



www.compostquality.ca

SUMMARY OF ANALYSIS REPORT

To: City Of Winnipeg
1120 Waverlet St.
Winnipeg, Manitoba R3TOP4

CQA Member#: 18-3000

Attention: Kimsong Bun

Sample I.D.: BATCH1

Report#: C21078-10133
C21078-70012

Sample Date: 2021-03-15
Reported Date: 2021-3-29

Compost to be Manufacture in: Manitoba
Feedstock: Leaf & Yard Residues

CQA COMPOST QUALITY & VALUE TESTING PARAMETERS REPORT

| SAMPLE ID | RECOMMENDED END USE/MARKET |
|----------------------------------|--|
| BATCH1 | Category A |
| Regulatory | See Appendix I |
| Product Quality | See Appendix II |
| Product Value/ Soil Suitability* | See Appendix III (Soil, Enviro, Manure Compost) |

The Compost Quality Alliance (CQA) is a voluntary quality monitoring program established by the Compost Council of Canada and the compost producers utilizing recognized standardized testing methodologies and uniform operating protocols to provide customer assurance in compost selection its use, and proper end-use utilization.

All analysis of this compost product was conducted and provided by A&L Canada Laboratories Inc. for the Compost Quality Alliance (CQA).

Haifeng Song, Senior Chemist

Ian McLachlin, Vice-President



A&L Canada Laboratories Inc.
London, Ontario Canada
(519) 457-2575

A proud member of



***PLEASE NOTE: Major Nutrients under the Fertilizer Act and Regulations (CFIA)**

Please see Appendix III for nutrient content (of impact to claims and labelling if used in declarations).

Compost is classified in Schedule II as a supplement, and as such nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and the label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash K2O. Source: T-4-120 - Regulation of Compost under the Fertilizers Act and Regulations. <http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>



Appendix I



CCME Guidelines 2005 & CFIA Fertilizer Act & Regulations:

Alberta, Manitoba, New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island & Territories

A. Maximum Concentrations for Trace Metals in Compost:

| Trace Elements | Test Results (ug/g) | Category A | Category B |
|-----------------|------------------------|--|------------|
| | | Maximum Concentration within Product (mg/kg dry weight) | |
| Arsenic (As) | 2.06 | 13 | 75 |
| Cadmium (Cd) | BDL | 3 | 20 |
| Chromium (Cr) | 10.14 | 210 | ** |
| Cobalt (Co) | 2.43 | 34 | 150 |
| Copper (Cu) | 23.67 | 400 | ** |
| Lead (Pb) | 10.99 | 150 | 500 |
| Mercury (Hg) | BDL | 0.8 | 5 |
| Molybdenum (Mo) | BDL | 5 | 20 |
| Nickel (Ni) | 6.67 | 62 | 180 |
| Selenium (Se) | BDL | 2 | 14 |
| Zinc (Zn) | 66.65 | 700 | 1850 |

** Upper limits are not established in the Trade Memorandum.

B. Foreign Matter in Compost:

| Test Results | | Category A | Category B |
|-----------------------------|---|---|---|
| Foreign Matter | | Contains no more than 1 piece of foreign matter >25mm/500ml | Contains no more than 2 pieces of foreign matter > 25mm/500mL |
| Pieces >25mm/500mL | 0 | | |
| Sharp Foreign Matter | | No sharp foreign matter >3mm per 500ml | No more than 3 pieces of sharp matter < 12.5mm/500mL Note: This compost shall not be used in pastures, parks, or residential |
| Pieces > 3mm/500mL | 0 | | |
| Pieces > 12.5mm/500mL | 0 | | |

C. Maturity/Stability:

| Method | Test Results | Required Limits |
|--|--------------|---|
| CO ₂ Respiration Rate CO ₂ Respiration Rate | 2.70 | ≤ 4 mg of carbon in the form of carbon dioxide per gram of organic matter per day |
| O ₂ Uptake Respiration Rate O ₂ Uptake Respiration Rate | | ≤ 400 mg oxygen/kg of volatile solids (or organic matter)/hour |

D. Pathogens:

| Pathogen | Test Results | Required Limits |
|----------------------------|--------------|--|
| Fecal Coliform (MPN/g dry) | 13 | <1000 MPN/g of total solids calculated on a dry weight basis |
| Salmonella (P-A/25g(ml)) | NEGATIVE | <3 MPN/4g total solids calculated on a dry weight basis |

The following references are from the CCME guidelines (PN1340), October 2005

*BDL = Below Detectable Limits

E. CFIA

| Parameter | Test Results |
|--------------------------|--------------|
| Total Organic Matter (%) | 36.73% |
| Moisture (%) | 26.57% |

All analysis conducted and prepared by:

A L Canada Laboratories

2136 Jetstream Rd London, Ontario N5V 3P5 (519) 457-2575



Appendix II Finished Compost Quality



| Parameter | Test Results |
|-------------------------------|--------------|
| pH | 7.2 |
| Carbon to Nitrogen Ratio | 17:1 |
| Particle Size/Texture (inch)+ | 1/4 Inch |
| Soluble Salts (ms/cm) | 1.7 |
| Sodium Base Saturation (%Na) | 2.60% |
| Major Nutrients | |
| Available Potassium (%K) | 13.39% |
| Available Magnesium (%Mg) | 23.98% |
| Available Calcium (%Ca) | 60.02% |

+ Majority of sample passes through this sieve size

Reference Compost Quality Parameters for CQA

| Use | pH | C:N | Moisture | Particle Size | Soluble Salts | %Na |
|----------------------------------|---------|-------|----------|---------------|---------------|-------|
| Remediation | 5.8-8.5 | 10-40 | NA | <2 in | <20 | <3% |
| Soil Amendment | 5.8-8.5 | 10-30 | NA | <1/2 in | <6 | <2% |
| Landscaping | 5.8-8.5 | 12-22 | <50% | <1/2 in | <5 | <2% |
| Planting Media | 5.5-7.8 | 12-22 | <50% | <1/2 in | <4 | <2% |
| Turf Establishment & Topdressing | 5.5-7.8 | 12-22 | <50% | <3/8 in | <3 | <1% |
| Greenhouse Seeding | 6-7 | 12-22 | <25% | <1/4 in | <2 | <0.5% |
| Greenhouse Establishment | 6-7 | 12-22 | <30% | <1/2 in | 2-3.5 | <0.5% |
| Field Nursery | 5.8-8 | 10-30 | <50% | <1/2 in | <3.5 | <1% |
| Agricultural Soil Amendments | 6-8 | 10-30 | <50% | <1/2 in | <20 | none |
| Potting Soil | 5.5-7.2 | 12-22 | <50% | <1/4 in | <2 | <1% |

These are examples of some of the many end uses suitable for compost

Unrestricted Use: Category A - Compost that can be used in any application, such as agricultural lands, residential gardens, horticultural operations, the nursery industry, and other businesses. Category A criteria for trace elements are achievable using best source separated MSW feedstock, municipal biosolids, pulp and paper mill biosolids, or manure.

Restricted Use: Category B - Compost that has a restricted use because of the presence of sharp foreign matter or higher trace element content. Category B compost may require additional control when deemed necessary by a province or territory.

Note: For a compost to meet the unrestricted use category, it must meet the unrestricted (Category A) requirements for all trace elements and sharp foreign matter. If the compost fails one criterion of the guideline for unrestricted use but meets the criteria for restricted (Category B) use, then it is classified as a Category B product. Products that do not meet the criteria for either Category A or B must be used or disposed of appropriately.



Appendix III
 Compost Agricultural Product Value
 on as is basis



| Agricultural End-Use | Analysis Result | Unit | Quantity in lbs/Ton |
|---------------------------------------|-----------------|-------|---------------------|
| Physical Parameters | | | |
| Dry Matter | 73.43% | % | |
| pH | 7.2 | | |
| Bulk Density | 500 | kg/m3 | |
| C:N Ratio | 17:1 | | |
| Fertilizer Equivalent Minerals | | | |
| Nitrogen Total | 1.20% | % | 24.0 |
| Ammonium Nitrogen | 100.15 | ppm | 0.20 |
| Total Phosphate (P as P2O5) | 0.28% | % | 5.6 |
| Total Potash (K as K2O) | 0.39% | % | 7.8 |
| Calcium | 7.67% | % | 153.4 |
| Magnesium | 3.84% | % | 76.8 |
| Sulfur | 1126.78 | ppm | 2.3 |

The Compost Quality Assurance program goes beyond the provincial requirements to establish full value and appropriate end-use. The Compost Report and Compost End-use table in Appendix II, has 10 different compost application uses from soil remediation, through to potting soil blends. Of note are available soluble salt limits and the percent available sodium for sensitive plants. Appendix III, lists the primary agricultural use parameters and quantitative nutrient content that reflects this compost samples agricultural end-use, and application value. This value includes macro and micro nutrients, soil building properties such as the addition of organic matter, increasing moisture holding capacity, and the soils slow release nutrients. These parameters improve beneficial soil health components soil structure and stability.

The results of our testing on this sample indicates that this product is a fine textured, compost (85%+ 1/4 in.), with rich mineral properties, which would meet criteria for agricultural soil amendment, blending and topdressing end-uses purposes. The C:N ratio 17:1 from Appendix II, on the soil suitability report indicates a low C:N ratio and indicating good nitrogen availability. The low C:N ratio in conjunction with the higher total nitrogen content listed in Appendix III indicates early high available nitrogen levels, and should be considered for crop planning. The proportion of available sodium (2.60% Na), which if used in too heavy a proportion could cause some problems with sensitive species. The sodium levels of this compost sample though high, is suitable for agricultural broadcast field applications and are made to improve the organic matter level and major nutrients phosphorus, potassium and magnesium levels. The compost is also rich in available calcium, sulfur, and iron, which make it ideal for soil enriching, and amendment. We recommend blending this material at a minimum of 2-3 parts soil blended to each part of this compost to dilute the sodium concentration.

Major Nutrients - Compost is classified in Schedule II (CFIA Fertilizer Act & Regulations) as a supplement, and as such, nutrient guarantees are not mandatory. However, if any claims are made regarding nutritional value of the product, such as for composted manure, the product would then be classified as a supplement and a fertilizer, and label would have to include the guarantees for the major nutrients. The guarantees for the major nutrients include the minimum amounts of Total Nitrogen (N), Available Phosphoric Acid (P2O5) and Soluble Potash (K2O).

Report Number: C21078-10133
 Account Number: 01707

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, Ontario, N5V 3P5
 Telephone: (519) 457-2575 Fax: (519) 457-2664



C21078-10133



To: CITY OF WINNIPEG
 1120 WAVERLET ST.
 WINNIPEG, MB R3T0P4

For: BATCH1

Attn: KIMSONG BUN

P.O. Number: 607261

Reported Date:
 Printed Date: Mar 29, 2021

COMPOST REPORT

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| Sample Number | Lab Number | pH | Lime Index | Available Organic Matter % | Phosphorus P ppm | Potassium K ppm | Magnesium Mg ppm | Calcium Ca ppm |
|---------------|------------|-----|------------|----------------------------|------------------|-----------------|------------------|----------------|
| BATCH1 | 67575 | 7.2 | 6.9 | 29.8 | 674 | 2686 | 1500 | 6174 |

| Sulfur S ppm | Zinc Zn ppm | Manganese Mn ppm | Iron Fe ppm | Copper Cu ppm | Boron B ppm | Sodium Na ppm | Nitrate-N NO3-N ppm | Soluble Salt ms/cm | Nitrogen (Total) (%) | Chloride ppm |
|--------------|-------------|------------------|-------------|---------------|-------------|---------------|---------------------|--------------------|----------------------|--------------|
| 186 | 29.0 | 48 | 97 | 1.9 | 6.5 | 308 | 43 | 1.7 | 1.20 | 1074 |

INTERPRETATION

| CEC | | Percent Base Saturation | | | | Proportional Equivalents (meq) | | | | Cation Ratio | | C/N Ratio |
|----------------|-------|-------------------------|--------|---------|------|--------------------------------|-------|-------|------|--------------|-------|-----------|
| meq/100g | % BS | % K | % Mg | % Ca | % Na | K | Mg | Ca | Na | Mg/K | Ca/Mg | |
| 51.4 | 100.0 | 13.39 | 23.98 | 60.02 | 2.60 | 6.89 | 12.34 | 30.87 | 1.34 | 2:1 | 3:1 | 17:1 |
| Optimum Range: | | 3 - 5 | 8 - 20 | 60 - 80 | | 0.5 - 1.3 | | | | 7:1 | 5:1 | |

CQA

* Results reported on a dry weight basis.

The results of this report relate to the sample submitted and analyzed.

* Crop yield is influenced by a number of factors in addition to soil fertility.

No guarantee or warranty concerning crop performance is made by A & L.

Results Authorized By:

Ian McLachlin, Vice President

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A & L Canada Laboratories Inc.

2136 Jetstream Rd, London, Ontario, N5V 3P5
Telephone: (519) 457-2575 Fax: (519) 457-2664



REPORT NUMBER: C21078-10133
ACCOUNT NUMBER: 01707

REPORT OF ANALYSIS

TO: CITY OF WINNIPEG
1120 WAVERLET ST.
WINNIPEG, MB R3T0P4
CANADA

RE: BATCH1

CQA2100111

DATE RECEIVED: 2021-03-19

DATE REPORTED: 2021-03-29

PAGE: 1 / 1

P.O. NUMBER: 607261

Attn: KIMSONG BUN

| LAB NO. | SAMPLE ID | ANALYSIS | RESULT | UNIT | METHOD |
|---------|-----------|------------------|--------|------|---------------|
| 67575 | BATCH1 | Nitrogen (Total) | 1.2 | % | TMECC.04.02-D |



C21078-10133

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REPORT NO.
C21078-70012

ACCOUNT NUMBER
01707

A & L Canada Laboratories Inc.

2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF WINNIPEG
1120 WAVERLET ST.
WINNIPEG, MB R3T0P4
CANADA
Canada

FOR:BATCH 1

ATTN:Kimsong Bun
Phone:204-619-4171

CERTIFICATE OF ANALYSIS

PAGE: 1 / 3

PROJECT NO:

PO#:607261
LAB NUMBER:787013
SAMPLE ID:BATCH 1

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2021-03-15
DATE RECEIVED:2021-03-19
DATE REPORTED:2021-03-26
DATE PRINTED:2021-03-29

| PARAMETER | Result | UNIT | DETECTION LIMIT | METHOD REFERENCE |
|------------|--------|------|-----------------|---------------------------------|
| Arsenic | 2.06 | ug/g | 1.00 | EPA 3050B/6010B(mod) * |
| Cadmium | BDL | ug/g | 1.00 | EPA 3050B/6010B(mod) * |
| Cobalt | 2.43 | ug/g | 1.00 | TMECC.04.06;EPA 3050/6010(mod) |
| Chromium | 10.14 | ug/g | 1.00 | TMECC.04.06;EPA 3050/6010(mod)* |
| Copper | 23.67 | ug/g | 1.00 | TMECC.04.06;EPA 3050/6010(mod) |
| Mercury | BDL | ug/g | 0.10 | EPA 7471 * |
| Molybdenum | BDL | ug/g | 1.0 | TMECC.04.06;EPA 3050/6010(mod)* |
| Nickel | 6.67 | ug/g | 1.00 | TMECC.04.06;EPA 3050/6010(mod) |
| Lead | 10.99 | ug/g | 1.00 | EPA 3050B/6010B(mod) * |
| Selenium | BDL | ug/g | 1.00 | EPA 3050/6010 (mod) * |
| Zinc | 66.65 | ug/g | 1.00 | TMECC.04.06;EPA 3050/6010(mod) |

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21078-70012

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO:CITY OF WINNIPEG
1120 WAVERLET ST.
WINNIPEG, MB R3T0P4
CANADA
Canada

FOR:BATCH 1

ATTN:Kimsong Bun
Phone:204-619-4171

CERTIFICATE OF ANALYSIS

PAGE: 2 / 3

PROJECT NO:

PO#:607261
LAB NUMBER:787013
SAMPLE ID:BATCH 1

SAMPLE MATRIX:COMPOST
DATE SAMPLED:2021-03-15
DATE RECEIVED:2021-03-19
DATE REPORTED:2021-03-26
DATE PRINTED:2021-03-29

| PARAMETER | Result | UNIT | DETECTION LIMIT | METHOD REFERENCE |
|---|----------|----------------------------------|-----------------|------------------|
| E. coli | <3 | MPN/g dry | 3 | TMECC 07.01 |
| Salmonella spp. | NEGATIVE | P-A/ 25.0g(ml) | 1 CFU | MFLP-75 * |
| Fecal Coliform | 13 | MPN/g dry | 3 | TMECC 07.01 |
| Total sharps > 2.8 mm* | 0 | pieces/500ml | | TMECC 03.08 |
| Total sharps > 12.5 mm | 0 | pieces/500ml | | TMECC 03.08 |
| Total FM > 2.8 mm* | BDL | % | 0.01 | TMECC 03.08 |
| Total FM > 25 mm | 0 | pieces/500ml | | TMECC 03.08 |
| Total plastics > 2.8 mm* | BDL | % | 0.01 | TMECC 03.08 |
| Total Organic Matter @ 550 deg C | 36.73 | % | 0.10 | LOI@550C |
| Moisture | 26.57 | % | 0.10 | TMECC.03.09-A |
| Sieve 2 Inch (% Passing) | 100.00 | % | 0.10 | ASTMD422 |
| Sieve 1 Inch (% Passing) | 100.00 | % | 0.10 | ASTMD422 |
| Sieve 1/2 Inch (% Passing) | 100.00 | % | 0.10 | ASTMD422 |
| Sieve 3/8 Inch (% Passing) | 97.00 | % | 0.01 | ASTMD422 |
| Sieve 1/4 Inch (% Passing) | 85.10 | % | 0.10 | ASTMD422 |
| Compost Stability Index | 7 | --- | | TMECC.05.08-B |
| Respiration-mgCO ₂ -C/g OM/day | 2.70 | mgCO ₂ -C/ gOM/day | 0.01 | TMECC.05.08-B |
| Respiration - mgCO ₂ -C/g TS/day | 1.00 | mgCO ₂ -C/ gTS/day | 0.01 | TMECC.05.08-B |

Maturity Index: 7 - Well matured, aged compost, cured; few limitations for usage.

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



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2136 Jetstream Road, London, ON, N5V 3P5 Tel: (519) 457-2575 Fax: (519) 457-2664



TO: CITY OF WINNIPEG
1120 WAVERLET ST.
WINNIPEG, MB R3T0P4
CANADA
Canada

FOR: BATCH 1

ATTN: Kimsong Bun
Phone: 204-619-4171

CERTIFICATE OF ANALYSIS

PAGE: 3 / 3

PROJECT NO:

PO#: 607261
LAB NUMBER: 787013
SAMPLE ID: BATCH 1

SAMPLE MATRIX: COMPOST
DATE SAMPLED: 2021-03-15
DATE RECEIVED: 2021-03-19
DATE REPORTED: 2021-03-26
DATE PRINTED: 2021-03-29

| PARAMETER | Result Dry Weight | Result As Received | UNIT | DETECTION LIMIT | METHOD REFERENCE |
|--|-------------------|--------------------|-------------------|-----------------|--------------------|
| Total Solids (as received) | | 73.43 | % | 0.10 | Gravimetric |
| Nitrogen & Carbon | | | | | |
| Total Organic Carbon | | 20.41 | % | 0.10 | Combustion |
| Ammonia (NH ₃ /NH ₄ -N) | 136.39 | 100.15 | ug/g | .01 | Colourimetric |
| Metals | | | | | |
| Potassium | 4415.50 | 3242.30 | ug/g | 5.00 | TMECC.04.04 |
| Total Potassium (as K ₂ O) | 0.53 | 0.39 | % | 0.05 | ICP |
| Phosphorus | 1661.00 | 1219.67 | ug/g | 5.00 | TMECC.04.03 * |
| Total Phosphorus (as P ₂ O ₅) | 0.38 | 0.28 | % | 0.05 | ICP |
| Aluminum | 3132.50 | 2300.19 | ug/g | 5.00 | TMECC.04.07 * |
| Boron | 28.63 | 21.02 | ug/g | 1.00 | TMECC.04.05 * |
| Calcium | 10.45 | 7.67 | % | 0.01 | TMECC.04.05 |
| Iron | 5545.00 | 4071.69 | ug/g | 5.00 | TMECC.04.05 * |
| Magnesium | 5.23 | 3.84 | % | 0.01 | TMECC.04.05 * |
| Manganese | 160.35 | 117.75 | ug/g | 1.00 | TMECC.04.05 * |
| Sodium | 0.12 | 0.09 | % | 0.01 | TMECC.04.05 * |
| Sulphur | 1534.50 | 1126.78 | ug/g | 5.00 | TMECC.04.05 * |
| Additional Parameters | | | | | |
| Bulk Density (as Recieved) | | 500 | kg/m ³ | 10 | Gravimetric |
| Conductivity (@ 25 deg C) | | 2.33 | ms/cm | 0.02 | Conductivity Meter |

* - accredited test

BDL - Below detectable levels

The results of this report relate to the sample submitted and analyzed.



C21078-70012

Results Authorized By:

Haifeng Song, Ph.D., C.Chem. Lab Director

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