WWOA 53rd Annual Conference
October 9, 2019

Biosolids/Compost Pilot Project

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DONOHUE

Outline

- Background
- Pilot Details
- Pilot Results

Why a Biosolids Pilot Project?

- To investigate alternatives for Biosolids handling
  - Examine if any efficiencies or cost savings can be achieved if combining yardwaste composting operations and biosolids.
  - Evaluate the feasibility of a full-scale biosolids composting operation
  - Class A biosolids goal

WWTP Overview

WWTP Overview – Solids Handling

Fort Atkinson Biosolids

- Aerobic Digestion
- Centrifuge Dewatering
- Cake Storage
- Land Application in Spring and Fall

Fort Atkinson Biosolids

Biosolids Production

Year	lb/yr	T/yr	CY/yr	T/day	CY/d	Dewatering Technology
2015	1,320,000	659	5,500	1.81	15.1	Belt press
2016	1,120,000	562	4,850	1.54	13.3	Belt press
2017	1,020,000	508	3,200	1.39	8.7	Centrifuge

Biosolids Storage

City Compost Site – Yard Waste

City Compost Site – Yard Waste

Yardwaste

- Leaves (collected in fall only)
- Yardwaste – grass clippings, leaves, garden waste
- Woodchips
- Brush

Yardwaste – Bulking Agent or Carbon Source

Material Type	CY/yr	Notes
Leaves	1,700	
Yard Waste	1,200	*Grass, leaves, garden waste*
Woodchips	500	*Average size <3/4”*
Woodchips	1,000	*Requires Grinding*
Total	**4,400**	

Yardwaste – Woodchip size

Woodchips (51% total solids and 49% moisture)

Woodchip sized (1/2” to 8”) with approximate distribution as follows:

½” or less – 20%

½” to 1” - 30%

1” to 4” – 40%

Greater than 4” – 10%

Composting Methods

- Windrow method
- Aerated static pile
- In-vessel

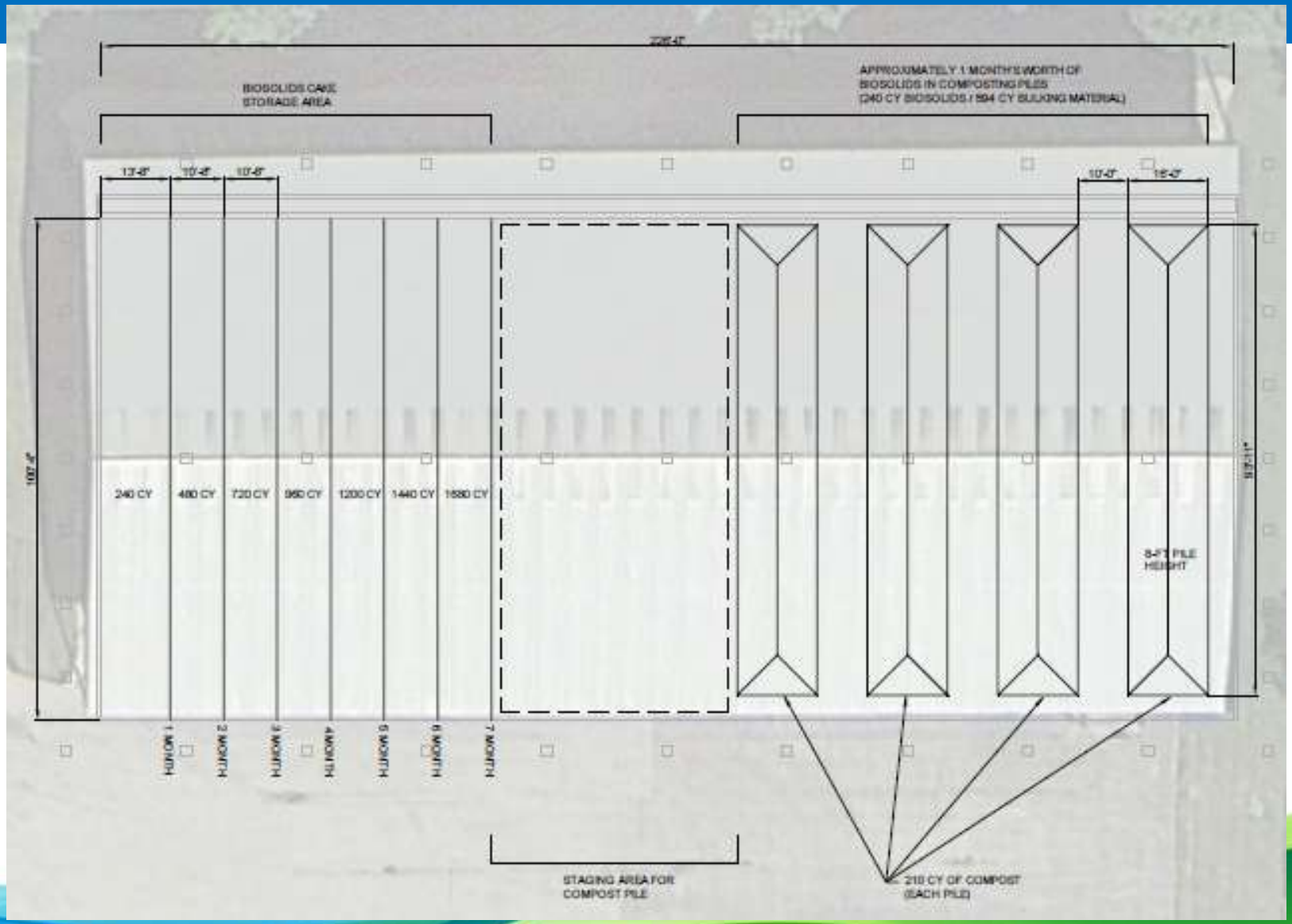
Compost Pilot

- Developed a plan
  - Aerated Static Pile
  - Space requirement in the biosolids barn
  - Volumes of bulking (Carbon) material and cover material needed
  - Air piping and air requirement for blowers and determination of time on and off
  - Equipment needed
  - Spreadsheets for documenting temperature
  - Recipes
  - How to make mix and make the piles
  - Where to monitor temperatures
  - Where to send off for analyses

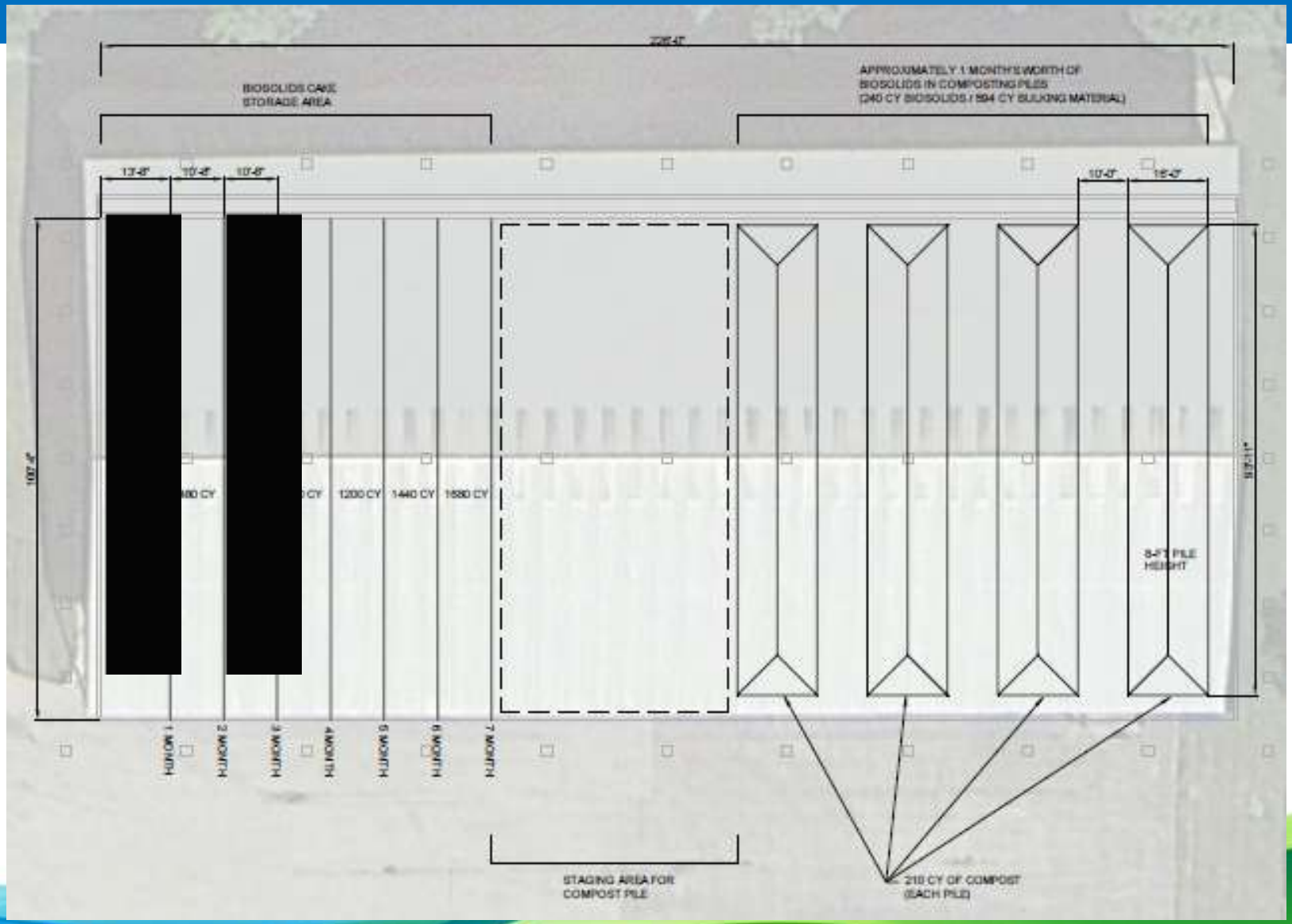
Compost Pilot

- 2 recipes to potentially achieve proper composting temperatures
  - Carbon to Nitrogen (C:N) ratio
  - Moisture
- Checked bulk density and free airspace
- Monitored temperatures daily
- Testing of finished product

Compost Pilot – Space required



Compost Pilot – Actual Pilot



Compost Pilot - Materials needed

- Pile dimensions of actual composting material (210 CY total/each pile)
  - Length – 94’
  - Width – 16’ at base and 1:1 slope to top (45 ^{o} angles)
  - Height – 8’
- Woodchip base dimensions (11 CY total/each pile)
  - Length – 75’
  - Width – 8’
  - Height – 0.5’
- Finished Compost for cover (60 CY total/each pile)
  - 6” cover over each pile

Compost Pilot – Compost Material

Compost Pilot – Making the Piles

Compost Pilot – Aeration

Compost Pilot – Equipment Needed

Compost Pilot

Compost Pilot – Recipe Pile #1

- Pile #1 (1 : 1.5 : 1)
  - Biosolids (2 bucket loads)
  - Woodchips (3 bucket loads)
  - Leaves (2 bucket loads)

- 15 loads = 30 yds of biosolids in pile #1

Compost Pilot – Recipe Pile #2

- Pile #2 (1 : 2 : 1)
  - Biosolids (2 bucket loads)
  - Woodchips (4 bucket loads)
  - Leaves (2 bucket loads)

Compost Pilot – Bulk density

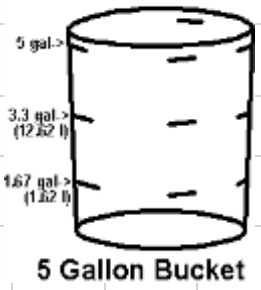
Bulk density

The procedures for measuring pile bulk density simulate the

1) Weigh empty bucket. Record weight.
2) Fill bucket 1/3 full with material (compost or feedstock)
3) Raise bucket 6” above firm surface and let it drop 10 times.
4) Fill bucket with an additional 1/3 of material.
5) Raise bucket 6” above surface and let it drop 10 times.
6) Fill bucket level to the brim and repeat dropping sequence.
7) Top off the bucket with material level to the brim. Do not drop.
8) Weigh the bucket with material.
9) Record weight and complete calculations on the data collection sheet.

Bulk Density Notes:

Pounds of feedstock in a 5-gal bucket multiplied by 40, equals lbs in a cubic



5 Gallon Bucket

Date	08/22/18	08/23/18		
Source of Material/Mix	Pile #1	Pile #2		
Weight of bucket with material, lb	40	34.3		
Weight of empty bucket, lb	2.3	2.3	2.3	2.3
Weight of material, lb (line 1 - line2)	37.7	32	-2.3	-2.3
Convert to lb/cubic yard (line 3 x 40)	**1508**	**1280**	**-92**	**-92**

NOTE: 5 GALLON BUCKET WEIGHTED 2.3 LB

Compost Pilot – Free air space

Date	08/22/18	08/23/18
Source of Material/Mix	Pile #1	Pile #2
Weight of bucket with material + water, lb	51.4	50.7
Weight of bucket with material, lb	40.0	34.3
Weight of water, lb (line 1 - line2)	11.4	16.4
Convert to % free air space (line 3 x 2.4)	**27%**	**39%**

Target free air space 35% to 60%

Compost Pilot

NM Recycling Coalition/Organics Recycling Organization
Composting Mixture Calculation Worksheet

Adapted for Fort Atkinson July 2018

Step 1. Fill in the table below for your materials. (You can copy from the "Materials" sheet.)

		(Enter either or both ->)		Total Weight Basis		Dry Weight Basis	
Material	**BD (lb/yd^3)**	**%Solids**	**%Moisture**	**%Carbon**	**%Nitrogen**	**%Carbon**	**%Nitrogen**
Biosolids	**1700**	20.26	80	**10.6**	**0.97**	**48.4**	**4.40**
Wood chips	532	55	45	45	0.09	81.8	0.2
Leaves	350	62	38	30.132	0.558	48.6	0.9
Grass clippings	500	18	82	10.404	0.612	57.8	3.4

Step 2. Enter pounds (lbs) below for each material in your proposed mixture, and ...

0

						Ratio Finder	Total Input for Compost Pile
Material	**lbs**	**lb Solids**	**lb Water**	**lb Carbon**	**lb Nitrogen**	**yd^3**	**yd^3**
Biosolids	1700	344	1356	181	16.5	1.0	469
Wood chips	798	439	359	359	0.7	**1.5**	703
Leaves	350	217	133	105	2.0	**1.0**	469
Grass clippings	0	0	0	0	0.0	**0.0**	0
Totals	**2848**	**1000**	**1848**	**646**	**19.1**	**4**	**1641**

Step 3. ... compare calculated performance indicator values with optimums.

Indicator	**Formula (from Totals row above)**	**Your Mix**	**Optimum**	**Advice**
C:N	lb Carbon/lb Nitrogen	33.8	30-60	Good mix!
H20:TVS	lb Water/lb Carbon	2.9	1.5-2.5	More C or less wet
BD	(lb Solids+lb Water)/yd^3	813.7	850-1000	Mix density is low
%Solids	lb Solids x 100/(lb Solids+lb Water)	35.1	40-60	Mix will be damp

Compost Pilot

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Composting Mixture Calculation Worksheet

Adapted for Fort Atkinson July 2018

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						Ratio Finder	Total Input for Compost Pile
Material	**lbs**	**lb Solids**	**lb Water**	**lb Carbon**	**lb Nitrogen**	**yd^3**	**yd^3**
Biosolids	1700	344	1356	181	16.5	1.0	469
Wood chips	1330	732	599	599	1.2	**2.5**	1,172
Leaves	175	109	67	53	1.0	**0.5**	234
Grass clippings	0	0	0	0	0.0	**0.0**	0
Totals	**3205**	**1184**	**2021**	**832**	**18.6**	**4**	**1876**

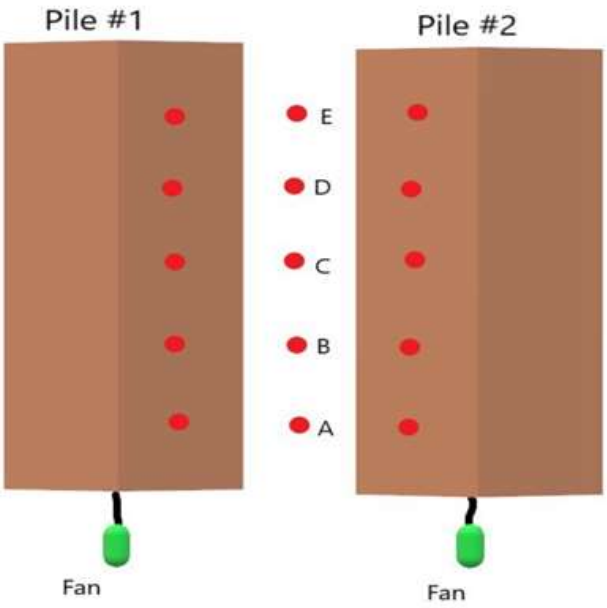
Step 3. ... compare calculated performance indicator values with optimums.

Indicator	**Formula (from Totals row above)**	**Your Mix**	**Optimum**	**Advice**
C:N	lb Carbon/lb Nitrogen	44.7	30-60	Good mix!
H20:TVS	lb Water/lb Carbon	2.4	1.5-2.5	Good mix!
BD	(lb Solids+lb Water)/yd^3	801.3	850-1000	Mix density is low
%Solids	lb Solids x 100/(lb Solids+lb Water)	37.0	40-60	Mix will be damp

Compost Pilot

Compost Pilot

Compost Pilot – Temperature monitoring



Compost Pilot

Compost Pilot

- Need to achieve 3 consecutive days at or above 131^{o} F
- Fecal Coliform less than 1000 MPN/g TS

Results – Compost Temperatures Pile #1

Fort Atkinson Composting Pilot

Temperature and Moisture Log

Pile # 1

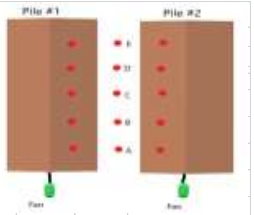
Notes: over 131° F under 131° F

Pile # 1 is the south pile Pile #2 is the north pile

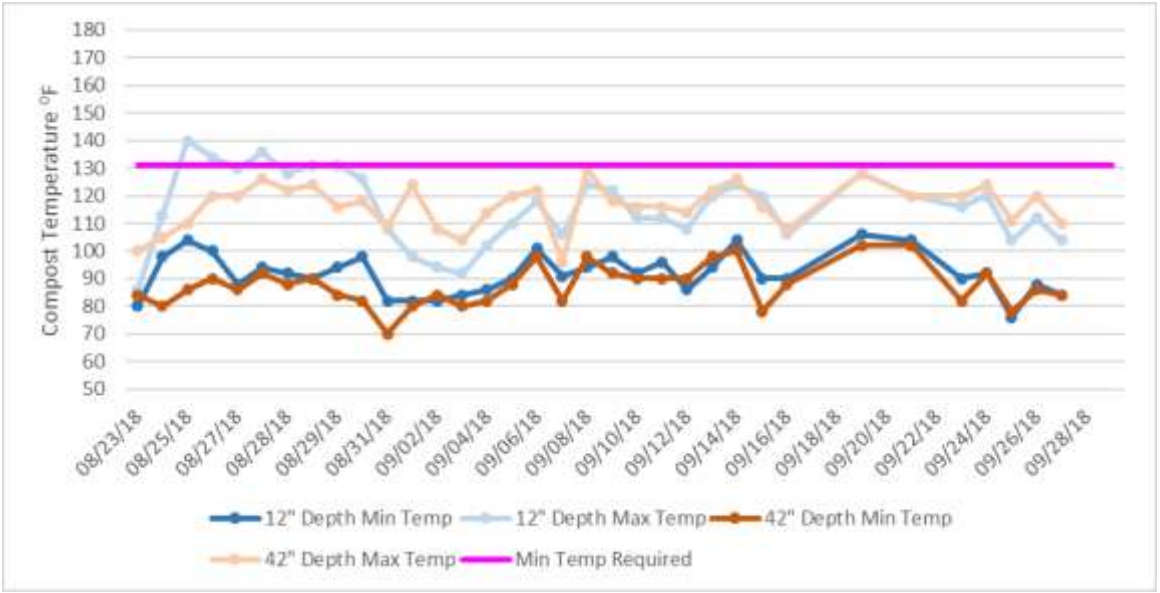
12" mark on temp probe actually 18" (accounting for 6" of cover)

48" long temp probe all the way in is measuring 42" (accounting for 6" of cover)

Moisture of "5" on scale set using finished compost



Date	Time	Depth probe	Compost Temperature ° F A	B	C	D	E	Moisture (0-10 scale)	Moisture Location	Notes
		12"	84	80	81	86	82			first day with air - pile constructed 8/21 and 8/22 - cover on 8/23
08/23/18	1:00 PM	42"	100	100	96	93	84	7.5	C	
		12"	98	113	106	98	102			
08/24/18	8:00 AM	42"	101	105	96	80	94	8	A	
		12"	105	120	140	104	108			
08/25/18	8:30 AM	42"	86	108	110	86	97	8	B	Air off
		12"	118	122	134	100	122			
08/26/18	8:30 AM	42"	102	114	118	90	120	8	D	Air off
		12"	107	118	114	88	130			
08/27/18	8:30 AM	42"	94	105	101	86	120	7.5	D	Air off
		12"	108	118	136	94	128			
08/27/18	10:05 AM	42"	110	118	126	92	112			Air on
		12"	94	112	126	92	128			Air off (72 outside
08/28/18	8:16 AM	42"	90	102	108	88	122	7	E	air temp)
		12"	90	111	131	97	122			
08/28/18	8:40 AM	42"	90	114	124	90	114			Air on
		12"	102	111	131	94	119			
08/29/18	8:30 AM	42"	84	90	102	88	116	9	C	Air on
		12"	98	116	126	102	119			
08/30/18	8:30 AM	42"	82	118	108	88	112	9	A	Air on Continously
		12"	95	108	96	82	90			
08/31/18	8:47 AM	42"	82	82	81	70	109	9	B	Air on Continously
		12"	82	98	92	82	96			
09/01/18	8:20 AM	42"	80	102	88	84	124	4	D	Air on Continously
		12"	82	92	90	88	94			
09/02/18	8:15 AM	42"	84	86	84	90	108	6	C	Air on Continously
		12"	84	92	90	86	90			
09/03/18	8:30 AM	42"	80	82	90	84	104	1	B	Air on Continously
		12"	86	91	86	86	102			
09/04/18	8:20 AM	42"	82	86	86	87	114	6	B	Air on Continously
		12"	90	100	92	96	110			Air on - changed to
09/05/18	8:15 AM	42"	88	92	96	96	120	7	A	30 min on and 30
		12"	101	108	108	110	118			
09/06/18	8:30 AM	42"	100	98	114	106	122	8	B	Air off
		12"	91	106	102	95	93			
09/07/18	8:15 AM	42"	82	88	89	82	96	7	C	Air off
		12"	94	114	124	112	122			
09/08/18	8:35 AM	42"	98	118	118	102	130	6	D	Air off
		12"	98	118	122	100	106			
09/09/18	8:57 AM	42"	104	110	118	92	112	7	E	Air off
		12"	92	112	108	96	108			
09/10/18	8:30 AM	42"	98	116	104	90	116	6	A	Air on
		12"	102	109	106	96	112			
09/11/18	8:27 AM	42"	104	110	98	90	116	9	B	Air on
		12"	86	90	102	92	108			
09/12/18	8:42 AM	42"	94	96	98	90	114	7	C	Air on
		12"	94	120	106	108	114			
09/13/18	8:20	42"	100	122	98	104	122	4	D	Air off
		12"	104	124	122	104	114			
09/14/18	8:13 AM	42"	110	126	116	100	120	7	E	Air on



Results – Compost Temperatures Pile #2

Fort Atkinson Composting Pilot

Temperature and Moisture Log

Pile # 2

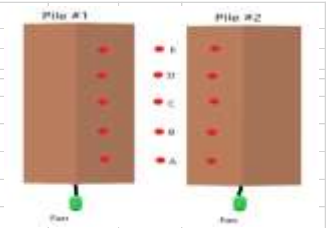
Notes: over 131° F under 131° F

Pile # 1 is the south pile and Pile #2 is north pile

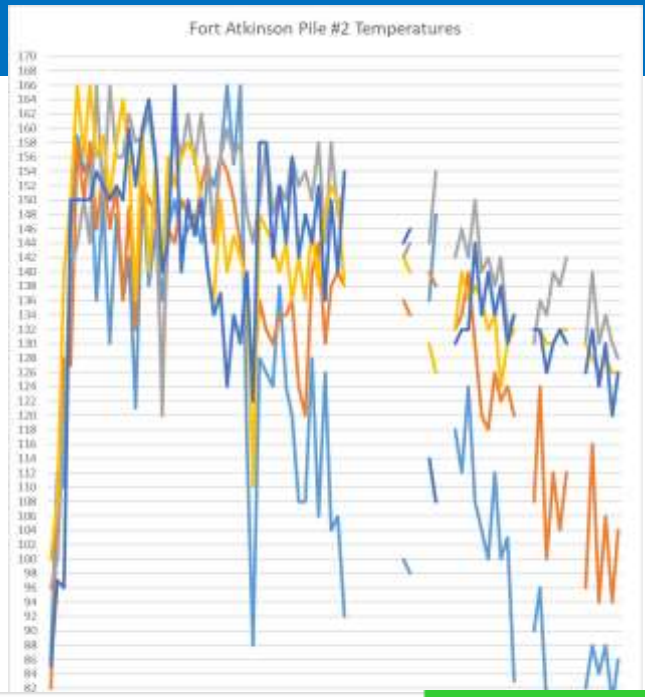
12" mark on temp probe actually 18" (accounting for 6" of cover)

48" long temp probe all the way in is measuring 42" (accounting for 6" of cover)

Moisture of "5" on scale set using finished compost



Date	Time	Depth probe	Compost Temperature ° F A	B	C	D	E	Moisture (0-10 scale)	Moisture Location	Notes
		12"	86	82	96	100	85			first day with air - pile constructed 8/23 and 8/24 - cover on 8/24
08/25/18	8:45 AM	42"	112	105	100	108	97	3.9	B	
		12"	110	128	120	140	96			
08/26/18	8:45 AM	42"	146	127	140	150	150	6		Air on
		12"	159	158	144	166	150			
08/27/18	8:50 AM	42"	154	150	150	156	150	10	D	Air on
		12"	156	158	144	166	150			
08/27/18	10:30 AM	42"	136	146	166	156	154			Air off
		12"	150	154	150	159	152			Air off (outside air
08/28/18	8:28 AM	42"	130	146	166	150	150	10	E	72 deg F
		12"	148	152	156	158	152			
08/28/18	8:50 AM	42"	136	136	156	164	150			Air on
		12"	142	149	162	155	160			
08/29/18	8:45 AM	42"	121	132	158	136	152	10	C	Air on
		12"	152	152	159	160	160			
08/30/18	8:40 AM	42"	138	150	162	140	164	10	A	Air on
		12"	146	148	155	155	156			
08/31/18	8:29 AM	42"	136	125	120	140	140	10	B	Air on
		12"	146	146	152	156	144			
09/01/18	8:30 AM	42"	150	144	160	152	166	9	D	Air on
		12"	144	150	156	156	140			
09/02/18	8:25 AM	42"	146	148	162	158	150	8	C	Air off
		12"	148	146	155	156	145			
09/03/18	8:35 AM	42"	144	152	162	150	150	10	B	Air off
		12"	154	156	154	140	140			
09/04/18	8:30 AM	42"	152	144	146	136	134	9	E	Air off
		12"	156	156	156	150	137			OFF - changed to
09/05/18	8:26	42"	166	154	160	140	124	8	A	30 on and 30 off
		12"	155	150	156	145	134			
09/06/18	8:40	42"	166	144	158	142	130	9.5	B	Air on
		12"	116	138	148	139	140			
09/07/18	8:30	42"	88	124	144	110	122	9	C	Air off
		12"	128	136	150	148	158			
09/08/18	845 am	42"	126	132	158	146	158	10	D	Air off
		12"	124	130	148	144	142			
09/09/18	9:10 AM	42"	138	134	152	140	152	10	E	Air on
		12"	124	134	150	144	144			
09/10/18	8:45	42"	120	136	156	136	156	8	A	Air off
		12"	108	124	152	142	142			
09/11/18	8:36 AM	42"	108	120	154	136	148	10	B	Air on
		12"	128	140	150	146	144			
09/12/18	8:51 AM	42"	106	144	158	138	152	8	C	Air on
		12"	126	130	144	148	136			
09/13/18	8:30	42"	104	138	158	152	150	8	D	Air off
		12"	106	140	148	150	140			
09/14/18	8:25	42"	92	138	152	138	154	8	E	Air off



Compost Pilot – Fecal Coliform results

Pile No.	# of consecutive days above 131 °F	Fecal Coliform (MNP/g TS)		Met Class A Requirements
1	0	No Result		NO
2	3	2,730[1]	5,000[2]	NO

Compost Pilot

Report Number
F18284-6513
Account Number
99990

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Scientists who don't mind getting dirty.™

3505 Conestoga Dr.
Fort Wayne, IN 46808
260.483.4759
algreatlakes.com

To: CITY OF FORT ATKINSON WWTP
101 NORTH MAIN ST
FORT ATKINSON, WI 53538

Attn: RYAN WAGNER

Sample ID: FORT COMPOST
Lab Number: 11964

Purchase Order: 284-6513
Date Sampled: 10/10/2018
Date Received: 10/11/2018
Date Reported: 10/24/2018 Page: 1 of 3

COMPOST ANALYSIS

Analysis	Unit	Analysis Result	Dry Basis Result	Analysis Method
Moisture @ 70 C	%	41.17		TMECC 03.09-A
Solids	%	58.83		TMECC 03.09-A
Total Nitrogen (N)	%	0.56	0.95	TMECC 04.02-D
Phosphorus (P)	%	0.24	0.40	TMECC 04.03-A
Phosphate (P_2O_5)	%	0.54	0.92	TMECC 04.03-A
Potassium (K)	%	0.16	0.28	TMECC 04.04-A
Potash (K_2O)	%	0.20	0.34	TMECC 04.04-A
Magnesium (Mg)	%	1.94	3.30	TMECC 04.05-MG
Calcium (Ca)	%	3.58	6.08	TMECC 04.05-CA
Arsenic	mg/kg	1.66	2.83	US EPA SW846-6020
Cadmium	mg/kg	< 0.281	< 0.477	US EPA SW846-6020
Chromium	mg/kg	11.9	20.2	US EPA SW846-6020
Copper	mg/kg	38.5	65.5	US EPA SW846-6010C
Mercury	mg/kg	< 0.325	< 0.553	US EPA SW846-6020
Molybdenum	mg/kg	1.18	2.00	US EPA SW846-6020

TMECC - Test Methods for the Examination of Composting and Compost (TMECC), The U.S. Composting Council.

Report Approved By: Greg Neyman - Vice President / COO

Approval Date: 10/24/2018

Compost Pilot

Report Number
F18284-6513
Account Number
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COMPOST ANALYSIS

Analysis	Unit	Analysis Result	Dry Basis Result	Analysis Method
Nickel	mg/kg	6.00	10.20	US EPA SW846-6020
Lead	mg/kg	22.3	37.9	US EPA SW846-6020
Selenium	mg/kg	0.91	1.55	US EPA SW846-6020
Zinc	mg/kg	78	133	US EPA SW846-6010C
503 Metals PASS/FAIL	pass/fail		PASS	EPA 503 Metal Limits
pH	-	8.0		TMECC 04.11-A
Soluble Salts	dS/m	1.41		TMECC 04.10-A
Fecal Coliform/MPN	MPN/g dry		2730	SM(20th)-9221E TMECC
Pathogen Reduction - PASS/FAIL	pass/fail		FAIL	40 CFR 503 Class A Compost
Ash @ 550 C	%	44.35	75.38	TMECC 03.02-B
Organic Matter (LOI @ 550 C)	%	14.48	24.62	TMECC 05.07-A
Total Organic Carbon (C)	%	7.24	12.31	TMECC 04.01-A
Carbon:Nitrogen Ratio (C:N)	-	13.0:1	13.0:1	TMECC 05.02-A
Foreign Material	%	0.04	0.06	TMECC 03.08-A
Germination - Emergence	%	100		TMECC 05.05-A

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Compost Pilot

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260.483.4759
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To: CITY OF FORT ATKINSON WWTP
101 NORTH MAIN ST
FORT ATKINSON, WI 53538

Attn: RYAN WAGNER
Sample ID: FORT COMPOST
Lab Number: 11964

Purchase Order: 284-6513
Date Sampled: 10/10/2018
Date Received: 10/11/2018
Date Reported: 10/24/2018 Page: 3 of 3

COMPOST ANALYSIS

Analysis	Unit	Analysis Result	Dry Basis Result	Analysis Method
Germination - Vigor	%	70		TMECC 05.05-A
Ave Ht of Seedlings in Control	centimeters	6.9		TMECC 05.05-A
Ave Ht of Seedlings in Compost	centimeters	5.9		TMECC 05.05-A
Respiration - CO2-C/g TS	mg CO2-C / g TS/Day		0.8	TMECC 05.08-B
Respiration - CO2-C/g OM	mg CO2-C / g OM/Day		1.7	TMECC 05.08-B
Compost Stability Index	-		Very Stable	TMECC 05.08
Retained on U.S. 2-inch Sieve	%		0.00	TMECC 02.02-B
Retained on U.S. 1-inch Sieve	%		0.00	TMECC 02.02-B
Retained on U.S. 5/8-inch Sieve	%		1.62	TMECC 02.02-B
Retained on U.S. 3/8-inch Sieve	%		23.50	TMECC 02.02-B
Retained on U.S. 1/4-inch Sieve	%		23.55	TMECC 02.02-B
Retained on U.S. 5/32-inch	%		18.12	TMECC 02.02-B

TMECC - Test Methods for the Examination of Composting and Compost (TMECC), The U.S. Composting Council.

Compost Survey of Interest

- Questionnaire / Survey developed
- Sent off to 37 places
  - Sod farms
  - Landscapers/Excavation Contractors
  - Jefferson County Highway Department
  - Landfill
  - Lawn care Companies
- 6 responses
- 2 potential buyers

Survey

FORT • ATKINSON

Compost Questionnaire/Survey

Survey Background

The intent of this survey is to evaluate the interest in a City of Fort Atkinson generated compost product. One of the main goals of this survey is to improve the awareness of the available compost to customers and to evaluate potential selling costs per cubic yard of material. Thank you for taking the time to fill in this questionnaire; it should only take 10 minutes. Please send the survey back in the self-addressed and stamped envelope by January 1st 2018. If you have any questions related this survey, please contact Jeremy Cramer at 920-318-4094 or email jcramer@donohue-associates.com.

Composting Background

Fort Atkinson has a municipal yard waste compost operation that is located east of Whitewater Avenue on Bark River Drive behind Memorial Park. Approximately 2000 cubic yards of leaf and yard waste derived compost is available on an annual basis.

There are many benefits to using the compost. They include the following:

- Improves soil structure, creating a better plant root environment
- Supplies significant quantities of organic matter
- Improves drainage of soil and reduces erosion
- Improves moisture holding capacity of soils
- Improves and stabilizes soil pH
- Supplies a variety of nutrients
- Supplies the soil with beneficial microorganisms

There is ample compost product available and this survey will help identify customer needs and interest regarding a compost product.

Fort Atkinson Yard Waste Compost - Screened

Fort Atkinson Yard Waste Compost Nutrient Value:

N: 0.70 % dry weight basis
P: 0.15 % dry weight basis
K: 0.24 % dry weight basis

pH: 6.7

Survey

1. Do you currently use compost for potting soil, plant bedding, plant bed top dressing, customer lawns, or any other use?

   Yes ☐
   No ☐
   Other (please list) _____ ☐

2. What are you currently paying for the compost material you are using? (if yes was selected above in question 1.)

   Cost paying per cubic yard (please list) _____

3. Do you currently stockpile compost on your site for use?

   Yes ☐
   No ☐

4. Do you have compost delivered to your site/facility?

   Yes ☐
   No ☐

5. How much compost would be needed and purchased annually? (please pick one)

   less than 500 cubic yards ☐
   500 to 1000 cubic yards ☐
   over 1000 cubic yards ☐
   Other (please list) _____ ☐

6. Is any certain quality required of the compost material to be purchased? (please answer all that apply).

   Compost material size _____
   NPK requirements _____
   other (please provide information _____

If you would like to be kept informed of the City's Compost material and availability, please provide the following information -- Organization / Name / Email / Phone:

Comments:

_____

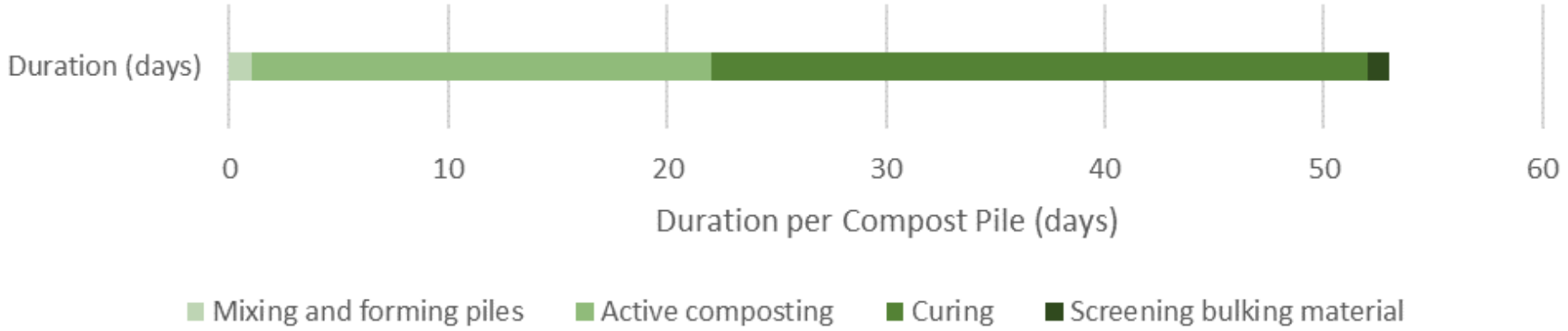
_____

Survey Results

Fort Atkinson Survey Results

		Questionaire Response					
Question #	Question	**1**	**2**	**3**	**4**	**5**	**6**
1	**Do you currently use compost?**	no	yes	yes, bio-retention basin	yes	no	no
2	**What are you paying?**		free	$35.00/ CY (80% compost and 20% quartz sand premixed			
3	**Do you stockpile compost?**	no	no	yes	no	no	no
4	**Do you transport your own compost?**	no	no	self transport	yes		
5	**How much would you need or purchase annually?**		less than 500 CY	less than 500 CY	less than 500 CY		
6	**any certain quality needed?**			WDNR Spec S100			No herbicide residue
Comments			no interest			Use woodchips and get for free from utility companies working in the area	
Address for more info to be sent				Hausz Bros Inc. / Dusty Behlke / DUSTY988@hotmail.com / 920-723-4871	Creative Landscapes Inc / Landon Belzer / landon@theloghomeguy.com / 920-988-2361		

Closing Comments



- Not enough space to compost needed volumes
  - Active composting
  - Curing
  - Finished product after screening

Closing Comments

- Weather could be a factor if doing static pile or windrow composting
- Amount of bulking material available (Woodchips of proper size) a factor
- Labor/time requirement for setting up the piles and then screening of the piles (approximately 119 hours for just the pilot)
- Payback – to break even on applied costs, the product must have demand at $6/CY without hauling, or $8/CY with hauling

Thank You / Acknowledgements

Andy Selle – City of Fort Atkinson

Paul Christensen – City of Fort Atkinson

Erin Sweeney – City of Fort Atkinson

Ryan Wagner – City of Fort Atkinson

Eric Lynne – Donohue & Associates

Stephen Matthias - Donohue & Associates

Compost Pilot - Goal

The purpose of the pilot/demonstration project is to enable the City of Fort Atkinson to evaluate composting as a means of beneficially reusing biosolids and yard waste. The main goals of the pilot project are as follows:

- understanding the time commitment by the Fort Atkinson staff
- understanding of space required for full scale composting
- understanding of material (leaves and woodchip) movement and storage
- understanding of amounts of feedstock (biosolids and leaves/woodchips) needed for full scale operation
- understanding of time requirement to actively compost and to cure the composted material while meeting WDNR Class A requirements
- understanding the space requirements for composting the cake biosolids storage building
- understanding of the equipment needed to successfully compost
- development of full scale annual costs to achieve Class A via biosolids composting derived from the pilot project results/findings

Compost Pilot – Class A Biosolid

The aerated static pile method can be used as a Process to Further Reduce Pathogens (PFRP).

Aerated Static Pile Class A biosolids are regulated under Wisconsin Administrative Codes NR 204. For aerated static pile composting of biosolids, the material needs to meet the time and temperature requirement to be considered Class A.

Process to Further Reduce Pathogens (PFRP) under Part 503 states for a static aerated compost pile, the material must achieve a temperature of 131 degrees F (55 degree C) or higher for a minimum of 3 consecutive days.

Pathogen reduction is function of these parameters:

1. Ensuring that all biosolids particles spend 3 consecutive days at temperatures that are equal to or greater than 55°C (131°F)
2. Preventing growth of pathogenic bacteria

Static Aerated Pile composting must take place on an approved engineered surface and meet the following:

- *Maintain* >55°C (131°F) *for 3 consecutive days*
- *Fecal coliform <1,000 MPN/g TS*