

SUPPLEMENTARY FILES-4

Supplementary Files for Article Entitled: “*Impact of Sedimentation on Water Seepage Capacity in Lake Nakuru*”

4.1. Hydrometer Analysis of Sediment Sub-Sample Along the Core Depth

4.1.1. Hydrometer Analysis of Sediment Sub-Sample Along the Core Depth (0 - 10)

LABORATORY TEST DATA SHEET							
Hydrometer Analysis of the Soil Sediment							
Scope:	Determination of the soil particle-size distribution for the fraction that is finer than No. 200 sieve size (0.075 mm)						
Description of soil: (sediment)			Sample Location: P1				
Location: Lake Nakuru (00°20'52'' S, 36°05'37'' E)			Minuscus Correction Factor (F _m)	1			
Sub-sample location on the core, (Cm)	≈0.0 - 10		Temperature Correction (F _T)	-0.1			
Dry weight of the soil, W _s (g)	38.94		Zero Correction Factor (F _Z)	7			
Temperature of test, T (°C)	19		Specific gravity of soil solids, G _s	1.86			
Tested by: Parfait IRADUKUNDA			Correction for G _s , a	1.346643 26			
Supervised by:			Date: 24 July 2019				
Sub-Sample No.1 (Test ID: 0 - 10)							
Time (t) in Min	Observed H. Reading, R	Corrected H. Reading, R _{cp}	Percentage Finer (%)	Corrected Reading, R _{cl}	Effective Length, L ⁺ (Cm)	A ⁺	D (Cm)
0.25	35	27.9	96.49	36	10.4	0.0187	0.1207
0.5	33	25.9	89.57	34	10.7	0.0187	0.0866
1	31.8	24.7	85.42	32.8	10.9	0.0187	0.0618
2	31.8	24.7	85.42	32.8	10.9	0.0187	0.0437
4	31.8	24.7	85.42	32.8	10.9	0.0187	0.0309
8	31.8	24.7	85.42	32.8	10.9	0.0187	0.0218
15	30	22.9	79.19	31	11.1	0.0187	0.0161
30	29.3	22.2	76.77	30.3	11.4	0.0187	0.0115
60	28	20.9	72.28	29	11.5	0.0187	0.0082
120	27	19.9	68.82	28	11.7	0.0187	0.0058
240	26	18.9	65.36	27	11.9	0.0187	0.0042
480	25.8	18.7	64.67	26.8	11.9	0.0187	0.0029
1440	18	10.9	37.69	19	13.2	0.0187	0.0018
2880	13	5.9	20.40	14	14	0.0187	0.0013

4.1.2. Hydrometer Analysis of Sediment Sub-Sample Along the Core Depth (10 - 20)

LABORATORY TEST DATA SHEET							
Hydrometer Analysis of the Soil Sediment							
Scope:	Determination of the soil particle-size distribution for the fraction that is finer than No. 200 sieve size (0.075 mm)						
Description of soil: (sediment)					Sample Location: P1		
Location: Lake Nakuru (00°20'52” S, 36°05'37” E)					Minuscus Correction Factor (F _m)		1
Sub-sample location on the core, (Cm)		10.0 - 20.0			Temperature Correction (F _T)		-0.1
Dry weight of the soil, W _s (g)		50.59			Zero Correction Factor (F _Z)		7
Temperature of test, T (°C)		19			Specific gravity of soil solids, G _s		1.64
Tested by: Parfait IRADUKUNDA					Correction for G _s , a		1.5955189
Supervised by:					Date : 24 July 2019		
Sub-Sample No.2 (Test ID: 10 - 20)							
Time (t) in Min	Observed H. Reading, R	Corrected H. Reading, R _{cp}	Percentage Finer (%)	Corrected Reading, R _{cl}	Effective Length, L ⁺ (Cm)	A ⁺	D (Cm)
0.25	36	28.9	91.15	37	10.2	0.0217	0.1385
0.5	33	25.9	81.68	34	10.7	0.0217	0.1003
1	32.2	25.1	79.16	33.2	10.9	0.0217	0.0716
2	30	22.9	72.22	31	11.2	0.0217	0.0513
4	26	18.9	59.61	27	11.9	0.0217	0.0374
8	25.4	18.3	57.71	26.4	11.9	0.0217	0.0265
15	25	17.9	56.45	26	12	0.0217	0.0194
30	24.8	17.7	55.82	25.8	12.1	0.0217	0.0138
60	24	16.9	53.30	25	12.2	0.0217	0.0098
120	22.6	15.5	48.88	23.6	12.4	0.0217	0.0070
240	20.8	13.7	43.21	21.8	12.7	0.0217	0.0050
480	18.4	11.3	35.64	19.4	13.1	0.0217	0.0036
1440	15.4	8.3	26.18	16.4	13.6	0.0217	0.0021
2880	12	4.9	15.45	13	14.2	0.0217	0.0015

4.1.3. Hydrometer Analysis of Sediment Sub-Sample Along the Core Depth (20 - 30)

LABORATORY TEST DATA SHEET							
Hydrometer Analysis of the Soil Sediment							
Scope:	Determination of the soil particle-size distribution for the fraction that is finer than No. 200 sieve size (0.075 mm)						
Description of soil: (<i>sediment</i>)					Sample Location: P1		
Location: Lake Nakuru (00°20'52" S, 36°05'37" E)					Minuscus Correction Factor (F _m)		1
Sub-sample location on the core, (Cm)		20.0 - 30.0			Temperature Correction (F _T)		-0.1
Dry weight of the soil, W _s (g)		38.09			Zero Correction Factor (F _Z)		7
Temperature of test, T (°C)		19			Specific gravity of soil solids, G _s		1.98
Tested by: Parfait IRADUKUNDA					Correction for G _s , a		1.25798999
Supervised by:					Date: 24 July 2019		
Sub-Sample No.3 (Test ID: 20 - 30)							
Time (t) in Min	Observed H. Reading, R	Corrected H. Reading, R _{cp}	Percentage Finer (%)	Corrected Reading, R _{cl}	Effective Length, L ⁺ (Cm)	A ⁺	D (Cm)
0.25	24	16.9	55.82	25	12.2	0.0175	0.1224
0.5	22	14.9	49.21	23	12.5	0.0175	0.0876
1	19.8	12.7	41.94	20.8	12.9	0.0175	0.0630
2	18	10.9	36.00	19	13.2	0.0175	0.0450
4	17.8	10.7	35.34	18.8	13.1	0.0175	0.0317
8	17.6	10.5	34.68	18.6	13.1	0.0175	0.0224
15	16.8	9.7	32.04	17.8	13.3	0.0175	0.0165
30	16.8	9.7	32.04	17.8	13.4	0.0175	0.0117
60	16.2	9.1	30.05	17.2	13.5	0.0175	0.0083
120	15.2	8.1	26.75	16.2	13.7	0.0175	0.0059
240	13.4	6.3	20.81	14.4	13.9	0.0175	0.0042
480	12.4	5.3	17.50	13.4	14.1	0.0175	0.0030
1440	11	3.9	12.88	12	14.3	0.0175	0.0017
2880	9	1.9	6.28	10	14.7	0.0175	0.0013

4.1.4. Hydrometer Analysis of Sediment Sub-Sample Along the Core Depth (30 - 40)

LABORATORY TEST DATA SHEET							
Hydrometer Analysis of the Soil Sediment							
Scope:	Determination of the soil particle-size distribution for the fraction that is finer than No. 200 sieve size (0.075 mm)						
Description of soil: (sediment)					Sample Location: P1		
Location: Lake Nakuru (00°20'52” S, 36°05'37” E)					Minuscus Correction Factor (F _m)	1	
Sub-sample location on the core, (Cm)		30.0 - 40.0			Temperature Correction (F _T)	-0.1	
Dry weight of the soil, Ws (g)		34.98			Zero Correction Factor (F _Z)	7	
Temperature of test, T (°C)		19			Specific gravity of soil solids, Gs	2.03	
Tested by: Parfait IRADUKUNDA					Correction for Gs, a	1.2271478	
Supervised by:					Date: 24 July 2019		
Sub-Sample No.4 (Test ID: 30 - 40)							
Time (t) in Min	Observed H. Reading, R	Corrected H. Reading, Rcp	Percentage Finer (%)	Corrected Reading, Rcl	Effective Length, L ⁺ (Cm)	A ⁺	D (Cm)
0.25	27	19.9	69.81	28	11.7	0.0171	0.1170
0.5	25.6	18.5	64.90	26.6	11.9	0.0171	0.0834
1	24.4	17.3	60.69	25.4	12.1	0.0171	0.0595
2	23.8	16.7	58.59	24.8	12.2	0.0171	0.0422
4	23.4	16.3	57.18	24.4	12.3	0.0171	0.0300
8	23	15.9	55.78	24	12.4	0.0171	0.0213
15	22.2	15.1	52.97	23.2	12.5	0.0171	0.0156
30	21.4	14.3	50.17	22.4	12.6	0.0171	0.0111
60	20.8	13.7	48.06	21.8	12.7	0.0171	0.0079
120	19.2	12.1	42.45	20.2	13	0.0171	0.0056
240	17.8	10.7	37.54	18.8	13.2	0.0171	0.0040
480	16.2	9.1	31.92	17.2	13.5	0.0171	0.0029
1440	15	7.9	27.71	16	13.7	0.0171	0.0017
2880	13	5.9	20.70	14	14.2	0.0171	0.0012

4.1.5. Hydrometer Analysis of Sediment Sub-Sample Along the Core Depth (40 - 50)

LABORATORY TEST DATA SHEET							
Hydrometer Analysis of the Soil Sediment							
Scope:	Determination of the soil particle-size distribution for the fraction that is finer than No. 200 sieve size (0.075 mm)						
Description of soil: (sediment)					Sample Location: P1		
Location: Lake Nakuru (00°20'52” S, 36°05'37” E)					Minuscus Correction Factor (F _m)	1	
Sub-sample location on the core, (Cm)		40.0 - 50.0			Temperature Correction (F _T)	-0.1	
Dry weight of the soil, W _s (g)		50			Zero Correction Factor (F _Z)	7	
Temperature of test, T (°C)		19			Specific gravity of soil solids, G _s	1.97	
Tested by: Parfait IRADUKUNDA					Correction for G _s , a	1.26454	
Supervised by:					Date: 24 July 2019		
Sub-Sample No.5 (Test ID: 40 - 50)							
Time (t) in Min	Observed H. Reading, R	Corrected H. Reading, R _{cp}	Percentage Finer (%)	Corrected Reading, R _{cl}	Effective Length, L ⁺ (Cm)	A ⁺	D (Cm)
0.25	37	29.9	75.62	38	10.1	0.0176	0.1120
0.5	35	27.9	70.56	36	10.4	0.0176	0.0803
1	33.8	26.7	67.53	34.8	10.6	0.0176	0.0574
2	32.6	25.5	64.49	33.6	10.8	0.0176	0.0409
4	32.4	25.3	63.99	33.4	10.8	0.0176	0.0289
8	32	24.9	62.97	33	10.9	0.0176	0.0206
15	31.2	24.1	60.95	32.2	11.1	0.0176	0.0152
30	30.2	23.1	58.42	31.2	11.2	0.0176	0.0108
60	28.4	21.3	53.87	29.4	11.5	0.0176	0.0077
120	27.2	20.1	50.83	28.2	11.7	0.0176	0.0055
240	25.2	18.1	45.78	26.2	12	0.0176	0.0039
480	23.2	16.1	40.72	24.2	12.4	0.0176	0.0028
1440	20	12.9	32.63	21	12.9	0.0176	0.0017
2880	16	8.9	22.51	17	13.5	0.0176	0.0012

4.1.6. Hydrometer Analysis of Sediment Sub-Sample Along the Core Depth (50 - 60)

LABORATORY TEST DATA SHEET							
Hydrometer Analysis of the Soil Sediment							
Scope:	Determination of the soil particle-size distribution for the fraction that is finer than No. 200 sieve size (0.075 mm)						
Description of soil: (sediment)					Sample Location No: P1		
Location: Lake Nakuru (00°20'52” S, 36°05'37” E)					Minuscus Correction Factor (F _m)		1
Sub-sample location on the core, (Cm)		50.0 - 60.0			Temperature Correction (F _T)		-0.1
Dry weight of the soil, Ws (g)		50			Zero Correction Factor (F _Z)		7
Temperature of test, T (°C)		19			Specific gravity of soil solids, Gs		1.89
Tested by: Parfait IRADUKUNDA					Correction for Gs, a		1.3222387
Supervised by:					Date: 24 July 2019		
Sub-Sample No.6 (Test ID: 50 - 60)							
Time (t) in Min	Observed H. Reading, R	Corrected H. Reading, Rcp	Percentage Finer (%)	Corrected Reading, Rcl	Effective Length, L ⁺ (Cm)	A ⁺	D (Cm)
0.25	38	30.9	81.71	39	9.9	0.0184	0.1157
0.5	37	29.9	79.07	38	10.1	0.0184	0.0827
1	35.4	28.3	74.84	36.4	10.3	0.0184	0.0590
2	35.2	28.1	74.31	36.2	10.4	0.0184	0.0419
4	34.8	27.7	73.25	35.8	10.4	0.0184	0.0297
8	34.4	27.3	72.19	35.4	10.5	0.0184	0.0211
15	33.8	26.7	70.61	34.8	10.6	0.0184	0.0155
30	32.6	25.5	67.43	33.6	10.8	0.0184	0.0110
60	31.2	24.1	63.73	32.2	11.1	0.0184	0.0079
120	29.2	22.1	58.44	30.2	11.4	0.0184	0.0057
240	26.6	19.5	51.57	27.6	11.8	0.0184	0.0041
480	24	16.9	44.69	25	12.2	0.0184	0.0029
1440	21	13.9	36.76	22	12.7	0.0184	0.0017
2880	17	9.9	26.18	18	13.3	0.0184	0.0012

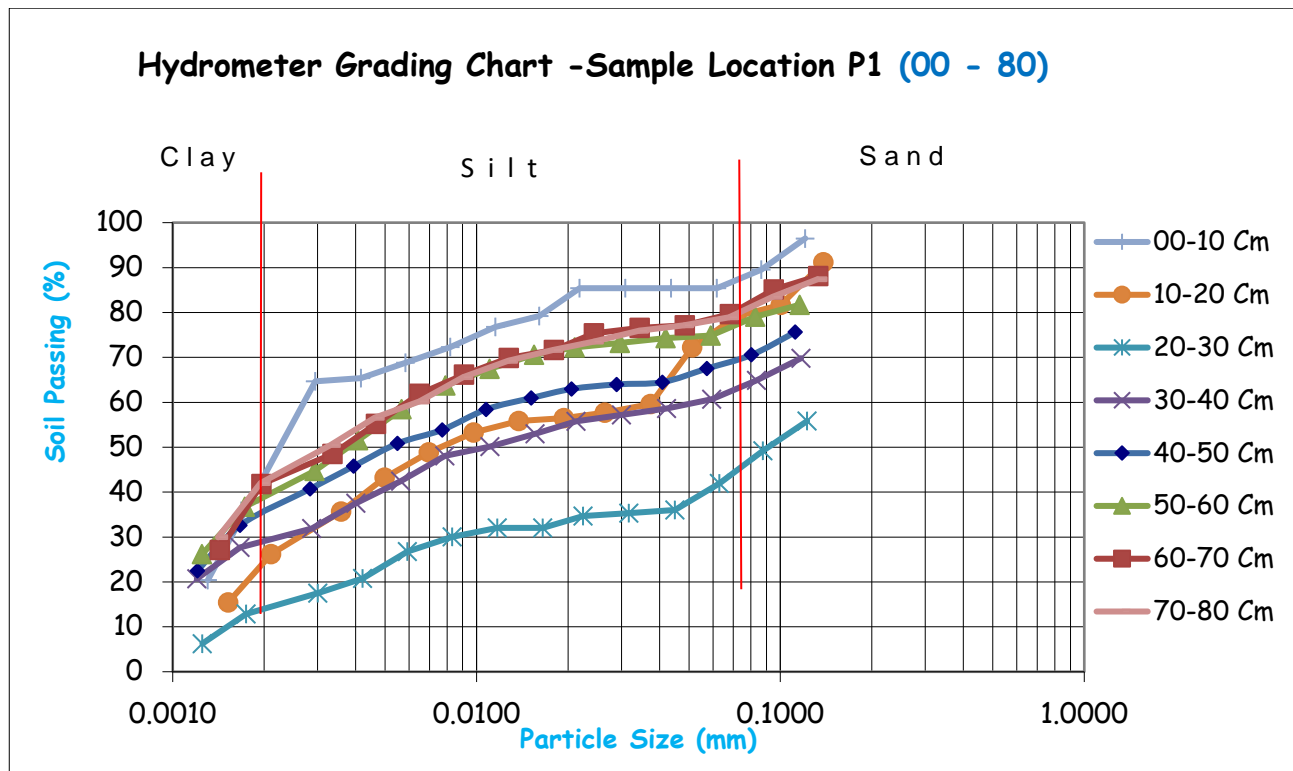
4.1.7. Hydrometer Analysis of Sediment Sub-Sample Along the Core Depth (60 - 70)

LABORATORY TEST DATA SHEET							
Hydrometer Analysis of the Soil Sediment							
Scope:	Determination of the soil particle-size distribution for the fraction that is finer than No. 200 sieve size (0.075 mm)						
Description of soil: (sediment)					Sample Location: P1		
Location: Lake Nakuru (00°20'52” S, 36°05'37” E)					Minuscus Correction Factor (F _m)		1
Sub-sample location on the core, (Cm)		60.0 - 70.0			Temperature Correction (F _T)		-0.1
Dry weight of the soil, W _s (g)		50			Zero Correction Factor (F _Z)		7
Temperature of test, T (°C)		19			Specific gravity of soil solids, G _s		1.69
Tested by: Parfait IRADUKUNDA					Correction for G _s , a		1.52502 05
Supervised by:					Date: 24 July 2019		
Sub-Sample No.7 (Test ID: 60 - 70)							
Time (t) in Min	Observed H. Reading, R	Corrected H. Reading, R _{cp}	Percentage Finer (%)	Corrected Reading, R _{cl}	Effective Length, L ⁺ (Cm)	A ⁺	D (Cm)
0.25	36	28.9	88.15	37	10.2	0.0209	0.1334
0.5	35	27.9	85.10	36	10.4	0.0209	0.0953
1	33.2	26.1	79.61	34.2	10.7	0.0209	0.0683
2	32.4	25.3	77.17	33.4	10.8	0.0209	0.0485
4	32.2	25.1	76.56	33.2	10.9	0.0209	0.0345
8	31.8	24.7	75.34	32.8	10.9	0.0209	0.0244
15	30.6	23.5	71.68	31.6	11.1	0.0209	0.0180
30	30	22.9	69.85	31	11.2	0.0209	0.0128
60	28.8	21.7	66.19	29.8	11.4	0.0209	0.0091
120	27.4	20.3	61.92	28.4	11.6	0.0209	0.0065
240	25.2	18.1	55.21	26.2	12	0.0209	0.0047
480	23	15.9	48.50	24	12.4	0.0209	0.0034
1440	20.8	13.7	41.79	21.8	12.7	0.0209	0.0020
2880	16	8.9	27.15	17	13.5	0.0209	0.0014

4.1.8. Hydrometer Analysis of Sediment Sub-Sample Along the Core Depth (70 - 80)

LABORATORY TEST DATA SHEET							
Hydrometer Analysis of the Soil Sediment							
Scope:	Determination of the soil particle-size distribution for the fraction that is finer than No. 200 sieve size (0.075 mm)						
Description of soil: (sediment)					Sample Location: P1		
Location: Lake Nakuru (00°20'52" S, 36°05'37" E)					Minuscus Correction Factor (F _m)	1	
Sub-sample location on the core, (Cm)		70.0 - 80.0			Temperature Correction (F _T)	-0.1	
Dry weight of the soil, W _s (g)		50			Zero Correction Factor (F _Z)	7	
Temperature of test, T (°C)		19			Specific gravity of soil solids, G _s	1.7	
Tested by: Parfait IRADUKUNDA					Correction for G _s , a	1.5121294	
Supervised by:					Date: 24 July 2019		
Sub-Sample No.8 (Test ID: 70 - 80)							
Time (t) in Min	Observed H. Reading, R	Corrected H. Reading, R _{cp}	Percentage Finer (%)	Corrected Reading, R _{cl}	Effective Length, L ⁺ (Cm)	A ⁺	D (Cm)
0.25	36	28.9	87.40	37	10.2	0.0207	0.1325
0.5	34.7	27.6	83.47	35.7	10.3	0.0207	0.0941
1	33.2	26.1	78.93	34.2	10.7	0.0207	0.0678
2	32.6	25.5	77.12	33.6	10.8	0.0207	0.0482
4	32.2	25.1	75.91	33.2	10.9	0.0207	0.0342
8	31.4	24.3	73.49	32.4	11	0.0207	0.0243
15	30.8	23.7	71.67	31.8	11.1	0.0207	0.0178
30	30	22.9	69.26	31	11.2	0.0207	0.0127
60	28.8	21.7	65.63	29.8	11.4	0.0207	0.0090
120	27	19.9	60.18	28	11.7	0.0207	0.0065
240	25.8	18.7	56.55	26.8	11.9	0.0207	0.0046
480	23.8	16.7	50.51	24.8	12.2	0.0207	0.0033
1440	21	13.9	42.04	22	12.7	0.0207	0.0019
2880	17	9.9	29.94	18	13.3	0.0207	0.0014

4.2. Hydrometer Analysis Grading Curves for Sub-Samples Along the Core Depth (0 – 80) of the Sediment Sample from Location P1



4.3. Hydrometer Analysis Ratio of the Sediment Soil Types Along with the Core Depth (0 - 80) for the Sediment Sample from Location P1

Sample P1, Sub-Sample No.1 (Test ID: 0 - 10)			AASHTO M145/T88	
Particles finer than 60%, D_{60} (mm)	0.0027	approximately equal size	Fine-Sand	13%
Particles finer than 30%, D_{30} (mm)	0.0016		Silt	43%
Particles finer than 10%, D_{10} (mm)	0.0012		Clay	<44%
Uniformity coefficient, C_u	2.25	approximately equal size	Soil Description: Silt Clay	
Curvature coefficient, C_c	0.79			

Sample P1, Sub-Sample No.2 (Test ID: 10 - 20)			AASHTO M145/T88	
Particles finer than 60%, D_{60} (mm)	0.038	approximately equal size	Fine-Sand	20%
Particles finer than 30%, D_{30} (mm)	0.0027		Silt	55%
Particles finer than 10%, D_{10} (mm)	0.0015		Clay	<25%
Uniformity coefficient, C_u	25.33	approximately equal size	Soil Description: Silt Loam	
Curvature coefficient, C_c	0.13			

Sample P1, Sub-Sample No.3 (Test ID: 20 - 30)			AASHTO M145/T88	
Particles finer than 60%, D ₆₀ (mm)	0.16		Fine-Sand	54%
Particles finer than 30%, D ₃₀ (mm)	0.0085		Silt	32%
Particles finer than 10%, D ₁₀ (mm)	0.0016		Clay	<14%
Uniformity coefficient, Cu	100.00	approximately equal size	Soil Description: Sandy Loam	
Curvature coefficient, Cc	0.28			

Sample P1, Sub-Sample No.4 (Test ID: 30 - 40)			AASHTO M145/T88	
Particles finer than 60%, D ₆₀ (mm)	0.065		Fine-Sand	36%
Particles finer than 30%, D ₃₀ (mm)	0.0023		Silt	35%
Particles finer than 10%, D ₁₀ (mm)	0.001		Clay	<29%
Uniformity coefficient, Cu	65.00	approximately equal size	Soil Description: Clay Loam	
Curvature coefficient, Cc	0.08			

Sample P1, Sub-Sample No.5 (Test ID: 40 - 50)			AASHTO M145/T88	
Particles finer than 60%, D ₆₀ (mm)	0.014		Fine-Sand	30%
Particles finer than 30%, D ₃₀ (mm)	0.0016		Silt	34%
Particles finer than 10%, D ₁₀ (mm)	0.0012		Clay	<36%
Uniformity coefficient, Cu	11.67	approximately equal size	Soil Description: Clay Loam	
Curvature coefficient, Cc	0.15			

Sample P1, Sub-Sample No.6 (Test ID: 50 - 60)			AASHTO M145/T88	
Particles finer than 60%, D ₆₀ (mm)	0.0062		Fine-Sand	22%
Particles finer than 30%, D ₃₀ (mm)	0.0014		Silt	39%
Particles finer than 10%, D ₁₀ (mm)	0.001		Clay	<39%
Uniformity coefficient, Cu	6.20	approximately equal size	Soil Description: Clay Loam	
Curvature coefficient, Cc	0.32			

Sample P1, Sub-Sample No.7 (Test ID: 60 - 70)			AASHTO M145/T88	
Particles finer than 60%, D ₆₀ (mm)	0.0058		Fine-Sand	18%
Particles finer than 30%, D ₃₀ (mm)	0.0016		Silt	39%
Particles finer than 10%, D ₁₀ (mm)	0.0013		Clay	<43%
Uniformity coefficient, Cu	4.46	approximately equal size	Soil Description: Clay	
Curvature coefficient, Cc	0.34			

Sample P1, Sub-Sample No.8 (Test ID: 70 - 80)			AASHTO M145/T88	
Particles finer than 60%, D ₆₀ (mm)	0.0065		Fine-Sand	20%
Particles finer than 30%, D ₃₀ (mm)	0.0015		Silt	38%
Particles finer than 10%, D ₁₀ (mm)	0.0011		Clay	<42%
Uniformity coefficient, Cu	5.91	approximately equal size	Soil Description: Clay	
Curvature coefficient, Cc	0.31			

Sample P1, Core Summary (ID: 0 - 80)			AASHTO M145/T88	
Particles finer than 60%, D_{60} (mm)	0.0065		Fine-Sand	26.63%
Particles finer than 30%, D_{30} (mm)	0.0015		Silt	39.38%
Particles finer than 10%, D_{10} (mm)	0.0011		Clay	34.00%
Uniformity coefficient, C_u	5.91	approximately equal size	Soil Description: Clay Loam	
Curvature coefficient, C_c	0.31			

Sample P1, Soil Ratio Summary Along the Core Depth				
Depth	Fine-Sand (%)	Silt (%)	Clay (%)	Silt + Clay (%)
10	13%	43%	44%	87%
20	20%	55%	25%	80%
30	54%	32%	14%	46%
40	36%	35%	29%	64%
50	30%	34%	36%	70%
60	22%	39%	39%	78%
70	18%	39%	43%	82%
80	20%	38%	42%	80%
Total	26.63%	39.38%	34.00%	

4.4. Graph of Hydrometer Analysis Ratio of the Sediment Soil Types Along with the Core Depth (0 - 80) for the Sediment Sample from Location P1

