

**Monthly Performance Report
(HWT-NG100-MPR-17-R0)**

**December 2017
(From 01/12/2017 to 31/12/2017)**

**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 December 2017
(As compared to Schedule – 7: Performance Standards, Volume – I of RFP)

Sr. No.	Parameter	Performance Standard As per Schedule – 7	Actual Performance 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: <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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 <u>153.87 TPD</u> . Quantum of Inert is <u>4.30 TPD</u> 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 <u>0.51</u> MW/100 tons of Input Biodegradable Waste as received in the Facility (in TPD).

Sr. No.	Parameter	Performance Standard As per Schedule – 7	Actual Performance at Plant (Monthly Average)										
4.	Biogas Flaring System	The Biogas Flaring System shall strictly be used only in case of emergency and not as a routine practice.	Biogas is being flared strictly, only under emergency and not as a routine practice. The average running time of Biogas Flaring System is 2.71 hours/day .										
5.	Discharge of treated effluent conforming to regulatory norms	Effluent Treatment Plant shall be operated under all conditions.	<p>Effluent Treatment Plant is being operated continuously and is meeting all statutory conditions. The Treated Effluent Characteristics are as follows:</p> <table border="1" data-bbox="1032 726 1403 940"> <tbody> <tr> <td>pH</td> <td>6.94</td> </tr> <tr> <td>BOD</td> <td>7 mg/l</td> </tr> <tr> <td>COD</td> <td>75 mg/l</td> </tr> <tr> <td>TSS</td> <td>8 mg/l</td> </tr> <tr> <td>TDS</td> <td>1655 mg/l</td> </tr> </tbody> </table>	pH	6.94	BOD	7 mg/l	COD	75 mg/l	TSS	8 mg/l	TDS	1655 mg/l
pH	6.94												
BOD	7 mg/l												
COD	75 mg/l												
TSS	8 mg/l												
TDS	1655 mg/l												
6.	General Housekeeping, hygienic conditions, cleanliness, safety norms, adequate manpower, treatment methodology for plant operation & maintenance and storage conditions in the plant.	Minimum housekeeping, safety norms and cleanliness conditions shall be maintained at all times as per the Bid Document requirement.	<ul style="list-style-type: none"> • 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. 										

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

#	Plant Performance Data: December 2017		
Sr. No.	Content	Month	Signature
1	Input Waste Composition	From 01.12.2017 To 31.12.2017	
2	Recyclables		
3	Electricity Generation		
4	Biogas Flare		
5	Effluent Treatment Plant		
6	Inert		
7	Housekeeping		

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

1 INPUT WASTE COMPOSITION:

Sr. No.	Description	Unit	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	Weekly Average		8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	Weekly Average		
A Input Waste:																					
1	Dry Waste	TPD	38.77	44.93	40.02	44.67	52.63	51.38	55.67	46.87	32.05%	49.70	59.11	46.15	49.74	50.61	53.39	49.20	51.13	34.70%	
2	Wet Waste	TPD	87.29	93.54	92.11	85.99	88.45	90.48	104.14	91.71	62.72%	74.59	102.68	86.35	102.33	94.36	92.71	95.35	92.62	62.86%	
3	Mixed Waste	TPD	11.20	8.04	6.76	5.19	4.69	5.24	1.02	6.02	4.12%	3.03	3.40	2.62	1.18	1.88	3.72	2.51	2.62	1.78%	
4	Mulched Tree Waste	TPD	1.67	0.00	0.86	1.46	1.30	3.06	3.02	1.62	1.11%	0.37	2.23	0.89	0.49	0.00	0.81	2.13	0.99	0.67%	
5	Total.....1+2+3+4	TPD	138.93	146.51	139.75	137.31	147.07	150.16	163.85	146.23	100.00%	127.69	167.42	136.01	153.74	146.85	150.63	149.19	147.36	100.00%	
B Input Waste Composition:																					
1	Organic / Bio degradable Fraction	65.00%	91.31	96.56	94.73	87.98	90.27	92.47	104.53	93.98	64.27%	75.67	103.97	87.40	102.79	95.08	94.08	96.31	93.61	63.53%	
2	Inorganic / Non-recyclable Fraction (RDF)		28.29	23.33	23.48	26.06	31.61	30.93	30.91	27.80	19.01%	32.07	40.41	26.18	29.12	26.51	32.90	30.17	31.05	21.07%	
3	Recyclables	14.00%	15.94	21.89	17.44	19.55	20.10	22.87	25.09	20.41	13.96%	17.11	17.96	17.69	17.08	20.57	18.45	19.65	18.36	12.46%	
	Glass	0.50%	0.13	0.09	0.14	0.12	0.12	0.12	0.08	0.11	0.08%	0.09	0.12	0.07	0.15	0.10	0.15	0.13	0.12	0.08%	
	Metal	0.50%	0.53	0.51	0.49	0.44	0.49	0.60	0.67	0.53	0.36%	0.42	0.70	0.60	0.69	0.62	0.48	0.57	0.58	0.40%	
	Paper / Cardboard / Tetrapack	4.00%	2.42	4.73	4.02	4.60	4.77	2.28	4.75	3.94	2.69%	3.64	2.83	2.46	3.06	3.96	4.23	3.98	3.45	2.34%	
	Mixed Plastic, Bottles, Cups, Food Packets, Coated Plastics	6.00%	6.67	7.78	5.94	8.35	8.06	11.19	10.18	8.31	5.68%	6.22	7.75	7.94	5.78	9.85	6.25	6.58	7.20	4.88%	
	Thermocoal / Styrofoam	1.00%	0.11	0.07	0.14	0.07	0.15	0.11	0.11	0.11	0.07%	0.06	0.12	0.14	0.15	0.09	0.14	0.07	0.11	0.07%	
	Cloth / Rags / Textiles	1.50%	2.18	3.94	2.28	2.73	3.71	3.32	3.39	3.08	2.11%	2.95	2.54	2.65	3.12	2.25	3.13	2.83	2.78	1.89%	
	Rubber Items	0.50%	0.67	0.40	0.56	0.44	0.53	0.62	0.64	0.55	0.38%	0.47	0.67	0.56	0.58	0.60	0.57	0.45	0.56	0.38%	
	Coconut		3.24	4.37	3.87	2.80	2.29	4.64	5.26	3.78	2.59%	3.26	3.23	3.28	3.54	3.10	3.49	5.03	3.56	2.42%	
4	Inert	10.00%	3.39	4.73	4.09	3.72	5.09	3.89	3.33	4.03	2.76%	2.83	5.07	4.73	4.75	4.68	5.20	3.06	4.33	2.94%	
5	Mulched Tree Waste	11.00%	1.67	0.00	0.86	1.46	1.30	3.06	3.02			0.37	2.23	0.89	0.49	0.00	0.81	2.13			
	Total.....1+2+3+4+5	100.00%									100.00%									100.00%	

2 RECYCLABLES:

Sr. No.	Description	Unit	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	Weekly Average		8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	Weekly Average		
A Recyclables:																					
1	Glass	Kg	125	88	140	124	118	120	82	114		89	117	68	154	103	151	134	117		
2	Metal	Kg	528	513	489	439	485	601	672	532		421	703	598	692	617	482	567	583		
3	Tetrapack	Kg	174	468	310	363	357	151	466	327		284	274	202	165	250	284	251	244		
4	Paper / Cardboard	Kg	2,243	4,264	3,715	4,236	4,408	2,132	4,286	3,612		3,355	2,555	2,260	2,894	3,715	3,949	3,732	3,209		
	Total.....3+4	Kg	2,417	4,732	4,025	4,599	4,765	2,283	4,752	3,939		3,639	2,829	2,462	3,059	3,965	4,233	3,983	3,453		
5	Plastic Films	Kg	5,675	6,496	5,173	7,121	6,778	9,844	8,506	7,085		5,136	6,426	6,918	4,746	8,642	5,226	5,895	6,141		
6	Hard Plastic	Kg	620	599	297	476	516	571	682	537		473	574	429	514	572	506	336	486		
7	Pet	Kg	373	685	469	751	766	772	987	686		609	752	596	520	640	519	349	569		
	Total.....5+6+7	Kg	6,668	7,780	5,939	8,348	8,060	11,187	10,175	8,308		6,218	7,752	7,943	5,780	9,854	6,251	6,580	7,197		
8	Thermocal	Kg	111	73	140	69	147	105	115	109		64	117	136	154	88	136	75	110		
9	Cloth / Rags / Textile	Kg	1,815	2,802	1,806	2,282	2,750	2,386	2,483	2,332		2,206	1,931	2,000	2,412	1,645	2,654	2,120	2,138		
10	Jute Bags	Kg	366	1,139	472	451	956	933	909	747		743	613	652	708	602	479	714	644		
	Total.....9+10	Kg	2,181	3,941	2,278	2,733	3,706	3,319	3,392	3,079		2,949	2,544	2,652	3,120	2,247	3,133	2,834	2,783		
11	Leather / Rubber / Rexine	Kg	667	396	559	439	529	616	639	549		472	670	558	584	602	572	448	558		
12	Coconut	Kg	3,237	4,366	3,871	2,801	2,294	4,640	5,260	3,781		3,256	3,231	3,278	3,536	3,099	3,495	5,028	3,560		
13	Total	Kg	15,934	21,889	17,441	19,552	20,104	22,871	25,087	20,411		17,108	17,963	17,695	17,079	20,575	18,453	19,649	18,360		
		TPD	15.93	21.89	17.44	19.55	20.10	22.87	25.09	20.41		17.11	17.96	17.70	17.08	20.58	18.45	19.65	18.36		

3 ELECTRICITY GENERATION:

Sr. No.	Description	Unit	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	Weekly Average		8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	Weekly Average		
A Biogas Gensets:																					
1	Biogas Genset-I: Running Time	hr	23.00	23.35	23.50	23.55	20.85	20.30	23.75	22.61		23.55	23.75	23.75	23.18	23.75	19.30	15.20	21.78		
2	Biogas Genset-I: Energy Generation	kW.hr	3,680	3,840	3,710	3,330	3,000	2,890	3,620	3,439		3,920	3,730	3,510	3,988	3,250	2,410	1,740	3,221		
3	Biogas Genset-II: Running Time	hr	23.00	23.40	23.50	23.55	20.75	20.20	23.75	22.59		23.60	23.75	23.75	18.68	23.75	19.25	15.05	21.12		
4	Biogas Genset-II: Energy Generation	kW.hr	3,640	3,770	3,670	3,320	2,970	2,870	3,650	3,413		3,900	3,520	3,095	3,152	3,490	2,660	1,890	3,101		
5	Total.....2+4	kW.hr	7,320	7,610	7,380	6,650	5,970	5,760	7,270	6,851		7,820	7,250	6,605	7,140	6,740	5,070	3,630	6,322		

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

Sr. No.	Description	Unit	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	Weekly Average	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	Weekly Average
B Electricity 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	91.31	96.56	94.73	87.98	90.27	92.47	104.53	93.98	75.67	103.97	87.40	102.79	95.08	94.08	96.31	93.61
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	318	326	314	282	287	284	306	303	332	305	278	341	284	263	240	292

4 BIOGAS FLARE:

Sr. No.	Description	Unit	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct	7-Oct	Weekly Average	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct	13-Oct	14-Oct	Weekly Average
1	Operation Time	hr/day	3.15	3.60	2.71	3.61	4.27	2.53	2.59	3.21	4.18	2.97	2.82	4.38	1.98	4.41	1.67	3.20

5 EFFLUENT TREATMENT PLANT:

Sr. No.	Description	Unit	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	Weekly Average	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	Weekly Average
A Raw Effluent Quality:																		
1	Flow	m ³ /day	79.67	68.71	69.44	76.48	88.61	77.59	82.88	77.63	85.41	88.60	79.78	78.05	78.64	83.07	86.67	82.89
2	pH	---	6.82	6.97	6.2	7.15	7.43	7.94	7.33	7.12	7.27	7.96	7.20	7.10	6.13	7.25	7.54	7.21
3	Biochemical Oxygen Demand (BOD5)	mg/l	1,554	2,038	2,455	2,057	1,648	2,186	2,109	2,007	1,890	2,372	2,039	1,827	1,845	2,492	2,172	2,091
4	Chemical Oxygen Demand (COD)	mg/l	5,206	6,746	6,776	4,464	3,724	4,940	7,065	5,560	4,744	6,120	5,546	3,983	4,465	8,448	4,605	5,416
5	Total Suspended Solids (TSS)	mg/l	2,813	3,118	4,174	4,525	2,769	4,459	4,977	3,834	4,064	4,032	3,854	3,416	3,026	5,258	3,714	3,909
6	Total Dissolve Solids (TDS)	mg/l	1,729	1,486	1,389	1,671	1,714	1,627	1,636	1,607	1,485	1,545	1,550	1,721	1,433	1,368	1,728	1,547
B Treated Effluent Quality:																		
1	pH	---	7.40	7.43	6.53	7.25	7.26	7.49	7.01	7.20	7.23	6.68	6.73	6.95	7.44	6.75	7.22	7.00
2	Biochemical Oxygen Demand (BOD5)	mg/l	8	9	5	8	6	8	8	7	7	5	5	7	5	8	6	6
3	Chemical Oxygen Demand (COD)	mg/l	61	72	53	71	73	82	74	69	55	79	59	83	75	91	83	75
4	Total Suspended Solids (TSS)	mg/l	9	10	6	9	7	9	9	8	8	6	6	8	6	9	7	7
5	Total Dissolve Solids (TDS)	mg/l	1,746	1,635	1,528	1,838	1,800	1,741	1,685	1,710	1,574	1,638	1,721	1,773	1,591	1,477	1,884	1,665

6 DISPOSAL OF INERT:

Sr. No.	Description	Unit	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	Weekly Average	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	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	138.93	146.51	139.75	137.31	147.07	150.16	163.85	146.23	127.69	167.42	136.01	153.74	146.85	150.63	149.19	147.36
3	Inert Fraction	TPD	3.390	4.732	4.095	3.721	5.089	3.889	3.326	4.035	2.835	5.073	4.733	4.751	4.685	5.197	3.058	4.333
4	% of Total Input Waste.....3/2	%	2.44%	3.23%	2.93%	2.71%	3.46%	2.59%	2.03%	2.77%	2.22%	3.03%	3.48%	3.09%	3.19%	3.45%	2.05%	2.93%

7 HOUSEKEEPING:

Sr. No.	Description	Unit	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	Weekly Average	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	Weekly Average
1	Hygienic 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

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

1 INPUT WASTE COMPOSITION:

Sr. No.	Description	Unit	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	Weekly Average	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	Weekly Average		
A	Input Waste:																			
1	Dry Waste	TPD	52.88	57.06	42.73	58.72	50.78	54.04	57.31	53.36	35.88%	55.96	50.69	48.36	55.24	61.11	64.05	56.55	55.99	35.37%
2	Wet Waste	TPD	88.97	88.98	99.89	89.82	97.80	93.67	100.85	94.28	63.39%	96.55	99.14	89.74	87.36	127.23	109.21	103.46	101.81	64.32%
3	Mixed Waste	TPD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
4	Mulched Tree Waste	TPD	0.49	1.24	0.00	1.26	0.59	2.80	1.20	1.08	0.73%	0.62	0.60	0.00	1.83	0.33	0.00	0.00	0.48	0.31%
5	Total.....1+2+3+4	TPD	142.34	147.28	142.62	149.80	149.17	150.51	159.36	148.73	100.00%	153.13	150.43	138.10	144.43	188.67	173.26	160.01	158.29	100.00%
B	Input Waste Composition:																			
1	Organic / Bio degradable Fraction	65.00%	88.97	88.98	99.89	89.82	97.80	93.67	100.85	94.28	63.39%	96.55	99.14	89.74	87.36	127.23	109.21	103.46	101.81	64.32%
2	Inorganic / Non-recyclable Fraction (RDF)		29.13	36.75	23.92	37.41	28.20	33.22	26.96	30.80	20.71%	29.49	22.68	25.16	35.45	34.14	38.89	33.38	31.31	19.78%
3	Recyclables	14.00%	21.24	17.23	15.90	19.44	18.20	18.66	26.84	19.64	13.21%	22.43	24.51	18.51	17.45	23.19	21.69	17.97	20.82	13.15%
	Glass	0.50%	0.14	0.09	0.10	0.15	0.07	0.08	0.10	0.10	0.07%	0.11	0.09	0.07	0.14	0.17	0.09	0.13	0.11	0.07%
	Metal	0.50%	0.63	0.66	0.58	0.54	0.49	0.54	0.69	0.59	0.40%	0.58	0.68	0.43	0.56	0.72	0.76	0.56	0.61	0.39%
	Paper / Cardboard / Tetrapack	4.00%	4.65	3.52	2.60	5.08	3.12	3.06	4.73	3.82	2.57%	2.82	4.33	4.47	2.17	5.91	3.78	3.22	3.81	2.41%
	Mixed Plastic, Bottles, Cups, Food Packets, Coated Plastics	6.00%	10.52	5.74	5.92	8.36	7.83	5.82	11.94	8.02	5.39%	10.00	11.22	7.98	7.96	9.47	6.17	7.34	8.59	5.43%
	Thermocoal / Styrofoam	1.00%	0.07	0.07	0.10	0.09	0.12	0.12	0.11	0.10	0.07%	0.12	0.15	0.12	0.14	0.13	0.16	0.11	0.13	0.08%
	Cloth / Rags / Textiles	1.50%	2.63	2.78	3.15	2.25	2.97	4.03	4.57	3.20	2.15%	4.03	3.51	2.20	3.83	3.30	4.59	2.66	3.44	2.18%
	Rubber Items	0.50%	0.37	0.74	0.64	0.67	0.51	0.68	0.75	0.62	0.42%	0.66	0.50	0.48	0.43	0.66	0.87	0.77	0.62	0.39%
	Coconut		2.22	3.62	2.81	2.31	3.09	4.33	3.95	3.19	2.15%	4.12	4.03	2.75	2.21	2.83	5.28	3.18	3.49	2.20%
4	Inert	10.00%	3.00	4.32	2.91	3.13	4.97	4.95	4.72	4.00	2.69%	4.66	4.11	4.70	4.17	4.11	3.47	5.20	4.34	2.74%
5	Mulched Tree Waste	11.00%	0.49	1.24	0.00	1.26	0.59	2.80	1.20			0.62	0.60	0.00	1.83	0.33	0.00	0.00		
	Total.....1+2+3+4+5	100.00%								100.00%										100.00%

2 RECYCLABLES:

Sr. No.	Description	Unit	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	Weekly Average	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	Weekly Average
A	Recyclables:																	
1	Glass	Kg	142	88	100	150	75	75	96	104	107	90	69	144	170	87	128	114
2	Metal	Kg	626	663	585	539	492	542	685	590	582	677	428	563	717	762	560	613
3	Tetrapack	Kg	400	243	236	427	203	177	265	279	186	277	268	145	449	193	180	243
4	Paper / Cardboard	Kg	4,254	3,277	2,359	4,652	2,915	2,878	4,468	3,543	2,632	4,055	4,206	2,021	5,457	3,584	3,036	3,570
	Total.....3+4	Kg	4,654	3,520	2,595	5,079	3,118	3,055	4,733	3,822	2,818	4,332	4,474	2,166	5,906	3,777	3,216	3,813
5	Plastic Films	Kg	8,583	4,836	4,924	6,879	6,516	4,974	10,170	6,697	8,689	10,044	6,537	6,860	8,354	5,261	6,302	7,435
6	Hard Plastic	Kg	915	414	402	702	634	437	740	606	760	572	798	661	616	592	477	639
7	Pet	Kg	1,020	494	592	777	681	414	1,027	715	550	606	647	438	502	315	566	518
	Total.....5+6+7	Kg	10,518	5,744	5,918	8,358	7,831	5,825	11,937	8,019	9,999	11,222	7,982	7,959	9,472	6,168	7,345	8,592
8	Thermocal	Kg	71	74	100	90	119	120	112	98	123	150	124	144	132	156	112	134
9	Cloth / Rags / Textile	Kg	2,001	2,060	2,241	1,728	2,315	3,360	3,814	2,503	3,355	2,713	1,577	2,706	2,440	3,310	2,231	2,619
10	Jute Bags	Kg	632	724	911	519	653	674	759	696	673	792	619	1,121	862	1,281	425	825
	Total.....9+10	Kg	2,633	2,784	3,152	2,247	2,968	4,034	4,573	3,199	4,028	3,505	2,196	3,827	3,302	4,591	2,656	3,444
11	Leather / Rubber / Rexine	Kg	370	736	642	674	507	677	749	622	658	496	483	433	660	866	768	623
12	Coconut	Kg	2,221	3,623	2,810	2,307	3,088	4,335	3,952	3,191	4,119	4,032	2,748	2,210	2,830	5,284	3,184	3,487
13	Total	Kg	21,235	17,232	15,902	19,444	18,198	18,663	26,837	19,644	22,434	24,504	18,504	17,446	23,189	21,691	17,969	20,820
		TPD	21.24	17.23	15.90	19.44	18.20	18.66	26.84	19.64	22.43	24.50	18.50	17.45	23.19	21.69	17.97	20.82

3 ELECTRICITY GENERATION:

Sr. No.	Description	Unit	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	Weekly Average	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	Weekly Average
A	Biogas Gensets:																	
1	Biogas Genset-I: Running Time	hr	16.10	20.05	24.00	23.95	21.00	16.77	24.00	20.84	16.10	21.06	18.70	17.56	23.11	18.31	16.89	18.82
2	Biogas Genset-I: Energy Generation	kW.hr	1,780	2,800	4,040	3,360	2,700	2,565	3,380	2,946	2,490	3,630	3,109	3,033	3,944	3,199	3,038	3,206
3	Biogas Genset-II: Running Time	hr	16.10	18.65	24.00	23.95	21.20	23.20	24.00	21.59	15.85	20.83	22.05	23.07	22.49	19.91	19.97	20.60
4	Biogas Genset-II: Energy Generation	kW.hr	2,130	2,520	3,980	3,270	2,550	3,752	3,360	3,080	2,510	3,476	3,234	3,563	3,162	3,206	2,778	3,133
5	Total.....2+4	kW.hr	3,910	5,320	8,020	6,630	5,250	6,317	6,740	6,027	5,000	7,106	6,343	6,596	7,106	6,405	5,816	6,339

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

Sr. No.	Description	Unit	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	Weekly Average	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	Weekly Average
B Electricity 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	88.97	88.98	99.89	89.82	97.80	93.67	100.85	94.28	96.55	99.14	89.74	87.36	127.23	109.21	103.46	101.81
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	243	275	334	277	249	315	281	282	313	339	313	327	311	336	319	323

4 BIOGAS FLARE:

Sr. No.	Description	Unit	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct	20-Oct	21-Oct	Weekly Average	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct	28-Oct	Weekly Average
1	Operation Time	hr/day	1.92	4.17	3.57	1.88	1.81	2.01	3.96	2.76	1.30	1.45	2.91	3.43	3.22	1.86	1.77	2.28

5 EFFLUENT TREATMENT PLANT:

Sr. No.	Description	Unit	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	Weekly Average	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	Weekly Average
A Raw Effluent Quality:																		
1	Flow	m ³ /day	87.29	86.03	86.42	87.05	83.42	84.03	76.57	84.40	87.20	88.19	88.81	79.66	78.97	64.05	69.06	79.42
2	pH	---	6.16	7.34	7.06	7.64	6.3	6.64	7.2	6.91	7.79	7.64	7.01	6.77	6.6	7.11	7.95	7.27
3	Biochemical Oxygen Demand (BOD5)	mg/l	1,600	2,414	1,757	2,195	2,346	1,787	2,126	2,032	1,740	1,774	1,663	1,602	1,528	2,340	2,488	1,876
4	Chemical Oxygen Demand (COD)	mg/l	4,048	5,287	4,199	4,522	5,325	4,039	4,847	4,610	4,420	3,956	4,856	4,550	4,324	5,780	5,523	4,773
5	Total Suspended Solids (TSS)	mg/l	3,072	6,011	4,199	3,314	5,208	3,628	4,635	4,295	2,680	2,785	3,575	3,396	2,353	5,569	6,096	3,779
6	Total Dissolve Solids (TDS)	mg/l	1,420	1,657	1,492	1,418	1,714	1,670	1,790	1,594	1,432	1,426	1,461	1,619	1,486	1,605	1,512	1,506
B Treated Effluent Quality:																		
1	pH	---	6.88	6.94	7.08	6.95	6.99	6.55	6.83	6.89	6.88	6.64	7.36	7.09	6.75	6.67	6.89	6.90
2	Biochemical Oxygen Demand (BOD5)	mg/l	9	7	8	7	5	7	5	7	7	7	6	5	8	7	6	7
3	Chemical Oxygen Demand (COD)	mg/l	85	64	79	62	84	87	76	77	65	54	86	87	53	77	63	69
4	Total Suspended Solids (TSS)	mg/l	10	8	9	8	6	8	6	8	8	8	7	6	9	8	7	8
5	Total Dissolve Solids (TDS)	mg/l	1,505	1,806	1,552	1,560	1,868	1,837	1,862	1,713	1,489	1,512	1,592	1,700	1,531	1,669	1,557	1,579

6 DISPOSAL OF INERT:

Sr. No.	Description	Unit	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	Weekly Average	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	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	142.34	147.28	142.62	149.80	149.17	150.51	159.36	148.73	153.13	150.43	138.10	144.43	188.67	173.26	160.01	158.29
3	Inert Fraction	TPD	3.003	4.315	2.909	3.131	4.967	4.952	4.717	3.999	4.655	4.107	4.695	4.174	4.113	3.465	5.200	4.344
4	% of Total Input Waste.....3/2	%	2.11%	2.93%	2.04%	2.09%	3.33%	3.29%	2.96%	2.68%	3.04%	2.73%	3.40%	2.89%	2.18%	2.00%	3.25%	2.78%

7 HOUSEKEEPING:

Sr. No.	Description	Unit	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	Weekly Average	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec	Weekly Average
1	Hygienic 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

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

1 INPUT WASTE COMPOSITION:

Sr. No.	Description	Unit	29-Dec	30-Dec	31-Dec	Weekly Average		Monthly Average	
A Input Waste:									
1	Dry Waste	TPD	60.41	68.73	50.14	59.76	35.42%	53.42	34.68%
2	Wet Waste	TPD	117.39	99.45	107.47	108.10	64.07%	97.71	63.47%
3	Mixed Waste	TPD	0.00	0.00	0.00	0.00	0.00%	1.73	1.18%
4	Mulched Tree Waste	TPD	0.88	1.33	0.37	0.86	0.51%	1.01	0.66%
5	Total.....1+2+3+4	TPD	178.68	169.51	157.98	168.72	100.00%	153.87	100.00%
B Input Waste Composition:									
1	Organic / Bio degradable Fraction	65.00%	117.39	99.45	107.47	108.10	64.07%	98.36	63.92%
2	Inorganic / Non-recyclable Fraction (RDF)		27.72	41.14	30.26	33.04	19.58%	30.80	20.03%
3	Recyclables	14.00%	27.84	23.73	16.84	22.80	13.52%	20.41	13.26%
	Glass	0.50%	0.09	0.08	0.13	0.10	0.06%	0.11	0.07%
	Metal	0.50%	0.75	0.63	0.58	0.65	0.39%	0.59	0.39%
	Paper / Cardboard / Tetrapack	4.00%	4.57	5.10	3.36	4.35	2.58%	3.87	2.52%
	Mixed Plastic, Bottles, Cups, Food Packets, Coated Plastics	6.00%	12.36	9.17	6.21	9.25	5.48%	8.27	5.37%
	Thermocoal / Styrofoam	1.00%	0.13	0.14	0.16	0.14	0.08%	0.12	0.08%
	Cloth / Rags / Textiles	1.50%	4.97	5.05	3.10	4.37	2.59%	3.38	2.18%
	Rubber Items	0.50%	0.79	0.66	0.66	0.70	0.42%	0.61	0.40%
	Coconut		4.18	2.90	2.64	3.24	1.92%	3.45	2.25%
4	Inert	10.00%	5.74	5.19	3.41	4.78	2.83%	4.30	2.79%
5	Mulched Tree Waste	11.00%	0.88	1.33	0.37				
	Total.....1+2+3+4+5	100.00%					100.00%		100.00%

2 RECYCLABLES:

Sr. No.	Description	Unit	29-Dec	30-Dec	31-Dec	Weekly Average		Monthly Average	
A Recyclables:									
1	Glass	Kg	89	85	126	100		110	
2	Metal	Kg	750	627	585	654		594	
3	Tetrapack	Kg	293	464	188	315		282	
4	Paper / Cardboard	Kg	4,281	4,638	3,177	4,032		3,593	
	Total.....3+4	Kg	4,574	5,102	3,365	4,347		3,875	
5	Plastic Films	Kg	10,869	7,822	5,271	7,987		7,069	
6	Hard Plastic	Kg	618	724	404	582		570	
7	Pet	Kg	878	624	534	679		633	
	Total.....5+6+7	Kg	12,365	9,170	6,209	9,248		8,273	
8	Thermocal	Kg	125	136	158	140		118	
9	Cloth / Rags / Textile	Kg	4,153	4,157	2,344	3,551		2,629	
10	Jute Bags	Kg	815	894	752	820		746	
	Total.....9+10	Kg	4,968	5,051	3,096	4,372		3,375	
11	Leather / Rubber / Rexine	Kg	786	661	664	704		611	
12	Coconut	Kg	4,181	2,899	2,638	3,239		3,452	
13	Total	Kg	27,838	23,731	16,841	22,803		20,408	
		TPD	27.84	23.73	16.84	22.80		20.41	

3 ELECTRICITY GENERATION:

Sr. No.	Description	Unit	29-Dec	30-Dec	31-Dec	Weekly Average		Monthly Average	
A Biogas Gensets:									
1	Biogas Genset-I: Running Time	hr	22.54	22.92	18.98	21.48		21.11	
2	Biogas Genset-I: Energy Generation	kW.hr	3,924	3,797	3,402	3,708		3,304	
3	Biogas Genset-II: Running Time	hr	18.51	17.21	21.04	18.92		20.96	
4	Biogas Genset-II: Energy Generation	kW.hr	2,962	2,310	3,625	2,966		3,139	
5	Total.....2+4	kW.hr	6,886	6,107	7,027	6,673		6,442	

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

Sr. No.	Description	Unit	29-Dec	30-Dec	31-Dec	Weekly Average	Monthly Average
B Electricity Generation:							
1	<u>As per Tender:</u> 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	117.39	99.45	107.47	108.10	98.36
3	Electricity Generation required as per Tender.....0.4 x 1000 x B2/100	kWH	240	240	240	240	240
4	Electricity generated..... (A2/A1) + (A4/A3)	kWH	334	300	352	329	305

4 BIOGAS FLARE:

Sr. No.	Description	Unit	29-Oct	30-Oct	31-Oct	Weekly Average	Monthly Average
1	Operation Time	hr/day	1.54	1.88	2.82	2.08	2.71

5 EFFLUENT TREATMENT PLANT:

Sr. No.	Description	Unit	29-Dec	30-Dec	31-Dec	Weekly Average	Monthly Average
A Raw Effluent Quality:							
1	Flow	m ³ /day	69.48	66.57	66.87	67.64	78.40
2	pH	---	6.15	6.6	6.3	6.35	6.97
3	Biochemical Oxygen Demand (BOD5)	mg/l	1,515	2,229	1,545	1,763	1,954
4	Chemical Oxygen Demand (COD)	mg/l	4,394	6,977	3,353	4,908	5,053
5	Total Suspended Solids (TSS)	mg/l	3,227	3,566	3,306	3,366	3,837
6	Total Dissolve Solids (TDS)	mg/l	1,542	1,427	1,722	1,564	1,564
B Treated Effluent Quality:							
1	pH	---	7	6.61	6.51	6.71	6.94
2	Biochemical Oxygen Demand (BOD5)	mg/l	6	7	6	6	7
3	Chemical Oxygen Demand (COD)	mg/l	86	89	75	83	75
4	Total Suspended Solids (TSS)	mg/l	7	8	7	7	8
5	Total Dissolve Solids (TDS)	mg/l	1,557	1,456	1,808	1,607	1,655

6 DISPOSAL OF INERT:

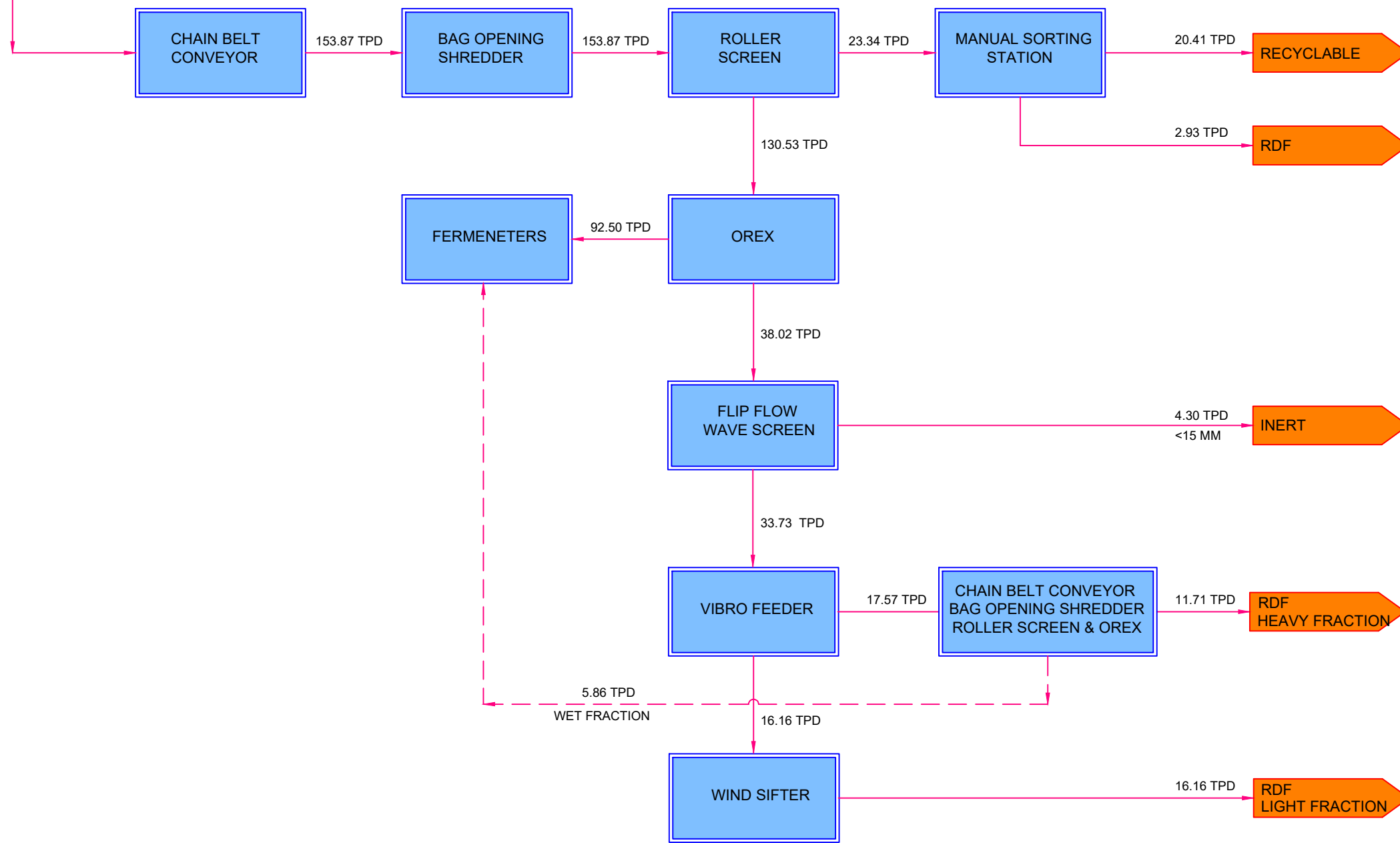
Sr. No.	Description	Unit	29-Dec	30-Dec	31-Dec	Weekly Average	Monthly Average
1	<u>As per Tender:</u> Maximum 10% of Inerts of the Total Input Waste (excluding Mulched Tree Waste) as received in the Facility.						
2	Input Waste	TPD	178.68	169.51	157.98	168.72	153.87
3	Inert Fraction	TPD	5.736	5.187	3.412	4.778	4.298
4	% of Total Input Waste.....3/2	%	3.21%	3.06%	2.16%	2.81%	2.79%

7 HOUSEKEEPING:

Sr. No.	Description	Unit	29-Dec	30-Dec	31-Dec	Weekly Average	Monthly Average
1	Hygienic Conditions	---	Accepted	Accepted	Accepted	Accepted	Accepted
2	Cleanliness	---	Accepted	Accepted	Accepted	Accepted	Accepted
3	Manpower Deployed	---	Accepted	Accepted	Accepted	Accepted	Accepted
4	Safety Norms	---	Accepted	Accepted	Accepted	Accepted	Accepted
5	Treatment Methodology	---	Accepted	Accepted	Accepted	Accepted	Accepted
6	Storage Conditions	---	Accepted	Accepted	Accepted	Accepted	Accepted

INPUT WASTE		
SR. NO.	NAME	WEIGHT (TPD)
1	RECYCLABLES	20.41
2	RDF	30.80
3	WET FRACTION	98.36
4	INERT	4.30
TOTAL		153.87

NUMBER OF RECYCLABLE FRACTIONS		
SR. NO.	NAME	WEIGHT (KG)
01	GLASS	110
02	METALS	594
03	TETRAPACK	282
04	PAPER/CARDBOARD	3593
05	PLASTIC FILM	7069
06	HARD PLASTIC	570
07	PET	633
08	THERMOCAL	118
09	CLOTH/RAGS/TEXTILE	2629
10	JUTE BAGS	746
11	LEATHER/RUBBER/REXINE	611
12	COCONUT	3452
TOTAL		20408



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		02/01/18
DSGN	SG		02/01/18
CHKD	SG		02/01/18
APPD	GK		02/01/18

TITLE :
 ANNEXURE -1
 MASS BALANCE
 DECEMBER 2017

SCALE
 NTS

SIZE
 A3

REV.
 R0