120-38

LABORATORY ITEM 462

MGG09005053

A SUMMARY OF SEDIMENT SIZE AND CHEMISTRY OF FOUR CORES FROM THE LONG BEACH NAVAL SHIPYARD. NAVY DIVERS. SEPTEMBER 1973.

Prepared by: R. Oser
J. Bowman

Prepared for: Code 6110

April 1974

Geological Laboratory
Nearshore Surveys Division
Oceanographic Surveys Department

U. S. NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON, D. C. 20373

MGG09005053

The results of the sediment size and composition analyses are printed out in tabular form.

The following is an explanation of the terms encountered on the data printout sheet:

CRUISE	A number assigned to each cruise for identification purposes.
SAMPLE	A consecutive number applied to each core taken successively throughout the cruise.
LATITUDE	Expressed in degrees, minutes, and tenths of minutes.
LONGITUDE	Expressed in degrees, minutes and tenths of minutes.
TAKEN	Date in day, month, and year that core was taken.
CORER TYPE	Letters corresponding to sampling device code below.

Corers		Grabs	
HYP	Hydroplastic piston	SPK	Shipek Sediment Sampler
HYG	Hydroplastic gravity	HLP	Alpine Heavy Duty Grab
KUP	Kullenberg piston	SMS	Small Mud Snapper
KUG	Kullenberg gravity	VVS	Van Veen Grab
PHL	Phlegar gravity	BED	Birge-Ekman Dredge
MEG	Modified Ewing gravity	DLS	Dietz-LaFond Snapper
MEP	Modified Ewing piston	OPG	Orange Peel Grab
VIB	Vibrocorer	SBS	Scoopfish Bottom Sampler
BOM	Boomerang	DOC	Diver operated Corer
EWP	Ewing piston		
EWG	Ewing gravity		

LENGTH	Length of core recorded in centimeters as observed in the laboratory.
PENETRATION	Penetration of coring device recorded in centimeters as observed in the field.
DEPTH	The uncorrected sonic sounding in meters.
ANALYZED	Date in day, month, and year that core was analyzed in the laboratory.
I.D. No.	Three or four digit laboratory project number followed by consecutive number assigned to each subsample analyzed.
INTERVAL	Interval of subsample as measured in centimeters from the top of the core.
MM	Particle diameter size intervals based on Wentworth size grades in millimeters.
PER	Percent of total sample weight within the given size interval.

MGG0.9005053

GRAVEL, SAND SILT, CLAY — Percent of the total sample weight within the four size classes.

Class ranges are:

1. Gravel - coarser than 2 mm
2. Sand - 2 to 0.0625 mm
3. Silt - 0.0625 to 0.0039 mm
4. Clay - finer than 0.0039

MEAN (MM) — The geometric mean of the distribution expressed in millimeters.

MEAN (PHI) — The logarithmic mean of the distribution expressed in phi units ($-\log_2$) of the diameter in millimeters.

STAN DEV — Standard deviation. A measure of the degree of spread or dispersion of the distribution about the mean expressed in phi units.

$$s = \sqrt{\frac{\sum f \quad (X_i - \bar{X})^2}{100}}$$

SKEWNESS — 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.

$$\text{Skewness} = \frac{2 \sum f \quad (X_i - X)^3}{100 \quad s^3}$$

KURTOSIS — A measure of the peakedness of the distribution. Positive values denote a "leptokurtic" distribution more "peaked" than normal. Negative values denote a "platykurtic" distribution, or a distribution more "flat" than normal. When using the following formula, a normal curve has a kurtosis of 0.

$$\text{Kurtosis} = \left[\frac{\sum f \quad (X_i - \bar{X})^4}{100 \quad s^4} \right] - 3$$

$CACO_3$ — Percent of the total sample weight soluble in 2 N HCL.

ORG CARBON — Percent organic carbon of the total sample weight as determined using a Leco carbon analyzer.

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

NITROGEN — Percent nitrogen of the total sample weight as determined by the Kjeldahl method.

LOG FOR CORE SAMPLES

M-3090005053

4

Project No: 462
Location: Long Beach, California

120-38

Logged By J.C. Bowman
Date Logged 14 FEB 74

	La No.	Color	Calc. Mat.	Sediment Type	Remarks
Sample No: L.B #1 Lat: 33°45'N Long: 118°14'W Date: SEP 73 Water depth:	462-1	Black, N2.5	Yes	Silt	0"-12" (0-30 cm) Strong Sewage (ammonia) odor Large Shell fragments
Sample No: Lat: Long: Date: Water depth:	462-2	Very dark gray N3	No	Clay	12"-30" (30-76cm) Sewage (ammonia) odor Dark Color may be masking visual presence of Shell fragments.
Sample No: Lat: Long: Date: Water depth:	462-3	Very dark gray N3	No	Sandy Silt	30"-49.5" (76-125.7cm) Dark Color may be masking visual Presence of Shell fragments.
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					

LOG FOR CORE SAMPLES

MGG09005053 5

Project No: 462
Location: Long Beach, California

120-38

Logged By J.C. Bowman
Date Logged 14 FEB 74

	La No.	Color	Calc. Mat.	Sediment Type	Remarks
Sample No: L.B. # 2 Lat: 33°45' N Long: 118° 14' W Date: SEP 73 Water depth:	462-4	Black N 2.5	Yes	Silt	0"-12" (0-30cm) Strong Sewage (ammonia) odor Large Shell fragments
Sample No: Lat: Long: Date: Water depth:	462-5	Black N2.5	No	Silt	12"-31" (30-79 cm) Sewage (ammonia) odor Dark Color may be masking visual presence of shell fragments.
Sample No: Lat: Long: Date: Water depth:	462-6	Gray N5	No	Sandy Silt	31"-50" (79-127cm) Decaying Organic matter odor Dark Color may be masking visual presence of shell fragments.
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					

LOG FOR CORE SAMPLES

MGG09005053

Project No: 462
Location: Long Beach, California

120-38

Logged By J.C. Bowman
Date Logged 14 FeB 74

	La No.	Color	Calc. Mat.	Sediment Type	Remarks
Sample No: L.B. #3 Lat: 33° 45' N Long: 118° 14' W Date: SEP 73 Water depth:	462-7	Black N 2.5	No	Silt	0"-12" (0-30cm) Sewage (Ammonia) odor Dark Color may be masking visual presence of Shell fragments.
Sample No: Lat: Long: Date: Water depth:	462-8	Black N 2.5	No	Sandy Silt	12"-24" (30-61cm) Dark Color may be masking visual Presence of Shell fragments.
Sample No: Lat: Long: Date: Water depth:	462-9	Gray N5	No	Sandy Silt.	24"-36" (61-91cm) Dark Color may be masking visual Presence of Shell fragments.
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					

LOG FOR GRAB SAMPLES

MGG 0 9 0 0 5 0 5 3 7

Project No: 462
Location: Long Beach, California

120-38

Logged By J. C. Bowman
Date Logged 14 FEB 74

	La No.	Color	Calc. Mat.	Sediment Type	Remarks
Sample No: L.B #4 Lat: 33° 45' N Long: 118° 14' W Date: SEP 73 Water depth:	462-10	Black N 2.5	No	Sandy Silt	0"-12" (0-30cm) Dark Color may be masking Visual Presence of Shell fragments.
Sample No: Lat: Long: Date: Water depth:	462-11	Black N 2.5	Yes	Sandy Silt	12"-26" (30-66cm) Shell fragments
Sample No: Lat: Long: Date: Water depth:	462-12	Black N 2.5	No	Sandy Silt	26"-40.5" (66-102.9cm) Dark Color may be masking Visual Presence of Shell fragments.
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					
Sample No: Lat: Long: Date: Water depth:					

462 120-38

B.O.D. Analysis (Long Beach)

Sample Number	BOD Run #1	BOD Run #2	BOD Ave. 1+2	σ		IDOD Run #1	IDOD Run #2	IDOD Ave. 1+2	σ	
	O_2 mg/kg	O_2 mg/kg	O_2 mg/kg			O_2 mg/kg	O_2 mg/kg	O_2 mg/kg		
1	264	280	272	11.31		75	76	75.5	.71	
2	251	277	264	18.38		100	99	99.5	.71	
3	250	250	250	0		102	98	100	2.82	
4	260	272	266	8.48		106	99	102.5	4.95	

120-38MGG09005053 SHEET

Chemical Analysis Summary - Lab Item 462

Core No / Interval (cm)	Elutriate Organic Nitrogen: Run One PPM N	Run Two PPM N	Run Three PPM N	Mean PPM	Standard Deviation	Organic Carbon: Run One % C	Run Two % C	Mean % C	Standard Deviation	Sample Number
LB #1										
0-30	1.120	~~5.065~~	1.105	1.112	.011	3.341	3.244	3.293	.068	1
30-76	~~0.680~~	0.985	0.865	0.925	.085	0.564	0.570	0.567	.005	2
76-125.7	0.700	—	0.795	0.748	.067	0.596	0.548	0.572	.034	3
LB #2										
0-30	1.285	1.140	~~1.950~~	1.212	.103	2.596	2.461	2.529	.096	4
30-79	1.450	~~0.000~~	1.365	1.408	.060	1.879	1.851	1.865	.019	5
79-127	0.000	~~0.670~~	0.000	0.000	.000	0.391	0.396	0.394	.004	6
LB #3										
0-30	1.010	~~2.070~~	0.875	0.942	.095	2.272	2.445	2.358	.123	7 *
30-61	0.975	0.955	0.940	0.957	.018	1.400	1.310	1.355	.063	8
61-91	0.690	0.765	~~3.240~~	0.728	.053	0.272	0.283	0.277	.008	9
LB #4										
0-30	1.500	1.105	~~9.000~~	1.302	.279	3.310	3.037	3.174	.193	10 *
30-66	1.950	~~0.830~~	1.440	1.695	.361	1.699	1.706	1.703	.005	11
66-102.9	0.690	~~2.685~~	0.815	0.752	.088	0.261	0.241	0.251	.014	12

* Results presented represent best of four analysis

SEDIMENT SIZE AND COMPOSITION DATA

CRUISE SHPY20 TAKEN SEP73 LATITUDE 33 45.00 N MARSDEN SQUARE 120-38 LENGTH 125.7 ANALYZED MAR74
SAMPLE L9-1 DEPTH LONGITUDE 118 14.00 W CORER TYPE DOC PENETRATION

DIAM (PHI)	DIAM (MM)	SUBSAMPLE ID. 462 1 PERCENT	462 2 PERCENT	462 3 PERCENT
	DEPTH INTERVAL	.0- 30.0	30.0- 76.0	76.0-125.7
<-4	>16.000	3.034	.000	.000
-4 TO -3	16.000 TO 8.000	.637	.000	.000
-3 TO -2	8.000 TO 4.000	18.202	2.001	.000
-2 TO -1	4.000 TO 2.000	4.490	.756	.428
-1 TO 0	2.000 TO 1.000	6.522	.684	.097
0 TO 1	1.000 TO .500	4.793	.699	.175
1 TO 2	.500 TO .250	2.485	1.298	.115
2 TO 3	.250 TO .125	2.621	6.566	7.676
3 TO 4	.125 TO .063	4.156	18.066	17.567
4 TO 5	.063 TO .031	2.245	27.778	14.963
5 TO 6	.031 TO .016	11.225	17.871	14.380
6 TO 7	.016 TO .008	10.466	8.256	9.619
7 TO 8	.008 TO .004	3.944	4.079	11.854
8 TO 9	.004 TO .002	4.399	2.331	6.024
9 TO 10	.002 TO .001	5.612	2.331	4.178
>10	<.001	15.169	7.285	12.923
	GRAVEL (>2.0 MM)	26.363	2.756	.428
	SAND (2.0-.063 MM)	20.578	27.312	25.630
	SILT (.063-.004 MM)	27.880	57.985	50.817
	CLAY (<.004 MM)	25.190	11.947	23.125
	MEAN (MM)	.0742	.0303	.0151
	MEAN (PHI)	3.753	5.015	6.047
	STANDARD DEVIATION	4.905	2.507	2.562
	SKEWNESS	-.045	.044	.148
	KURTOSIS	-1.427	1.380	-.732
	ORGANIC CARBON	3.293	.567	.572
	NITROGEN (KJELDAHL)	1.112	.925	.748
	COLOR (GSA)	N2.5	N3	N3

MC09005053

SEDIMENT SIZE AND COMPOSITION DATA

CRUISE SHPYRD TAKEN SEP73 LATITUDE 33 45.00 N MARSDEN SQUARE 120-38 LENGTH 127.0 ANALYZED MAR74
SAMPLE LR-2 DEPTH LONGITUDE 118 14.00 W CORER TYPE DOC PENETRATION

	SUBSAMPLE ID.	462 4	462 5	462 6
	DEPTH INTERVAL	.0- 30.0	30.0- 79.0	79.0-127.0
DIAM (PHI)	DIAM (MM)	PERCENT	PERCENT	PERCENT
<-4	>16.000	11.431	14.741	.000
-4 TO -3	16.000 TO 8.000	7.249	10.984	.000
-3 TO -2	8.000 TO 4.000	3.301	7.896	.000
-2 TO -1	4.000 TO 2.000	6.078	3.789	1.280
-1 TO 0	2.000 TO 1.000	4.383	2.881	.575
0 TO 1	1.000 TO .500	1.957	1.544	.781
1 TO 2	.500 TO .250	1.227	1.035	.868
2 TO 3	.250 TO .125	1.065	1.081	10.739
3 TO 4	.125 TO .063	1.862	1.289	19.959
4 TO 5	.063 TO .031	4.294	1.910	20.566
5 TO 6	.031 TO .016	8.085	5.174	13.017
6 TO 7	.016 TO .008	13.940	7.721	7.918
7 TO 8	.008 TO .004	7.528	11.859	6.834
8 TO 9	.004 TO .002	4.182	4.855	4.230
9 TO 10	.002 TO .001	5.576	7.959	3.363
>10	<.001	17.643	15.282	9.871
	GRAVEL (>2.0 MM)	28.058	37.409	1.280
	SAND (2.0-.063 MM)	10.494	7.830	32.921
	SILT (.063-.004 MM)	33.846	26.664	48.335
	CLAY (<.004 MM)	27.601	28.097	17.464
	MEAN (MM)	.0615	.1005	.0246
	MEAN (PHI)	4.024	3.314	5.346
	STANDARD DEVIATION	5.372	5.797	2.618
	SKEWNESS	-.191	-.084	.211
	KURTOSIS	-1.353	-1.664	-.106
	ORGANIC CARBON	2.529	1.865	.394
	NITROGEN (KJELDAHL)	1.212	1.408	.000
	COLOR (GSA)	N2.5	N2.5	N5

MC09005053

SEDIMENT SIZE AND COMPOSITION DATA

CRUISE SHPYRD TAKEN SEP73 LATITUDE 33 45.00 N MARSDEN SQUARE 120-38 LENGTH 91.0 ANALYZED MAR74
SAMPLE LR-3 DEPTH LONGITUDE 118 14.00 W CORER TYPE DOC PENETRATION

	SUBSAMPLE ID.	462 7	462 8	462 9
	DEPTH INTERVAL	.0- 30.0	30.0- 61.0	61.0-910.0
DIAM (PHI)	DIAM (MM)	PERCENT	PERCENT	PERCENT
<-4	>16.000	.000	13.098	.000
-4 TO -3	16.000 TO 8.000	.000	.000	.000
-3 TO -2	8.000 TO 4.000	.000	.000	.000
-2 TO -1	4.000 TO 2.000	7.376	2.480	.000
-1 TO 0	2.000 TO 1.000	1.330	4.261	.055
0 TO 1	1.000 TO .500	2.170	4.541	.141
1 TO 2	.500 TO .250	1.572	6.532	.996
2 TO 3	.250 TO .125	1.306	14.041	25.076
3 TO 4	.125 TO .063	1.784	12.225	26.269
4 TO 5	.063 TO .031	3.446	4.052	19.723
5 TO 6	.031 TO .016	9.371	5.938	11.096
6 TO 7	.016 TO .008	5.139	7.160	4.577
7 TO 8	.008 TO .004	24.788	5.763	2.635
8 TO 9	.004 TO .002	5.139	4.191	2.080
9 TO 10	.002 TO .001	10.883	4.191	2.080
>10	<.001	25.695	11.526	5.270
	GRAVEL (>2.0 MM)	7.376	15.578	.000
	SAND (2.0-.063 MM)	8.162	41.600	52.538
	SILT (.063-.004 MM)	42.745	22.913	38.031
	CLAY (<.004 MM)	41.717	19.909	9.431
	MEAN (MM)	.0076	.0812	.0447
	MEAN (PHI)	7.045	3.623	4.482
	STANDARD DEVIATION	3.521	4.531	2.162
	SKEWNESS	-.585	-.120	.696
	KURTOSIS	.528	-.732	1.413
	ORGANIC CARBON	2.358	1.355	.277
	NITROGEN (KJELDAHL)	.942	.957	.728
	COLOR (GSA)	N2.5	N2.5	N5

MGG09005053

SEDIMENT SIZE AND COMPOSITION DATA

CRUISE SHPYRD TAKEN SEP73 LATITUDE 33 45.00 N MARSDEN SQUARE 120-38 LENGTH 102.9 ANALYZED MAR74
SAMPLE LR-4 DEPTH LONGITUDE 118 14.00 W CORER TYPE DOC PENETRATION

	SUBSAMPLE TO.	462 10	462 11	462 12
	DEPTH INTERVAL	.0- 30.0	30.0- 66.0	66.0-102.9
DIAM (PHI)	DIAM (MM)	PERCENT	PERCENT	PERCENT
<-4	>16.000	20.738	20.430	.000
-4 TO -3	16.000 TO 8.000	.000	5.581	.000
-3 TO -2	8.000 TO 4.000	15.096	3.192	5.172
-2 TO -1	4.000 TO 2.000	7.624	3.665	5.356
-1 TO 0	2.000 TO 1.000	3.492	4.729	3.430
0 TO 1	1.000 TO .500	1.921	3.556	1.715
1 TO 2	.500 TO .250	1.029	2.436	1.557
2 TO 3	.250 TO .125	.755	1.371	6.174
3 TO 4	.125 TO .063	.778	1.504	24.116
4 TO 5	.063 TO .031	6.633	2.696	23.325
5 TO 6	.031 TO .016	1.906	6.621	9.235
6 TO 7	.016 TO .008	7.243	9.931	5.937
7 TO 8	.008 TO .004	6.099	6.148	3.694
8 TO 9	.004 TO .002	4.575	6.148	2.770
9 TO 10	.002 TO .001	5.718	7.803	2.111
>10	<.001	16.392	14.188	5.409
	GRAVEL (>2.0 MM)	43.458	32.868	10.528
	SAND (2.0-.063 MM)	7.975	13.597	36.992
	SILT (.063-.004 MM)	21.882	25.396	42.190
	CLAY (<.004 MM)	26.685	28.139	10.290
	MEAN (MM)	.1634	.1078	.0613
	MEAN (PHI)	2.614	3.214	4.028
	STANDARD DEVIATION	5.798	5.696	3.095
	SKEWNESS	.050	-.084	-.075
	KURTOSIS	-1.645	-1.572	.214
	ORGANIC CARBON	3.174	1.355	.251
	NITROGEN (KJELDAHL)	.000	.957	.752
	COLOR (GSA)	N2.5	N2.5	N2.5

MG090050 58

14

MGG09005053

TRANSMITTAL AND TRANSFER RECORD
NDW-NAVOCEANO-4610/1 (Rev. 9-63)

U.S. NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON, D.C. 20390

This form and one copy should be sent to the receiver. The copy will then be returned as a receipt. Originator retains third copy for file. This form should not be used for correspondence.

FROM	REFER TO
Code 34234	J. Kravitz, 433-2490
TO	**ATTENTION**
Code D62, NGSDC	M. Weiss

THE ITEMS LISTED BELOW WERE FORWARDED TO YOU BY:

[XX] ORDINARY MAIL [ ] REGISTERED MAIL [ ] AIR MAIL [ ] EXPRESS [ ] GOVERNMENT TRUCK [ ] BY HAND [ ] OTHER

One (1) copy of Lab Item 462:

"A Summary of Sediment Size and Chemistry of Four Cores from the Long Beach Naval Shipyard. Navy Divers. September 1973."

FORWARDED BY (Signature)	TITLE	DATE FORWARDED
K.B. PEERY K B Peery	Hd., Data Conversion & Lab Br.	19 April 1974
RECEIVED BY (Signature)	**TITLE**	**DATE RECEIVED**
MW		23 Apr 1974

GPO 907-850