





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

Lab #	2792752	Report of Analysis		Report Number: 18-101-4105	
<b>Account:</b> 27791	DOUG BULLOCK CITY OF RICHLAND PO BOX 190 RICHLAND WA 99352		 Robert Ferris Account Manager 402-829-9871		
<b>Date Sampled:</b> <b>Date Received:</b> <b>Sample ID:</b>	2018-03-27 2018-03-28 F.C. ROW 1027-17				
			NUTRIENT ANALYSIS		
			Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
<b>NUTRIENTS</b>					
Nitrogen					
Total Nitrogen	%	1.76	2.56	35.2	
Organic Nitrogen	%	1.69	2.46	33.8	
Ammonium Nitrogen	%	0.041	0.060	0.8	
Nitrate Nitrogen	%	0.03	0.04	0.6	
Major and Secondary Nutrients					
Phosphorus	%	0.74	1.08	14.8	
Phosphorus as P2O5	%	1.69	2.46	33.8	
Potassium	%	1.04	1.51	20.8	
Potassium as K2O	%	1.25	1.82	25.0	
Sulfur	%	0.34	0.50	6.8	
Calcium	%	1.69	2.46	33.8	
Magnesium	%	0.51	0.74	10.2	
Sodium	%	0.050	0.073	1.0	
Micronutrients					
Iron	ppm	9130	13295	18.3	
Manganese	ppm	192	280	0.4	
Boron	ppm	< 100	---	---	
<b>OTHER PROPERTIES</b>					
Moisture	%	31.33			
Total Solids	%	68.67	1373.4		
Organic Matter	%	27.50	40.05	550.0	
Ash	%	40.80	59.41	816.0	
Total Carbon	%	16.17	23.55		
Chloride	%	0.25	0.36		
pH		6.4			
Conductivity 1:5 (Soluble Salts)	mS/cm	5.86			

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

Lab #	2792752	<b>Biological &amp; Physical Properties</b>	Report Number: 18-101-4105								
<b>Account:</b> 27791	DOUG BULLOCK CITY OF RICHLAND PO BOX 190 RICHLAND WA 99352		 Robert Ferris Client Service Representative 402-829-9871								
<b>Date Sampled:</b>	2018-03-27		NUTRIENT ANALYSIS								
<b>Date Received:</b>	2018-03-28										
<b>Sample ID:</b>	F.C. ROW 1027-17										
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;"></th> <th style="width: 15%;">Analysis (as rec'd)</th> <th style="width: 15%;">Analysis (dry weight)</th> <th style="width: 10%;">Units</th> <th style="width: 10%;">Detection Limit</th> <th style="width: 15%;">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						
<b>Biological Properties</b>											
Germination	100		%	1	TMECC 05.05A						
Germination Vigor	83		%	1	TMECC 05.05A						
CO <sub>2</sub> OM Evolution	0.51		mgCO <sub>2</sub> -C/gOM/day	0.01	TMECC 05.08B						
CO <sub>2</sub> Solids Evolution	0.62		mgCO <sub>2</sub> -C/gTS/day	0.01	TMECC 05.08B						
Fecal Coliform		20	mpn/g	0.2	EPA 1681						
Stability Rating	Stable		N/A	N/A	TMECC 05.08B						
<b>Physical Properties</b>											
Bulk Density (Loose)	1011		lbs/cu yard	1	WT/VOL						
Bulk Density (Packed)	1129		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		2.5	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"		93	%	0.01	TMECC Sieve						

Compost Results Interpretations

Page 1

Report #:

18-101-4105

DATE RECEIVED:

2018-03-28

Organic Matter %		Greater than 20% indicates a desirable range for compost on a dry weight basis.
27.50	As Received	
40.05	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.
9.2:1		

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
31.33		

>55% = Indicates overly wet compost

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 #:

18-101-4105

DATE RECEIVED:

2018-03-28

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
5.9

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 #: 18-101-4105  
DATE RECEIVED: 2018-03-28

**pH Value**  
6.4

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)**

6.84 Average Nutrient Content Dry Weight <2 = Low, >5 = High  
2-1.5-1.5 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%.

**18-101-4105**

REPORT DATE  
**Apr 11, 2018**  
 RECEIVED DATE  
**Mar 28, 2018**

SEND TO  
**27791**



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

ISSUE DATE  
**Apr 11, 2018**

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

**REPORT OF ANALYSIS**  
 For: (27791) CITY OF RICHLAND  
 NUTRIENT ANALYSIS

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

Sample ID: **F.C. ROW 1027-17** Lab Number: **2792752** Date Sampled: **2018-03-27**

Cadmium (total)	n.d.	n.d.	mg/kg	0.50	EPA 6010	ras7-2018/03/29	bab2-2018/04/03
Chromium (total)	11.0	16.0	mg/kg	1.00	EPA 6010	ras7-2018/03/29	bab2-2018/04/03
Mercury (total)	0.05	0.08	mg/kg	0.05	EPA 7471	ccm2-2018/04/03	bab2-2018/04/03
Lead (total)	11.8	17.2	mg/kg	5.0	EPA 6010	ras7-2018/03/29	bab2-2018/04/03
Molybdenum (total)	3.0	4.4	mg/kg	1.0	EPA 6010	ras7-2018/03/29	bab2-2018/04/03
Nickel (total)	10.8	15.7	mg/kg	1.0	EPA 6010	ras7-2018/03/29	bab2-2018/04/03
Selenium (total)	n.d.	n.d.	mg/kg	10.0	EPA 6010	ras7-2018/03/29	bab2-2018/04/03
Zinc (total)	204.2	297.3	mg/kg	2.0	EPA 6010	ras7-2018/03/29	bab2-2018/04/03
Copper (total)	122	178	mg/kg	1	EPA 6010	ras7-2018/03/29	bab2-2018/04/03
Arsenic (total)	3.35	4.88	mg/kg	0.5	EPA 6020	ras7-2018/04/03	bab2-2018/04/03

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**



2792752-752  
 Samples: 1 Page: 1/1  
 Lara L. Mikels  
 2018 03 28 12:29

**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  
 City, State Zip code: Omaha, Nebraska 68144-3693  
 Email: \_\_\_\_\_

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 Brunton

**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.tmecc.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!** 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
F.C. Row 1037-17	<input checked="" type="checkbox"/> Green waste <input type="checkbox"/> Manure <input type="checkbox"/> Food <input checked="" type="checkbox"/> Biosolids <input type="checkbox"/> MSW <input type="checkbox"/> Wood <input type="checkbox"/> Carcass <input type="checkbox"/> Fish Waste <input type="checkbox"/> Grease, Fats	Date: <u>3-27-18</u> Time: <u>Grab Comp.</u> Initials: <u>KB</u>	Compost <input checked="" type="checkbox"/> Feedstock <input type="checkbox"/> Mulch <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Windrow <input checked="" type="checkbox"/> Static pile <input type="checkbox"/> In-Vessel <input type="checkbox"/> <input type="checkbox"/> <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 C	2792752

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 USCC STANDARDS AND PRACTICES COMMITTEE WITH CRUTIAL 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	Date	Time	Receiving Signature	Date	Time
<u>[Signature]</u>	<u>3-27-18</u>	<u>1400</u>			
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

11.0.2018