

Silt/Debris Flow Monitoring at Buskett Gardens

*part of the EU LIFE Saving Buskett – Soil stabilisation
measures to protect Annex I habitats in Buskett-Girgenti
Natura 2000 site*

Interim Report

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15/05/2015	1.0	First Version	Dr. Peter Glanville Emma Cassar
14/07/2015	2.0	Second Version; addition of Laboratory Results	Dr. Peter Glanville Emma Cassar Solidbase Laboratory Ltd

AMENDMENT RECORD

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Table of Contents

1.0	Interim Report.....	1
1.1	Laboratory Results	7
2.0	Conclusion – Way forward.....	8
3.0	Appendix A.....	10
4.0	Appendix B	11

Table of Figures

Figure 1: An area was dug out to make space for the silt trap which needs to be at ground level to allow the flow of rainwater into the silt trap.	1
Figure 2: The gutter for Silt Trap 2 as it was before it was moved to a better position to improve the flow of water. With the previous position water was found to be diverted away from the gutter resulting in a reduction of water entering the silt trap.	2
Figure 3: The gutter was moved to a position in order to improve the flow of water and avoid water from being diverted away from the gutter.	2
Figure 4: Daily rainfall as recorded by rain gauge on site.....	6
Figure 5: Plan showing proposed interventions at Buskett-Girgenti Natura 2000 site by MSDEC	9

List of Tables

Table 1: Raw data of sediment collected in silt traps by weight in grams.3

Table 2: Raw Data of Rainfall in mm as recorded by Rain Gauge on site.3

1.0 Interim Report

Following the submission of the Method Statement and an onsite visit, comments were made on improving the system, hence the Method Statement was updated and a second version was submitted. Consequently, sediment data has been collected every fortnight and rainfall data has been recorded using a rain gauge onsite, from December 2014 up to March 2015. As specified in the Method Statement site visits during the wet season from October to March took place on fortnightly basis while during the dry season, from April to September, site visits are held on monthly basis.

For each site visit a record sheet was produced and these can be found in Appendix A.

Silt Trap 1 was installed on the 9th December 2014 and Silt Trap 2 was installed on 3rd December 2014. Arrangements had to be made to the gutter of Silt trap 2 to improve the flow of water entering the silt trap. Figure 1, Figure 2 and Figure 3 show the process in which a suitable area was dug out to make space for the silt traps and gutters.



Figure 1: An area was dug out to make space for the silt trap which needs to be at ground level to allow the flow of rainwater into the silt trap.



Figure 2: The gutter for Silt Trap 2 as it was before it was moved to a better position to improve the flow of water. With the previous position water was found to be diverted away from the gutter resulting in a reduction of water entering the silt trap.



Figure 3: The gutter was moved to a position in order to improve the flow of water and avoid water from being diverted away from the gutter.

Table 1 shows the day when the silt traps were emptied, the amount of rainfall between visits and the total amount of sediment collected.

Table 1: Raw data of sediment collected in silt traps by weight in grams.

Date	Silt Trap 1 Sediment in grams	Silt Trap 2 Sediment in grams	Rainfall Between Visits (mm) starting from 3 rd December 2015	Total Rainfall (mm) since 3 rd December 2014
23-12-14	4	72	69.2	69.2
06-01-15	3	1301	66.2	135.4
20-01-15	0	28	1	136.4
03-02-15	2	220	30.6	167
18-02-15	2	511	9.6	176.6
03-03-15	1	538	45.8	222.4
17-03-15	1	370	8.2	230.6
30-03-15	3	402	35	265.6

The rainfall recorded by the rain gauge onsite is given in Table 2 and illustrated in Figure 4.

Table 2: Raw Data of Rainfall in mm as recorded by Rain Gauge on site.

Date	Rainfall (mm)
03-12-14	0
04-12-14	0
05-12-14	0
06-12-14	0
07-12-14	5.8
08-12-14	0
09-12-14	12.4
10-12-14	34.4
11-12-14	15.8
12-12-14	0
13-12-14	0
14-12-14	0
15-12-14	0
16-12-14	0
17-12-14	0
18-12-14	0.2
19-12-14	0
20-12-14	0
21-12-14	0
22-12-14	0.6
23-12-14	0
24-12-14	0
25-12-14	0
26-12-14	4
27-12-14	5
28-12-14	1.8
29-12-14	1.2
30-12-14	34.4
31-12-14	8.2
01-01-15	11

Date	Rainfall (mm)
02-01-15	0
03-01-15	0
04-01-15	0
05-01-15	0.6
06-01-15	0
07-01-15	0
08-01-15	0
09-01-15	0
10-01-15	0
11-01-15	0
12-01-15	0
13-01-15	0
14-01-15	0
15-01-15	0
16-01-15	0.2
17-01-15	0.2
18-01-15	0
19-01-15	0.6
20-01-15	0.4
21-01-15	0
22-01-15	3.8
23-01-15	4
24-01-15	1
25-01-15	3.8
26-01-15	3
27-01-15	3.6
28-01-15	8
29-01-15	0
30-01-15	0.2
31-01-15	0
01-02-15	0
02-02-15	2.8
03-02-15	0
04-02-15	0
05-02-15	1.4
06-02-15	0
07-02-15	0
08-02-15	3.8
09-02-15	0.4
10-02-15	0.4
11-02-15	0
12-02-15	0.2
13-02-15	0
14-02-15	3.2
15-02-15	0
16-02-15	0
17-02-15	0.2
18-02-15	9.4
19-02-15	0
20-02-15	0
21-02-15	5.2
22-02-15	0.6
23-02-15	11
24-02-15	5
25-02-15	0

Date	Rainfall (mm)
26-02-15	7
27-02-15	0
28-02-15	0
01-03-15	7.6
02-03-15	0
03-03-15	0
04-03-15	0
05-03-15	0.8
06-03-15	1
07-03-15	0
08-03-15	2.6
09-03-15	0
10-03-15	0.4
11-03-15	0
12-03-15	0.2
13-03-15	0
14-03-15	3.2
15-03-15	0
16-03-15	0
17-03-15	0.2
18-03-15	0
19-03-15	0
20-03-15	0
21-03-15	0.4
22-03-15	0
23-03-15	0
24-03-15	3.6
25-03-15	0.2
26-03-15	2.6
27-03-15	16.2
28-03-15	11.6
29-03-15	0.2
30-03-15	0
31-03-15	0
01-04-15	0
02-04-15	0
03-04-15	0
04-04-15	0
05-04-15	0
06-04-15	0
07-04-15	0.4

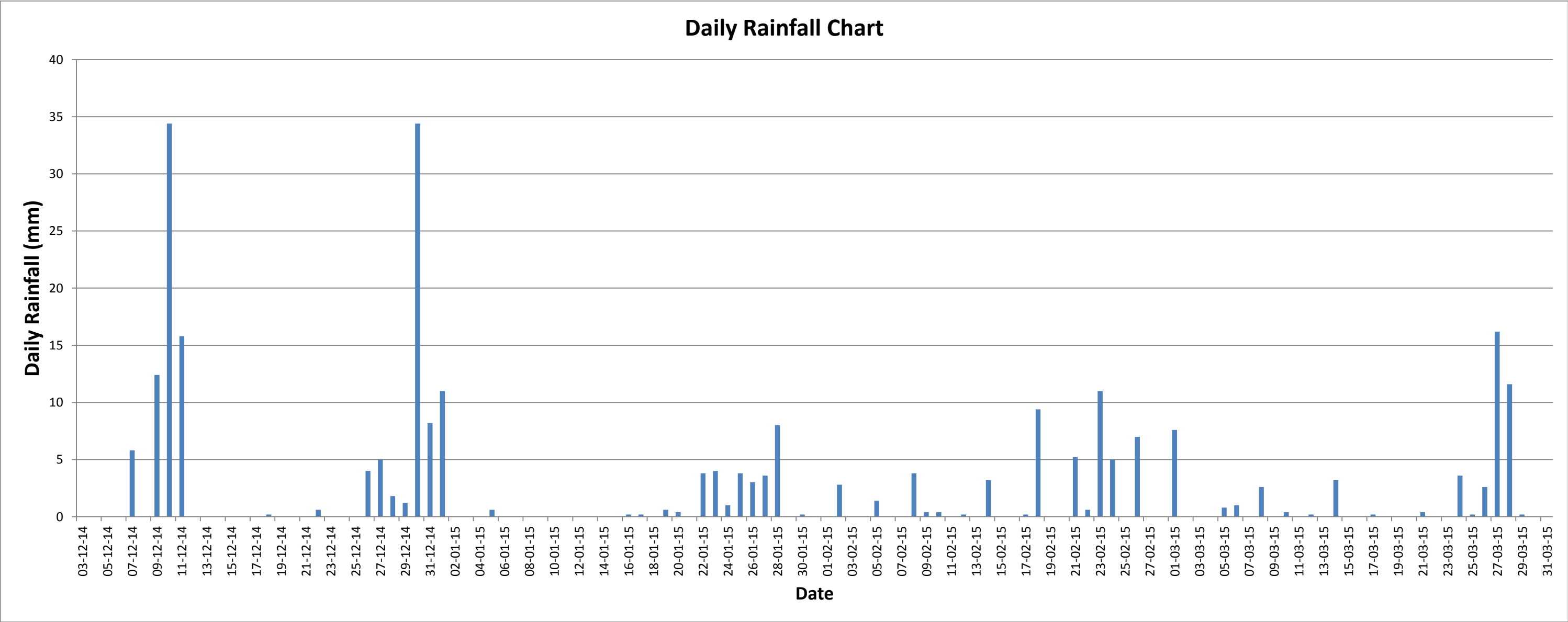


Figure 4: Daily rainfall as recorded by rain gauge on site

1.1 Laboratory Results

As specified in the Method Statement, all samples collected were combined into a single sample for each silt trap monitoring location and sent to the Laboratory for the Particle Size Distribution Test.

The Method used and Results of the samples are attached in Appendix B.

2.0 Conclusion – Way forward

Monthly visits are currently being held during the dry season which covers the months from April through to September. Consultants are awaiting instructions from the client on when construction works are to commence specifically construction works numbered 1, 16, 17, 40, 41, 42 and 32 on drawing BUS-1600-14 as shown in Figure 5.

When works are confirmed to commence, silt traps shall be removed to avoid contamination and shall then be placed once works are finished. Following this a post-construction monitoring period shall start and the data collected during this period shall be compared to the data collected in the pre-construction period.

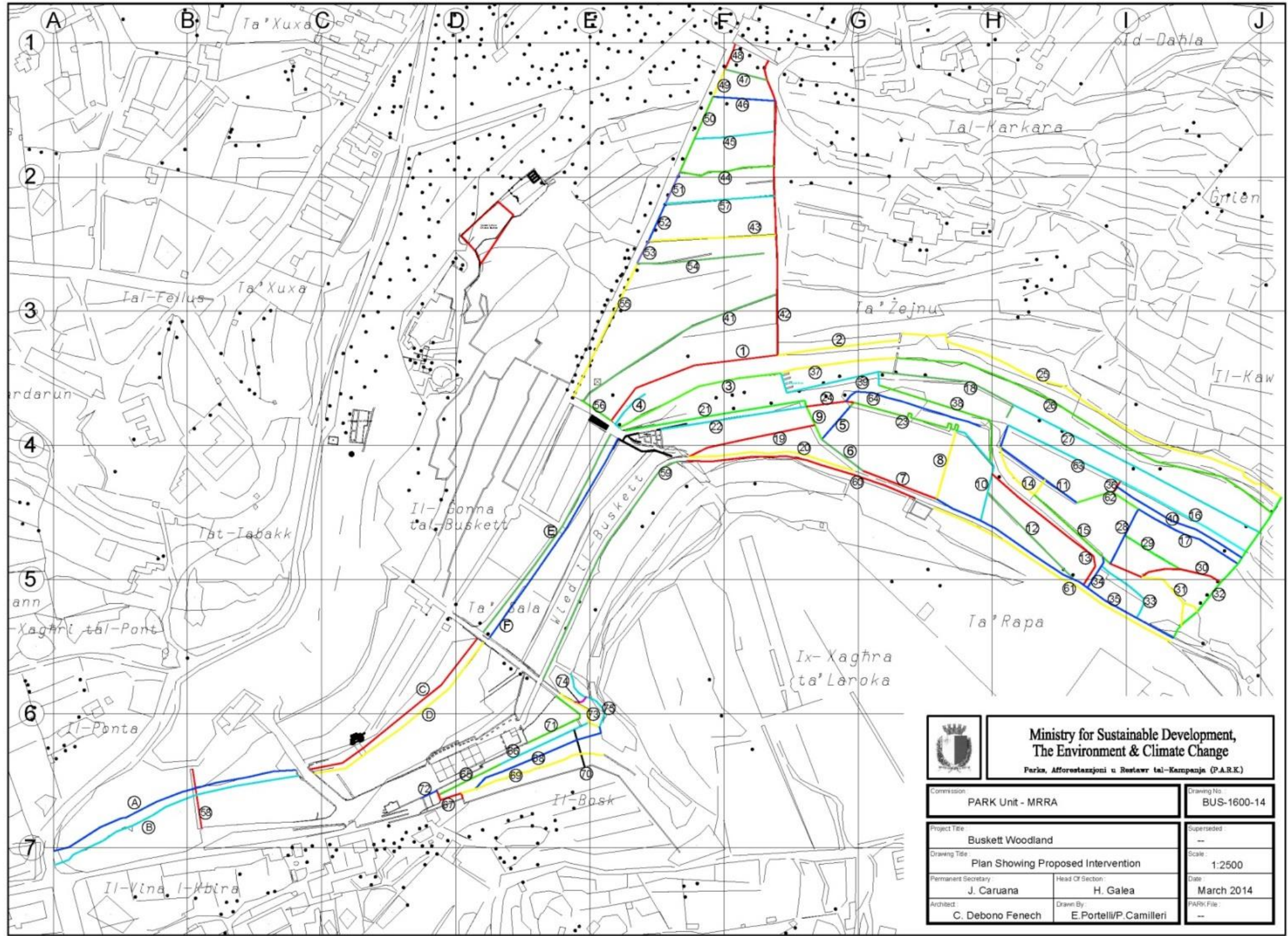


Figure 5: Plan showing proposed interventions at Buskett-Girgenti Natura 2000 site by MSDEC

3.0 Appendix A

Field Record Sheet	
Record No.: 1	Date of Visit: 23 rd December 2014
Site Reference: Buskett, Rabat, Malta	
Sampled By: Emma Cassar/Sacha Dunlop	Begin Time: 10:00am
Monitoring Season: Dry /Wet	
Coordinates of Silt Trap 1 35° 51.548'N 14° 24.027'E:	Coordinates of Silt Trap 2: 35° 51.461'N 14° 24.268'E
Dimensions of Silt Trap 1: Length 0.67m/Width 0.52m/Depth 0.49m	Dimensions of Silt Trap 2: Length 0.67m/Width 0.52m/Depth 0.49m
Comments or Issues encountered on Site: (Condition of Silt Trap and Adjacent Catchment – Erosion features on Terrace, natural or man-made; any sediment build up)	
Silt Trap point 1:	Silt Trap point 2:
Few mm of water with specks of sediment.	Few mm of sediment, water was of a dark brown colour.
Weather Conditions	
Status (sunny/cloudy/rainy): Sunny	
Temperature (°C): 13.5°C	
Wind (km/h): 6.2km/h (S)	
Data from Rainfall Gauge (mm) since previous site visit: 69.2mm	
Total Rainfall (mm) since 3 rd December 2014: 69.2mm	
Description of sample (visual) eg clay/silt/sand/gravel/organic matter:	
Silt Trap 1: Specks of sediment	
Silt Trap 2: Water of a dark colour including suspended sediment (very turbid)	
Sampling Bottle Label	
Sample Date and Time: 23/12/14 at 10:00am	Sample Date and Time: 23/12/14 at 11:00am
Location of Sample: Silt Trap 1	Location of Sample: Silt Trap 2

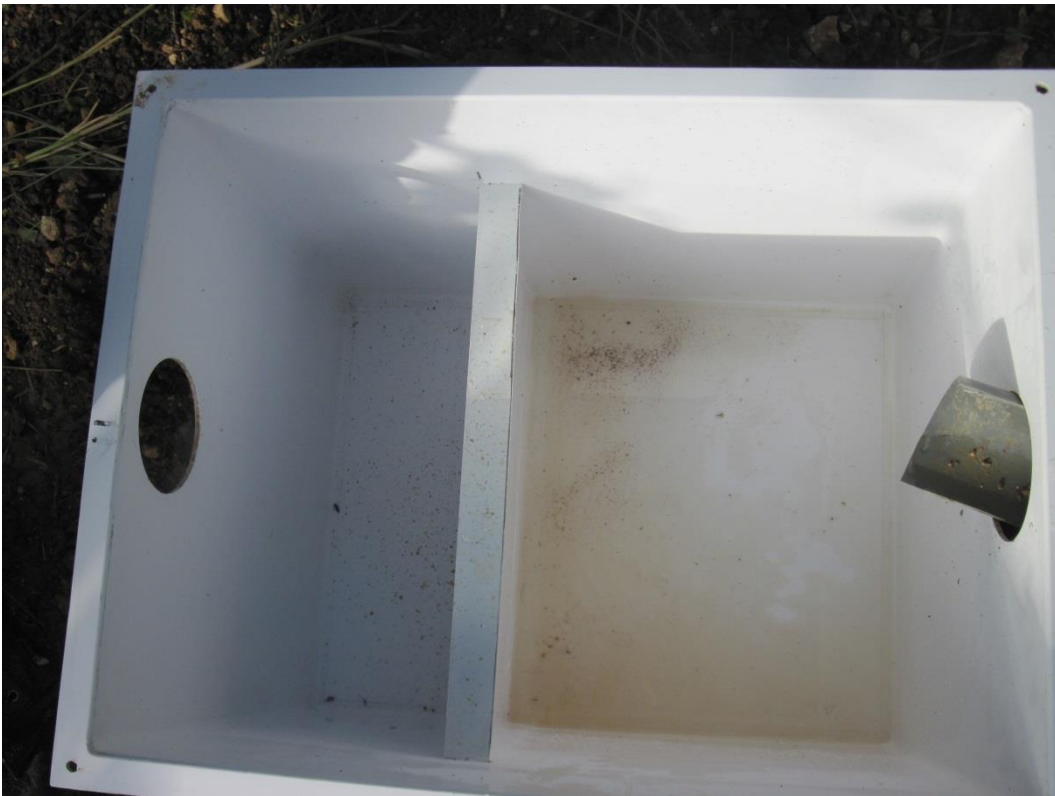
Name of Sampler: Emma Cassar/Sacha Dunlop	Name of Sampler: Emma Cassar/Sacha Dunlop
Delivery Date to Laboratory: 2 nd June 2015	
Date of Results Received: 11 th July 2015	
Dried weight of sample (g): Silt Trap 1: 4g Silt Trap 2: 72g	

Photos of Silt Trap 1











Photos of Silt Trap 2













Field Record Sheet	
Record No.: 2	Date of Visit: 6 th January 2015
Site Reference: Buskett, Rabat, Malta	
Sampled By: Emma Cassar and Sacha Dunlop	Begin Time: 13:00
Monitoring Season: Dry /Wet	
Coordinates of Silt Trap 1 35° 51.548'N 14° 24.027'E:	Coordinates of Silt Trap 2: 35° 51.461'N 14° 24.268'E
Dimensions of Silt Trap 1: Length 0.67m/Width 0.52m/Depth 0.49m	Dimensions of Silt Trap 2: Length 0.67m/Width 0.52m/Depth 0.49m
Comments or Issues encountered on Site: (Condition of Silt Trap and Adjacent Catchment – Erosion features on Terrace, natural or man-made; any sediment build up)	
Silt Trap point 1: During a site visit on 2 nd January 2015 the area was water logged and the pipe and trap were pushed up. On the same day the trap and pipe were adjusted and pushed down back to their original position. During this site visit on the 6 th January 2015 the trap and pipe were found as set on the previous site visit.	Silt Trap point 2: No issues encountered. Following from the previous site visit the area was relatively dry.
Weather Conditions	
Status (sunny/cloudy/rainy): Sunny/Cloudy	
Temperature (°C): 9.6°C	
Wind (km/h) 8.7km/h (S)	
Data from Rainfall Gauge (mm) since previous site visit: 66.2mm	
Total Rainfall (mm) since 3 rd December 2014: 135.4mm	
Description of sample (visual) eg clay/silt/sand/gravel/organic matter: Silt Trap 1: clear water with visible specks of sediment Silt Trap 2: Water of a dark colour indicating a high amount of suspended sediment	
Sampling Bottle Label	
Sample Date and Time: 06/01/15 13:30	Sample Date and Time: 06/01/15 14:30
Location of Sample: Silt Trap 1	Location of Sample: Silt Trap 2

Name of Sampler: Emma Cassar/Sacha Dunlop	Name of Sampler: Emma Cassar/Sacha Dunlop
Delivery Date to Laboratory: 2 nd June 2015	
Date of Results Received: 11 th July 2015	
Dried weight of sample (g): Silt Trap 1: 3g Silt Trap 2: 1301g	

Photos of Silt Trap 1:









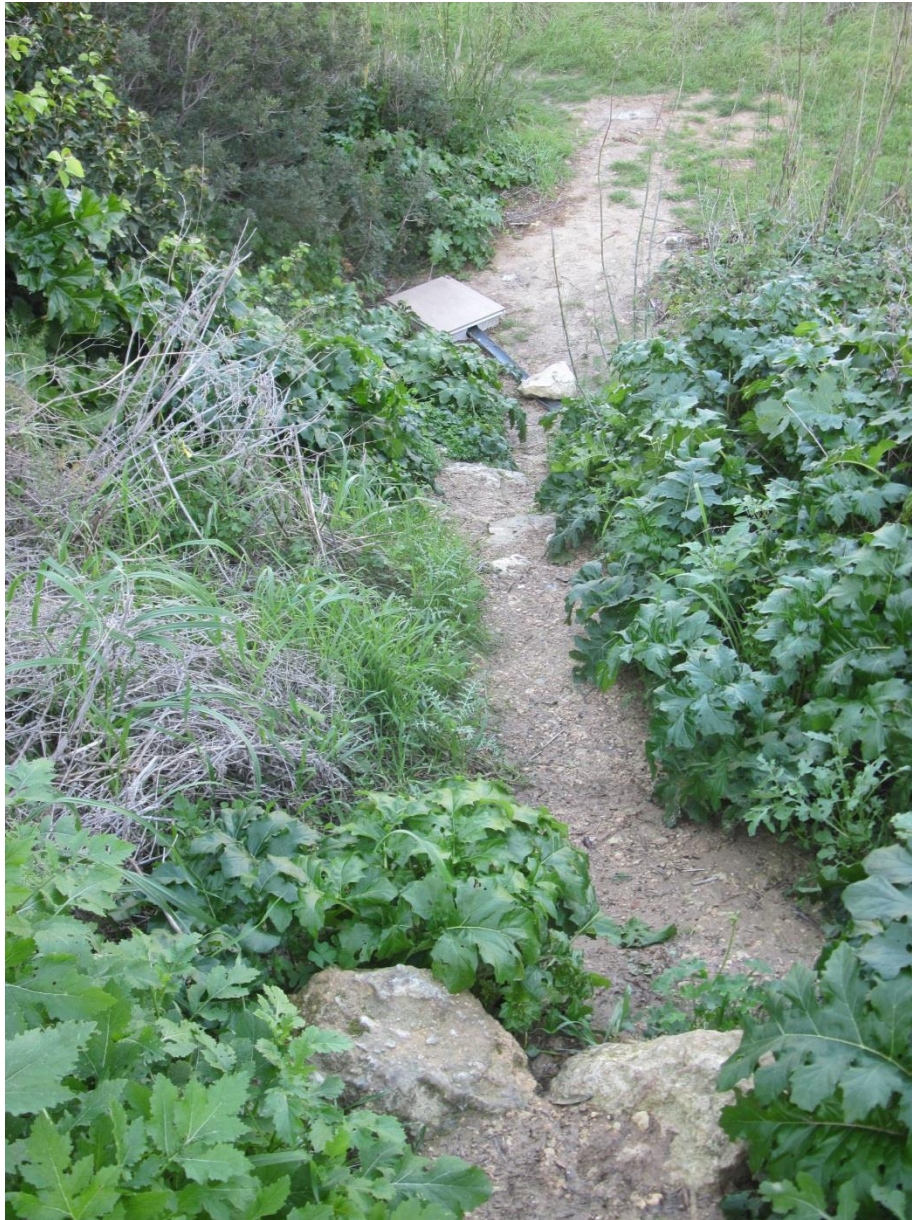


Photos of Silt Trap 2:









Field Record Sheet	
Record No.: 3	Date of Visit: 20 th January 2015
Site Reference: Buskett, Rabat, Malta	
Sampled By: Emma Cassar	Begin Time: 11:30am
Monitoring Season: Dry /Wet	
Coordinates of Silt Trap 1 35° 51.548'N 14° 24.027'E:	Coordinates of Silt Trap 2: 35° 51.461'N 14° 24.268'E
Dimensions of Silt Trap 1: Length 0.67m/Width 0.52m/Depth 0.49m	Dimensions of Silt Trap 2: Length 0.67m/Width 0.52m/Depth 0.49m
Comments or Issues encountered on Site: (Condition of Silt Trap and Adjacent Catchment – Erosion features on Terrace, natural or man-made; any sediment build up)	
Silt Trap point 1:	Silt Trap point 2:
No water was found in the silt trap.	A few mm of water and sediment were found. The silt trap had been previously tampered with and the cover was stolen. Monitors were notified on 15 th January 2015 and a temporary cover was put on 16 th January 2015. A permanent cover was placed on 20 th January 2015.
Weather Conditions	
Status (sunny/cloudy/rainy): rainy/cloudy	
Temperature (°C): 12.4°C	
Wind (km/h): 5km/h (S)	
Data from Rainfall Gauge (mm) since previous site visit: 1 mm	
Total Rainfall (mm) since 3 rd December 2014: 136.4mm	
Description of sample (visual) eg clay/silt/sand/gravel/organic matter:	
Silt Trap 1: No water	
Silt Trap 2 :Silt/gravel mixed with some organic matter	
Sampling Bottle Label	
Sample Date and Time: 20/01/15 at 11:30am	Sample Date and Time: 20/01/15 at 12:30pm
Location of Sample: Silt Trap 1	Location of Sample: Silt Trap 2

Name of Sampler: Emma Cassar	Name of Sampler: Emma Cassar
Delivery Date to Laboratory: 2 nd June 2015	
Date of Results Received: 11 th July 2015	
Dried weight of sample (g): Silt Trap 1: none Silt Trap 2: 28g	

Rain Gauge



Silt Trap 1





Silt Trap 2







Field Record Sheet	
Record No.: 4	Date of Visit: 3 rd February 2015
Site Reference: Buskett, Rabat, Malta	
Sampled By: Emma Cassar and Sacha Dunlop	Begin Time: 10:00am
Monitoring Season: Dry /Wet	
Coordinates of Silt Trap 1 35° 51.548'N 14° 24.027'E:	Coordinates of Silt Trap 2: 35° 51.461'N 14° 24.268'E
Dimensions of Silt Trap 1: Length 0.67m/Width 0.52m/Depth 0.49m	Dimensions of Silt Trap 2: Length 0.67m/Width 0.52m/Depth 0.49m
Comments or Issues encountered on Site: (Condition of Silt Trap and Adjacent Catchment – Erosion features on Terrace, natural or man-made; any sediment build up)	
Silt Trap point 1: Few mm of water found mainly clear water with sediment specks. Sediment build up in the drainage pipe was found.	Silt Trap point 2: Silt Trap was full on one side a few cm below the inlet. Water was dark in colour. Few mm of sediment was found at the bottom. Drainage pipe was clean.
Weather Conditions	
Status (sunny/cloudy/rainy): sunny	
Temperature (°C): 11.8°C	
Wind (km/h): 15.9km/h (S)	
Data from Rainfall Gauge (mm) since previous site visit: 30.6mm	
Total Rainfall (mm) since 3 rd December 2014: 167mm	
Description of sample (visual) eg clay/silt/sand/gravel/organic matter: Silt Trap 1: Clear water with specks of sediment Silt Trap 2 :Silt/gravel mixed with some organic matter	
Sampling Bottle Label	
Sample Date and Time: 03/02/15 at 10:00am	Sample Date and Time: 03/02/15 at 11:30am
Location of Sample: Silt Trap 1	Location of Sample: Silt Trap 2

Name of Sampler: Emma Cassar/Sacha Dunlop	Name of Sampler: Emma Cassar/Sacha Dunlop
Delivery Date to Laboratory: 2 nd June 2015	
Date of Results Received: 11 th July 2015	
Dried weight of sample (g): Silt Trap 1: 2g Silt Trap 2: 220g	

Rain Gauge



Silt Trap 1







Silt Trap 2











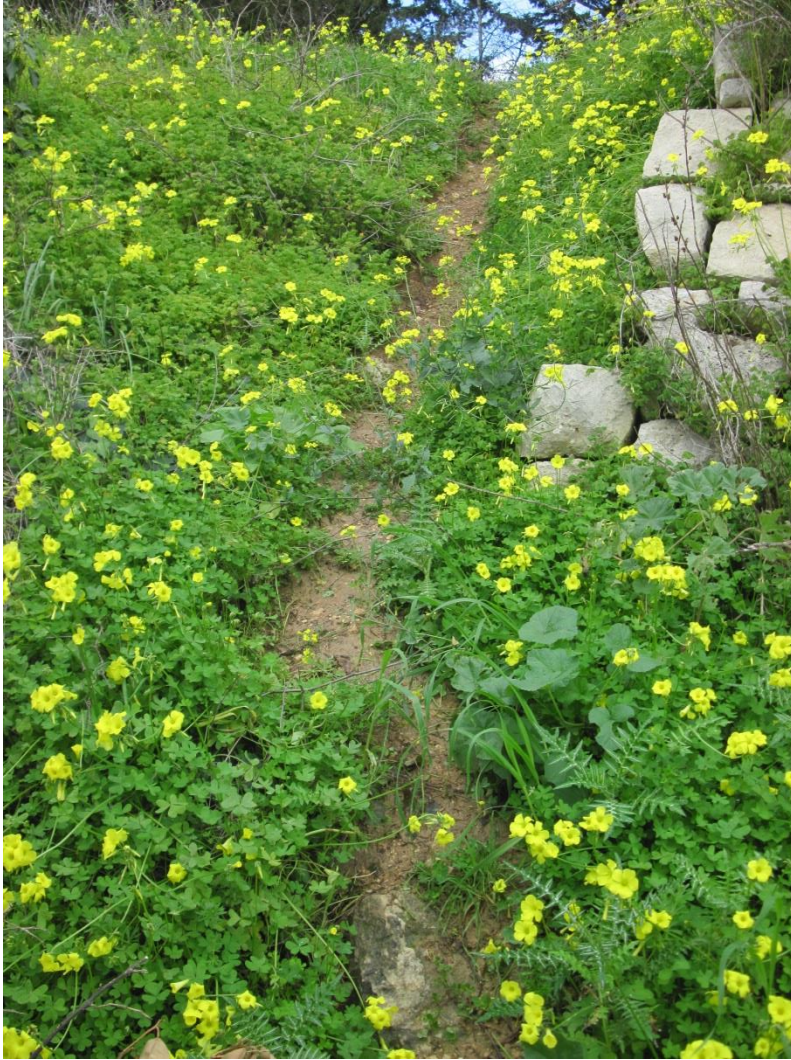
Field Record Sheet	
Record No.:5	Date of Visit: 18 th February 2015
Site Reference: Buskett, Rabat, Malta	
Sampled By: Emma Cassar	Begin Time: 09:00am
Monitoring Season: Dry /Wet	
Coordinates of Silt Trap 1 35° 51.548'N 14° 24.027'E:	Coordinates of Silt Trap 2: 35° 51.461'N 14° 24.268'E
Dimensions of Silt Trap 1: Length 0.67m/Width 0.52m/Depth 0.49m	Dimensions of Silt Trap 2: Length 0.67m/Width 0.52m/Depth 0.49m
Comments or Issues encountered on Site: (Condition of Silt Trap and Adjacent Catchment – Erosion features on Terrace, natural or man-made; any sediment build up)	
Silt Trap point 1:	Silt Trap point 2:
Few fragments of sediment found in clear water	Silt Trap was full on both sides. Water was of a dark brown colour. Sediment depth was a few mm up to 1 cm on one side.
Weather Conditions	
Status (sunny/cloudy/rainy): sunny/cloudy	
Temperature (°C): 11.3°C	
Wind (km/h): 24.9km/h (S)	
Data from Rainfall Gauge (mm) since previous site visit: 9.6mm	
Total Rainfall (mm) since 3 rd December 2014: 176.6mm	
Description of sample (visual) eg clay/silt/sand/gravel/organic matter:	
Silt Trap 1: Clear water with specks of sediment	
Silt Trap 2 :Silt/gravel mixed with some organic matter	
Sampling Bottle Label	
Sample Date and Time: 18/02/15 at 9:00am	Sample Date and Time: 18/02/15 at 10:00am
Location of Sample: Silt Trap 1	Location of Sample: Silt Trap 2

Name of Sampler: Emma Cassar	Name of Sampler: Emma Cassar
Delivery Date to Laboratory: 2 nd June 2015	
Date of Results Received: 11 th July 2015	
Dried weight of sample (g): Silt Trap 1: 2g Silt Trap 2: 511g	

Silt Trap 1

















Silt Trap 2















Field Record Sheet	
Record No.:6	Date of Visit: 3 rd March 2015
Site Reference: Buskett, Rabat, Malta	
Sampled By: Emma Cassar	Begin Time: 14:00
Monitoring Season: Dry /Wet	
Coordinates of Silt Trap 1 35° 51.548'N 14° 24.027'E:	Coordinates of Silt Trap 2: 35° 51.461'N 14° 24.268'E
Dimensions of Silt Trap 1: Length 0.67m/Width 0.52m/Depth 0.49m	Dimensions of Silt Trap 2: Length 0.67m/Width 0.52m/Depth 0.49m
Comments or Issues encountered on Site: (Condition of Silt Trap and Adjacent Catchment – Erosion features on Terrace, natural or man-made; any sediment build up)	
Silt Trap point 1:	Silt Trap point 2:
Few fragments of sediment found in clear water	Silt Trap was full on both sides. Water was of a dark brown colour. Sediment depth was a few mm up to 1 cm on one side.
Weather Conditions	
Status (sunny/cloudy/rainy): sunny/cloudy	
Temperature (°C): 13.3°C	
Wind (km/h): 15.4km/h (S)	
Data from Rainfall Gauge (mm) since previous site visit: 45.8mm	
Total Rainfall (mm) since 3 rd December 2014: 222.4mm	
Description of sample (visual) eg clay/silt/sand/gravel/organic matter:	
Silt Trap 1: Clear water with specks of sediment	
Silt Trap 2 :Silt/gravel mixed with some organic matter	
Sampling Bottle Label	
Sample Date and Time: 03/03/15 at 14:00	Sample Date and Time: 03/03/15 at 15:00
Location of Sample: Silt Trap 1	Location of Sample: Silt Trap 2

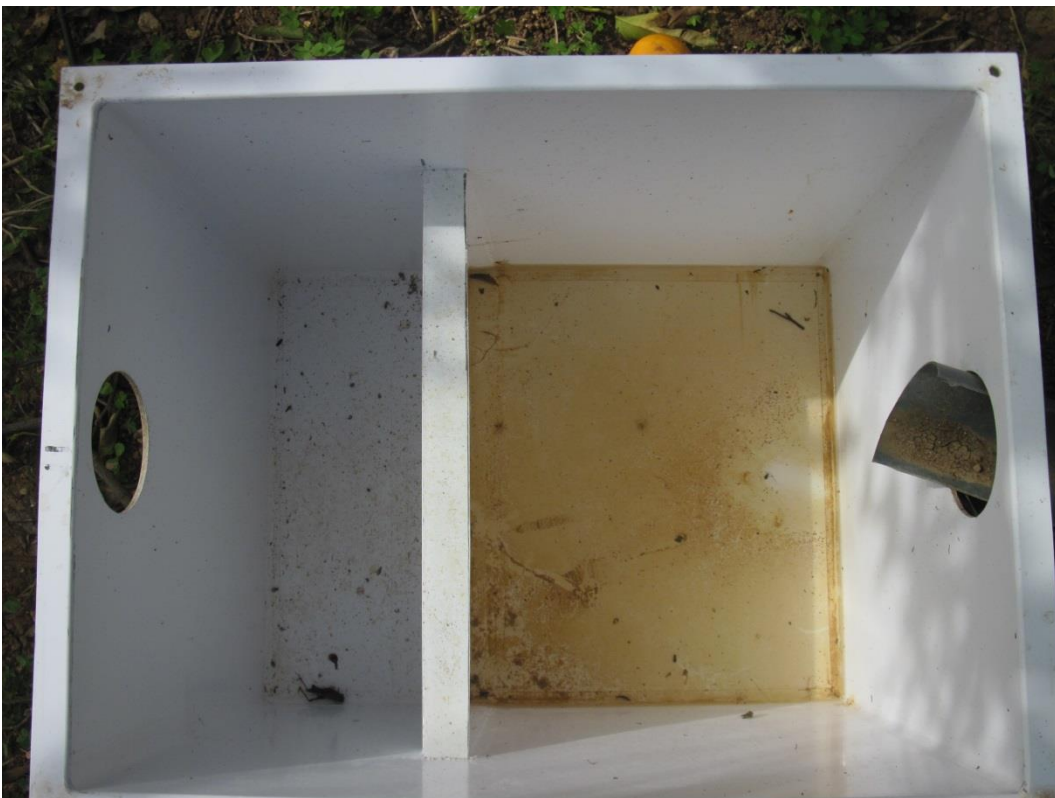
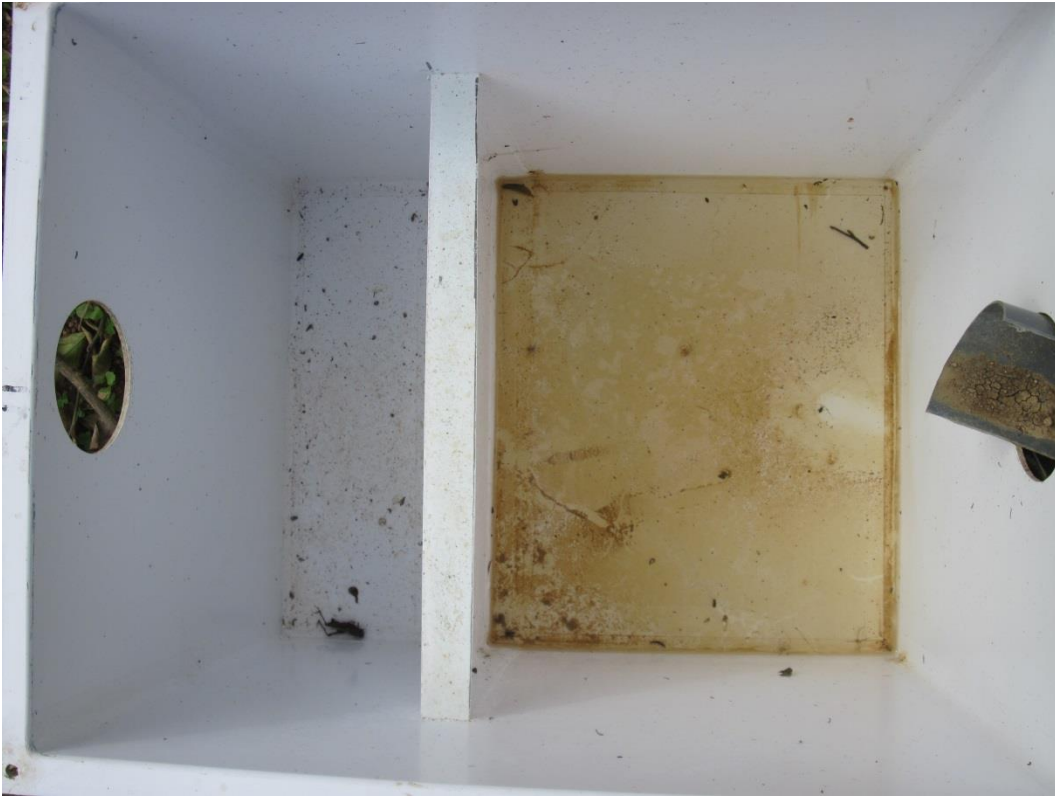
Name of Sampler: Emma Cassar	Name of Sampler: Emma Cassar
Delivery Date to Laboratory: 2 nd June 2015	
Date of Results Received: 11 th July 2015	
Dried weight of sample (g): Silt Trap 1: 1g Silt Trap 2: 538g	

Silt Trap 1













Silt Trap 2















Field Record Sheet	
Record No.:7	Date of Visit: 17 th March 2014
Site Reference: Buskett, Rabat, Malta	
Sampled By: Emma Cassar	Begin Time: 09:00am
Monitoring Season: Dry /Wet	
Coordinates of Silt Trap 1 35° 51.548'N 14° 24.027'E:	Coordinates of Silt Trap 2: 35° 51.461'N 14° 24.268'E
Dimensions of Silt Trap 1: Length 0.67m/Width 0.52m/Depth 0.49m	Dimensions of Silt Trap 2: Length 0.67m/Width 0.52m/Depth 0.49m
Comments or Issues encountered on Site: (Condition of Silt Trap and Adjacent Catchment – Erosion features on Terrace, natural or man-made; any sediment build up)	
Silt Trap point 1: Few fragments of sediment found in clear water	Silt Trap point 2: Silt Trap was full on both sides. Water was of a dark brown colour. Sediment depth was a few mm up to 1 cm on one side. Silt Trap had been found to be tampered with as stones had been found at the bottom of the trap.
Weather Conditions	
Status (sunny/cloudy/rainy): sunny/cloudy	
Temperature (°C): 10.6°C	
Wind (km/h): 7.3km/h (N)	
Data from Rainfall Gauge (mm) since previous site visit: 8.2mm	
Total Rainfall (mm) since 3 rd December 2014: 230.6mm	
Description of sample (visual) eg clay/silt/sand/gravel/organic matter: Silt Trap 1: Clear water with specks of sediment Silt Trap 2 :Silt/gravel mixed with some organic matter	
Sampling Bottle Label	
Sample Date and Time: 17/03/15 at 9:00am	Sample Date and Time: 17/03/15 at 10:00am
Location of Sample: Silt Trap 1	Location of Sample: Silt Trap 2

Name of Sampler: Emma Cassar	Name of Sampler: Emma Cassar
Delivery Date to Laboratory: 2 nd June 2015	
Date of Results Received: 11 th July 2015	
Dried weight of sample (g): Silt Trap 1: 1g Silt Trap 2: 370g	

Silt Trap 1













Silt Trap 2













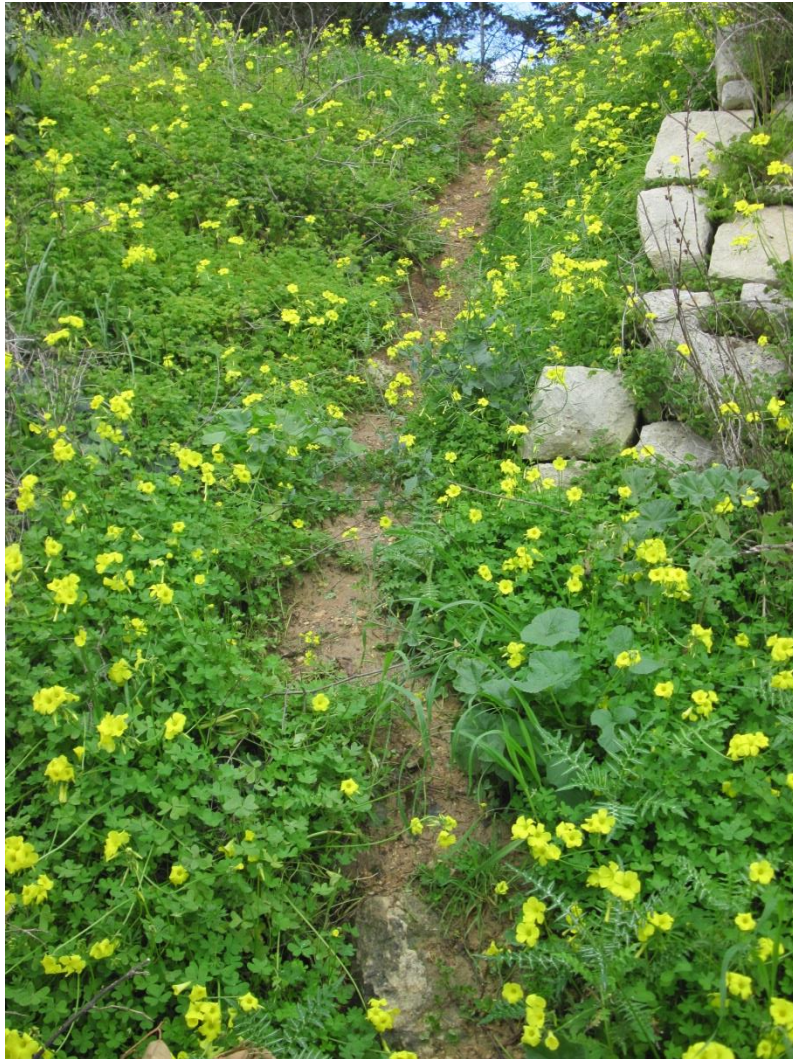
Field Record Sheet	
Record No.:8	Date of Visit: 30 th March 2015
Site Reference: Buskett, Rabat, Malta	
Sampled By: Emma Cassar	Begin Time: 10:00am
Monitoring Season: Dry /Wet	
Coordinates of Silt Trap 1 35° 51.548'N 14° 24.027'E:	Coordinates of Silt Trap 2: 35° 51.461'N 14° 24.268'E
Dimensions of Silt Trap 1: Length 0.67m/Width 0.52m/Depth 0.49m	Dimensions of Silt Trap 2: Length 0.67m/Width 0.52m/Depth 0.49m
Comments or Issues encountered on Site: (Condition of Silt Trap and Adjacent Catchment – Erosion features on Terrace, natural or man-made; any sediment build up)	
Silt Trap point 1: Few fragments of sediment found in clear water	Silt Trap point 2: Silt Trap was full on both sides. Water was of a dark brown colour. Sediment depth was a few mm up to 1 cm on one side.
Weather Conditions	
Status (sunny/cloudy/rainy): sunny/cloudy	
Temperature (°C): 13.8°C	
Wind (km/h): 23.53km/h (S)	
Data from Rainfall Gauge (mm) since previous visit: 35mm	
Total Rainfall (mm) since 3 rd December 2015: 265.6mm	
Description of sample (visual) eg clay/silt/sand/gravel/organic matter: Silt Trap 1: Clear water with specks of sediment Silt Trap 2 :Silt/gravel mixed with some organic matter	
Sampling Bottle Label	
Sample Date and Time: 30/03/15 at 10:00am	Sample Date and Time: 30/03/15 at 11:00am
Location of Sample: Silt Trap 1	Location of Sample: Silt Trap 2

Name of Sampler: Emma Cassar	Name of Sampler: Emma Cassar
Delivery Date to Laboratory: 2 nd June 2015	
Date of Results Received: 11 th July 2015	
Dried weight of sample (g): Silt Trap 1: 3g Silt Trap 2: 402g	

Silt Trap 1

















Silt Trap 2













4.0 Appendix B

TEST REPORT

AIS Environment Ltd,
AIS House,
18, St. John Street,
Fgura, FGR 1447,
Malta

Date: 11 July 2015

Job No: J1185

Attn: Ms Emma Cassar

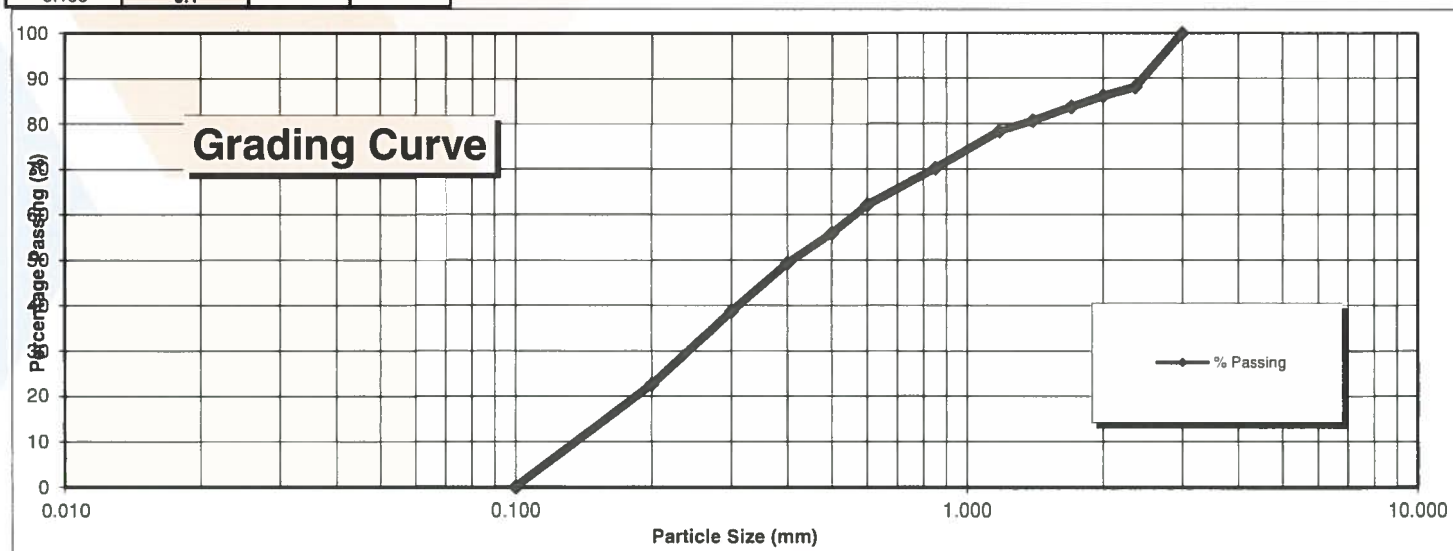
Silt content, Moisture content & Grading

Client AIS Environment Ltd,	Location of sampling Silt Trap 1			Sample type Sand	
Date received 02/06/2015	Source N/A	Sampled by Client	Date test completed 10/07/2015	Tested by M.Amoury	

Sample No	S15/0797
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Sieve Size mm	Percentage Passing	Overall Limits	
		Lower	Upper
3.000	100		
2.360	88		
2.000	86		
1.700	84		
1.400	81		
1.180	78		
0.850	70		
0.600	62		
0.500	56		
0.400	49		
0.300	39		
0.200	23		
0.100	0.1		

Type of test	Result
Moisture content %	0.0
Silt Content passing 0.63mic (%)	0.0

Description of material: **Sand from .09mm to 3mm with some organic material.**Comments: **Solidbase was only supplied 12g material and this made it really difficult to conduct a test.**

Report No : 3


 Kenneth Spiteri
Laboratory Manager

Tal-Handaq Industrial Estate,
N/S in Handaq Road,
Gormi, QRM 4000, Malta.

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Co. No.: C 33162
VAT No.: MT 1695 3537

Directors: Paolo Bugeja
Gordon Baldacchino

Particle-Size Analysis of soil

to ASTM D422 1998

Client	AIS Environment Ltd. (Attn: Ms Emma Cassar)	Job Ref:	J1185
Location	Silt Trap 2, Buskett	Borehole/Pit Ref:	Silt trap 2
		Sample No:	S15/0789
Soil	Silt trap sediments	Depth (m)	N.A.
Analyst	Christian Schembri	Date tested	03/07/2015
		Report No:	1

Method of preparation	Sampled from silt trap, crushed with pestle and mortar, riffled, wet sieved using distilled water, dried in oven for a minimum of 24hrs and weighed, then sampled for sedimentation. The organics were not treated with H ₂ O ₂ (hydrogen peroxide).
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Wet sieving

Sieve	aperture	mass of sieve	mass of sieve & retained	mass of soil retained	mass of soil passing	% passing
	microns	g	g	g	g	
	2000	396.50	396.90	0.40	299.11	99.87%
18	1000	355.10	355.60	0.50	298.61	99.70%
40	500	312.50	314.30	1.80	296.81	99.10%
60	250	437.30	442.14	4.84	291.97	97.48%
100	125	279.60	287.90	8.30	283.67	94.71%
200	63	257.66	273.98	16.32	267.35	89.26%
pan		1259.38	1526.73	267.35		

Analysis for sample part inclusive of organics

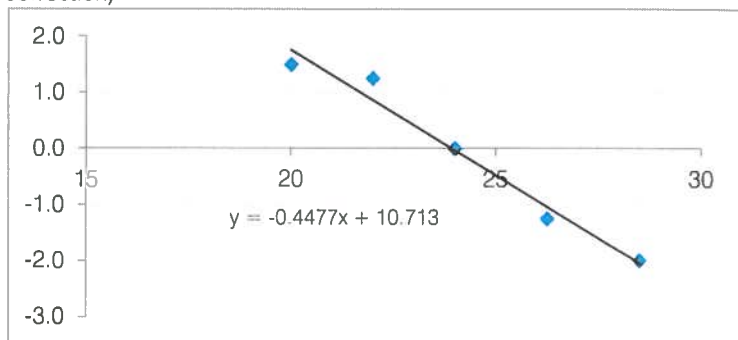
plastic container	1259.38	g		
plastic container + dry soil passing 63 micron	1526.73	g		
passing 63µm sieve	267.35	g		
remaining in pan after drying sieves	0.00	g		
total passing 63µm sieve	267.35	g	- equivalent to	89.26% of total
total mass of soil (dry)	299.51	g		

J1185 - Silt trap 2 - S15/0789

Composite correction for Hydrometer reading

(dispersant + effect of variation in temperature + meniscus correction)

Temp.	Hydro- meter
°C	
20.00	1.5000
22.00	1.2500
24.00	0.0000
26.25	-1.2500
28.50	-2.0000



Specific gravity of soil particles, G_s

2.650

Hydrometer used

152H

Specific gravity assumed?

Yes

Sedimentation test

Container for sedimentation specimen

195.00 g

Container + dry specimen

245.32 g

mass passing 63μ used for sedimentation

50.32 g

- equivalent to

89.26% of 56.37g

mass of sample represented by mass used in hydrometer test

W

56.37 g

Sedimentation

Time	Hydrometer reading	Temp.	Hydrometer correction	Hydro- meter reading corrected	% of soil remaining in suspension	Constant K (depending on temp and G_s)	L	D
min		°C			%		cm	mm
0.00								
1.00	48.5	23.5	0.1921	48.6921	86.37	0.012895	8.34	0.03724
2.00	47.0	23.5	0.1921	47.1921	83.71	0.012895	8.59	0.02672
5.00	45.5	23.5	0.1921	45.6921	81.05	0.012895	8.83	0.01714
10.00	43.5	24.0	-0.0318	43.4682	77.11	0.012820	9.16	0.01227
15.00	42.0	24.0	-0.0318	41.9682	74.45	0.012820	9.41	0.01015
30.00	40.0	24.3	-0.1437	39.8563	70.70	0.012783	9.73	0.00728
60.00	37.5	24.5	-0.2557	37.2444	66.07	0.012745	10.14	0.00524
125.00	34.0	24.5	-0.2557	33.7444	59.86	0.012745	10.72	0.00373
240.00	31.5	24.5	-0.2557	31.2444	55.42	0.012745	11.13	0.00274
1440.00	25.0	24.4	-0.2109	24.7891	43.97	0.012760	12.19	0.00117
2880.00	23.0	24.4	-0.2109	22.7891	40.43	0.012760	12.52	0.00084

J1185 - Silt trap 2 - S15/0789

Summary of results (inclusive of organics)

Method	Diameter	% passing
Wet sieving	5.6000	
	4.0000	
	2.0000	99.87%
	1.0000	99.70%
	0.5000	99.10%
	0.4250	
	0.2500	97.48%
	0.1250	94.71%
	0.0750	
	0.0630	89.26%
Hydrometer analysis	0.0372	86.37%
	0.0267	83.71%
	0.0171	81.05%
	0.0123	77.11%
	0.0102	74.45%
	0.0073	70.70%
	0.0052	66.07%
	0.0037	59.86%
	0.0027	55.42%
	0.0012	43.97%
	0.0008	40.43%

Size fractions

	passing	fraction
Clay	50.00%	50.00%
Silt	88.93%	38.93%
Sand		11.07%

Maximum particle size 2 mm

Visible particle shape

Visible particle hardness

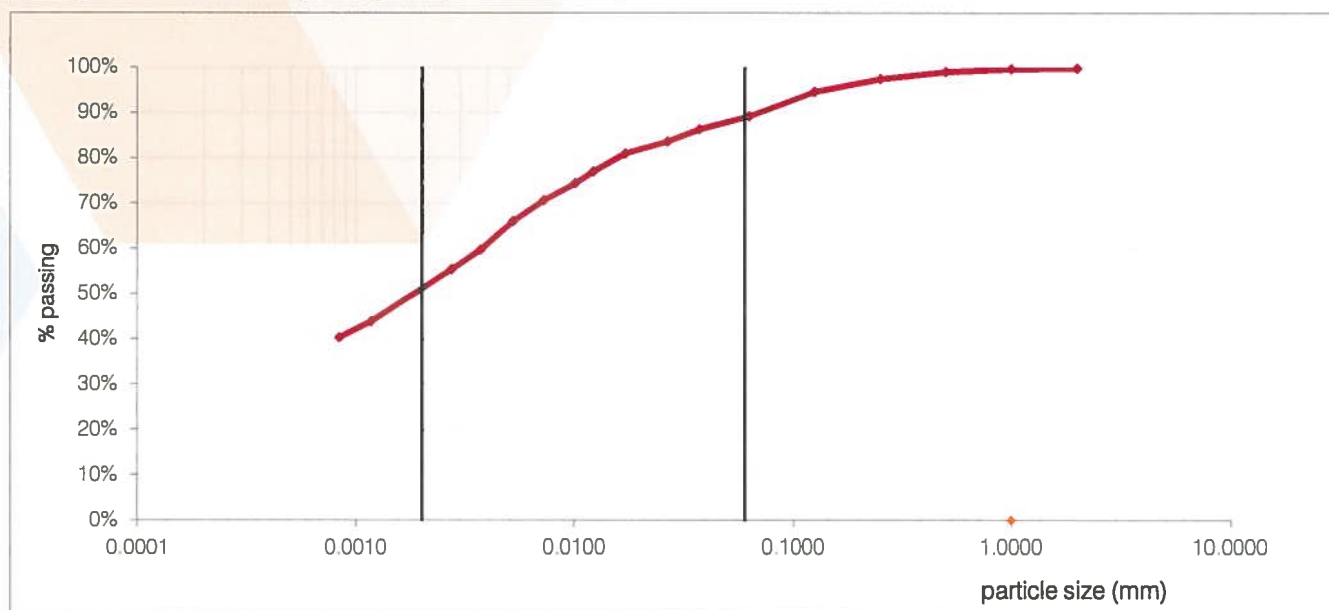
Difficulty in dispersing 2mm fraction

Dispersion device used

Apparatus A - mechanically operated stirring device

Dispersion period

Soaked for a minimum of 16 hours and stirred for 1 minute



Paolo Bugeja
Managing Director

Particle-Size Analysis of soil

to ASTM D422 1998

Client AIS Environment Ltd. (Attn: Ms Emma Cassar)
 Location Silt Trap 2, Buskett
 Soil Silt trap sediments
 Analyst Jonathan Azzopardi

Job Ref: J1185
 Borehole/Pit Ref: Silt trap 2
 Sample No: S15/0789
 Depth (m): N.A.
 Date tested: 03/07/2015
 Report No: 2

Method of preparation Sampled from silt trap, crushed with pestle and mortar, riffled, wet sieved using distilled water, dried in oven for a minimum of 24hrs and weighed. Each portion was treated with 6% H₂O₂ (hydrogen peroxide) by volume to distilled water. This solution was added to each portion until no more effervescence was observed. Each portion was dried and re-weighed such as to determine the particle size distribution of organics too. A sample was taken for sedimentation.

Wet sieving

Sieve	aperture	mass of sieve	mass of sieve & retained (without organics)	mass of soil retained (without organics)	mass of soil passing (without organics)	% passing (without organics)	mass of organic content	Total mass of soil passing (including organics)
	microns	g	g	g	g		g	g
	2000	396.50	396.90	0.40	291.40	99.86%		0.40
18	1000	355.10	355.56	0.46	290.94	99.71%	0.04	0.50
40	500	312.50	314.25	1.75	289.19	99.11%	0.05	1.80
	425							
60	250	437.30	441.83	4.53	284.66	97.55%	0.31	4.84
100	125	279.60	287.20	7.60	277.06	94.95%	0.70	8.30
	75							
200	63	257.66	273.46	15.80	261.26	89.53%	0.52	16.32
pan		1259.38	1520.64	261.26			6.09	267.35

Analysis for sample part without organics

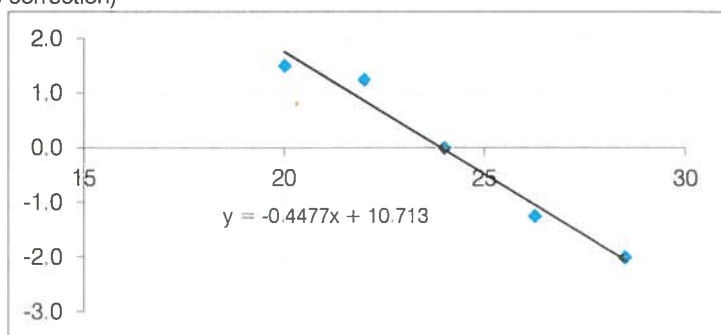
plastic container	1259.38	g		
plastic container + dry soil passing 63 micron	1520.64	g		
passing 63µm sieve	261.26	g		
remaining in pan after drying sieves	0.00	g		
total passing 63µm sieve	261.26	g	- equivalent to	89.53% of total
total mass of soil (dry)	291.80	g		

J1185 - Silt trap 2 - S15/0789

Composite correction for Hydrometer reading

(dispersant + effect of variation in temperature + meniscus correction)

Temp.	Hydro- meter
°C	
20.00	1.5000
22.00	1.2500
24.00	0.0000
26.25	-1.2500
28.50	-2.0000



Specific gravity of soil particles, G_s 2.600
Specific gravity assumed? Yes

Hydrometer used 152H ▼

Sedimentation test

Container for sedimentation specimen 596.69 g
Container + dry specimen 645.59 g
mass passing 63 μ used for sedimentation 48.90 g - equivalent to 89.53% of 54.62g

mass of sample represented by mass used in hydrometer test W 54.62 g

Sedimentation

Time	Hydrometer reading	Temp.	Hydrometer correction	Hydro- meter reading corrected	% of soil remaining in suspension	Constant K (depending on temp and G_s)	L	D
min		°C			%		cm	mm
0.00								
1.00	48.0	24.0	-0.0318	47.9682	88.71	0.013010	8.42	0.03776
2.00	46.0	24.0	-0.0318	45.9682	85.01	0.013010	8.75	0.02721
5.00	43.0	24.0	-0.0318	42.9682	79.46	0.013010	9.24	0.01769
10.00	42.0	24.0	-0.0318	41.9682	77.61	0.013010	9.41	0.01262
15.00	40.5	24.3	-0.1661	40.3339	74.59	0.012965	9.65	0.01040
30.00	38.0	24.3	-0.1661	37.8339	69.97	0.012965	10.06	0.00751
60.00	36.0	24.5	-0.2557	35.7444	66.10	0.012935	10.39	0.00538
120.00	34.0	24.3	-0.1661	33.8339	62.57	0.012965	10.72	0.00387
240.00	31.5	24.0	-0.0318	31.4682	58.19	0.013010	11.13	0.00280
1440.00	26.5	24.0	-0.0318	26.4682	48.95	0.013010	11.95	0.00119
2880.00	25.5	24.3	-0.1661	25.3339	46.85	0.012965	12.11	0.00084

J1185 - Silt trap 2 - S15/0789

Summary of results (without organics)

Method	Diameter	% passing
Wet sieving	5.6000	
	4.0000	
	2.0000	99.86%
	1.0000	99.71%
	0.5000	99.11%
	0.4250	
	0.2500	97.55%
	0.1250	94.95%
	0.0750	
	0.0630	89.53%
Hydrometer analysis	0.0378	88.71%
	0.0272	85.01%
	0.0177	79.46%
	0.0126	77.61%
	0.0104	74.59%
	0.0075	69.97%
	0.0054	66.10%
	0.0039	62.57%
	0.0028	58.19%
	0.0012	48.95%
	0.0008	46.85%

Size fractions

	passing	fraction
Clay	53.61%	53.61%
Silt	89.44%	35.83%
Sand		10.56%

Maximum particle size 2 mm

Visible particle shape

Visible particle hardness

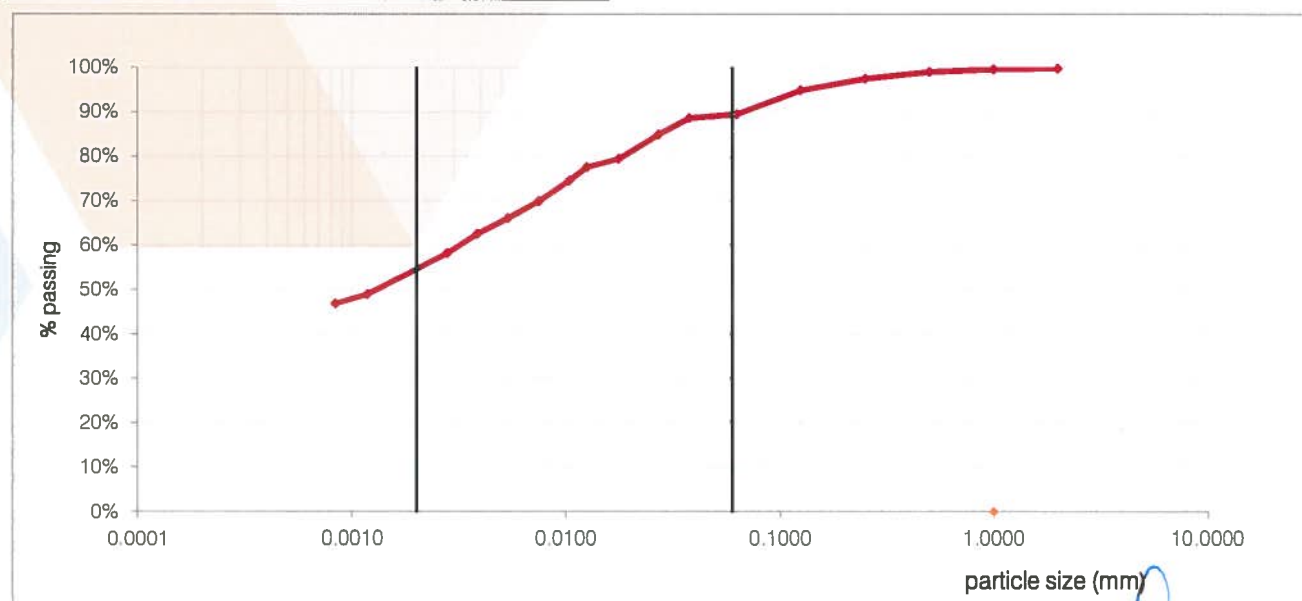
Difficulty in dispersing 2mm fraction

Dispersion device used

Apparatus A - mechanically operated stirring device

Dispersion period

Soaked for a minimum of 16 hours and stirred for 1 minute




 Paolo Bugeja
 Managing Director