



Public Works

TECHNICAL MEMORANDUM

DATE: December 9, 2016

TO: Lance Kautz, Florida Department of Environmental Protection
Steve Morgan, Florida Department of Environmental Protection

FROM: Larry Ruiz, Hillsborough County Solid Waste Management Division
Ron Wiesman, Hillsborough County Solid Waste Management Division

CC: Beth Schinella, Hillsborough County Public Utilities Department
Kim Byer, Hillsborough County Solid Waste Management Division

SUBJECT: Hillsborough County Biosolids Composting Monthly Report: November 2016

Biosolids Received (wet tons):	718.34 tons received 10/10 through 10/31
Source of Biosolids:	Hillsborough County AWWTP (Falkenburg, Valrico, and South)
Source of Bulking Agent:	Hillsborough County Yard Waste Processing Sites (Falkenburg Road and South County facilities)
General Description of Activities:	<ul style="list-style-type: none"> • All incoming biosolids were mixed with bulking agent and formed into windrows on the same day as received. • 9 total windrows are in active composting as of 11/30/16. • Windrow temperatures were monitored daily, • Seven windrows have met PFRP temp and time requirements. • Seven windrows have been turned. • All windrows are currently in active composting. No materials are in curing. • No sampling or analysis was performed. • No compost was distributed for use.
Attachments:	Windrow construction and temperature records.

Board of County Commissioners

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Hillsborough County Composting - Monitoring Sheet (MSAP Method)					Windrow # 16-10-13	
Windrow Construction:			Date Commenced: 10-10-16	Date Completed: 10--16		
Date	Operator Name	Biosolids (tons)	Biosolids (yards)	Yard Waste (yards)	Overs (yards)	Cover (yards)
10/10/16	Oscar Ochoa	20.85	27.11	60.00	0.00	
10/10/16	Oscar Ochoa	21.38	27.79	60.00	0.00	44.00
10/11/16	Oscar Ochoa	22.27	28.95	60.00	0.00	
10/11/16	Oscar Ochoa	22.66	29.46	60.00	0.00	40.00
10/12/16	Ron Wiesman	22.82	29.67	60.00	0.00	
10/12/16	Ron Wiesman	22.63	29.42	60.00	0.00	36.00
10/13/16	Ron Wiesman	17.99	23.39	60.00	0.00	
10/13/16	Ron Wiesman	22.75	29.58	60.00	0.00	44.00
Totals		173.35	225.36	480.00	0.00	164.00
Windrow Construction ratio:		2.86 /1				

MSAP Process Temperature Chart Windrow# 16-10-13

Temperature: Shading equals temperature 131 or greater for PFRP.

Days	Date	Point 1				Point 2				Point 3				Point 4				Average				Turn
		10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10"	20"	30"	40"	
1	10/14/16	161	166	153	138	159	149	144	150	149	139	130	129	143	128	116	116	153	145.5	135.75	133.25	
2	10/15/16	161	161	153	144	155	152	149	150	149	139	131	129	147	139	129	125	153	147.75	140.5	137	
3	10/16/16																					
4	10/17/16	160	166	154	150	160	164	160	162	151	148	142	140	160	154	140	138	157.75	158	149	147.5	
5	10/18/16	160	165	160	154	160	160	158	158	154	152	154	160	164	162	150	142	159.5	159.75	155.5	153.5	
6	10/19/16	158	166	162	152	162	160	158	156	160	158	158	160	160	164	154	144	160	162	158	153	
7	10/20/16	156	168	166	154	160	160	158	156	159	158	158	160	162	164	157	150	159.25	162.5	159.75	155	
8	10/21/16	160	166	164	152	158	160	156	155	158	160	158	160	158	168	162	154	158.5	163.5	160	155.25	
9	10/22/16	159	162	164	160	158	161	165	171	150	161	163	165	152	169	172	163	154.75	163.25	166	164.75	
10	10/23/16																					
11	10/24/16	160	164	160	154	162	162	160	160	162	162	160	162	154	166	166	154	159.5	163.5	161.5	157.5	
12	10/25/16	158	166	160	152	166	164	160	158	166	164	160	160	160	166	166	158	162.5	165	161.5	157	
13	10/26/16	156	166	160	152	164	164	161	160	164	164	160	160	158	164	166	158	160.5	164.5	161.75	157.5	
14	10/27/16	150	166	160	150	162	164	162	161	164	162	162	162	154	162	165	158	157.5	163.5	162.25	157.75	
15	10/28/16	146	166	160	150	160	162	162	162	163	162	162	162	144	160	164	158	153.25	162.5	162	158	
16	10/29/16	142	158	162	162	161	168	172	172	152	164	162	162	138	162	168	164	148.25	163	166	165	
17	10/30/16																					
18	10/31/16	148	166	164	162	156	168	168	170	160	164	164	162	140	160	166	164	151	164.5	165.5	164.5	
19	11/1/16	148	165	166	161	152	166	166	168	162	166	162	162	142	160	164	161	151	164.25	164.5	163	
20	11/2/16	147	166	165	162	160	167	168	168	162	164	162	163	147	162	165	161	154	164.75	165	163.5	
21	11/3/16	146	166	165	160	162	168	168	168	163	164	162	164	150	166	166	163	155.25	166	165.25	163.75	
22	11/4/16	146	166	164	160	163	168	168	169	164	162	162	164	154	168	166	164	156.75	166	165	164.25	
23	11/5/16	134	166	164	165	160	165	165	172	160	164	164	164	139	160	165	170	148.25	163.75	164.5	167.75	
24	11/6/16																					
25	11/7/16	136	164	164	164	161	166	168	171	157	164	164	163	138	148	164	166	148	160.5	165	166	
26	11/8/16	135	162	164	162	162	166	168	170	154	162	164	162	138	144	162	164	147.25	158.5	164.5	164.5	
27	11/9/16	138	157	162	161	154	162	166	170	150	158	161	163	140	152	160	162	145.5	157.25	162.25	164	
28	11/10/16	138	154	164	162	158	162	166	166	150	158	160	160	141	158	162	161	146.75	158	163	162.25	
29	11/11/16	143	163	163	161	159	163	162	160	150	160	160	157	141	162	165	160	148.25	162	162.5	159.5	
30	11/12/16	143	162	162	160	150	160	170	170	158	163	161	158	142	162	165	168	148.25	161.75	164.5	164	
31	11/13/16																					
32	11/14/16	142	160	164	162	151	161	168	170	156	162	164	162	138	160	165	167	146.75	160.75	165.25	165.25	
33	11/15/16	140	159	164	162	152	164	168	170	148	162	164	164	132	158	166	166	143	160.75	165.5	165.5	
34	11/16/16	140	154	162	160	148	161	164	164	140	162	162	162	134	156	165	166	140.5	158.25	163.25	163	
35	11/17/16	140	152	160	160	145	160	160	158	135	160	161	161	138	156	164	168	139.5	157	161.25	161.75	
36	11/18/16	136	158	160	157	140	160	157	159	132	155	158	157	134	158	160	160	135.5	157.75	158.75	158.25	
37	11/19/16	147	162	162	160	140	161	162	162	135	159	160	162	141	160	162	161	140.75	160.5	161.5	161.25	
38	11/20/16																					
39	11/21/16	138	154	160	162	132	158	166	166	140	158	164	164	131	154	162	164	135.25	156	163	164	
40	11/22/16	132	149	161	162	131	152	165	166	132	152	164	164	131	148	163	164	131.5	150.25	163.25	164	Yes
41	11/23/16	140	150	160	156	150	161	161	160	134	154	164	168	133	144	160	156	139.25	152.25	161.25	160	
42	11/24/16																					
43	11/25/16	158	172	164	157	158	161	164	161	150	162	160	160	150	161	169	171	154	164	164.25	162.25	
44	11/26/16	155	170	170	164	160	161	164	160	151	164	165	161	150	160	168	170	154	163.75	166.75	163.75	
45	11/27/16																					
46	11/28/16	148	160	166	164	156	158	164	164	148	162	165	165	150	158	166	168	150.5	159.5	165.25	165.25	
47	11/29/16	142	160	164	166	150	152	165	166	144	162	164	165	146	152	165	168	145.5	156.5	164.5	166.25	
48	11/30/16	138	158	165	166	148	150	165	165	140	160	165	165	142	148	166	166	142	154	165.25	165.5	

Hillsborough County Composting - Monitoring Sheet (MSAP Method)					Windrow #_16-10-18	
Windrow Construction:			Date Commenced: 10-14-16	Date Completed: 10-18-16		
Date	Operator Name	Biosolids (tons)	Biosolids (yards)	Yard Waste (yards)	Overs (yards)	Cover (yards)
10/14/16	Oscar Ochoa	21.66	28.16	60.00	0.00	
10/14/16	Oscar Ochoa	21.47	27.91	60.00	0.00	20
10/15/16	Oscar Ochoa	22.18	28.83	60.00	0.00	
10/15/16	Oscar Ochoa	21.03	27.34	60.00	0.00	30
10/17/16	Oscar Ochoa	22.27	28.95	60.00	0.00	
10/17/16	Oscar Ochoa	21.49	27.94	60.00	0.00	50
10/18/16	Oscar Ochoa	21.50	27.95	60.00	0.00	
10/18/16	Oscar Ochoa	22.53	29.29	60.00	0.00	50
Totals		174.13	226.37	480.00	0.00	150.00
Windrow Construction ratio:		2.78 /1				

MSAP Process Temperature Chart Windrow# 16-10-18

Temperature: Shading equals temperature 131 or greater for PFRP.

Days	Date	Point 1				Point 2				Point 3				Point 4				Average				Turn
		10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10"	20"	30"	40"	
1	10/19/16	166	170	152	136	164	170	162	146	160	166	152	136	136	150	136	118	156.5	164	150.5	134	
2	10/20/16	160	162	154	142	160	162	154	144	158	160	156	144	150	156	140	134	157	160	151	141	
3	10/21/16	166	168	156	150	168	164	160	146	166	170	162	154	164	164	148	132	166	166.5	156.5	145.5	
4	10/22/16	158	172	170	162	151	163	164	161	140	162	165	161	156	153	164	163	151.25	162.5	165.75	161.75	
5	10/23/16																					
6	10/24/16	168	170	164	158	166	168	166	156	162	166	165	160	152	158	154	154	162	165.5	162.25	157	
7	10/25/16	160	166	160	154	164	168	162	154	162	167	166	160	156	164	158	156	160.5	166.25	161.5	156	
8	10/26/16	162	168	162	156	160	166	160	154	160	166	164	160	152	162	160	160	158.5	165.5	161.5	157.5	
9	10/27/16	164	168	162	158	161	164	159	153	156	162	162	160	150	161	162	160	157.75	163.75	161.25	157.75	
10	10/28/16	168	170	164	158	162	160	156	152	154	160	162	160	148	160	162	162	158	162.5	161	158	
11	10/29/16	156	170	171	178	152	150	158	161	152	148	158	162	137	152	158	160	149.25	155	161.25	165.25	
12	10/30/16																					
13	10/31/16	158	168	168	164	158	162	164	160	156	162	160	161	138	160	160	162	152.5	163	163	161.75	
14	11/1/16	158	166	166	163	156	164	166	158	158	166	162	160	138	160	162	164	152.5	164	164	161.25	
15	11/2/16	160	168	166	164	160	166	165	160	158	166	166	163	148	162	166	165	156.5	165.5	165.75	163	
16	11/3/16	160	168	168	164	162	168	165	160	158	168	168	165	150	164	168	166	157.5	167	167.25	163.75	
17	11/4/16	162	170	168	164	164	168	164	161	158	169	170	166	156	164	170	166	160	167.75	168	164.25	
18	11/5/16	146	162	171	165	155	162	164	164	138	158	164	165	142	160	165	164	145.25	160.5	166	164.5	
19	11/6/16																					
20	11/7/16	146	164	168	165	156	160	164	162	136	156	164	164	134	158	165	164	143	159.5	165.25	163.75	
21	11/8/16	144	162	166	164	156	160	162	162	134	152	163	164	132	154	164	164	141.5	157	163.75	163.5	
22	11/9/16	141	162	166	163	152	164	166	161	140	158	164	165	134	152	163	164	141.75	159	164.75	163.25	
23	11/10/16	144	164	166	164	154	164	163	160	144	158	162	162	137	156	163	162	144.75	159.33	163.5	162	
24	11/11/16	146	163	160	158	159	163	162	160	150	160	160	157	141	162	165	160	149	162	161.75	158.75	
25	11/12/16	140	163	162	161	157	163	162	158	141	160	164	163	138	160	160	158	144	161.5	162	160	
26	11/13/16																					
27	11/14/16	140	165	164	162	158	164	166	160	140	159	164	164	136	156	161	160	143.5	161	163.75	161.5	
28	11/15/16	139	166	166	162	158	164	168	160	138	158	165	164	134	150	162	162	142.25	159.5	165.25	162	
29	11/16/16	142	166	163	161	155	164	166	158	136	160	165	161	150	166	164	162	145.75	164	164.5	160.5	
30	11/17/16	148	164	160	160	154	154	165	159	131	160	165	160	131	141	158	162	141	154.75	162	160.25	
31	11/18/16	150	165	164	160	141	160	160	159	140	160	164	160	140	158	162	161	142.75	160.75	162.5	160	
32	11/19/16	150	162	164	162	143	160	161	159	132	159	161	161	147	159	160	152	143	160	161.5	158.5	
33	11/20/16																					
34	11/21/16	146	160	164	166	136	158	160	160	132	156	163	160	132	152	158	162	136.5	156.5	161.25	162	
35	11/22/16	131	138	161	161	131	148	158	158	131	146	161	162	131	148	158	162	131	145	159.5	160.75	Yes
36	11/23/16	162	170	162	156	166	154	170	150	164	162	150	150	156	164	138	136	162	162.5	155	148	
37	11/24/16																					
38	11/25/16	160	170	162	150	162	169	165	164	162	169	165	164	159	165	160	150	160.75	168.25	163	157	
39	11/26/16	161	170	161	154	164	170	165	164	160	162	165	164	160	161	160	148	161.25	165.75	162.75	157.5	
40	11/27/16																					
41	11/28/16	156	168	162	162	162	168	166	165	157	161	165	169	154	161	160	158	157.25	164.5	163.25	163.5	
42	11/29/16	150	166	164	163	160	164	165	166	154	160	164	165	142	160	161	162	151.5	162.5	163.5	164	
43	11/30/16	146	166	162	164	160	162	165	166	152	158	164	164	142	159	162	162	150	161.25	163.25	164	

Hillsborough County Composting - Monitoring Sheet (MSAP Method)					Windrow #_16-10-22	
Windrow Construction:			Date Commenced: 10-19-16	Date Completed: 10-22-16		
Date	Operator Name	Biosolids (tons)	Biosolids (yards)	Yard Waste (yards)	Overs (yards)	Cover (yards)
10/19/16	Ron Wiesman	23.10	30.03	60.00	0.00	
10/19/16	Ron Wiesman	21.27	27.65	60.00	0.00	36
10/20/16	Ron Wiesman	22.56	29.33	60.00	0.00	
10/20/16	Ron Wiesman	21.18	27.53	52.00	0.00	40
10/21/16	Oscar Ochoa	21.62	28.11	52.00	0.00	
10/21/16	Oscar Ochoa	21.62	28.11	56.00	0.00	40
10/22/16	Oscar Ochoa	19.79	25.73	52.00	0.00	
10/22/16	Oscar Ochoa	19.81	25.75	56.00	0.00	40
Totals		170.95	222.24	448.00	0.00	156.00
Windrow Construction ratio:		2.72 /1				

MSAP Process Temperature Chart Windrow# 16-10-22

Temperature: Shading equals temperature 131 or greater for PFRP.

Days	Date	Point 1				Point 2				Point 3				Point 4				Average				Turn
		10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10"	20"	30"	40"	
1	10/23/16																					
2	10/24/16	160	142	132	124	164	148	134	120	164	158	144	128	142	128	118	116	157.5	144	132	122	
3	10/25/16	158	148	136	128	166	150	128	120	162	163	142	128	156	140	120	120	160.5	150.25	131.5	124	
4	10/26/16	158	156	148	132	164	150	136	129	156	164	152	134	156	144	131	125	158.5	153.5	141.75	130	
5	10/27/16	156	160	160	138	162	152	141	131	153	164	158	146	158	148	135	131	157.25	156	148.5	136.5	
6	10/28/16	154	166	162	140	160	152	146	132	148	166	162	156	160	150	138	131	155.5	158.5	152	139.75	
7	10/29/16	152	164	164	162	140	160	155	150	142	162	172	165	165	159	157	157	149.75	161.25	162	158.5	
8	10/30/16																					
9	10/31/16	156	166	166	160	156	161	158	151	152	163	172	160	166	162	158	156	157.5	163	163.5	156.75	
10	11/1/16	160	170	168	160	160	164	161	154	160	162	170	162	166	166	160	158	161.5	165.5	164.75	158.5	
11	11/2/16	160	172	169	160	158	163	160	158	160	166	170	160	166	166	160	158	161	166.75	164.75	159	
12	11/3/16	161	172	170	160	156	162	159	160	160	166	168	160	166	166	160	160	160.75	166.5	164.25	160	
13	11/4/16	161	172	170	158	152	161	158	160	160	168	168	158	166	166	160	160	159.75	166.75	164	159	
14	11/5/16	140	161	172	170	138	162	164	162	142	158	170	170	158	162	170	158	144.5	160.75	169	165	
15	11/6/16																					
16	11/7/16	140	160	170	166	140	160	164	162	140	160	167	166	158	166	168	160	144.5	161.5	167.25	163.5	
17	11/8/16	140	158	170	164	138	158	164	162	139	158	164	164	160	168	164	162	144.25	160.5	165.5	163	
18	11/9/16	140	162	170	162	140	160	166	161	141	160	166	164	164	170	166	164	146.25	163	167	162.75	
19	11/10/16	142	165	168	161	144	162	164	160	141	164	164	165	161	168	166	164	147	164.75	165.5	162.5	
20	11/11/16	149	167	158	161	150	165	164	150	141	166	162	150	161	166	165	161	150.25	166	162.25	155.5	
21	11/12/16	144	170	168	160	150	160	160	158	150	164	158	160	161	165	168	157	151.25	164.75	163.5	158.75	
22	11/13/16																					
23	11/14/16	142	162	170	162	148	160	166	160	150	162	166	164	162	167	163	161	150.5	162.75	166.25	161.75	
24	11/15/16	140	160	170	165	144	160	168	162	148	160	166	164	162	167	168	161	148.5	161.75	168	163	
25	11/16/16	136	160	170	164	138	160	165	164	140	154	164	162	160	163	170	166	143.5	159.25	167.25	164	
26	11/17/16	131	161	161	157	140	153	150	160	157	165	161	158	158	163	160	155	146.5	160.5	158	157.5	
27	11/18/16	136	160	164	160	139	158	152	159	132	161	160	150	160	165	162	159	141.75	161	159.5	157	
28	11/19/16	132	160	160	154	142	160	160	159	148	162	160	151	161	160	150	162	145.75	160.5	157.5	156.5	
29	11/20/16																					
30	11/21/16	136	148	166	168	138	158	162	164	132	150	162	164	142	158	164	164	137	153.5	163.5	165	
31	11/22/16	132	150	166	170	132	151	163	164	138	156	163	165	140	160	166	165	135.5	154.25	164.5	166	Yes
32	11/23/16	148	146	144	144	154	158	161	160	146	152	150	146	160	168	172	170	152	156	156.75	155	
33	11/24/16																					
34	11/25/16	170	171	164	167	152	169	161	151	162	158	156	147	142	165	170	170	156.5	165.75	162.75	158.75	
35	11/26/16	170	169	170	165	152	165	165	160	159	158	155	145	150	164	170	171	157.75	164	165	160.25	
36	11/27/16																					
37	11/28/16	160	166	170	172	135	132	168	170	131	154	166	170	132	152	162	171	139.5	151	166.5	170.75	
38	11/29/16	156	162	168	171	148	161	165	170	150	160	165	168	149	158	162	166	150.75	160.25	165	168.75	
39	11/30/16	150	158	168	168	156	160	166	168	151	158	166	168	150	158	164	165	151.75	158.5	166	167.25	

Hillsborough County Composting - Monitoring Sheet (MSAP Method)					Windrow # <u>16-10-27</u>	
Windrow Construction:			Date Commenced: 10-24-16		Date Completed: 10-27-16	
Date	Operator Name	Biosolids (tons)	Biosolids (yards)	Yard Waste (yards)	Overs (yards)	Cover (yards)
10/24/16	Oscar Ochoa	19.02	24.73	52.00	0.00	
10/24/16	Oscar Ochoa	17.81	23.15	52.00	0.00	40
10/25/16	Oscar Ochoa	21.00	27.30	52.00	0.00	
10/25/16	Oscar Ochoa	22.02	28.63	52.00	0.00	40
10/26/16	Ron Wiesman	21.57	28.04	60.00	0.00	
10/26/16	Mike Bayne	21.72	28.24	60.00	0.00	36
10/27/16	Mike Bayne	22.37	29.08	60.00	0.00	
10/27/16	Mike Bayne	20.96	27.25	60.00	0.00	40
Totals		166.47	216.41	448.00	0.00	156.00
Windrow Construction ratio:		2.79 /1				

MSAP Process Temperature Chart Windrow# 16-10-27																						
Temperature: Shading equals temperature 131 or greater for PFRP.																						
Days	Date	Point 1				Point 2				Point 3				Point 4				Average				Turn
		10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10"	20"	30"	40"	
1	10/28/16	148	166	166	146	132	166	162	156	150	138	124	120	131	160	162	148	140.25	157.5	153.5	142.5	
2	10/29/16	144	163	167	162	132	159	170	170	160	165	158	136	136	162	165	162	143	162.25	165	157.5	
3	10/30/16																					
4	10/31/16	156	164	166	160	150	161	170	166	162	162	160	150	150	162	165	160	154.5	162.25	165.25	159	
5	11/1/16	164	170	165	160	160	164	170	164	166	164	160	156	158	166	166	160	162	166	165.25	160	
6	11/2/16	164	169	165	160	158	164	170	164	166	166	162	156	160	168	166	160	162	166.75	165.75	160	
7	11/3/16	164	168	164	160	156	164	168	164	166	169	165	158	164	172	166	160	162.5	168.25	165.75	160.5	
8	11/4/16	164	168	164	160	156	164	168	164	166	169	165	158	164	172	166	160	162.5	168.25	165.75	160.5	
9	11/5/16	156	160	170	171	152	156	164	165	148	163	170	165	170	170	160	160	156.5	162.25	166	165.25	
10	11/6/16																					
11	11/7/16	154	166	167	162	148	154	164	166	149	163	168	165	158	162	166	162	152.25	161.25	166.25	163.75	
12	11/8/16	152	166	166	162	146	154	164	168	150	160	164	164	156	158	165	162	151	159.5	164.75	164	
13	11/9/16	152	168	168	162	140	156	167	168	150	162	166	164	151	161	168	165	148.25	161.75	167.25	164.75	
14	11/10/16	154	168	165	160	144	158	166	166	150	162	164	164	152	161	164	165	150	162.25	164.75	163.75	
15	11/11/16	152	167	161	160	148	162	164	165	151	160	162	164	152	162	165	166	150.75	162.75	163	163.75	
16	11/12/16	149	166	163	162	146	160	163	164	149	160	162	164	154	162	166	164	149.5	162	163.5	163.5	
17	11/13/16																					
18	11/14/16	148	160	165	161	156	160	160	161	148	158	161	164	156	163	168	161	152	160.25	163.5	161.75	
19	11/15/16	145	159	170	165	150	158	160	162	144	158	160	160	150	162	168	161	147.25	159.25	164.5	162	
20	11/16/16	140	158	168	168	142	152	164	166	138	152	160	160	156	163	170	166	144	156.25	165.5	165	
21	11/17/16	140	160	166	167	141	155	161	162	140	155	160	160	150	162	166	166	142.75	158	163.25	163.75	
22	11/18/16	139	160	165	166	138	161	161	162	142	154	159	160	152	161	165	165	142.75	159	162.5	163.25	
23	11/19/16	138	158	164	165	132	159	161	162	142	151	158	158	154	161	162	164	141.5	157.25	161.25	162.25	
24	11/20/16																					
25	11/21/16	138	158	158	166	131	148	158	162	136	148	158	158	134	156	158	166	134.75	152.5	158	163	
26	11/22/16	132	148	161	162	131	144	160	163	131	140	156	158	131	146	160	163	131.25	144.5	159.25	161.5	Yes
27	11/23/16	162	164	158	154	142	152	158	154	142	152	152	140	148	160	161	156	148.5	157	157.25	151	
28	11/24/16																					
29	11/25/16	172	177	176	172	151	160	170	171	152	170	170	160	156	161	163	162	157.75	167	169.75	166.25	
30	11/26/16	169	175	172	168	163	165	168	170	168	165	168	165	161	164	162	161	165.25	167.25	167.5	166	
31	11/27/16																					
32	11/28/16	162	164	165	162	161	158	162	171	160	157	164	166	162	162	159	160	161.25	160.25	162.5	164.75	
33	11/29/16	160	162	165	165	161	157	162	168	160	158	165	166	160	161	160	160	160.25	159.5	163	164.75	
34	11/30/16	160	161	163	164	160	157	161	164	159	159	164	164	160	161	158	160	159.75	159.5	161.5	163	

Hillsborough County Composting - Monitoring Sheet (MSAP Method)					Windrow # 16-11-1	
Windrow Construction:			Date Commenced: 10-28-16		Date Completed: 11-1-16	
Date	Operator Name	Biosolids (tons)	Biosolids (yards)	Yard Waste (yards)	Overs (yards)	Cover (yards)
10/28/16	Mike Bayne	21.65	28.15	60.00	0.00	
10/28/16	Mike Bayne	20.88	27.14	60.00	0.00	40
10/29/16	Oscar Ochoa	20.33	26.43	60.00	0.00	
10/29/16	Oscar Ochoa	18.82	24.47	60.00	0.00	36
10/31/16	Oscar Ochoa	20.83	27.08	60.00	0.00	
10/31/16	Oscar Ochoa	22.24	28.91	60.00	0.00	36
11/1/16	Ron Wiesman	20.52	26.68	56.00	0.00	
11/1/16	Ron Wiesman	21.71	28.22	56.00	0.00	40
Totals		166.98	217.07	472.00	0.00	152.00
Windrow Construction ratio:		2.87 /1				
Note: Yard waste yards = number of buckets * 4.00						

MSAP Process Temperature Chart Windrow# 16-11-1																						
Temperature: Shading equals temperature 131 or greater for PFRP.																						
Days	Date	Point 1				Point 2				Point 3				Point 4				Average				Turn
		10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10"	20"	30"	40"	
1	11/2/16	160	150	150	131	160	150	138	130	154	140	120	118	152	148	132	134	156.5	147	135	128.25	
2	11/3/16	161	158	152	142	158	148	146	136	160	144	134	126	156	152	140	142	158.75	150.5	143	136.5	
3	11/4/16	164	160	156	152	158	144	148	140	162	148	138	131	160	158	144	150	161	152.5	146.5	143.25	
4	11/5/16	150	160	164	164	158	143	142	136	160	162	142	132	160	162	164	162	157	156.75	153	148.5	
5	11/6/16																					
6	11/7/16	154	166	166	168	164	160	150	144	164	150	146	146	162	164	162	160	161	160	156	154.5	
7	11/8/16	154	162	162	164	160	162	160	146	160	150	154	154	160	166	165	168	158.5	160	160.25	158	
8	11/9/16	162	164	162	166	160	161	160	150	162	166	160	150	162	168	165	168	161.5	164.75	161.75	158.5	
9	11/10/16	162	162	162	165	162	161	161	153	162	164	160	154	160	165	165	168	161.5	163	162	160	
10	11/11/16	164	162	162	166	162	160	161	155	164	161	160	156	159	160	166	168	162.25	160.75	162.25	161.25	
11	11/12/16	158	161	162	165	160	159	160	157	160	160	162	158	158	161	166	168	159	160.25	162.5	162	
12	11/13/16																					
13	11/14/16	156	161	164	164	162	161	158	158	156	160	160	158	156	162	166	168	157.5	161	162	162	
14	11/15/16	150	160	164	164	161	163	158	157	152	160	160	158	150	162	166	168	153.25	161.25	162	161.75	
15	11/16/16	150	162	164	164	160	164	158	155	148	160	160	158	148	163	164	166	151.5	162.25	161.5	160.75	
16	11/17/16	146	159	162	164	156	161	160	161	147	158	162	160	147	162	164	165	149	160	162	162.5	
17	11/18/16	140	157	163	165	151	158	162	163	145	156	163	163	146	160	162	164	145.5	157.75	162.5	163.75	
18	11/19/16	138	156	163	164	146	156	164	165	140	152	165	164	141	155	163	165	141.25	154.75	163.75	164.5	
19	11/20/16																					
20	11/21/16	154	158	164	164	148	158	156	158	131	152	160	160	131	158	164	166	141	156.5	161	162	
21	11/22/16	150	162	164	162	148	162	164	158	136	154	160	160	131	158	164	166	141.25	159	163	161.5	
22	11/23/16	162	168	166	164	152	162	162	157	140	156	161	160	142	161	168	168	149	161.75	164.25	162.25	Yes
23	11/24/16																					
24	11/25/16	164	171	164	165	156	161	170	162	159	164	165	163	164	171	168	168	160.75	166.75	166.75	164.5	
25	11/26/16	162	167	165	165	160	163	168	166	163	162	166	164	161	166	167	168	161.5	164.5	166.5	165.75	
26	11/27/16																					
27	11/28/16	158	163	164	165	160	162	166	165	161	162	165	166	159	162	166	166	159.5	162.25	165.25	165.5	
28	11/29/16	156	162	165	165	158	161	165	165	159	162	164	165	156	160	165	165	157.25	161.25	164.75	165	
29	11/30/16	156	160	164	164	155	159	164	165	157	161	165	165	152	158	165	165	155	159.5	164.5	164.75	

Hillsborough County Composting - Monitoring Sheet (MSAP Method)					Windrow # 16-11-5	
Windrow Construction:			Date Commenced: 11-2-16		Date Completed: 11-5-16	
Date	Operator Name	Biosolids (tons)	Biosolids (yards)	Yard Waste (yards)	Overs (yards)	Cover (yards)
11/2/16	Mike Bayne	23.82	30.97	60.00	0.00	
11/2/16	Mike Bayne	22.08	28.70	60.00	0.00	40
11/3/16	Mike Bayne	22.29	28.98	60.00	0.00	
11/3/16	Mike Bayne	21.96	28.55	60.00	0.00	40
11/4/16	Oscar Ochoa	21.99	28.59	60.00	0.00	
11/4/16	Oscar Ochoa	21.95	28.54	60.00	0.00	36
11/5/16	Oscar Ochoa	22.01	28.61	60.00	0.00	
11/5/16	Oscar Ochoa	21.44	27.87	60.00	0.00	36
Totals		177.54	230.80	480.00	0.00	152.00
Windrow Construction ratio:		2.74 /1				
Note: Yard waste yards = number of buckets * 4.00						

MSAP Process Temperature Chart Windrow# 16-11-5																						
Temperature: Shading equals temperature 131 or greater for PFRP.																						
Days	Date	Point 1				Point 2				Point 3				Point 4				Average				Turn
		10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10"	20"	30"	40"	
1	11/6/16																					
2	11/7/16	160	172	172	166	167	170	160	134	146	167	170	156	146	152	150	160	154.75	165.25	163	154	
3	11/8/16	166	170	172	164	170	172	162	152	160	172	172	162	150	158	162	168	161.5	168	167	161.5	
4	11/9/16	160	170	167	162	168	168	160	152	164	172	171	162	166	168	170	168	164.5	169.5	167	161	
5	11/10/16																	#####	#####	#####	#####	
6	11/11/16	160	165	164	164	165	168	168	156	162	161	168	164	160	170	170	168	161.75	166	167.5	163	
7	11/12/16	160	162	168	160	159	158	168	168	159	160	169	166	161	169	170	168	159.75	162.25	168.75	165.5	
8	11/13/16																					
9	11/14/16	156	162	167	163	156	165	168	160	160	162	168	158	158	167	170	170	157.5	164	168.25	162.75	
10	11/15/16	152	164	168	162	154	165	168	162	160	164	168	158	154	166	170	170	155	164.75	168.5	163	
11	11/16/16	158	162	170	164	154	166	166	164	158	170	169	156	151	165	171	172	155.25	165.75	169	164	
12	11/17/16	156	162	168	165	153	162	165	164	156	168	169	161	149	164	168	170	153.5	164	167.5	165	
13	11/18/16	150	160	166	164	152	162	164	165	154	166	168	165	148	160	166	169	151	162	166	165.75	
14	11/19/16	146	158	165	164	149	160	163	164	151	162	168	166	142	158	156	168	147	159.5	163	165.5	
15	11/20/16																					
16	11/21/16	138	158	160	162	136	152	160	162	144	160	170	168	132	146	158	166	137.5	154	162	164.5	
17	11/22/16	142	155	164	162	138	156	162	162	143	160	170	166	140	150	166	170	140.75	155.25	165.5	165	
18	11/23/16	162	166	166	162	154	166	168	164	150	162	170	164	140	152	162	168	151.5	161.5	166.5	164.5	
19	11/24/16																					
20	11/25/16	154	164	162	160	148	160	166	164	145	158	166	164	138	149	161	166	146.25	157.75	163.75	163.5	
21	11/26/16	144	160	161	161	145	156	162	164	140	156	164	163	136	146	160	164	141.25	154.5	161.75	163	Yes
22	11/27/16																					
23	11/28/16	161	163	165	160	158	162	165	164	162	165	165	166	158	162	165	165	159.75	163	165	163.75	
24	11/29/16	160	161	165	164	158	160	164	165	160	161	165	166	158	160	164	165	159	160.5	164.5	165	
25	11/30/16	156	160	164	165	157	158	165	165	159	160	164	165	158	158	164	164	157.5	159	164.25	164.75	

Hillsborough County Composting - Monitoring Sheet (MSAP Method)					Windrow # 16-11-10	
Windrow Construction:			Date Commenced: 11-7-16		Date Completed: 11-10-16	
Date	Operator Name	Biosolids (tons)	Biosolids (yards)	Yard Waste (yards)	Overs (yards)	Cover (yards)
11/7/16	Oscar Ochoa	21.59	28.07	60.00	0.00	
11/7/16	Oscar Ochoa	22.32	29.02	60.00	0.00	36
11/8/16	Ron Wiesman	15.97	20.76	60.00	0.00	
11/8/16	Ron Wiesman	21.46	27.90	60.00	0.00	40
11/9/16	Mike Bayne	20.15	26.20	60.00	0.00	
11/9/16	Mike Bayne	21.39	27.81	60.00	0.00	40
11/10/16	Mike Bayne	20.55	26.72	60.00	0.00	
11/10/16	Mike Bayne	21.70	28.21	60.00	0.00	40
Totals		165.13	214.67	480.00	0.00	156.00
Windrow Construction ratio:		2.96 /1				
Note: Yard waste yards = number of buckets * 4.00						

MSAP Process Temperature Chart Windrow# 16-11-10																						
Temperature: Shading equals temperature 131 or greater for PFRP.																						
Days	Date	Point 1				Point 2				Point 3				Point 4				Average				Turn
		10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10"	20"	30"	40"	
1	11/11/16	150	132	104	100	140	130	100	94	153	138	128	118	140	130	118	108	145.75	132.5	112.5	105	
2	11/12/16	157	151	138	131	152	147	144	140	158	154	136	134	150	152	138	132	154.25	151	139	134.25	
3	11/13/16																					
4	11/14/16	160	160	148	138	160	162	156	150	160	160	150	146	161	161	150	140	160.25	160.75	151	143.5	
5	11/15/16	160	152	140	134	161	165	148	142	161	156	141	138	158	158	141	140	160	157.75	142.5	138.5	
6	11/16/16	164	160	148	140	162	162	156	150	162	160	148	144	164	160	148	140	163	160.5	150	143.5	
7	11/17/16	163	161	150	145	160	161	159	152	160	161	156	150	162	161	155	148	161.25	161	155	148.75	
8	11/18/16	162	162	156	149	158	160	159	155	159	161	159	156	160	161	157	155	159.75	161	157.75	153.75	
9	11/19/16	162	161	150	152	156	161	160	156	157	161	160	158	156	162	159	156	157.75	161.25	157.25	155.5	
10	11/20/16																					
11	11/21/16	154	165	160	154	150	162	160	158	156	162	162	158	152	164	160	155	153	163.25	160.5	156.25	
12	11/22/16	164	165	160	154	150	162	160	158	156	162	162	158	152	164	160	155	155.5	163.25	160.5	156.25	
13	11/23/16	152	164	160	154	146	162	164	160	146	156	162	160	152	164	160	154	149	161.5	161.5	157	
14	11/24/16																					
15	11/25/16	158	164	161	160	145	159	164	162	144	156	163	163	149	162	162	160	149	160.25	162.5	161.25	
16	11/26/16	144	160	163	164	138	156	162	163	140	152	164	164	148	151	162	162	142.5	154.75	162.75	163.25	Yes
17	11/27/16																					
18	11/28/16	161	163	165	163	165	166	163	164	162	163	164	163	160	163	162	162	162	163.75	163.5	163	
19	11/29/16	160	162	165	165	162	164	164	165	159	162	164	165	160	162	165	164	160.25	162.5	164.5	164.75	
20	11/30/16	158	160	164	165	161	163	165	165	160	161	164	164	158	160	164	165	159.25	161	164.25	164.75	

Hillsborough County Composting - Monitoring Sheet (MSAP Method)					Windrow # 16-11-15	
Windrow Construction:			Date Commenced: 11-11-16		Date Completed: 11-15-16	
Date	Operator Name	Biosolids (tons)	Biosolids (yards)	Yard Waste (yards)	Overs (yards)	Cover (yards)
11/11/16	Oscar Ochoa	22.17	28.82	56.00	0.00	
11/11/16	Oscar Ochoa	21.20	27.56	56.00	0.00	40
11/12/16	Oscar Ochoa	22.04	28.65	56.00	0.00	
11/12/16	Oscar Ochoa	20.30	26.39	52.00	0.00	40
11/14/16	Oscar Ochoa	22.48	29.22	56.00	0.00	
11/14/16	Oscar Ochoa	20.05	26.07	60.00	0.00	40
11/15/16	Oscar Ochoa	21.16	27.51	52.00	0.00	
11/15/16	Oscar Ochoa	21.29	27.68	52.00	0.00	40
Totals		170.69	221.90	440.00	0.00	160.00
Windrow Construction ratio:		1.98 /1				
Note: Yard waste yards = number of buckets * 4.00						

MSAP Process Temperature Chart Windrow# 16-11-15

Temperature:																						
Days	Date	Point 1				Point 2				Point 3				Point 4				Average				Turn
		10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10"	20"	30"	40"	
1	11/16/16	168	170	160	158	163	160	146	130	164	166	140	126	166	170	156	118	165.25	166.5	150.5	133	
2	11/17/16	168	169	161	158	162	162	151	131	162	165	150	136	165	169	160	131	164.25	166.25	155.5	139	
3	11/18/16	166	168	163	158	162	164	152	138	158	162	154	142	160	166	160	142	161.5	165	157.25	145	
4	11/19/16	164	168	165	159	162	164	156	140	156	160	158	150	158	165	163	150	160	164.25	160.5	149.75	
5	11/20/16																					
6	11/21/16	164	166	166	160	164	166	158	146	134	158	160	156	144	162	168	170	151.5	163	163	158	
7	11/22/16	162	168	168	162	160	162	161	150	150	161	162	156	152	166	168	165	156	164.25	164.75	158.25	
8	11/23/16	160	170	170	164	160	166	164	154	150	164	166	160	152	166	170	164	155.5	166.5	167.5	160.5	
9	11/24/16																					
10	11/25/16	156	160	168	166	159	164	165	160	151	164	165	162	150	162	166	166	154	162.5	166	163.5	
11	11/26/16	154	158	166	166	156	161	164	163	150	162	164	164	150	161	165	166	152.5	160.5	164.75	164.75	
12	11/27/16																					
13	11/28/16	154	156	165	166	156	160	165	164	150	161	165	166	149	160	166	166	152.25	159.25	165.25	165.5	
14	11/29/16	152	155	165	165	155	158	165	165	150	160	164	166	148	158	166	166	151.25	157.75	165	165.5	
15	11/30/16	148	154	164	165	150	156	164	165	148	157	163	165	147	156	165	165	148.25	155.75	164	165	

Hillsborough County Composting - Monitoring Sheet (MSAP Method)					Windrow # 16-11-19	
Windrow Construction:			Date Commenced: 11-16-16		Date Completed: 11-19-16	
Date	Operator Name	Biosolids (tons)	Biosolids (yards)	Yard Waste (yards)	Overs (yards)	Cover (yards)
11/16/16	Mike Bayne	22.20	28.86	60.00	0.00	
11/16/16	Mike Bayne	21.33	27.73	60.00	0.00	40
11/17/16	Mike Bayne	21.63	28.12	60.00	0.00	
11/17/16	Mike Bayne	21.93	28.51	60.00	0.00	40
11/18/16	Oscar Ochoa	22.04	28.65	60.00	0.00	
11/18/16	Oscar Ochoa	21.30	27.69	52.00	0.00	40
11/19/16	Oscar Ochoa	10.62	13.81	36.00	0.00	
11/19/16	Oscar Ochoa	21.70	28.21	60.00	0.00	32
Totals		162.75	211.58	448.00	0.00	152.00
Windrow Construction ratio:		2.84 /1				
Note: Yard waste yards = number of buckets * 4.00						

MSAP Process Temperature Chart Windrow# 16-10-19

Temperature:

Days	Date	Point 1				Point 2				Point 3				Point 4				Average				Turn
		10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10"	20"	30"	40"	
1	11/20/16																					
2	11/21/16	158	150	134	140	150	136	122	120	156	144	120	112	158	156	130	130	155.5	146.5	126.5	125.5	
3	11/22/16	148	150	136	142	158	152	134	134	160	160	136	131	160	161	134	131	156.5	155.75	135	134.5	
4	11/23/16	158	160	152	152	158	160	142	136	160	161	152	148	163	163	156	148	159.75	161	150.5	146	
5	11/24/16																					
6	11/25/16	160	158	156	152	158	160	151	140	156	158	157	154	160	162	158	154	158.5	159.5	155.5	150	
7	11/26/16	160	160	158	154	155	158	154	148	152	158	158	156	158	161	158	156	156.25	159.25	157	153.5	
8	11/27/16																					
9	11/28/16	158	162	162	158	148	152	156	152	150	162	159	158	152	156	160	158	152	158	159.25	156.5	
10	11/29/16	157	162	162	158	149	154	160	158	150	162	159	158	152	156	162	161	152	158.5	160.75	158.75	
11	11/30/16	156	162	164	159	152	156	160	159	151	161	160	159	150	158	166	164	152.25	159.25	162.5	160.25	