



13611 B Street • Omaha, Nebraska 68144-3693 • (402) 334-7770 • FAX (402) 334-9121 • www.midwestlabs.com

Lab #	2848114	Report of Analysis		Report Number: 18-267-4182																																																																																																																																																	
Account: 27791	DOUG BULLOCK CITY OF RICHLAND PO BOX 190 RICHLAND WA 99352		 Robert Ferris Account Manager 402-829-9871 CITY OF RICHLAND COMPOST FA																																																																																																																																																		
Date Sampled:	2018-09-12																																																																																																																																																				
Date Received:	2018-09-13																																																																																																																																																				
Sample ID:	FC ROW 0430-18																																																																																																																																																				
Total content, lbs per ton (as rec'd)																																																																																																																																																					
<table border="1"> <thead> <tr> <th></th> <th></th> <th>Analysis (as rec'd)</th> <th>Analysis (dry weight)</th> <th></th> </tr> </thead> <tbody> <tr> <td colspan="5">NUTRIENTS</td> </tr> <tr> <td colspan="5">Nitrogen</td> </tr> <tr> <td>Total Nitrogen</td> <td>%</td> <td>1.78</td> <td>2.08</td> <td>35.6</td> </tr> <tr> <td>Organic Nitrogen</td> <td>%</td> <td>1.56</td> <td>1.82</td> <td>31.1</td> </tr> <tr> <td>Ammonium Nitrogen</td> <td>%</td> <td>0.223</td> <td>0.260</td> <td>4.5</td> </tr> <tr> <td>Nitrate Nitrogen</td> <td>%</td> <td>< 0.01</td> <td>----</td> <td>----</td> </tr> <tr> <td colspan="5">Major and Secondary Nutrients</td> </tr> <tr> <td>Phosphorus</td> <td>%</td> <td>0.54</td> <td>0.63</td> <td>10.8</td> </tr> <tr> <td>Phosphorus as P2O5</td> <td>%</td> <td>1.24</td> <td>1.45</td> <td>24.8</td> </tr> <tr> <td>Potassium</td> <td>%</td> <td>0.54</td> <td>0.63</td> <td>10.8</td> </tr> <tr> <td>Potassium as K2O</td> <td>%</td> <td>0.65</td> <td>0.76</td> <td>13.0</td> </tr> <tr> <td>Sulfur</td> <td>%</td> <td>0.25</td> <td>0.29</td> <td>5.0</td> </tr> <tr> <td>Calcium</td> <td>%</td> <td>1.82</td> <td>2.12</td> <td>36.4</td> </tr> <tr> <td>Magnesium</td> <td>%</td> <td>0.46</td> <td>0.54</td> <td>9.2</td> </tr> <tr> <td>Sodium</td> <td>%</td> <td>0.050</td> <td>0.058</td> <td>1.0</td> </tr> <tr> <td colspan="5">Micronutrients</td> </tr> <tr> <td>Iron</td> <td>ppm</td> <td>14800</td> <td>17272</td> <td>29.6</td> </tr> <tr> <td>Manganese</td> <td>ppm</td> <td>252</td> <td>294</td> <td>0.5</td> </tr> <tr> <td>Boron</td> <td>ppm</td> <td>< 100</td> <td>----</td> <td>----</td> </tr> <tr> <td colspan="5">OTHER PROPERTIES</td> </tr> <tr> <td>Moisture</td> <td>%</td> <td>14.31</td> <td></td> <td></td> </tr> <tr> <td>Total Solids</td> <td>%</td> <td>85.69</td> <td></td> <td>1713.8</td> </tr> <tr> <td>Organic Matter</td> <td>%</td> <td>35.10</td> <td>40.96</td> <td>702.0</td> </tr> <tr> <td>Ash</td> <td>%</td> <td>49.90</td> <td>58.23</td> <td>998.0</td> </tr> <tr> <td>Total Carbon</td> <td>%</td> <td>18.78</td> <td>21.92</td> <td></td> </tr> <tr> <td>Chloride</td> <td>%</td> <td>0.08</td> <td>0.09</td> <td></td> </tr> <tr> <td>pH</td> <td></td> <td>6.5</td> <td></td> <td></td> </tr> <tr> <td>Conductivity 1:5 (Soluble Salts)</td> <td>mS/cm</td> <td>2.58</td> <td></td> <td></td> </tr> </tbody> </table>							Analysis (as rec'd)	Analysis (dry weight)		NUTRIENTS					Nitrogen					Total Nitrogen	%	1.78	2.08	35.6	Organic Nitrogen	%	1.56	1.82	31.1	Ammonium Nitrogen	%	0.223	0.260	4.5	Nitrate Nitrogen	%	< 0.01	----	----	Major and Secondary Nutrients					Phosphorus	%	0.54	0.63	10.8	Phosphorus as P2O5	%	1.24	1.45	24.8	Potassium	%	0.54	0.63	10.8	Potassium as K2O	%	0.65	0.76	13.0	Sulfur	%	0.25	0.29	5.0	Calcium	%	1.82	2.12	36.4	Magnesium	%	0.46	0.54	9.2	Sodium	%	0.050	0.058	1.0	Micronutrients					Iron	ppm	14800	17272	29.6	Manganese	ppm	252	294	0.5	Boron	ppm	< 100	----	----	OTHER PROPERTIES					Moisture	%	14.31			Total Solids	%	85.69		1713.8	Organic Matter	%	35.10	40.96	702.0	Ash	%	49.90	58.23	998.0	Total Carbon	%	18.78	21.92		Chloride	%	0.08	0.09		pH		6.5			Conductivity 1:5 (Soluble Salts)	mS/cm	2.58		
		Analysis (as rec'd)	Analysis (dry weight)																																																																																																																																																		
NUTRIENTS																																																																																																																																																					
Nitrogen																																																																																																																																																					
Total Nitrogen	%	1.78	2.08	35.6																																																																																																																																																	
Organic Nitrogen	%	1.56	1.82	31.1																																																																																																																																																	
Ammonium Nitrogen	%	0.223	0.260	4.5																																																																																																																																																	
Nitrate Nitrogen	%	< 0.01	----	----																																																																																																																																																	
Major and Secondary Nutrients																																																																																																																																																					
Phosphorus	%	0.54	0.63	10.8																																																																																																																																																	
Phosphorus as P2O5	%	1.24	1.45	24.8																																																																																																																																																	
Potassium	%	0.54	0.63	10.8																																																																																																																																																	
Potassium as K2O	%	0.65	0.76	13.0																																																																																																																																																	
Sulfur	%	0.25	0.29	5.0																																																																																																																																																	
Calcium	%	1.82	2.12	36.4																																																																																																																																																	
Magnesium	%	0.46	0.54	9.2																																																																																																																																																	
Sodium	%	0.050	0.058	1.0																																																																																																																																																	
Micronutrients																																																																																																																																																					
Iron	ppm	14800	17272	29.6																																																																																																																																																	
Manganese	ppm	252	294	0.5																																																																																																																																																	
Boron	ppm	< 100	----	----																																																																																																																																																	
OTHER PROPERTIES																																																																																																																																																					
Moisture	%	14.31																																																																																																																																																			
Total Solids	%	85.69		1713.8																																																																																																																																																	
Organic Matter	%	35.10	40.96	702.0																																																																																																																																																	
Ash	%	49.90	58.23	998.0																																																																																																																																																	
Total Carbon	%	18.78	21.92																																																																																																																																																		
Chloride	%	0.08	0.09																																																																																																																																																		
pH		6.5																																																																																																																																																			
Conductivity 1:5 (Soluble Salts)	mS/cm	2.58																																																																																																																																																			

13611 B Street • Omaha, Nebraska 68144-3693 • (402) 334-7770 • FAX (402) 334-9121 • www.midwestlabs.com

Lab #	2848114	Biological & Physical Properties	Report Number: 18-267-4182								
Account: 27791	DOUG BULLOCK CITY OF RICHLAND PO BOX 190 RICHLAND WA 99352		 Robert Ferris Client Service Representative 402-829-9871								
Date Sampled:	2018-09-12		CITY OF RICHLAND COMPOST FA								
Date Received:	2018-09-13										
Sample ID:	FC ROW 0430-18										
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 10%;">Analysis (as rec'd)</th> <th style="width: 10%;">Analysis (dry weight)</th> <th style="width: 10%;">Units</th> <th style="width: 10%;">Detection Limit</th> <th style="width: 10%;">Method</th> </tr> </thead> </table>							Analysis (as rec'd)	Analysis (dry weight)	Units	Detection Limit	Method
	Analysis (as rec'd)	Analysis (dry weight)	Units	Detection Limit	Method						
Biological Properties											
Germination	88		%	1	TMECC 05.05A						
Germination Vigor	100		%	1	TMECC 05.05A						
CO ₂ OM Evolution	0.72		mgCO ₂ -C/gOM/day	0.01	TMECC 05.08B						
CO ₂ Solids Evolution	0.65		mgCO ₂ -C/gTS/day	0.01	TMECC 05.08B						
Fecal Coliform		0	mpn/g	0.2	EPA 1681						
Stability Rating	Stable		N/A	N/A	TMECC 05.08B						
Physical Properties											
Bulk Density (Loose)	758		lbs/cu yard	1	WT/VOL						
Bulk Density (Packed)	944		lbs/cu yard	1	WT/VOL						
Film Plastics	n.d.		%	0.25	Microscopic						
Glass Fragments	n.d.		%	0.25	Microscopic						
Hard Plastics	n.d.		%	0.25	Microscopic						
Metal Fragment	n.d.		%	0.25	Microscopic						
Sharps	Absent		---	---	Microscopic						
Max. Particle Length		2.0	inches	N/A	TMECC Sieve						
Sieve % Passing 3"		100	%	0.01	TMECC Sieve						
Sieve % Passing 2"		100	%	0.01	TMECC Sieve						
Sieve % Passing 1.5"		100	%	0.01	TMECC Sieve						
Sieve % Passing 1"		100	%	0.01	TMECC Sieve						
Sieve % Passing 3/4"		100	%	0.01	TMECC Sieve						
Sieve % Passing 5/8"		100	%	0.01	TMECC Sieve						
Sieve % Passing 3/8"		100	%	0.01	TMECC Sieve						
Sieve % Passing 1/4"		99	%	0.01	TMECC Sieve						

Compost Results Interpretations

Page 1

Report #:

18-267-4182

DATE RECEIVED:

2018-09-13

Organic Matter %		Greater than 20% indicates a desirable range for compost on a dry weight basis.
35.10	As Received	
40.96	Dry Weight	

Compost is a significant source of Organic Matter, which is an important supplier of carbon. Organic Matter improves soil and plant efficiency by improving soil physical properties, providing a source of energy to beneficial organisms, and enhancing the reservoir of soil nutrients.

C/N Ratio		20-30 indicates an ideal range for the initial compost process. 10-20 indicates an ideal range for a finished compost.
10.6:1		

All organic matter is made up of substantial amounts of carbon with lesser amounts of nitrogen. The balance of these two elements is called the Carbon/Nitrogen Ratio. For the best performance, the compost pile requires the correct proportion of carbon for energy and nitrogen for protein production. If the C:N ratio is too high (excess carbon) decomposition slows down. If the C:N ratio is too low (excess Nitrogen) the compost pile could be difficult to manage.

Moisture %		<35% = Indicates overly dry compost >55% = Indicates overly wet compost
14.31		

Moisture Percent is the measure of water present in the compost and expressed as a percentage of total weight. Moisture present affects handling and transport. Overly dry will be light and dusty while overly wet will be heavy and clumpy. A desirable moisture content of finished compost will range between 40 to 50%.

Compost Results Interpretations

Page 2

Report #:

18-267-4182

DATE RECEIVED:

2018-09-13

Conductivity or Soluble Salts measures the conductance of electrical current in a liquid compost slurry. Excessive soluble salt content in a compost can prevent or delay seed germination and proper root growth. Conductivity analysis is done on a 1:5 basis.

Conductivity 1:5
2.6

Conductivity Level	Interpretation
Greater than 10	Very High nutrient content. Use for Ag Applications
5 - 10	High nutrient content. Use for Ag Applications
3 - 5	Higher than desirable for salt sensitive plants, some loss of vigor
0.6 - 3	Desirable range for most plants
0.3 - 0.6	Ideal range for greenhouse growth media
0.0 - 0.3	Very Low: Indicates very low nutrient status: plants may show deficiencies.

Compost Results Interpretations
Page 3

Report #: 18-267-4182
DATE RECEIVED: 2018-09-13

pH Value
6.5

0 to 14 scale with 6 to 8 as normal pH levels for compost
A pH in the 6 to 8 pH range indicates a more mature compost

pH measures the acidity or alkalinity of the compost, and is a measurement of the hydrogen ion activity of a soil or compost on a logarithmic scale. The pH scale ranges from 0 to 14 and 7 indicates a neutral pH. Growing media with a higher pH or pH greater than 7 can benefit from a compost that has a more acidic pH or pH below 7. This type of application will possibly lower the soil pH making the soil more conducive to plants that thrive in a more acidic soil condition.

Nutrient Index (Ag Index)
>10

The Nutrient Index normally runs between 1 and 10.

The Nutrient Index is obtained by dividing the total nutrients (N,P,K) by the amount of salt (Sodium and Chloride). The higher the Nutrient Index the less chance of having a toxic buildup of Sodium (salt) in the soil.

AG INDEX CHART										
<i>salt injury possible</i>	<i>use on soils with excellent drainage characteristics, good water quality and low salts</i>				<i>you may use on soils with poor drainage, poor water quality, or high salts</i>					<i>for all soils</i>
1	2	3	4	5	6	7	8	9	10	> 10

Nutrients (N+P205+K20)
4.28 Average Nutrient Content Dry Weight <2 = Low, >5 = High
2-1-0.5 Rating As Received

The most commonly used compost data is the amount of Nitrogen, Phosphate, and Potash (abbreviated as N,P,K) present and the information is similar to that found in common fertilizers. If a compost result has the rating 1-2-2 it means that the compost has 1% Nitrogen, 2% Phosphate and 2% Potash. Most compost tests will have a average nutrient level (N+P+K) of < 5%.

18-267-4182

REPORT DATE
Sep 24, 2018
 RECEIVED DATE
Sep 13, 2018

SEND TO
27791



13611 B Street • Omaha, Nebraska 68144-3693 • (402) 334-7770
 www.midwestlabs.com

ISSUE DATE
Sep 25, 2018

**CITY OF RICHLAND
 DOUG BULLOCK
 PO BOX 190
 RICHLAND WA 99352**

REPORT OF ANALYSIS
 For: (27791) CITY OF RICHLAND
 CITY OF RICHLAND COMPOST FACILITY

Analysis	Level Found		Reporting			Analyst- Date	Verified- Date
	As Received	Dry Weight	Units	Limit	Method		

Sample ID: FC ROW 0430-18	Lab Number: 2848114		Date Sampled: 2018-09-12				
Cadmium (total)	0.55	0.64	mg/kg	0.50	EPA 6010	trh1-2018/09/14	bab2-2018/09/20
Chromium (total)	17.9	20.9	mg/kg	1.00	EPA 6010	trh1-2018/09/14	bab2-2018/09/20
Mercury (total)	0.12	0.14	mg/kg	0.05	EPA 7471	com2-2018/09/18	bab2-2018/09/20
Lead (total)	13.0	15.2	mg/kg	5.0	EPA 6010	trh1-2018/09/14	bab2-2018/09/20
Molybdenum (total)	5.1	5.9	mg/kg	1.0	EPA 6010	trh1-2018/09/14	bab2-2018/09/20
Nickel (total)	14.0	16.3	mg/kg	1.0	EPA 6010	trh1-2018/09/14	bab2-2018/09/20
Selenium (total)	n.d.	n.d.	mg/kg	10.0	EPA 6010	trh1-2018/09/14	bab2-2018/09/20
Zinc (total)	195.2	227.8	mg/kg	2.0	EPA 6010	trh1-2018/09/14	bab2-2018/09/20
Copper (total)	101	118	mg/kg	1	EPA 6010	trh1-2018/09/14	bab2-2018/09/20
Arsenic (total)	3.93	4.59	mg/kg	0.5	EPA 6020	ras7-2018/09/20	bab2-2018/09/20

EPA 1681 holding time of < 24 hours from sampling to laboratory set up of samples for biosolids and compost has been exceeded. Individual states enforce different holding times for compost or biosolids so please contact the regulatory body in your state for their requirements.
 n.d. = not detected , ppm = parts per million, mg/kg

For questions please contact:

Rob Ferris
 Account Manager
 ferris@midwestlabs.com (402)829-9871

The result(s) issued on this report only reflect the analysis of the sample(s) submitted.

Our reports and letters are for the exclusive and confidential use of our clients and may not be reproduced in whole or in part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.



US COMPOSTING COUNCIL



2848114-114
 Samples: 1 Page: 1/3
 Arilyn Hixon
 2016 09 13 11:22

OFFICIAL Seal of Testing Assurance
Compost Sample Chain of Custody Form

STA Laboratory: Midwest Laboratories Tel: (402) 334-1770
 Address: 13611 "B" St FAX: (402) 334-9121
 Email: _____
 City, State Zip code: Omaha, Nebraska 68144-3693

Client/Reporting Company: City of Richland Tel: (509) 942-7481
 Contact Name: Steve Brewer FAX: (509) 942-7346
 Billing Address: P.O. Box 190 Email: SBREWER@CT
MS # 27 Richland, WA, US
 City, State Zip code: Richland, WA 99352

Send Results to: Steve Brewer
 City, State Zip code: P.O. Box 190 MS#27 Richland, WA 99352

Name or Source of Sample(s): City of Richland Compost Facility
 Name of Person(s), Sample Collector(s): Kasey Bruton

LABORATORY USE ONLY Storage Locations
 Freezer _____ Cold Room _____ Storage Shelf _____

Sample Condition: _____
 Temperature: _____ Malodor: _____ Moisture: _____

Sample Type: POINT COMPOSITE STRATIFIED INTERVAL
 P.O. Number: _____

USCC Member: YES NO

SELECTION OF ANALYSIS. Refer to <http://www.tnec.org/cap/methods.html> for details.
 STA Suite: State DOT Tests (Indicate State); A, B, C - Specify other tests in fields A through C. (e.g. tests required for regulated samples, etc.). NOTE 1 STA analytical results via the STA Compost Technical Data Sheet and this Chain of Custody form are submitted to STA program management.

A B C

Client Sample ID and Special Instructions	1. List Feedstocks 2. Check all that apply 3. List % by volume. (Optional)		Collection Date/Time	Sample Matrix	Composting Operation Type	Shipping Temperature	Indicate Compost Analysis Requirements (*identify state)			LAB USE ONLY Job Number & Sample Status	
	A	B					C				
FC Row 0430-18	<input checked="" type="checkbox"/> Green waste	<input type="checkbox"/> Carcass	Date: <u>9-12-18</u> Time: <u>10:00</u> Initials: <u>KB</u>	Compost <input checked="" type="checkbox"/> Feedstock <input type="checkbox"/> Mulch <input type="checkbox"/>	Windrow <input checked="" type="checkbox"/> Static pile <input type="checkbox"/> In-Vessel <input type="checkbox"/>	Ambient <input type="checkbox"/> Wet Ice <input checked="" type="checkbox"/> Dry Ice <input type="checkbox"/>	STA Suite	State DOT	Identify State	A B	2848114

INFORM THE STA LABORATORY AND SPECIFY THE REQUIRED LABORATORY TESTS WHEN SUBMITTING REGULATED COMPOST SAMPLES (please use spaces A, B and C provided above).
 PLEASE PROVIDE SPECIFIC FEEDSTOCK AND OPERATIONAL DETAIL IN THE SPACE PROVIDED.
 YOUR VOLUNTEERED INFORMATION PROVIDES USGC STANDARDS AND PRACTICES COMMITTEE WITH CRUCIAL DATA NEEDED TO BETTER UNDERSTAND THE COMPOSTING PROCESS AND COMPOST END USES.

Wash. + ORE.

STA W/O SALMONELLA (WANT FECAL COLIFORM TEST PERFORMED)

Releasing Signature 1	<u>[Signature]</u>	Date	<u>9-12-18</u>	Time	<u>1400</u>	Receiving Signature 1	<u>[Signature]</u>	Date	<u>9/13/18</u>	Time	
Releasing Signature 2		Date		Time		Receiving Signature 2		Date		Time	
Releasing Signature 3		Date		Time		Receiving Signature 3		Date		Time	
Releasing Signature 4		Date		Time		Receiving Signature 4		Date		Time	

18.0-24



2848114-114
 Samples: Page:
 1 2/3
 Kellyn Hines
 2016 09 13 11:22

Regulatory

This sheet **MUST** be filled out before samples can be processed. To ensure that holding times are met, it is your responsibility that a completed form comes attached to the Chain of Custody. **Samples must be received on ice.**

Is this sample for regulatory/permit reporting?

Yes No

What city/state was your sample collected in?

Richland Wa

What agency/state are you reporting to?

US Campost Council

What type of sample? (Circle One)

Drinking Water

Ground Water

Wastewater

Solid waste

Hazardous Waste

UST

Storm Water

Process Water

Campost

SEE REVERSE SIDE FOR SAMPLING INSTRUCTIONS



Sample Acceptance Checklist

Document Number: RC CHKLIST 001

Revision No.: 3

Effective Date: 1/31/17

Page 1 of 1



2848114-114

Samples: 1 Page: 3/3

Ashlyn Hinson
2018 09 13 11:22

Lab Number:

Thermometer Used: Therm Fisher IR MI

Cooler Intact: Yes No

Received on Ice: Yes No

Sample Temperature (°C): 13.0

Hand Delivered: Yes No

Date & Initials of person accepting samples: AK 9/13/18

Comments:

Chain of Custody present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Chain of Custody complete?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Sample ID(s):	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Sample Location(s):	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Client Contact:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Analysis Requested:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Sampler name on COC?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Date & Time of collection:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Sample labels match COC?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Written in indelible ink?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Labels indicate proper preservation?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Chain of Custody relinquished with signature?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Samples arrived within hold time?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Sufficient volume?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Appropriate containers used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Headspace in VOA vials?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Trip Blank present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A

Client Notification/Resolution: Date/Time Contacted: _____

Person Contacted: _____ Contacted By: _____

Comments/Resolution: _____
