

Annexure 6

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List of Team Members

The following staff were engaged at different stages of the project-

Project Manager: Mr. Umesh Gupta
Project Leader: Mr. Rajesh Kumar Roshan
Field Staff: Mr. Pawan Kumar Mishra

Laboratory Staff

Lab Manager: Mr. Umesh Gupta
Senior Officer: Mr. Sachin Gupta
Senior Analyst: Mr. Jai Bhagwan.
Analyst, AAS/ICP: Mr. Shahzad Siddiqui
Analyst, AAS/ICP: Mr. Praveen
Analyst: Ms. Annapurna
Analyst: Ms. Nutan Das
Analyst: Mohd. Shahid
Lab Attendant Mr. Bhesh Raj
Lab Attendant Mr. Dina Nath

*For sorting at the Landfill Site some local labourers / Rag pickers were involved.

Authorized Signatory:

Objective & Scope of Work

1. Objective:

The objective of this study was to carry out physical Characterization, Chemical Characterization at Shimla City from seven different sites. There is also one day Quantification of Solid Waste generated from the Shimla City.

2. Scope of Work:

A) Physical Characterization of MSW:

Percentage wise (%) Gravimetric Profiling of the garbage including the following:

- ✚ Density (Kg/M^3) of garbage in each transport vehicle without compaction in case of an open truck.
- ✚ Metals
- ✚ Glass/Ceramics
- ✚ Food and Carbon waste
- ✚ Paper and Cardboard
- ✚ Textiles
- ✚ Plastics
- ✚ Rubber/Leather
- ✚ Inert
- ✚ Misc. Combustible
- ✚ Misc. Incombustible
- ✚ Moisture

Note: Segregation to be as exclusive as possible and all individual components to be reported.

B) Chemical Characterization of MSW:

Following Tests /Parameters are to be undertaken during chemical analysis:

- ✚ pH
- ✚ Nitrogen
- ✚ Phosphorus
- ✚ Potassium

- ✚ Carbon
- ✚ C/N Ratio
- ✚ Calorific value (kcal/Kg)
- ✚ Color
- ✚ Temperature
- ✚ Organic Matter

ii.
iii.
iv.
v.

C) Particle Size Distribution of MSW:

Particle size distribution of solid waste is undertaken using different size of sieves as follows:

- ✚ 10 mm
- ✚ 20 mm
- ✚ 50 mm
- ✚ 100 mm
- ✚ 200 mm

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Methodology adopted for Physical Characterization of Municipal Solid Waste:

Physical Characterization of MSW was done in the presence of Municipal Corporation of Shimla representative. Total 7 number of samples (Tippers, Dumpers) containing MSW were analyzed for physical Characterization. It was insured that none of the sample remain lower than the standard sampling pre-requisite. Tippers/Dumpers from identified areas were taken for the sampling. The net weight of the content was determined by weighing with a weighbridge – near /on the way to site). To determine the density of waste measurement of garbage volume in the RC/Dumper placer was done. Whole waste was dropped on plastic sheet so as to avoid intermixing with the exiting components in the landfill.

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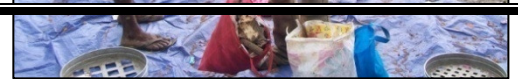
The truck contents were then physically separated for the components as mentioned earlier in the scope of work above. Segregation of the components was as exclusive as possible and all the individual components separated were reported. Each of the fractions separated was then weighed individually using a suitable weighing device by the personnel's of Spectro Analytical Labs Ltd., Okhla Industrial Area Phase - II, New Delhi.

entire dumper contents weight.

The aggregate of all fraction weights comprised the



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Methodology adopted for Chemical Characterization of Municipal Solid Waste:

Samples for Chemical Characterization of MSW were collected in presence of Municipal Corporation of Shimla representative. The sample collection was as per the quarter and coning method.

For chemical testing the samples collected consisted of approx 5 Kgs of mixed waste in plastic envelopes to ensure minimum loss of moisture etc. In all seven number of samples were collected for the chemical characterization of the waste. The details are appended in the next chapter.

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QUANTIFICATION OF MUNICIPAL SOLID WASTE GENERATED FROM SHIMLA CITY ON 05/08/2010

Time	Solid Waste collection Location	Vehicle No	Vehicle Type	Gross weight (Kgs.)	Empty weight (Kgs.)	Net weight (Kgs.)
3:50 AM	Dhalli Chowk	HP 07A 0730	Dumper	4465	3845	620
4:30 AM	Mahali Chowk	HP 07A 0733	Dumper	4580	3830	750
5:00 AM	High Court/KNH	HP 07A 5384	Tunner	5955	5045	910
5:10 AM	Panchayat Bhawan	HP 07B 0735	Dumper	4750	3840	910
5:15 AM	Sabji Mandi	HP 07A 0732	Dumper	4470	3850	620
5:30 AM	Bhatta Kuffer	HP 07A 0730	Dumper	4345	3845	500
6:00 AM	Sabji Mandi	HP 07A 0732	Dumper	4705	3850	855
6:00 AM	Indira Gandhi Medical College (IGMC)	HP 07A 0734	Dumper	4620	3840	780
6:05 AM	Lower Bazar	HP 07A 0731	Dumper	4665	3840	825
6:20 AM	Bhatta Kuffer 1	HP 07A 0730	Dumper	4590	3845	745
6:20 AM	Tootu Chowk	HP 07A 0733	Dumper	4495	3830	665
6:25 AM	PNB/Library	HP 07A 5384	Tunner	5930	5045	885
6:25 AM	Caffe Coffey Sanjauli	HP 07B 0735	Dumper	4485	3840	645
6:30 AM	Manchanda/Diplome nt	HP 07A 0736	Tunner	5955	5045	910
6:45 AM	Lower Bazar	HP 07A 0734	Dumper	4460	3840	620
6:50 AM	Baluganj Bazar	HP 07A 0731	Dumper	4470	3840	630
7:05 AM	Dalton	HP 07A 0732	Dumper	4380	3850	530
7:20 AM	Dargah/Chakkar	HP 07A 5384	Tunner	6085	5045	1040
7:25 AM	KNH	HP 07A 0733	Dumper	4450	3830	620
7:30 AM	Kolkata Tea Stall	HP 07B 0735	Dumper	4600	3840	760
7:40 AM	Oakland tunnel	HP 07A 0730	Dumper	4570	3845	725
7:50 AM	Kalnog	HP 07A 0732	Dumper	4475	3850	625

Solid waste Categorization and quantification in/at Shimla City

Time	Solid Waste collection Location	Vehicle No	Vehicle Type	Gross weight (Kgs.)	Empty weight (Kgs.)	Net weight (Kgs.)
8:00 AM	Boys Hostel Summer Hill	HP 07A 0731	Dumper	4505	3840	665
8:05 AM	Nigam Vihar	HP 07B 0735	Dumper	4370	3840	530
8:30 AM	Sanjauli college	HP 07A 0730	Dumper	4525	3845	680
8:30 AM	Bus Stand	HP 07A 0734	Dumper	4485	3840	645
8:33 AM	Castopan/Govt college	HP 07A 0736	Tunner	6180	5045	1135
8:35 AM	Chota Shimla Bus stand	HP 07A 0733	Dumper	4640	3830	810
8:40 AM	B Park	HP 07A 5384	Tunner	5530	5045	485
8:40 AM	Ridge	HP 07A 0732	Dumper	4360	3850	510
8:45 AM	Knowood	HP 07A 0731	Dumper	4350	3840	510
8:50 AM	Bus Stand area	HP 07A 0647	Tipper	4165	3035	1130
9:00 AM	Khangna Dhar No 4	HP 07B 0735	Dumper	4445	3840	605
9:20 AM	Main Bus Stand	HP 07A 0734	Dumper	4425	3840	585
9:25 AM	Kapil Hotel	HP 07A 0730	Dumper	4350	3845	505
9:30 AM	HHH (Hotel Holiday Home)	HP 07A 0732	Dumper	4340	3850	490
9:35 AM	Lower Bazar Area	HP 07 5305	Big Tipper	10255	7245	3010
9:45 AM	BCS/BCS	HP 07A 0736	Tunner	6065	5045	1020
10:00 AM	Clark Area	HP 07A 0647	Tipper	4540	3035	1505
10:20 AM	Him Karan Sanjauli	HP 07B 0735	Dumper	4695	3840	855
10:25 AM	Tootu Bangala Colony	HP 07A 0733	Dumper	4580	3830	750
10:25 AM	Chaura Maidan	HP 07A 0734	Dumper	4550	3840	710
10:25 AM	Ridge, Chota Shimla area	HP 07A 0646	Tipper	4005	3040	965
10:30 AM	Dhalli, Cemetery, Nobhar	HR 37B 5529	Pickup	2780	1940	840

Solid waste Categorization and quantification in/at Shimla City

Time	Solid Waste collection Location	Vehicle No	Vehicle Type	Gross weight (Kgs.)	Empty weight (Kgs.)	Net weight (Kgs.)
10:30 AM	New Shimla Area	HP 07B 2328	Pickup	3650	2140	1510
10:35 AM	State bank of india	HP 07A 0730	Dumper	4340	3845	495
10:40 AM	Lakkar Bazar, Sanjauli area	HP 07A 0644	Tipper	3875	3035	840
11:00 AM	Sector 4/Sector 2 New Shimla	HP 07A 0736	Tunner	6160	5045	1115
11:00 AM	Long wood, Lakkar Bazar	HP 07A 0713	Pickup	1835	1610	225
11:15 AM	Sector 4 new shimla	HP 07B 0735	Dumper	4490	3840	650
11:30 AM	Kathu Jail	HP 07A 0734	Dumper	4310	3840	470
11:35 AM	Kenthu area	HP 07A 0718	Pickup	2115	1625	490
11:45 AM	Himland	HP 07A 5384	Tunner	5685	5045	640
12:10 PM	BCS School	HP 07B 0735	Dumper	4820	3840	980
12:15 PM	NABHA	HP 07A 0734	Dumper	4820	3840	980
12:15 PM	Mall Road Area	HP 07A 0648	Tipper	4465	3040	1425
1:00 PM	Ghora Chowki	HP 07A 0644	Tipper	3600	3035	565
1:05 PM	Sector 8 New Shimla	HP 07B 0735	Dumper	4435	3840	595
1:05 PM	Sanjauli/Dhalli	HP 07A 0736	Tunner	5675	5045	630
1:10 PM	Bhatta Kuffer, Houseing Board Colony	HP 63 1243	Pickup	2985	1945	1040
1:25 PM	Long wood area	HP 07A 0713	Pickup	1805	1610	195
2:15 PM	Panchayat Bhawan	HP 07B 0735	Dumper	4700	3840	860
2:25 PM	Phingas area	HP 07A 0718	Pickup	2145	1625	520
3:20 PM	Mischamper Khalini	HP 07A 0736	Tunner	5535	5045	490
5:50 PM	Chabra, Yashobhara, Woodpark, Woodrina	HR 37B 5529	Pickup	2850	1940	910
Total weight of Municipal Solid Waste generated in Shimla City =						50,735

LOCATION OF THE COLLECTION POINTS

S.No.	Name of Location	Category	Sample No.	Analysis		
				Physical	Particle Size Distribution	Chemical
1	Sanjoli, Lakkar Bazar	Mixed Area	1	Yes	Yes	Yes
2	Vikash Nagar	Residential	2	Yes	Yes	Yes
3	Bihari Line near Bus Stand	Residential	3	Yes	Yes	Yes
4	Sai Bhawan / Sector 2	Residential	4	Yes	Yes	Yes
5	DC Office	Commercial	5	Yes	Yes	Yes
6	Castopan, Diploment	Commercial	6	Yes	Yes	Yes
7	Gulmarg	Mixed Area	7	Yes	Yes	Yes

Authorized Signatory:

PHYSICAL CHARACTERIZATION

Sample No. : 1
Identification of the Waste : Mixed Area
Collection Point : Sanjauli, Lakkar Bazar
Date of Monitoring : 03/08/2010
Vehicle No. : HP07A/0644
Net Content (Material) Kgs : 4220-3035 = 1185 Kgs.
Density of the Material, Kg/m³ : 313.5

Physical Characterization of Municipal Solid Waste in/at Shimla city

S.No.	Components	Weight of Components (Kg)	Percentage (%)
1	Metals	2	0.2
2	Glass/Ceramics	8	0.7
3	Food & Carbon waste	488	41.2
4	Paper & Cardboard	89	7.5
5	Textiles	34	2.9
6	Plastic	103	8.7
7	Rubber/Leather	11	0.9
8	Inert	142	11.9
9	Misc. Combustible	172	14.5
10	Misc. Incombustible	136	11.5

Authorized Signatory:

PHYSICAL CHARACTERIZATION

Sample No. : 2
Identification of the Waste : Residential Area
Collection Point : Vikash Nagar
Date of Monitoring : 03/08/2010
Vehicle No. : HP07B/0735
Net Content (Material) Kgs : 4590-3840 = 750 Kgs.
Density of the Material, Kg/m³ : 207.64

Physical Characterization of Municipal Solid Waste in/at Shimla city

S.No.	Components	Weight of Components (Kg)	Percentage (%)
1	Metals	1	0.1
2	Glass/Ceramics	12	1.6
3	Food & Carbon waste	286	38.1
4	Paper & Cardboard	122	16.3
5	Textiles	41	5.5
6	Plastic	90	12.0
7	Rubber/Leather	25	3.3
8	Inert	71	9.5
9	Misc. Combustible	21	2.8
10	Misc. Incombustible	81	10.8

Authorized Signatory:

PHYSICAL CHARACTERIZATION

Sample No. : 3
Identification of the Waste : Residential Area
Collection Point : Bihari Line near Bus stand
Date of Monitoring : 03/08/2010
Vehicle No. : HP07B/0734
Net Content (Material) Kgs : 5170-3845 = 1325 Kgs.
Density of the Material, Kg/m³ : 366.8

Physical Characterization of Municipal Solid Waste in/at Shimla

S.No.	Components	Weight of Components (Kg)	Percentage (%)
1	Metals	3	0.2
2	Glass/Ceramics	8	0.6
3	Food & Carbon waste	662	49.9
4	Paper & Cardboard	141	10.6
5	Textiles	29	2.2
6	Plastic	152	11.5
7	Rubber/Leather	9	0.7
8	Inert	116	8.8
9	Misc. Combustible	59	4.5
10	Misc. Incombustible	146	11

Authorized Signatory:

PHYSICAL CHARACTERIZATION

Sample No. : 4
Identification of the Waste : Residential
Collection Point : Sai Bhawan, Sector II
Date of Monitoring : 03/08/2010
Vehicle No. : HP07B/0736
Net Content (Material) Kgs : 6065-5045 = 1020 Kgs.
Density of the Material, Kg/m³ : 184.1

Physical Characterization of Municipal Solid Waste in/at Shimla city

S.No.	Components	Weight of Components (Kg)	Percentage (%)
1	Metals	3	0.3
2	Glass/Ceramics	15	1.5
3	Food & Carbon waste	435	42.6
4	Paper & Cardboard	162	15.9
5	Textiles	56	5.5
6	Plastic	84	8.2
7	Rubber/Leather	9	0.9
8	Inert	84	8.2
9	Misc. Combustible	75	7.4
10	Misc. Incombustible	97	9.5

Authorized Signatory:

PHYSICAL CHARACTERIZATION

Sample No. : 5
Identification of the Waste : Commercial
Collection Point : DC Office
Date of Monitoring : 04/08/2010
Vehicle No. : HP07B/0734
Net Content (Material) Kgs : 4355-3845 = 510 Kgs.
Density of the Material, Kg/m³ : 313.5

Physical Characterization of Municipal Solid Waste in/at Shimla city

S.No.	Components	Weight of Components (Kg)	Percentage (%)
1	Metals	0.5	0.1
2	Glass/Ceramics	3.5	0.7
3	Food & Carbon waste	96	18.8
4	Paper & Cardboard	167	32.8
5	Textiles	16	3.1
6	Plastic	87	17.1
7	Rubber/Leather	14	2.7
8	Inert	31	6.1
9	Misc. Combustible	22	4.3
10	Misc. Incombustible	73	14.3

Authorized Signatory:

PHYSICAL CHARACTERIZATION

Sample No. : 6
Identification of the Waste : Commercial
Collection Point : Castopan, Diploment
Date of Monitoring : 04/08/2010
Vehicle No. : HP07B/0736
Net Content (Material) kgs : 6025-5045 = 980 kgs
Density of the Material, Kg/m³ : 176.89

Physical Characterization of Municipal Solid Waste in/at Shimla

S. No.	Components	Weight of Components (Kg)	Percentage (%)
1	Metals	2	0.2
2	Glass/Ceramics	21	2.1
3	Food & Carbon waste	354	36.1
4	Paper & Cardboard	164	16.8
5	Textiles	59	6
6	Plastic	116	11.8
7	Rubber/Leather	21	2.2
8	Inert	96	9.8
9	Misc. Combustible	57	5.8
10	Misc. Incombustible	90	9.2

Authorized Signatory:

PHYSICAL CHARACTERIZATION

Sample No. : 7
Identification of the Waste : Mixed Area
Collection Point : Gulmarg
Date of Monitoring : 04/08/2010
Vehicle No. : HP07B/0734
Net Content (Material) Kgs : 4980-3845 = 1135 Kgs.
Density of the Material, Kg/m³ : 314.23

Characterization of Municipal Solid Waste in/at Shimla city

S. No.	Components	Weight of Components (Kg)	Percentage (%)
1	Metals	11	0.9
2	Glass/Ceramics	19	1.7
3	Food & Carbon waste	295	26.0
4	Paper & Cardboard	205	18.1
5	Textiles	78	6.8
6	Plastic	164	14.5
7	Rubber/Leather	55	4.8
8	Inert	129	11.4
9	Misc. Combustible	54	4.8
10	Misc. Incombustible	125	11.0

Authorized Signatory:

PARTICLE SIZE DISTRIBUTION

Sample No. : 1
 Identification of the Waste : Mixed Area
 Collection Point : Sanjauli, Lakkar Bazar
 Date of Monitoring : 03/08/2010
 Vehicle No. : HP07A/0644
 Net Content (Material) Kgs : 4220-3035 = 1185 Kgs.
 Density of the Material, Kg/m³ : 313.5

SIEVE ANALYSIS		
	SIZE RANGES / FRACTIONS	WEIGHT (%)
1.	< 10 mm	6
2.	10 mm - 20 mm	21
3.	20 mm - 50 mm	32
4.	50 mm - 100 mm	25
5.	100 mm - 200 mm	13
6.	> 200 mm	3

Authorized Signatory:

PARTICLE SIZE DISTRIBUTION

Sample No. : 2
Identification of the Waste : Residential Area
Collection Point : Vikash Nagar
Date of Monitoring : 03/08/2010
Vehicle No. : HP07B/0735
Net Content (Material) Kgs : 4590-3840 = 750 Kgs.
Density of the Material, Kg/m³ : 207.64

SIEVE ANALYSIS		
	SIZE RANGES / FRACTIONS	WEIGHT (%)
1.	< 10 mm	3
2.	10 mm - 20 mm	24
3.	20 mm - 50 mm	26
4.	50 mm - 100 mm	29
5.	100 mm - 200 mm	16
6.	> 200 mm	2

Authorized Signatory:

PARTICLE SIZE DISTRIBUTION

Sample No. : 3
Identification of the Waste : Residential Area
Collection Point : Bihari Line near Bus stand
Date of Monitoring : 03/08/2010
Vehicle No. : HP07B/0734
Net Content (Material) Kgs : 5170-3845 = 1325 Kgs.
Density of the Material, Kg/m³ : 366.8

SIEVE ANALYSIS		
	SIZE RANGES / FRACTIONS	WEIGHT (%)
1.	< 10 mm	4
2.	10 mm - 20 mm	26
3.	20 mm - 50 mm	27
4.	50 mm - 100 mm	31
5.	100 mm - 200 mm	12
6.	> 200 mm	0

Authorized Signatory:

PARTICLE SIZE DISTRIBUTION

Sample No. : 4
Identification of the Waste : Residential
Collection Point : Sai Bhawan, Sector II
Date of Monitoring : 03/08/2010
Vehicle No. : HP07B/0736
Net Content (Material) Kgs : 6065-5045 = 1020 kgs.
Density of the Material, Kg/m³ : 184.1

SIEVE ANALYSIS		
	SIZE RANGES / FRACTIONS	WEIGHT (%)
1.	< 10 mm	3
2.	10 mm - 20 mm	20
3.	20 mm - 50 mm	30
4.	50 mm - 100 mm	26
5.	100 mm - 200 mm	20
6.	> 200 mm	1

Authorized Signatory:

PARTICLE SIZE DISTRIBUTION

Sample No. : 5
Identification of the Waste : Commercial
Collection Point : DC Office
Date of Monitoring : 04/08/2010
Vehicle No. : HP07B/0734
Net Content (Material) Kgs : 4355-3845 = 510 Kgs.
Density of the Material, Kg/m³ : 313.5

SIEVE ANALYSIS		
	SIZE RANGES / FRACTIONS	WEIGHT (%)
1.	< 10 mm	2
2.	10 mm - 20 mm	12
3.	20 mm - 50 mm	19
4.	50 mm - 100 mm	30
5.	100 mm - 200 mm	32
6.	> 200 mm	5

Authorized Signatory:

PARTICLE SIZE DISTRIBUTION

Sample No. : 6
Identification of the Waste : Commercial
Collection Point : Castopan, Diploment
Date of Monitoring : 04/08/2010
Vehicle No. : HP07B/0736
Net Content (Material) Kgs : 6025-5045 = 980 Kgs.
Density of the Material, Kg/m³ : 176.89

SIEVE ANALYSIS		
	SIZE RANGES / FRACTIONS	WEIGHT (%)
1.	< 10 mm	4
2.	10 mm - 20 mm	17
3.	20 mm - 50 mm	24
4.	50 mm - 100 mm	28
5.	100 mm - 200 mm	25
6.	> 200 mm	2

Authorized Signatory:

PARTICLE SIZE DISTRIBUTION

Sample No. : 7
Identification of the Waste : Mixed Area
Collection Point : Gulmarg
Date of Monitoring : 04/08/2010
Vehicle No. : HP07B/0734
Net Content (Material) Kgs : 4980-3845 = 1135 Kgs.
Density of the Material, Kg/m³ : 314.23

SIEVE ANALYSIS		
	SIZE RANGES / FRACTIONS	WEIGHT (%)
1.	< 10 mm	6
2.	10 mm - 20 mm	14
3.	20 mm - 50 mm	26
4.	50 mm - 100 mm	31
5.	100 mm - 200 mm	19
6.	> 200 mm	4

Authorized Signatory:

CHEMICAL COMPOSITION ANALYSIS

Sample No : 1
Location : Sanjauli, Lakkar Bazar
Identification : Mixed Area
Date of Collection : 03/08/2010

S.No.	Parameter	Test Results
1	pH	6.23
2	Moisture (%), w/w	52.5
3	Nitrogen (%), w/w	0.71
4	Phosphorous (%), w/w	0.25
5	Potassium (%), w/w	0.63
6	Total carbon (%), w/w	36.96
7	C/N ratio	52.06
8	Calorific value (kcal/Kg)	2950
9	Colour	Gray
10	Temperature, °C	12.5
11	Organic Matter (%), w/w	47.5

Authorized Signatory:

CHEMICAL COMPOSITION ANALYSIS

Sample No : 2
Location : Vikash Nagar
Identification : Residential Area
Date of Collection : 03/08/2010

S.No.	Parameter	Test Results
1	pH	6.48
2	Moisture (%), w/w	58.3
3	Nitrogen (%), w/w	0.87
4	Phosphorous (%), w/w	0.39
5	Potassium (%), w/w	0.32
6	Total carbon (%), w/w	35.48
7	C/N ratio	40.78
8	Calorific value (kcal/Kg)	2840
9	Colour	Gray
10	Temperature, °C	13.4
11	Organic Matter (%), w/w	41.7

Authorized Signatory:

CHEMICAL COMPOSITION ANALYSIS

Sample No : 3
Location : Bihari Line near Bus stand
Identification : Residential area
Date of Collection : 03/08/2010

S.No.	Parameter	Test Results
1	pH	5.31
2	Moisture (%), w/w	56.9
3	Nitrogen (%), w/w	1.24
4	Phosphorous (%), w/w	0.27
5	Potassium (%), w/w	0.51
6	Total carbon (%), w/w	39.92
7	C/N ratio	32.19
8	Calorific value (kcal/Kg)	3190
9	Colour	Gray
10	Temperature, °C	14.5
11	Organic Matter (%), w/w	43.1

Authorized Signatory:

CHEMICAL COMPOSITION ANALYSIS

Sample No : 4
Location : Sai Bhawan, Sector II
Identification : Residential
Date of Collection : 03/08/2010

S.No.	Parameter	Test Results
1	pH	4.86
2	Moisture (%), w/w	49.4
3	Nitrogen (%), w/w	0.84
4	Phosphorous (%), w/w	0.32
5	Potassium (%), w/w	0.46
6	Total carbon (%), w/w	34.08
7	C/N ratio	40.57
8	Calorific value (kcal/Kg)	2720
9	Colour	Gray
10	Temperature, °C	10.4
11	Organic Matter (%), w/w	40.44

Authorized Signatory:

CHEMICAL COMPOSITION ANALYSIS

Sample No : 5
Location : DC Office
Identification : Commercial
Date of Collection : 04/08/2010

S.No.	Parameter	Test Results
1	pH	6.84
2	Moisture (%), w/w	40.7
3	Nitrogen (%), w/w	0.68
4	Phosphorous (%), w/w	0.17
5	Potassium (%), w/w	0.28
6	Total carbon (%), w/w	25.04
7	C/N ratio	36.82
8	Calorific value (kcal/Kg)	2480
9	Colour	Gray
10	Temperature, °C	10.5
11	Organic Matter (%), w/w	30.03

Authorized Signatory:

CHEMICAL COMPOSITION ANALYSIS

Sample No : 6
Location : Castopan, Diploment
Identification : Commercial
Date of Collection : 04/08/2010

S.No.	Parameter	Test Results
1	pH	6.13
2	Moisture (%), w/w	48.5
3	Nitrogen (%), w/w	1.19
4	Phosphorous (%), w/w	0.24
5	Potassium (%), w/w	0.65
6	Total carbon (%), w/w	38.88
7	C/N ratio	32.67
8	Calorific value (kcal/Kg)	3040
9	Colour	Gray
10	Temperature, °C	10.5
11	Organic Matter (%), w/w	34.24

Authorized Signatory:

CHEMICAL COMPOSITION ANALYSIS

Sample No : 7
Location : Gulmarg
Identification : Mixed Area
Date of Collection : 04/08/2010

S.No.	Parameter	Test Results
1	pH	6.75
2	Moisture (%), w/w	45.4
3	Nitrogen (%), w/w	0.93
4	Phosphorous (%), w/w	0.25
5	Potassium (%), w/w	0.34
6	Total carbon (%), w/w	30.8
7	C/N ratio	33.11
8	Calorific value (kcal/Kg)	2670
9	Colour	Gray
10	Temperature, °C	11.2
11	Organic Matter (%), w/w	39.64

Authorized Signatory: