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TECHNICAL NOTE

DATE: October1984 **REPORT NO:** 84-28

TITLE: Particle Size Data Report

AUTHOR: K. Salisbury

REASON FOR REPORT: This report responds to a request for particle size data from Dr. Carolyn Eyles, University of Toronto.

CORRESPONDENCE FILE NO: Study 84-330

1.0 INTRODUCTION

Dr. Carolyn Eyles, University of Toronto, submitted eighteen samples to the laboratory requesting sand, silt and clay percentages.

The size-analyses were performed using the Sedigraph Analyzer (Duncan and LaHaie, 1979) by Keith Salisbury.

2.0 PROCEDURE

(A) The Sieve and Sedigraph Method which provides sand, silt and clay percentages was used to analyse the sample.

Briefly the procedure consists of:

1. Splitting the sample to 2g.
2. Removing particles large enough to block Sedigraph Suction Tube (0.088 mm).
3. Dispersing sample in a Calgon suspension.
4. Automatic analysis with the Sedigraph.
5. Processing the results with SIZDIST: a FORTRAN IV computer program (Sandilands and Duncan, 1980).

(B) Sieve analysis which provides gravel, sand and silt/clay percentages was used to analyze 2 samples.

Briefly, the procedure consists of:

1. Splitting the sample to 100-200 g.
2. Sieving the split at 1/2 or 1/4 PHI intervals.
3. Processing the results with SIZDIST: a FORTRAN IV computer program. (Sandilands and Duncan, 1980).

3.0 RESULTS

(A) For the Sieve and Sedigraph Method, the output consists of:

1. A histogram of the frequency distribution.
2. The percentage and cumulative percentages of the material occurring within each 1/2 PHI unit.
3. Moment measure statistics (Krumbein & Pettijohn, 1938) and graphic (Folk and Ward, 1957) statistics.
4. Percentiles.
5. Percent gravel, sand, silt and clay.
6. Ratios used to plot Folk's Ternary Classification.
7. Shepard (1954) and Folk (1974) Ternary Classifications.

(B) For the Sieve Method, the output consists of:

1. A histogram of the frequency distribution.
2. The percentage and cumulative percentage of the material occurring within 1/2 PHI unit.
3. Moment measures (Krumbein and Pettijohn, 1938) and graphic (Folk and Ward, 1957) statistics.
4. Percentiles.
5. Percent gravel, sand and silt/clay.
6. Ratios used to plot Folk's Ternary Classification.
7. Shepard (1954) and Folk (1974) Ternary Classification.

4.0 REFERENCES

Duncan, G.A. and LaHaie, G.G. 1979. Size Analysis Procedures used in the Sedimentology Laboratory, NWRI. NWRI, CCIW, Hydraulics Division Manual, September 1979.

Folk, R.L. 1974. Petrology of Sedimentary Rocks. Hemphill Publishing Co., Austin, Texas, 182 p.

Folk, R.L. and Ward W.C. 1957. Brazos River Bar: A Study in the Significance of Grain Size Parameters. Jour. Sed. Petrology, V. 27, pp 3-26.

Krumbein, W.C. and Pettijohn, F.J. 1938. Manual of Sedimentary Petrography. Appleton-Century-Crofts, New York, 549 p.

Sandilands, R.G. and Duncan, G.A. 1980. SIZDIST - A Computer Program for Size Analysis. NWRI, CCIW, Hydraulics Division Technical Note No. 80-08.

Shepard, F.P. 1954. Nomenclature Based on Sand-Silt Ratios. Jour. Sed. Petrology, V. 24, pp. 151-158.

PHI CONVERSION

The results of samples analyzed in the Sedimentology Lab are presented using the PHI scale (Krumbein, 1934). The conversion from this PHI equation, $\phi = -\log_2 \xi$ (where ξ is the diameter in millimeters) to the Wentworth scale is listed below.

PHI (ϕ)	Millimeters	Microns	Wentworth Size Class
-5.0	32		
-4.5	24		
-4.0	16		Pebble (-2 to -6ϕ)
-3.5	12		
-3.0	8		
-2.5	6		
-2.0	4		
-1.5	2.83		Granule
-1.0	2.00		
-0.5	1.41		Very coarse sand
0.0	1.00		
0.5	0.71		Coarse sand
1.0	0.51	500	
1.5	0.35	350	Medium sand
2.0	0.25	250	
2.5	0.177	177	Fine sand
3.0	0.125	125	
3.5	0.088	88	Very fine sand
4.0	0.0625	62.5	
8.0	0.0039	3.9	Silt↑ Clay↓

APPENDIX 1

SIZDIST OUTPUT

A II SEDIGRAPH ANALYSIS

10/19/84

PHI	PCT.	CUMPCT.	
3.50	0.00		
4.00	0.00	0.00	
4.50	0.00	0.00	
5.00	0.00	0.00	
5.50	0.00	0.00	
6.00	1.52	1.52	**
6.50	6.09	7.61	******
7.00	12.18	19.80	**********
7.50	14.21	34.01	**********
8.00	10.15	44.16	**********
8.50	9.14	53.30	*********
9.00	9.14	62.44	*********
9.50	7.61	70.05	********
10.00	4.06	74.11	****
10.50	5.58	79.70	******
11.00	5.08	84.77	*****
11.50	5.08	89.85	*****
12.00	4.06	93.91	****
******	6.09	100.00	******

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
8.44	1.61	.24	-.82	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE 4.0 TO 12.0 PHI

> 5 PERCENT OF THE FINES ARE NOT RESOLVED, OBTAIN FOLK STATS. GRAPHICALLY

PERCENTILES MEDIAN 8.32 5TH 6.29 16TH 6.84 25TH 7.18
75TH 10.08 84TH 10.92 95TH******

PCT. GRAVEL .00 SAND 0.00 SILT (PIPETTE) 0.00 CLAY (PIPETTE) 0.00
(SEDIGRAPH) 44.16 (SEDIGRAPH) 55.84

GRAVEL+SAND .00 SILT/(SILT+CLAY) 44.16PCT.GRAV+SAND/SILT+CLAY .00

LABELS SHEPARD -SILTY CLAY FOLK(GMS)-MUD (SCS)-MUD

A III 10 CM SEDIGRAPH ANALYSIS

10/19/84

PHI	PCT.	CUMPCT.	
3.50			
	0.00		
4.00		0.00	
	.50		*
4.50		.50	
	0.00		
5.00		.50	
	.50		*
5.50		1.00	
	1.00		*
6.00		2.00	
	3.50		***
6.50		5.50	
	7.00		*******
7.00		12.50	
	12.50		**********
7.50		25.00	
	13.00		**********
8.00		38.00	
	11.50		**********
8.50		49.50	
	9.50		*********
9.00		59.00	
	9.00		*********
9.50		68.00	
	6.50		*******
10.00		74.50	
	5.50		******
10.50		80.00	
	4.50		*****
11.00		84.50	
	3.50		***
11.50		88.00	
	4.00		****
12.00		92.00	
	8.00		********
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS
8.55	1.52	.14	-.40

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES
FOR SIZE RANGE 4.0 TO 12.0 PHI

> 5 PERCENT OF THE FINES ARE NOT RESOLVED, OBTAIN FOLK STATS. GRAPHICALLY

PERCENTILES MEDIAN 8.53 5TH 6.43 16TH 7.14 25TH 7.50
75TH 10.05 84TH 10.94 95TH******

PCT. GRAVEL .00 SAND 0.00 SILT (PIPETTE) 0.00 CLAY (PIPETTE) 0.00
(SEDIGRAPH) 38.00 (SEDIGRAPH) 62.00

GRAVEL+SAND .00 SILT/(SILT+CLAY) 38.00PCT.GRAV+SAND/SILT+CLAY .00

LABELS SHEPARD -SILTY CLAY FOLK(GMS)-MUD (SCS)-MUD

A V N 50 CM SEDIGRAPH ANALYSIS

10/19/84

PHI	PCT.	CUMPCT.	
3.50			
	0.00		
4.00		0.00	
	0.00		
4.50		0.00	
	.51		*
5.00		.51	
	8.67		*********
5.50		9.18	
	17.35		**********
6.00		26.53	
	16.33		**********
6.50		42.86	
	10.20		**********
7.00		53.06	
	9.18		*********
7.50		62.24	
	7.14		*******
8.00		69.39	
	5.10		*****
8.50		74.49	
	4.59		*****
9.00		79.08	
	2.55		***
9.50		81.63	
	3.06		***
10.00		84.69	
	2.55		***
10.50		87.24	
	2.04		**
11.00		89.29	
	3.06		***
11.50		92.35	
	2.55		***
12.00		94.90	
	5.10		*****
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS
7.26	1.75	.50	.12

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES
FOR SIZE RANGE 4.0 TO 12.0 PHI

> 5 PERCENT OF THE FINES ARE NOT RESOLVED, OBTAIN FOLK STATS. GRAPHICALLY

PERCENTILES MEDIAN 6.85 5TH 5.26 16TH 5.70 25TH 5.96
75TH 8.56 84TH 9.89 95TH******

PCT. GRAVEL .00 SAND 0.00 SILT (PIPETTE) 0.00 CLAY (PIPETTE) 0.00
(SEDIGRAPH) 69.39 (SEDIGRAPH) 30.61

GRAVEL+SAND .00 SILT/(SILT+CLAY) 69.39PCT.GRAV+SAND/SILT+CLAY .00

LABELS SHEPARD -CLAYEY SILT FOLK(GMS)-MUD (SOS)-SILT

A 3 SEDIGRAPH ANALYSIS

PHI	PCT.	CUMPCT.	
3.50			10/19/84
	0.00		
4.00		0.00	
	6.06		******
4.50		6.06	
	36.36		**********
5.00		42.42	
	30.30		**********
5.50		72.73	
	9.60		**********
6.00		82.32	
	4.55		*****
6.50		86.87	
	3.03		***
7.00		89.90	
	1.52		**
7.50		91.41	
	1.52		**
8.00		92.93	
	1.01		*
8.50		93.94	
	1.01		*
9.00		94.95	
	1.01		*
9.50		95.96	
	.51		*
10.00		96.46	
	.51		*
10.50		96.97	
	.51		*
11.00		97.47	
	1.01		*
11.50		98.48	
	1.01		*
12.00		99.49	
	.51		*
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
5.52	1.39	1.32	7.39	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE 4.0 TO 12.0 PHI
5.32	1.09	.53	2.20	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES MEDIAN 5.13 5TH 4.41 16TH 4.64 25TH 4.76

75TH 5.62 84TH 6.18 95TH 9.03

PCT. GRAVEL .00 SAND 0.00 SILT (PIPETTE) 0.00 CLAY (PIPETTE) 0.00

(SEDIGRAPH) 92.93 (SEDIGRAPH) 7.07

GRAVEL+SAND .00 SILT/(SILT+CLAY) 92.93PCT.GRAV+SAND/SILT+CLAY .00

LABELS SHEPARD -SILT FOLK(GMS)-MUD (SCS)-SILT

A 8 SEDIGRAPH ANALYSIS

PHI	PCT.	CUMPCT.		10/19/84
3.50				
	0.00			
4.00		0.00		
	1.02		*	
4.50		1.02		
	1.53		**	
5.00		2.55		
	2.55		***	
5.50		5.10		
	11.22		**********	
6.00		16.33		
	14.29		**********	
6.50		30.61		
	10.20		**********	
7.00		40.82		
	10.20		**********	
7.50		51.02		
	8.16		********	
8.00		59.18		
	7.14		*******	
8.50		66.33		
	6.12		******	
9.00		72.45		
	5.10		*****	
9.50		77.55		
	4.59		*****	
10.00		82.14		
	3.57		****	
10.50		85.71		
	3.06		***	
11.00		88.78		
	2.04		**	
11.50		90.82		
	1.53		**	
12.00		92.35		
	7.65		********	
*****		100.00		

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
7.58	1.70	.27	-.46	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE 4.0 TO 12.0 PHI

> 5 PERCENT OF THE FINES ARE NOT RESOLVED, OBTAIN FOLK STATS. GRAPHICALLY

PERCENTILES MEDIAN 7.45 5TH 5.48 16TH 5.99 25TH 6.30
75TH 9.25 84TH 10.26 95TH******

PCT. GRAVEL .00 SAND 0.00 SILT (PIPETTE) 0.00 CLAY (PIPETTE) 0.00
(SEDIGRAPH) 59.18 (SEDIGRAPH) 40.82

GRAVEL+SAND .00 SILT/(SILT+CLAY) 59.18PCT.GRAV+SAND/SILT+CLAY .00

LABELS SHEPARD -CLAYEY SILT FOLK(GMS)-MUD (SCS)-MUD

A 15 SEDIGRAPH ANALYSIS

10/19/84

PHI	PCT.	CUMPCT.	
3.50	0.00		
4.00	0.00	0.00	
4.50	0.00	0.00	
5.00	.51	0.00	*
5.50	1.52	.51	**
6.00	7.07	2.02	*******
6.50	1.52	9.09	**
7.00	22.73	10.61	**********
7.50	10.10	33.33	**********
8.00	12.12	43.43	**********
8.50	9.09	55.56	*********
9.00	7.07	64.65	*******
9.50	6.06	71.72	******
10.00	4.55	77.78	*****
10.50	3.54	82.32	****
11.00	3.54	85.86	****
11.50	3.54	89.39	****
12.00	7.07	92.93	*******
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS
8.38	1.50	.26	-.41

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES
FOR SIZE RANGE 4.0 TO 12.0 PHI

> 5 PERCENT OF THE FINES ARE NOT RESOLVED, OBTAIN FOLK STATS. GRAPHICALLY

PERCENTILES MEDIAN 8.27 5TH 6.21 16TH 7.12 25TH 7.32
75TH 9.77 84TH 10.74 95TH******

PCT. GRAVEL .00 SAND 0.00 SILT (PIPETTE) 0.00 CLAY (PIPETTE) 0.00
(SEDIGRAPH) 43.43 (SEDIGRAPH) 56.57

GRAVEL+SAND .00 SILT/(SILT+CLAY) 43.43PCT.GRAV+SAND/SILT+CLAY .00

LABELS SHEPARD -SILTY CLAY FOLK(GMS)-MUD (SCS)-MUD

0184 A SIEVE ONLY SAMPLE WT.=230.7200

10/19/84

PHI	PCT.	CUMPCT.	
-4.00			
	8.66		*********
-3.50		8.66	
	6.11		******
-3.00		14.77	
	7.75		********
-2.50		22.52	
	7.48		*******
-2.00		30.00	
	5.49		*****
1.50		35.48	
	7.84		********
.00		43.33	
	12.04		************
.50		55.36	
	10.71		**********
.00		66.07	
	9.08		*********
.50		75.16	
	7.17		*******
1.00		82.32	
	4.15		****
1.50		86.49	
	4.04		****
.00		90.53	
	2.90		***
.50		93.43	
	2.59		***
3.00		96.02	
	1.60		**
3.50		97.62	
	1.25		*
4.00		98.88	
	1.12		*
****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
-.79	1.88	.12	-.62	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.5 TO 4.0 PHI
-.81	2.02	.01	.94	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES MEDIAN -.72 5TH -3.71 16TH -2.92 25TH -2.33
75TH .49 84TH 1.20 95TH 2.80

CT. GRAVEL 43.33 SAND 55.55 SILT+CLAY 1.12
RAVEL+SAND 98.88 GRAV+SAND/SILT+CLAY 88.08
LABELS SHEPARD -SAND FOLK(GMS)-SANDY GRAVEL (SCS)-

0184 B SIEVE ONLY SAMPLE WT.= 77.5800

10/19/84

PHI	PCT.	CUMPCT.	
-4.00			
	10.35		**********
-3.50		10.35	
	2.23		**
-3.00		12.58	
	10.60		**********
-2.50		23.18	
	4.40		****
-2.00		27.57	
	12.59		**********
-1.50		40.16	
	15.47		**********
-1.00		55.63	
	14.71		**********
-.50		70.34	
	8.78		*********
0.00		79.12	
	6.54		*******
.50		85.65	
	4.73		*****
1.00		90.38	
	2.46		**
1.50		92.85	
	1.96		**
2.00		94.81	
	1.52		**
2.50		96.33	
	1.04		*
3.00		97.37	
	1.41		*
3.50		98.78	
	.61		*
4.00		99.38	
	.62		*
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
-1.16	1.62	.24	.23	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.5 TO 4.0 PHI
-1.22	1.69	.04	1.16	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES MEDIAN -1.18 5TH -3.76 16TH -2.84 25TH -2.29
75TH -.23 84TH .37 95TH 2.06

PCT. GRAVEL 55.63 SAND 43.75 SILT+CLAY .62
GRAVEL+SAND 99.38 GRAV+SAND/SILT+CLAY 160.63
LABELS SHEPARD -SAND FOLK(GMS)-SANDY GRAVEL (SCS)-

0184 C SIEVE ONLY SAMPLE WT.= 97.7300

10/19/84

PHI	PCT.	CUMPCT.	
-4.50			
	5.02		*****
-4.00		5.02	
	0.00		
-3.50		5.02	
	0.00		
-3.00		5.02	
	1.44		*
-2.50		6.47	
	2.19		**
-2.00		8.66	
	5.10		*****
-1.50		13.75	
	7.06		*******
-1.00		20.81	
	13.46		**********
-.50		34.27	
	14.75		**********
0.00		49.02	
	14.06		**********
.50		63.08	
	12.29		**********
1.00		75.37	
	7.35		*******
1.50		82.72	
	5.38		*****
2.00		88.10	
	3.57		****
2.50		91.67	
	2.40		**
3.00		94.08	
	2.48		**
3.50		96.55	
	1.48		*
4.00		98.04	
	1.96		**
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
-.02	1.65	-.19	.72	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -4.0 TO 4.0 PHI
.10	1.83	-.03	1.61	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES MEDIAN .03 5TH -4.00 16TH -1.34 25TH -.84

75TH .98 84TH 1.62 95TH 3.19

PCT. GRAVEL 20.81 SAND 77.22 SILT+CLAY 1.96

GRAVEL+SAND 98.04 GRAV+SAND/SILT+CLAY 49.90

LABELS SHEPARD -SAND FOLK(GMS)-GRAVELLY SAND (SCS)-

0184 D SIEVE ONLY SAMPLE WT.= 74.5300

PHI	PCT.	CUMPCT.	
-2.00			10/19/84
	.20		
-1.50		.20	
	.58		*
-1.00		.78	
	.71		*
-.50		1.49	
	1.93		**
0.00		3.42	
	4.54		*****
.50		7.96	
	8.91		*********
1.00		16.87	
	11.58		**********
1.50		28.44	
	20.72		**********
2.00		49.16	
	21.78		**********
2.50		70.94	
	12.63		**********
3.00		83.56	
	6.92		*******
3.50		90.49	
	4.43		****
4.00		94.91	
	5.09		*****
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
1.89	.98	-.23	.41	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -1.5 TO 4.0 PHI

> 5 PERCENT OF THE FINES ARE NOT RESOLVED, OBTAIN FOLK STATS. GRAPHICALLY

PERCENTILES	MEDIAN 2.02	5TH .17	16TH .95	25TH 1.35
		75TH 2.66	84TH 3.03	95TH******

PCT. GRAVEL .78 SAND 94.14 SILT+CLAY 5.09

GRAVEL+SAND 94.91 GRAV+SAND/SILT+CLAY 18.66

LABELS SHEPARD -SAND FOLK(GMS)-SAND (SCS)-

0584 SIEVE ONLY SAMPLE WT.=259.5900

10/19/84

PHI	PCT.	CUMPCT.	
-4.50	2.79		***
-4.00	6.33	2.79	******
-3.50	5.02	9.12	*****
-3.00	7.70	14.14	********
-2.50	7.83	21.84	********
-2.00	11.71	29.67	**********
-1.50	9.40	41.38	*********
-1.00	11.35	50.78	**********
-.50	7.83	62.12	********
0.00	6.92	69.96	*******
.50	6.80	76.88	*******
1.00	4.04	83.68	****
1.50	3.31	87.72	***
2.00	3.43	91.03	***
2.50	1.74	94.46	**
3.00	1.46	96.20	*
3.50	1.10	97.67	*
4.00	1.24	98.76	*
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
-.96	1.85	.17	-.44	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -4.0 TO 4.0 PHI
-.96	1.96	.10	1.00	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES MEDIAN -1.04 5TH -3.83 16TH -2.88 25TH -2.30

75TH .36 84TH 1.04 95TH 2.65

PCT. GRAVEL 50.78 SAND 47.99 SILT+CLAY 1.24

GRAVEL+SAND 98.76 GRAV+SAND/SILT+CLAY 79.87

LABELS SHEPARD -SAND FOLK(GMS)-SANDY GRAVEL (SCS)-

0684 SIEVE ONLY SAMPLE WT.=113.1800

10/19/84

PHI	PCT.	CUMPCT.	
-3.50	1.37		*
-3.00	0.00	1.37	
-2.50	1.32	1.37	*
-2.00	1.23	2.69	*
-1.50	2.51	3.91	***
-1.00	8.20	6.42	********
-.50	19.08	14.62	**********
0.00	26.49	33.70	**********
.50	17.64	60.19	**********
1.00	7.55	77.83	********
1.50	5.90	85.39	******
2.00	3.37	91.29	***
2.50	3.36	94.65	***
3.00	1.07	98.01	*
3.50	.77	99.08	*
4.00	.15	99.85	
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
.39	1.12	.03	1.48	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.0 PHI
.42	1.05	.17	1.37	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES MEDIAN .31 5TH -1.28 16TH -.46 25TH -.23
75TH .92 84TH 1.41 95TH 2.55

PCT. GRAVEL 6.42 SAND 93.43 SILT+CLAY .15

GRAVEL+SAND 99.85 GRAV+SAND/SILT+CLAY 664.76

LABELS SHEPARD -SAND FOLK(GMS)-GRAVELLY SAND (SCS)-

1284 A SIEVE ONLY SAMPLE WT.=100.4900

10/19/84

PHI	PCT.	CUMPCT.	
-2.00			
	.42		
-1.50		.42	
	2.53		***
-1.00		2.95	
	15.38		**********
-.50		18.33	
	21.77		**********
0.00		40.10	
	18.07		**********
.50		58.17	
	14.24		**********
1.00		72.42	
	8.57		*********
1.50		80.98	
	6.71		*******
2.00		87.69	
	4.53		*****
2.50		92.22	
	3.10		***
3.00		95.32	
	2.23		**
3.50		97.55	
	1.20		*
4.00		98.76	
	1.24		*
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
.48	1.11	.42	.23	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -1.5 TO 4.0 PHI
.47	1.16	.32	1.06	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES	MEDIAN	.27	5TH	-.93	16TH	-.58	25TH	-.35
			75TH	1.15	84TH	1.72	95TH	2.95

PCT. GRAVEL 2.95 SAND 95.81 SILT+CLAY 1.24

GRAVEL+SAND 98.76 GRAV+SAND/SILT+CLAY 79.39

LABELS SHEPARD -SAND FOLK(GMS)-SAND (SCS)-

1284 B SIEVE ONLY SAMPLE WT.= 95.5400

10/19/84

PHI	PCT.	CUMPCT.	
-1.00			
	.04		
-.50		.04	
	.72		*
0.00		.76	
	9.02		*********
.50		9.79	
	27.68		**********
1.00		37.47	
	22.65		**********
1.50		60.12	
	16.58		**********
2.00		76.70	
	11.07		**********
2.50		87.77	
	5.26		*****
3.00		93.04	
	3.54		****
3.50		96.58	
	2.16		**
4.00		98.73	
	1.27		*
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
1.41	.84	.37	.15	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -.5 TO 4.0 PHI
1.41	.89	.27	1.06	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES MEDIAN 1.28 5TH .23 16TH .61 25TH .77
75TH 1.95 84TH 2.33 95TH 3.28

PCT. GRAVEL 0.00 SAND 98.73 SILT+CLAY 1.27

GRAVEL+SAND 98.73 GRAV+SAND/SILT+CLAY 77.96

LABELS SHEPARD -SAND FOLK(GMS)-SAND (SCS)-

1384 A SIEVE ONLY SAMPLE WT.=125.4100

10/19/84

PHI	PCT.	CUMPCT.	
-4.00			
	2.84		***
-3.50		2.84	
	2.22		**
-3.00		5.06	
	4.48		****
-2.50		9.55	
	6.44		******
-2.00		15.99	
	15.75		**********
-1.50		31.73	
	15.01		**********
-1.00		46.75	
	15.79		**********
-.50		62.54	
	9.82		**********
0.00		72.36	
	7.94		********
.50		80.30	
	6.89		*******
1.00		87.19	
	3.63		****
1.50		90.82	
	2.84		***
2.00		93.66	
	1.79		**
2.50		95.45	
	1.45		*
3.00		96.90	
	1.40		*
3.50		98.30	
	.88		*
4.00		99.19	
	.81		*
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
-.73	1.50	.28	.41	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.5 TO 4.0 PHI
-.71	1.51	.21	1.17	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES MEDIAN -.90 5TH -3.01 16TH -2.00 25TH -1.71
75TH .17 84TH .77 95TH 2.37

PCT. GRAVEL 46.75 SAND 52.44 SILT+CLAY .81
GRAVEL+SAND 99.19 GRAV+SAND/SILT+CLAY 122.15
LABELS SHEPARD -SAND FOLK(GMS)-SANDY GRAVEL (SCS)-

1384 B SIEVE ONLY SAMPLE WT.=480.0400

10/19/84

PHI	PCT.	CUMPCT.	
-5.00			
	12.72		**********
-4.50		12.72	
	13.42		**********
-4.00		26.15	
	8.54		*********
-3.50		34.69	
	13.92		**********
-3.00		48.61	
	8.62		*********
-2.50		57.23	
	7.08		*******
-2.00		64.31	
	8.37		********
-1.50		72.68	
	5.97		******
-1.00		78.65	
	5.24		*****
-.50		83.89	
	4.01		****
0.00		87.89	
	3.33		***
.50		91.23	
	2.56		***
1.00		93.79	
	1.43		*
1.50		95.21	
	1.27		*
2.00		96.49	
	1.09		*
2.50		97.58	
	.89		*
3.00		98.47	
	.74		*
3.50		99.21	
	.41		
4.00		99.62	
	.38		
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
-2.47	1.91	.46	.33	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -4.5 TO 4.0 PHI
-2.59	1.92	.32	.93	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES MEDIAN -2.92 5TH -4.80 16TH -4.38 25TH -4.04
75TH -1.31 84TH -.49 95TH 1.43

PCT. GRAVEL 78.65 SAND 20.97 SILT+CLAY .38

GRAVEL+SAND 99.62 GRAV+SAND/SILT+CLAY 264.22

LABELS SHEPARD -SAND FOLK(GMS)-SANDY GRAVEL (SCS)-

1884 B SIEVE ONLY SAMPLE WT.=165.1600

10/19/84

PHI	PCT.	CUMPCT.	
-4.00			
	5.92		******
-3.50		5.92	
	6.24		******
-3.00		12.16	
	7.11		*******
-2.50		19.27	
	5.96		******
-2.00		25.24	
	9.92		**********
-1.50		35.16	
	9.98		**********
-1.00		45.14	
	11.42		**********
-.50		56.56	
	10.45		**********
0.00		67.01	
	9.27		*********
.50		76.28	
	7.21		*******
1.00		83.49	
	3.71		****
1.50		87.20	
	2.95		***
2.00		90.16	
	2.41		**
2.50		92.56	
	2.16		**
3.00		94.73	
	1.80		**
3.50		96.53	
	1.65		**
4.00		98.18	
	1.82		**
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
-.77	1.80	.18	-.32	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.5 TO 4.0 PHI
-.82	1.96	.07	1.11	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES	MEDIAN -.79	5TH -3.58	16TH -2.73	25TH -2.02
		75TH .43	84TH 1.07	95TH 3.08

PCT. GRAVEL 45.14 SAND 53.04 SILT+CLAY 1.82

GRAVEL+SAND 98.18 GRAV+SAND/SILT+CLAY 53.87

LABELS SHEPARD -SAND FOLK(GMS)-SANDY GRAVEL (SCS)-

23779

1884 A SIEVE ONLY SAMPLE WT.=529.5900

10/19/84

PHI	PCT.	CUMPCT.	
-5.00			
	16.39		**********
-4.50		16.39	
	17.56		**********
-4.00		33.95	
	13.38		**********
-3.50		47.33	
	8.67		*********
-3.00		56.00	
	8.73		*********
-2.50		64.73	
	3.01		***
-2.00		67.74	
	4.59		*****
-1.50		72.33	
	3.19		***
-1.00		75.52	
	3.44		***
-.50		78.96	
	2.69		***
0.00		81.65	
	2.43		**
.50		84.08	
	2.33		**
1.00		86.41	
	1.96		**
1.50		88.37	
	2.67		***
2.00		91.04	
	4.01		****
2.50		95.04	
	1.90		**
3.00		96.94	
	.81		*
3.50		97.75	
	1.02		*
4.00		98.77	
	1.23		*
*****		100.00	

MEAN	ST.DEV.	SKEWNESS	KURTOSIS	
-2.50	2.30	.54	-.00	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -4.5 TO 4.0 PHI
-2.46	2.36	.56	.95	FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD,1957

PERCENTILES	MEDIAN -3.35	5TH -4.85	16TH -4.51	25TH -4.25
		75TH -1.08	84TH .48	95TH 2.49

PCT. GRAVEL 75.52 SAND 23.25 SILT+CLAY 1.23

GRAVEL+SAND 98.77 GRAV+SAND/SILT+CLAY 80.16

LABELS SHEPARD -SAND FOLK(GMS)-SANDY GRAVEL (SCS)-