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A SUMMARY OF ENGINEERING PROPERTIES, SIZE, AND COMPOSITION ANALYSES OF CORES FROM AREA LIMA, MAY, 1965.

Engineering Properties
Prepared by: Jess B. Coleman

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Size and Composition
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December 1965

Geological Laboratories Branch
Ocean Surveys Division
Oceanographic Surveys Dept.

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EXPLANATION OF DATA PAGES
CORE ANALYSIS SUMMARY SHEET
Engineering Properties
NAVOCEANO (EXP) 3167/18B (Rev. 1-63)

Results of engineering properties, core analysis performed by the U. S. Naval Oceanographic Office Geological Laboratory are recorded on Core Analysis Summary Sheet Engineering Properties.

The following is a description of the terms employed on the Core Analysis Summary Sheet:

1. Cruise Number. A number assigned to each cruise for identification purposes.

2. Latitude. Expressed in degrees, minutes, and seconds.

3. Longitude. Expressed in degrees, minutes, and seconds.

4. Sample Number. A consecutive number, commencing with 1, applied to each core taken successively throughout the cruise.

5. Date Taken. Day (GMT), month, and year.

6. Water Depth (m). The uncorrected sonic sounding recorded in meters.

7. Type Corer. Identified by the name of device employed.

8. Core Length(cm). Recorded in centimeters as observed in the laboratory.

9. Core Penetration (cm). Recorded in centimeters as observed in the field.

10. Subsample Depth in Core (cm). Interval of subsample as measured in centimeters from the top of the core.

11. Wet Unit Weight (g/cm^3). The weight (solids plus water) per unit volume of the sediment mass.

12. Specific Gravity of Solids. The ratio of weight in air of a given volume of a sediment at 20°C to the weight in air of an equal volume of distilled water at 20°C.

13. Water Content (% dry weight). The ratio, in percent, of the weight of water in a given mass of the sediment sample to the weight of the solid particles.

14. <u>Void Ratio</u>. The ratio of the volume of void spaces to the volume of solid particles in the sediment sample as computed from Wet Unit Weight, Specific Gravity of Solids, and Water Content.

15. <u>Saturated Void Ratio</u>. The Void Ratio at 100 percent saturation as computed from Water Content and Specific Gravity of Solids.

$$\text{Saturated Void Ratio} = \frac{\text{Water Content X Specific Gravity of Solids}}{100}$$

16. <u>Porosity (%)</u>. The ratio, usually expressed as a percentage, of the volume of voids of a sediment mass to the total volume of the sediment mass.

17. <u>Liquid Limit</u>. Water Content, in percent, at which a pat of sediment cut by a groove of standard dimension will flow together for a distance of 1/2 inch under the impact of 25 blows in a standard liquid limit apparatus.

18. <u>Plastic Limit</u>. Water Content, in percent, at which a sediment will just begin to crumble when rolled into a thread approximately 1/8 inch in diameter.

19. <u>Plasticity Index</u>. The numerical difference between the Liquid Limit and Plastic Limit of the sediment mass.

20. <u>Liquidity Index</u>. The ratio, expressed in percentage, of (1) the natural water content of the sediment sample minus its Plastic Limit to (2) its Plasticity Index.

21. <u>Compression Index</u>. The slope of the linear portion of the Pressure-Void Ratio curve on a semi-log plot.

22. <u>Compressive Strength</u>. The load per unit area required to shear an unconfined, natural or remolded, sediment mass.

23. <u>Cohesion</u>. The shearing strength per unit area under zero externally applied load.

24. <u>Sensitivity</u>. The ratio of the natural to the remolded strength. It is a measure of the loss of strength due to remolding the sediment mass.

25. <u>Angle of Internal Friction (°)</u>. The angle between the abscissa and the tangent of the curve representing the relationship of "shearing resistance" to "normal stress" acting within a sediment mass.

26. <u>Activity</u>. The ratio of the Plasticity Index to the clay fraction percentage (< .002 mm) of the sediment mass.

27. <u>Modulus of Elasticity</u>. The ratio of stress to strain of the sediment mass.

28. <u>Slump (%)</u>. The ratio, in percent, of the amount of height change immediately before the compressive strength test to the original height of a cylinder of sediment.

EXPLANATION OF COMPUTER DATA SHEET
SEDIMENT SIZE AND COMPOSITION

Results of sediment-size and -composition core analysis performed by the U. S. Naval Oceanographic Office Geological Laboratory are tabulated on Computer Data Sheet Sediment Size and Composition.

The following is an explanation of the terms employed on the Computer Data Sheet:

1. CRUISE. A number assigned to each cruise for identification purposes.

2. SAMPLE. A consecutive number applied to each core taken successively throughout the cruise.

3. LATITUDE. Expressed in degrees, minutes, and tenths of minutes.

4. LONGITUDE. Expressed in degrees, minutes, and tenths of minutes.

5. TAKEN. Date in month, day, and year that core was taken.

6. CORER TYPE. Number corresponding to sampling device code below.

    1. Hydroplastic piston   6. Orange Peel
    2. Hydroplastic gravity   7. Ewing
    3. Kullenberg piston   8. Vibrocorer
    4. Kullenberg gravity   9. Dredge
    5. Phleger gravity   0. Other

7. LENGTH. Length of core recorded in centimeters as observed in the laboratory.

8. PENETRATION. Penetration of coring device recorded in centimeters as observed in the field.

9. DEPTH. The uncorrected sonic sounding recorded in meters.

10. ANALYZED. Date in month, day, and year that core was analyzed in the laboratory.

11. ID. NO. Three digit laboratory project number followed by consecutive number assigned to each subsample analyzed.

12. INTERVAL. Interval of subsample as measured in centimeters from the top of the core.

13. <u>MM</u>. Particle diameter size intervals based on Wentworth size grades in millimeters.

14. <u>PER.</u> Percent of total sample weight within the given size interval.

15. <u>GRAVEL, SAND, SILT, CLAY</u>. Percent of total sample weight within the four size classes.

Class ranges are:
- Gravel – coarser than 2 mm
- Sand – 2 to 0.0625 mm
- Silt – 0.0625 to 0.0039 mm
- Clay – finer than 0.0039 mm

16. <u>MEAN (MM)</u>. The geometric mean of the distribution expressed in millimeters.

17. <u>MEAN (PHI)</u>. The logarithmic mean of the distribution expressed in phi units ($-\log_2$ of the diameter in millimeters).

18. <u>STAN DEV</u>. Standard deviation. A measure of the degree of spread or dispersion of the distribution about the mean expressed in phi units.

$$\sigma = \sqrt{\sum f (X_i - \overline{X})^2 / 100}$$

19. <u>SKEWNESS</u>. A measure of the asymmetry of the distribution. Positive values denote skewness of the distribution toward the fine particles, negative values denote skewness toward the coarse particles. A normal distribution has a skewness of 0.

$$\alpha_3 = \frac{1}{100} \sigma^{-3} \sum f (X_i - \overline{X})^3$$

20. <u>KURTOSIS</u>. A measure of the peakedness of the distribution. Positive values denote a "leptokurtic" distribution, or a distribution more "peaked" than normal. Negative values denote a "platykurtic" distribution, or a distribution more "flat" than normal. A normal curve has a kurtosis of 0.

$$\alpha_4 = \frac{1}{100} \sigma^{-4} \sum f (X_i - \overline{X})^4 - 3$$

21. <u>CACO$_3$</u>. Percent calcium carbonate of the total sample weight as determined by the insoluble residue method.

22. <u>ORG CARBON</u>. Percent organic carbon of the total sample weight as determined by the Allison method.

23. COLOR. Wet sediment color, based on the Geological Society of America Rock-Color Chart, as determined in the laboratory.

24. DOM MINERAL. Dominant mineral (s) comprising the sample assemblage.

25. SEC MINERAL. Secondary mineral (s) comprising the sample assemblage.

v. Calcium Carbonate (%). Percentage of total sample weight deter-
mined by **EDTA** method.

w. Organic Carbon (%). Percentage of total sample weight determined
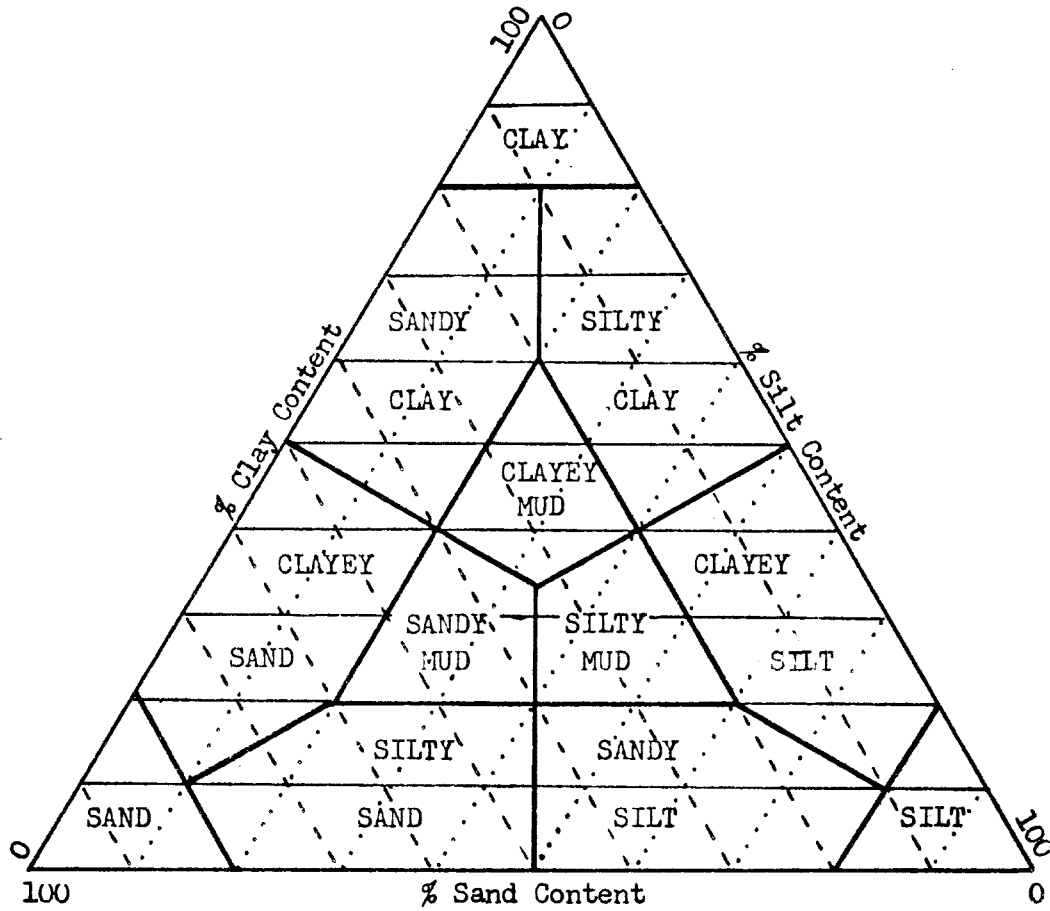by **Allison** method.

15. <u>Remarks</u>.

FIGURE B-1. MODIFIED NOMENCLATURE OF SEDIMENT TYPES
(after Shepard, 1954, p. 157)

SEDIMENT SIZE AND COMPOSITION DATA

	SAMPLE 1	LATITUDE 18 38.0 N	LONGITUDE 86	1.0 M	TAKEN 12/05/69
CRUISE ?	LENGTH 420.0	PENETRATION 609.0	DEPTH 4417.0		ANALYZED 12/05/69
CORER TYPE ?					

ID. NO.	255 1	255 2	255 3	255 4	255 5	255 6
INTERVAL	0.0- 7.0	7.0-14.0	14.0-21.0	21.0-28.0	30.0-37.0	40.0-47.0
MN	PER	PER	PER	PER	PER	PER
4.0000	0.000	0.000	0.000	0.000	0.000	0.000
2.0000	0.000	0.000	0.000	0.000	0.000	0.000
1.0000	0.000	0.052	0.095	0.000	0.000	0.049
0.5000	0.120	0.105	0.095	0.072	0.146	2.272
0.2500	0.301	0.345	0.095	0.092	0.195	7.018
0.1250	0.602	0.525	0.285	0.092	1.319	3.297
0.0625	1.732	0.370	0.000	1.579	2.015	
0.0312	17.580	0.000	0.000	19.679	0.000	
0.0156	0.000	21.942	15.684	28.203	69.411	11.927
0.0078	19.352	0.000	0.000	0.000	0.000	12.385
0.0039	0.000	12.336	14.289	1.218	0.000	
0.0020	29.488	0.000	0.000	0.000	27.752	
0.0010	14.750	29.396	29.943	24.424	17.661	
0.0005	24.985	12.073	13.308	12.442	15.138	
0.0000-		21.522	25.665	21.659	5.602	

	PER	PER	PER	PER	PER	PER
GRAVEL	0.000	0.000	0.000	0.000	0.000	0.000
SAND	1.445	2.770	1.141	0.369	21.335	19.138
SILT	32.932	34.278	29.943	41.106	70.628	24.312
CLAY	65.623	62.942	68.916	58.525	8.037	60.550
MEAN (MM)	0.0019	0.0023	0.0018	0.0025	0.3218	0.0438
MEAN (PHI)	9.0352	8.7462	9.1940	8.6438	5.9122	8.1895
STAN DEV	2.2570	2.3744	2.1674	2.3448	1.8574	3.1790
SKEWNESS	-0.3748	-0.3158	-0.4192	-0.1603	-0.9006	-0.4318
KURTOSIS	-0.2641	-0.5440	-0.0532	-1.2312	4.1403	-1.1943
CACO3	75.600	78.400	79.600	79.700	78.500	89.800
ORG CARBON	0.490	0.000	0.000	0.000	0.520	0.000
COLOR	10YR6/2	5GY7/1	5GY7/1	5GY7/1	5Y 8/1	2.5Y8/1
DOM MINERAL						
SEC MINERAL						

I.D. NO.	255 7	255 8	255 9	255 10	255 11	255 12
INTERVAL	50.0- 52.0	52.0- 57.0	60.0- 67.0	70.0- 77.0	80.0- 87.0	90.0- 97.0
PHI	PER	PER	BSR	PER	PER	PER
4.0000	0.000	0.000	0.000	0.000	0.000	0.000
2.0000	0.000	0.059	0.000	0.067	0.050	0.000
1.0000	0.141	0.083	0.002	0.201	0.050	0.000
0.5000	1.693	1.325	0.720	1.674	0.785	0.048
0.2500	11.989	6.624	1.782	3.809	2.514	0.086
0.1253	15.456	2.915	1.325	3.952	2.514	0.056
0.0625	19.464	4.557	2.010	4.689	2.715	0.056
0.0312	22.144	0.000	0.000	0.000	0.000	0.000
0.0156	0.000	17.700	8.451	11.855	8.748	12.433
0.0078	2.116	0.000	0.000	0.000	0.000	0.000
0.0039	0.000	11.650	12.314	3.684	11.312	20.359
0.0020	9.168	0.000	0.000	0.000	0.000	0.000
0.0010	4.231	21.178	29.059	26.122	27.149	29.141
0.0005	13.393	18.018	20.786	19.424	19.105	14.972
-0.0000		15.898	24.984	24.447	24.687	27.119
GRAVEL	0.000	0.063	0.000	0.067	0.050	0.000
SAND	48.942	15.474	5.436	14.401	8.748	0.226
SILT	24.260	29.397	20.786	15.459	20.060	32.943
CLAY	26.798	55.114	79.778	69.991	71.141	67.232
MEAN (MM)	0.0222	0.0041	0.0017	0.0026	0.0020	0.0016
MEAN (PHI)	5.4929	7.0192	9.2181	8.5484	8.9761	9.2402
STAN DEV	3.4659	3.1803	2.3866	3.1834	2.7326	2.8204
SKEWNESS	0.2960	-0.3659	0.7250	0.5549	0.6444	0.3293
KURTOSIS	-1.0355	-0.6210	1.7492	0.0995	1.1413	0.5319
CACO3	82.300	79.200	68.200	60.400	63.900	74.200
ORG CARBON	0.920	0.000	0.000	0.370	0.000	0.000
COLOR	10YR6/2	10YR6/2	10YR6/2	10YR6/2	10YR6/2	10YR6/2
DOM MINERAL	COQUINA				IRREG.BOT	TRACE MN
SEC MINERAL	PTEROPODS					

ID. NO. INTERVAL	255 13 97.0-99.0	255 14 100.0-107.0	255 15 110.0-117.0	255 16 120.0-127.0	255 17 130.0-137.0	255 18 140.0-147.0
MM	PER	PER	PER	PER	PER	PER
4.0000	0.000	0.000	0.000	0.000	0.000	0.000
2.0000	0.077	0.269	0.000	0.000	0.000	0.000
1.0000	0.033	0.404	0.038	0.047	0.107	0.078
0.5000	0.118	1.456	0.786	0.889	0.169	0.545
0.2500	0.116	2.691	0.977	2.901	0.320	1.946
0.1250	0.077	3.319	0.902	3.369	0.427	2.179
0.0625	0.270	2.518	0.904	2.901	0.427	2.646
0.0312	0.000	0.000	0.000	0.000	0.000	0.000
0.0156	1.868	5.832	18.752	7.534	11.580	8.860
0.0078	0.000	0.000	0.000	0.000	0.000	0.000
0.0039	14.260	7.290	15.487	14.740	15.475	14.786
0.0020	0.000	0.000	0.000	0.000	0.000	0.000
0.0010	11.944	28.162	20.014	21.093	16.275	24.459
0.0005	4.824	28.875	12.982	18.464	14.941	16.342
0.00001	6.360	30.152	30.792	27.141	40.288	26.459
GRAVEL	0.077	0.265	0.000	0.000	0.000	0.000
SAND	0.618	10.404	2.272	10.108	1.441	7.393
SILT	76.148	13.121	34.439	22.274	27.094	23.346
CLAY	23.157	76.209	63.289	67.018	71.505	69.261
MEAN (MM)	0.0086	0.0018	0.0019	0.0024	0.0013	0.0019
MEAN (PHI)	6.8610	9.1309	9.0169	8.9045	9.5763	9.0207
STAN DEV	2.0608	2.9408	2.4126	2.8330	2.2430	2.5475
SKEWNESS	0.4632	-0.8028	-0.5901	-0.6311	-0.5621	-0.6478
KURTOSIS	0.9002	1.6834	0.5275	0.7361	0.6532	1.687
CACO3	86.000	96.900	62.100	95.400	49.300	95.900
ORG CARBON	0.000	0.000	0.320	0.000	0.300	0.000
COLOR	5Y 8/2	10YR6/2	10YR6/2	10YR5/2	10YR5/2	10YR5/2
DOM MINERAL	IRREGULAR	PTEROPODS	VARVED	VARVED	VARVED	VARVED
SEC MINERAL						

SEDIMENT SIZE AND COMPOSITION DATA

CRUISE   SAMPLE L   LATITUDE 19 38.0 N   LONGITUDE 86   1.0 M   TAKEN 12/05/65
CORER TYPE 7   LENGTH 420.0   PENETRATION 659.0   (DEPTH 4443.0)   ANALYZED 12/../66

MM	255 19 148.0-151.0 PER	255 20 151.0-157.0 PER	255 21 160.0-167.0 PER	255 27 170.0-177.0 PER	255 23 180.0-187.0 PER	255 24 187.0-195.0 PER
4.0000	0.000	0.000	0.000	0.000	0.000	0.000
2.0000	0.000	0.098	0.000	0.000	0.000	0.000
1.0000	0.057	0.058	0.255	0.048	0.49	0.124
0.5000	0.057	1.480	1.327	1.442	1.368	0.373
0.2500	0.115	4.350	3.872	4.315	3.322	1.242
0.1250	0.403	4.060	3.816	2.644	2.031	1.242
0.0625	1.722	5.452	4.425	4.135	3.420	2.230
0.0312	0.000	0.000	0.000	0.000	0.000	0.000
0.0156	9.400	11.195	8.910	8.730	10.992	6.584
0.0078	8.611	7.251	0.000	0.000	0.000	0.000
0.0039	0.000	0.000	8.020	7.092	13.670	0.043
0.0020	4.079	27.262	0.000	0.000	0.000	0.000
0.0010	5.741	15.081	25.719	29.808	23.695	25.466
0.0005	8.695	23.782	20.741	18.510	18.075	23.632
0.0000			23.507	22.596	22.472	26.087
GRAVEL	0.057	0.068	0.000	0.000	0.000	0.005
SAND	2.354	15.371	13.496	12.644	11.069	5.217
SILT	78.071	18.445	16.938	16.442	24.670	19.627
CLAY	19.518	66.125	69.067	70.913	64.240	75.155
MEAN (MM)	0.0101	0.0029	0.0024	0.0024	0.0024	0.0015
MEAN (PHI)	6.6268	8.4316	8.7091	8.7194	8.6126	9.3671
STD DEV	2.1634	3.1751	3.0458	2.9963	2.9238	2.8922
SKEWNESS	0.6047	0.5507	-0.4051	-0.4315	-0.9525	-0.7815
KURTOSIS	0.4642	0.2249	0.2978	0.5069	0.2913	2.2071
CACO3	78.300	57.600	63.900	69.800	61.900	89.700
ORG CARBON	0.000	0.000	0.000	0.000	0.000	0.350
COLOR	10YR6/2	10YR6/2	10YR4/3	10YR6/3	10YR6/2	10YR6/2
DOM MINERAL			10YR6T7/.			
SEC MINERAL			SLUMP BEDS			

I.D. NO.	255 25	255 26	255 27	255 28	255 29	255 30
INTERVAL	300.0-307.0	210.0-217.0	220.0-227.0	230.0-237.0	240.0-247.0	250.0-257.0
MM	PER	PER	PER	PER	PER	PER
4.0000	0.000	0.000	0.000	0.000	0.000	0.000
2.0000	0.059	0.000	0.000	0.000	0.000	0.000
1.0000	0.110	0.052	0.000	0.056	0.067	0.000
0.5000	0.387	0.312	0.066	0.056	0.067	0.051
0.2500	0.773	1.146	0.066	0.111	0.067	0.051
0.1290	1.047	0.988	0.066	0.056	0.067	0.051
0.0625	1.380	1.976	0.132	0.167	0.067	0.000
0.0312	0.000	0.000	0.000	0.000	0.000	4.064
0.0156	24.166	7.072	2.981	3.809	1.672	0.000
0.0078	12.148	8.320	6.908	7.226	10.368	12.794
0.0039	0.000	0.000	0.000	0.000	0.000	0.000
0.0020	22.039	17.821	22.687	23.902	24.000	20.215
0.0010	14.081	15.081	17.769	17.785	17.057	18.168
0.0005	23.192	17.181	49.342	46.971	46.488	44.524
0.0000-						
GRAVEL	0.055	0.000	0.000	0.000	0.000	0.000
SAND	3.750	4.924	0.324	0.445	0.334	0.259
SILT	36.134	15.393	9.868	10.895	12.340	16.888
CLAY	59.912	80.083	89.803	88.660	87.625	82.907
MEAN (MM)	0.0025	0.0013	0.0007	0.0003	0.0008	0.0009
MEAN (PHI)	8.6242	9.4484	10.3442	10.2927	10.2993	10.1372
STAN DEV	2.5794	2.3134	1.5146	1.6311	1.5147	1.6856
SKEWNESS	-0.3349	-0.8362	-0.9247	-0.934	-0.8485	-0.8798
KURTOSIS	-0.3950	2.5738	4.2938	4.5679	4.4986	1.5442
CACO3	76.100	90.800	91.300	90.200	53.700	53.900
ORG CARBON	0.540	0.000	0.000	0.000	0.000	0.740
COLOR	10YR7/2	10YR5/4	5Y 5/2	5Y 5/2	5G 4/1	5G 4/1
DOM MINERAL	THIN MN RD	TRACE MN	TRACE MN	TRACE MN	TRACE MN	TRACE MN
SEC MINERAL						

ID. NO. INTERVAL	255 31 265.0-268.0	255 32 270.0-277.0	255 33 280.0-287.0	255 34 290.0-297.0	255 35 305.0-307.0	255 36 310.0-317.0
MM	PER	PER	PER	PER	PER	PER
4.0000	0.000	0.000	0.000	0.000	0.000	0.000
2.0000	0.000	0.000	0.000	0.000	0.000	0.000
1.0000	0.062	0.047	0.071	0.062	0.058	0.094
0.5000	0.062	0.949	1.699	4.809	0.251	0.575
0.2500	0.125	2.941	4.812	12.700	1.444	1.916
0.1250	0.187	3.745	3.408	6.658	0.990	1.213
0.0625	1.123	6.167	3.397	7.398	21.433	1.341
0.0312	0.000	0.000	0.000	0.000	0.000	0.000
0.0156	23.973	11.385	7.643	20.284	32.243	9.642
0.0078	0.000	0.000	0.000	0.000	0.000	0.000
0.0039	14.321	12.314	15.924	16.954	9.764	14.049
0.0020	0.000	0.000	0.000	0.000	0.000	0.000
0.0010	14.944	29.412	31.493	17.571	16.176	31.602
0.0005	13.076	18.736	17.339	5.857	6.355	21.711
0.0000	32.061	14.231	14.154	7.707	9.954	17.880
GRAVEL	0.000	0.000	0.000	0.000	0.000	0.000
SAND	1.619	13.899	13.447	11.628	38.156	5.109
SILT	38.294	23.719	23.967	37.238	30.351	23.691
CLAY	60.087	62.381	62.987	31.134	31.495	71.201
MEAN (MM)	0.0021	0.0032	0.0031	0.0136	0.0117	0.0013
MEAN (PHI)	8.9209	8.3088	8.3408	6.1973	6.4182	9.0313
STAN DEV	2.4863	2.9034	2.9503	3.3754	2.9334	2.9770
SKEWNESS	-0.2510	-0.4809	-0.5642	-0.5595	-0.1757	-0.7143
KURTOSIS	-1.0929	-0.1252	-0.3441	-1.2087	-1.1494	1.8861
CACO3	68.400	64.600	51.500	38.600	56.700	72.600
ORG CARBON	0.000	0.000	0.000	0.000	0.120	0.000
COLOR	5G 4/1	5Y 7/1	5Y 5/1	5Y 5/1	5Y 5/1	5Y 5/1
DOM MINERAL	TRACE MN	VARVED		IRNCO.TOP		TIN MN B
SEC MINERAL						

MGG0905018

SEDIMENT SIZE AND COMPOSITION DATA

	SAMPLE LENGTH	LATITUDE 19 38.0 N PENETRATION 389.0	LONGITUDE 86 24.0 N DEPTH 2407.0		1.0 M	TAKEN 12/05/89 ANALYZED 12/05/89

ID. NO. INTERVAL	255 37 320.0-327.0	255 38 330.0-337.0	255 39 340.0-347.0	255 40 350.0-357.0	255 41 360.0-367.0	255 42 373.0-380.0
MM	PER	PER	PER	PER	PER	PER
-4.0000	0.000	0.000	0.000	0.000	0.000	0.000
-2.0000	0.000	0.000	0.051	0.000	0.000	0.000
-1.0000	0.043	0.000	0.051	0.045	0.032	0.047
-0.5000	0.043	0.042	0.051	0.045	0.032	0.047
-0.2500	0.130	0.052	0.051	0.045	0.064	0.519
-0.1250	0.216	0.082	0.405	0.227	1.970	0.047
-0.0625	0.389	0.164	1.217	3.000	22.126	44.313
-0.0312	0.000	0.000	0.000	30.945	0.000	37.565
-0.0156	4.795	9.436	13.495	49.683	49.000	0.000
-0.0078	0.000	0.000	0.492	0.000	0.000	3.067
-0.0039	12.000	12.705	13.692	14.091	5.299	0.000
-0.0020	37.565	34.010	31.187	23.182	0.000	6.607
-0.0010	21.000	21.721	19.270	13.844	6.510	1.416
-0.0005	22.594	21.721	20.536	15.000	7.306	6.371
-0.0000						
GRAVEL	0.000	0.000	0.051	0.000	0.000	0.000
SAND	0.821	0.410	1.775	3.318	23.724	44.974
SILT	17.322	22.131	27.191	44.636	54.881	40.632
CLAY	81.857	77.459	70.954	52.049	21.195	14.394
MEAN (MM)	0.0012	0.0014	0.0017	0.0033	0.0140	0.0243
MEAN (PHI)	9.6745	9.4910	9.1694	8.2314	6.1597	5.3650
STAN DEV	1.6683	1.8222	2.1055	2.4161	2.4884	2.3870
SKEWNESS	-0.4995	-0.5500	-0.4974	-0.1023	0.4417	0.6714
KURTOSIS	2.8177	2.8490	-0.4735	-1.2835	-0.2845	0.9244
CACO3	72.900	76.200	76.500	83.600	91.300	89.100
ORG CARBON	0.000	0.000	0.000	0.430	0.000	0.000
COLOR	5Y 7/1	5Y 7/1	5Y 7/1	5Y 7/1	5Y 7/1	5Y 7/1
DOM MINERAL						
SEC MINERAL						

ID. NO.	255. 43	255. 44	255. 45	255. 46	255. 47
INTERVAL	380.0-391.0	390.0-397.0	400.0-407.0	410.0-417.0	417.0-420.0
MM	PER	PER	PER	PER	PER
4.0000	0.000	0.000	0.000	0.000	0.000
2.0000	0.000	0.000	0.002	0.035	0.000
1.0000	0.041	0.044	0.049	0.035	0.051
0.5000	0.532	0.648	0.576	0.245	0.074
0.2500	7.191	8.973	1.871	0.560	2.726
0.1250	18.453	23.210	2.499	0.529	2.778
0.0625	34.054	15.291	2.927	3.428	8.951
0.0312	0.000	0.000	0.000	0.000	0.000
0.0156	29.052	16.790	11.228	25.149	48.611
0.0078	0.000	0.000	0.000	0.000	0.000
0.0039	1.227	2.913	10.597	11.787	5.601
0.0020	0.000	0.000	0.000	0.000	0.000
0.0010	2.804	5.088	31.190	23.610	11.917
0.0005	1.441	1.388	18.714	16.264	9.200
0.0000-	4.705	6.244	20.393	18.363	10.288
GRAVEL	0.000	0.000	0.000	0.035	0.000
SAND	60.270	66.178	7.917	4.792	15.381
SILT	35.319	19.103	21.795	38.458	54.012
CLAY	4.411	12.720	70.294	58.237	30.607
MEAN (MM)	0.0429	0.0475	0.0031	0.0024	0.0096
MEAN (PHI)	4.5421	4.3973	8.0781	8.4717	6.7090
STAN DEV	2.1633	2.7205	2.6122	2.5416	2.7926
SKEWNESS	0.7766	0.7196	-0.6278	-0.2758	-0.1529
KURTOSIS	2.1302	1.1325	0.8609	-0.7346	-0.8971
CACO3	91.900	91.800	71.400	83.100	70.100
ORG CARBON	0.000	0.000	0.380	0.000	0.000
COLOR	5Y 7/1	5Y 7/1	5Y 7/2	5Y 7/1	5Y 7/1
DOM MINERAL		INCR.SHELL	THIN MN NO		5Y7/2TO6/2
SEC MINERAL					

CORE ANALYSIS SUMMARY SHEET
ENGINEERING PROPERTIES

MGG0900 5018

ANALYZED BY _J.B. Coleman_

DATE _11/Aug/65_

NAVOCEANO-EXP-3167/18-B (Rev. 1-63)

1. CRUISE NO. 045-96
2. LATITUDE 19° 38' N
3. LONGITUDE 86° 01' W
4. SAMPLE NO. EWING #1
5. DATE TAKEN (Day, month, year) 12/May/65
6. WATER DEPTH (m) 4407
7. TYPE CORER EWING PISTON
8. CORE LENGTH (cm) 420
9. CORER PENETRATION (cm) 609

	0-7	7-14	14-21	21-28	28-30	30-37	37-40	40-47	47-50	50-57	57-60	60-67
10. SUBSAMPLE DEPTH IN CORE (cm)	0-7	7-14	14-21	21-28	28-30	30-37	37-40	40-47	47-50	50-57	57-60	60-67
11. WET UNIT WEIGHT (g/cm³)	1.516	1.621	1.593	1.605		1.747		1.524		1.543		1.514
12. SPECIFIC GRAVITY OF SOLIDS	2.726	2.739	2.731	2.719		2.744		2.718		2.721		2.745
13. WATER CONTENT (% dry weight)	88.91	86.12	83.58	69.71		52.21		83.57		86.21		87.28
14. VOID RATIO	2.40	2.14	2.14	1.88		1.39		2.27		2.28		2.46
15. SATURATED VOID RATIO	2.42	2.36	2.28	1.90		1.43		2.27		2.35		2.40
16. POROSITY (%)	70.6	68.2	68.2	65.2		58.2		69.4		69.5		70.6
17. LIQUID LIMIT												
18. PLASTIC LIMIT												
19. PLASTICITY INDEX												
20. LIQUIDITY INDEX												
21. COMPRESSION INDEX FROM LL												
22. COMPRESSIVE STRENGTH NATURAL (g/cm²)		39	22			380		170				120
22. COMPRESSIVE STRENGTH REMOLD (g/cm²)												
23. COHESION NATURAL (g/cm²)	8.13	14	11	2.49		190		85		60.98		60
23. COHESION REMOLD (g/cm²)	2.71			1.24						3.32		
24. SENSITIVITY	3			2						18		
25. ANGLE OF INTERNAL FRICTION (°)												
26. ACTIVITY												
27. MODULUS OF ELASTICITY		110	39			1830		940				550
28. SLUMP (%)	1.68		1.49			1.20		1.06				2.66
29. REMARKS												

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CORE ANALYSIS SUMMARY SHEET
ENGINEERING PROPERTIES

NAVOCEANO-EXP-3167/18-8 (Rev.1-63)

ANA MGG 0250265 8 DATE 12/Aug/65   2.55

1. CRUISE NO.
2. LATITUDE 19° 38' N
3. LONGITUDE 86° 01' W
4. SAMPLE NO. EWING #1
5. DATE TAKEN (Day, month, year) 12/May/65
6. WATER DEPTH (m) 4407
7. TYPE CORER EWING PISTON
8. CORE LENGTH (cm) 420
9. CORER PENETRATION (cm) 609

		10. SUBSAMPLE DEPTH IN CORE (cm)					
	67-70	77-80	87-90	97-100	107-110	117-120	120-127
11. WET UNIT WEIGHT (g/cm³)	1.478	1.502	1.668	1.546	1.639		1.486
12. SPECIFIC GRAVITY OF SOLIDS	2.714	2.730	2.736	2.739	2.752		—*
13. WATER CONTENT (% dry weight)	97.77	92.12	62.49	87.55	76.26		—*
14. VOID RATIO	2.63	2.49	1.67	2.32	1.96		
15. SATURATED VOID RATIO	2.65	2.51	1.71	2.40	2.10		
16. POROSITY (%)	72.5	21.4	62.5	69.9	66.2		
17. LIQUID LIMIT							
18. PLASTIC LIMIT							
19. PLASTICITY INDEX							
20. LIQUIDITY INDEX							
21. COMPRESSION INDEX FROM LL							
22. COMPRESSIVE STRENGTH NATURAL (g/cm²)	83		174	73	63		
REMOLD (g/cm²)							
23. COHESION NATURAL (g/cm²)	42	28.62	87	36	32	26.55	
REMOLD (g/cm²)		7.47				8.30	
24. SENSITIVITY		4				3	
25. ANGLE OF INTERNAL FRICTION (°)							
26. ACTIVITY							
27. MODULUS OF ELASTICITY	410		810	275	275		
28. SLUMP (%)	2.73		1.82	1.60	3.06		

29. REMARKS * Broke crucible, lost moisture. No specific gravity run.

PRNC-NAVOCEANO-3167/18 B (4-63)

CORE ANALYSIS SUMMARY SHEET
ENGINEERING PROPERTIES

ANALYZED BY _J. B. Coleman_

DATE _14/AUG/65_

1. CRUISE NO.
2. LATITUDE _19° 38' N_
3. LONGITUDE _86° 01' W_
4. SAMPLE NO. _EWING #1_
5. DATE TAKEN (Day, month, year) _12/May/65_
6. WATER DEPTH (m) _4407_
7. TYPE CORER _EWING PISTON_
8. CORE LENGTH (cm) _420_
9. CORE PENETRATION (cm) _609_

	127-130	130-137	137-140	140-147	147-150	150-157	157-160	160-167	167-170	170-177	177-180	180-187	187-194
10. SUBSAMPLE DEPTH IN CORE (cm)	127/130	130/137	137/140	140/147	147/150	150/157	157/160	160/167	167/170	170/177	177/180	180/187	187/194
11. WET UNIT WEIGHT (g/cm²)		1.522		1.543		1.472		1.489		1.510		1.538	1.584
12. SPECIFIC GRAVITY OF SOLIDS		2.760		2.710		2.747		2.756				2.722	2.700
13. WATER CONTENT (% dry weight)		88.03		83.59		91.44		97.81		92.94		91.58	73.71
14. VOID RATIO		2.41		2.22		2.57		2.66				2.39	1.96
15. SATURATED VOID RATIO		2.42		2.26		2.51		2.70				2.49	1.99
16. POROSITY (%)		70.7		69.0		72.0		72.7				70.5	66.2
17. LIQUID LIMIT													
18. PLASTIC LIMIT													
19. PLASTICITY INDEX													
20. LIQUIDITY INDEX													
21. COMPRESSION INDEX FROM LL													
22. COMPRESSIVE STRENGTH — NATURAL (g/cm²)		76		102				72		88			138
22. COMPRESSIVE STRENGTH — REMOLD (g/cm²)													
23. COHESION — NATURAL (g/cm²)		38		51		26.55		36		44		24.06	79
23. COHESION — REMOLD (g/cm²)						4.15						5.39	
24. SENSITIVITY						6						4	
25. ANGLE OF INTERNAL FRICTION (°)													
26. ACTIVITY													
27. MODULUS OF ELASTICITY		355		575				300		330			570
28. SLUMP (%)		2.48		2.48				4.34		0.62			0.00
29. REMARKS													

CORE ANALYSIS SUMMARY SHEET
ENGINEERING PROPERTIES

MGG0905018

ANALYZED BY *J.B. Coleman*   DATE *8 Sept/66*

NAVOCEANO-EXP-3167/18-B (Rev. 1-63)

1. CRUISE NO.	
2. LATITUDE	19° 38' N
3. LONGITUDE	86° 01' W
4. SAMPLE NO.	EWING #1
5. DATE TAKEN (Day, month, year)	12/May/65
6. WATER DEPTH (m)	4407
7. TYPE CORER	EWING PISTON
8. CORE LENGTH (cm)	420
9. CORER PENETRATION (cm)	609

	194-195*	195-200	200-207	207-210	210-217	217-220	220-227	227-230	230-237	237-249	246-247	247-250
10. SUBSAMPLE DEPTH IN CORE (cm)												
11. WET UNIT WEIGHT (g/cm³)		1.426**			1.490		1.524		1.508		1.485	
12. SPECIFIC GRAVITY OF SOLIDS		—**			2.761		2.772		2.769		2.772	
13. WATER CONTENT (% dry weight)		—**			88.72		85.64		90.99		97.24	
14. VOID RATIO					2.50		2.38		2.51		2.68	
15. SATURATED VOID RATIO					2.45		2.37		2.52		2.70	
16. POROSITY (%)					71.4		70.4		71.5		72.8	
17. LIQUID LIMIT												
18. PLASTIC LIMIT												
19. PLASTICITY INDEX												
20. LIQUIDITY INDEX												
21. COMPRESSION INDEX FROM LL												
22. COMPRESSIVE STRENGTH NATURAL (g/cm²)					61		49				70	
REMOLD (g/cm²)												
23. COHESION NATURAL (g/cm²)		38.16			31		25		52.27		35	
REMOLD (g/cm²)		3.30							3.32			
24. SENSITIVITY		16							16			
25. ANGLE OF INTERNAL FRICTION (°)												
26. ACTIVITY												
27. MODULUS OF ELASTICITY					2.57		779				330	
28. SLUMP (%)					0.58		1.57				1.46	

29. REMARKS * 195 cm is End of Section #1 of Core.
 ** Moisture and specific gravity not taken

CORE ANALYSIS SUMMARY SHEET
ENGINEERING PROPERTIES

NAVOCEANO-EXP-3167/18-8 (Rev.1-63)

ANALYZED BY __J.B. Coleman__

DATE __8/Sept/65__

1. CRUISE NO. 045-96
2. LATITUDE 19° 38' N
3. LONGITUDE 86° 01' W
4. SAMPLE NO. Ewing #1
5. DATE TAKEN (Day, month, year) 12/May/65
6. WATER DEPTH (m) 4407
7. TYPE CORER Ewing Piston
8. CORE LENGTH (cm) 420
9. CORER PENETRATION (cm) 609

	250-257	257-260	260-267	267-270	270-277	277-280	280-287	287-290	290-297	297-300	300-307	307-310
10. SUBSAMPLE DEPTH IN CORE (cm)												
11. WET UNIT WEIGHT (g/cm³)	1.468		1.631		1.478		1.445		1.485		1.481	
12. SPECIFIC GRAVITY OF SOLIDS	2.745		2.760		2.725		2.731		2.621		2.702	
13. WATER CONTENT (% dry weight)	89.88		70.65		93.99		102.89		86.62		99.07	
14. VOID RATIO	2.55		1.89		2.58		2.83		2.89		2.63	
15. SATURATED VOID RATIO	2.47		1.95		2.56		2.81		2.27		2.68	
16. POROSITY (%)	71.8		65.4		72.1		73.9		69.6		72.5	
17. LIQUID LIMIT												
18. PLASTIC LIMIT												
19. PLASTICITY INDEX												
20. LIQUIDITY INDEX												
21. COMPRESSION INDEX FROM LL												
22. COMPRESSIVE STRENGTH NATURAL (g/cm²)	52				128		216		244			
22. COMPRESSIVE STRENGTH REMOLD (g/cm²)												
23. COHESION NATURAL (g/cm²)	26		17.01		64		108		>315**		122	
23. COHESION REMOLD (g/cm²)	4.98								96.95**			
24. SENSITIVITY			3						3?			
25. ANGLE OF INTERNAL FRICTION (°)												
26. ACTIVITY												
27. MODULUS OF ELASTICITY	179				548		1050		1775**			
28. SLUMP (%)	2.84				2.11		0.11		0.00**			

29. REMARKS * No slump but 0.58% stretch
    ** Did not shear, went over limits of spring.

MGG0905018

CORE ANALYSIS SUMMARY SHEET
ENGINEERING PROPERTIES

ANALYZED BY __J.B. Coleman__

DATE __10/SEPT/65__

NAVOCEANO-EXP-3162/1B-B (Rev. 1-63)

1. CRUISE NO.		4. SAMPLE NO. EWING #1		7. TYPE CORER EWING PISTON
2. LATITUDE 19° 38' N		5. DATE TAKEN (Day, month, year) 12/MAY/65		8. CORE LENGTH (cm) 420
3. LONGITUDE 86° 01' W		6. WATER DEPTH (m) 4407		9. CORER PENETRATION (cm) 609

	310-317	317-320	320-327	327-330	330-337	337-340	340-347	347-350	350-357	357-360	360-367	367-373
10. SUBSAMPLE DEPTH IN CORE (cm)	310-317	317-320	320-327	327-330	330-337	337-340	340-347	347-350	350-357	357-360	360-367	367-373
11. WET UNIT WEIGHT (g/cm³)	1.514		1.539		1.493		1.485		1.546		1.700	
12. SPECIFIC GRAVITY OF SOLIDS	2.737		2.738		2.719		2.736		2.746		2.743	
13. WATER CONTENT (% dry weight)	95.86		86.63		103.26		112.29		79.98		52.68	
14. VOID RATIO	2.54		2.32		2.70		2.91		2.20		1.46	
15. SATURATED VOID RATIO	2.62		2.37		2.81		3.07		2.20		1.44	
16. POROSITY (%)	71.8		69.9		73.0		74.4		68.7		59.4	
17. LIQUID LIMIT												
18. PLASTIC LIMIT												
19. PLASTICITY INDEX												
20. LIQUIDITY INDEX												
21. COMPRESSION INDEX FROM LL												
22. COMPRESSIVE STRENGTH NATURAL (g/cm²)	52								30			
REMOLD (g/cm²)											576	
23. COHESION NATURAL (g/cm²)	26		27.79		4.58		4.98		15		288	
REMOLD (g/cm²)			11.61		2.48		3.32					
24. SENSITIVITY			2		2		2					
25. ANGLE OF INTERNAL FRICTION (°)												
26. ACTIVITY												
27. MODULUS OF ELASTICITY	195								60		1211	
28. SLUMP (%)	0.11										2.73	

29. REMARKS * may be slightly low

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CORE ANALYSIS SUMMARY SHEET
ENGINEERING PROPERTIES

MGG0905018

ANALYZED BY J.B. Coleman   DATE 11/SEPT/65

NAVOCEANO-EXP-316/18-B (Rev. 1-63)

1. CRUISE NO.									
2. LATITUDE 19° 38' N									
3. LONGITUDE 66° 01' W									
4. SAMPLE NO. Ewing #1									
5. DATE TAKEN (Day, month, year) 12/May/65									
6. WATER DEPTH (m) 4407									
7. TYPE CORER Ewing Piston									
8. CORE LENGTH (cm) 420									
9. CORER PENETRATION (cm) 609									

	373-380	380-387	387-390	390-397	397-400	400-407	407-410	410-417	417-420 Bottom
10. SUBSAMPLE DEPTH IN CORE (cm)									
11. WET UNIT WEIGHT (g/cm³)	1.713	1.719		1.668		1.569		1.701	
12. SPECIFIC GRAVITY OF SOLIDS	2.744	2.720		2.728		2.741		2.749	
13. WATER CONTENT (% dry weight)	51.28	55.65		53.25		71.78		54.36	
14. VOID RATIO	1.44	1.46		1.51		2.00		1.50	
15. SATURATED VOID RATIO	1.41	1.51		1.45		1.97		1.49	
16. POROSITY (%)	59.0	59.4		60.1		66.7		59.9	
17. LIQUID LIMIT									
18. PLASTIC LIMIT									
19. PLASTICITY INDEX									
20. LIQUIDITY INDEX									
21. COMPRESSION INDEX FROM LL									
22. COMPRESSIVE STRENGTH NATURAL (g/cm²)		>750**		309			239		
REMOLD (g/cm²)									
23. COHESION NATURAL (g/cm²)	970.68 >375**			155		29.82	120		
REMOLD (g/cm²)	37.96					10.85			
24. SENSITIVITY	26								
25. ANGLE OF INTERNAL FRICTION (°)									
26. ACTIVITY									
27. MODULUS OF ELASTICITY	10,900			3020			1150		
28. SLUMP (%)	0.15			2.00			3.39		

29. REMARKS: * Reading may be low. ** Weights collapsed, did not sheer.