Certificate of Analysis

Catalogue Number: 140-025-111
Description: Certified Reference Standard *Agro***MAT Compost**
Lot Number: **SC0063619**
Date of Initial Certification: **May 3rd, 2010**
Date of Last Verification: **N/A**

Consensus Values:

Parameters	Units	Consensus Value	Confidence Interval	Tolerance Interval
pH	-----	6.86	6.79 – 6.93	6.44 – 7.28
Organic Matter	%	46	42 – 51	22 – 70
NO_3-N	mg/kg	1054	970 – 1138	655 – 1453
N-Total	%	(0.84)	-----	-----
H_2O	%	3.5	3.3 – 3.8	2.3 – 4.8
C/N Ratio	-----	(33.3)	-----	-----
Al-Total	mg/kg	7347	6941 – 7754	4827 – 9867
As-Total	mg/kg	5.8	5.5 – 6.1	3.7 – 7.9
Ca–Total	mg/kg	45 092	43 663 – 46521	35 615 – 54 569
Cd-Total	mg/kg	1.16	1.10 – 1.23	0.73 – 1.60
Co-Total	mg/kg	5.15	4.89 – 5.40	3.53 – 6.76
Cr-Total	mg/kg	34.7	33.5 – 36.0	26.3 – 43.1
Cu–Total	mg/kg	245	235 – 255	176 – 313
Fe–Total	mg/kg	16 939	16 385 – 17 494	13 162 – 20 716
Hg-Total	mg/kg	0.62	0.59 – 0.65	0.41 – 0.83
K–Total	mg/kg	1278	1199 – 1356	759 – 1797
Mg–Total	mg/kg	4496	4304 – 4688	3223 – 5770
Mn–Total	mg/kg	629	606 – 653	468 – 791
Mo-Total	mg/kg	1.99	1.78 – 2.21	0.68 – 3.31
Na-Total	mg/kg	(408)	-----	-----
Ni-Total	mg/kg	29.5	28.2 – 30.8	20.7 – 38.2
P-Total	mg/kg	6471	6141 – 6800	4318 – 8623
Pb-Total	mg/kg	30.2	28.6 – 31.8	20.2 – 40.2
S-Total	mg/kg	2440	2299 – 2580	1565 – 3314
Se-Total	mg/kg	0.68	0.59 – 0.77	0.19 – 1.17
Zn-Total	mg/kg	224	216 – 232	168 – 280

Notes:
1. Values in bracket are not certified. They are listed for information only.

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Date of receipt: _____

Organization responsible for the certification:

SCP SCIENCE
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Baie d'Urfé, QC, Canada
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Person responsible for initial certification: Daniel Boisvert, Chemist

Please note that the Material Safety Data Sheet and this Certificate of Analysis are available on our web site.
(Ce certificat est également disponible en français)

Description:

The Reference Standard CP-1 is a natural compost material (not spiked or fortified) with a particle size of - 35 mesh. It is designed to be used for quality control verification, internal standards validation or methods development for the analysis of the listed parameters using the indicated methods.

Stability:

This certification is valid for two years from the shipping date or 48 months after the verification date, whichever comes first, provided the material is kept tightly capped and stored under normal laboratory conditions. **SCP SCIENCE** will monitor the stability of representative samples and if any changes occur that invalidate this certification, **SCP SCIENCE** will notify purchasers.

Instructions for use:

Before weighing, mix the material by shaking the container to avoid segregation in the bottle. In order to have a representative sample, the minimum use quantity must be 250 mg to conform with previous homogeneity testing.

Preparation method:

The initial sample has been dried and sieved through a 20 mesh sieve. The 'fines' portion has been further crushed and sieved with 100% of the material passing through a 35 mesh screen. The final material has then been packaged in 100 g containers and tested for homogeneity.

The homogeneity of the material has undergone third party verification by Particle Size Analysis and by Total Metals Digestion (leachable and extractable metals) using ICP-AES for analysis. The method used for the determination of the homogeneity of the material is based on ISO Guide 35.

Certification and Calculation Methods:

The Certification Method is based on a round-robin analysis involving 22 laboratories. Each laboratory was asked to supply analysis data for a specific list of parameters. Not all the laboratories supplied data for the different parameters. Certified Values are based on an average of 14 values per parameter (20 values being the highest and 9 values being the lowest). Values in brackets are not certified as less than 9 values were received.

They are provided for information only. The digestion method used for metals is similar to EPA 3050B (HCl / HNO3) and tested by ICP (ICP OES, ICP-MS). The humidity % has been determined by drying at 105°C. Organic matter has been determined by ignition at 360°C and 550°C. Colorimetry or SFA has been used for nitrates. Combustion or Colorimetry has been used for nitrogen %.

The outliers were removed using the Dixon Test after confirmation that there was neither a connection between outliers and the methods used for analysis nor between the outliers and the nature of the sample.

The Confidence Interval has been calculated using the 95% Confidence Level (equivalent to 2□) using the following formula:

$$x \pm \frac{ts}{\sqrt{n}}$$

where
- n: number of data
- s: Standard Deviation of the Average
- t: factor for Student Test
- x: Reference Value

The Confidence Interval should be used for routine quality control.

The Tolerance Interval has been calculated using again a 95% probability with a 95% inclusion of the population. The following formula was used:

$$x \pm ks$$

where
- k: factor for two-sided Tolerance Limits
- s: Standard Deviation of the Average
- x: Reference Value

The Tolerance Interval is an indication of the lowest possible value and the highest possible value based on the complete set of data, exclusive of outliers, used to calculate the Certified Value.

The following table is a guideline on how to interpret the results:

Results within Confidence Interval	Method working properly
Results consistently outside Confidence Interval but within Tolerance Interval	Method needs improvement
Results outside Tolerance Interval	Method not working properly

References:

ISO Guide 30 (1992): Terms and definitions used in connection with reference materials
ISO Guide 31 (1981): Contents of certificates of reference materials
ISO Guide 35 (1989): Certification of reference materials--General and statistical principles
Standard Reference Materials-Handbook for SRM Users - John K. Taylor
Quality Assurance of Chemical Measurements - John K. Taylor
Handbook on Reference Methods for Soil Analysis(1992) - Soil and Plant Analysis Council