בקטוכם
BACTOCHEM

Bactochem Laboratories Limited

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ISRAC Israel Laboratory Accreditation Authority
ISO/IEC 17025
No. 022

Certificate of Analysis

Issue Date : 06/03/2013
Report No. : 61/157937
Edition : 1

Sample Description	Sediment- Shallow
Sample Code	5

Analysis Results:

Test	Units	Results	Method
Ag – Silver (in ICP)	mg/l	<0.500	SM 3120 b
Al -Aluminum (in ICP)	mg/l	849.0	SM 3120 b
Ba-Barium (in ICP)	mg/l	4.9	SM 3120 b
Co-Cobalt (in ICP)	mg/l	1.1	SM 3120 b
Cu-Copper (in ICP)	mg/l	2.3	SM 3120 b
Hg – Mercury (in ICP)	mg/l	<0.500	SM 3120 b
K-Potassium (in ICP)	mg/l	1074.0	SM 3120 b
Li-Lithium (in ICP)	mg/l	1.3	SM 3120 b
Mg-Magnesium (in ICP)	mg/l	2182.0	SM 3120 b
Mn-Manganese (in ICP)	mg/l	15.9	SM 3120 b
Mo-Molybdenum (in ICP)	mg/l	<0.500	SM 3120 b
Na-Sodium (in ICP)	mg/l	3845.0	SM 3120 b
Ni-Nickel (in ICP)	mg/l	2.3	SM 3120 b
P-Phosphorus (in ICP)	mg/l	474.0	SM 3120 b
Pb-Lead (in ICP)	mg/l	2.8	SM 3120 b
S-Sulfur (in ICP)	mg/l	509.0	SM 3120 b
Sb-Antimony (in ICP)	mg/l	<3.0	SM 3120 b
Se-Selenium (in ICP)	mg/l	<3.0	SM 3120 b
Si-Silica (in ICP)	mg/l	60	SM 3120 b
Sn-Tin (in ICP)	mg/l	<3.0	SM 3120 b
Sr - Strontium (in ICP)	mg/l	45.0	SM 3120 b
Ti -Titanium (in ICP)	mg/l	61.0	SM 3120 b
V-Vanadium (in ICP)	mg/l	7.4	SM 3120 b
Zn-Zinc (in ICP)	mg/l	7.6	SM 3120 b
Dry Matter	%	74.6	
Grease&Oil (FTIR, Blue Book Method)	mg/l	<0.3	CSA, Blue book #77
Mineral oil(FTIR,Blue Book	mg/l	<0.3	CSA, Blue book #77

Date:19/03/13
Authorized Signatory

Date:00/00/00
Authorized Signatory

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Total nitrogen (as N)	mg/l	204	calculation

Sample Description	Sediment- deep
Sample Code	#3

As – Arsenic (in ICP)	mg/l	<5.0	SM 3120 b
B-Boron (in ICP)	mg/l	6.7	SM 3120 b
Be-Beryllium (in ICP)	mg/l	<0.100	SM 3120 b
Ca-Calcium (in ICP)	mg/l	34529.0	SM 3120 b
Cd-Cadmium (in ICP)	mg/l	<2.0	SM 3120 b
Cr-Chromium (in ICP)	mg/l	<13.0	SM 3120 b
Fe-Iron (in ICP)	mg/l	4315.0	SM 3120 b

Sample Description	Sediment- port
Sample Code	#4

As – Arsenic (in ICP)	mg/l	<5.0	SM 3120 b
B-Boron (in ICP)	mg/l	4.8	SM 3120 b
Be-Beryllium (in ICP)	mg/l	0.100	SM 3120 b
Ca-Calcium (in ICP)	mg/l	48666.0	SM 3120 b
Cd-Cadmium (in ICP)	mg/l	<2.0	SM 3120 b
Cr-Chromium (in ICP)	mg/l	14	SM 3120 b
Fe-Iron (in ICP)	mg/l	4087.0	SM 3120 b

Sample Description	Sediment- shallow
Sample Code	#5

As – Arsenic (in ICP)	mg/l	<5.0	SM 3120 b
B-Boron (in ICP)	mg/l	<3.0	SM 3120 b
Be-Beryllium (in ICP)	mg/l	<0.100	SM 3120 b
Ca-Calcium (in ICP)	mg/l	5915.0	SM 3120 b
Cd-Cadmium (in ICP)	mg/l	<2.0	SM 3120 b
Cr-Chromium (in ICP)	mg/l	6.4	SM 3120 b
Fe-Iron (in ICP)	mg/l	2968.0	SM 3120 b

Date:19/03/13 — Authorized Signatory

Date:00/00/00 — Authorized Signatory

Authorized Signatory

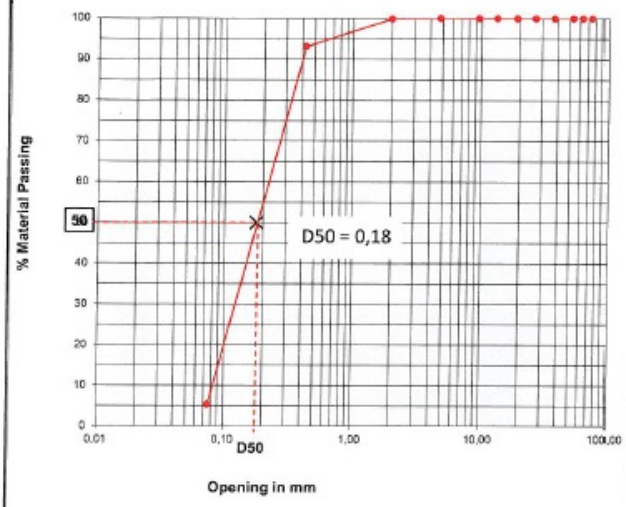
6.14 ANEXO 3: ANÁLISE GRANULOMÉTRICA DAS AMOSTRAS DE SEDIMENTOS

aurecon	SUMMARY SHEET	LAB/G01

Company: Logistica | Lab no: L-0970 | Date: 5-Mar-13

Sample Description: Sample # 1 | Classification: A-3 (0)

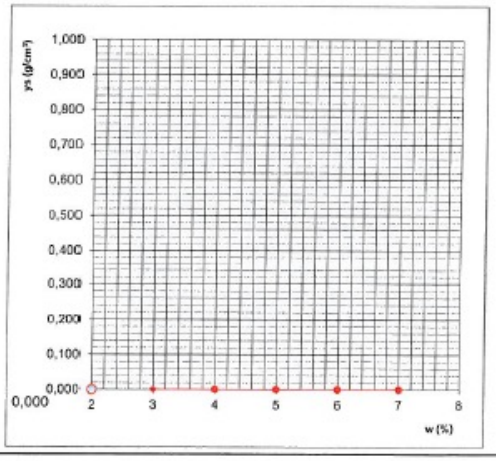
Source | Unified



SIEVE ANALYSIS

Sieve size (mm)	Mass passing sieve		% Passing Sieve
75,0			
63,0			
53,0			
37,5			
26,5			
19,0			
13,2			
9,5			
4,75		1185,5	100,0
2,00		1184,1	99,9
0,425		1104,1	93,1
0,075	(A) x (E) ÷ 100		5,3
		G.M	1,0

Natural Moisture	%
Linear Shrinkage	%
MOD:	gr/cm³
Optimum Moisture:	%
Liquid Limit:	%
Plastic Limit:	%
Plasticity Index:	%
CBR:	90% / 95% / 100%
Sand Equivalent:	%
Relative Density of Grains:	gr/cm³



Done by: Kabue | Date: 5-Mar-13

Calculated by: Kabue | Date: 5-Mar-13

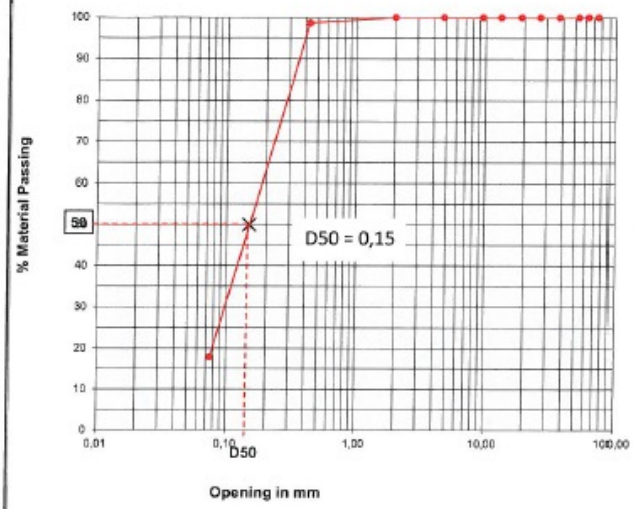
Checked by: | Date: 5-Mar-13

aurecon	SUMMARY SHEET	LAB/G01

Company: Logistica | Lab no: L-0971 | Date: 5-Mar-13

Sample Description: Sample # 2 | Classification: A-2-4 (0)

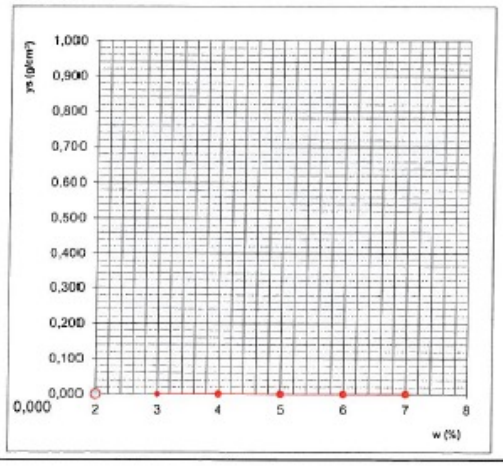
Source | Unified



SIEVE ANALYSIS

Sieve size (mm)	Mass passing sieve		% Passing Sieve
75,0			
63,0			
53,0			
37,5			
26,5			
19,0			
13,2			
9,5			
4,75			
2,00		1083,8	100,0
0,425		1069,0	98,6
0,075	(A) x (E) ÷ 100		17,8
		G.M	0,8

Natural Moisture	%
Linear Shrinkage	%
MOD:	gr/cm³
Optimum Moisture:	%
Liquid Limit:	%
Plastic Limit:	%
Plasticity Index:	%
CBR:	90% / 95% / 100%
Sand Equivalent:	%
Relative Density of Grains:	gr/cm³



Done by: Kabue | Date: 5-Mar-13

Calculated by: Kabue | Date: 5-Mar-13

Checked by: | Date: 5-Mar-13

aurecon

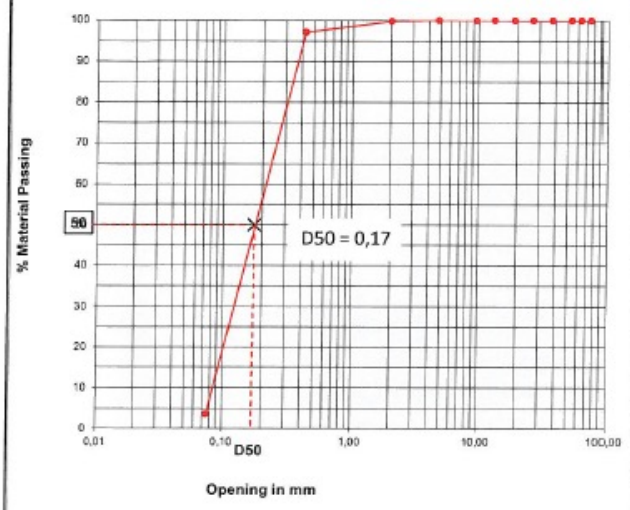
SUMMARY SHEET

LAB/G01

Company: Logistica | Lab no: L-0972 | Date: 5-Mar-13

Sample Description: Sample # 3 | Classification: A-3 (0)

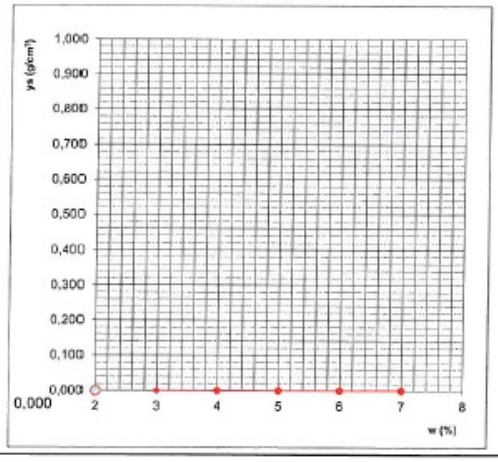
Source | Unified



SIEVE ANALYSIS

Sieve size (mm)	Mass passing sieve		% Passing Sieve
75,0			
63,0			
53,0			
37,5			
26,5			
19,0			
13,2			
9,5			
4,75		1027,6	100,0
2,00		1025,3	99,8
0,425		998,2	97,1
0,075	(A) x (E) ÷ 100		3,6
		G.M	1,0

Natural Moisture	%
Linear Shrinkage	%
MOD:	gr/cm³
Optimum Moisture:	%
Liquid Limit:	%
Plastic Limit:	%
Plasticity Index:	%
CBR:	90% / 95% / 100%
Sand Equivalent:	%
Relative Density of Grains:	gr/cm³



Done by: Kabue | Date: 5-Mar-13

Calculated by: Kabue | Date: 5-Mar-13

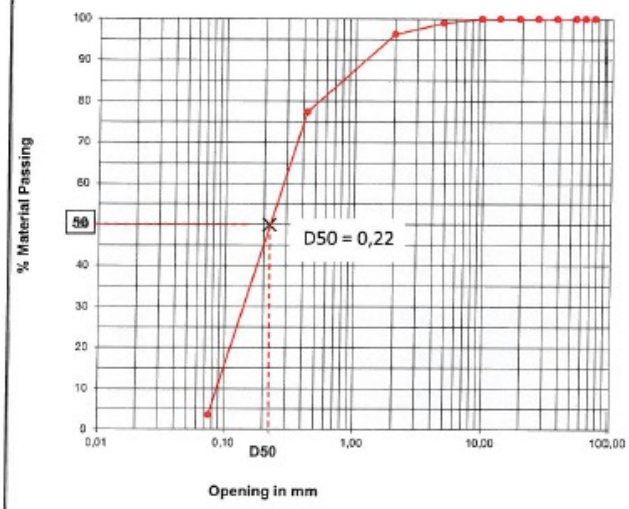
Checked by: | Date: 5-Mar-13

aurecon	SUMMARY SHEET	LAB/G01

Company: Logistica | Lab no: L-0973 | Date: 5-Mar-13

Sample Description: Sample # 4 | Classification: A-3 (0)

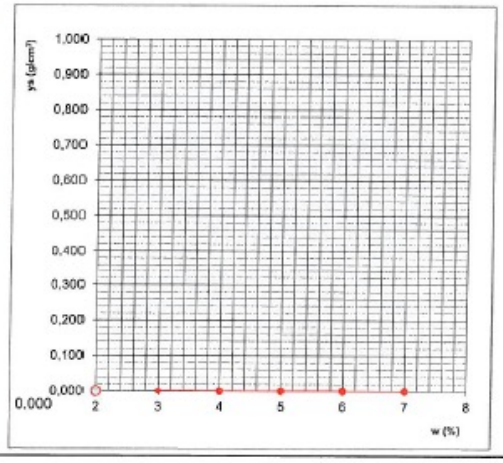
Source | Unified



SIEVE ANALYSIS

Sieve size (mm)	Mass passing sieve		% Passing Sieve
75,0			
63,0			
53,0			
37,5			
26,5			
19,0			
13,2			
9,5		1041,4	100,0
4,75		1030,9	99,0
2,00		1002,5	96,3
0,425		806,1	77,4
0,075	(A) x (E) ÷ 100		3,6
		G.M	1,2

Natural Moisture	%
Linear Shrinkage	%
MOD:	gr/cm³
Optimum Moisture:	%
Liquid Limit:	%
Plastic Limit:	%
Plasticity Index:	%
CBR:	90% / 95% / 100%
Sand Equivalent:	%
Relative Density of Grains:	gr/cm³



Done by: Kabue | Date: 5-Mar-13

Calculated by: Kabue | Date: 5-Mar-13

Checked by: | Date: 5-Mar-13

7. CONCLUSÕES E RECOMENDAÇÕES PARA A AIA

Concluímos e recomendamos que, com base no apresentado por escrito neste relatório sobre a avaliação ambiental, a construção da expansão de um novo terminal de contentores proposto no existente Porto de Namibe é viável e não irá causar qualquer efeito ambiental negativo sobre a área natural da Baía de Namibe tanto abaixo do nível da água do mar como acima do mesmo, bem com em terra.

A expansão do novo terminal de contentores proposto no Porto de Namibe irá apoiar o desenvolvimento da cidade de Namibe de um ponto de vista económico e cultural.