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Lab # 8723335 **Report of Analysis** Report Number: 20-056-4004

Account: 34024	KARLA ADAMI CITY OF LARAMIE WWTP PO BOX C LARAMIE WY 82073
Date Sampled:	2020-02-10
Date Received:	2020-02-11
Sample ID:	832938-1

Robert Ferris
Account Manager
402-829-9871

Compost Pkg

		Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
NUTRIENTS				
Nitrogen				
Total Nitrogen	%	0.89	1.06	17.8
Organic Nitrogen	%	0.77	0.92	15.4
Ammonium Nitrogen	%	0.092	0.110	1.8
Nitrate Nitrogen	%	0.03	0.04	0.6
Major and Secondary Nutrients				
Phosphorus	%	0.32	0.38	6.4
Phosphorus as P2O5	%	0.73	0.87	14.6
Potassium	%	0.52	0.62	10.4
Potassium as K2O	%	0.63	0.75	12.6
Sulfur	%	0.24	0.29	4.8
Calcium	%	3.01	3.59	60.2
Magnesium	%	0.65	0.77	13.0
Sodium	%	0.080	0.095	1.6
Micronutrients				
Iron	ppm	8560	10201	17.1
Manganese	ppm	211	251	0.4
Boron	ppm	< 100	----	----
OTHER PROPERTIES				
Moisture	%	16.09		
Total Solids	%	83.91		1678.2
Organic Matter	%	17.70	21.09	354.0
Ash	%	66.00	78.66	1320.0
Total Carbon	%	7.89	9.40	
Chloride	%	0.07	0.08	
pH		7.5		
Conductivity 1:5 (Soluble Salts)	mS/cm	2.66		

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Lab # 8723335 **Biological & Physical Properties** Report Number: 20-056-4004

Account: 34024	KARLA ADAMI CITY OF LARAMIE WWTP PO BOX C LARAMIE WY 82073
Date Sampled:	2020-02-10
Date Received:	2020-02-11
Sample ID:	832938-1

Robert Ferris
Client Service Representative
402-829-9871

Compost Pkg

	Analysis (as rec'd)	Analysis (dry weight)	Units	Detection Limit	Method
Biological Properties					
Germination	100		%	1	TMECC 05.05A
Germination Vigor	100		%	1	TMECC 05.05A
CO_2 OM Evolution	1.09		$mgCO_2$-C/gOM/day	0.01	TMECC 05.08B
CO_2 Solids Evolution	0.49		$mgCO_2$-C/gTS/day	0.01	TMECC 05.08B
Fecal Coliform		< 0.2	mpn/g	0.2	EPA 1681
Salmonella		< 0.26	mpn/4g	0.26	EPA 1682
Stability Rating	Stable		N/A	N/A	TMECC 05.08B
Physical Properties					
Bulk Density (Loose)	1281		lbs/cu yard	1	WT/VOL
Bulk Density (Packed)	1432		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		0.5	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"		100	%	0.01	TMECC Sieve

Compost Results Interpretations

Page 1

Report #:	20-056-4004
DATE RECEIVED:	2020-02-11

Organic Matter %

17.70 As Received

21.09 Dry Weight

Greater than 20% indicates a desirable range for compost on a dry weight basis.

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

8.9:1

20-30 indicates an ideal range for the initial compost process.

10-20 indicates an ideal range for a finished compost.

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 %

16.09

<35% = Indicates overly dry compost

>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 #:	20-056-4004
DATE RECEIVED:	2020-02-11

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
2.7

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 #: 20-056-4004

DATE RECEIVED: 2020-02-11

pH Value

7.5

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

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

Nutrients (N+P205+K20)

2.68 Average Nutrient Content Dry Weight <2 = Low, >5 = High

1-0.5-0.5 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%.

REPORT NUMBER
20-056-4004

REPORT DATE
Feb 25, 2020

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34024

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ISSUE DATE
Feb 25, 2020

CITY OF LARAMIE WWTP
KARLA ADAMI
PO BOX C
LARAMIE WY 82073

REPORT OF ANALYSIS

For: (34024) CITY OF LARAMIE WWTP
Compost Pkg

Analysis	Level Found As Received	Level Found Dry Weight	Units	Reporting Limit	Method	Analyst-Date	Verified-Date
Sample ID: **832938-1** Lab Number: **8723335** Date Sampled: **2020-02-10 1100**							
Cadmium (total)	n.d.	n.d.	mg/kg	0.50	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Chromium (total)	9.73	11.6	mg/kg	1.00	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Mercury (total)	0.09	0.11	mg/kg	0.05	EPA 7471	trh1-2020/02/13	kkh9-2020/02/16
Lead (total)	12.0	14.3	mg/kg	5.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Molybdenum (total)	1.8	2.2	mg/kg	1.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Nickel (total)	7.0	8.3	mg/kg	1.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Selenium (total)	n.d.	n.d.	mg/kg	10.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Zinc (total)	114.9	136.9	mg/kg	2.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Copper (total)	79.7	95.0	mg/kg	1	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Arsenic (total)	3.26	3.89	mg/kg	0.5	EPA 6020	ras7-2020/02/14	kkh9-2020/02/16
Aluminum (total)	5860	6980	mg/kg	5.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Cobalt (total)	2.52	3.01	mg/kg	1.00	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Total neutralizing value (CaCO3 eq)	6.7		%	0.1	AOAC 955.01	eas2-2020/02/17	asl4-2020/02/19

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

REPORT NUMBER
20-056-4004

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CITY OF LARAMIE WWTP
KARLA ADAMI
PO BOX C
LARAMIE WY 82073

REPORT OF ANALYSIS

For: (34024) CITY OF LARAMIE WWTP
Compost Pkg

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

EPA 1682 holding time of < 6 hours from sampling to laboratory set up of samples for biosolids and compost has been exceeded. If a level of Salmonella was reported, the value would be considered an estimate. 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, ppm = mg/kg

For questions please contact:

Heather Ramig
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Lab # 8723336 **Report of Analysis** Report Number: 20-056-4005

Account: 34024	KARLA ADAMI CITY OF LARAMIE WWTP PO BOX C LARAMIE WY 82073
Date Sampled:	2020-02-10
Date Received:	2020-02-11
Sample ID:	832938-2

Robert Ferris
Account Manager
402-829-9871

Compost Pkg

		Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
NUTRIENTS				
Nitrogen				
Total Nitrogen	%	1.01	1.23	20.2
Organic Nitrogen	%	0.90	1.10	18.0
Ammonium Nitrogen	%	0.091	0.111	1.8
Nitrate Nitrogen	%	0.02	0.02	0.4
Major and Secondary Nutrients				
Phosphorus	%	0.31	0.38	6.2
Phosphorus as P2O5	%	0.71	0.87	14.2
Potassium	%	0.51	0.62	10.2
Potassium as K2O	%	0.61	0.75	12.2
Sulfur	%	0.24	0.29	4.8
Calcium	%	2.94	3.59	58.8
Magnesium	%	0.59	0.72	11.8
Sodium	%	0.070	0.086	1.4
Micronutrients				
Iron	ppm	8020	9798	16.0
Manganese	ppm	203	248	0.4
Boron	ppm	< 100	----	----
OTHER PROPERTIES				
Moisture	%	18.15		
Total Solids	%	81.85		1637.0
Organic Matter	%	16.40	20.04	328.0
Ash	%	65.20	79.66	1304.0
Total Carbon	%	9.74	11.90	
Chloride	%	0.09	0.11	
pH		7.5		
Conductivity 1:5 (Soluble Salts)	mS/cm	2.53		

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Lab # 8723336 **Biological & Physical Properties** Report Number: 20-056-4005

Account: 34024	KARLA ADAMI CITY OF LARAMIE WWTP PO BOX C LARAMIE WY 82073
Date Sampled:	2020-02-10
Date Received:	2020-02-11
Sample ID:	832938-2

Robert Ferris
Client Service Representative
402-829-9871

Compost Pkg

	Analysis (as rec'd)	Analysis (dry weight)	Units	Detection Limit	Method
Biological Properties					
Germination	100		%	1	TMECC 05.05A
Germination Vigor	100		%	1	TMECC 05.05A
CO_2 OM Evolution	1.09		$mgCO_2$-C/gOM/day	0.01	TMECC 05.08B
CO_2 Solids Evolution	0.43		$mgCO_2$-C/gTS/day	0.01	TMECC 05.08B
Fecal Coliform		< 0.2	mpn/g	0.2	EPA 1681
Salmonella		< 0.26	mpn/4g	0.26	EPA 1682
Stability Rating	Stable		N/A	N/A	TMECC 05.08B
Physical Properties					
Bulk Density (Loose)	1281		lbs/cu yard	1	WT/VOL
Bulk Density (Packed)	1500		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		0.5	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"		100	%	0.01	TMECC Sieve

Compost Results Interpretations

Page 1

Report #:	20-056-4005
DATE RECEIVED:	2020-02-11

Organic Matter %

16.40 As Received

20.04 Dry Weight

Greater than 20% indicates a desirable range for compost on a dry weight basis.

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

9.6:1

20-30 indicates an ideal range for the initial compost process.

10-20 indicates an ideal range for a finished compost.

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 %

18.15

<35% = Indicates overly dry compost

>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 #:	20-056-4005
DATE RECEIVED:	2020-02-11

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
2.5

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 #: 20-056-4005

DATE RECEIVED: 2020-02-11

pH Value

7.5

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

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

Nutrients (N+P205+K20)

2.85 Average Nutrient Content Dry Weight <2 = Low, >5 = High

1-0.5-0.5 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%.

REPORT NUMBER
20-056-4005

REPORT DATE
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ISSUE DATE
Feb 25, 2020

CITY OF LARAMIE WWTP
KARLA ADAMI
PO BOX C
LARAMIE WY 82073

REPORT OF ANALYSIS

For: (34024) CITY OF LARAMIE WWTP
Compost Pkg

Analysis	Level Found As Received	Level Found Dry Weight	Units	Reporting Limit	Method	Analyst-Date	Verified-Date
Sample ID: **832938-2** Lab Number: **8723336** Date Sampled: **2020-02-10 1100**							
Cadmium (total)	n.d.	n.d.	mg/kg	0.50	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Chromium (total)	9.58	11.7	mg/kg	1.00	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Mercury (total)	0.13	0.16	mg/kg	0.05	EPA 7471	trh1-2020/02/13	kkh9-2020/02/16
Lead (total)	11.4	13.9	mg/kg	5.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Molybdenum (total)	1.8	2.2	mg/kg	1.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Nickel (total)	6.4	7.8	mg/kg	1.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Selenium (total)	n.d.	n.d.	mg/kg	10.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Zinc (total)	106.2	129.7	mg/kg	2.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Copper (total)	72.4	88.5	mg/kg	1	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Arsenic (total)	2.81	3.43	mg/kg	0.5	EPA 6020	ras7-2020/02/14	kkh9-2020/02/16
Aluminum (total)	5160	6310	mg/kg	5.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Cobalt (total)	2.31	2.82	mg/kg	1.00	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Total neutralizing value (CaCO3 eq)	7.3		%	0.1	AOAC 955.01	eas2-2020/02/17	asl4-2020/02/19

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

REPORT NUMBER
20-056-4005

REPORT DATE
Feb 25, 2020

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ISSUE DATE
Feb 25, 2020

CITY OF LARAMIE WWTP
KARLA ADAMI
PO BOX C
LARAMIE WY 82073

REPORT OF ANALYSIS

For: (34024) CITY OF LARAMIE WWTP
Compost Pkg

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

EPA 1682 holding time of < 6 hours from sampling to laboratory set up of samples for biosolids and compost has been exceeded. If a level of Salmonella was reported, the value would be considered an estimate. 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, ppm = mg/kg

For questions please contact:

Heather Ramig
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Lab # 8723337 **Report of Analysis** Report Number: 20-066-4105

Account: 34024	KARLA ADAMI CITY OF LARAMIE WWTP PO BOX C LARAMIE WY 82073
Date Sampled:	2020-02-10
Date Received:	2020-02-11
Sample ID:	832938-3

Robert Ferris
Account Manager
402-829-9871

Compost Pkg

		Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
NUTRIENTS				
Nitrogen				
Total Nitrogen	%	1.17	1.43	23.4
Organic Nitrogen	%	1.06	1.30	21.2
Ammonium Nitrogen	%	0.089	0.109	1.8
Nitrate Nitrogen	%	0.02	0.02	0.4
Major and Secondary Nutrients				
Phosphorus	%	0.29	0.35	5.8
Phosphorus as P2O5	%	0.66	0.81	13.2
Potassium	%	0.53	0.65	10.6
Potassium as K2O	%	0.64	0.78	12.8
Sulfur	%	0.23	0.28	4.6
Calcium	%	2.67	3.26	53.4
Magnesium	%	0.59	0.72	11.8
Sodium	%	0.070	0.086	1.4
Micronutrients				
Iron	ppm	8260	10099	16.5
Manganese	ppm	200	245	0.4
Boron	ppm	< 100	----	----
OTHER PROPERTIES				
Moisture	%	18.21		
Total Solids	%	81.79		1635.8
Organic Matter	%	17.10	20.91	342.0
Ash	%	64.40	78.74	1288.0
Total Carbon	%	11.14	13.62	
Chloride	%	0.07	0.09	
pH		7.5		
Conductivity 1:5 (Soluble Salts)	mS/cm	2.68		

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Lab # 8723337 **Biological & Physical Properties** Report Number: 20-066-4105

Account: 34024	KARLA ADAMI CITY OF LARAMIE WWTP PO BOX C LARAMIE WY 82073
Date Sampled:	2020-02-10
Date Received:	2020-02-11
Sample ID:	832938-3

Robert Ferris
Client Service Representative
402-829-9871

Compost Pkg

	Analysis (as rec'd)	Analysis (dry weight)	Units	Detection Limit	Method
Biological Properties					
Germination	100		%	1	TMECC 05.05A
Germination Vigor	100		%	1	TMECC 05.05A
CO_2 OM Evolution	1.01		$mgCO_2$-C/gOM/day	0.01	TMECC 05.08B
CO_2 Solids Evolution	0.43		$mgCO_2$-C/gTS/day	0.01	TMECC 05.08B
Fecal Coliform		1	mpn/g	0.2	EPA 1681
Salmonella		< 0.26	mpn/4g	0.26	EPA 1682
Stability Rating	Stable		N/A	N/A	TMECC 05.08B
Physical Properties					
Bulk Density (Loose)	1264		lbs/cu yard	1	WT/VOL
Bulk Density (Packed)	1533		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		1.0	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"		100	%	0.01	TMECC Sieve

Compost Results Interpretations

Page 1

Report #:	20-066-4105
DATE RECEIVED:	2020-02-11

Organic Matter %

17.10 As Received

20.91 Dry Weight

Greater than 20% indicates a desirable range for compost on a dry weight basis.

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

9.5:1

20-30 indicates an ideal range for the initial compost process.

10-20 indicates an ideal range for a finished compost.

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 %

18.21

<35% = Indicates overly dry compost

>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 #:	20-066-4105
DATE RECEIVED:	2020-02-11

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
2.7

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 #: 20-066-4105

DATE RECEIVED: 2020-02-11

pH Value

7.5

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

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

Nutrients (N+P205+K20)

3.02 Average Nutrient Content Dry Weight <2 = Low, >5 = High

1-0.5-0.5 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%.

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CITY OF LARAMIE WWTP
KARLA ADAMI
PO BOX C
LARAMIE WY 82073

REPORT OF ANALYSIS

For: (34024) CITY OF LARAMIE WWTP
Compost Pkg

Analysis	Level Found As Received	Level Found Dry Weight	Units	Reporting Limit	Method	Analyst-Date	Verified-Date
Sample ID: **832938-3** Lab Number: **8723337** Date Sampled: **2020-02-10 1100**							
Cadmium (total)	n.d.	n.d.	mg/kg	0.50	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Chromium (total)	9.98	12.2	mg/kg	1.00	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Mercury (total)	0.10	0.12	mg/kg	0.05	EPA 7471	trh1-2020/02/13	kkh9-2020/02/16
Lead (total)	24.9	30.4	mg/kg	5.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Molybdenum (total)	1.6	1.9	mg/kg	1.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Nickel (total)	6.6	8.1	mg/kg	1.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Selenium (total)	n.d.	n.d.	mg/kg	10.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Zinc (total)	111.8	136.7	mg/kg	2.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Copper (total)	77.5	94.8	mg/kg	1	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Arsenic (total)	2.98	3.64	mg/kg	0.5	EPA 6020	ras7-2020/02/14	kkh9-2020/02/16
Aluminum (total)	6000	7340	mg/kg	5.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Cobalt (total)	2.54	3.11	mg/kg	1.00	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Total neutralizing value (CaCO3 eq)	5.4		%	0.1	AOAC 955.01	eas2-2020/02/17	asl4-2020/02/19

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

REPORT NUMBER
20-066-4105

REPORT DATE
Mar 06, 2020

SEND TO
34024

RECEIVED DATE
Feb 11, 2020

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ISSUE DATE
Mar 06, 2020

CITY OF LARAMIE WWTP
KARLA ADAMI
PO BOX C
LARAMIE WY 82073

REPORT OF ANALYSIS

For: (34024) CITY OF LARAMIE WWTP
Compost Pkg

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

EPA 1682 holding time of < 6 hours from sampling to laboratory set up of samples for biosolids and compost has been exceeded. If a level of Salmonella was reported, the value would be considered an estimate. 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, ppm = mg/kg

For questions please contact:

Heather Ramig
Senior Account Manager
hramig@midwestlabs.com (402)829-9891

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Lab # 8723338 **Report of Analysis** Report Number: 20-056-4006

Account: 34024	KARLA ADAMI CITY OF LARAMIE WWTP PO BOX C LARAMIE WY 82073
Date Sampled:	2020-02-10
Date Received:	2020-02-11
Sample ID:	832938-4

Robert Ferris
Account Manager
402-829-9871

Compost Pkg

		Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
NUTRIENTS				
Nitrogen				
Total Nitrogen	%	1.06	1.29	21.2
Organic Nitrogen	%	0.95	1.16	19.0
Ammonium Nitrogen	%	0.090	0.110	1.8
Nitrate Nitrogen	%	0.02	0.02	0.4
Major and Secondary Nutrients				
Phosphorus	%	0.34	0.41	6.8
Phosphorus as P2O5	%	0.78	0.95	15.6
Potassium	%	0.57	0.69	11.4
Potassium as K2O	%	0.69	0.84	13.8
Sulfur	%	0.25	0.30	5.0
Calcium	%	2.93	3.57	58.6
Magnesium	%	0.62	0.76	12.4
Sodium	%	0.080	0.097	1.6
Micronutrients				
Iron	ppm	8460	10303	16.9
Manganese	ppm	213	259	0.4
Boron	ppm	127	155	0.3
OTHER PROPERTIES				
Moisture	%	17.89		
Total Solids	%	82.11		1642.2
Organic Matter	%	16.90	20.58	338.0
Ash	%	64.90	79.04	1298.0
Total Carbon	%	10.25	12.48	
Chloride	%	0.07	0.09	
pH		7.6		
Conductivity 1:5 (Soluble Salts)	mS/cm	2.58		

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Lab # 8723338 **Biological & Physical Properties** Report Number: 20-056-4006

Account: 34024	KARLA ADAMI CITY OF LARAMIE WWTP PO BOX C LARAMIE WY 82073
Date Sampled:	2020-02-10
Date Received:	2020-02-11
Sample ID:	832938-4

Robert Ferris
Client Service Representative
402-829-9871

Compost Pkg

	Analysis (as rec'd)	Analysis (dry weight)	Units	Detection Limit	Method
Biological Properties					
Germination	100		%	1	TMECC 05.05A
Germination Vigor	100		%	1	TMECC 05.05A
CO_2 OM Evolution	1.08		mgCO_2-C/gOM/day	0.01	TMECC 05.08B
CO_2 Solids Evolution	0.45		mgCO_2-C/gTS/day	0.01	TMECC 05.08B
Fecal Coliform		0	mpn/g	0.2	EPA 1681
Salmonella		1	mpn/4g	0.26	EPA 1682
Stability Rating	Stable		N/A	N/A	TMECC 05.08B
Physical Properties					
Bulk Density (Loose)	1281		lbs/cu yard	1	WT/VOL
Bulk Density (Packed)	1483		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		0.5	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"		100	%	0.01	TMECC Sieve

Compost Results Interpretations

Page 1

Report #:	20-056-4006
DATE RECEIVED:	2020-02-11

Organic Matter %

16.90 As Received

20.58 Dry Weight

Greater than 20% indicates a desirable range for compost on a dry weight basis.

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

9.7:1

20-30 indicates an ideal range for the initial compost process.

10-20 indicates an ideal range for a finished compost.

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 %

17.89

<35% = Indicates overly dry compost

>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 #:	20-056-4006
DATE RECEIVED:	2020-02-11

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 #: 20-056-4006

DATE RECEIVED: 2020-02-11

pH Value

7.6

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

Nutrients (N+P205+K20)

3.08 Average Nutrient Content Dry Weight <2 = Low, >5 = High

1-1-0.5 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%.

REPORT NUMBER
20-056-4006

REPORT DATE
Feb 25, 2020

SEND TO
34024

RECEIVED DATE
Feb 11, 2020

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ISSUE DATE
Feb 25, 2020

CITY OF LARAMIE WWTP
KARLA ADAMI
PO BOX C
LARAMIE WY 82073

REPORT OF ANALYSIS

For: (34024) CITY OF LARAMIE WWTP
Compost Pkg

Analysis	Level Found As Received	Level Found Dry Weight	Units	Reporting Limit	Method	Analyst-Date	Verified-Date
Sample ID: **832938-4** Lab Number: **8723338**	Date Sampled: **2020-02-10 1100**						
Cadmium (total)	n.d.	0.51	mg/kg	0.50	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Chromium (total)	10.1	12.3	mg/kg	1.00	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Mercury (total)	0.12	0.15	mg/kg	0.05	EPA 7471	trh1-2020/02/13	kkh9-2020/02/16
Lead (total)	14.0	17.1	mg/kg	5.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Molybdenum (total)	1.8	2.2	mg/kg	1.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Nickel (total)	6.8	8.3	mg/kg	1.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Selenium (total)	n.d.	n.d.	mg/kg	10.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Zinc (total)	111.2	135.4	mg/kg	2.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Copper (total)	75.7	92.2	mg/kg	1	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Arsenic (total)	2.88	3.51	mg/kg	0.5	EPA 6020	ras7-2020/02/14	kkh9-2020/02/16
Aluminum (total)	5710	6950	mg/kg	5.0	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Cobalt (total)	2.49	3.03	mg/kg	1.00	EPA 6010	ery3-2020/02/13	kkh9-2020/02/16
Total neutralizing value (CaCO3 eq)	6.1		%	0.1	AOAC 955.01	eas2-2020/02/17	asl4-2020/02/19

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

REPORT NUMBER
20-056-4006

REPORT DATE
Feb 25, 2020

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34024

RECEIVED DATE
Feb 11, 2020

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ISSUE DATE
Feb 25, 2020

CITY OF LARAMIE WWTP
KARLA ADAMI
PO BOX C
LARAMIE WY 82073

REPORT OF ANALYSIS

For: (34024) CITY OF LARAMIE WWTP
Compost Pkg

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

EPA 1682 holding time of < 6 hours from sampling to laboratory set up of samples for biosolids and compost has been exceeded. If a level of Salmonella was reported, the value would be considered an estimate. 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, ppm = mg/kg

For questions please contact:

Heather Ramig
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