
6.92	M	2.37	2.72	3.02	3.16	3.44	3.77	3.94	4.41	3.47	0.49	0.12	1.13	3.48	0.53	0.59	4.16	0.0	88.8	11.2	0.0	6.92 M
7.12	M	3.53	4.31	5.26	5.78	7.29	9.48	10.74	13.31	7.76	2.74	0.30	1.00	7.82	2.59	0.44	2.02	0.0	3.5	56.5	40.0	7.12 M
8.17	M	-0.75	0.37	1.33	1.85	2.93	5.41	7.13	10.80	3.80	3.03	0.48	1.20	3.92	3.21	1.07	3.66	0.0	67.0	19.9	13.0	8.17 M
20.29	M	-1.16	-0.05	1.15	1.79	3.13	5.35	7.18	12.12	3.82	3.35	0.41	1.40	3.94	3.37	0.94	3.54	0.0	64.5	22.5	13.0	20.29 M
29.02	M	0.96	1.98	2.49	2.61	2.87	3.12	3.23	3.46	2.87	0.41	-0.12	1.21	2.84	0.51	-1.46	8.43	0.0	99.7	0.3	0.0	29.02 M
37.40	M	-0.36	0.76	1.56	1.95	2.68	3.37	3.78	7.46	2.68	1.57	0.21	1.93	3.00	2.16	2.29	10.42	0.0	87.9	7.8	4.4	37.40 M
45.29	M	4.14	4.71	5.29	5.68	7.03	9.86	11.64	15.26	7.99	3.18	0.51	1.03	7.88	2.66	0.53	1.83	0.0	0.8	59.9	39.3	45.29 M
45.32	M	2.71	3.04	3.26	3.37	3.64	3.96	4.21	5.95	3.70	0.68	0.40	2.03	3.93	1.40	4.15	22.42	0.0	81.1	15.9	2.9	45.32 M
53.50	M	-1.13	-0.19	0.83	1.32	2.28	3.20	3.79	7.14	2.30	1.85	0.17	1.60	2.54	2.35	1.61	8.02	0.0	86.7	9.4	3.9	53.50 M
61.07	M	0.02	0.97	1.97	2.32	3.19	5.40	6.25	7.96	3.80	2.13	0.40	0.93	3.86	2.31	1.03	4.36	0.0	64.0	31.2	4.8	61.07 M
61.31	M	0.57	1.29	2.04	2.35	3.17	4.69	5.84	7.99	3.68	1.97	0.42	1.18	3.76	2.17	1.41	5.57	0.0	67.4	27.6	5.0	61.31 M
61.90	M	1.62	2.06	2.34	2.48	2.78	3.09	3.25	3.62	2.79	0.46	0.06	1.06	2.83	0.72	5.00	55.16	0.0	98.1	1.6	0.4	61.90 M
65.47	M	1.81	2.21	2.75	2.98	3.31	3.64	3.80	4.15	3.29	0.55	-0.10	1.21	3.28	0.59	-0.18	4.43	0.0	93.7	6.3	0.0	65.47 M
65.60	M DD	2.01	3.78	4.27	4.58	5.64	7.37	8.39	11.73	6.10	2.24	0.43	1.17	6.28	2.36	1.09	3.66	0.0	11.1	70.0	18.9	65.60 M
71.61	M	-0.95	0.29	1.79	2.52	3.83	5.57	6.66	9.07	4.09	2.55	0.18	1.18	4.15	2.71	0.57	3.94	0.0	54.8	36.5	8.7	71.61 M
81.83	M	0.54	2.36	3.57	4.49	7.16	10.10	11.56	14.51	7.43	3.84	0.16	0.89	7.37	3.43	-0.01	1.90	0.0	21.9	35.7	42.4	81.83 M
82.97	M	-0.85	-0.07	1.40	2.38	5.22	7.42	8.61	11.28	5.08	3.52	0.00	0.92	5.15	3.52	0.19	2.50	0.0	39.3	40.8	19.9	82.97 M
85.00	M	0.90	1.47	2.15	2.52	3.17	3.78	4.24	7.17	3.19	1.38	0.21	1.85	3.48	1.87	2.52	11.22	0.0	82.4	13.7	3.9	85.00 M
90.81	M	1.20	1.82	2.30	2.50	2.98	3.83	5.07	10.08	3.45	1.95	0.61	2.56	3.79	2.43	2.20	7.38	0.0	78.1	14.1	7.8	90.81 M
96.65	M	2.18	2.62	2.94	3.12	3.49	4.27	5.40	9.41	3.94	1.64	0.65	2.41	4.24	2.16	2.34	8.14	0.0	71.8	20.7	7.6	96.65 M
98.83	M	1.86	3.52	5.20	5.91	7.75	10.13	11.33	13.77	8.09	3.09	0.17	1.00	8.05	2.88	-0.00	2.05	0.0	7.4	45.5	47.1	98.83 M
105.63	M	-0.61	0.79	2.44	3.24	6.15	9.69	10.99	13.63	6.53	4.08	0.15	0.81	6.48	3.92	0.06	1.84	0.0	35.9	26.1	38.0	105.63 M
110.26	M	2.14	2.51	2.86	3.05	3.49	3.94	4.27	7.26	3.54	1.07	0.35	2.19	3.84	1.67	3.28	15.07	0.0	80.4	15.4	4.1	110.26 M
111.57	M DD	0.88	1.93	2.84	3.59	5.52	8.13	9.57	12.70	5.98	3.31	0.27	0.97	6.09	3.19	0.51	2.32	0.0	31.0	43.0	26.0	111.57 M
124.43	M	-0.21	1.23	3.36	4.81	7.02	9.46	10.85	13.68	7.08	3.76	0.05	1.10	7.10	3.45	-0.17	2.33	0.0	20.6	40.7	38.7	124.43 M
124.79	M TUF	4.34	4.90	5.44	5.70	6.38	7.59	8.38	10.11	6.73	1.52	0.40	1.13	6.90	1.70	1.52	4.98	0.0	0.0	80.2	19.8	124.79 M
124.80	M TUF	4.09	4.74	5.39	5.83	6.95	8.37	9.25	11.16	7.20	1.94	0.25	1.04	7.36	2.10	0.83	3.13	0.0	0.9	68.3	30.7	124.80 M
124.91	M TUF	4.68	5.20	5.70	5.94	6.68	7.87	8.65	10.33	7.01	1.51	0.38	1.09	7.16	1.72	1.39	4.55	0.0	0.0	77.1	22.9	124.91 M
126.17	M	-0.31	1.12	3.62	4.07	6.80	9.95	11.41	13.56	7.19	3.77	0.12	0.87	7.01	3.69	-0.05	1.96	0.0	24.8	33.3	41.8	126.17 M
133.79	M	-0.47	0.78	3.10	4.02	6.60	9.93	11.25	13.92	6.98	4.03	0.13	0.91	6.85	3.83	-0.06	1.95	0.0	25.7	33.4	41.0	133.79 M
137.17	M DD	-0.83	0.26	2.05	3.50	5.87	8.77	10.17	13.04	6.03	3.97	0.09	0.99	6.13	3.76	0.01	2.23	0.0	29.2	39.3	31.5	137.17 M
138.64	M D	2.79	4.43	5.69	6.57	9.37	11.98	13.22	15.74	9.42	3.60	0.07	0.86	9.15	2.88	-0.43	1.85	0.0	3.2	33.4	63.4	138.64 M
148.23	M D	-1.05	0.05	2.82	4.45	7.36	10.04	11.22	13.61	7.13	4.15	-0.08	0.99	7.10	3.95	-0.42	2.36	0.0	22.6	33.5	43.9	148.23 M
151.69	M	3.35	4.94	6.37	7.53	9.74	12.04	13.14	15.35	9.75	3.27	0.04	0.95	9.56	2.64	-0.62	2.23	0.0	2.0	27.3	70.8	151.69 M
156.27	M D	-0.49	0.75	3.02	4.82	7.35	10.06	11.26	13.70	7.21	4.02	-0.04	1.01	7.22	3.77	-0.33	2.22	0.0	20.3	35.7	44.0	156.27 M
162.51	M D	-0.83	0.30	3.32	5.16	8.14	10.74	11.92	14.31	7.79	4.27	-0.12	1.03	7.66	3.96	-0.58	2.41	0.0	19.8	29.0	51.3	162.51 M
165.75	M	0.97	2.94	4.23	5.02	7.87	9.48	10.25	11.82	7.45	2.85	-0.16	0.82	7.58	2.99	-0.15	2.32	0.0	14.1	37.7	48.2	165.75 M

```
        GRAIN SIZE ANALYSIS. FOLK-AFTER FOLK AND WARD (1957). INMAN-AFTER INMAN (1952).
            PERCENTILES DETERMINED BY INTERPOLATION OF NORMAL PROBABILITY CURVE        VERSION 3.2

CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

   *** CIROS2  D - DISAGGREGATION PROBS. DD - ALTERED ANALYSIS

  4.21 M
              DATA  0.69 1.00 1.14 1.85 2.65 8.35 9.6311.91 4.54 0.57 0.15 0.16 0.07 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
  FREQUENCY PERCENT  1.6  2.3  2.7  4.3  6.2 19.6 22.5 27.9 10.6  1.3  0.4  0.4  0.2  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 CUMULATIVE PERCENT  1.6  4.0  6.6 11.0 17.2 36.7 59.3 87.1 97.8 99.1 99.5 99.8100.0100.0100.0100.0100.0100.0100.0100.0100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 99.11 SILT =  0.89 CLAY =  0.00

PERCENTILES (1,5,16,25,50,75,84,95) -0.74  0.22  1.36  1.72  2.29  2.70  2.88  3.29
MOMENT MEASURES MEAN  2.11  STDEV 1.03  SKEW-1.64  KURT  8.25
GRAPHIC (FOLK)  MEAN  2.18  STDEV 0.84  SKEW-0.28  KURT  1.28  INMAN SD 0.76  SK -0.22

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  1.62%
-0.50- I
 0.00- I**
 0.50- I***
 0.98- I****
 1.44- I******
 2.06- I********************
 2.45- I************************
 2.96- I******************************
 3.53- I***********
 4.06- I*
 4.50- I
 5.00- I
 5.50- I
 6.00- I
 6.50- I
 7.00- I
 7.50- I
 8.00- I
 8.50- I
 9.00- I
      I
10.00- I
      I  REST = 0.00%


  6.92 M
              DATA  0.00 0.00 0.00 0.00 0.00 0.02 0.12 1.10 4.52 2.94 0.71 0.26 0.13 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.0  0.2  1.2 11.2 46.1 30.0  7.2  2.7  1.3  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.0  0.2  1.4 12.7 58.8 88.8 96.0 98.7100.0100.0100.0100.0100.0100.0100.0100.0100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 88.78 SILT = 11.22 CLAY =  0.00

PERCENTILES (1,5,16,25,50,75,84,95)  2.37  2.72  3.02  3.16  3.44  3.77  3.94  4.41
MOMENT MEASURES MEAN  3.48  STDEV 0.53  SKEW 0.59  KURT  4.16
GRAPHIC (FOLK)  MEAN  3.47  STDEV 0.49  SKEW 0.12  KURT  1.13  INMAN SD 0.46  SK  0.10

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I
 2.45- I*
 2.96- I***********
 3.53- I*************************************************
 4.06- I******************************
 4.50- I*******
 5.00- I***
 5.50- I*
 6.00- I
 6.50- I
 7.00- I
 7.50- I
 8.00- I
 8.50- I
 9.00- I
      I
10.00- I
      I  REST = 0.00%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

  7.12 M
                DATA  0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.02 0.05 0.06 0.11 0.17 0.17 0.17 0.17 0.14 0.14 0.12 0.10 0.16 0.42
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  1.0  2.5  3.0  5.5  8.5  8.5  8.5  8.5  7.0  7.0  6.0  5.0  8.0 21.0
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  1.0  3.5  6.5 12.0 20.5 29.0 37.5 46.0 53.0 60.0 66.0 71.0 79.0100.0
PROPORTIONS:  GRAVEL = 0.00 SAND =  3.50 SILT = 56.50 CLAY = 40.00
                                                                        *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95)  3.53  4.31  5.26  5.78  7.29  9.48 10.74 13.31
MOMENT MEASURES MEAN  7.82  STDEV 2.59  SKEW 0.44  KURT  2.02
GRAPHIC (FOLK)  MEAN  7.76  STDEV 2.74  SKEW 0.30  KURT  1.00  INMAN SD 2.74  SK  0.26

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I
 2.45- I
 2.96- I
 3.53- I*
 4.06- I***
 4.50- I***
 5.00- I******
 5.50- I*********
 6.00- I*********
 6.50- I*********
 7.00- I*********
 7.50- I*******
 8.00- I*******
 8.50- I******
 9.00- I*****
      I****
10.00- I****
      I  REST =21.00%


  8.17 M
                DATA  0.32 0.38 0.51 1.11 1.42 2.38 2.00 2.56 2.17 1.25 0.57 0.57 0.64 0.64 0.58 0.46 0.38 0.35 0.35 0.35 0.61 1.43
  FREQUENCY PERCENT  1.5  1.8  2.4  5.3  6.8 11.3  9.5 12.2 10.3  5.9  2.7  2.7  3.0  3.0  2.8  2.2  1.8  1.7  1.7  1.7  2.9  6.8
 CUMULATIVE PERCENT  1.5  3.3  5.8 11.0 17.8 29.1 38.6 50.8 61.1 67.0 69.8 72.5 75.5 78.6 81.3 83.5 85.3 87.0 88.6 90.3 93.2100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 67.05 SILT = 19.92 CLAY = 13.03

PERCENTILES (1,5,16,25,50,75,84,95) -0.75  0.37  1.33  1.85  2.93  5.41  7.13 10.80
MOMENT MEASURES MEAN  3.92  STDEV 3.21  SKEW 1.07  KURT  3.66
GRAPHIC (FOLK)  MEAN  3.80  STDEV 3.03  SKEW 0.48  KURT  1.20  INMAN SD 2.90  SK  0.45

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  1.52%
-0.50- I
 0.00- I**
 0.50- I**
 0.98- I*****
 1.44- I*******
 2.06- I***********
 2.45- I**********
 2.96- I************
 3.53- I**********
 4.06- I******
 4.50- I***
 5.00- I***
 5.50- I***
 6.00- I***
 6.50- I***
 7.00- I**
 7.50  I**
 8.00- I**
 8.50- I**
 9.00- I**
      I*
10.00- I*
      I  REST = 6.80%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

 20.29 M
                DATA  0.57 0.54 0.68 1.12 1.23 2.04 1.61 2.05 2.10 1.54 0.81 0.93 0.65 0.56 0.55 0.45 0.35 0.40 0.32 0.30 0.40 1.70
  FREQUENCY PERCENT  2.7  2.6  3.3  5.4  5.9  9.8  7.7  9.8 10.0  7.4  3.9  4.4  3.1  2.7  2.6  2.2  1.7  1.9  1.5  1.4  1.9  8.1
 CUMULATIVE PERCENT  2.7  5.3  8.6 13.9 19.8 29.6 37.3 47.1 57.1 64.5 68.4 72.8 75.9 78.6 81.2 83.4 85.1 87.0 88.5 90.0 91.9100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 64.50 SILT = 22.49 CLAY = 13.01

PERCENTILES (1,5,16,25,50,75,84,95) -1.16 -0.05  1.15  1.79  3.13  5.35  7.18 12.12
MOMENT MEASURES MEAN  3.94  STDEV 3.37  SKEW 0.94  KURT  3.54
GRAPHIC (FOLK)  MEAN  3.82  STDEV 3.35  SKEW 0.41  KURT  1.40  INMAN SD 3.01  SK  0.35

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
       I  COARSE FRACTION =  2.73%
-0.50- I
 0.00- I***
 0.50- I***
 0.98- I*****
 1.44- I******
 2.06- I**********
 2.45- I********
 2.96- I**********
 3.53- I**********
 4.06- I*******
 4.50- I****
 5.00- I****
 5.50- I***
 6.00- I***
 6.50- I***
 7.00- I**
 7.50- I**
 8.00- I**
 8.50- I**
 9.00- I*
       I*
10.00- I*
       I  REST = 8.13%


 29.02 M
                DATA  0.00 0.03 0.02 0.10 0.14 0.52 1.11 6.46 5.39 0.42 0.03 0.01 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
  FREQUENCY PERCENT  0.0  0.2  0.1  0.7  1.0  3.7  7.8 45.4 37.9  3.0  0.2  0.1  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 CUMULATIVE PERCENT  0.0  0.2  0.4  1.1  2.0  5.7 13.5 58.9 96.8 99.7 99.9100.0100.0100.0100.0100.0100.0100.0100.0100.0100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 99.72 SILT =  0.28 CLAY =  0.00

PERCENTILES (1,5,16,25,50,75,84,95)  0.96  1.98  2.49  2.61  2.87  3.12  3.23  3.46
MOMENT MEASURES MEAN  2.84  STDEV 0.51  SKEW-1.46  KURT  8.43
GRAPHIC (FOLK)  MEAN  2.87  STDEV 0.41  SKEW-0.12  KURT  1.21  INMAN SD 0.37  SK -0.03

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I*
 1.44- I*
 2.06- I****
 2.45- I********
 2.96- I**********************************************
 3.53- I****************************************
 4.06- I***
 4.50- I
 5.00- I
 5.50- I
 6.00- I
 6.50- I
 7.00- I
 7.50- I
 8.00- I
 8.50- I
 9.00- I
       I
10.00- I
       I  REST = 0.00%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

 37.40 M
              DATA  0.18 0.21 0.32 0.89 1.47 3.20 2.96 4.31 4.36 1.80 0.51 0.35 0.15 0.15 0.17 0.15 0.13 0.13 0.11 0.08 0.14 0.65
  FREQUENCY PERCENT  0.8  0.9  1.4  4.0  6.6 14.3 13.2 19.2 19.4  8.0  2.3  1.6  0.7  0.7  0.8  0.7  0.6  0.6  0.5  0.4  0.6  2.9
 CUMULATIVE PERCENT  0.8  1.7  3.2  7.1 13.7 28.0 41.2 60.4 79.8 87.9 90.1 91.7 92.4 93.0 93.8 94.5 95.0 95.6 96.1 96.5 97.1100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 87.87 SILT =  7.76 CLAY =  4.37

PERCENTILES (1,5,16,25,50,75,84,95) -0.36  0.76  1.56  1.95  2.68  3.37  3.78  7.46
MOMENT MEASURES MEAN  3.00  STDEV 2.16  SKEW 2.29  KURT 10.42
GRAPHIC (FOLK)  MEAN  2.68  STDEV 1.57  SKEW 0.21  KURT  1.93  INMAN SD 1.11  SK -0.01

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
       I  COARSE FRACTION =  0.80%
-0.50- I
 0.00- I*
 0.50- I*
 0.98- I****
 1.44- I*******
 2.06- I***************
 2.45- I*************
 2.96- I********************
 3.53- I********************
 4.06- I********
 4.50- I**
 5.00- I**
 5.50- I*
 6.00- I*
 6.50- I*
 7.00- I*
 7.50- I*
 8.00- I*
 8.50- I
 9.00- I
       I
10.00- I
       I  REST = 2.90%


 45.29 M
              DATA  0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.02 0.05 0.18 0.29 0.26 0.26 0.19 0.15 0.13 0.12 0.11 0.15 0.61
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.8  2.0  7.1 11.5 10.3 10.3  7.5  6.0  5.2  4.8  4.4  6.0 24.2
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.8  2.8  9.9 21.4 31.7 42.1 49.6 55.6 60.7 65.5 69.8 75.8100.0
PROPORTIONS:  GRAVEL = 0.00 SAND =  0.79 SILT = 59.92 CLAY = 39.29
                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95)  4.14  4.71  5.29  5.68  7.03  9.86 11.64 15.26
MOMENT MEASURES MEAN  7.88  STDEV 2.66  SKEW 0.53  KURT  1.83
GRAPHIC (FOLK)  MEAN  7.99  STDEV 3.18  SKEW 0.51  KURT  1.03  INMAN SD 3.17  SK  0.45

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I
 2.45- I
 2.96- I
 3.53- I
 4.06- I*
 4.50- I**
 5.00- I*******
 5.50- I************
 6.00- I**********
 6.50- I**********
 7.00- I********
 7.50- I******
 8.00- I*****
 8.50- I*****
 9.00- I****
       I***
10.00- I***
       I  REST =24.21%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

 45.32 M
              DATA  0.00 0.00 0.00 0.00 0.01 0.01 0.01 0.33 4.44 4.62 0.89 0.51 0.11 0.11 0.09 0.05 0.05 0.04 0.04 0.03 0.06 0.21
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.1  0.1  0.1  2.8 38.2 39.8  7.7  4.4  0.9  0.9  0.8  0.4  0.4  0.3  0.3  0.3  0.5  1.8
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.1  0.2  0.3  3.1 41.3 81.1 88.8 93.2 94.1 95.1 95.9 96.3 96.7 97.1 97.4 97.7 98.2100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 81.14 SILT = 15.93 CLAY =  2.93

PERCENTILES (1,5,16,25,50,75,84,95)  2.71  3.04  3.26  3.37  3.64  3.96  4.21  5.95
MOMENT MEASURES MEAN  3.93  STDEV 1.40  SKEW 4.15  KURT 22.42
GRAPHIC (FOLK)  MEAN  3.70  STDEV 0.68  SKEW 0.40  KURT  2.03  INMAN SD 0.47  SK  0.21

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I
 2.45- I
 2.96- I***
 3.53- I************************************
 4.06- I*****************************************
 4.50- I********
 5.00- I****
 5.50- I*
 6.00- I*
 6.50- I*
 7.00- I
 7.50- I
 8.00- I
 8.50- I
 9.00- I
      I
10.00- I
      I  REST = 1.81%


 53.50 M
              DATA  0.85 0.98 1.22 2.08 2.43 4.33 3.39 3.98 3.11 1.55 0.65 0.64 0.22 0.22 0.28 0.22 0.18 0.18 0.16 0.12 0.17 0.62
  FREQUENCY PERCENT  3.1  3.6  4.4  7.5  8.8 15.7 12.3 14.4 11.3  5.6  2.4  2.3  0.8  0.8  1.0  0.8  0.7  0.7  0.6  0.4  0.6  2.2
 CUMULATIVE PERCENT  3.1  6.6 11.1 18.6 27.4 43.1 55.4 69.8 81.1 86.7 89.1 91.4 92.2 93.0 94.0 94.8 95.5 96.1 96.7 97.1 97.8100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 86.73 SILT =  9.39 CLAY =  3.88

PERCENTILES (1,5,16,25,50,75,84,95) -1.13 -0.19  0.83  1.32  2.28  3.20  3.79  7.14
MOMENT MEASURES MEAN  2.54  STDEV 2.35  SKEW 1.61  KURT  8.02
GRAPHIC (FOLK)  MEAN  2.30  STDEV 1.85  SKEW 0.17  KURT  1.60  INMAN SD 1.48  SK  0.02

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  3.08%
-0.50- I
 0.00- I****
 0.50- I****
 0.98- I********
 1.44- I*********
 2.06- I****************
 2.45- I*************
 2.96- I***************
 3.53- I************
 4.06- I******
 4.50- I**
 5.00- I**
 5.50- I*
 6.00- I*
 6.50- I*
 7.00- I*
 7.50- I*
 8.00- I*
 8.50- I*
 9.00- I
      I
10.00- I
      I  REST = 2.25%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

 61.07 M
              DATA  0.04 0.12 0.25 0.43 0.55 1.51 1.91 2.65 2.00 1.12 0.70 0.51 0.76 0.88 0.88 0.66 0.40 0.36 0.21 0.14 0.17 0.28
  FREQUENCY PERCENT  0.2  0.7  1.5  2.6  3.3  9.1 11.6 16.0 12.1  6.8  4.2  3.1  4.6  5.3  5.3  4.0  2.4  2.2  1.3  0.8  1.0  1.7
 CUMULATIVE PERCENT  0.2  1.0  2.5  5.1  8.4 17.5 29.1 45.1 57.2 64.0 68.2 71.3 75.9 81.2 86.6 90.6 93.0 95.2 96.4 97.3 98.3100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 64.00 SILT = 31.16 CLAY =  4.84

PERCENTILES (1,5,16,25,50,75,84,95)  0.02  0.97  1.97  2.32  3.19  5.40  6.25  7.96    *** SAMPLE    BIMODAL    ***
MOMENT MEASURES MEAN  3.86  STDEV 2.31  SKEW 1.03  KURT  4.36
GRAPHIC (FOLK)  MEAN  3.80  STDEV 2.13  SKEW 0.40  KURT  0.93  INMAN SD 2.14  SK  0.43

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
       I  COARSE FRACTION =  0.24%
-0.50- I
 0.00- I*
 0.50- I**
 0.98- I***
 1.44- I***
 2.06- I*********
 2.45- I*************
 2.96- I*****************
 3.53- I*************
 4.06- I*******
 4.50- I****
 5.00- I***
 5.50- I*****
 6.00- I*****
 6.50- I*****
 7.00- I****
 7.50- I**
 8.00- I**
 8.50- I*
 9.00- I*
       I*
10.00- I*
       I  REST = 1.69%


 61.31 M
              DATA  0.03 0.09 0.10 0.54 0.96 2.64 3.12 4.43 3.57 2.39 1.28 1.81 0.72 0.85 1.06 0.67 0.54 0.39 0.31 0.23 0.31 0.47
  FREQUENCY PERCENT  0.1  0.3  0.4  2.0  3.6 10.0 11.8 16.7 13.5  9.0  4.8  6.8  2.7  3.2  4.0  2.5  2.0  1.5  1.2  0.9  1.2  1.8
 CUMULATIVE PERCENT  0.1  0.5  0.8  2.9  6.5 16.4 28.2 44.9 58.4 67.4 72.2 79.1 81.8 85.0 89.0 91.5 93.5 95.0 96.2 97.1 98.2100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 67.41 SILT = 27.61 CLAY =  4.98

PERCENTILES (1,5,16,25,50,75,84,95)  0.57  1.29  2.04  2.35  3.17  4.69  5.84  7.99
MOMENT MEASURES MEAN  3.76  STDEV 2.17  SKEW 1.41  KURT  5.57
GRAPHIC (FOLK)  MEAN  3.68  STDEV 1.97  SKEW 0.42  KURT  1.18  INMAN SD 1.90  SK  0.40

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
       I  COARSE FRACTION =  0.11%
-0.50- I
 0.00- I
 0.50- I
 0.98- I**
 1.44- I****
 2.06- I**********
 2.45- I*************
 2.96- I******************
 3.53- I**************
 4.06- I*********
 4.50- I*****
 5.00- I*******
 5.50- I***
 6.00- I***
 6.50- I****
 7.00- I***
 7.50- I**
 8.00- I*
 8.50- I*
 9.00- I*
       I*
10.00- I*
       I  REST = 1.77%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06, 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

 61.90 M
              DATA  0.00 0.00 0.01 0.01 0.04 0.62 2.37 5.88 3.78 0.54 0.09 0.06 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.02
  FREQUENCY PERCENT  0.0  0.0  0.1  0.1  0.3  4.6 17.5 43.5 28.0  4.0  0.7  0.4  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
 CUMULATIVE PERCENT  0.0  0.0  0.1  0.1  0.4  5.0 22.6 66.1 94.1 98.1 98.7 99.2 99.3 99.3 99.4 99.5 99.6 99.6 99.7 99.8 99.9100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 98.08 SILT =  1.55 CLAY =  0.37

PERCENTILES (1,5,16,25,50,75,84,95)  1.62  2.06  2.34  2.48  2.78  3.09  3.25  3.62
MOMENT MEASURES MEAN  2.83  STDEV 0.72  SKEW 5.00  KURT 55.16
GRAPHIC (FOLK)  MEAN  2.79  STDEV 0.46  SKEW 0.06  KURT  1.06  INMAN SD 0.45  SK  0.04

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I*****
 2.45- I******************
 2.96- I*********************************************
 3.53- I****************************
 4.06- I****
 4.50- I*
 5.00- I
 5.50- I
 6.00- I
 6.50- I
 7.00- I
 7.50- I
 8.00- I
 8.50- I
 9.00- I
      I
10.00- I
      I  REST = 0.15%


 65.47 M
              DATA  0.00 0.00 0.00 0.00 0.01 0.32 0.44 1.43 4.12 2.44 0.43 0.13 0.01 0.01 0.01 0.00 0.00 0.00 0.00 0.00 0.00 0.00
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.1  3.4  4.7 15.3 44.1 26.1  4.6  1.4  0.1  0.1  0.1  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.1  3.5  8.2 23.5 67.6 93.7 98.3 99.7 99.8 99.9100.0100.0100.0100.0100.0100.0100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 93.69 SILT =  6.31 CLAY =  0.00

PERCENTILES (1,5,16,25,50,75,84,95)  1.81  2.21  2.75  2.98  3.31  3.64  3.80  4.15
MOMENT MEASURES MEAN  3.28  STDEV 0.59  SKEW-0.18  KURT  4.43
GRAPHIC (FOLK)  MEAN  3.29  STDEV 0.55  SKEW-0.10  KURT  1.21  INMAN SD 0.52  SK -0.07

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I***
 2.45- I*****
 2.96- I***************
 3.53- I*********************************************
 4.06- I**************************
 4.50- I*****
 5.00- I*
 5.50- I
 6.00- I
 6.50- I
 7.00- I
 7.50- I
 8.00- I
 8.50- I
 9.00- I
      I
10.00- I
      I  REST = 0.00%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

 65.60 M  DD
              DATA  0.00 0.00 0.00 0.00 0.01 0.01 0.00 0.00 0.02 0.17 0.23 0.25 0.21 0.18 0.16 0.11 0.10 0.09 0.07 0.06 0.06 0.17
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.5  0.5  0.0  0.0  1.1  8.9 12.1 13.2 11.1  9.5  8.4  5.8  5.3  4.7  3.7  3.2  3.2  8.9
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.5  1.1  1.1  1.1  2.1 11.1 23.2 36.3 47.4 56.8 65.3 71.1 76.3 81.1 84.7 87.9 91.1100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 11.05 SILT = 70.00 CLAY = 18.95

PERCENTILES (1,5,16,25,50,75,84,95)  2.01  3.78  4.27  4.58  5.64  7.37  8.39 11.73
MOMENT MEASURES MEAN  6.28  STDEV 2.36  SKEW 1.09  KURT  3.66
GRAPHIC (FOLK)  MEAN  6.10  STDEV 2.24  SKEW 0.43  KURT  1.17  INMAN SD 2.06  SK  0.34

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I*
 2.06- I*
 2.45- I
 2.96- I
 3.53- I*
 4.06- I*********
 4.50- I************
 5.00- I*************
 5.50- I***********
 6.00- I*********
 6.50- I********
 7.00- I******
 7.50- I*****
 8.00- I*****
 8.50- I****
 9.00- I***
       I**
10.00- I**
       I  REST = 8.95%


 71.61 M
              DATA  0.83 0.81 0.84 1.39 1.46 2.49 2.16 3.46 4.89 4.52 3.18 3.16 1.84 1.78 1.78 1.35 1.10 1.04 0.80 0.68 0.92 1.24
  FREQUENCY PERCENT  2.0  1.9  2.0  3.3  3.5  6.0  5.2  8.3 11.7 10.8  7.6  7.6  4.4  4.3  4.3  3.2  2.6  2.5  1.9  1.6  2.2  3.0
 CUMULATIVE PERCENT  2.0  3.9  5.9  9.3 12.8 18.7 23.9 32.2 43.9 54.8 62.4 70.0 74.4 78.6 82.9 86.1 88.8 91.3 93.2 94.8 97.0100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 54.77 SILT = 36.51 CLAY =  8.72

PERCENTILES (1,5,16,25,50,75,84,95) -0.95  0.29  1.79  2.52  3.83  5.57  6.66  9.07
MOMENT MEASURES MEAN  4.15  STDEV 2.71  SKEW 0.57  KURT  3.94
GRAPHIC (FOLK)  MEAN  4.09  STDEV 2.55  SKEW 0.18  KURT  1.18  INMAN SD 2.43  SK  0.16

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
       I  COARSE FRACTION =  1.99%
-0.50- I
 0.00- I**
 0.50- I**
 0.98- I***
 1.44- I***
 2.06- I******
 2.45- I*****
 2.96- I********
 3.53- I************
 4.06- I***********
 4.50- I********
 5.00- I********
 5.50- I****
 6.00- I****
 6.50- I****
 7.00- I***
 7.50- I***
 8.00- I**
 8.50- I**
 9.00- I**
       I*
10.00- I*
       I  REST = 2.97%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

 81.83 M
              DATA  0.04 0.06 0.12 0.22 0.22 0.32 0.26 0.73 1.69 1.48 0.75 0.92 1.14 1.14 1.28 1.07 0.93 1.14 1.14 1.00 1.78 6.04
  FREQUENCY PERCENT  0.2  0.3  0.5  0.9  0.9  1.4  1.1  3.1  7.2  6.3  3.2  3.9  4.9  4.9  5.5  4.6  4.0  4.9  4.9  4.3  7.6 25.7
 CUMULATIVE PERCENT  0.2  0.4  0.9  1.9  2.8  4.2  5.3  8.4 15.6 21.9 25.1 29.0 33.9 38.7 44.2 48.7 52.7 57.6 62.4 66.7 74.3100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 21.90 SILT = 35.66 CLAY = 42.44
                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95)  0.54  2.36  3.57  4.49  7.16 10.10 11.56 14.51
MOMENT MEASURES MEAN  7.37  STDEV 3.43  SKEW-0.01  KURT  1.90
GRAPHIC (FOLK)  MEAN  7.43  STDEV 3.84  SKEW 0.16  KURT  0.89  INMAN SD 3.99  SK  0.10

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
       I  COARSE FRACTION =  0.17%
-0.50- I
 0.00- I
 0.50- I*
 0.98- I*
 1.44- I*
 2.06- I*
 2.45- I*
 2.96- I***
 3.53- I*******
 4.06- I******
 4.50- I***
 5.00- I****
 5.50- I*****
 6.00- I*****
 6.50- I*****
 7.00- I*****
 7.50- I****
 8.00- I*****
 8.50- I*****
 9.00- I****
       I****
10.00- I****
       I  REST =25.73%


 82.97 M
              DATA  0.21 0.34 0.30 0.38 0.36 0.54 0.38 0.43 0.44 0.45 0.43 0.32 0.67 0.62 0.57 0.54 0.39 0.44 0.31 0.31 0.44 0.88
  FREQUENCY PERCENT  2.2  3.5  3.1  3.9  3.7  5.5  3.9  4.4  4.5  4.6  4.4  3.3  6.9  6.4  5.8  5.5  4.0  4.5  3.2  3.2  4.5  9.0
 CUMULATIVE PERCENT  2.2  5.6  8.7 12.6 16.3 21.8 25.7 30.2 34.7 39.3 43.7 47.0 53.8 60.2 66.1 71.6 75.6 80.1 83.3 86.5 91.0100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 39.28 SILT = 40.82 CLAY = 19.90

PERCENTILES (1,5,16,25,50,75,84,95) -0.85 -0.07  1.40  2.38  5.22  7.42  8.61 11.28    *** SAMPLE    BIMODAL    ***
MOMENT MEASURES MEAN  5.15  STDEV 3.52  SKEW 0.19  KURT  2.50
GRAPHIC (FOLK)  MEAN  5.08  STDEV 3.52  SKEW 0.00  KURT  0.92  INMAN SD 3.60  SK -0.06

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
       I  COARSE FRACTION =  2.15%
-0.50- I
 0.00- I***
 0.50- I***
 0.98- I****
 1.44- I****
 2.06- I******
 2.45- I****
 2.96- I****
 3.53- I*****
 4.06- I*****
 4.50- I****
 5.00- I***
 5.50- I*******
 6.00- I******
 6.50- I******
 7.00  I******
 7.50- I****
 8.00- I*****
 8.50- I***
 9.00- I***
       I**
10.00- I**
       I  REST = 9.03%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

 85.00 M
              DATA  0.00 0.00 0.04 0.39 0.99 2.79 2.65 4.99 8.13 4.62 1.14 1.11 0.43 0.37 0.36 0.28 0.22 0.18 0.18 0.14 0.21 0.64
  FREQUENCY PERCENT  0.0  0.0  0.1  1.3  3.3  9.3  8.9 16.7 27.2 15.5  3.8  3.7  1.4  1.2  1.2  0.9  0.7  0.6  0.6  0.5  0.7  2.1
 CUMULATIVE PERCENT  0.0  0.0  0.1  1.4  4.8 14.1 23.0 39.7 66.9 82.4 86.2 89.9 91.4 92.6 93.8 94.7 95.5 96.1 96.7 97.2 97.9100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 82.38 SILT = 13.70 CLAY =  3.92

PERCENTILES (1,5,16,25,50,75,84,95)  0.90  1.47  2.15  2.52  3.17  3.78  4.24  7.17
MOMENT MEASURES MEAN  3.48  STDEV 1.87  SKEW 2.52  KURT 11.22
GRAPHIC (FOLK)  MEAN  3.19  STDEV 1.38  SKEW 0.21  KURT  1.85  INMAN SD 1.04  SK  0.02

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I*
 1.44- I***
 2.06- I*********
 2.45- I*********
 2.96- I******************
 3.53- I****************************
 4.06- I***************
 4.50- I****
 5.00- I****
 5.50- I*
 6.00- I*
 6.50- I*
 7.00- I*
 7.50- I*
 8.00- I*
 8.50- I*
 9.00- I
       I
10.00- I
       I  REST = 2.14%


 90.81 M
              DATA  0.00 0.00 0.02 0.02 0.10 0.51 1.05 2.00 1.62 0.55 0.22 0.21 0.12 0.11 0.11 0.10 0.09 0.10 0.10 0.06 0.05 0.38
  FREQUENCY PERCENT  0.0  0.0  0.3  0.3  1.3  6.8 14.0 26.6 21.5  7.3  2.9  2.8  1.6  1.5  1.5  1.3  1.2  1.3  1.3  0.8  0.7  5.1
 CUMULATIVE PERCENT  0.0  0.0  0.3  0.5  1.9  8.6 22.6 49.2 70.7 78.1 81.0 83.8 85.4 86.8 88.3 89.6 90.8 92.2 93.5 94.3 94.9100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 78.06 SILT = 14.10 CLAY =  7.85

PERCENTILES (1,5,16,25,50,75,84,95)  1.20  1.82  2.30  2.50  2.98  3.83  5.07 10.08
MOMENT MEASURES MEAN  3.79  STDEV 2.43  SKEW 2.20  KURT  7.38
GRAPHIC (FOLK)  MEAN  3.45  STDEV 1.95  SKEW 0.61  KURT  2.56  INMAN SD 1.39  SK  0.51

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I*
 2.06- I*******
 2.45- I***************
 2.96- I****************************
 3.53- I***********************
 4.06- I*******
 4.50- I***
 5.00- I***
 5.50- I**
 6.00- I*
 6.50- I*
 7.00- I*
 7.50- I*
 8.00- I*
 8.50- I*
 9.00- I*
       I
10.00- I
       I  REST = 5.05%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

 96.65 M
              DATA  0.00 0.00 0.00 0.01 0.01 0.04 0.14 1.30 3.17 1.68 0.58 0.36 0.18 0.18 0.17 0.14 0.12 0.10 0.09 0.09 0.11 0.38
  FREQUENCY PERCENT  0.0  0.0  0.0  0.1  0.1  0.5  1.6 14.7 35.8 19.0  6.6  4.1  2.0  2.0  1.9  1.6  1.4  1.1  1.0  1.0  1.2  4.3
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.1  0.2  0.7  2.3 16.9 52.8 71.8 78.3 82.4 84.4 86.4 88.4 89.9 91.3 92.4 93.4 94.5 95.7100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 71.75 SILT = 20.68 CLAY =  7.57

PERCENTILES (1,5,16,25,50,75,84,95)  2.18  2.62  2.94  3.12  3.49  4.27  5.40  9.41
MOMENT MEASURES MEAN  4.24  STDEV 2.16  SKEW 2.34  KURT  8.14
GRAPHIC (FOLK)  MEAN  3.94  STDEV 1.64  SKEW 0.65  KURT  2.41  INMAN SD 1.23  SK  0.55

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I
 2.45- I**
 2.96- I***************
 3.53- I************************************
 4.06- I*******************
 4.50- I*******
 5.00- I****
 5.50- I**
 6.00- I**
 6.50- I**
 7.00- I**
 7.50- I*
 8.00- I*
 8.50- I*
 9.00- I*
       I*
10.00- I*
       I  REST = 4.29%


 98.83 M
              DATA  0.00 0.00 0.01 0.04 0.03 0.08 0.08 0.15 0.26 0.30 0.28 0.58 0.65 0.95 1.10 0.75 0.80 0.75 0.75 0.75 1.20 3.36
  FREQUENCY PERCENT  0.0  0.0  0.1  0.3  0.2  0.6  0.6  1.2  2.0  2.3  2.2  4.5  5.1  7.4  8.5  5.8  6.2  5.8  5.8  5.8  9.3 26.1
 CUMULATIVE PERCENT  0.0  0.0  0.1  0.4  0.6  1.2  1.9  3.0  5.1  7.4  9.6 14.1 19.1 26.5 35.0 40.9 47.1 52.9 58.7 64.6 73.9100.0
PROPORTIONS:  GRAVEL = 0.00 SAND =  7.38 SILT = 45.53 CLAY = 47.09
                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95)  1.86  3.52  5.20  5.91  7.75 10.13 11.33 13.77
MOMENT MEASURES MEAN  8.05  STDEV 2.88  SKEW-0.00  KURT  2.05
GRAPHIC (FOLK)  MEAN  8.09  STDEV 3.09  SKEW 0.17  KURT  1.00  INMAN SD 3.06  SK  0.17

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I*
 2.45- I*
 2.96- I*
 3.53- I**
 4.06- I**
 4.50- I**
 5.00- I*****
 5.50- I*****
 6.00- I*******
 6.50- I*********
 7.00- I******
 7.50- I******
 8.00- I******
 8.50- I******
 9.00- I******
       I*****
10.00- I*****
       I  REST =26.11%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

105.63 M
              DATA  0.23 0.18 0.32 0.49 0.51 0.81 0.70 1.10 1.46 1.41 0.73 0.74 0.54 0.59 0.75 0.70 0.54 0.65 0.75 0.70 1.62 4.55
  FREQUENCY PERCENT  1.1  0.9  1.6  2.4  2.5  4.0  3.5  5.5  7.3  7.0  3.6  3.7  2.7  2.9  3.7  3.5  2.7  3.2  3.7  3.5  8.1 22.7
 CUMULATIVE PERCENT  1.1  2.0  3.6  6.1  8.6 12.7 16.1 21.6 28.9 35.9 39.6 43.2 45.9 48.9 52.6 56.1 58.8 62.0 65.8 69.3 77.3100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 35.92 SILT = 26.11 CLAY = 37.97
                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95) -0.61  0.79  2.44  3.24  6.15  9.69 10.99 13.63
MOMENT MEASURES MEAN  6.48  STDEV 3.92  SKEW 0.06  KURT  1.84
GRAPHIC (FOLK)  MEAN  6.53  STDEV 4.08  SKEW 0.15  KURT  0.81  INMAN SD 4.28  SK  0.13

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  1.15%
-0.50- I
 0.00- I*
 0.50- I**
 0.98- I**
 1.44- I***
 2.06- I****
 2.45- I***
 2.96- I*****
 3.53- I*******
 4.06- I*******
 4.50- I****
 5.00- I****
 5.50- I***
 6.00- I***
 6.50- I****
 7.00- I***
 7.50- I***
 8.00- I***
 8.50- I****
 9.00- I***
      I****
10.00- I****
      I  REST =22.67%


110.26 M
              DATA  0.00 0.00 0.00 0.00 0.02 0.07 0.42 2.22 4.20 3.64 0.91 0.54 0.12 0.11 0.11 0.08 0.08 0.08 0.08 0.06 0.10 0.30
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.2  0.5  3.2 16.9 32.0 27.7  6.9  4.1  0.9  0.8  0.8  0.6  0.6  0.6  0.6  0.5  0.8  2.3
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.2  0.7  3.9 20.8 52.7 80.4 87.4 91.5 92.4 93.2 94.1 94.7 95.3 95.9 96.5 97.0 97.7100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 80.44 SILT = 15.45 CLAY =  4.11

PERCENTILES (1,5,16,25,50,75,84,95)  2.14  2.51  2.86  3.05  3.49  3.94  4.27  7.26
MOMENT MEASURES MEAN  3.84  STDEV 1.67  SKEW 3.28  KURT 15.07
GRAPHIC (FOLK)  MEAN  3.54  STDEV 1.07  SKEW 0.35  KURT  2.19  INMAN SD 0.70  SK  0.12

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I*
 2.45- I***
 2.96- I*****************
 3.53- I*********************************
 4.06- I*****************************
 4.50- I*******
 5.00- I****
 5.50- I*
 6.00- I*
 6.50- I*
 7.00- I*
 7.50- I*
 8.00- I*
 8.50- I*
 9.00- I
      I
10.00- I
      I  REST = 2.28%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

111.57 M  DD
              DATA  0.01 0.04 0.04 0.08 0.16 0.59 0.73 1.01 0.98 1.02 0.97 1.00 0.84 0.84 0.88 0.64 0.64 0.64 0.56 0.48 0.77 2.09
  FREQUENCY PERCENT  0.1  0.3  0.3  0.5  1.1  3.9  4.9  6.7  6.5  6.8  6.5  6.7  5.6  5.6  5.9  4.3  4.3  4.3  3.7  3.2  5.1 13.9
 CUMULATIVE PERCENT  0.1  0.3  0.6  1.1  2.2  6.1 11.0 17.7 24.3 31.0 37.5 44.2 49.8 55.4 61.2 65.5 69.8 74.0 77.7 80.9 86.1100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 31.05 SILT = 42.97 CLAY = 25.98

PERCENTILES (1,5,16,25,50,75,84,95)  0.88  1.93  2.84  3.59  5.52  8.13  9.57 12.70
MOMENT MEASURES MEAN  6.09  STDEV 3.19  SKEW 0.51  KURT  2.32
GRAPHIC (FOLK)  MEAN  5.98  STDEV 3.31  SKEW 0.27  KURT  0.97  INMAN SD 3.36  SK  0.20

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  0.07%
-0.50- I
 0.00- I
 0.50- I
 0.98- I*
 1.44- I*
 2.06- I****
 2.45- I*****
 2.96- I*******
 3.53- I*******
 4.06- I*******
 4.50- I******
 5.00- I*******
 5.50- I******
 6.00- I******
 6.50- I******
 7.00- I****
 7.50- I****
 8.00- I****
 8.50- I****
 9.00- I***
      I***
10.00- I***
      I  REST =13.92%



124.43 M
              DATA  0.15 0.18 0.26 0.41 0.40 0.64 0.53 0.73 0.80 0.87 0.55 0.83 0.95 1.35 1.83 1.51 1.43 1.35 1.27 1.19 1.75 5.12
  FREQUENCY PERCENT  0.6  0.7  1.1  1.7  1.7  2.7  2.2  3.0  3.3  3.6  2.3  3.4  3.9  5.6  7.6  6.3  5.9  5.6  5.3  4.9  7.3 21.2
 CUMULATIVE PERCENT  0.6  1.4  2.4  4.1  5.8  8.5 10.7 13.7 17.0 20.6 22.9 26.3 30.3 35.9 43.5 49.8 55.7 61.3 66.6 71.5 78.8100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 20.62 SILT = 40.66 CLAY = 38.71
                                                                                *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95) -0.21  1.23  3.36  4.81  7.02  9.46 10.85 13.68
MOMENT MEASURES MEAN  7.10  STDEV 3.45  SKEW-0.17  KURT  2.33
GRAPHIC (FOLK)  MEAN  7.08  STDEV 3.76  SKEW 0.05  KURT  1.10  INMAN SD 3.74  SK  0.02

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  0.62%
-0.50- I
 0.00- I*
 0.50- I*
 0.98- I**
 1.44- I**
 2.06- I***
 2.45- I**
 2.96- I***
 3.53- I***
 4.06- I****
 4.50- I**
 5.00- I***
 5.50- I****
 6.00- I******
 6.50- I********
 7.00- I******
 7.50- I******
 8.00- I******
 8.50- I*****
 9.00- I*****
      I****
10.00- I****
      I  REST =21.24%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

124.79 M TUF
                DATA  0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0018.0020.0016.5012.50 7.50 6.50 5.00 3.50 6.00 5.50
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 17.8 19.8 16.3 12.4  7.4  6.4  5.0  3.5  5.9  5.4
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 17.8 37.6 54.0 66.3 73.8 80.2 85.1 88.6 94.6100.0
PROPORTIONS:  GRAVEL = 0.00 SAND =  0.00 SILT = 80.20 CLAY = 19.80

PERCENTILES (1,5,16,25,50,75,84,95)  4.34  4.90  5.44  5.70  6.38  7.59  8.38 10.11
MOMENT MEASURES MEAN  6.90  STDEV 1.70  SKEW 1.52  KURT  4.98
GRAPHIC (FOLK)  MEAN  6.73  STDEV 1.52  SKEW 0.40  KURT  1.13  INMAN SD 1.47  SK  0.36

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I
 2.45- I
 2.96- I
 3.53- I
 4.06- I
 4.50- I
 5.00- I
 5.50- I******************
 6.00- I********************
 6.50- I****************
 7.00- I************
 7.50- I*******
 8.00- I******
 8.50- I*****
 9.00- I***
       I***
10.00- I***
       I  REST = 5.45%



124.80 M TUF
                DATA  0.00 0.00 0.00 0.00 0.00 0.01 0.00 0.00 0.01 0.04 0.08 0.52 0.48 0.70 0.70 0.70 0.59 0.57 0.48 0.32 0.48 0.67
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.0  0.2  0.0  0.0  0.2  0.6  1.3  8.2  7.6 11.0 11.0 11.0  9.3  9.0  7.6  5.0  7.6 10.6
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.0  0.2  0.2  0.2  0.3  0.9  2.2 10.4 18.0 29.0 40.0 51.0 60.3 69.3 76.9 81.9 89.4100.0
PROPORTIONS:  GRAVEL = 0.00 SAND =  0.94 SILT = 68.35 CLAY = 30.71

PERCENTILES (1,5,16,25,50,75,84,95)  4.09  4.74  5.39  5.83  6.95  8.37  9.25 11.16
MOMENT MEASURES MEAN  7.36  STDEV 2.10  SKEW 0.83  KURT  3.13
GRAPHIC (FOLK)  MEAN  7.20  STDEV 1.94  SKEW 0.25  KURT  1.04  INMAN SD 1.93  SK  0.19

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I
 2.45- I
 2.96- I
 3.53- I
 4.06- I*
 4.50- I*
 5.00- I********
 5.50- I********
 6.00- I************
 6.50- I************
 7.00- I************
 7.50- I*********
 8.00- I*********
 8.50- I********
 9.00- I*****
       I****
10.00- I****
       I  REST =10.55%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

124.91 M TUF
              DATA  0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0010.5017.0018.0013.5010.00 8.50 5.50 4.50 6.50 6.50
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 10.4 16.9 17.9 13.4 10.0  8.5  5.5  4.5  6.5  6.5
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 10.4 27.4 45.3 58.7 68.7 77.1 82.6 87.1 93.5100.0
PROPORTIONS:  GRAVEL = 0.00 SAND =  0.00 SILT = 77.11 CLAY = 22.89

PERCENTILES (1,5,16,25,50,75,84,95)  4.68  5.20  5.70  5.94  6.68  7.87  8.65 10.33
MOMENT MEASURES MEAN  7.16  STDEV 1.72  SKEW 1.39  KURT  4.55
GRAPHIC (FOLK)  MEAN  7.01  STDEV 1.51  SKEW 0.38  KURT  1.09  INMAN SD 1.47  SK  0.34

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I
 2.45- I
 2.96- I
 3.53- I
 4.06- I
 4.50- I
 5.00- I
 5.50- I**********
 6.00- I******************
 6.50- I*******************
 7.00- I**************
 7.50- I**********
 8.00- I********
 8.50- I*****
 9.00- I****
       I***
10.00- I***
       I  REST = 6.47%


126.17 M
              DATA  0.15 0.22 0.24 0.37 0.34 0.47 0.33 0.39 0.61 2.22 1.71 1.50 0.60 0.60 0.60 0.66 0.60 0.90 0.84 0.90 1.97 5.28
  FREQUENCY PERCENT  0.7  1.0  1.1  1.7  1.6  2.2  1.5  1.8  2.8 10.3  8.0  7.0  2.8  2.8  2.8  3.1  2.8  4.2  3.9  4.2  9.2 24.6
 CUMULATIVE PERCENT  0.7  1.7  2.8  4.6  6.1  8.3  9.9 11.7 14.5 24.8 32.8 39.8 42.6 45.3 48.1 51.2 54.0 58.2 62.1 66.3 75.4100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 24.84 SILT = 33.35 CLAY = 41.81
                                                                                *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95) -0.31  1.12  3.62  4.07  6.80  9.95 11.14 13.56
MOMENT MEASURES MEAN  7.01  STDEV 3.69  SKEW-0.05  KURT  1.96
GRAPHIC (FOLK)  MEAN  7.19  STDEV 3.77  SKEW 0.12  KURT  0.87  INMAN SD 3.76  SK  0.15

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  0.70%
-0.50- I
 0.00- I*
 0.50- I*
 0.98- I**
 1.44- I**
 2.06- I**
 2.45- I**
 2.96- I**
 3.53- I***
 4.06- I**********
 4.50- I********
 5.00- I********
 5.50- I***
 6.00- I***
 6.50- I***
 7.00- I***
 7.50- I***
 8.00- I****
 8.50- I****
 9.00- I****
       I*****
10.00- I*****
       I  REST =24.56%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

133.79 M
              DATA  0.26 0.40 0.37 0.64 0.60 0.79 0.53 0.61 0.80 2.03 1.97 2.42 0.62 0.70 0.78 0.86 0.78 1.01 1.09 1.17 2.26 6.71
 FREQUENCY PERCENT  0.9  1.5  1.4  2.3  2.2  2.9  1.9  2.2  2.9  7.4  7.2  8.8  2.3  2.6  2.8  3.1  2.8  3.7  4.0  4.3  8.2 24.5
CUMULATIVE PERCENT  0.9  2.4  3.8  6.1  8.3 11.2 13.1 15.3 18.2 25.7 32.8 41.7 43.9 46.5 49.3 52.5 55.3 59.0 63.0 67.3 75.5100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 25.66 SILT = 33.36 CLAY = 40.99
                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95) -0.47  0.78  3.10  4.02  6.60  9.93 11.25 13.92
MOMENT MEASURES MEAN  6.85  STDEV 3.83  SKEW-0.06  KURT  1.95
GRAPHIC (FOLK)  MEAN  6.98  STDEV 4.03  SKEW 0.13  KURT  0.91  INMAN SD 4.08  SK  0.14

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  0.95%
-0.50- I
 0.00- I*
 0.50- I*
 0.98- I**
 1.44- I**
 2.06- I***
 2.45- I**
 2.96- I**
 3.53- I***
 4.06- I*******
 4.50- I*******
 5.00- I*********
 5.50- I**
 6.00- I***
 6.50- I***
 7.00- I***
 7.50- I***
 8.00- I****
 8.50- I****
 9.00- I****
       I****
10.00- I****
       I  REST =24.49%


137.17 M DD
              DATA  0.18 0.21 0.26 0.33 0.29 0.38 0.26 0.31 0.37 0.41 0.46 0.67 0.60 0.55 0.50 0.39 0.42 0.45 0.45 0.39 0.65 1.74
 FREQUENCY PERCENT  1.8  2.0  2.5  3.2  2.8  3.7  2.5  3.0  3.6  4.0  4.5  6.5  5.8  5.4  4.9  3.8  4.1  4.4  4.4  3.8  6.3 16.9
CUMULATIVE PERCENT  1.8  3.8  6.3  9.5 12.4 16.1 18.6 21.6 25.2 29.2 33.7 40.2 46.1 51.4 56.3 60.1 64.2 68.5 72.9 76.7 83.1100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 29.21 SILT = 39.34 CLAY = 31.45
                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95) -0.83  0.26  2.05  3.50  5.87  8.77 10.17 13.04
MOMENT MEASURES MEAN  6.13  STDEV 3.76  SKEW 0.01  KURT  2.23
GRAPHIC (FOLK)  MEAN  6.03  STDEV 3.97  SKEW 0.09  KURT  0.99  INMAN SD 4.06  SK  0.06

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  1.75%
-0.50- I
 0.00- I**
 0.50- I***
 0.98- I***
 1.44- I***
 2.06- I****
 2.45- I***
 2.96- I***
 3.53- I****
 4.06- I****
 4.50- I****
 5.00- I*******
 5.50- I******
 6.00- I*****
 6.50- I*****
 7.00- I****
 7.50- I****
 8.00- I****
 8.50- I****
 9.00- I****
       I***
10.00- I***
       I  REST =16.94%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

138.64 M D
              DATA  0.00 0.00 0.00 0.00 0.00 0.03 0.02 0.04 0.06 0.09 0.16 0.27 0.38 0.38 0.38 0.30 0.27 0.33 0.33 0.38 0.76 3.22
  FREQUENCY PERCENT  0.0  0.0  0.0  0.0  0.0  0.4  0.3  0.5  0.8  1.2  2.2  3.6  5.1  5.1  5.1  4.1  3.6  4.5  4.5  5.1 10.3 43.5
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.0  0.0  0.4  0.7  1.2  2.0  3.2  5.4  9.1 14.2 19.3 24.5 28.5 32.2 36.6 41.1 46.2 56.5100.0
PROPORTIONS:  GRAVEL = 0.00 SAND =  3.24 SILT = 33.38 CLAY = 63.38
                                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95)  2.79  4.43  5.69  6.57  9.37 11.98 13.22 15.74
MOMENT MEASURES MEAN  9.15  STDEV 2.88  SKEW-0.43  KURT  1.85                       ***  INSUFFICIENT  DATA  ***

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I
 2.45- I
 2.96- I*
 3.53- I*
 4.06- I*
 4.50- I**
 5.00- I****
 5.50- I*****
 6.00- I*****
 6.50- I*****
 7.00- I****
 7.50- I****
 8.00- I****
 8.50- I****
 9.00- I*****
       I*****
10.00- I*****
       I  REST =43.51%


148.23 M D
              DATA  0.37 0.37 0.30 0.33 0.27 0.36 0.25 0.29 0.37 0.56 0.42 0.32 0.78 0.78 0.84 0.67 0.56 0.78 0.72 0.67 1.45 3.90
  FREQUENCY PERCENT  2.4  2.4  2.0  2.1  1.8  2.3  1.6  1.9  2.4  3.6  2.7  2.1  5.1  5.1  5.5  4.4  3.6  5.1  4.7  4.4  9.4 25.4
 CUMULATIVE PERCENT  2.4  4.8  6.8  8.9 10.7 13.0 14.6 16.5 18.9 22.6 25.3 27.4 32.5 37.6 43.0 47.4 51.0 56.1 60.8 65.2 74.6100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 22.59 SILT = 33.53 CLAY = 43.88
                                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95) -1.06  0.05  2.82  4.45  7.36 10.04 11.22 13.61
MOMENT MEASURES MEAN  7.10  STDEV 3.95  SKEW-0.42  KURT  2.36
GRAPHIC (FOLK)  MEAN  7.13  STDEV 4.15  SKEW-0.08  KURT  0.99  INMAN SD 4.20  SK -0.08

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  2.41%
-0.50- I
 0.00- I**
 0.50- I**
 0.98- I**
 1.44- I**
 2.06- I**
 2.45- I**
 2.96- I**
 3.53- I**
 4.06- I****
 4.50- I***
 5.00- I**
 5.50- I*****
 6.00- I*****
 6.50- I*****
 7.00- I****
 7.50- I****
 8.00- I*****
 8.50- I*****
 9.00- I****
       I*****
10.00- I*****
       I  REST =25.39%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

151.69 M
              DATA  0.00 0.00 0.00 0.01 0.01 0.01 0.01 0.02 0.03 0.07 0.06 0.21 0.25 0.29 0.43 0.29 0.29 0.36 0.50 0.47 0.93 3.76
  FREQUENCY PERCENT  0.0  0.0  0.0  0.1  0.1  0.1  0.1  0.3  0.4  0.9  0.8  2.6  3.1  3.6  5.4  3.6  3.6  4.5  6.3  5.9 11.6 47.0
 CUMULATIVE PERCENT  0.0  0.0  0.0  0.1  0.3  0.4  0.5  0.7  1.1  2.0  2.7  5.4  8.5 12.1 17.5 21.1 24.7 29.2 35.5 41.4 53.0100.0
PROPORTIONS:  GRAVEL = 0.00 SAND =  2.00 SILT = 27.25 CLAY = 70.75
                                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95)  3.36  4.94  6.37  7.53  9.74 12.04 13.14 15.35
MOMENT MEASURES MEAN  9.56  STDEV 2.64  SKEW-0.62  KURT  2.23                       ***  INSUFFICIENT  DATA  ***

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I
 2.45- I
 2.96- I
 3.53- I
 4.06- I*
 4.50- I*
 5.00- I***
 5.50- I***
 6.00- I****
 6.50- I*****
 7.00- I****
 7.50- I****
 8.00- I*****
 8.50- I******
 9.00- I******
       I******
10.00- I******
       I  REST =47.00%


156.27 M D
              DATA  0.11 0.18 0.16 0.24 0.48 0.27 0.15 0.19 0.23 0.28 0.31 0.34 0.67 0.58 0.58 0.54 0.46 0.54 0.54 0.50 1.04 2.87
  FREQUENCY PERCENT  1.0  1.6  1.4  2.1  4.3  2.4  1.3  1.7  2.0  2.5  2.8  3.0  6.0  5.2  5.2  4.8  4.1  4.8  4.8  4.4  9.2 25.5
 CUMULATIVE PERCENT  1.0  2.6  4.0  6.1 10.4 12.8 14.1 15.8 17.9 20.3 23.1 26.1 32.1 37.2 42.4 47.2 51.2 56.0 60.8 65.3 74.5100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 20.34 SILT = 35.70 CLAY = 43.96
                                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95) -0.49  0.75  3.02  4.82  7.35 10.06 11.26 13.70
MOMENT MEASURES MEAN  7.22  STDEV 3.77  SKEW-0.33  KURT  2.22
GRAPHIC (FOLK)  MEAN  7.21  STDEV 4.02  SKEW-0.04  KURT  1.01  INMAN SD 4.12  SK -0.05

       0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
       T    T    T    T    T    T    T
       I  COARSE FRACTION =  0.98%
-0.50- I
 0.00- I**
 0.50- I*
 0.98- I**
 1.44- I****
 2.06- I**
 2.45- I*
 2.96- I**
 3.53- I**
 4.06- I**
 4.50- I***
 5.00- I***
 5.50- I******
 6.00- I*****
 6.50- I*****
 7.00- I*****
 7.50- I****
 8.00- I*****
 8.50- I*****
 9.00- I****
       I*****
10.00- I*****
       I  REST =25.49%
```

```
CLASS MIDPOINTS-PHI -2.50-0.25 0.25 0.74 1.21 1.75 2.26 2.70 3.24 3.80 4.28 4.75 5.25 5.75 6.25 6.75 7.25 7.75 8.25 8.75 9.5012.00
CLASS LIMITS  - PHI -0.50 0.00 0.50 0.98 1.44 2.06 2.45 2.96 3.53 4.06 4.50 5.00 5.50 6.00 6.50 7.00 7.50 8.00 8.50 9.0010.00

162.51 M D
              DATA  0.66 0.76 0.81 0.88 0.54 0.72 0.48 0.63 0.87 1.09 0.88 0.71 1.15 1.72 1.72 1.85 1.28 1.57 1.72 1.72 3.8511.97
  FREQUENCY PERCENT  1.8  2.0  2.2  2.3  1.4  1.9  1.3  1.7  2.3  2.9  2.3  1.9  3.1  4.6  4.6  4.9  3.4  4.2  4.6  4.6 10.2 31.9
 CUMULATIVE PERCENT  1.8  3.8  5.9  8.3  9.7 11.6 12.9 14.6 16.9 19.8 22.1 24.0 27.1 31.7 36.2 41.2 44.6 48.7 53.3 57.9 68.1100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 19.80 SILT = 28.95 CLAY = 51.25
                                                                    *** EXTRAPOLATED TOO FAR ***
PERCENTILES (1,5,16,25,50,75,84,95) -0.83  0.30  3.32  5.16  8.14 10.74 11.92 14.31
MOMENT MEASURES MEAN  7.66  STDEV 3.96  SKEW-0.58  KURT  2.41
GRAPHIC (FOLK)  MEAN  7.79  STDEV 4.27  SKEW-0.12  KURT  1.03  INMAN SD 4.30  SK -0.12

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  1.76%
-0.50- I
 0.00- I**
 0.50- I**
 0.98- I**
 1.44- I*
 2.06- I**
 2.45- I*
 2.96- I**
 3.53- I**
 4.06- I***
 4.50- I**
 5.00- I**
 5.50- I***
 6.00- I*****
 6.50- I*****
 7.00- I*****
 7.50- I***
 8.00- I****
 8.50- I*****
 9.00- I*****
      I*****
10.00- I*****
      I  REST =31.85%


165.75 M
              DATA  0.02 0.04 0.02 0.02 0.02 0.07 0.10 0.22 0.38 0.51 0.53 0.54 0.37 0.37 0.41 0.41 0.45 0.67 0.84 0.80 1.30 1.86
  FREQUENCY PERCENT  0.2  0.4  0.2  0.2  0.2  0.7  1.0  2.2  3.8  5.1  5.3  5.4  3.7  3.7  4.1  4.1  4.5  6.7  8.4  8.0 13.1 18.7
 CUMULATIVE PERCENT  0.2  0.6  0.8  1.0  1.2  1.9  2.9  5.1  8.9 14.1 19.4 24.8 28.5 32.3 36.4 40.5 45.0 51.8 60.2 68.2 81.3100.0
PROPORTIONS:  GRAVEL = 0.00 SAND = 14.07 SILT = 37.69 CLAY = 48.24

PERCENTILES (1,5,16,25,50,75,84,95)  0.97  2.94  4.23  5.02  7.87  9.48 10.25 11.82
MOMENT MEASURES MEAN  7.58  STDEV 2.99  SKEW-0.15  KURT  2.32
GRAPHIC (FOLK)  MEAN  7.45  STDEV 2.85  SKEW-0.16  KURT  0.82  INMAN SD 3.01  SK -0.21

      0----5---10---15---20---25---30% FOR 0.5 PHI INTERVALS
      T    T    T    T    T    T    T
      I  COARSE FRACTION =  0.20%
-0.50- I
 0.00- I
 0.50- I
 0.98- I
 1.44- I
 2.06- I*
 2.45- I*
 2.96- I**
 3.53- I****
 4.06- I*****
 4.50- I*****
 5.00- I*****
 5.50- I****
 6.00- I****
 6.50- I****
 7.00- I****
 7.50- I*****
 8.00- I*******
 8.50- I********
 9.00- I********
      I*******
10.00- I*******
      I  REST =18.69%
```