Monthly Performance Report
(HWT-NG100-MPR-16-R0)

November 2017
(From 01/11/2017 to 30/11/2017)

100 TPD Municipal Solid Waste (MSW) Facility
Calangute, North Goa

Prepared By

Hindustan Waste Treatment Pvt. Ltd.
(HWT)

Submitted To

Department of Science & Technology (DS&T)

&

Goa State Infrastructural Development Corporation Limited (GSIDC)

Table – 1

Summary of Overall Average Results for November 2017

(As compared to Schedule – 7: Performance Standards, Volume – I of RFP)

Sr. No.	Parameter	Performance Standard As per Schedule – 7	Actual Performace at Plant (Monthly Average)
1.	Number of fractions of recyclables sorted per day from the input mixed waste	Minimum 10 numbers of fractions shall be sorted daily from the input dry waste as received in the facility. The list of fractions are as follows: 1. PET Bottles 2. Mixed Plastic Articles 3. Newspapers / other Paper Material 4. Cardboard 5. Styrofoam &Thermocol 6. Coconut Shells 7. Clothes 8. Rubber Articles 9. Metal Articles & Cans 10. E-waste Articles and any Hazardous Waste	13 numbers of fractions are being sorted daily from the input dry waste as received in the facility. The list of fractions are as follows: 1. Glass 2. Metal Articles & Cans 3. Tetrapacks 4. Paper / Cardboard 5. Plastic Film 6. Hard Plastics 7. PET Bottles 8. Styrofoam &Thermocol 9. Cloth / Rags / Textile 10. Jute bags 11. Leather / Rubber / Rexine 12. Coconut Shells 13. E-waste Articles and any Hazardous Waste
2.	Quantum of reject/residues to be sent to the landfill after processing. No organic fraction shall be disposed in the landfill.	Maximum 10% of inert of the total input waste as received in the facility (in TPD).	Input waste to the Plant is **144.70 TPD**. Quantum of Inert is **4.21 TPD** which is **< 10%** of the Total Input Waste as received in the Facility. No Organic Waste has been disposed in the Sanitary Landfill Facility.
3.	Electricity generation in the Plant	Minimum electricity to be generated in the plant shall be 0.40 MW per 100 tons of input wet biodegradable waste as received in the Facility (in TPD).	Electricity generation is **0.52** MW/100 tons of Input Biodegradable Waste as received in the Facility (in TPD).

<table>
<tr><th>Sr. No.</th><th>Parameter</th><th>Performance Standard
As per Schedule – 7</th><th>Actual Performace at Plant
(Monthly Average)</th></tr>
<tr><td>4.</td><td>Biogas Flaring System</td><td>The Biogas Flaring System shall strictly be used only in case of emergency and not as a routine practice.</td><td>Biogas is being flared strictly, only under emergency and not as a routine practice. The average running time of Biogas Flaring System is <u>2.41 hours/day</u>.</td></tr>
<tr><td>5.</td><td>Discharge of treated effluent conforming to regulatory norms</td><td>Effluent Treatment Plant shall be operated under all conditions.</td><td>Effluent Treatment Plant is being operated continuously and is meeting all statutory conditions. The Treated Effluent Characteristics are as follows:

<table><tr><td>pH</td><td>7.04</td></tr><tr><td>BOD</td><td>7 mg/l</td></tr><tr><td>COD</td><td>68 mg/l</td></tr><tr><td>TSS</td><td>8 mg/l</td></tr><tr><td>TDS</td><td>1,620 mg/l</td></tr></table>.</td></tr>
<tr><td>6.</td><td>General Housekeeping, hygienic conditions, cleanliness, safety norms, adequate manpower, treatment methodology for plant operation & maintenance and storage conditions in the plant.</td><td>Minimum housekeeping, safety norms and cleanliness conditions shall be maintained at all times as per the Bid Document requirement.</td><td>High standard of Housekeeping, Cleanliness and Safety are being maintained at all times at the Plant.
Adequate manpower has been deployed in all shifts.
Also, the treatment methodology is being followed properly and proper storage conditions have been maintained in the Plant.</td></tr>
</table>

#	Plant Performance Data: November 2017		
Sr. No.	**Content**	**Month**	**Signature**
1	Input Waste Composition	From 01.11.2017 To 30.11.2017	
2	Recyclables		
3	Electricity Generation		
4	Biogas Flare		
5	Effluent Treatment Plant		
6	Inert		
7	Housekeeping		

1 INPUT WASTE COMPOSITION:

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average		8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average	
A	**Input Waste:**																			
1	Dry Waste	TPD	18.180	42.850	41.070	42.040	40.470	33.580	50.140	**38.333**	**26.94%**	33.220	30.730	28.580	33.710	33.840	35.150	32.290	**32.503**	**23.84%**
2	Wet Waste	TPD	67.080	72.780	73.530	71.960	70.260	81.690	78.270	**73.653**	**51.76%**	65.490	88.560	77.430	74.240	66.210	84.490	82.450	**76.981**	**56.47%**
3	Mixed Waste	TPD	38.300	34.360	26.840	26.020	20.580	31.740	27.670	**29.359**	**20.63%**	25.720	27.700	27.560	22.680	20.200	29.880	27.810	**25.936**	**19.03%**
4	Mulched Tree Waste	TPD	1.090	1.300	0.820	1.940	0.430	0.650	0.490	**0.960**	**0.67%**	1.940	0.580	0.880	0.600	1.640	0.650	0.000	**0.899**	**0.66%**
5	**Total.....1+2+3+4**	**TPD**	**124.650**	**151.290**	**142.260**	**141.960**	**131.740**	**147.660**	**156.570**	**142.304**	**1.000**	**126.370**	**147.570**	**134.450**	**131.230**	**121.890**	**150.170**	**142.550**	**136.319**	**1.000**
B	**Input Waste Composition:**																			
1	**Organic / Bio degradable Fraction**	**65.00%**	**83.13**	**87.14**	**84.45**	**82.58**	**78.72**	**95.05**	**89.56**	**85.80**	**60.30%**	**76.32**	**100.28**	**89.12**	**83.74**	**74.57**	**97.04**	**94.24**	**87.90**	**64.48%**
2	**Inorganic / Non-recyclable Fraction (RDF)**		**20.45**	**38.46**	**33.50**	**38.94**	**31.18**	**28.47**	**41.54**	**33.22**	**23.34%**	**31.03**	**24.24**	**24.64**	**25.38**	**26.53**	**27.90**	**24.26**	**26.28**	**19.28%**
3	**Recyclables**	**14.00%**	**17.86**	**21.71**	**20.66**	**16.42**	**18.13**	**19.46**	**20.26**	**19.21**	**13.50%**	**15.43**	**18.11**	**16.93**	**18.00**	**17.00**	**21.08**	**19.33**	**17.98**	**13.19%**
	Glass	0.50%	0.09	0.08	0.13	0.07	0.09	0.09	0.13	**0.10**	**0.07%**	0.11	0.09	0.08	0.08	0.10	0.15	0.10	**0.10**	**0.07%**
	Metal	0.50%	0.41	0.70	0.46	0.55	0.62	0.52	0.77	**0.57**	**0.40%**	0.47	0.49	0.50	0.52	0.45	0.69	0.58	**0.53**	**0.39%**
	Paper / Cardboard / Tetrapack	4.00%	3.64	4.33	2.75	3.65	2.65	3.94	2.44	**3.34**	**2.35%**	2.12	3.04	3.23	2.39	2.24	3.56	2.91	**2.78**	**2.04%**
	Mixed Plastic, Bottles, Cups, Food Packets, Coated Plastics	6.00%	7.01	10.50	8.98	5.91	7.65	8.24	8.63	**8.13**	**5.71%**	5.43	7.76	5.63	9.02	6.96	7.84	8.31	**7.28**	**5.34%**
	Thermocoal / Styrofoam	1.00%	0.11	0.08	0.07	0.14	0.09	0.12	0.11	**0.10**	**0.07%**	0.13	0.09	0.08	0.13	0.12	0.08	0.14	**0.11**	**0.08%**
	Cloth / Rags / Textiles	1.50%	2.12	2.54	3.24	2.44	2.70	3.22	3.35	**2.80**	**1.97%**	2.69	2.82	2.39	2.95	2.77	2.94	3.19	**2.82**	**2.07%**
	Rubber Items	0.50%	0.49	0.48	0.50	0.60	0.53	0.63	0.64	**0.55**	**0.39%**	0.47	0.46	0.65	0.56	0.39	0.65	0.48	**0.52**	**0.38%**
	Coconut		4.00	3.01	4.54	3.07	3.79	2.70	4.20	**3.62**	**2.54%**	4.01	3.36	4.37	2.35	3.97	5.18	3.61	**3.84**	**2.81%**
4	**Inert**	**10.00%**	**3.20**	**3.98**	**3.66**	**4.02**	**3.72**	**4.68**	**5.21**	**4.07**	**2.86%**	**3.59**	**4.94**	**3.76**	**4.11**	**3.79**	**4.14**	**4.72**	**4.15**	**3.05%**
5	**Mulched Tree Waste**	**11.00%**	**1.09**	**1.30**	**0.82**	**1.94**	**0.43**	**0.65**	**0.49**			**1.94**	**0.58**	**0.88**	**0.60**	**1.64**	**0.65**	**0.00**		
	Total.....1+2+3+4+5	**100.00%**									**100.00%**									**100.00%**

2 RECYCLABLES:

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
1	Glass	Kg	87	76	128	71	92	89	125	**95**	114	89	81	79	98	150	100	**102**
2	Metal	Kg	411	696	455	554	619	517	767	**574**	468	487	497	525	451	691	584	**529**
3	Tetrapack	Kg	178	156	124	168	156	185	95	**152**	102	146	103	105	117	128	160	**123**
4	Paper / Cardboard	Kg	3,461	4,171	2,622	3,481	2,492	3,757	2,347	**3,190**	2,021	2,894	3,124	2,283	2,126	3,431	2,748	**2,661**
	Total.....3+4	**Kg**	**3,639**	**4,327**	**2,746**	**3,649**	**2,648**	**3,942**	**2,442**	**3,342**	**2,123**	**3,040**	**3,227**	**2,388**	**2,243**	**3,559**	**2,908**	**2,784**
5	Plastic Films	Kg	5,814	8,851	7,675	5,126	6,307	6,814	7,247	**6,833**	4,608	6,738	4,884	7,762	6,069	6,514	6,856	**6,204**
6	Hard Plastic	Kg	574	913	530	472	635	758	578	**637**	429	598	445	739	445	627	756	**577**
7	Pet	Kg	616	735	772	307	712	667	802	**659**	397	427	304	514	445	698	698	**498**
	Total.....5+6+7	**Kg**	**7,004**	**10,499**	**8,977**	**5,905**	**7,654**	**8,239**	**8,627**	**8,129**	**5,434**	**7,763**	**5,633**	**9,015**	**6,959**	**7,839**	**8,310**	**7,279**
8	Thermocal	Kg	112	76	71	142	92	118	110	**103**	126	89	81	131	122	75	143	**110**
9	Cloth / Rags / Textile	Kg	1,791	1,792	2,371	2,044	1,917	2,289	2,664	**2,124**	2,005	2,167	1,680	2,306	2,272	2,222	2,258	**2,130**
10	Jute Bags	Kg	328	750	873	398	783	930	687	**678**	686	651	713	647	495	721	936	**693**
	Total.....9+10	**Kg**	**2,119**	**2,542**	**3,244**	**2,442**	**2,700**	**3,219**	**3,351**	**2,802**	**2,691**	**2,818**	**2,393**	**2,953**	**2,767**	**2,943**	**3,194**	**2,823**
11	Leather / Rubber / Rexine	Kg	486	484	498	596	527	635	642	**553**	468	457	645	564	390	646	485	**522**
12	Coconut	Kg	4,001	3,011	4,538	3,066	3,794	2,702	4,196	**3,615**	4,006	3,365	4,370	2,349	3,974	5,181	3,607	**3,836**
13	**Total**	**Kg**	**17,859**	**21,711**	**20,657**	**16,425**	**18,126**	**19,461**	**20,260**	**19,214**	**15,430**	**18,108**	**16,927**	**18,004**	**17,004**	**21,084**	**19,331**	**17,984**
		TPD	**17.86**	**21.71**	**20.66**	**16.43**	**18.13**	**19.46**	**20.26**	**19.21**	**15.43**	**18.11**	**16.93**	**18.00**	**17.00**	**21.08**	**19.33**	**17.98**

3 ELECTRICITY GENERATION:

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
A	**Biogas Gensets:**																	
1	Biogas Genset-I: Running Time	hr	18.90	18.95	23.65	23.45	19.65	23.35	23.75	**21.67**	21.20	21.70	21.25	22.95	23.60	23.55	22.25	**22.36**
2	Biogas Genset-I: Energy Generation	kW.hr	2,400	2,900	3,700	3,050	2,170	3,370	3,670	**3,037**	2,970	3,390	2,960	3,500	3,640	3,640	3,310	**3,344**
3	Biogas Genset-II: Running Time	hr	18.50	18.90	23.65	21.30	19.65	23.35	23.75	**21.30**	21.35	21.60	21.15	22.95	23.60	23.50	22.25	**22.34**
4	Biogas Genset-II: Energy Generation	kW.hr	2,850	2,950	3,740	3,770	3,340	3,510	3,760	**3,417**	3,780	3,440	3,490	3,640	3,660	3,720	3,740	**3,639**
5	**Total.....2+4**	**kW.hr**	**5,250**	**5,850**	**7,440**	**6,820**	**5,510**	**6,880**	**7,430**	**6,454**	**6,750**	**6,830**	**6,450**	**7,140**	**7,300**	**7,360**	**7,050**	**6,983**

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
B	**Electricty Generation:**																	
1	**As per Tender:** Minimum electricity to be generated in the plant shall be 0.4 MW per per 100 tons of Input Biodegradable Waste as received in the Facility.																	
2	Biodegradable Waste.....1.B4	Tons	83.13	87.14	84.45	82.58	78.72	95.05	89.56	**85.80**	76.32	100.28	89.12	83.74	74.57	97.04	94.24	**87.90**
3	Electricity Generation required as per Tender.....0.4 x 1000 x B2/100	kWH	240	240	240	240	240	240	240	**240**	240	240	240	240	240	240	240	**240**
4	Electricity generated..... (A2/A1) + (A4/A3)	kWH	281	309	315	307	280	295	313	**300**	317	315	304	311	309	313	317	**312**

4 BIOGAS FLARE:

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
1	**Operation Time**	**hr/day**	3.32	7.25	0.08	0.00	4.72	3.38	3.47	**3.17**	5.75	2.88	8.33	4.00	3.48	2.20	1.68	**4.05**

5 EFFLUENT TREATMENT PLANT:

Sr. No.	Parameter	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
A	**Raw Effluent Quality:**																	
1	Flow	m^3/day	47.80	64.20	69.96	64.15	72.62	72.05	66.63	**65.34**	80.78	64.52	66.77	71.81	29.71	70.42	76.21	**65.75**
2	pH	---	6.07	6.70	7.74	6.45	7.05	7.35	6.65	**6.86**	6.96	7.92	6.15	7.13	6.64	7.26	6.18	**6.89**
3	Biochemical Oxygen Demand (BOD5)	mg/l	2,334	1,667	2,035	1,661	2,218	2,278	2,266	**2,066**	2,007	2,447	1,906	2,148	1,892	1,514	2,040	**1,993**
4	Chemical Oxygen Demand (COD)	mg/l	7,119	3,351	6,410	3,621	4,680	7,290	5,574	**5,435**	4,476	8,491	4,365	6,294	6,357	4,572	5,202	**5,680**
5	Total Suspended Solids (TSS)	mg/l	4,808	4,001	4,986	3,106	5,501	5,331	5,144	**4,697**	4,596	5,334	3,031	3,866	3,084	3,376	4,549	**3,977**
6	Total Dissolve Solids (TDS)	mg/l	1,776	1,336	1,758	1,625	1,651	1,421	1,348	**1,559**	1,376	1,448	1,468	1,474	1,769	1,330	1,413	**1,468**
B	**Treated Effluent Quality:**																	
1	pH	---	7.46	7.08	7.24	6.81	7.08	7.3	7.13	**7.16**	7.06	7.02	6.52	6.54	6.97	6.72	6.91	**6.82**
2	Biochemical Oxygen Demand (BOD5)	mg/l	6	6	9	5	7	8	8	**7**	8	8	7	8	6	9	5	**7**
3	Chemical Oxygen Demand (COD)	mg/l	51	89	51	83	67	66	63	**67**	77	56	57	62	62	71	72	**65**
1	Total Suspended Solids (TSS)	mg/l	7	7	10	6	8	9	9	**8**	9	9	8	9	7	10	6	**8**
2	Total Dissolve Solids (TDS)	mg/l	1,794	1,456	1,934	1,641	1,816	1,492	1,361	**1,642**	1,445	1,535	1,527	1,621	1,928	1,410	1,554	**1,574**

6 DISPOSAL OF INERT:

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
1	**As per Tender:** Maximum 10% of Inerts of the Total Input Waste (excluding Mulched Tree Waste) as received in the Facility.																	
2	**Input Waste**	**TPD**	**124.65**	**151.29**	**142.26**	**141.96**	**131.74**	**147.66**	**156.57**	**142.30**	**126.37**	**147.57**	**134.45**	**131.23**	**121.89**	**150.17**	**142.55**	**136.32**
3	Inert Fraction	**TPD**	**3.20**	**3.98**	**3.66**	**4.02**	**3.72**	**4.68**	**5.21**	**4.07**	**3.59**	**4.94**	**3.76**	**4.11**	**3.79**	**4.14**	**4.72**	**4.15**
4	**% of Total Input Waste.....3/2**	**%**	**2.57%**	**2.63%**	**2.57%**	**2.83%**	**2.82%**	**3.17%**	**3.33%**	**2.85%**	**2.84%**	**3.35%**	**2.80%**	**3.13%**	**3.11%**	**2.76%**	**3.31%**	**3.04%**

7 HOUSEKEEPING:

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
1	Hygenic Conditions	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**
2	Cleanliness	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**
3	Manpower Deployed	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**
4	Safety Norms	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**
5	Treatment Methodology	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**
6	Storage Conditions	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**

1 INPUT WASTE COMPOSITION:

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average		22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average	
A	**Input Waste:**																			
1	Dry Waste	TPD	31.230	30.450	30.840	33.760	29.660	31.360	37.320	32.089	23.39%	36.610	35.100	34.980	37.540	19.090	44.650	35.020	34.713	22.83%
2	Wet Waste	TPD	75.840	71.260	86.290	81.080	79.960	76.190	61.050	75.953	55.35%	83.720	92.160	71.150	95.140	74.300	95.580	90.790	86.120	56.64%
3	Mixed Waste	TPD	33.260	25.600	26.740	21.160	21.710	39.500	30.050	28.289	20.62%	26.120	28.850	27.120	34.160	35.940	29.180	28.090	29.923	19.68%
4	Mulched Tree Waste	TPD	1.330	1.250	0.380	0.750	0.000	0.230	2.270	0.887	0.65%	2.660	1.100	1.910	1.200	1.890	0.000	0.380	1.306	0.86%
5	**Total.....1+2+3+4**	**TPD**	**141.660**	**128.560**	**144.250**	**136.750**	**131.330**	**147.280**	**130.690**	137.217	1.000	**149.110**	**157.210**	**135.160**	**168.040**	**131.220**	**169.410**	**154.280**	152.061	1.000
B	**Input Waste Composition:**																			
1	**Organic / Bio degradable Fraction**	**65.00%**	**89.81**	**81.70**	**97.39**	**89.73**	**89.14**	**92.66**	**73.88**	87.76	63.96%	**94.32**	**104.13**	**82.46**	**109.42**	**89.72**	**107.78**	**102.76**	98.66	64.88%
2	**Inorganic / Non-recyclable Fraction (RDF)**		**31.86**	**25.20**	**23.55**	**26.06**	**19.57**	**32.40**	**35.31**	27.71	20.19%	**33.18**	**30.60**	**33.24**	**32.41**	**19.89**	**34.63**	**24.38**	29.76	19.57%
3	**Recyclables**	**14.00%**	**16.18**	**18.06**	**18.59**	**17.20**	**18.49**	**17.85**	**17.93**	17.76	12.94%	**17.43**	**18.41**	**15.79**	**21.07**	**17.79**	**21.38**	**21.77**	19.09	12.56%
	Glass	0.50%	0.10	0.09	0.13	0.11	0.08	0.13	0.07	0.10	0.07%	0.09	0.09	0.14	0.13	0.12	0.12	0.12	0.12	0.08%
	Metal	0.50%	0.45	0.49	0.71	0.59	0.51	0.68	0.63	0.58	0.42%	0.55	0.49	0.45	0.52	0.46	0.71	0.56	0.53	0.35%
	Paper / Cardboard / Tetrapack	4.00%	3.80	3.64	4.15	2.16	3.27	2.27	2.12	3.06	2.23%	2.76	3.66	2.37	2.89	3.07	3.78	3.70	3.18	2.09%
	Mixed Plastic, Bottles, Cups, Food Packets, Coated Plastics	6.00%	6.47	6.67	7.24	7.92	6.26	7.86	8.30	7.25	5.28%	7.66	7.25	6.03	10.79	8.12	6.86	10.23	8.13	5.35%
	Thermocoal / Styrofoam	1.00%	0.13	0.10	0.09	0.08	0.08	0.13	0.09	0.10	0.07%	0.10	0.09	0.12	0.08	0.12	0.10	0.12	0.11	0.07%
	Cloth / Rags / Textiles	1.50%	2.20	2.84	2.22	2.22	3.07	3.00	2.38	2.56	1.87%	2.39	3.49	2.93	2.86	2.24	3.49	3.59	3.00	1.97%
	Rubber Items	0.50%	0.57	0.57	0.48	0.56	0.64	0.50	0.64	0.56	0.41%	0.73	0.74	0.58	0.60	0.41	0.69	0.74	0.64	0.42%
	Coconut		2.46	3.66	3.58	3.57	4.57	3.27	3.71	3.55	2.58%	3.15	2.59	3.18	3.19	3.25	5.62	2.70	3.38	2.23%
4	**Inert**	**10.00%**	**3.81**	**3.60**	**4.72**	**3.76**	**4.12**	**4.37**	**3.57**	3.99	2.91%	**4.18**	**4.07**	**3.68**	**5.14**	**3.82**	**5.62**	**5.37**	4.55	2.99%
5	**Mulched Tree Waste**	**11.00%**	**1.33**	**1.25**	**0.38**	**0.75**	**0.00**	**0.23**	**2.27**			**2.66**	**1.10**	**1.91**	**1.20**	**1.89**	**0.00**	**0.38**		
	Total.....1+2+3+4+5	100.00%									100.00%									100.00%

2 RECYCLABLES:

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
1	Glass	Kg	99	90	130	109	79	133	65	101	89	94	135	134	118	119	123	116
2	Metal	Kg	453	489	707	588	512	677	627	579	552	487	446	521	459	712	555	533
3	Tetrapack	Kg	137	193	141	127	160	86	104	135	124	183	140	168	107	215	189	161
4	Paper / Cardboard	Kg	3,660	3,445	4,013	2,033	3,110	2,182	2,013	2,922	2,634	3,480	2,226	2,723	2,963	3,563	3,514	3,015
	Total.....3+4	**Kg**	**3,797**	**3,638**	**4,154**	**2,160**	**3,270**	**2,268**	**2,117**	3,058	**2,758**	**3,663**	**2,366**	**2,891**	**3,070**	**3,778**	**3,703**	3,176
5	Plastic Films	Kg	5,509	5,598	6,097	6,485	5,293	6,960	7,203	6,164	6,622	6,240	4,919	9,396	6,758	5,708	8,664	6,901
6	Hard Plastic	Kg	388	567	695	784	388	472	523	545	613	551	512	680	609	659	808	633
7	Pet	Kg	576	507	449	649	583	433	573	539	429	457	597	712	755	494	757	600
	Total.....5+6+7	**Kg**	**6,473**	**6,672**	**7,241**	**7,918**	**6,264**	**7,865**	**8,299**	7,247	**7,664**	**7,248**	**6,028**	**10,788**	**8,122**	**6,861**	**10,229**	8,134
8	Thermocal	Kg	127	103	87	82	79	133	91	100	104	94	122	84	118	102	123	107
9	Cloth / Rags / Textile	Kg	1,825	2,023	1,675	1,788	2,483	2,350	1,763	1,987	1,706	2,586	2,182	2,025	1,892	2,614	2,559	2,223
10	Jute Bags	Kg	371	818	546	428	590	655	616	575	680	904	751	831	352	876	1,035	776
	Total.....9+10	**Kg**	**2,196**	**2,841**	**2,221**	**2,216**	**3,073**	**3,005**	**2,379**	2,562	**2,386**	**3,490**	**2,933**	**2,856**	**2,244**	**3,490**	**3,594**	2,999
11	Leather / Rubber / Rexine	Kg	567	566	476	561	644	501	640	565	731	739	581	605	407	695	741	643
12	Coconut	Kg	2,465	3,664	3,577	3,569	4,570	3,270	3,712	3,547	3,146	2,594	3,176	3,193	3,254	5,624	2,700	3,384
13	Total	Kg	16,177	18,063	18,593	17,203	18,491	17,852	17,930	17,758	17,430	18,409	15,787	21,072	17,792	21,381	21,768	19,091
		TPD	16.18	18.06	18.59	17.20	18.49	17.85	17.93	17.76	17.43	18.41	15.79	21.07	17.79	21.38	21.77	19.09

3 ELECTRICITY GENERATION:

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
A	**Biogas Gensets:**																	
1	Biogas Genset-I: Running Time	hr	23.70	21.30	19.65	23.80	21.75	20.50	23.65	22.05	23.10	20.25	13.60	23.60	21.25	21.65	17.75	20.17
2	Biogas Genset-I: Energy Generation	kW.hr	3,410	2,910	2,970	3,430	2,980	3,110	3,700	3,216	3,780	2,920	1,920	3,330	3,020	3,150	2,740	2,980
3	Biogas Genset-II: Running Time	hr	23.70	21.95	19.55	23.80	21.65	20.45	23.60	22.10	23.15	20.70	18.50	23.55	21.25	21.65	17.65	20.92
4	Biogas Genset-II: Energy Generation	kW.hr	3,690	3,560	3,030	3,590	3,640	3,240	3,810	3,509	3,870	3,900	3,140	3,370	3,420	3,200	3,220	3,446
5	**Total.....2+4**	**kW.hr**	**7,100**	**6,470**	**6,000**	**7,020**	**6,620**	**6,350**	**7,510**	6,724	**7,650**	**6,820**	**5,060**	**6,700**	**6,440**	**6,350**	**5,960**	6,426

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
B	**Electricty Generation:**																	
1	**As per Tender:** Minimum electricity to be generated in the plant shall be 0.4 MW per per 100 tons of Input Biodegradable Waste as received in the Facility.																	
2	Biodegradable Waste.....1.B4	Tons	89.81	81.70	97.39	89.73	89.14	92.66	73.88	**87.76**	94.32	104.13	82.46	109.42	89.72	107.78	102.76	**98.66**
3	Electricity Generation required as per Tender.....0.4 x 1000 x B2/100	kWH	240	240	240	240	240	240	240	**240**	240	240	240	240	240	240	240	**240**
4	Electricity generated..... (A2/A1) + (A4/A3)	kWH	300	299	306	295	305	310	318	**305**	331	333	311	284	303	293	337	**313**

4 BIOGAS FLARE:

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
1	**Operation Time**	**hr/day**	0.27	4.67	6.78	2.23	4.93	3.17	0.00	**3.15**	0.27	2.28	0.25	0.45	1.58	1.80	1.77	**1.20**

5 EFFLUENT TREATMENT PLANT:

Sr. No.	Parameter	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
A	**Raw Effluent Quality:**																	
1	Flow	m^3/day	72.81	75.67	83.03	80.96	83.84	80.66	78.34	**79.33**	79.08	83.02	75.85	69.47	72.74	59.80	70.57	**72.93**
2	pH	---	6.88	7.26	6.71	6.79	6.02	7.11	6.74	**6.79**	7.3	6.4	6.49	7.68	7.81	6.63	6.26	**6.94**
3	Biochemical Oxygen Demand (BOD5)	mg/l	2,412	2,049	1,801	1,969	1,801	2,333	1,877	**2,035**	1,795	2,149	2,473	1,911	1,766	1,871	2,089	**2,008**
4	Chemical Oxygen Demand (COD)	mg/l	6,464	6,188	4,791	6,084	3,980	5,506	6,138	**5,593**	5,870	5,480	6,677	4,758	5,898	5,781	6,288	**5,822**
5	Total Suspended Solids (TSS)	mg/l	4,028	4,590	3,836	4,765	3,170	4,246	4,186	**4,117**	4,326	3,868	5,144	4,281	2,985	4,247	3,614	**4,066**
6	Total Dissolve Solids (TDS)	mg/l	1,324	1,720	1,317	1,456	1,787	1,707	1,387	**1,528**	1,482	1,607	1,441	1,668	1,404	1,496	1,664	**1,537**
B	**Treated Effluent Quality:**																	
1	pH	---	6.56	6.59	6.51	6.77	7.27	6.72	7.47	**6.84**	7.12	7.16	6.77	7.4	7.04	7.46	7.49	**7.21**
2	Biochemical Oxygen Demand (BOD5)	mg/l	9	6	7	8	8	7	9	**8**	6	7	6	7	9	7	5	**7**
3	Chemical Oxygen Demand (COD)	mg/l	72	81	77	86	79	81	56	**76**	55	83	53	90	90	53	57	**69**
1	Total Suspended Solids (TSS)	mg/l	10	7	8	9	9	8	10	**9**	7	8	7	8	10	8	6	**8**
2	Total Dissolve Solids (TDS)	mg/l	1,364	1,840	1,330	1,572	1,984	1,895	1,470	**1,636**	1,586	1,639	1,470	1,735	1,474	1,571	1,681	**1,594**

6 DISPOSAL OF INERT:

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
1	**As per Tender:** Maximum 10% of Inerts of the Total Input Waste (excluding Mulched Tree Waste) as received in the Facility.																	
2	**Input Waste**	**TPD**	**141.66**	**128.56**	**144.25**	**136.75**	**131.33**	**147.28**	**130.69**	**137.22**	**149.11**	**157.21**	**135.16**	**168.04**	**131.22**	**169.41**	**154.28**	**152.06**
3	Inert Fraction	**TPD**	**3.81**	**3.60**	**4.72**	**3.76**	**4.12**	**4.37**	**3.57**	**3.99**	**4.18**	**4.07**	**3.68**	**5.14**	**3.82**	**5.62**	**5.37**	**4.55**
4	**% of Total Input Waste.....3/2**	**%**	**2.69%**	**2.80%**	**3.27%**	**2.75%**	**3.14%**	**2.97%**	**2.73%**	**2.91%**	**2.80%**	**2.59%**	**2.72%**	**3.06%**	**2.91%**	**3.32%**	**3.48%**	**2.98%**

7 HOUSEKEEPING:

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
1	Hygenic Conditions	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**
2	Cleanliness	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**
3	Manpower Deployed	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**
4	Safety Norms	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**
5	Treatment Methodology	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**
6	Storage Conditions	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	**Accepted**

1 INPUT WASTE COMPOSITION:

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average		Monthly Average	
A	**Input Waste:**							
1	Dry Waste	TPD	37.330	29.490	**33.410**	**0.21**	**34.209**	**23.69%**
2	Wet Waste	TPD	88.000	89.250	**88.625**	**0.57**	**80.266**	**55.44%**
3	Mixed Waste	TPD	32.290	30.100	**31.195**	**0.20**	**28.940**	**20.00%**
4	Mulched Tree Waste	TPD	3.380	1.320	**2.350**	**0.02**	**1.280**	**0.87%**
5	**Total…..1+2+3+4**	**TPD**	**161.000**	**150.160**	**155.580**	**1.000**	**144.696**	**100%**
B	**Input Waste Composition:**							
1	**Organic / Bio degradable Fraction**	**65.00%**	**101.66**	**101.89**	**101.78**	**65.42%**	**92.38**	**63.81%**
2	**Inorganic / Non-recyclable Fraction (RDF)**		**33.45**	**23.55**	**28.50**	**18.32%**	**29.09**	**20.14%**
3	**Recyclables**	**14.00%**	**21.80**	**20.27**	**21.04**	**13.52%**	**19.02**	**13.14%**
	Glass	0.50%	0.10	0.09	**0.09**	**0.06%**	**0.10**	**0.07%**
	Metal	0.50%	0.52	0.47	**0.49**	**0.32%**	**0.54**	**0.38%**
	Paper / Cardboard / Tetrapack	4.00%	2.53	2.43	**2.48**	**1.59%**	**2.97**	**2.06%**
	Mixed Plastic, Bottles, Cups, Food Packets, Coated Plastics	6.00%	8.73	10.26	**9.49**	**6.10%**	**8.06**	**5.56%**
	Thermocoal / Styrofoam	1.00%	0.14	0.14	**0.14**	**0.09%**	**0.11**	**0.08%**
	Cloth / Rags / Textiles	1.50%	3.78	2.97	**3.38**	**2.17%**	**2.91**	**2.01%**
	Rubber Items	0.50%	0.56	0.60	**0.58**	**0.37%**	**0.57**	**0.40%**
	Coconut		5.44	3.32	**4.38**	**2.82%**	**3.75**	**2.60%**
4	**Inert**	**10.00%**	**4.09**	**4.44**	**4.27**	**2.74%**	**4.21**	**2.91%**
5	**Mulched Tree Waste**	**11.00%**	**3.38**	**1.32**				
	Total…..1+2+3+4+5	**100.00%**				**100.00%**		**100.00%**

2 RECYCLABLES:

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
1	Glass	Kg	97	90	**94**	**101**
2	Metal	Kg	515	465	**490**	**541**
3	Tetrapack	Kg	131	122	**127**	**140**
4	Paper / Cardboard	Kg	2,396	2,311	**2,354**	**2,828**
	Total…..3+4	**Kg**	**2,527**	**2,433**	**2,480**	**2,968**
5	Plastic Films	Kg	7,391	8,502	**7,947**	**6,810**
6	Hard Plastic	Kg	838	954	**896**	**658**
7	Pet	Kg	497	800	**649**	**589**
	Total…..5+6+7	**Kg**	**8,726**	**10,256**	**9,491**	**8,056**
8	Thermocal	Kg	145	135	**140**	**112**
9	Cloth / Rags / Textile	Kg	2,838	2,411	**2,625**	**2,218**
10	Jute Bags	Kg	946	562	**754**	**695**
	Total…..9+10	**Kg**	**3,784**	**2,973**	**3,379**	**2,913**
11	Leather / Rubber / Rexine	Kg	564	601	**583**	**573**
12	Coconut	Kg	5,442	3,319	**4,381**	**3,753**
13	**Total**	**Kg**	**21,800**	**20,272**	**21,036**	**19,017**
		TPD	**21.80**	**20.27**	**21.04**	**19.02**

3 ELECTRICITY GENERATION:

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
A	**Biogas Gensets:**					
1	Biogas Genset-I: Running Time	hr	23.75	23.55	**23.65**	**21.98**
2	Biogas Genset-I: Energy Generation	kW.hr	3,870	3,940	**3,905**	**3,296**
3	Biogas Genset-II: Running Time	hr	23.80	23.50	**23.65**	**22.06**
4	Biogas Genset-II: Energy Generation	kW.hr	3,890	3,950	**3,920**	**3,586**
5	**Total…..2+4**	**kW.hr**	**7,760**	**7,890**	**7,825**	**6,882**

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
B	**Electricty Generation:**					
1	**As per Tender:** Minimum electricity to be generated in the plant shall be 0.4 MW per per 100 tons of Input Biodegradable Waste as received in the Facility.					
2	Biodegradable Waste.....1.B4	Tons	101.66	101.89	**101.78**	**92.38**
3	Electricity Generation required as per Tender.....0.4 x 1000 x B2/100	kWH	240	240	**240**	**240**
4	Electricity generated..... (A2/A1) + (A4/A3)	kWH	326	335	**331**	**312**

4 BIOGAS FLARE:

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
1	**Operation Time**	**hr/day**	0.72	0.23	**0.48**	**2.41**

5 EFFLUENT TREATMENT PLANT:

Sr. No.	Parameter	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
A	**Raw Effluent Quality:**					
1	Flow	m^3/day	84.37		**84.37**	**73.54**
2	pH	---	7.88	6.42	**7.15**	**6.93**
3	Biochemical Oxygen Demand (BOD5)	mg/l	1,657	2,049	**1,853**	**1,991**
4	Chemical Oxygen Demand (COD)	mg/l	3,679	6,741	**5,210**	**5,548**
5	Total Suspended Solids (TSS)	mg/l	3,563	4,651	**4,107**	**4,193**
6	Total Dissolve Solids (TDS)	mg/l	1,579	1,650	**1,615**	**1,542**
B	**Treated Effluent Quality:**					
1	pH	---	7.33	7.04	**7.19**	**7.04**
2	Biochemical Oxygen Demand (BOD5)	mg/l	5	6	**6**	**7**
3	Chemical Oxygen Demand (COD)	mg/l	54	70	**62**	**68**
1	Total Suspended Solids (TSS)	mg/l	6	7	**7**	**8**
2	Total Dissolve Solids (TDS)	mg/l	1,595	1,716	**1,656**	**1,620**

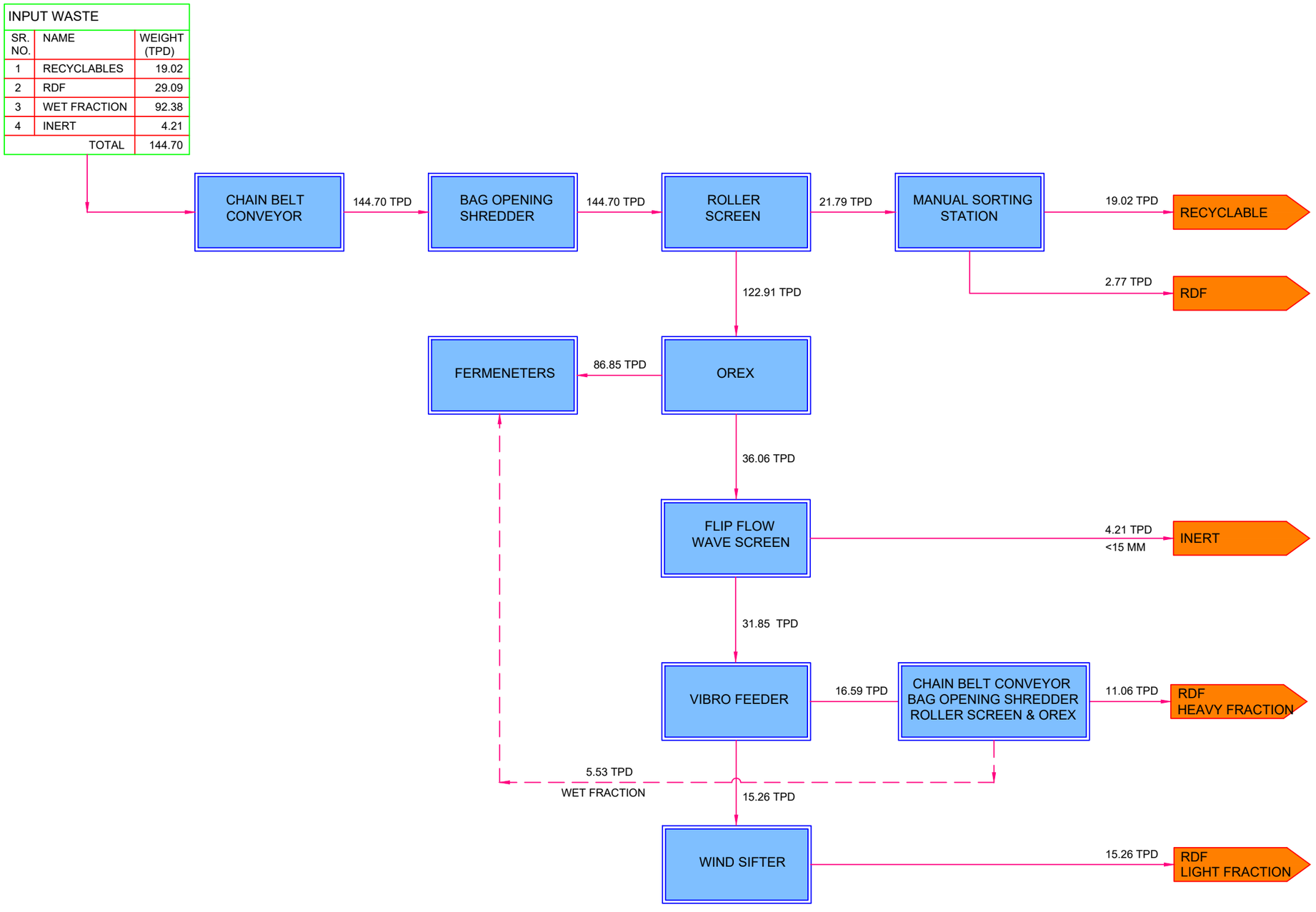
6 DISPOSAL OF INERT:

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
1	**As per Tender:** Maximum 10% of Inerts of the Total Input Waste (excluding Mulched Tree Waste) as received in the Facility.					
2	**Input Waste**	**TPD**	**161.00**	**150.16**	**155.58**	**144.70**
3	Inert Fraction	**TPD**	**4.09**	**4.44**	**4.27**	**4.21**
4	**% of Total Input Waste.....3/2**	**%**	**2.54%**	**2.96%**	**2.75%**	**2.91%**

7 HOUSEKEEPING:

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
1	Hygenic Conditions	---	Accepted	Accepted	**Accepted**	**Accepted**
2	Cleanliness	---	Accepted	Accepted	**Accepted**	**Accepted**
3	Manpower Deployed	---	Accepted	Accepted	**Accepted**	**Accepted**
4	Safety Norms	---	Accepted	Accepted	**Accepted**	**Accepted**
5	Treatment Methodology	---	Accepted	Accepted	**Accepted**	**Accepted**
6	Storage Conditions	---	Accepted	Accepted	**Accepted**	**Accepted**

INPUT WASTE		
SR. NO.	NAME	WEIGHT (TPD)
1	RECYCLABLES	19.02
2	RDF	29.09
3	WET FRACTION	92.38
4	INERT	4.21
	TOTAL	144.70



NUMBER OF RECYCLABLE FRACTIONS		
SR. NO.	NAME	WEIGHT (KG)
01	GLASS	101
02	METALS	541
03	TETRAPACK	140
04	PAPER/CARDBOARD	2828
05	PLASTIC FILM	6810
06	HARD PLASTIC	658
07	PET	589
08	THERMOCAL	112
09	CLOTH/RAGS/TEXTILE	2218
10	JUTE BAGS	695
11	LEATHER/RUBBER/REXINE	573
12	COCONUT	3753
	TOTAL	19017

OWNER: .
DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT.
THE MANAGING ASSOCIATE:
GOA STATE INFRASTRUCTURE DEVELOPMENT LTD.
CONTRACTOR:
M/s HINDUSTAN WASTE TREATMENT PVT. LTD.

	NAME	SIGN	DATE
DRWN	CS		01/12/17
DSGN	SG		01/12/17
CHKD	SG		01/12/17
APPD	GK		01/12/17

TITLE :
ANNEXURE -1
MASS BALANCE
NOVEMBER 2017

SCALE NTS

SIZE A3 | REV. R0