



PUBLIC WORKS

PO Box 1110 Tampa, FL 33601-1110
(813) 272-5912 | Fax: (813) 272-5811

MEMORANDUM

DATE: February 10, 2017

TO: Steve Morgan, Environmental Permitting Manager, FDEP
Lance Kautz, Environmental Specialist I, FDEP

FROM: Larry Ruiz, Section Manager, Public Works, SWMD

SUBJECT: Hillsborough County Biosolids Composting Monthly Report: January 2017

**BOARD OF COUNTY
COMMISSIONERS**

Victor D. Crist
Ken Hagan

Al Higginbotham

Pat Kemp

Lesley "Les" Miller, Jr.

Sandra L. Murman

Stacy R. White

COUNTY ADMINISTRATOR

Michael S. Merrill

COUNTY ATTORNEY

Chip Fletcher

INTERNAL AUDITOR

Peggy Caskey

CHIEF DEV. & INFRA.

SERVICES ADMINISTRATOR

Lucia E. Garsys

| | |
|------------------------------------|---|
| Biosolids Received (wet tons): | 1505.92 tons received 1/2 through 1/31 |
| Source of Biosolids: | Hillsborough County Falkenburg AWWTP |
| Source of Bulking Agent: | Hillsborough County - South County Yard Waste Processing Site |
| 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. • 10 total windrows are in active composting as of 1/31/17. • Windrow temperatures were monitored daily. • 4 windrow has met temperature and time requirements of the Process to Further Reduce Pathogens (PFRP). • 5 windrow have been turned. • The previous 10 windrows have been moved to the curing section and combined for a total of 5 large windrows. • Sampling was collected and sent to the lab on 1/31/2017. • No compost was distributed for use. |
| Attachments: | A-K; Windrow construction and temperature records. |

LER/rww
Attachments

CC: Beth Schinella, Division Director, Utility Operations, PUD
Kim Byer, Division Director, Solid Waste Management Division, PWD
Ron Wiesman, Manager, Southeast County Landfill, PWD/SWMD

Attachment A

| MSAP Process Temperature Chart Windrow# 16-12-9 | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 12/10/16 | 160 | 170 | 170 | 161 | 174 | 180 | 178 | 178 | 175 | 178 | 178 | 178 | 170 | 170 | 138 | 138 | 169.75 | 174.5 | 166 | 163.75 | |
| 2 | 12/11/16 | | | | | | | | | | | | | | | | | | | | | |
| 3 | 12/12/16 | 165 | 171 | 172 | 165 | 171 | 175 | 172 | 166 | 170 | 175 | 175 | 172 | 164 | 166 | 149 | 141 | 167.5 | 171.75 | 167 | 161 | |
| 4 | 12/13/16 | 168 | 172 | 174 | 168 | 168 | 170 | 164 | 160 | 165 | 172 | 170 | 160 | 161 | 164 | 158 | 142 | 165.5 | 169.5 | 166.5 | 157.5 | |
| 5 | 12/14/16 | 162 | 170 | 176 | 168 | 166 | 169 | 164 | 160 | 166 | 175 | 168 | 162 | 160 | 165 | 158 | 142 | 163.5 | 169.75 | 166.5 | 158 | |
| 6 | 12/15/16 | 158 | 166 | 180 | 167 | 163 | 167 | 163 | 159 | 168 | 180 | 166 | 163 | 158 | 165 | 159 | 144 | 161.75 | 169.5 | 167 | 158.25 | |
| 7 | 12/16/16 | 160 | 168 | 172 | 168 | 160 | 168 | 164 | 158 | 163 | 170 | 168 | 166 | 162 | 166 | 154 | 158 | 161.25 | 168 | 164.5 | 162.5 | |
| 8 | 12/17/16 | 160 | 170 | 172 | 170 | 165 | 169 | 162 | 158 | 161 | 175 | 175 | 169 | 158 | 160 | 150 | 155 | 161 | 168.5 | 164.75 | 163 | |
| 9 | 12/18/16 | | | | | | | | | | | | | | | | | | | | | |
| 10 | 12/19/16 | 144 | 170 | 170 | 166 | 161 | 166 | 162 | 158 | 160 | 172 | 170 | 168 | 160 | 160 | 148 | 150 | 156.25 | 167 | 162.5 | 160.5 | |
| 11 | 12/20/16 | 132 | 160 | 165 | 167 | 160 | 163 | 161 | 160 | 160 | 164 | 165 | 165 | 152 | 160 | 144 | 140 | 151 | 161.75 | 158.75 | 158 | |
| 12 | 12/21/16 | 138 | 152 | 168 | 172 | 148 | 169 | 170 | 162 | 140 | 169 | 174 | 174 | 149 | 168 | 156 | 154 | 143.75 | 164.5 | 167 | 165.5 | |
| 13 | 12/22/16 | 131 | 140 | 162 | 170 | 142 | 164 | 170 | 165 | 136 | 168 | 173 | 176 | 142 | 168 | 174 | 168 | 137.75 | 160 | 169.75 | 169.75 | |
| 14 | 12/23/16 | 132 | 152 | 161 | 163 | 152 | 162 | 168 | 169 | 150 | 162 | 168 | 168 | 160 | 161 | 150 | 140 | 148.5 | 159.25 | 161.75 | 160 | |
| 15 | 12/24/16 | 138 | 152 | 161 | 168 | 150 | 161 | 163 | 164 | 151 | 160 | 164 | 170 | 140 | 161 | 160 | 145 | 144.75 | 158.5 | 162 | 161.75 | |
| 16 | 12/25/16 | | | | | | | | | | | | | | | | | | | | | |
| 17 | 12/26/16 | 150 | 161 | 161 | 158 | 160 | 168 | 160 | 150 | 141 | 150 | 160 | 160 | 145 | 150 | 142 | 139 | 149 | 157.25 | 155.75 | 151.75 | Turn |
| 18 | 12/27/16 | 152 | 160 | 158 | 156 | 150 | 160 | 161 | 158 | 138 | 150 | 158 | 162 | 142 | 148 | 139 | 132 | 145.5 | 154.5 | 154 | 152 | |
| 19 | 12/28/16 | 135 | 159 | 172 | 173 | 160 | 171 | 170 | 170 | 131 | 162 | 172 | 160 | 155 | 171 | 169 | 173 | 145.25 | 165.75 | 170.75 | 169 | |
| 20 | 12/29/16 | 155 | 160 | 160 | 158 | 162 | 156 | 144 | 142 | 162 | 156 | 150 | 142 | 164 | 152 | 142 | 136 | 160.75 | 156 | 149 | 144.5 | |
| 21 | 12/30/16 | 155 | 161 | 163 | 160 | 160 | 155 | 158 | 150 | 160 | 155 | 157 | 155 | 160 | 155 | 150 | 150 | 158.75 | 156.5 | 157 | 153.75 | |
| 22 | 12/31/16 | 155 | 161 | 165 | 162 | 150 | 160 | 161 | 152 | 150 | 160 | 161 | 162 | 157 | 160 | 157 | 150 | 153 | 160.25 | 161 | 156.5 | Turn |
| 23 | 1/1/17 | | | | | | | | | | | | | | | | | | | | | |
| 24 | 1/2/17 | 145 | 159 | 162 | 165 | 156 | 170 | 175 | 177 | 164 | 177 | 178 | 178 | 149 | 170 | 173 | 171 | 153.5 | 169 | 172 | 172.75 | |
| 25 | 1/3/17 | 138 | 156 | 158 | 166 | 156 | 170 | 174 | 177 | 160 | 174 | 174 | 176 | 152 | 170 | 170 | 166 | 151.5 | 167.5 | 169 | 171.25 | |
| 26 | 1/4/17 | 132 | 142 | 152 | 168 | 158 | 170 | 173 | 177 | 152 | 171 | 174 | 175 | 154 | 170 | 165 | 161 | 149 | 163.25 | 166 | 170.25 | |
| 27 | 1/5/17 | 128 | 139 | 141 | 160 | 158 | 170 | 174 | 176 | 148 | 166 | 173 | 175 | 142 | 165 | 168 | 168 | 144 | 160 | 164 | 169.75 | |

| MSAP Process Temperature Chart Windrow# 16-12-14 | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 12/15/16 | 158 | 156 | 140 | 138 | 150 | 148 | 134 | 131 | 160 | 158 | 132 | 130 | 140 | 131 | 120 | 110 | 152 | 148.25 | 131.5 | 127.25 | |
| 2 | 12/16/16 | 161 | 159 | 140 | 140 | 164 | 162 | 140 | 131 | 160 | 165 | 138 | 132 | 144 | 140 | 138 | 122 | 157.25 | 156.5 | 139 | 131.25 | |
| 3 | 12/17/16 | 160 | 159 | 148 | 146 | 160 | 164 | 148 | 142 | 162 | 164 | 146 | 140 | 149 | 152 | 138 | 128 | 157.75 | 159.75 | 145 | 139 | |
| 4 | 12/18/16 | | | | | | | | | | | | | | | | | | | | | |
| 5 | 12/19/16 | 160 | 166 | 164 | 164 | 163 | 170 | 166 | 150 | 154 | 166 | 158 | 156 | 160 | 162 | 138 | 132 | 159.25 | 166 | 156.5 | 150.5 | |
| 6 | 12/20/16 | 159 | 164 | 164 | 160 | 161 | 168 | 166 | 150 | 152 | 166 | 163 | 159 | 158 | 164 | 147 | 138 | 157.5 | 165.5 | 160 | 151.75 | |
| 7 | 12/21/16 | 154 | 166 | 164 | 157 | 159 | 168 | 164 | 151 | 152 | 165 | 167 | 161 | 156 | 165 | 158 | 142 | 155.25 | 166 | 163.25 | 152.75 | |
| 8 | 12/22/16 | 143 | 163 | 165 | 163 | 149 | 163 | 163 | 152 | 150 | 161 | 164 | 162 | 162 | 169 | 162 | 140 | 151 | 164 | 163.5 | 154.25 | |
| 9 | 12/23/16 | 160 | 159 | 158 | 150 | 160 | 158 | 150 | 142 | 150 | 162 | 162 | 158 | 161 | 164 | 150 | 138 | 157.75 | 160.75 | 155 | 147 | |
| 10 | 12/24/16 | 142 | 159 | 158 | 150 | 152 | 160 | 158 | 150 | 142 | 158 | 161 | 150 | 151 | 152 | 158 | 152 | 146.75 | 157.25 | 158.75 | 150.5 | |
| 11 | 12/25/16 | | | | | | | | | | | | | | | | | | | | | |
| 12 | 12/26/16 | 132 | 160 | 170 | 175 | 132 | 158 | 167 | 170 | 142 | 160 | 165 | 167 | 150 | 160 | 168 | 157 | 139 | 159.5 | 167.5 | 167.25 | |
| 13 | 12/27/16 | 132 | 162 | 169 | 175 | 150 | 160 | 162 | 165 | 143 | 158 | 164 | 164 | 148 | 160 | 162 | 158 | 143.25 | 160 | 164.25 | 165.5 | |
| 14 | 12/28/16 | 152 | 168 | 170 | 162 | 134 | 164 | 163 | 152 | 147 | 162 | 164 | 162 | 161 | 164 | 155 | 148 | 148.5 | 164.5 | 163 | 156 | |
| 15 | 12/29/16 | 156 | 168 | 165 | 158 | 160 | 166 | 164 | 152 | 156 | 160 | 163 | 161 | 164 | 156 | 146 | 138 | 159 | 162.5 | 159.5 | 152.25 | |
| 16 | 12/30/16 | 150 | 160 | 166 | 170 | 160 | 166 | 165 | 160 | 160 | 161 | 165 | 170 | 148 | 151 | 158 | 160 | 154.5 | 159.5 | 163.5 | 165 | |
| 17 | 12/31/16 | 142 | 160 | 171 | 172 | 158 | 162 | 160 | 161 | 160 | 162 | 170 | 171 | 140 | 151 | 158 | 160 | 150 | 158.75 | 164.75 | 166 | |
| 18 | 1/1/17 | | | | | | | | | | | | | | | | | | | | | |
| 19 | 1/2/17 | 132 | 150 | 151 | 151 | 132 | 144 | 151 | 158 | 138 | 150 | 161 | 165 | 132 | 150 | 160 | 161 | 133.5 | 148.5 | 155.75 | 158.75 | |
| 20 | 1/3/17 | 131 | 148 | 152 | 151 | 132 | 146 | 151 | 159 | 136 | 150 | 160 | 163 | 131 | 148 | 161 | 161 | 132.5 | 148 | 156 | 158.5 | Turn |
| 21 | 1/4/17 | 160 | 173 | 178 | 178 | 155 | 171 | 178 | 174 | 160 | 172 | 175 | 176 | 162 | 174 | 174 | 172 | 159.25 | 172.5 | 176.25 | 175 | |
| 22 | 1/5/17 | 148 | 172 | 175 | 173 | 159 | 172 | 176 | 174 | 159 | 171 | 177 | 177 | 149 | 170 | 173 | 169 | 153.75 | 171.25 | 175.25 | 173.25 | |
| 23 | 1/6/17 | 140 | 160 | 167 | 168 | 146 | 160 | 167 | 170 | 145 | 160 | 166 | 172 | 142 | 164 | 170 | 171 | 143.25 | 161 | 167.5 | 170.25 | |
| 24 | 1/7/17 | 137 | 156 | 164 | 167 | 142 | 158 | 166 | 166 | 142 | 158 | 162 | 168 | 140 | 160 | 166 | 168 | 140.25 | 158 | 164.5 | 167.25 | |
| 25 | 1/8/17 | | | | | | | | | | | | | | | | | | | | | |
| 26 | 1/9/17 | 136 | 154 | 163 | 166 | 140 | 156 | 166 | 166 | 141 | 158 | 161 | 168 | 139 | 157 | 166 | 167 | 139 | 156.25 | 164 | 166.75 | Turn |
| 27 | 1/10/17 | 150 | 160 | 161 | 158 | 157 | 158 | 161 | 160 | 150 | 162 | 164 | 162 | 151 | 159 | 162 | 164 | 152 | 159.75 | 162 | 161 | |
| 28 | 1/11/17 | 161 | 164 | 166 | 162 | 163 | 165 | 165 | 166 | 158 | 164 | 166 | 164 | 160 | 162 | 168 | 166 | 160.5 | 163.75 | 166.25 | 164.5 | |

Attachment B

| MSAP Process Temperature Chart Windrow# 16-12-19 | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 12/20/16 | 160 | 161 | 140 | 140 | 160 | 163 | 140 | 138 | 162 | 158 | 132 | 119 | 120 | 119 | 120 | 117 | 150.5 | 150.25 | 133 | 128.5 | |
| 2 | 12/21/16 | 158 | 162 | 154 | 146 | 160 | 158 | 152 | 154 | 164 | 158 | 144 | 122 | 132 | 128 | 124 | 120 | 153.5 | 151.5 | 143.5 | 135.5 | |
| 3 | 12/22/16 | 156 | 160 | 150 | 148 | 158 | 158 | 151 | 156 | 162 | 154 | 137 | 126 | 138 | 139 | 131 | 128 | 153.5 | 152.75 | 142.25 | 139.5 | |
| 4 | 12/23/16 | 154 | 158 | 152 | 150 | 154 | 158 | 154 | 156 | 158 | 157 | 147 | 131 | 140 | 144 | 134 | 131 | 151.5 | 154.25 | 146.75 | 142 | |
| 5 | 12/24/16 | 150 | 160 | 160 | 150 | 154 | 157 | 156 | 156 | 154 | 158 | 152 | 131 | 141 | 146 | 136 | 132 | 149.75 | 155.25 | 151 | 142.25 | |
| 6 | 12/25/16 | | | | | | | | | | | | | | | | | | | | | |
| 7 | 12/26/16 | 148 | 162 | 161 | 152 | 150 | 157 | 158 | 157 | 148 | 157 | 157 | 158 | 142 | 148 | 135 | 132 | 147 | 156 | 152.75 | 149.75 | |
| 8 | 12/27/16 | 145 | 160 | 158 | 150 | 150 | 159 | 157 | 150 | 147 | 152 | 150 | 142 | 150 | 150 | 137 | 134 | 148 | 155.25 | 150.5 | 144 | |
| 9 | 12/28/16 | 157 | 165 | 162 | 145 | 165 | 168 | 162 | 153 | 153 | 163 | 150 | 136 | 155 | 154 | 138 | 136 | 157.5 | 162.5 | 153 | 142.5 | |
| 10 | 12/29/16 | 140 | 160 | 162 | 161 | 141 | 158 | 161 | 161 | 150 | 160 | 160 | 157 | 150 | 148 | 140 | 137 | 145.25 | 156.5 | 155.75 | 154 | |
| 11 | 12/30/16 | 140 | 160 | 160 | 152 | 150 | 161 | 162 | 160 | 150 | 157 | 150 | 149 | 140 | 145 | 141 | 137 | 145 | 155.75 | 153.25 | 149.5 | |
| 12 | 12/31/16 | 139 | 160 | 160 | 152 | 152 | 163 | 161 | 160 | 150 | 157 | 151 | 147 | 141 | 149 | 140 | 139 | 145.5 | 157.25 | 153 | 149.5 | |
| 13 | 1/1/17 | | | | | | | | | | | | | | | | | | | | | |
| 14 | 1/2/17 | 144 | 161 | 164 | 161 | 145 | 159 | 162 | 162 | 132 | 161 | 164 | 164 | 149 | 151 | 151 | 147 | 142.5 | 158 | 160.25 | 158.5 | |
| 15 | 1/3/17 | 140 | 162 | 164 | 160 | 147 | 160 | 161 | 162 | 138 | 161 | 164 | 163 | 152 | 156 | 157 | 152 | 144.25 | 159.75 | 161.5 | 159.25 | |
| 16 | 1/4/17 | 138 | 164 | 163 | 160 | 149 | 160 | 161 | 162 | 141 | 162 | 164 | 161 | 158 | 161 | 158 | 160 | 146.5 | 161.75 | 161.5 | 160.75 | |
| 17 | 1/5/17 | 134 | 169 | 167 | 160 | 145 | 164 | 164 | 161 | 145 | 166 | 162 | 160 | 157 | 164 | 158 | 160 | 145.25 | 165.75 | 162.75 | 160.25 | |
| 18 | 1/6/17 | 131 | 166 | 167 | 164 | 140 | 162 | 166 | 164 | 142 | 165 | 164 | 162 | 156 | 163 | 160 | 162 | 142.25 | 164 | 164.25 | 163 | |
| 19 | 1/7/17 | 148 | 164 | 156 | 152 | 150 | 164 | 161 | 156 | 162 | 161 | 159 | 160 | 153 | 164 | 161 | 158 | 153.25 | 163.25 | 159.25 | 156.5 | Turn |
| 20 | 1/8/17 | | | | | | | | | | | | | | | | | | | | | |
| 21 | 1/9/17 | 160 | 163 | 168 | 170 | 140 | 160 | 170 | 170 | 138 | 158 | 163 | 171 | 140 | 161 | 168 | 171 | 144.5 | 160.5 | 167.25 | 170.5 | |
| 22 | 1/10/17 | 158 | 165 | 162 | 158 | 158 | 160 | 160 | 157 | 150 | 158 | 158 | 160 | 149 | 158 | 158 | 158 | 153.75 | 160.25 | 159.5 | 158.25 | |
| 23 | 1/11/17 | 157 | 170 | 166 | 150 | 160 | 171 | 162 | 153 | 150 | 168 | 165 | 156 | 155 | 162 | 171 | 156 | 155.5 | 167.75 | 166 | 153.75 | |
| 24 | 1/12/17 | 158 | 170 | 170 | 166 | 154 | 167 | 168 | 166 | 157 | 171 | 169 | 158 | 159 | 168 | 166 | 160 | 157 | 169 | 168.25 | 162.5 | |
| 25 | 1/13/17 | 156 | 168 | 170 | 168 | 150 | 166 | 167 | 167 | 156 | 168 | 170 | 162 | 154 | 166 | 168 | 166 | 154 | 167 | 168.75 | 165.75 | Turn |
| 26 | 1/14/17 | 161 | 170 | 162 | 160 | 161 | 170 | 168 | 164 | 162 | 169 | 164 | 162 | 158 | 162 | 168 | 166 | 160.5 | 167.75 | 165.5 | 163 | |

| MSAP Process Temperature Chart Windrow# 16-12-22 | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 12/23/16 | 148 | 122 | 115 | 101 | 144 | 122 | 120 | 115 | 132 | 138 | 122 | 120 | 150 | 152 | 130 | 118 | 143.5 | 133.5 | 121.75 | 113.5 | |
| 2 | 12/24/16 | 149 | 140 | 132 | 121 | 150 | 142 | 128 | 124 | 156 | 148 | 130 | 126 | 158 | 156 | 134 | 123 | 153.25 | 146.5 | 131 | 123.5 | |
| 3 | 12/25/16 | | | | | | | | | | | | | | | | | | | | | |
| 4 | 12/26/16 | 150 | 151 | 138 | 133 | 151 | 158 | 142 | 132 | 162 | 150 | 132 | 128 | 161 | 158 | 138 | 128 | 156 | 154.25 | 137.5 | 130.25 | |
| 5 | 12/27/16 | 165 | 155 | 142 | 132 | 150 | 147 | 138 | 135 | 169 | 150 | 131 | 134 | 160 | 150 | 132 | 131 | 161 | 150.5 | 135.75 | 133 | |
| 6 | 12/28/16 | 163 | 160 | 144 | 134 | 154 | 157 | 144 | 136 | 164 | 158 | 137 | 136 | 160 | 156 | 140 | 132 | 160.25 | 157.75 | 141.25 | 134.5 | |
| 7 | 12/29/16 | 141 | 161 | 160 | 136 | 142 | 158 | 161 | 136 | 162 | 163 | 152 | 142 | 160 | 158 | 140 | 132 | 151.25 | 160 | 153.25 | 136.5 | |
| 8 | 12/30/16 | 150 | 154 | 150 | 137 | 154 | 150 | 144 | 135 | 160 | 160 | 153 | 144 | 155 | 160 | 148 | 138 | 154.75 | 156 | 148.75 | 138.5 | |
| 9 | 12/31/16 | 150 | 150 | 140 | 136 | 150 | 150 | 142 | 136 | 160 | 159 | 140 | 132 | 155 | 160 | 150 | 132 | 153.75 | 154.75 | 143 | 134 | |
| 10 | 1/1/17 | | | | | | | | | | | | | | | | | | | | | |
| 11 | 1/2/17 | 150 | 152 | 148 | 138 | 152 | 150 | 140 | 138 | 160 | 156 | 147 | 139 | 152 | 160 | 150 | 139 | 153.5 | 154.5 | 146.25 | 138.5 | |
| 12 | 1/3/17 | 150 | 158 | 150 | 140 | 152 | 157 | 148 | 140 | 162 | 160 | 148 | 140 | 154 | 162 | 154 | 140 | 154.5 | 159.25 | 150 | 140 | |
| 13 | 1/4/17 | 150 | 164 | 153 | 140 | 156 | 161 | 151 | 146 | 162 | 162 | 149 | 141 | 159 | 168 | 155 | 142 | 156.75 | 163.75 | 152 | 142.25 | |
| 14 | 1/5/17 | 148 | 164 | 156 | 146 | 150 | 164 | 156 | 148 | 162 | 160 | 148 | 138 | 152 | 166 | 154 | 140 | 153 | 163.5 | 153.5 | 143 | |
| 15 | 1/6/17 | 144 | 149 | 158 | 156 | 140 | 150 | 155 | 158 | 144 | 150 | 158 | 161 | 139 | 149 | 160 | 158 | 141.75 | 149.5 | 157.75 | 158.25 | |
| 16 | 1/7/17 | 142 | 148 | 158 | 158 | 138 | 148 | 158 | 158 | 140 | 148 | 158 | 160 | 138 | 148 | 155 | 159 | 139.5 | 148 | 157.25 | 158.75 | |
| 17 | 1/8/17 | | | | | | | | | | | | | | | | | | | | | |
| 18 | 1/9/17 | 144 | 154 | 155 | 156 | 142 | 148 | 156 | 156 | 142 | 150 | 161 | 157 | 136 | 142 | 152 | 158 | 141 | 148.5 | 156 | 156.75 | |
| 19 | 1/10/17 | 144 | 152 | 159 | 155 | 145 | 156 | 163 | 160 | 146 | 159 | 162 | 160 | 152 | 160 | 163 | 162 | 146.75 | 156.75 | 161.75 | 159.25 | |
| 20 | 1/11/17 | 164 | 172 | 168 | 165 | 156 | 160 | 141 | 138 | 169 | 174 | 170 | 156 | 162 | 164 | 167 | 154 | 162.75 | 167.5 | 161.5 | 153.25 | Turn |
| 21 | 1/12/17 | 162 | 168 | 168 | 163 | 168 | 169 | 154 | 146 | 153 | 164 | 171 | 160 | 154 | 158 | 172 | 166 | 159.25 | 164.75 | 166.25 | 158.75 | |
| 22 | 1/13/17 | 157 | 162 | 168 | 172 | 158 | 160 | 168 | 170 | 162 | 162 | 170 | 171 | 160 | 164 | 167 | 168 | 159.25 | 162 | 168.25 | 170.25 | |
| 23 | 1/14/17 | 156 | 160 | 170 | 172 | 162 | 168 | 172 | 172 | 164 | 162 | 170 | 172 | 160 | 164 | 166 | 167 | 160.5 | 163.5 | 169.5 | 170.75 | |
| 24 | 1/15/17 | | | | | | | | | | | | | | | | | | | | | |
| 25 | 1/16/17 | 148 | 156 | 162 | 152 | 154 | 154 | 152 | 151 | 156 | 160 | 154 | 152 | 154 | 154 | 152 | 151 | 153 | 156 | 155 | 151.5 | |
| 26 | 1/17/17 | 158 | 155 | 152 | 150 | 150 | 151 | 150 | 150 | 148 | 152 | 154 | 150 | 152 | 151 | 150 | 150 | 152 | 152.25 | 151.5 | 150 | Turn |
| 27 | 1/18/17 | 168 | 172 | 164 | 162 | 170 | 170 | 160 | 158 | 164 | 166 | 164 | 160 | 164 | 161 | 156 | 156 | 166.5 | 167.25 | 161 | 159 | |
| 28 | 1/19/17 | 162 | 170 | 170 | 170 | 160 | 166 | 166 | 162 | 160 | 165 | 168 | 166 | 162 | 166 | 160 | 158 | 161 | 166.75 | 166 | 164 | |
| 29 | 1/20/17 | 158 | 162 | 167 | 171 | 156 | 161 | 166 | 169 | 158 | 162 | 164 | 170 | 160 | 164 | 168 | 170 | 158 | 162.25 | 166.25 | 170 | |

Attachment C

| MSAP Process Temperature Chart Windrow# 16-12-24 | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 12/25/16 | | | | | | | | | | | | | | | | | | | | | |
| 2 | 12/26/16 | 132 | 122 | 116 | 108 | 138 | 128 | 115 | 108 | 142 | 128 | 122 | 115 | 150 | 142 | 132 | 125 | 140.5 | 130 | 121.25 | 114 | |
| 3 | 12/27/16 | 149 | 138 | 121 | 118 | 157 | 146 | 132 | 124 | 166 | 154 | 137 | 126 | 167 | 155 | 134 | 128 | 159.75 | 148.25 | 131 | 124 | |
| 4 | 12/28/16 | 154 | 146 | 123 | 124 | 158 | 154 | 138 | 118 | 154 | 147 | 122 | 105 | 162 | 168 | 144 | 131 | 157 | 153.75 | 131.75 | 119.5 | |
| 5 | 12/29/16 | 160 | 158 | 140 | 130 | 156 | 158 | 151 | 144 | 150 | 152 | 141 | 131 | 158 | 161 | 158 | 143 | 156 | 157.25 | 147.5 | 137 | |
| 6 | 12/30/16 | 160 | 152 | 144 | 135 | 150 | 160 | 160 | 155 | 150 | 145 | 137 | 131 | 147 | 150 | 140 | 136 | 151.75 | 151.75 | 145.25 | 139.25 | |
| 7 | 12/31/16 | 158 | 142 | 132 | 138 | 150 | 159 | 160 | 155 | 150 | 143 | 132 | 132 | 143 | 149 | 139 | 132 | 150.25 | 148.25 | 140.75 | 139.25 | |
| 8 | 1/1/17 | | | | | | | | | | | | | | | | | | | | | |
| 9 | 1/2/17 | 137 | 152 | 148 | 140 | 152 | 160 | 157 | 150 | 158 | 148 | 140 | 132 | 152 | 160 | 150 | 140 | 149.75 | 155 | 148.75 | 140.5 | |
| 10 | 1/3/17 | 138 | 158 | 154 | 142 | 150 | 160 | 161 | 158 | 156 | 152 | 146 | 134 | 148 | 162 | 156 | 148 | 148 | 158 | 154.25 | 145.5 | |
| 11 | 1/4/17 | 138 | 162 | 158 | 148 | 142 | 160 | 164 | 165 | 141 | 155 | 149 | 136 | 140 | 163 | 163 | 154 | 140.25 | 160 | 158.5 | 150.75 | |
| 12 | 1/5/17 | 142 | 156 | 152 | 152 | 140 | 142 | 160 | 157 | 145 | 156 | 152 | 144 | 156 | 166 | 161 | 149 | 145.75 | 155 | 156.25 | 150.5 | |
| 13 | 1/6/17 | 152 | 156 | 160 | 161 | 158 | 160 | 161 | 162 | 152 | 157 | 162 | 162 | 156 | 161 | 164 | 163 | 154.5 | 158.5 | 161.75 | 162 | |
| 14 | 1/7/17 | 152 | 156 | 159 | 161 | 159 | 160 | 161 | 162 | 148 | 157 | 161 | 162 | 158 | 162 | 164 | 164 | 154.25 | 158.75 | 161.25 | 162.25 | |
| 15 | 1/8/17 | | | | | | | | | | | | | | | | | | | | | |
| 16 | 1/9/17 | 156 | 161 | 162 | 162 | 156 | 159 | 161 | 162 | 156 | 158 | 164 | 165 | 158 | 161 | 164 | 163 | 156.5 | 159.75 | 162.75 | 163 | |
| 17 | 1/10/17 | 148 | 158 | 162 | 162 | 158 | 160 | 162 | 162 | 150 | 152 | 164 | 164 | 158 | 158 | 162 | 164 | 153.5 | 157 | 162.5 | 163 | |
| 18 | 1/11/17 | 144 | 160 | 162 | 148 | 148 | 156 | 162 | 160 | 149 | 153 | 150 | 156 | 150 | 163 | 166 | 162 | 147.75 | 158 | 160 | 156.5 | |
| 19 | 1/12/17 | 144 | 163 | 149 | 131 | 142 | 155 | 164 | 162 | 150 | 162 | 153 | 158 | 148 | 164 | 162 | 161 | 146 | 161 | 157 | 153 | |
| 20 | 1/13/17 | 148 | 154 | 158 | 161 | 150 | 154 | 163 | 162 | 146 | 154 | 162 | 163 | 145 | 158 | 162 | 163 | 147.25 | 155 | 161.25 | 162.25 | |
| 21 | 1/14/17 | 146 | 158 | 160 | 159 | 153 | 160 | 161 | 160 | 149 | 157 | 160 | 160 | 150 | 160 | 164 | 162 | 149.5 | 158.75 | 161.25 | 160.25 | |
| 22 | 1/15/17 | | | | | | | | | | | | | | | | | | | | Turn | |
| 23 | 1/16/17 | 146 | 158 | 160 | 159 | 150 | 159 | 161 | 161 | 148 | 154 | 158 | 158 | 148 | 158 | 163 | 162 | 148 | 157.25 | 160.5 | 160 | |
| 24 | 1/17/17 | 162 | 161 | 158 | 158 | 164 | 164 | 162 | 160 | 164 | 162 | 158 | 156 | 164 | 164 | 160 | 161 | 163.5 | 162.75 | 159.5 | 158.75 | |
| 25 | 1/18/17 | 160 | 161 | 160 | 164 | 163 | 162 | 162 | 164 | 163 | 162 | 164 | 162 | 164 | 164 | 163 | 163 | 162.5 | 162.25 | 162.25 | 163.25 | |
| 26 | 1/19/17 | 160 | 160 | 162 | 168 | 160 | 162 | 162 | 166 | 160 | 164 | 166 | 166 | 162 | 166 | 168 | 166 | 160.5 | 163 | 164.5 | 166.5 | |
| 27 | 1/20/17 | 160 | 162 | 164 | 168 | 154 | 162 | 166 | 168 | 150 | 160 | 169 | 170 | 148 | 158 | 168 | 168 | 153 | 160.5 | 166.75 | 168.5 | |
| 28 | 1/21/17 | 152 | 163 | 166 | 169 | 149 | 162 | 165 | 170 | 150 | 161 | 168 | 169 | 148 | 160 | 168 | 170 | 149.75 | 161.5 | 166.75 | 169.5 | |

| MSAP Process Temperature Chart Windrow# 16-12-28 | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 12/29/16 | 138 | 133 | 122 | 116 | 120 | 119 | 114 | 100 | 150 | 142 | 134 | 130 | 118 | 115 | 101 | 100 | 131.5 | 127.25 | 117.75 | 111.5 | |
| 2 | 12/30/16 | 160 | 145 | 136 | 127 | 160 | 142 | 137 | 127 | 150 | 153 | 150 | 141 | 150 | 140 | 122 | 115 | 155 | 145 | 136.25 | 127.5 | |
| 3 | 12/31/16 | 160 | 144 | 132 | 127 | 160 | 142 | 132 | 127 | 150 | 155 | 150 | 146 | 145 | 139 | 122 | 118 | 153.75 | 145 | 134 | 129.5 | |
| 4 | 1/1/17 | | | | | | | | | | | | | | | | | | | | | |
| 5 | 1/2/17 | 157 | 157 | 142 | 136 | 156 | 152 | 144 | 139 | 142 | 160 | 159 | 150 | 152 | 143 | 138 | 131 | 151.75 | 153 | 145.75 | 139 | |
| 6 | 1/3/17 | 154 | 157 | 146 | 138 | 155 | 158 | 148 | 140 | 149 | 160 | 158 | 148 | 156 | 148 | 140 | 136 | 153.5 | 155.75 | 148 | 140.5 | |
| 7 | 1/4/17 | 153 | 158 | 146 | 136 | 150 | 161 | 150 | 135 | 150 | 160 | 158 | 141 | 158 | 150 | 132 | 140 | 152.75 | 157.25 | 146.5 | 138 | |
| 8 | 1/5/17 | 154 | 156 | 144 | 135 | 159 | 158 | 146 | 134 | 148 | 157 | 164 | 149 | 158 | 154 | 134 | 142 | 154.75 | 156.25 | 147 | 140 | |
| 9 | 1/6/17 | 152 | 150 | 139 | 132 | 156 | 158 | 148 | 134 | 146 | 156 | 164 | 150 | 156 | 156 | 138 | 138 | 152.5 | 155 | 147.25 | 138.5 | |
| 10 | 1/7/17 | 150 | 152 | 138 | 132 | 156 | 156 | 146 | 132 | 146 | 154 | 160 | 148 | 154 | 156 | 138 | 136 | 151.5 | 154.5 | 145.5 | 137 | |
| 11 | 1/8/17 | | | | | | | | | | | | | | | | | | | | | |
| 12 | 1/9/17 | 158 | 170 | 170 | 162 | 152 | 163 | 170 | 170 | 152 | 168 | 170 | 168 | 160 | 162 | 170 | 170 | 155.5 | 165.75 | 170 | 167.5 | |
| 13 | 1/10/17 | 166 | 172 | 173 | 169 | 168 | 173 | 174 | 174 | 163 | 173 | 172 | 172 | 166 | 173 | 172 | 171 | 165.75 | 172.75 | 172.75 | 171.5 | |
| 14 | 1/11/17 | 166 | 172 | 173 | 169 | 168 | 173 | 174 | 174 | 163 | 175 | 172 | 172 | 166 | 173 | 172 | 171 | 165.75 | 173.25 | 172.75 | 171.5 | |
| 15 | 1/12/17 | 162 | 171 | 173 | 172 | 165 | 173 | 173 | 174 | 160 | 175 | 173 | 173 | 162 | 171 | 172 | 172 | 162.25 | 172.5 | 172.75 | 172.75 | |
| 16 | 1/13/17 | 164 | 172 | 171 | 172 | 167 | 172 | 172 | 173 | 161 | 171 | 172 | 172 | 164 | 170 | 171 | 171 | 164 | 171.25 | 171.5 | 172 | |
| 17 | 1/14/17 | 162 | 171 | 171 | 172 | 165 | 169 | 171 | 172 | 160 | 170 | 171 | 171 | 162 | 169 | 170 | 171 | 162.25 | 169.75 | 170.75 | 171.5 | |
| 18 | 1/15/17 | | | | | | | | | | | | | | | | | | | | | |
| 19 | 1/16/17 | 160 | 169 | 174 | 175 | 154 | 164 | 172 | 174 | 154 | 162 | 170 | 172 | 162 | 168 | 174 | 173 | 157.5 | 165.75 | 172.5 | 173.5 | |
| 20 | 1/17/17 | 161 | 170 | 174 | 174 | 152 | 164 | 171 | 173 | 154 | 162 | 169 | 173 | 160 | 166 | 173 | 173 | 156.75 | 165.5 | 171.75 | 173.25 | |
| 21 | 1/18/17 | 162 | 170 | 173 | 172 | 148 | 162 | 171 | 172 | 152 | 160 | 168 | 173 | 156 | 162 | 172 | 172 | 154.5 | 163.5 | 171 | 172.25 | |
| 22 | 1/19/17 | 156 | 168 | 172 | 172 | 146 | 158 | 170 | 172 | 148 | 158 | 168 | 173 | 150 | 164 | 172 | 172 | 150 | 162 | 170.5 | 172.25 | |
| 23 | 1/20/17 | 152 | 166 | 172 | 172 | 144 | 156 | 168 | 172 | 146 | 154 | 167 | 174 | 152 | 166 | 172 | 172 | 148.5 | 160.5 | 169.75 | 172.5 | |
| 24 | 1/21/17 | 150 | 164 | 170 | 172 | 142 | 150 | 163 | 170 | 140 | 152 | 164 | 174 | 160 | 168 | 172 | 172 | 148 | 158.5 | 167.25 | 172 | |
| 25 | 1/22/17 | | | | | | | | | | | | | | | | | | | | | |
| 26 | 1/23/17 | 148 | 167 | 170 | 172 | 149 | 158 | 166 | 170 | 140 | 154 | 168 | 174 | 154 | 166 | 173 | 174 | 147.75 | 161.25 | 169.25 | 172.5 | |
| 27 | 1/24/17 | 146 | 160 | 170 | 171 | 156 | 162 | 168 | 171 | 140 | 156 | 170 | 174 | 152 | 166 | 174 | 174 | 148.5 | 161 | 170.5 | 172.5 | |
| 28 | 1/25/17 | 149 | 160 | 171 | 172 | 150 | 158 | 167 | 171 | 140 | 152 | 168 | 173 | 150 | 162 | 173 | 174 | 147.25 | 158 | 169.75 | 172.5 | |
| 29 | 1/26/17 | 152 | 161 | 171 | 172 | 144 | 156 | 166 | 172 | 140 | 148 | 166 | 172 | 150 | 160 | 172 | 173 | 146.5 | 156.25 | 168.75 | 172.25 | |
| 30 | 1/27/17 | 150 | 160 | 170 | 172 | 142 | 154 | 167 | 172 | 140 | 149 | 166 | 172 | 148 | 160 | 172 | 173 | 145 | 155.75 | 168.75 | 172.25 | |
| 31 | 1/28/17 | 147 | 168 | 171 | 172 | 132 | 156 | 167 | 172 | 119 | 145 | 164 | 176 | 155 | 172 | 174 | 174 | 138.25 | 160.25 | 169 | 173.5 | |

Attachment D

| MSAP Process Temperature Chart Windrow# 16-12-31 | | | | | | | | | | | | | | | | | | | | | | |
|--|---------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 1/1/17 | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1/2/17 | 152 | 150 | 138 | 136 | 150 | 144 | 128 | 126 | 156 | 150 | 123 | 122 | 156 | 154 | 130 | 112 | 153.5 | 149.5 | 129.75 | 124 | |
| 3 | 1/3/17 | 164 | 166 | 152 | 144 | 163 | 164 | 142 | 136 | 160 | 162 | 144 | 134 | 162 | 160 | 141 | 136 | 162.25 | 163 | 144.75 | 137.5 | |
| 4 | 1/4/17 | 158 | 162 | 164 | 162 | 150 | 158 | 160 | 160 | 160 | 162 | 164 | 162 | 150 | 162 | 164 | 160 | 154.5 | 161 | 163 | 161 | |
| 5 | 1/5/17 | 157 | 162 | 164 | 164 | 160 | 162 | 162 | 162 | 158 | 162 | 165 | 160 | 156 | 162 | 164 | 160 | 157.75 | 162 | 163.75 | 161.5 | |
| 6 | 1/6/17 | 152 | 156 | 162 | 164 | 150 | 156 | 160 | 160 | 152 | 158 | 165 | 164 | 152 | 160 | 165 | 162 | 151.5 | 157.5 | 163 | 162.5 | |
| 7 | 1/7/17 | 158 | 160 | 162 | 166 | 148 | 154 | 158 | 158 | 152 | 158 | 164 | 162 | 153 | 160 | 164 | 162 | 152.75 | 158 | 162 | 162 | |
| 8 | 1/8/17 | | | | | | | | | | | | | | | | | | | | | |
| 9 | 1/9/17 | 156 | 163 | 162 | 161 | 162 | 163 | 165 | 164 | 158 | 163 | 164 | 164 | 161 | 164 | 165 | 163 | 159.25 | 163.25 | 164 | 163 | |
| 10 | 1/10/17 | 153 | 158 | 161 | 163 | 157 | 162 | 164 | 162 | 157 | 161 | 164 | 163 | 160 | 165 | 166 | 165 | 156.75 | 161.5 | 163.75 | 163.25 | |
| 11 | 1/11/17 | 154 | 160 | 161 | 163 | 157 | 161 | 164 | 162 | 158 | 162 | 164 | 163 | 160 | 165 | 166 | 165 | 157.25 | 162 | 163.75 | 163.25 | |
| 12 | 1/12/17 | 156 | 161 | 163 | 164 | 156 | 160 | 165 | 162 | 158 | 162 | 165 | 165 | 158 | 164 | 165 | 164 | 157 | 161.75 | 164.5 | 163.75 | |
| 13 | 1/13/17 | 158 | 162 | 165 | 165 | 155 | 160 | 165 | 163 | 160 | 163 | 165 | 165 | 156 | 162 | 165 | 163 | 157.25 | 161.75 | 165 | 164 | |
| 14 | 1/14/17 | 156 | 160 | 163 | 164 | 156 | 160 | 163 | 162 | 155 | 161 | 164 | 165 | 158 | 162 | 164 | 164 | 156.25 | 160.75 | 163.5 | 163.75 | |
| 15 | 1/15/17 | | | | | | | | | | | | | | | | | | | | | |
| 16 | 1/16/17 | 154 | 160 | 164 | 163 | 158 | 164 | 166 | 164 | 157 | 160 | 163 | 165 | 155 | 162 | 165 | 164 | 156 | 161.5 | 164.5 | 164 | |
| 17 | 1/17/17 | 160 | 164 | 166 | 162 | 158 | 162 | 164 | 160 | 157 | 162 | 163 | 158 | 158 | 164 | 162 | 156 | 158.25 | 163 | 163.75 | 159 | |
| 18 | 1/18/17 | 159 | 161 | 163 | 161 | 157 | 161 | 164 | 163 | 157 | 162 | 163 | 163 | 158 | 164 | 163 | 161 | 157.75 | 162 | 163.25 | 162 | |
| 19 | 1/19/17 | 149 | 160 | 164 | 167 | 149 | 159 | 166 | 168 | 151 | 160 | 166 | 168 | 152 | 159 | 166 | 164 | 150.25 | 159.5 | 165.5 | 166.75 | Turn |
| 20 | 1/20/17 | 162 | 160 | 154 | 152 | 164 | 159 | 154 | 152 | 162 | 159 | 153 | 150 | 144 | 156 | 152 | 152 | 158 | 158.5 | 153.25 | 151.5 | |
| 21 | 1/21/17 | 164 | 166 | 160 | 158 | 168 | 164 | 157 | 155 | 166 | 165 | 158 | 156 | 160 | 159 | 156 | 155 | 164.5 | 163.5 | 157.75 | 156 | |
| 22 | 1/22/17 | | | | | | | | | | | | | | | | | | | | | |
| 23 | 1/23/17 | 164 | 166 | 168 | 168 | 166 | 168 | 170 | 168 | 160 | 166 | 170 | 168 | 164 | 166 | 168 | 166 | 163.5 | 166.5 | 169 | 167.5 | |
| 24 | 1/24/17 | 158 | 165 | 170 | 172 | 160 | 166 | 170 | 170 | 152 | 161 | 170 | 170 | 160 | 166 | 170 | 170 | 157.5 | 164.5 | 170 | 170.5 | |
| 25 | 1/25/17 | 156 | 164 | 170 | 172 | 160 | 166 | 170 | 170 | 156 | 163 | 170 | 170 | 166 | 168 | 170 | 170 | 159.5 | 165.25 | 170 | 170.5 | Turn |
| 26 | 1/26/17 | 156 | 162 | 170 | 171 | 161 | 165 | 170 | 170 | 160 | 166 | 170 | 171 | 170 | 170 | 170 | 168 | 161.75 | 165.75 | 170 | 170 | |
| 27 | 1/27/17 | 170 | 168 | 165 | 160 | 170 | 166 | 162 | 159 | 174 | 169 | 164 | 158 | 159 | 158 | 155 | 152 | 168.25 | 165.25 | 161.5 | 157.25 | |
| 28 | 1/28/17 | 166 | 174 | 176 | 172 | 168 | 172 | 175 | 172 | 168 | 174 | 176 | 173 | 170 | 174 | 172 | 170 | 168 | 173.5 | 174.75 | 171.75 | |

Attachment E

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow # 17-1-4 | |
|---|---------------|------------------|--------------------------|--------------------|------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 12-31-16 | | Date Completed: 1-4-17 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 12/31/16 | Oscar Ochoa | 22.25 | 28.93 | 52.00 | 12.00 | |
| 1/2/17 | Oscar Ochoa | 22.17 | 28.82 | 52.00 | | |
| 1/2/17 | Oscar Ochoa | 22.47 | 29.21 | 52.00 | 20.00 | |
| 1/3/17 | Oscar Ochoa | 22.12 | 28.76 | 52.00 | | |
| 1/3/17 | Oscar Ochoa | 21.13 | 27.47 | 52.00 | | |
| 1/3/17 | Oscar Ochoa | 22.61 | 29.39 | 52.00 | 40.00 | |
| 1/4/17 | Mike Bayne | 21.24 | 27.61 | 52.00 | | |
| 1/4/17 | Mike Bayne | 21.53 | 27.99 | 52.00 | 40.00 | |
| | | | | | | |
| | | | | | | |
| Totals | | 175.52 | 228.18 | 416.00 | 112.00 | 0.00 |
| | | | | | | |
| Windrow Construction ratio: | | 2.31 /1 | | | | |
| | | | | | | |
| | | | | | | |

Note: Yard waste yards = number of buckets * 4.00

| MSAP Process Temperature Chart Windrow# 17-1-4 | | | | | | | | | | | | | | | | | | | | | | |
|--|---------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 1/5/17 | 122 | 102 | 95 | 93 | 158 | 132 | 112 | 108 | 149 | 122 | 106 | 100 | 136 | 116 | 103 | 100 | 141.25 | 118 | 104 | 100.25 | |
| 2 | 1/6/17 | 138 | 110 | 110 | 100 | 152 | 138 | 120 | 119 | 144 | 140 | 122 | 115 | 155 | 151 | 132 | 116 | 147.25 | 134.75 | 121 | 112.5 | |
| 3 | 1/7/17 | 140 | 133 | 119 | 115 | 148 | 140 | 128 | 116 | 150 | 148 | 132 | 128 | 160 | 156 | 140 | 128 | 149.5 | 144.25 | 129.75 | 121.75 | |
| 4 | 1/8/17 | | | | | | | | | | | | | | | | | | | | | |
| 5 | 1/9/17 | 154 | 164 | 156 | 139 | 158 | 166 | 150 | 142 | 164 | 166 | 156 | 140 | 158 | 164 | 160 | 138 | 158.5 | 165 | 155.5 | 139.75 | |
| 6 | 1/10/17 | 154 | 162 | 166 | 156 | 156 | 166 | 170 | 152 | 160 | 164 | 161 | 148 | 159 | 166 | 164 | 150 | 157.25 | 164.5 | 165.25 | 151.5 | |
| 7 | 1/11/17 | 158 | 161 | 160 | 156 | 158 | 167 | 170 | 158 | 164 | 166 | 160 | 146 | 160 | 166 | 156 | 148 | 160 | 165 | 161.5 | 152 | |
| 8 | 1/12/17 | 161 | 162 | 160 | 155 | 160 | 158 | 169 | 160 | 160 | 164 | 162 | 148 | 162 | 164 | 158 | 150 | 160.75 | 162 | 162.25 | 153.25 | |
| 9 | 1/13/17 | 154 | 160 | 158 | 155 | 156 | 162 | 168 | 162 | 158 | 164 | 166 | 154 | 160 | 164 | 157 | 154 | 157 | 162.5 | 162.25 | 156.25 | |
| 10 | 1/14/17 | 156 | 161 | 160 | 156 | 154 | 162 | 168 | 164 | 160 | 162 | 164 | 156 | 162 | 160 | 158 | 152 | 158 | 161.25 | 162.5 | 157 | |
| 11 | 1/15/17 | | | | | | | | | | | | | | | | | | | | | |
| 12 | 1/16/17 | 156 | 159 | 158 | 150 | 152 | 160 | 166 | 160 | 158 | 163 | 160 | 150 | 158 | 158 | 158 | 150 | 156 | 160 | 160.5 | 152.5 | |
| 13 | 1/17/17 | 157 | 156 | 152 | 146 | 156 | 160 | 162 | 155 | 157 | 164 | 155 | 144 | 156 | 154 | 150 | 146 | 156.5 | 158.5 | 154.75 | 147.75 | |
| 14 | 1/18/17 | 157 | 153 | 141 | 140 | 160 | 161 | 148 | 132 | 153 | 166 | 152 | 132 | 152 | 153 | 139 | 140 | 155.5 | 158.25 | 145 | 136 | |
| 15 | 1/19/17 | 157 | 150 | 134 | 138 | 157 | 161 | 146 | 136 | 153 | 168 | 159 | 138 | 150 | 153 | 139 | 137 | 154.25 | 158 | 144.5 | 137.25 | Turn |
| 16 | 1/20/17 | 152 | 160 | 156 | 150 | 154 | 160 | 161 | 152 | 156 | 162 | 160 | 156 | 154 | 159 | 162 | 159 | 154 | 160.25 | 159.75 | 154.25 | |
| 17 | 1/21/17 | 158 | 162 | 162 | 158 | 160 | 161 | 162 | 160 | 162 | 162 | 161 | 161 | 161 | 162 | 161 | 162 | 160.25 | 161.75 | 161.5 | 160.25 | |
| 18 | 1/22/17 | | | | | | | | | | | | | | | | | | | | | |
| 19 | 1/23/17 | 156 | 160 | 160 | 160 | 157 | 160 | 162 | 164 | 160 | 161 | 161 | 160 | 159 | 160 | 161 | 162 | 158 | 160.25 | 161 | 161.5 | |
| 20 | 1/24/17 | 150 | 158 | 158 | 160 | 150 | 160 | 162 | 166 | 152 | 160 | 160 | 160 | 158 | 160 | 161 | 160 | 152.5 | 159.5 | 160.25 | 161.5 | Turn |
| 21 | 1/25/17 | 156 | 162 | 160 | 161 | 160 | 162 | 164 | 165 | 158 | 162 | 164 | 164 | 162 | 162 | 160 | 161 | 159 | 162 | 162 | 162.75 | |
| 22 | 1/26/17 | 146 | 163 | 166 | 163 | 146 | 165 | 160 | 162 | 154 | 160 | 160 | 165 | 157 | 165 | 158 | 160 | 150.75 | 163.25 | 161 | 162.5 | |
| 23 | 1/27/17 | 140 | 162 | 164 | 163 | 143 | 168 | 160 | 160 | 160 | 160 | 165 | 165 | 158 | 168 | 160 | 162 | 150.25 | 164.5 | 162.25 | 162.5 | |
| 24 | 1/28/17 | 145 | 150 | 168 | 140 | 149 | 165 | 166 | 164 | 156 | 161 | 168 | 166 | 140 | 165 | 152 | 166 | 147.5 | 160.25 | 163.5 | 159 | Turn |
| 25 | 1/29/17 | | | | | | | | | | | | | | | | | | | | | |
| 26 | 1/30/17 | 142 | 160 | 169 | 172 | 152 | 165 | 171 | 173 | 152 | 161 | 169 | 171 | 150 | 163 | 170 | 172 | 149 | 162.25 | 169.75 | 172 | |
| 27 | 1/31/17 | 150 | 162 | 169 | 170 | 152 | 165 | 170 | 170 | 150 | 165 | 170 | 172 | 160 | 169 | 171 | 171 | 153 | 165.25 | 170 | 170.75 | |

Attachment F

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow # 17-1-7 | |
|---|---------------|------------------|------------------------|------------------------|------------------|---------------|
| Windrow Construction: | | | Date Commenced: 1-4-17 | Date Completed: 1-7-17 | | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 1/4/17 | Mike Bayne | 21.38 | 27.79 | 56.00 | 16.00 | |
| 1/5/17 | Mike Bayne | 21.17 | 27.52 | 56.00 | | |
| 1/5/17 | Mike Bayne | 21.11 | 27.44 | 56.00 | 16.00 | |
| 1/6/17 | Oscar Ochoa | 20.60 | 26.78 | 52.00 | | |
| 1/6/17 | Oscar Ochoa | 0.00 | 0.00 | 52.00 | 32.00 | |
| 1/7/17 | Oscar Ochoa | 22.58 | 29.35 | 52.00 | | |
| 1/7/17 | Jerry Devoe | 22.21 | 28.87 | 52.00 | | |
| 1/7/17 | Jerry Devoe | 21.48 | 27.92 | 52.00 | 40.00 | |
| | | | | | | |
| | | | | | | |
| Totals | | 150.53 | 195.69 | 428.00 | 104.00 | 0.00 |
| | | | | | | |
| Windrow Construction ratio: | | 2.72 /1 | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

| MSAP Process Temperature Chart Windrow# 17-1-7 | | | | | | | | | | | | | | | | | | | | | | |
|--|---------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 1/8/17 | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1/9/17 | 160 | 150 | 131 | 130 | 140 | 134 | 120 | 119 | 146 | 140 | 112 | 110 | 142 | 130 | 112 | 110 | 147 | 138.5 | 118.75 | 117.25 | |
| 3 | 1/10/17 | 162 | 158 | 142 | 136 | 158 | 158 | 138 | 126 | 158 | 148 | 128 | 126 | 150 | 144 | 130 | 128 | 157 | 152 | 134.5 | 129 | |
| 4 | 1/11/17 | 164 | 162 | 144 | 138 | 158 | 160 | 144 | 134 | 162 | 156 | 140 | 132 | 158 | 156 | 136 | 133 | 160.5 | 158.5 | 141 | 134.25 | |
| 5 | 1/12/17 | 162 | 164 | 150 | 144 | 160 | 160 | 156 | 148 | 162 | 164 | 156 | 146 | 162 | 163 | 150 | 148 | 161.5 | 162.75 | 153 | 146.5 | |
| 6 | 1/13/17 | 162 | 164 | 156 | 150 | 162 | 162 | 156 | 152 | 164 | 165 | 160 | 152 | 162 | 163 | 156 | 152 | 162.5 | 163.5 | 157 | 151.5 | |
| 7 | 1/14/17 | 161 | 164 | 158 | 152 | 163 | 164 | 158 | 152 | 165 | 166 | 162 | 156 | 163 | 163 | 158 | 154 | 163 | 164.25 | 159 | 153.5 | |
| 8 | 1/15/17 | | | | | | | | | | | | | | | | | | | | | |
| 9 | 1/16/17 | 156 | 160 | 160 | 154 | 154 | 158 | 160 | 151 | 158 | 160 | 158 | 152 | 152 | 156 | 154 | 148 | 155 | 158.5 | 158 | 151.25 | |
| 10 | 1/17/17 | 156 | 159 | 161 | 152 | 155 | 158 | 160 | 150 | 158 | 160 | 158 | 150 | 156 | 162 | 160 | 146 | 156.25 | 159.75 | 159.75 | 149.5 | |
| 11 | 1/18/17 | 160 | 162 | 155 | 140 | 158 | 157 | 145 | 138 | 161 | 156 | 139 | 137 | 154 | 145 | 156 | 140 | 158.25 | 155 | 148.75 | 138.75 | |
| 12 | 1/19/17 | 166 | 164 | 144 | 138 | 154 | 152 | 133 | 132 | 153 | 154 | 138 | 133 | 156 | 147 | 148 | 136 | 157.25 | 154.25 | 140.75 | 134.75 | Turn |
| 13 | 1/20/17 | 158 | 161 | 156 | 152 | 161 | 164 | 161 | 154 | 157 | 166 | 161 | 162 | 156 | 162 | 161 | 158 | 158 | 163.25 | 159.75 | 156.5 | |
| 14 | 1/21/17 | 156 | 158 | 156 | 153 | 148 | 151 | 154 | 150 | 146 | 150 | 154 | 156 | 150 | 154 | 154 | 155 | 150 | 153.25 | 154.5 | 153.5 | |
| 15 | 1/22/17 | | | | | | | | | | | | | | | | | | | | | |
| 16 | 1/23/17 | 160 | 161 | 160 | 164 | 163 | 162 | 162 | 164 | 163 | 162 | 164 | 162 | 164 | 164 | 163 | 163 | 162.5 | 162.25 | 162.25 | 163.25 | |
| 17 | 1/24/17 | 150 | 160 | 162 | 164 | 160 | 163 | 162 | 163 | 159 | 160 | 160 | 159 | 157 | 160 | 161 | 161 | 156.5 | 160.75 | 161.25 | 161.75 | |
| 18 | 1/25/17 | 160 | 160 | 162 | 162 | 160 | 162 | 162 | 166 | 160 | 164 | 166 | 166 | 162 | 166 | 162 | 160 | 160.5 | 163 | 163 | 163.5 | |
| 19 | 1/26/17 | 162 | 168 | 156 | 160 | 157 | 156 | 158 | 162 | 154 | 158 | 146 | 162 | 151 | 143 | 160 | 160 | 156 | 156.25 | 155 | 161 | |
| 20 | 1/27/17 | 157 | 161 | 160 | 159 | 159 | 160 | 159 | 160 | 150 | 159 | 160 | 159 | 154 | 160 | 156 | 155 | 155 | 160 | 158.75 | 158.25 | |
| 21 | 1/28/17 | 155 | 160 | 160 | 159 | 159 | 161 | 159 | 156 | 149 | 158 | 160 | 150 | 154 | 160 | 156 | 155 | 154.25 | 159.75 | 158.75 | 155 | Turn |
| 22 | 1/29/17 | | | | | | | | | | | | | | | | | | | | | |
| 23 | 1/30/17 | 160 | 161 | 160 | 164 | 163 | 162 | 162 | 164 | 163 | 162 | 164 | 162 | 164 | 164 | 163 | 163 | 162.5 | 162.25 | 162.25 | 163.25 | |
| 24 | 1/31/17 | 160 | 160 | 162 | 168 | 160 | 162 | 162 | 166 | 160 | 164 | 166 | 166 | 162 | 166 | 168 | 166 | 160.5 | 163 | 164.5 | 166.5 | |

Attachment G

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | Windrow # 17-1-11 | | |
|---|---------------|------------------|------------------------|--------------------|-------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 1-9-17 | | Date Completed: 1-11-17 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 1/9/17 | Oscar Ochoa | 21.32 | 27.72 | 56.00 | | |
| 1/9/17 | Oscar Ochoa | 22.33 | 29.03 | 56.00 | | |
| 1/9/17 | Oscar Ochoa | 22.28 | 28.96 | 56.00 | 40.00 | |
| 1/10/17 | Oscar Ochoa | 22.15 | 28.80 | 56.00 | | |
| 1/10/17 | Oscar Ochoa | 21.96 | 28.55 | 56.00 | | |
| 1/10/17 | Oscar Ochoa | 21.55 | 28.02 | 56.00 | 40.00 | |
| 1/11/17 | Mike Bayne | 22.47 | 29.21 | 56.00 | | |
| 1/11/17 | Mike Bayne | 22.27 | 28.95 | 56.00 | 32.00 | |
| | | | | | | |
| | | | | | | |
| Totals | | 176.33 | 229.23 | 448.00 | 112.00 | 0.00 |
| | | | | | | |
| Windrow Construction ratio: | | 2.44 /1 | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

| MSAP Process Temperature Chart Windrow# 17-1-11 | | | | | | | | | | | | | | | | | | | | | | |
|--|---------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 1/12/17 | 158 | 152 | 136 | 130 | 159 | 154 | 144 | 140 | 160 | 154 | 148 | 142 | 158 | 146 | 132 | 128 | 158.75 | 151.5 | 140 | 135 | |
| 2 | 1/13/17 | 164 | 161 | 148 | 140 | 161 | 162 | 154 | 149 | 164 | 162 | 154 | 150 | 162 | 156 | 146 | 136 | 162.75 | 160.25 | 150.5 | 143.75 | |
| 3 | 1/14/17 | 164 | 162 | 150 | 144 | 166 | 164 | 156 | 150 | 160 | 164 | 160 | 156 | 158 | 162 | 148 | 142 | 162 | 163 | 153.5 | 148 | |
| 4 | 1/15/17 | | | | | | | | | | | | | | | | | | | | | |
| 5 | 1/16/17 | 161 | 163 | 156 | 150 | 160 | 161 | 163 | 154 | 158 | 158 | 156 | 156 | 156 | 160 | 154 | 148 | 158.75 | 160.5 | 157.25 | 152 | |
| 6 | 1/17/17 | 162 | 160 | 160 | 152 | 160 | 158 | 160 | 160 | 156 | 160 | 162 | 160 | 154 | 158 | 160 | 152 | 158 | 159 | 160.5 | 156 | |
| 7 | 1/18/17 | 163 | 158 | 160 | 156 | 157 | 146 | 166 | 164 | 155 | 161 | 162 | 161 | 154 | 150 | 160 | 158 | 157.25 | 153.75 | 162 | 159.75 | |
| 8 | 1/19/17 | 156 | 159 | 161 | 161 | 154 | 162 | 170 | 169 | 159 | 163 | 166 | 166 | 156 | 161 | 164 | 163 | 156.25 | 161.25 | 165.25 | 164.75 | |
| 9 | 1/20/17 | 154 | 160 | 154 | 152 | 154 | 161 | 163 | 163 | 163 | 162 | 160 | 158 | 154 | 160 | 154 | 150 | 156.25 | 160.75 | 157.75 | 155.75 | |
| 10 | 1/21/17 | 154 | 150 | 155 | 160 | 154 | 151 | 160 | 160 | 159 | 151 | 153 | 158 | 150 | 158 | 160 | 160 | 154.25 | 152.5 | 157 | 159.5 | |
| 11 | 1/22/17 | | | | | | | | | | | | | | | | | | | | | |
| 12 | 1/23/17 | 152 | 160 | 158 | 159 | 152 | 156 | 158 | 161 | 158 | 150 | 148 | 150 | 150 | 152 | 156 | 154 | 153 | 154.5 | 155 | 156 | |
| 13 | 1/24/17 | 156 | 161 | 159 | 158 | 152 | 157 | 150 | 144 | 157 | 150 | 140 | 138 | 150 | 149 | 140 | 132 | 153.75 | 154.25 | 147.25 | 143 | |
| 14 | 1/25/17 | 154 | 158 | 156 | 160 | 154 | 158 | 152 | 146 | 156 | 152 | 142 | 136 | 150 | 150 | 140 | 132 | 153.5 | 154.5 | 147.5 | 143.5 | Turn |
| 15 | 1/26/17 | 154 | 154 | 158 | 166 | 160 | 148 | 158 | 160 | 149 | 154 | 160 | 164 | 153 | 148 | 156 | 166 | 154 | 151 | 158 | 164 | |
| 16 | 1/27/17 | 150 | 165 | 170 | 171 | 152 | 164 | 170 | 171 | 152 | 160 | 170 | 172 | 158 | 164 | 174 | 175 | 153 | 163.25 | 171 | 172.25 | |
| 17 | 1/28/17 | 150 | 164 | 171 | 171 | 150 | 165 | 170 | 171 | 152 | 161 | 170 | 173 | 158 | 165 | 175 | 175 | 152.5 | 163.75 | 171.5 | 172.5 | |
| 18 | 1/29/17 | | | | | | | | | | | | | | | | | | | | | |
| 19 | 1/30/17 | 161 | 163 | 162 | 156 | 160 | 164 | 165 | 158 | 161 | 165 | 162 | 159 | 161 | 170 | 164 | 159 | 160.75 | 165.5 | 163.25 | 158 | Turn |
| 20 | 1/31/17 | 160 | 162 | 160 | 158 | 165 | 170 | 167 | 162 | 158 | 164 | 165 | 162 | 156 | 164 | 165 | 160 | 159.75 | 165 | 164.25 | 160.5 | |

Attachment H

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow # 17-1-14 | |
|---|---------------|------------------|-------------------------|--------------------|-------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 1-11-17 | | Date Completed: 1-14-17 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 1/11/17 | Mike Bayne | 22.60 | 29.38 | 56.00 | 16.00 | |
| 1/12/17 | Mike Bayne | 22.52 | 29.28 | 56.00 | | |
| 1/12/17 | Mike Bayne | 22.62 | 29.41 | 56.00 | | |
| 1/12/17 | Mike Bayne | 14.97 | 19.46 | 56.00 | 40.00 | |
| 1/13/17 | Jerry Devoe | 22.22 | 28.89 | 56.00 | | |
| 1/13/17 | Jerry Devoe | 22.34 | 29.04 | 56.00 | | |
| 1/13/17 | Jerry Devoe | 23.25 | 30.23 | 56.00 | 40.00 | |
| 1/14/17 | Jerry Devoe | 21.62 | 28.11 | 56.00 | | |
| 1/14/17 | Jerry Devoe | 21.46 | 27.90 | 56.00 | 28.00 | |
| Totals | | 193.60 | 251.68 | 504.00 | 124.00 | 0.00 |
| Windrow Construction ratio: | | 2.50 /1 | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

| MSAP Process Temperature Chart Windrow# 17-1-14 | | | | | | | | | | | | | | | | | | | | | | |
|--|---------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 1/15/17 | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1/16/17 | 160 | 162 | 158 | 140 | 141 | 150 | 138 | 130 | 150 | 161 | 142 | 136 | 148 | 153 | 140 | 138 | 149.75 | 156.5 | 144.5 | 136 | |
| 3 | 1/17/17 | 152 | 144 | 139 | 144 | 157 | 135 | 140 | 132 | 156 | 147 | 148 | 140 | 160 | 154 | 142 | 140 | 156.25 | 145 | 142.25 | 139 | |
| 4 | 1/18/17 | 152 | 144 | 139 | 146 | 157 | 135 | 144 | 140 | 156 | 147 | 148 | 144 | 165 | 154 | 146 | 148 | 157.5 | 145 | 144.25 | 144.5 | |
| 5 | 1/19/17 | 150 | 144 | 146 | 148 | 154 | 148 | 148 | 146 | 152 | 149 | 150 | 146 | 162 | 156 | 148 | 148 | 154.5 | 149.25 | 148 | 147 | |
| 6 | 1/20/17 | 140 | 143 | 150 | 150 | 142 | 152 | 150 | 148 | 150 | 153 | 151 | 150 | 161 | 158 | 151 | 150 | 148.25 | 151.5 | 150.5 | 149.5 | |
| 7 | 1/21/17 | 150 | 146 | 150 | 151 | 148 | 151 | 152 | 148 | 152 | 158 | 151 | 149 | 158 | 152 | 148 | 150 | 152 | 151.75 | 150.25 | 149.5 | |
| 8 | 1/22/17 | | | | | | | | | | | | | | | | | | | | | |
| 9 | 1/23/17 | 152 | 161 | 160 | 153 | 151 | 153 | 150 | 150 | 153 | 160 | 162 | 153 | 150 | 160 | 158 | 158 | 151.5 | 158.5 | 157.5 | 153.5 | |
| 10 | 1/24/17 | 150 | 157 | 158 | 149 | 154 | 152 | 156 | 148 | 156 | 159 | 154 | 137 | 150 | 150 | 148 | 140 | 152.5 | 154.5 | 154 | 143.5 | |
| 11 | 1/25/17 | 152 | 160 | 156 | 148 | 154 | 154 | 156 | 150 | 156 | 162 | 154 | 138 | 154 | 150 | 146 | 140 | 154 | 156.5 | 153 | 144 | |
| 12 | 1/26/17 | 155 | 163 | 156 | 147 | 155 | 155 | 156 | 152 | 156 | 166 | 154 | 139 | 155 | 149 | 140 | 138 | 155.25 | 158.25 | 151.5 | 144 | |
| 13 | 1/27/17 | 146 | 150 | 151 | 148 | 150 | 160 | 161 | 158 | 158 | 160 | 151 | 150 | 150 | 151 | 142 | 140 | 151 | 155.25 | 151.25 | 149 | |
| 14 | 1/28/17 | 140 | 149 | 151 | 148 | 150 | 159 | 161 | 160 | 158 | 160 | 151 | 150 | 150 | 152 | 141 | 141 | 149.5 | 155 | 151 | 149.75 | |
| 15 | 1/29/17 | | | | | | | | | | | | | | | | | | | | | |
| 16 | 1/30/17 | 160 | 162 | 160 | 157 | 158 | 157 | 145 | 139 | 160 | 161 | 150 | 143 | 160 | 152 | 140 | 135 | 159.5 | 158 | 148.75 | 143.5 | |
| 17 | 1/31/17 | 161 | 158 | 160 | 158 | 154 | 159 | 152 | 148 | 160 | 165 | 158 | 152 | 156 | 158 | 146 | 140 | 157.75 | 160 | 154 | 149.5 | |

Attachment I

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow # 17-1-19 | |
|---|---------------|------------------|-------------------------|--------------------|-------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 1-16-17 | | Date Completed: 1-19-17 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 1/16/17 | Oscar Ochoa | 21.43 | 27.86 | 56.00 | | |
| 1/16/17 | Oscar Ochoa | 22.13 | 28.77 | 56.00 | | |
| 1/16/17 | Oscar Ochoa | 23.12 | 30.06 | 56.00 | 44.00 | |
| 1/17/17 | Oscar Ochoa | 23.41 | 30.43 | 56.00 | | |
| 1/17/17 | Oscar Ochoa | 22.30 | 28.99 | 56.00 | | |
| 1/17/17 | Oscar Ochoa | 22.15 | 28.80 | 56.00 | 44.00 | |
| 1/18/17 | Mike Bayne | 20.80 | 27.04 | 56.00 | | |
| 1/18/17 | Mike Bayne | 21.39 | 27.81 | 56.00 | | |
| 1/18/17 | Mike Bayne | 21.19 | 27.55 | 56.00 | 44.00 | |
| 1/19/17 | Mike Bayne | 21.34 | 27.74 | 56.00 | 16.00 | |
| Totals | | 219.26 | 285.04 | 560.00 | 148.00 | 0.00 |
| Windrow Construction ratio: | | 2.48 /1 | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

| MSAP Process Temperature Chart Windrow# 17-1-19 | | | | | | | | | | | | | | | | | | | | | | |
|--|---------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 1/20/17 | 150 | 140 | 120 | 120 | 132 | 122 | 118 | 115 | 140 | 138 | 122 | 120 | 141 | 120 | 118 | 115 | 140.75 | 130 | 119.5 | 117.5 | |
| 2 | 1/21/17 | 150 | 141 | 131 | 130 | 138 | 140 | 130 | 128 | 146 | 140 | 128 | 122 | 145 | 131 | 126 | 121 | 144.75 | 138 | 128.75 | 125.25 | |
| 3 | 1/22/17 | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1/23/17 | 156 | 148 | 146 | 136 | 150 | 146 | 134 | 130 | 150 | 147 | 138 | 128 | 151 | 139 | 135 | 126 | 151.75 | 145 | 138.25 | 130 | |
| 5 | 1/24/17 | 150 | 151 | 151 | 141 | 150 | 144 | 138 | 131 | 152 | 150 | 141 | 138 | 150 | 140 | 140 | 132 | 150.5 | 146.25 | 142.5 | 135.5 | |
| 6 | 1/25/17 | 150 | 156 | 150 | 141 | 151 | 148 | 146 | 132 | 156 | 151 | 140 | 138 | 155 | 148 | 145 | 136 | 153 | 150.75 | 145.25 | 136.75 | |
| 7 | 1/26/17 | 151 | 160 | 142 | 140 | 152 | 150 | 150 | 132 | 157 | 154 | 138 | 138 | 157 | 153 | 146 | 138 | 154.25 | 154.25 | 144 | 137 | |
| 8 | 1/27/17 | 143 | 145 | 143 | 142 | 143 | 144 | 140 | 140 | 141 | 144 | 140 | 139 | 151 | 152 | 148 | 140 | 144.5 | 146.25 | 142.75 | 140.25 | |
| 9 | 1/28/17 | 143 | 145 | 141 | 140 | 143 | 145 | 140 | 140 | 141 | 145 | 140 | 139 | 150 | 152 | 150 | 140 | 144.25 | 146.75 | 142.75 | 139.75 | |
| 10 | 1/29/17 | | | | | | | | | | | | | | | | | | | | | |
| 11 | 1/30/17 | 152 | 158 | 151 | 149 | 155 | 164 | 167 | 165 | 160 | 161 | 158 | 150 | 155 | 158 | 149 | 141 | 155.5 | 160.25 | 156.25 | 151.25 | |
| 12 | 1/31/17 | 150 | 159 | 159 | 155 | 153 | 161 | 166 | 165 | 156 | 160 | 160 | 152 | 150 | 155 | 152 | 148 | 152.25 | 158.75 | 159.25 | 155 | |

Attachment J

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow # 17-1-23 | |
|---|---------------|------------------|-------------------------|--------------------|-------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 1-19-17 | | Date Completed: 1-23-17 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 1/19/17 | Mike Bayne | 20.99 | 27.29 | 56.00 | | |
| 1/19/17 | Mike Bayne | 23.50 | 30.55 | 56.00 | 32.00 | |
| 1/20/17 | Jerry Devoe | 22.28 | 28.96 | 56.00 | | |
| 1/20/17 | Jerry Devoe | 20.38 | 26.49 | 56.00 | 28.00 | |
| 1/21/17 | Jerry Devoe | 22.21 | 28.87 | 56.00 | | |
| 1/21/17 | Jerry Devoe | 21.87 | 28.43 | 56.00 | | |
| 1/21/17 | Jerry Devoe | 20.92 | 27.20 | 56.00 | 44.00 | |
| 1/23/17 | Oscar Ochoa | 18.30 | 23.79 | 56.00 | | |
| 1/23/17 | Oscar Ochoa | 21.93 | 28.51 | 56.00 | | |
| 1/23/17 | Oscar Ochoa | 21.40 | 27.82 | 56.00 | 44.00 | |
| Totals | | 213.78 | 277.91 | 560.00 | 148.00 | 0.00 |
| | | | | | | |
| | | | | | | |
| Windrow Construction ratio: | | 2.55 /1 | | | | |
| | | | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

| MSAP Process Temperature Chart Windrow# 17-1-23 | | | | | | | | | | | | | | | | | | | | | | |
|--|---------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|--------|--------|--------|------|
| 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 | 1/24/17 | 150 | 132 | 125 | 120 | 161 | 160 | 152 | 110 | 144 | 138 | 128 | 123 | 140 | 132 | 123 | 117 | 148.75 | 140.5 | 132 | 117.5 | |
| 2 | 1/25/17 | 161 | 168 | 148 | 129 | 160 | 163 | 152 | 119 | 161 | 168 | 155 | 126 | 146 | 159 | 130 | 122 | 157 | 164.5 | 146.25 | 124 | |
| 3 | 1/26/17 | 164 | 170 | 152 | 131 | 161 | 162 | 143 | 127 | 161 | 169 | 146 | 130 | 147 | 163 | 134 | 126 | 158.25 | 166 | 143.75 | 128.5 | |
| 4 | 1/27/17 | 160 | 163 | 164 | 148 | 143 | 161 | 164 | 150 | 142 | 162 | 161 | 140 | 160 | 163 | 163 | 146 | 151.25 | 162.25 | 163 | 146 | |
| 5 | 1/28/17 | 159 | 161 | 164 | 160 | 143 | 161 | 165 | 165 | 142 | 160 | 161 | 158 | 160 | 163 | 164 | 161 | 151 | 161.25 | 163.5 | 161 | |
| 6 | 1/29/17 | | | | | | | | | | | | | | | | | | | | | |
| 7 | 1/30/17 | 158 | 161 | 160 | 160 | 135 | 155 | 161 | 163 | 150 | 160 | 161 | 159 | 138 | 150 | 155 | 150 | 145.25 | 156.5 | 159.25 | 158 | |
| 8 | 1/31/17 | 156 | 161 | 160 | 160 | 140 | 156 | 160 | 161 | 155 | 161 | 165 | 165 | 140 | 155 | 161 | 161 | 147.75 | 158.25 | 161.5 | 161.75 | |

Attachment K

| Hillsborough County Composting - Monitoring Sheet (MSAP Method) | | | | | Windrow # 17-1-28 | |
|---|---------------|------------------|-------------------------|--------------------|-------------------------|---------------|
| Windrow Construction: | | | Date Commenced: 1-24-17 | | Date Completed: 1-28-17 | |
| Date | Operator Name | Biosolids (tons) | Biosolids (yards) | Yard Waste (yards) | Overs (yards) | Cover (yards) |
| 1/24/17 | Oscar Ochoa | 22.42 | 29.15 | 56.00 | | |
| 1/24/17 | Oscar Ochoa | 22.19 | 28.85 | 56.00 | 28.00 | |
| 1/25/17 | Mike Bayne | 22.05 | 28.67 | 56.00 | | |
| 1/25/17 | Mike Bayne | 22.57 | 29.34 | 56.00 | | |
| 1/25/17 | Mike Bayne | 22.50 | 29.25 | 56.00 | 44.00 | |
| 1/26/17 | Mike Bayne | 22.77 | 29.60 | 56.00 | | |
| 1/26/17 | Mike Bayne | 22.27 | 28.95 | 56.00 | | |
| 1/26/17 | Mike Bayne | 22.43 | 29.16 | 56.00 | 44.00 | |
| 1/27/17 | Jerry Devoe | 22.30 | 28.99 | 56.00 | | |
| 1/28/17 | Jerry Devoe | 22.55 | 29.32 | 56.00 | | |
| 1/28/17 | Oscar Ochoa | 22.33 | 29.03 | 56.00 | 44.00 | |
| Totals | | 246.38 | 320.29 | 616.00 | 160.00 | 0.00 |
| | | | | | | |
| | | | | | | |
| Windrow Construction ratio: | | 2.42 /1 | | | | |
| | | | | | | |
| | | | | | | |
| Note: Yard waste yards = number of buckets * 4.00 | | | | | | |

| MSAP Process Temperature Chart Windrow# 17-1-28 | | | | | | | | | | | | | | | | | | | | | | |
|--|---------|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-------|-------|--------|------|
| 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 | 1/29/17 | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1/30/17 | 159 | 157 | 139 | 122 | 158 | 162 | 147 | 134 | 161 | 154 | 140 | 128 | 142 | 137 | 124 | 113 | 155 | 152.5 | 137.5 | 124.25 | |
| 3 | 1/31/17 | 163 | 162 | 148 | 131 | 161 | 165 | 150 | 138 | 162 | 161 | 148 | 130 | 158 | 146 | 134 | 128 | 161 | 158.5 | 145 | 131.75 | |