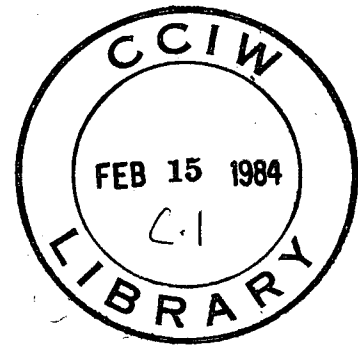


HYDRAULICS DIVISION  
TECHNICAL NOTE



**DATE:**

January 19, 1984

**REPORT NO:** 84-03

**TITLE:**

Particle Size Data Report - Lake Superior,  
Sediment Bank

**AUTHOR:**

G.A. Duncan

**REASON FOR REPORT:**

This report responds to a request for particle size data from Dr. R.A. Bourbonniere, Aquatic Ecology Division

**CORRESPONDENCE FILE NO:** Study 83-302

## 1.0 INTRODUCTION

This report provides the results of particle size analysis on sediments from Lake Superior.

Dr. R. Bourbonniere, AED, submitted 40 samples from the Lake Superior, Sediment Bank Study, requesting sand, silt, and clay percentages.

The samples were analyzed by Sedigraph and the unused portion returned to Dr. Bourbonniere.

## 2.0 PROCEDURES

The Sieve and Sedigraph Method which provides sand, silt, and clay percentages was used to analyze the samples. 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)

## 3.0 RESULTS

For the Sieve and Sedigraph 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 Fold (1974) Ternary Classification.

**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  $\xi$  is the diameter in millimeters) to the Wentworth scale is listed below.

PHI ( $\phi$ )	Millimeters	Microns	Wentworth Size Class
-5.0	32		
-4.5	24		
-4.0	16		Pebble (-2 to -6 $\phi$ )
-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+

#### 4.0 REFERENCES

- Duncan, G.A. AND LaHaie, G.G. 1979. Size Analysis Procedures used in the Sedimentology Laboratory, NWRI. NWRI, CCIW, Hydraulic Division Manual, September 1979.
- Folk, R.L. 1968. 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, Report No. 80-08.
- Shepard, F.P. 1954. Nomenclature Based on Sand-Silt Ratios. Jour. Sed. Petrology, V. 24, pp. 151-158.

**APPENDIX 1**

**SIZDIST OUTPUT**

PHI	PCT.	CUMPCT.	
3.50	ASSUMED	UPPER	LIMIT
4.00	7.00	7.00	*****
4.50	2.50	9.50	***
5.00	1.50	11.00	**
5.50	1.00	12.00	*
6.00	3.00	15.00	***
6.50	4.50	19.50	*****
7.00	7.00	26.50	*****
7.50	10.00	36.50	*****
8.00	10.50	47.00	*****
8.50	8.00	55.00	*****
9.00	8.50	63.50	*****
9.50	7.50	71.00	*****
10.00	6.00	77.00	*****
10.50	5.50	82.50	*****
11.00	4.50	87.00	*****
11.50	4.00	91.00	****
12.00	3.00	94.00	***
****	6.00	100.00	*****

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN	8.19	5TH*****	16TH	6.11	25TH	6.89
			75TH	9.83	84TH	10.67	95TH*****
PCT. GRAVEL	.00	SAND	7.00	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00
				(SEDIGRAPH)	40.00	(SEDIGRAPH)	53.00
GRAVEL+SAND	7.00	SILT/(SILT+CLAY)	43.01	PCT. GRAV+SAND/SILT+CLAY			.08
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD				(SCS)-MUD	

01/19/84

PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

	1.42		*
-3.00	0.00	1.42	
-2.50	0.00	1.42	
-2.00	0.00	1.42	
-1.50	0.00	1.42	
-1.00	1.97	3.39	**
-.50	3.94	7.33	****
0.00	3.94	11.27	****
.50	4.93	16.20	*****
1.00	4.93	21.13	*****
1.50	3.94	25.08	****
2.00	4.93	30.01	*****
2.50	3.94	33.95	****
3.00	6.90	40.85	*****
3.50	6.90	47.75	*****
4.00	7.89	55.64	*****
4.50	8.87	64.51	*****
5.00	7.89	72.40	*****
*****	27.60	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

2.24 1.95 -.30 -.44 KROMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 5.0 PHI

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

PERCENTILES	MEDIAN	3.64	5TH	-.80	16TH	.48	25TH	1.49
			75TH	*****	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	1.42	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	19.72	(SEDIGRAPH)	78.87	
GRAVEL+SAND	1.42	SILT/(SILT+CLAY)	20.00	PCT. GRAV+SAND/SILT+CLAY			.01	
LABELS SHEPARD	-CLAY		FOLK(GMS)-MUD			(SCS)-CLAY		



01/19/84

PHI	PCT.	CUM.PCT.	
-3.50	ASSUMED UPPER LIMIT		***
-3.00	2.64	2.64	
-2.50	0.00	2.64	
-2.00	.49	3.13	
-1.50	.49	3.62	
-1.00	1.97	5.59	**
-.50	5.41	11.00	*****
0.00	6.88	17.88	*****
.50	9.34	27.22	*****
1.00	11.31	38.53	*****
1.50	9.34	47.88	*****
2.00	8.85	56.73	*****
2.50	7.87	64.60	*****
3.00	5.90	70.50	*****
3.50	6.39	76.89	*****
4.00	4.43	81.31	****
4.50	3.33	85.25	****
5.00	6.39	91.64	*****
*****	8.36	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.50 1.84 -.08 -.17

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 5.0 PHI

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

PERCENTILES	MEDIAN	1.62	5TH	-1.15	16TH	-.14	25TH	.38
			75TH	3.35	84TH	4.34	95TH	*****
PCT. GRAVEL	.00	SAND	2.64	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	35.90	(SEDIGRAPH)	61.47	
GRAVEL+SAND	2.64	SILT/(SILT+CLAY)	36.87PCT. GRAV+SAND/SILT+CLAY				.03	
LABELS SHEPARD -SILTY CLAY FOLK(GMS)-MUD				(SCS)-MUD				

01/19/84

PHI PCT. CUM PCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	.44	.44	
-2.50	0.00	.44	
-2.00	0.00	.44	
-1.50	.50	.94	*
-1.00	1.51	2.45	**
-.50	2.11	4.46	**
0.00	6.03	10.49	*****
.50	9.05	19.55	*****
1.00	13.07	32.62	*****
1.50	11.06	43.68	*****
2.00	12.07	55.75	*****
2.50	9.55	65.30	*****
3.00	7.04	72.34	*****
3.50	6.54	78.88	*****
4.00	5.03	83.91	*****
****	16.09	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.44 1.29 -.11 -.00

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.0 PHI

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

PERCENTILES	MEDIAN	1.76	5TH	-.46	16TH	.30	25TH	.71
			75TH	3.20	84TH	71.70	95TH	*****
PCT. GRAVEL	.00	SAND	.44	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	32.18	(SEDIGRAPH)	67.38	
GRAVEL+SAND	.44	SILT/(SILT+CLAY)	32.32	PCT. GRAV+SAND/SILT+CLAY			.00	
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD				(SCS)-CLAY		



01/19/84

PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	1.18	1.18	*
-2.50	0.00	1.18	
-2.00	0.00	1.18	
-1.50	0.00	1.18	
-1.00	1.98	3.15	**
-.50	3.46	6.61	***
0.00	5.44	12.05	*****
.50	8.89	20.94	*****
1.00	10.38	31.32	*****
1.50	11.36	42.68	*****
2.00	14.52	57.51	*****
2.50	10.87	68.38	*****
3.00	7.31	76.28	*****
3.50	5.93	82.21	*****
****	17.79	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.28 1.26 -.37 .97

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 3.5 PHI

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

PERCENTILES	MEDIAN	1.75	5TH	-.73	16TH	.22	25TH	.70
			75TH	2.92	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	1.18	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	30.14	(SEDIGRAPH)	68.68	
GRAVEL+SAND	1.18	SILT/(SILT+CLAY)	30.50	PCT. GRAV+SAND/SILT+CLAY	.01			
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD		(SCS)-CLAY				

PHI PCT. CUM PCT.

-3.50 ASSUMED UPPER LIMIT

-3.50	2.56	2.56	***
-3.00	0.00	2.56	
-2.50	0.00	2.56	
-2.00	.98	2.56	*
-1.50	.98	3.55	*
-1.00	2.95	4.53	***
-.50	4.43	7.49	****
0.00	6.40	11.91	*****
.50	8.37	18.31	*****
1.00	10.33	26.68	*****
1.50	10.83	37.01	*****
2.00	10.83	47.84	*****
2.50	8.37	58.66	*****
3.00	32.97	67.03	*****
****	100.00		*****

MEAN ST. DEV. SKEWNESS KURTOSIS

1.08	1.38	-.61	1.66	KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 3.0 PHI
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> 5 PERCENT OF THE FINES ARE NOT RESOLVED, OBTAIN FOLK STATS. GRAPHICALLY

PERCENTILES	MEDIAN	2.10	5TH	-.92	16TH	.32	25TH	.90
			75TH	*****	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	2.56	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	24.11	(SEDIGRAPH)	73.32	
GRAVEL+SAND	2.56	SILT/(SILT+CLAY)	24.75	PCT. GRAV+SAND/SILT+CLAY			.03	
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD				(SCS)-CLAY		

PHI	PCT. CUM PCT.	
-3.50	ASSUMED UPPER LIMIT	
	15.84	*****
-3.00	0.00 15.84	
-2.50	2.55 15.84	***
-2.00	4.68 18.39	*****
-1.50	5.53 23.06	*****
-1.00	8.50 28.59	*****
-.50	7.55 37.09	*****
0.00	12.75 44.74	*****
.50	10.20 57.49	*****
1.00	6.83 67.69	*****
1.50	5.95 74.50	*****
2.00	4.25 80.45	****
2.50	3.40 84.70	***
3.00	2.55 88.10	***
3.50	1.28 90.65	*
4.00	8.08 91.92	*****
*****	100.00	

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN	.21	5TH*****	16TH -2.47	25TH -1.32
			75TH 1.54	84TH 2.42	95TH*****
PCT. GRAVEL	.00	SAND 15.84	SILT (PIPETTE)	0.00	CLAY (PIPETTE) 0.00
			(SEDIGRAPH) 51.86		(SEDIGRAPH) 32.31
GRAVEL+SAND	15.84	SILT/(SILT+CLAY)	61.62	PCT. GRAV+SAND/SILT+CLAY	.19
LABELS SHEPARD	-CLAYEY SILT	FOLK(GMS)-SANDY MUD		(SCS)-SANDY MUD	

01/19/84

PHI PCT. CUM PCT.

-3.50	ASSUMED UPPER LIMIT		*****
-3.00	23.08	23.08	***
-2.50	2.62	25.70	****
-2.00	3.93	29.64	*****
-1.50	5.58	35.32	*****
-1.00	5.24	40.56	*****
-.50	4.37	44.93	*****
0.00	6.12	51.05	*****
.50	7.43	58.48	*****
1.00	6.56	65.04	*****
1.50	5.24	70.28	*****
2.00	6.12	76.40	****
2.50	4.37	80.77	*****
3.00	5.24	86.01	****
3.50	3.93	89.95	*****
****	10.75	100.00	*****

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN	- .09	5TH*****	16TH*****	25TH	-2.63
			75TH	1.89	84TH	2.81
			95TH*****			
PCT. GRAVEL	.00	SAND 23.08	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00
			(SEDIGRAPH)	41.96	(SEDIGRAPH)	34.96
GRAVEL+SAND	23.08	SILT/(SILT+CLAY)	54.55	PCT. GRAV+SAND/SILT+CLAY	.30	
LABELS SHEPARD	-SAN	SIL	CLY	FOLK(GMS)-SANDY MUD	(SCS)-SANDY MUD	

01/19/84

PHI	PCT.	CUM PCT.	
-3.50		19.83	ASSUMED UPPER LIMIT *****
-3.00	0.00	19.83	
-2.50	0.00	19.83	
-2.00	3.24	19.83	***
-1.50	3.24	23.07	***
-1.00	4.86	26.31	****
-.50	5.57	31.17	*****
0.00	6.88	36.83	*****
.50	7.59	43.72	*****
1.00	8.10	51.41	*****
1.50	8.91	59.51	*****
2.00	7.29	68.42	*****
2.50	4.85	75.71	*****
3.00	4.15	80.56	****
3.50	2.83	84.61	***
4.00	12.55	87.45	*****
****		100.00	

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN	.91	5TH*****	16TH*****	25TH -1.20
			75TH 2.45	84TH 3.42	95TH*****
PCT. GRAVEL	.00	SAND 19.83	SILT (PIPETTE)	0.00	CLAY (PIPETTE) 0.00
			(SEDIGRAPH) 31.58		(SEDIGRAPH) 48.59
GRAVEL+SAND	19.83	SILT/(SILT+CLAY)	39.39	PCT. GRAV+SAND/(SILT+CLAY)	.25
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-SANDY MUD		(SCS)-SANDY MUD	



01/19/84

PHI PCT. CUM PCT.

-3.50 ASSUMED UPPER LIMIT

-3.50	6.40	6.40	*****
-3.00	.94	6.40	*
-2.50	.94	7.34	*
-2.00	2.34	8.27	**
-1.50	3.28	10.61	***
-1.00	3.28	13.89	***
-.50	5.52	17.16	*****
0.00	6.08	22.78	*****
.50	7.49	28.86	*****
1.00	8.42	36.35	*****
1.50	8.42	44.78	*****
2.00	9.36	53.20	*****
2.50	8.42	62.56	*****
3.00	6.55	70.98	*****
3.50	22.75	77.54	*****
****	100.00		

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN	1.81	5TH*****	16TH	-.68	25TH	.18
			75TH	3.31	84TH*****	95TH*****	

PCT. GRAVEL	.00	SAND	6.40	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00
				(SEDIGRAPH)	29.95	(SEDIGRAPH)	63.65

GRAVEL+SAND 6.40 SILT/(SILT+CLAY) 32.00 PCT. GRAV+SAND/SILT+CLAY .07

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

01/19/84

PHI	PCT. CUM PCT.	
-3.50	ASSUMED UPPER LIMIT	
	.13	
-3.00	0.00	.13
-2.50	0.00	.13
-2.00	1.00	.13
-1.50	1.00	1.13
-1.00	3.99	2.13
-.50	5.99	6.12
0.00	9.99	12.11
.50	10.49	22.10
1.00	10.49	32.59
1.50	11.49	43.07
2.00	10.49	54.56
2.50	6.49	65.05
3.00	6.99	71.54
3.50	6.49	78.53
4.00	5.99	85.02
4.50	3.00	91.01
5.00	5.99	94.01
*****		100.00

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MEAN ST.DEV. SKEWNESS KURTOSIS

1.74 1.54 .03 -.66

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 5.0 PHI

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

PERCENTILES	MEDIAN	1.80	5TH	-.64	16TH	.19	25TH	.64
			75TH	3.25	84TH	3.92	95TH	*****
PCT. GRAVEL	.00	SAND	.13	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	32.46	(SEDIGRAPH)	67.41	
GRAVEL+SAND	.13	SILT/(SILT+CLAY)	32.50	PCT. GRAV+SAND/SILT+CLAY			.00	
LABELS SHEPARD	-SILTY CLAY FOLK(GMS)-MUD				(SGS)-CLAY			

PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	.28	.28	*
-2.50	1.00	1.28	
-2.00	.50	1.78	*
-1.50	1.50	3.28	**
-1.00	1.99	5.27	****
-.50	3.99	9.26	*****
0.00	4.99	14.24	*****
.50	7.98	22.22	*****
1.00	8.97	31.20	*****
1.50	10.97	42.16	*****
2.00	19.94	62.11	*****
2.50	7.98	70.09	*****
3.00	7.98	78.06	*****
3.50	6.98	85.04	*****
4.00	4.49	89.53	*****
****	10.47	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.37 1.40 -.28 .24 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.0 PHI

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

PERCENTILES	MEDIAN	1.70	5TH	-1.07	16TH	.11	25TH	.65
			75TH	2.81	84TH	3.43	95TH	*****
PCT. GRAVEL	.00	SAND	.28	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	30.91	(SEDIGRAPH)	68.80	
GRAVEL+SAND	.28	SILT/(SILT+CLAY)	31.00	PCT. GRAV+SAND/SILT+CLAY	.00			
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD		(SCS)-CLAY				

01/19/84

PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	.50	.50	
-2.50	.50	1.00	
-2.00	.50	1.50	
-1.50	0.00	1.50	
-1.00	.99	2.49	*
-.50	1.99	4.48	**
0.00	3.98	8.46	****
.50	5.47	13.93	*****
1.00	6.47	20.40	*****
1.50	8.46	28.86	*****
2.00	9.95	38.81	*****
2.50	10.45	49.26	*****
3.00	8.35	58.21	*****
3.50	8.95	67.17	*****
4.00	6.35	74.13	*****
4.50	6.96	81.10	*****
****	18.90	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.96 1.52 -.30 .29 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.5 PHI

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

PERCENTILES	MEDIAN	2.54	5TH	-.43	16TH	.66	25TH	1.27
			75TH	4.06	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	.50	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	19.90	(SEDIGRAPH)	79.60	
GRAVEL+SAND	.50	SILT/(SILT+CLAY)	20.00	PCT. GRAV+SAND/SILT+CLAY			.01	
LABELS SHEPARD	-CLAY	FOLK(GMS)-MUD		(SCS)-CLAY				

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PHI PCT. CUM PCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	7.21	7.21	*****
-2.50	2.34	9.55	**
-2.00	2.34	11.89	**
-1.50	3.28	15.17	***
-1.00	2.34	17.52	**
-.50	3.75	21.27	****
0.00	5.15	26.42	*****
.50	6.39	32.51	*****
1.00	6.56	39.07	*****
1.50	7.50	46.57	*****
2.00	7.97	54.54	*****
2.50	8.90	63.44	*****
3.00	7.33	70.47	*****
3.50	7.97	78.44	*****
4.00	5.16	83.60	*****
4.50	5.16	88.75	*****
5.00	4.69	93.44	*****
*****	6.56	100.00	*****

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN	1.72	5TH*****	16TH	-1.32	25TH	-.14
			75TH	3.28	84TH	4.04	95TH*****

PCT. GRAVEL	.00	SAND	7.21	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00
				(SEDIGRAPH)	31.87	(SEDIGRAPH)	60.93

GRAVEL+SAND 7.21 SILT/(SILT+CLAY) 34.34 PCT. GRAV+SAND/SILT+CLAY .08

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

01/19/84

PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.50	2.98		***
-3.00	0.00	2.98	
-2.50	0.00	2.98	
-2.00	0.00	2.98	
-1.50	0.00	2.98	
-1.00	1.46		*
-1.00	3.40	4.44	***
-.50		7.83	
0.00	3.88	11.71	****
.50	3.83		****
.50		15.59	
1.00	4.85		*****
1.00	4.37	20.44	****
1.50		24.81	
2.00	5.34		*****
2.00	5.82	30.15	*****
2.50		35.97	
3.00	6.79		*****
3.00	7.76	42.76	*****
3.50		50.52	
4.00	8.25		*****
4.00	8.73	58.77	*****
4.50		67.50	
****	32.50		*****
****	100.00		

MEAN ST.DEV. SKEWNESS KURTOSIS

1.92    1.93    -.42    .17    KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES  
 FOR SIZE RANGE -3.0 TO 4.5 PHI

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

PERCENTILES	MEDIAN	3.47	5TH	-.92	16TH	.54	25TH	1.52
			75TH	*****	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	2.98	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	17.46	(SEDIGRAPH)	79.56	
GRAVEL+SAND	2.98	SILT/(SILT+CLAY)	18.00	PCT. GRAV+SAND/SILT+CLAY			.03	
LABELS SHEPARD	-CLAY	FOLK(GMS)-MUD		(SCS)-CLAY				

01/19/84

PHI PCT. CUM PCT.

-3.50	ASSUMED UPPER LIMIT		
	7.33		*****
-3.00	0.00	7.33	
-2.50		7.33	
-2.00	.34	8.26	*
-1.50	.94	9.20	*
-1.00	.94	10.13	*
-.50	2.34	12.47	**
0.00	4.58	17.15	*****
.50	6.39	23.24	*****
1.00	6.55	29.79	*****
1.50	7.95	37.75	*****
2.00	8.89	46.64	*****
2.50	10.30	56.94	*****
3.00	8.43	65.36	*****
3.50	8.43	73.79	*****
4.00	6.55	80.34	*****
*****	19.66	100.00	*****

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN 2.16	5TH*****	16TH -.12	25TH .63
		75TH 3.59	84TH*****	95TH*****
PCT. GRAVEL	.00	SAND 7.33	SILT (PIPETTE) 0.00	CLAY (PIPETTE) 0.00
			(SEDIGRAPH) 22.47	(SEDIGRAPH) 70.21
GRAVEL+SAND	7.33	SILT/(SILT+CLAY)	24.24	PCT. GRAV+SAND/SILT+CLAY .08
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD		(SCS)-CLAY

PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	.21		
-2.50	0.00	.21	
-2.00	0.00	.21	
-1.50	0.00	.21	
-1.00	1.00	1.21	*
-.50	2.99	4.20	***
0.00	2.99	7.20	***
.50	4.49	11.69	****
1.00	4.49	16.18	****
1.50	6.49	22.66	*****
2.00	8.48	31.15	*****
2.50	9.98	41.13	*****
3.00	9.48	50.61	*****
3.50	8.98	59.59	*****
4.00	7.48	67.07	*****
4.50	8.48	75.55	*****
*****	24.45	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

2.18 1.47 -.26 -.30

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.5 PHI

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

PERCENTILES	MEDIAN	2.97	5TH	-.37	16TH	.98	25TH	1.64
			75TH	4.47	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	.21	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	15.97	(SEDIGRAPH)	83.82	
GRAVEL+SAND	.21	SILT/(SILT+CLAY)	16.00	PCT.GRAV+SAND/SILT+CLAY			.00	
LABELS SHEPARD	-CLAY	FOLK(GMS)-MUD		(SGS)-CLAY				



PHI PCT. CUMPCT.

-3.50	ASSUMED UPPER LIMIT		
	9.29		*****
-3.00	0.00	9.29	
-2.50		9.29	
	.91		*
-2.00		10.19	
	.91		*
-1.50		11.10	
	1.81		**
-1.00		12.92	
	4.08		****
-.50		17.00	
	5.44		*****
0.00		22.44	
	6.80		*****
.50		29.24	
	8.15		*****
1.00		37.41	
	9.98		*****
1.50		47.39	
	10.89		*****
2.00		58.27	
	9.52		*****
2.50		67.80	
	6.80		*****
3.00		74.60	
	6.35		*****
3.50		80.95	
	5.44		*****
4.00		86.39	
	13.61		*****
****		100.00	

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN	1.62	5TH*****	16TH	-.62	25TH	.19
			75TH	3.03	84TH	3.78	95TH*****
PCT. GRAVEL	.00	SAND	9.29	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00
				(SEDIGRAPH)	28.12	(SEDIGRAPH)	62.59
GRAVEL+SAND	9.29	SILT/(SILT+CLAY)	31.00	PCT. GRAV+SAND/SILT+CLAY			.10
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD				(SCS)-CLAY	

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PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	4.25	4.25	****
-2.50	0.00	4.25	
-2.00	0.03	4.25	
-1.50	.48	4.73	
-1.00	1.91	6.65	**
-.50	3.83	10.48	****
0.00	6.22	16.70	*****
.50	8.52	25.32	*****
1.00	9.10	34.41	*****
1.50	10.05	44.47	*****
2.00	9.57	54.04	*****
2.50	9.57	63.62	*****
3.00	6.70	70.32	*****
3.50	5.74	76.06	*****
****	23.94	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

.99 1.57 -.45 .77 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 3.5 PHI

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

PERCENTILES	MEDIAN	1.79	5TH	-1.43	16TH	-.06	25TH	.48
			75TH	3.41	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	4.25	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	30.16	(SEDIGRAPH)	65.59	
GRAVEL+SAND	4.25	SILT/(SILT+CLAY)	31.50	PCT. GRAV+SAND/SILT+CLAY			.04	
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD		(SCS)-CLAY				

PHI PCT. CUM PCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	.08	.08	
-2.50	1.00	1.08	*
-2.00	3.00	4.08	***
-1.50	6.99	11.07	*****
-1.00	7.99	19.06	*****
-.50	11.99	31.05	*****
0.00	13.99	45.04	*****
.50	17.99	63.03	*****
1.00	10.99	74.02	*****
1.50	7.99	82.01	*****
2.00	5.50	87.51	*****
2.50	3.50	91.01	***
3.00	2.50	93.51	**
****	6.49	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

.03 1.22 .04 -.37 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 3.0 PHI

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

PERCENTILES	MEDIAN	.14	5TH	-1.93	16TH	-1.19	25TH	-.75
			75TH	1.06	84TH	1.68	95TH	*****
PCT. GRAVEL	.00	SAND	.08	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	73.94	(SEDIGRAPH)	25.98	
GRAVEL+SAND	.08	SILT/(SILT+CLAY)	74.0	PCT. GRAV+SAND/SILT+CLAY	.00			
LABELS SHEPARD -CLAYEY SILT FOLK(GMS)-MUD				(SCS)-SILT				

PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	.83	.83	*
-2.50	0.00	.83	
-2.00	0.00	.83	
-1.50	0.00	.83	
-1.00	.99	1.82	*
-.50	2.98	4.79	***
0.00	3.97	8.76	****
.50	4.96	13.72	*****
1.00	6.45	20.17	*****
1.50	7.93	28.10	*****
2.00	10.41	38.51	*****
2.50	11.90	50.41	*****
3.00	9.92	60.33	*****
****	39.67	100.00	*****

MEAN ST. DEV. SKEWNESS KURTOSIS

1.34 1.20 -.54 1.43 Krumbein + Pettijohn (1938) Moment Measures  
 for size range -3.0 to 3.0 phi

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

PERCENTILES	MEDIAN	2.48	5TH	-.47	16TH	.68	25TH	1.30
			75TH	*****	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	.83	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	19.34	(SEDIGRAPH)	79.83	
GRAVEL+SAND	.83	SILT/(SILT+CLAY)	19.50	PCT. GRAV+SAND/SILT+CLAY	.01			
LABELS SHEPARD	-CLAY	FOLK (GMS)	-MUD	(SCS)	-CLAY			

PHI PCT. CUM PCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	1.48	1.48	*
-2.50	0.00	1.48	
-2.00	3.48	1.48	***
-1.50	5.97	4.97	*****
-1.00	6.47	10.94	*****
-0.50	6.97	17.41	*****
0.00	9.95	24.37	*****
0.50	10.45	34.32	*****
1.00	8.46	44.77	*****
1.50	5.97	53.23	*****
2.00	8.46	59.20	*****
2.50	6.47	67.66	*****
3.00	4.98	74.13	*****
****	20.90	79.10	*****
****	100.00	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

.26 1.47 -.07 -.74 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 3.0 PHI

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

PERCENTILES	MEDIAN	.81	5TH	-2.00	16TH	-1.11	25TH	-.47
			75TH	2.59	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	1.48	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	51.75	(SEDIGRAPH)	46.77	
GRAVEL+SAND	1.48	SILT/(SILT+CLAY)	52.53	PCT. GRAV+SAND/SILT+CLAY			.02	
LABELS SHEPARD -CLAYEY SILT FOLK(GMS)-MUD				(SCS)-MUD				

PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	1.34	1.34	*
-2.50	0.00	1.34	
-2.00	0.00	1.34	
-1.50	0.00	1.34	
-1.00	0.33	1.34	
-.50	1.00	2.34	*
0.00	2.99	5.33	***
.50	3.99	9.32	****
1.00	4.48	13.80	****
1.50	5.48	19.28	*****
2.00	6.98	26.26	*****
2.50	8.97	35.23	*****
3.00	9.47	44.69	*****
3.50	10.46	55.16	*****
4.00	10.96	66.12	*****
****	33.88	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

2.10 1.44 -.60 1.97 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.0 PHI

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

PERCENTILES	MEDIAN	3.25	5TH	-.06	16TH	1.20	25TH	1.91
			75TH	*****	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	1.34	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDI GRAPH)	12.46	(SEDI GRAPH)	86.20	
GRAVEL+SAND	1.34	SILT/(SILT+CLAY)	12.63	PCT. GRAV+SAND/SILT+CLAY			.01	
LABELS SHEPARD	-CLAY	FOLK(GMS)-MUD		(SCS)-CLAY				

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PHI	PCT. CUM PCT.	
-3.50	ASSUMED UPPER LIMIT	*****
-3.00	5.39	5.09
-2.50	0.00	5.09
-2.00	0.00	5.09
-1.50	.48	5.57
-1.00	.48	6.05
-.50	2.88	8.92
0.00	1.92	10.84
.50	2.88	13.72
1.00	4.79	18.51
1.50	6.71	25.22
2.00	8.63	33.85
2.50	10.55	44.40
3.00	8.63	53.02
3.50	9.59	62.61
4.00	8.63	71.24
*****	28.76	100.00

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN 2.82	5TH*****	16TH .74	25TH 1.48
		75TH*****	84TH*****	95TH*****
PCT. GRAVEL	.00	SAND 5.09	SILT (PIPETTE) 0.00	CLAY (PIPETTE) 0.00
			(SEDIGRAPH) 13.42	(SEDIGRAPH) 81.49
GRAVEL+SAND	5.09	SILT/(SILT+CLAY)	14.14	PCT. GRAV+SAND/SILT+CLAY .05
LABELS SHEPARD -CLAY		FOLK(GMS)-MUD		(SCS)-CLAY

01/19/84

PHI	PCT.	CUM PCT.	
-3.50	ASSUMED UPPER LIMIT		***
-3.00	3.11	3.11	
-2.50	0.00	3.11	
-2.00	0.00	3.11	
-1.50	0.00	3.11	
-1.00	1.94	5.05	**
-.50	2.42	7.47	**
0.00	2.42	9.89	**
.50	5.33	15.22	*****
1.00	5.33	20.55	*****
1.50	6.78	27.33	*****
2.00	9.69	37.02	*****
2.50	9.59	46.71	*****
3.00	9.20	55.92	*****
3.50	8.24	64.15	*****
4.00	7.27	71.42	*****
4.50	6.78	78.20	*****
*****	21.80	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.86 1.75 -.48 .90 Krumbein + Pettijohn (1938) Moment Measures  
 for size range -3.0 to 4.5 phi

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

PERCENTILES	MEDIAN	2.68	5TH	-1.01	16TH	.57	25TH	1.33
			75TH	4.26	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	3.11	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	17.44	(SEDIGRAPH)	79.45	
GRAVEL+SAND	3.11	SILT/(SILT+CLAY)	18.00	PCT. GRAV+SAND/SILT+CLAY	.03			
LABELS SHEPARD	-CLAY	FOLK(GMS)-MUD		(SCS)-CLAY				



PHI PCT. CUM PCT.

-3.50	ASSUMED UPPER LIMIT		
-3.00	.59	.69	*
-2.50	0.00	.69	
-2.00	0.00	.69	
-1.50	1.99	2.67	**
-1.00	1.49	4.16	*
-.50	2.48	6.65	**
0.00	4.97	11.61	*****
.50	7.45	13.06	*****
1.00	9.43	28.49	*****
1.50	10.92	39.42	*****
2.00	10.92	50.34	*****
2.50	11.42	61.76	*****
3.00	8.44	70.21	*****
3.50	6.95	77.16	*****
4.00	5.95	83.12	*****
****	16.88	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.50 1.41 -.26 .15 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.0 PHI

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

PERCENTILES	MEDIAN	1.98	5TH	-.83	16TH	.29	25TH	.81
			75TH	3.34	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	.69	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	27.81	(SEDIGRAPH)	71.51	
GRAVEL+SAND	.69	SILT/(SILT+CLAY)	28.00	PCT. GRAV+SAND/SILT+CLAY	.01			
LABELS SHEPARD	-SILTY CLAY			FOLK(GMS)-MUD		(SCS)-CLAY		

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PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	1.15	1.15	*
-2.50	0.00	1.15	
-2.00	0.00	1.15	
-1.50	0.00	1.15	
-1.00	.49	1.64	
-.50	2.47	4.11	**
0.00	2.97	7.08	***
.50	3.95	11.03	****
1.00	3.95	14.99	****
1.50	5.93	20.92	*****
2.00	7.91	28.83	*****
2.50	9.89	38.71	*****
3.00	9.39	48.10	*****
3.50	10.38	58.48	*****
4.00	7.91	66.39	*****
****	33.61	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.95 1.45 -.53 1.32 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.0 PHI

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

PERCENTILES	MEDIAN	3.09	5TH	-.35	16TH	1.09	25TH	1.76
			75TH	*****	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	1.15	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	13.84	(SEDIGRAPH)	85.01	
GRAVEL+SAND	1.15	SILT/(SILT+CLAY)	14.00	PCT. GRAV+SAND/SILT+CLAY			.01	
LABELS SHEPARD	-CLAY		FOLK(GMS)-MUD			(SCS)-CLAY		

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PHI PCT. CUMPCT.

-3.50	ASSUMED UPPER LIMIT		
-3.00	8.23	8.23	*****
-2.50	4.58	12.91	*****
-2.00	9.83	22.75	*****
-1.50	11.71	34.45	*****
-1.00	7.12	41.47	*****
-.50	6.55	48.03	*****
0.00	6.09	54.12	*****
.50	7.96	62.07	*****
1.00	5.62	67.69	*****
1.50	4.21	71.91	*****
2.00	5.52	77.53	*****
2.50	4.21	81.74	*****
3.00	3.75	85.49	*****
****	14.51	100.00	*****

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN	-.34	5TH*****	16TH	-2.34	25TH	-1.90
			75TH	1.78	84TH	2.80	95TH*****
PCT. GRAVEL	.00	SAND	8.23	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00
				(SEDIGRAPH)	59.46	(SEDIGRAPH)	32.31
GRAVEL+SAND	8.23	SILT/(SILT+CLAY)	64.8	PCT. GRAV+SAND/SILT+CLAY			.09
LABELS SHEPARD	-CLAYEY SILT	FOLK(GMS)-MUD				(SCS)-MUD	

PHI PCT. CUM PCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	4.65	4.65	*****
-2.50	0.00	4.65	
-2.00	3.81	8.46	****
-1.50	7.63	16.09	*****
-1.00	10.49	26.58	*****
-0.50	16.21	42.79	*****
0.00	13.35	56.14	*****
0.50	13.35	69.49	*****
1.00	6.20	75.69	*****
1.50	5.24	80.93	****
2.00	4.29	85.22	****
2.50	3.34	88.56	***
3.00	2.38	90.94	**
3.50	2.38	93.33	**
4.00	1.43	94.76	*
****	5.24	100.00	****

MEAN ST.DEV. SKEWNESS KURTOSIS

-0.17 1.53 .18 .08

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.0 PHI

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

PERCENTILES	MEDIAN	-0.23	5TH	-2.45	16TH	-1.51	25TH	-1.08
			75TH	.94	84TH	1.86	95TH	*****

PCT. GRAVEL	.00	SAND	4.65	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00
				(SEDIGRAPH)	71.04	(SEDIGRAPH)	24.31

GRAVEL+SAND 4.65 SILT/(SILT+CLAY) 74.50 PCT. GRAV+SAND/SILT+CLAY .05

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

PHI	PCT.	CUM PCT.	
-3.50			ASSUMED UPPER LIMIT
-3.00	.30	.30	
-2.50	0.00	.30	
-2.00	1.01	1.31	*
-1.50	.50	1.81	*
-1.00	1.51	3.32	**
-.50	4.03	7.35	****
0.00	6.04	13.39	*****
.50	9.57	22.96	*****
1.00	11.58	34.54	*****
1.50	9.06	43.61	*****
2.00	10.57	54.18	*****
2.50	7.55	61.73	*****
3.00	7.55	69.29	*****
3.50	6.55	75.83	*****
4.00	5.54	81.37	*****
****	18.63	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.35 1.41 -.11 -.33

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.0 PHI

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

PERCENTILES	MEDIAN	1.80	5TH	-.79	16TH	.14	25TH	.59
			75TH	3.44	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	.30	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	34.24	(SEDIGRAPH)	65.46	
GRAVEL+SAND	.30	SILT/(SILT+CLAY)	34.34	PCT. GRAV+SAND/SILT+CLAY	.00			
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD		(SCS)-MUD				

PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	.10	.10	
-2.50	.50	.60	
-2.00	0.00	.60	
-1.50	0.00	.60	
-1.00	1.00	1.60	*
-.50	3.00	4.60	***
0.00	3.50	8.09	***
.50	6.99	15.08	*****
1.00	6.49	21.58	*****
1.50	8.49	30.07	*****
2.00	9.99	40.06	*****
2.50	9.99	50.05	*****
3.00	8.99	59.04	*****
3.50	8.49	67.53	*****
4.00	6.99	74.53	*****
4.50	7.99	82.52	*****
5.00	8.49	91.01	*****
*****	8.99	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

2.24 1.63 -.14 -.53

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 5.0 PHI

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

PERCENTILES	MEDIAN	2.50	5TH	-.44	16TH	.57	25TH	1.20
			75TH	4.03	84TH	4.59	95TH	*****
PCT. GRAVEL	.00	SAND	.10	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	21.48	(SEDIGRAPH)	78.42	
GRAVEL+SAND	.10	SILT/(SILT+CLAY)	21.50	PCT. GRAV+SAND/SILT+CLAY			.00	
LABELS SHEPARD	-CLAY	FOLK(GMS)-MUD		(SCS)-CLAY				

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PHI	PCT.	CUM.PCT.	
-3.50	ASSUMED UPPER LIMIT		
-3.00	.22	.22	
-2.50	0.00	.22	
-2.00	.50	.73	*
-1.50	0.00	.73	
-1.00	2.11	2.73	**
-.50	3.01	5.74	***
0.00	6.32	11.76	*****
.50	7.02	18.78	*****
1.00	9.02	27.80	*****
1.50	9.02	36.83	*****
2.00	10.03	46.85	*****
2.50	8.02	54.88	*****
3.00	8.52	63.40	*****
3.50	7.52	70.92	*****
4.00	7.52	78.44	*****
4.50	5.52	83.96	*****
5.00	7.52	91.48	*****
*****	8.52	100.00	*****

MEAN ST. DEV. SKEWNESS KURTOSIS

2.00 1.67 -.06 -.71 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 5.0 PHI

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

PERCENTILES	MEDIAN	2.20	5TH	-.62	16TH	.30	25TH	.84
			75TH	3.77	84TH	4.50	95TH	*****
PCT. GRAVEL	.00	SAND	.22	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	27.58	(SEDIGRAPH)	72.20	
GRAVEL+SAND	.22	SILT/(SILT+CLAY)	27.64	PCT. GRAV+SAND/SILT+CLAY			.00	
LABELS SHEPARD	-SILTY CLAY			FOLK(GMS)-MUD		(SCS)-CLAY		

01/19/84

PHI	PCT.	CUMPCT.	
-3.50	ASSUMED UPPER LIMIT		*
-3.00	.75	.76	
-2.50	.50	1.26	
-2.00	0.00	1.26	
-1.50	1.00	2.26	*
-1.00	2.49	4.75	**
-.50	3.49	8.24	***
0.00	3.49	11.73	***
.50	5.49	17.22	****
1.00	6.98	24.20	*****
1.50	5.98	30.18	*****
2.00	8.48	38.66	*****
2.50	9.48	48.14	*****
3.00	8.98	57.11	*****
3.50	7.98	65.09	*****
4.00	6.48	71.57	*****
****	28.43	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.58 1.56 -.33 -.01 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.0 PHI

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

PERCENTILES	MEDIAN	2.60	5TH	-.96	16TH	.39	25TH	1.07
			75TH	*****	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	.76	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	23.44	(SEDIGRAPH)	75.80	
GRAVEL+SAND	.75	SILT/(SILT+CLAY)	23.62PCT. GRAV+SAND/SILT+CLAY		.01			
LABELS SHEPARD	-CLAY		FOLK(GMS)-MUD			(SCS)-CLAY		



01/19/84

PHI PCT. CUMPCT.

-3.50	ASSUMED UPPER LIMIT		
	5.21	5.21	*****
-3.00	.48	5.69	
-2.50	.96	6.65	*
-2.00	1.44	8.08	*
-1.50	1.91	10.00	**
-1.00	2.87	12.87	***
-.50	3.93	16.70	****
0.00	6.22	22.92	*****
.50	6.22	29.15	*****
1.00	7.66	36.81	*****
1.50	10.05	46.86	*****
2.00	9.10	55.96	*****
2.50	8.14	64.10	*****
3.00	7.19	71.28	*****
3.50	7.18	78.46	*****
4.00	5.27	83.72	*****
4.50	16.28	100.00	*****

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN 2.17	5TH*****	16TH -.09	25TH .67
		75TH 3.76	84TH*****	95TH*****
PCT. GRAVEL	.00	SAND 5.21	SILT (PIPETTE) 0.00	CLAY (PIPETTE) 0.00
			(SEDIGRAPH) 23.94	(SEDIGRAPH) 70.85
GRAVEL+SAND	5.21	SILT/(SILT+CLAY)	25.25PCT. GRAV+SAND/SILT+CLAY	.05
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD		(SCS)-CLAY

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PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	1.84	1.84	**
-2.50	.49	2.33	
-2.00	2.45	4.78	**
-1.50	6.87	11.66	*****
-1.00	9.33	20.98	*****
-.50	8.34	29.32	*****
0.00	7.85	37.18	*****
.50	7.85	45.03	*****
1.00	7.36	52.39	*****
1.50	7.36	59.75	*****
2.00	6.87	66.63	*****
2.50	6.87	73.50	*****
3.00	4.91	78.40	*****
3.50	4.91	83.31	*****
4.00	3.44	86.75	***
4.50	2.94	89.69	***
5.00	2.45	92.15	**
*****	7.85	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

.72 1.94 .10 -.79 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 5.0 PHI

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

PERCENTILES	MEDIAN	.84	5TH	-1.98	16TH	-1.27	25TH	-.76
			75TH	2.65	84TH	3.60	95TH	*****
PCT. GRAVEL	.00	SAND	1.84	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	50.55	(SEDIGRAPH)	47.61	
GRAVEL+SAND	1.84	SILT/(SILT+CLAY)	51.50	PCT. GRAV+SAND/SILT+CLAY			.02	
LABELS SHEPARD	-CLAYEY	SILT FOLK (GMS)	-MUD				(SCS)	-MUD

PHI	PCT.	CUMPCT.	
-3.50			ASSUMED UPPER LIMIT
-3.00	2.40	2.40	**
-2.50	0.00	2.40	
-2.00	0.00	2.40	
-1.50	0.00	2.40	
-1.00	2.44	4.84	**
-.50	2.44	7.28	**
0.00	2.93	10.21	***
.50	3.90	14.11	****
1.00	4.88	18.99	*****
1.50	5.85	24.85	*****
2.00	7.32	32.17	*****
2.50	9.27	41.44	*****
3.00	9.27	50.71	*****
3.50	9.76	60.47	*****
4.00	7.81	68.28	*****
4.50	9.27	77.55	*****
*****	22.45	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

2.04 1.76 -.48 .71 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.5 PHI

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

PERCENTILES	MEDIAN	2.95	5TH	-.97	16TH	.69	25TH	1.51
			75TH	4.36	84TH	*****	95TH	*****
PCT. GRAVEL	.00	SAND	2.40	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	16.59	(SEDIGRAPH)	81.01	
GRAVEL+SAND	2.40	SILT/(SILT+CLAY)	17.00	PCT. GRAV+SAND/SILT+CLAY			.02	
LABELS SHEPARD	-CLAY	FOLK(GMS)-MUD		(SCS)-CLAY				

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PHI PCT. CUMPCT.  
 -3.50 ASSUMED UPPER LIMIT

-3.00	6.45	6.45	*****
-2.50	0.00	6.45	
-2.00	.47	6.92	
-1.50	0.00	6.92	
-1.00	2.36	9.29	**
-.50	.94	10.23	*
0.00	2.83	13.07	***
.50	4.72	17.79	*****
1.00	5.20	22.99	*****
1.50	6.14	29.13	*****
2.00	8.50	37.63	*****
2.50	9.45	47.08	*****
3.00	8.03	55.12	*****
3.50	9.92	65.04	*****
4.00	6.61	71.65	*****
4.50	8.98	80.63	*****
*****	19.37	100.00	*****

NO STATISTICS ARE COMPUTED BECAUSE THE UPPER SIZE LIMIT IS ASSUMED AND THIS AFFECTS MORE THAN 5 PERCENT OF THE SAMPLE

PERCENTILES	MEDIAN	2.68	5TH*****	16TH	.31	25TH	1.16
			75TH	4.19	84TH*****	95TH*****	
PCT. GRAVEL	.00	SAND	6.45	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00
				(SEDIGRAPH)	16.54	(SEDIGRAPH)	77.01
GRAVEL+SAND	6.45	SILT/(SILT+CLAY)	17.68	PCT. GRAV+SAND/SILT+CLAY			.07
LABELS SHEPARD	-CLAY	FOLK(GMS)-MUD		(SCS)-CLAY			

PHI PCT. CUMPCT.

-3.50 ASSUMED UPPER LIMIT

-3.00	.18	.18	
-2.50	0.00	.18	
-2.00	0.30	.18	
-1.50	1.00	1.18	*
-1.00	1.00	2.18	*
-.50	3.99	6.17	****
0.00	5.99	12.16	*****
.50	10.98	23.14	*****
1.00	13.97	37.12	*****
1.50	13.97	51.09	*****
2.00	13.97	65.06	*****
2.50	10.48	75.54	*****
3.00	6.99	82.53	*****
3.50	5.49	88.02	****
4.00	2.99	91.02	***
4.50	2.99	94.01	***
****	5.99	100.00	*****

MEAN ST.DEV. SKEWNESS KURTOSIS

1.40 1.30 .03 -.11 KRUMBEIN + PETTICORN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 4.5 PHI

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

PERCENTILES	MEDIAN	1.46	5TH	-.65	16TH	.17	25TH	.57
			75TH	2.47	84TH	3.13	95TH	*****
PCT. GRAVEL	.00	SAND	.18	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	36.93	(SEDIGRAPH)	62.88	
GRAVEL+SAND	.18	SILT/(SILT+CLAY)	37.00	PCT. GRAV+SAND/SILT+CLAY	.00			
LABELS SHEPARD	-SILTY CLAY	FOLK(GMS)-MUD		(SCS)-MUD				

LS 83 T46A (GRAINSIZE) 1 SEDIGRAPH ANALYSIS

PHI PCT. CUMPCT.

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-3.50	ASSUMED UPPER LIMIT		
-3.00	.15		
-2.50	0.00	.15	
-2.00	0.00	.15	
-1.50	2.02	.15	**
-1.00	2.52	2.17	***
-.50	3.53	4.69	****
0.00	7.06	8.22	*****
.50	8.57	15.28	*****
1.00	10.59	23.85	*****
1.50	9.08	34.44	*****
2.00	10.39	43.52	*****
2.50	9.08	53.61	*****
3.00	7.06	62.68	*****
3.50	7.06	69.74	*****
4.00	5.55	76.80	*****
4.50	4.54	82.35	*****
5.00	3.03	86.89	***
*****	10.09	89.91	*****
		100.00	

MEAN ST.DEV. SKEWNESS KURTOSIS

1.61 1.62 .00 -.66

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -3.0 TO 5.0 PHI

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

PERCENTILES	MEDIAN	1.82	5TH	-.96	16TH	.04	25TH	.55
			75TH	3.37	84TH	4.18	95TH	*****
PCT. GRAVEL	.00	SAND	.15	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	34.29	(SEDIGRAPH)	65.56	
GRAVEL+SAND	.15	SILT/(SILT+CLAY)	34.34	PCT. GRAV+SAND/SILT+CLAY			.00	
LABELS SHEPARD	-SILTY CLAY			FOLK(GMS)-MUD			(SCS)-MUD	