SOURCE APPORTIONMENT OF AMBIENT AIR TSP SAMPLES FROM INTERCITY STATION WAKAS, BOCAUE, BULACAN, REGION 3

Final Report

Submitted to:

Department of Environment and Natural Resources Environmental Management Bureau – REGION 3

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University Of The Philippines College Of Science Institute Of Environmental Science And Meteorology December 28, 2020

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PREFACE

The DENR-EMB-Region 3, through its air quality monitoring network, has collected the TSP samples from February 2018 to December 2019 for source apportionment analysis. The TSP filter samples were submitted to the Environmental Pollution Studies Laboratory of the Institute of Environmental Science and Meteorology, University of the Philippines, Diliman. This report contains the report on the analysis performed on the filters, from receiving, cutting into portions, digestion, data analysis and diagnostics.

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EXECUTIVE SUMMARY

Air particulate matter filters collected between February 2018 to December 2019 collected from the Intercity Station, Wakas, Bocaue, Bulacan was submitted by the EMB-Region 3 to the Environmental Pollution Studies Laboratory of the Institute of Environmental Science and Meteorology, University of the Philippines- Diliman (EPSL-IESM-UPD) . The 51 air particulate matter filter samples (TSP) were digested for 11 heavy metals (Ca, Na, K, Mg, Al, Cr, Cu, Mn, Ni, Pb, Zn), and the results subjected to positive matrix factorization (PMF) modeling. Six factor sources were resolved using the in-house emission factors from the EPSL-IESM-UP Diliman, as follows: Factor 1 (Biomass burning, BB mixed with Road Dust, RD), Factor 2 (Vehicle emissions mixed with RD), Factor 3 (Vehicle emissions mixed with RD), Factor 5 (Biomass burning mixed with RD), and Factor 6 (Vehicle emissions (mixed with RD). These factor sources are applicable to the TSP sampled between February 2018 to December 2019 in Intercity Station, Wakas, Bocaue, Bulacan.

The six factor sources was further resolved into three sources, with the vehicle sources resolved into gasoline-fed and diesel fed vehicle sources. For the site (Intercity Station, Wakas, Bocaue, Bulacan) and duration (February 2018 to December 2019) of the submitted TSP samples, biomass burning sources comprises 33% of the emission source, while road dust contributes 26%. Vehicle sources, the largest at 46%, is made-up of 28% emissions from diesel-fed engines, while 13% are emissions from gasoline-fed engines. When classified according to DENR emission classification where the biomass burning and road dust comprises the 'area sources', while vehicle emissions 'mobile sources, the resolved factor sources has generated 41% from mobile sources (Diesel and gasoline-fed vehicles) and 59% from area sources (Biomass burning and Road dust).

These apportioned sources and their contributions are site specific and period specific. Hence, the results from this study is applicable to TSP sampled between 2018-2019 in Intercity Station, Wakas, Bocaue, Bulacan. Source apportionment studies are needed to determine the sources and contributions in other sites and period of interest.



Figure 1. Sources and contribution of TSP from Intercity station between 2018 and 2019 of air quality monitoring

INTRODUCTION

SOURCE APPORTIONMENT

To better understand the emissions and transport of particulate matter in an area, receptor models are efficient tools that can give better estimate of the pollutant sources, based on relative abundant fractions of tracer elements that facilitate profile identification (Cayetano MG, 2012). Receptor models can facilitate the identification of pollution sources and give a quantitative estimation of the emission rates of the pollutants. More so, receptor models gives a better understanding of the transport of the substances from the source to the downwind locations and can give insight on the physical and chemical transformation process that can occur during transport, wherein the overall key is the aerosol mass balance. In brief, receptor models are management tools for air quality studies that involve the quantitative estimation of the emission rates of the pollutants, identification of the pollution source, understanding of the transport of substances from sources to downwind locations and the knowledge of the physical and chemical transformation process that occur during that transport (Hopke 2009). In one of his presentations, Philip Hopke stressed out that "receptor models focus on the behavior of the ambient environment at the point of impact", compared to "source oriented models that focus on the transport, dilution, and transformations that begin at the source and follow the pollutants to the sampling or receptor site" (Hopke 2011). The key in receptor modelling is conservation of mass, as in Equation 1, *i.e.*, measured concentrations, **x** are the results of a summation of the mass contributions, **g** contributions and **f** sources,

$$x_{ij} = \sum_{k=1}^{p} g_{ik} f_{kj}$$
 Equation 1

which would account for $\mathbf{j} = 1...\mathbf{m}$ chemical species in the $\mathbf{i} = 1...\mathbf{n}$ samples as contributions from $\mathbf{k} = 1...\mathbf{p}$ independent sources. There are several receptor models to solve Equation 1 that depends on the variety of information available.

Factor analysis, FA, is a way of solving Equation 1, when source profiles and contributions are both unknown. Based on suggested global definition by Malinowski (Malinowski 1991), FA is a "multivariate technique for reducing matrices to their lowest dimensionality by the use of orthogonal factor space and transformations that yield predictions and/or recognizable factors". FA follows the gist of this definition except that orthogonal vectors are not necessarily obeyed (since orthogonality is not meaningful when the error estimates, i.e., standard deviations are greater than unity).

Positive Matrix Factorization, PMF (Paatero 1997; Paatero 1999) is a weighted least squares model, weighted based on known uncertainty (error) of the elements of the data matrix (Paatero 1997). It utilizes the residual matrix term \mathbf{e}_{ij} , which is a portion of the measurement that cannot be fit by the model. To illustrate PMF, it was previously defined that the left-hand term in Equation 1 is the measured concentrations and the right-hand side as the modelled variables. By defining the residual matrix, \mathbf{e}_{ij} as the difference between measurement (\mathbf{x}_{ij}) and model (as a function of \mathbf{g} and \mathbf{f}),

$$e_{ij} = x_{ij} - \sum_{k=1}^{p} g_{ik} f_{kj} \qquad \qquad \text{Equation 2.}$$

Now, introducing a weighting term (uncertainty, s_{ij}) to Equation 2 and minimizing it, an object function (Q) can be defined:

$$Q(e_{ij}) = \sum_{i=1}^{m} \sum_{j=1}^{n} (\frac{e_{ij}}{s_{ij}})^2$$
 Equation 3.

The approach is now to minimize $Q(e_{ij})$ with respect to \mathbf{g}_{ik} and \mathbf{f}_{kj} with the constraint that all of the elements of \mathbf{g}_{ik} and \mathbf{f}_{kj} is non-negative. The explicit minimization function with the inclusion of error estimates to allow down weighting of uncertain data makes physical sense in receptor modelling of environmental data (Ramadan *et al.* 2003).

METHOD

DIGESTION OF FILTER SAMPLES

Filters were received, labelled and preserved until analysis on November 26, 2020 (Appendix 1). A 2 cm x 10cm portion of the filter was cut and placed in digestion tubes, preserved, until ready for analysis. The 51 air particulate matter filter samples (TSP) were digested in order to extract metals that are within the TSP samples. The ETHOS UP microwave digester of the EPSL-IESM-UPD was used. This process lowers the risk of contamination and speed of digestion. ETHOS UP has a database which lists different matrices to be analyzed and the corresponding reagents that must be used before proceeding to the actual process of microwave-assisted digestion. In the methodology developed (Cayetano, 2020), dilute nitric acid was used instead of concentrated nitric acid which was a modification in the instrument protocol. Although dilute nitric acid was used in the method, no traces of solids were separated since the final solution after digestion was a clear solution. The solution was then submitted to CRL labs for quantification of the trace elements using either inductively-coupled plasma – optical emission spectrometry (ICP-OES) which detected presence of trace elements due to its very low detection limit, or Flame Atomic Absorption Spectrophotometry (FAAS). The trace elements considered were Ca, Na, K, Mg, Al, Cr, Cu, Mn, Ni, Pb, Zn. The results of the analysis are presented Appendix 2.

PMF ANALYSIS

The PMF modelling was conducted using US EPA PMF v5.0 GUI, utilising the TSP data set generated from the results of the elemental analysis. In PMF analysis, the selection of chemical species is imperative, while accepting and rejecting variables (species and samples) are crucial. When optimizing the number of factors, it is necessary to look closely at the PMF run that apportions the TSP on all factors. A run is disqualified when it resulted to at least one factor having PM_{2.5} equals zero. Results of PMF analysis is presented in Appendix 3.

SUMMARY OF RESULTS

PHASE 1: PMF ANNALYSIS RESULTS

The PMF input data comprised of 12 species (including TSP mass), with species input set to a modeling uncertainty of 10-20%, and resulting to a signal to noise ratio of 4-9. The PMF run output passed the diagnostic statistics, at six factor profiles, which resolved the average TSP in the filter portion from 0.53 ug/m3 to 6.49 ug/m3. The residuals did not exceed +/- 5, except for a few, but are still within acceptable results. Scaled residuals plots are presented in Appendix 3. Report on the input data, and the satisfactory output data, including descriptive statistics, correlation coefficients, standard error, FPEAK runs selected and base model runs are presented in Appendix 4 (Results of Analysis, EPSL).

PHASE 2: PROFILES AND CONTRIBUTIONS

The six factor profiles were then subjected to Phase 2 analysis (Diagnostics of Profiles and contributions), using the emission factors from a look-up table of emissions generated in-house (Cayetano 2020c EPSL-IESM-UPD), and are guaranteed emissions sourced from the Philippines. The ratio of the indicator elements were compared to the emission factors of the EPSL-IESM-UPD, with indications of 25%, 50% and 100% chances that the ratio of the TSP samples matches that of the EF. The resolved TSP factors were then assigned and presented in Table 1:

Table 1. USEPA PMF Version 5 resolved six-factor sources for EMB-Region 3 TSP sampled between February 2018 to December 2019 in Intercity Station, Wakas, Bocaue, Bulacan

Description	Highest percentage	Mixed with	Strong indicator for
Factor 1	Biomass Burning	RD	
Factor 2	Vehicle Emissions	RD	Gasoline (4W) vehicles
Factor 3	Vehicle Emissions	BB, RD	Diesel Vehicles
Factor 4	Vehicle Emissions	RD	Gasoline & Diesel vehicles
Factor 5	Biomass Burning	RD	
Factor 6	Vehicle Emissions	RD	Gasoline & Diesel vehicles

It is apparent that the road dust are mixed across all resolved factors. This is expected for TSP because these samples carry all the particle sizes that are available in the ambient air, including coarse mode (PM2.5-10), and most of the large-sized particles.

If classified according to DENR emission classification, Biomass burning and Road dust comprises the 'area sources', while vehicle emissions belong to 'mobile sources. Hence, this resolved factor has generated 41% from mobile sources (Diesel and gasoline-fed vehicles) and 59% from Area Sources (Biomass burning and Road dust) (Figure 1).



Figure 1. Sources and contribution of TSP from Intercity station between 2018 and 2019 of air quality monitoring

Phase 2 analysis also employs grouping the resolved factors into common factors, and were further resolved to a total of three (3) major source factors for TSP, In Table 2: Percentages are also provided, with Vehicle emission sources (at 41%) comprising the largest among all resolved factors.

Table 2. Grouped Factor sources for EMB-Region 3 TSP sampled between February 2018 to December 2019 in Intercity Station, Wakas, Bocaue, Bulacan

	Percentage in TSP
Biomass burning	33%
Road dust	26%
Vehicle emissions	41%



Figure 2. Grouped factor sources for EMB-Region 3 TSP sampled between February 2018 to December 2019 in Intercity Station, Wakas, Bocaue, Bulacan

Figure 3. Grouped factor sources for EMB-Region 3 TSP sampled between February 2018 to December 2019 in Intercity Station, Wakas, Bocaue, Bulacan

The vehicle emissions, which comprises 41% of the TSP contributions, are further resolved into 28% diesel-fed vehicles and 13% Gasoline-fed vehicles. It is important to note that these apportioned sources and their contributions are site specific and period specific. The results of this source apportionment study is applicable only for TSP sampled between 2018-2019 in Intercity Station, Wakas, Bocaue, Bulacan.

If sources and contribution for the rest of the air quality monitoring stations are needed, source apportionment studies need to be conducted separately. This is because sources may vary with sites and period of interest. Nevertheless, these results may provide guidance on further control measures that may be implemented in order to better manage the air quality of Region 3.

ACKNOWLEDGEMENT

The TSP samples were provided by the DENR-EMB-Region 3 – sincere gratitude to the Air Quality Management Section. The use of ETHOS-UP Microwave digester was made possible by the support from the Department of Science and Technology Philippine Council for Industry, Energy and Emerging Technology Research and Development (DOST-PCIEERD) – Synergistic Capacity Advancement in the Management of Laguna Lake (Program SCALE) through Project TRAce Fish (Trace organics and metals in Commodity Fish: Method optimization, extent of contamination and health risk due to fish intake). The microbalance, and lab instruments used are from the support by the GIST Research Institute (GRI) grant funded by the Gwangju Institute of Science and Technology (GIST) in 2018, 2019 and 2020. Sincere appreciation to Raian Lapresca, Mark Edward Jolejole for the assistance in the digestion of samples, and to Dr. Carmela Capule of the CRL Lab for the assistance in the analysis of heavy metals.

- Cayetano, Mylene G. (2012), PhD Dissertation. Gwangju Institute of Science and Tchnology, South Korea.
- Hopke, P. K. (2009). Chapter 1 Theory and Application of Atmospheric Source Apportionment. Developments in Environmental Science. **9:** 1-33.
- Hopke, P. K. (2011). "Source Approtionment: Current Practice and Applications." School Seminar presentation at Gwangju Institute of Science and Technology.
- Hopke, P. K., P. Paatero, H. Jia, R. T. Ross and R. A. Harshman (1998). "Three-way (PARAFAC) factor analysis: examination and comparison of alternative computational methods as applied to illconditioned data." Chemometrics and intelligent laboratory systems 43(1-2): 25-42.
- Malinowski, E. R. (1991). Factor Analysis in Chemistry. New York, John Wiley & Sons, Inc.
- Paatero, P. (1997). "Least squares formulation of robust non-negative factor analysis." Chemometrics and intelligent laboratory systems **37**(1): 23-35.
- Paatero, P. (1999). "The multilinear engine a table-driven, least squares program for solving multilinear problems, including the n-way parallel factor analysis model." Journal of Computational and Graphical Statistics **8**(4): 854-888.
- Paatero, P. and P. K. Hopke (2003). "Discarding or downweighting high-noise variables in factor analytic models." Analytica Chimica Acta **490**(1-2): 277-289.
- Paatero, P., P. K. Hopke, X.-H. Song and Z. Ramadan (2002). "Understanding and controlling rotations in factor analytic models." Chemometrics and intelligent laboratory systems 60(1–2): 253-264.
- Ramadan, Z., B. Eickhout, X.-H. Song, L. M. C. Buydens and P. K. Hopke (2003). "Comparison of Positive Matrix Factorization and Multilinear Engine for the source apportionment of particulate pollutants." Chemometrics and intelligent laboratory systems 66(1): 15-28.
- Cayetano, MG, (2020) Determination of metal content of PM2.5 sampled from QCG site during the TAME-BC campaign, Environmental Pollution Studies Laboratory Lab notebook No. 2, pp 18-19.
- Cayetano, MG, (2020) Source Apportionment EMB R3. Environmental Pollution Studies Laboratory Lab notebook No. 2, pp 21-23
- Cayetano, MG, (2020) Look-up Table of Emission Factors Philippines. Environmental Pollution Studies Laboratory Lab notebook No. 2, Appendix 1, pp 1-2

APPENDICES

APPENDIX 1: TSP SAMPLING DATA

Start Date (Month- Day-Year)	Start Time (hh:mm AM/PM)	Tem perat ure	End Date (Month- Day-Year)	EndTime (hh:mm AM/PM)	Tem perat ure	PM Mas s (g)	elapsed time, minutes	Volume of air sampled	PM concentrat ion (ug/m3)	Initial Weight (mg)	Final Weigh t(mg)	DEN R Cod e	EP SL ID
						0.00				4 5245	4 525	9534 389	1
1-21-19	9:55 AM	30.1	1-22-19	9:55 AM	30.1	0.76	1440	1712.60 291	445.22872	4.7377	5.5002	9534 359	42
01/07/2019	10:45 AM	32.3	01/08/201 9	10:45 AM	32.3	0.49 02	1440	1712.60 291	286.23097 5	4.7212	5.2114	9534 347	43
03/11/2019	10:40 AM	33.1	03/12/201 9	10:40 AM	33.1	0.53 88	1440	1712.60 291	314.60883 2	4.4226	4.9614	9267 371	44
3-18-19	10:56 AM	33.2	3-19-19	10:56 AM	33.2	0.69 44	1440	1712.60 291	405.46468 6	4.3817	5.0761	9267 361	45
8-27-19	1:30 PM	28.2	8-28-19	1:30 PM	28.2	0.32 7	1440	1712.60 291	190.93743 1	4.4744	4.8014	9267 326	46
2-18-19	11:15 AM	34.1	2-19-19	11:15 AM	34.1	0.79	1440	1712.60 291	464.96476	4.6542	5.4505	9490 810	47
3-25-19	10:45 AM	31	3-26-19	10:45 AM	31	63	1440	291	570.06793	4.4442	5.4205	9267 370	48
08/05/2019	10:55 AM	31.4	08/06/201 9	10:55 AM	31.4	0.57 28	1440	1712.60 291	334.46165 4	4.6426	5.2154	9534 302	49
7-22-19	11:45 AM	32.4	7-23-19	11:45 AM	32.4	0.22 49	1440	1712.60 291	131.32057 6	4.6804	4.9053	9534 304	50
1-28-19	10:30 AM	24.5	1-29-19	10:30 AM	24.5	0.12 47	1440	1712.60 291	72.813142 8	4.7233	4.848	9534 325	51
1-14-19	11:16 AM	31.4	1-15-19	11:16 AM	31.4	0.76 04	1440	1712.60 291	444.00251 6	4.7062	5.4666	9534 346	32
02/11/2019	10:47 AM	31.4	02/12/201 9	10:47 AM	31.4	0.76 17	1440	1712.60 291	444.76159 5	4.7449	5.5066	9534 348	33
7-29-19	11:00 AM	27.4	7-30-19	11:00 AM	27.4	0.26 42	1440	1712.60 291	154.26810 2	4.7115	4.9757	9534 310	34
07/08/2019	12:05 PM	31.3	07/09/201 9	12:05 PM	31.3	0.31 85	1440	1712.60 291	185.97422 6	4.6228	4.9413	8995 524	35
08/12/2019	11:45 AM	29.7	8-13-19	11:45 AM	29.7	0.03 3	1440	1712.60 291	19.268915 1	4.4462	4.4792	9267 344	36
9-16-19	11:00 AM	30.1	9-17-19	11:00 AM	30.1	0.29 22	1440	1712.60 291	170.61748 5	4.3297	4.6219	9715 876	37
5-14-19	10:38 AM	33.4	5-15-19	10:38 AM	33.4	0.70 95	1440	1712.60 291	414.28167 5	4.433	5.1425	9267 369	38
5-20-19	11:35 AM	32.7	5-21-19	11:35 AM	32.7	0.78 73	1440	1712.60 291	459.70960 2	4.4062	5.1935	9267 321	39
5-27-19	10:50 AM	33.3	5-28-19	10:50 AM	33.3	0.28 71	1440	1712.60 291	167.63956 1	4.4296	4.7167	9267 322	40
6-24-19	10:55 AM	32.3	6-25-19	10:55 AM	32.3	0.21 32	1440	1712.60 291	124.48887	4.3657	4.5789	9267 309	41
6-17-19	11:20 AM	33.2	6-18-19	11:20 AM	33.2	0.58 11	1440	1712.60 291	339.30807 8	4.3758	4.9569	9267 308	22
04/08/2019	11:20 AM	34	04/09/201 9	11:20 AM	34	0.66 41	1440	1712.60 291	387.77231 9	4.3895	5.0536	9267 360	23
4-15-19	11:05 AM	27.5	4-16-19	11:05 AM	27.5	0.76 44	1440	1712.60 291	446.33814 2	4.4421	5.2065	9267 368	24
09/02/2019	11:25 AM	30.2	09/03/201 9	11:25 AM	30.2	0.53 93	1440	1712.60 291	314.90078 5	4.5405	5.0798	9534 390	25
4-22-19	3:25 PM	38.1	4-23-18	3:25 PM	38.1	1.00 57	1440	1712.60 291	587.23478 5	4.4392	5.4449	9267 350	26
4-29-19	11:50 AM	37.4	4-30-19	11:50 AM	37.4	0.88 24	1440	1712.60 291	515.23911 2	4.4234	5.3058	9267 352	27
05/06/2019	11:03 AM	31	05/07/201 9	11:03 AM	31	0.35 33	1440	1712.60 291	206.29417 3	4.6696	5.0229	9490 805	28
01/07/2019	10:00 AM	32.5	01/08/201 9	10:00 AM	32.5	0.97 19	1440	1712.60 291	567.49874 5	4.5967	5.5686	9534 360	29
11/05/2019	10:48 AM	32.5	11/06/201 9	10:48 AM	32.5	0.69 8	1440	1712.60 291	407.56675	4.7312	5.4292	9490 842	30
11/12/2019	11:32 AM	31.4	11-13-19	11:32 AM	31.4	0.92 25	1440	1712.60 291	538.65376 3	4.7276	5.6501	9534 340	31
06/03/2019	10:35 AM	33.4	06/04/201 9	10:35 AM	33.4	1.34 2	1440	1712.60 291	783.60254 7	4.4383	5.7803	9267 323	2
07/10/2018	11:30 AM	28.2	07/11/201 8	11:30 AM	28.2	0.03 04	1440	1712.60 291	17.750758 2	4.6822	4.7126	9379 221	3
07/02/2018	11:13 AM	32.4	07/03/201 8	11:13 AM	32.4	0.39 55	1440	1712.60 291	230.93502 8	4.6824	5.0779	9379 220	4
7-30-18	11:40 AM	31.2	7-31-18	11:40 AM	31.2	0.15 61	1440	1712.60 291	91.147807 5	4.6671	4.8232	9379 206	5
7-16-18	10:46 AM	31.4	7-17-18	10:46 AM	31.4	0.19 83	1440	1712.60 291	115.78866 3	4.6799	4.8782	9379 207	6

									PM			DEN	
Start Date	Start Time	Tem	End Date	EndTime	Tem	PM	elapsed	Volume	concentrat	Initial	Final	R	EP
(Month-	(hh:mm	perat	(Month-	(hh:mm	perat	Mas	time,	of air	ion	Weight	Weigh	Cod	SL
Day-Year)	AM/PM)	ure	Day-Year)	AM/PM)	ure	s (g)	minutes	sampled	(ug/m3)	(mg)	t(mg)	е	ID
						0.93		1712.60	545.48546			9379	
6-18-18	10:20 AM	32.1	6-19-18	10:20 AM	32.1	42	1440	291	9	4.3765	5.3107	226	7
						0.62		1712.60	366.16777			9496	
8-13-18	10:45 AM	31.4	8-14-18	10:45 M	31.4	71	1440	291	8	4.6671	5.2942	900	8
						0.02		1712.60	14.656053			9490	
8-28-18	10:50 AM	26.2	8-29-18	10:50 AM	26.2	51	1440	291	6	4.6583	4.6834	891	9
			09/11/201			0.32		1712.60	187.84272			9490	
09/10/2018	8:25 AM	31.3	8	8:25 AM	31.3	17	1440	291	7	4.6465	4.9682	882	10
						0.05		1712.60	31.063826			9379	
6-28-18	10:48 AM	31.2	6-29-18	10:48 AM	31.2	32	1440	291	8	4.6976	4.7508	225	11
						0.47		1712.60	277.58915			9490	
8-22-18	11:20 AM	32.1	8-23-18	11:20 AM	32.1	54	1440	291	9	4.661	5.1364	892	12
			10/12/201			0.83		1712.60	488.72975			9490	
10/11/2018	9:50 AM	32	8	9:50 AM	32	7	1440	291	6	4.7353	5.5723	858	13
			10/02/201			0.42		1712.60	247.10923			9490	
10/01/2018	11:20 AM	32.1	8	11:20 AM	32.1	32	1440	291	9	4.7531	5.1763	857	14
						0.82		1712.60	484.17528			9490	
10-15-18	10:45 AM	31.4	10-16-18	10:45 AM	31.4	92	1440	291	5	4.7378	5.567	866	15
			09/06/201			0.18		1712.60	106.50454			9490	
09/05/2018	11:20 AM	32.4	8	11:20 AM	32.4	24	1440	291	9	4.6663	4.8487	881	16
						0.92		1712.60	538.65376			9490	
9-24-18	10:40 AM	31.4	9-25-18	10:40 AM	31.4	25	1440	291	3	4.6969	5.6194	878	17
						0.56		1712.60	331.13338			9490	
10-22-18	10:15 AM	32.3	10-23-18	10:15 AM	32.3	71	1440	291	6	4.6687	5.2358	867	18
						0.68		1712.60	398.51619			9534	
11-26-18	11:20 AM	32.3	11-27-18	11:20 AM	32.3	25	1440	291	9	4.7176	5.4001	342	19
			12/04/201			0.87		1712.60	509.63360			9534	
12/03/2018	10:40 AM	31.4	8	10:40 AM	31.4	28	1440	291	9	4./138	5.5866	324	20
	10 50 111	00.5		10 50 411	20.5	0.75		1/12.60	443.53539	4 7 40 7	F 500 -	9534	
11-19-18	10:50 AM	32.3	11-20-18	10:50 AM	32.3	96	1440	291	1	4./405	5.5001	341	21

APPENDIX 2: RESULTS OF ANALYSIS - ELEMENTAL COMPOSITION OF TSP



17 December 2020

Environmental Pollution Studies Laboratory Institute of Environmental Science and Meteorology, P. Velasquez St. University of the Philippines, Diliman, Quezon City

ATTN:

Dr. Mylene G. Cayetano

Project Name: Lab. Nos.: Not Supplied P00107991-01/51

Enclosed are the results for samples received by CRL Environmental Corporation and tested for the parameters in the enclosed chain of custody.

Our DENR Recognition with C. R. No. 023/2018, will expire on September 24, 2021.

Likewise, our DOH Accreditation with Accreditation No. 03-001-20-1.W-2, is valid from January 01, 2020 until December 31, 2022.

Please note that any unused portion of the sample/s will be discarded 15 days after the date of this report, unless you have requested otherwise.

Thank you for the opportunity to service the needs of your company. Please feel free to call us at (045) 599-3943 or (02) 552-5100 if we can be of further service to you.

Very truly yours,

RIACARM Chief Operating Officer

 Address: Bldg. 2 Berthaphil Compound 1, Berthaphil Inc. Industrial Park, Jose Abad Santos Ave., Clark Freeport Zone (CFZ), Pampanga, 2023 Philippines Tel: (6345) 599-3943 * (6345) 499-6529 * (632) 8552-5100 * Fax: (6345) 599-3963 Email: crl@crllabs.com * http://www.crllabs.com **Results of Analyses**

Environmental Pollution Studies Laboratory

Institute of Environmental Science and Meteorology, P. Velasquez St. University of the Philippines, Diliman, Quezon City



Lab No.:P00107991

Project Name: Not Supplied Attention: Dr. Mylene G. Cayetano

mgil, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL,	DateSampled: Not 1 Matrix: Digestate 0.06 ^A 1.5 ^{AA} 0.01 ^A 0.02 ^A 0.00 ^A 0.1 ^A 2.5 ^{AA} 0.00 ^A 0.5 ^A 0.00 ^A sult set for Sample N DateSampled: Not 3 Matrix: Digestate 0.02 ^A	Supplied ICP - CES Flame AAS ICP - OES ICP - OES ICP - OES ICP - OES Flame AAS Flame AAS Flame AAS ICP - CES ICP - OES ICP - OES ICP - OES ICP - OES	12/14/20 12/16/20 12/14/20 12/14/20 12/14/20 12/14/20 12/12/20 12/12/20 12/14/20 12/14/20	PPG MLSA PPG PPG PPG MLSA MLSA MLSA MLSA PPG PPG
mgil, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL,	Matrix: Digestate 0.06 ^A 1.5 ^{AA} 0.01 ^A 0.02 ^A 0.00 ^A 0.00 ^A 0.1 ^A 2.5 ^{AA} 5.0 ^A 75 ^A 0.5 ^A 0.5 ^A 0.005 ^A sult set for Sample N DateSampled: Not S Matrix: Digestate 0.02 ^A	ICP - CES Flame AAS ICP - CES ICP - CES ICP - CES ICP - CES Flame AAS Flame AAS Flame AAS ICP - CES ICP - CES ICP - CES ICP - CES	12/14/20 12/16/20 12/14/20 12/14/20 12/14/20 12/12/20 12/12/20 12/12/20 12/14/20 12/14/20	PPG MLSA PPG PPG PPG MLSA MLSA PPG PPG PPG
mgil mgiL mgiL mgiL mgiL mgiL mgiL mgiL mgiL	0.08* 1.5** 0.01* 0.03* 0.1* 2.5** 5.0* 75* 0.5* 0.05* suit set for Sample N DateSampled: Not S Matrix: Digestate 0.02*	ICP - 0ES Flame AAS ICP - 0ES ICP - 0ES ICP - 0ES Flame AAS Flame AAS Flame AAS ICP - 0ES ICP - 0ES ICP - 0ES	12/14/20 12/14/20 12/14/20 12/14/20 12/14/20 12/12/20 12/12/20 12/14/20 12/14/20	PPG MLSA PPG PPG PPG MLSA MLSA PPG PPG PPG
mgil, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL, mgiL,	0.08* 1.5** 0.03* 0.003* 0.1* 2.5** 5.0* 75* 0.5* 0.005* sult set for Sample N DateSampled: Not 3 Matrix: Digestate 0.02*	ICP - CES Flame AAS ICP - CES ICP - CES ICP - CES ICP - CES Flame AAS Flame AAS Flame AAS Flame AAS ICP - CES ICP - CES ICP - CES	12/14/20 12/15/20 12/14/20 12/14/20 12/14/20 12/15/20 12/15/20 12/15/20 12/15/20 12/14/20 12/14/20	PPG MLSA PPG PPG PPG MLSA MLSA PPG PPG
mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	1.5% 0.01* 0.02* 0.00* 0.1* 2.5** 5.0* 75* 0.5% 0.5% 0.005* suit set for Sample N DateSampled: Not S Matrix: Digestate 0.02*	Flame AAS ICP - OES ICP - OES ICP - OES ICP - OES ICP - OES Flame AAS Flame AAS Flame AAS ICP - OES ICP - OES ICP - OES ICP - OES ICP - OES	12/14/20 12/14/20 12/14/20 12/14/20 12/14/20 12/14/20 12/14/20 12/12/20 12/14/20 12/14/20	NISA NISA PPG PPG MISA MISA MISA PPG PPG
mgL mgL mgL mgL mgL mgL mgL mgL mgL mgL	0.01* 0.02* 0.1* 2.5** 5.0* 75* 0.5* 0.05* suit set for Sample N DateSampled: Not S Matrix: Digestate 0.02*	ICP - OES ICP - OES ICP - OES ICP - OES Flame AAS Flame AAS Flame AAS Flame AAS ICP - OES ICP - OES ICP - OES ICP - OES	12/14/20 12/14/20 12/14/20 12/14/20 12/12/20 12/12/20 12/12/20 12/14/20 12/14/20	MISA PPG PPG PPG MISA MISA MISA PPG PPG
mgL mgL mgL mgL mgL mgL mgL mgL mgL mgL	0.00* 0.00* 0.1* 2.5** 5.0* 75* 0.5* 0.00* suit set for Sample N DateSampled: Not 3 Matrix: Digestate 0.02*	ICP - OES ICP - OES ICP - OES ICP - OES Flame A43 Flame A43 Flame A43 Flame A43 ICP - OES ICP - OES ICP - OES	12/14/20 12/14/20 12/14/20 12/12/20 12/12/20 12/12/20 12/14/20 12/14/20	PPG PPG PPG MLSA MLSA MLSA PPG PPG
mgi, mgi, mgi, mgi, mgi, mgi, >>> end of re mgi, mgi, mgi, mgi,	0 cc2* 0 cc2* 0 1^ 2 5** 5 0* 75* 0 5* 0 co5* suit set for Sample N DateSampled: Not S Matrix: Digestate 0.02*	ICP - CES ICP - CES ICP - CES Flame A43 Flame A43 Flame A43 ICP - CES ICP - CES ICP - CES 0.7P00107991-01 <<<	12/14/20 12/14/20 12/14/20 12/12/20 12/12/20 12/12/20 12/14/20 12/14/20	PPG PPG MLSA MLSA MLSA PPG PPG
mgil mgil mgil mgil mgil mgil >>> end of re mgil mgil mgil	0.003* 0.1* 2.5** 5.0* 7.5* 0.5* 0.005* suit set for Sample N DateSampled: Not S Matrix: Digestate 0.02*	ICP - 0ES ICP - 0ES Flame AAS Flame AAS Flame AAS ICP - 0ES ICP - 0ES ICP - 0ES 0: JP00107991-01 <<<	12/14/20 12/14/20 12/12/20 12/12/20 12/12/20 12/14/20 12/14/20	PPG PPG MLSA MLSA MLSA PPG PPG
mgit, mgit, mgit, mgit, mgit, mgit, mgit, mgit,	0.1* 2.5** 5.0* 75* 0.5* 0.005* suit set for Sample Not S DateSampled: Not S Matrix: Digestate 0.02*	ICP - 0E5 Flame A45 Flame A45 Flame A45 ICP - 0E5 ICP - 0E5 0::P00107991-01 <<< kupplied	12/14/20 12/12/20 12/10/20 12/14/20 12/14/20 12/14/20	PPG MLSA MLSA MLSA PPG PPG
mgit, mgit, mgit, mgit, >>> end of re mgit, mgit, mgit, mgit,	2 5 ⁿ⁴ 50 ⁿ 75 ⁿ 0.5 ⁿ 0.005 ⁿ suit set for Sample N DateSampled: Not S Matrix: Digestate 0.02 ⁿ	Flamo AAS Filame AAS Filame AAS ICP - OES ICP - OES 0: 3P00107991-01 <<< kupplied	12/12/00 12/10/20 12/12/20 12/14/20 12/14/20	MLSA MLSA PPG PPG
mgit, mgit, mgit, mgit, mgit, mgit, mgit, mgit,	5.0° 75° 0.5° 0.005° suit set for Sample N DateSampled: Not S Matrix: Digestate 0.02°	Flame AAS Filame AAS ICP - OES ICP - OES 0: JP00107991-01 <<< kupplied	12/10/20 12/12/20 12/14/20 12/14/20	MLSA MLSA PPG PPG
mg/L mg/L >>> end of re mg/L mg/L mg/L mg/L	75 ⁴ 0.5 ⁵ 0.005 ⁵ suit set for Sample N DateSampled: Not S Matrix: Digestate 0.02 ⁴	Fiame A43 ICP - OES ICP - OES 0.:P00107991-01 <<< isupplied	12/12/20 12/14/20 12/14/20	MLSA PPG PPG
mgit, mgit, >>> end of re mgit, mgit, mgit, mgit,	0.5" 0.005" sult set for Sample N DateSampled: Not S Matrix: Digestate 0.02"	ICP - CES ICP - CES 0P00107991-01 <<< supplied	12/14/20 12/14/20	PPG PPG
mg/L >>> end of re mg/L mg/L mg/L mg/L	0.005* suit set for Sample N DateSampled: Not S Matrix: Digestate 0.02*	ICP - OES 0.3P00107991-01 <<< Rupplied	12/14/20	PPG
>>> end of re mg/L mg/L mg/L mg/L	suit set for Sample N DateSampled: Not S Matrix: Digestate 0.02*	0.3P00107991-01 <<< Supplied		
mgil. mgil. mgil. mgil.	DateSampled: Not § Matrix: Digestate 0.02*	Supplied		
mgil. mgil. mgil.	Matrix: Digestate			
mg/L mg/L mg/L mg/L	0.02*			
mg/L mg/L mg/L mg/L	0.02*			
mg/L mg/L mg/L mg/L	0.02*			
mgit. mgit. mgit.		ICP - OES	12/14/20	PPG
mg1. mg1	1.5**	Flame AAS	12/10/20	MLSA
mga.	0.005*	ICP - DES	12/14/20	89.0
	0.02*	ICP - DES	12/14/20	895
mgit.	0.003*	ICP - OFS	12/14/20	000
mgit.	0.03*	ICP - OES	13/14/00	PPG -
mpiL	3 3**	Flame AAS	12/14/20	PPG
mg/L	5.0*	Flame AAS	12/12/20	MLSA
mg/L	75^	Flame AAS	12/10/20	MLSA
mg/L	1.0*	ICP . OF S	12/12/20	MLSA
mg/L	0.005*	ICP - CES	12/14/20	PPG
>>> end of res	sult set for Samula M	800107001 02 444	12714120	PHQ
	non set for Gampie re	2.3-00107001-02 eee		
	JateSampled: Not Se	upplied		
	Aatrix: Digestate			
mat	0.004			
mail	6 02-	ICP - OES	12/14/20	PPG
mod	1.5	Flame AAS	12/10/20	MLSA
mod	0.009-	ICP - OES	12/14/20	PPG
mail	0.02**	RUP - QES	12/14/20	PPG
mgr.	0.000+	ICP - CES	12/14/20	PPC
- apr	0.00*	ICP - OES	12/14/20	PPG
mar	2.5**	Fiame AAS	12/12/20	MLSA
mgi	5.0*	Flame AAS	12/10/20	MLSA
mpiL	75*	Flame AAS	12/12/20	MLSA
mgiL	0.5*	ICP - OES	12/14/20	880
mgit	0.005*	ICP - CIES	12/14/20	PPG
>>> end of resi	ult set for Sample No.	P00107991-03 <<<		
D	ateSampled: Not Su	polied		
	atrix: Digestate			
	and algebra			
mgr.	0.08*	ICP - CES	12/14/20	PPG
mgi	1.5**	Flame AAS	12/10/20	MLSA .
mantal	Address BL	a 2 Berthanhil Compound 1 Days		State State
mental	Clark Freenow	Zone (CEZ) Pamarana 2022 nr 1	ul Inc. Industrial Park, Jo	se Abad Sar
LOH:	Tel: (6345) 59	19-3943 * (6345) 499-6529 * (632) 8	552-5100 * Env: (6144)	\$90,3063
	mgi mgi mgi mgi mgi mgi >>> end of res D M mgi mgi mgi	mpL 0.000* mpI 0.000* mpI 0.005* mpL 0.05* mpL 0.05* mpL 0.05* >>> end of result set for Sample No DateSampled: Not Su Matrix: Digestate mpL 0.08* mpL 1.5** emental Clark Freepor Tel: (6345) 55 Emeil: enforces	mpL 0.000* ICP - 0ES mpL 0.00* ICP - 0ES mpL 0.00* ICP - 0ES mpL 5.0* Flame AAS mpL 5.0* Flame AAS mpL 0.5* ICP - 0ES mpL 0.5* ICP - 0ES mpL 0.00* ICP - 0ES mpL 0.00* ICP - 0ES mpL 0.08* ICP - 0ES mpL 0.08* ICP - 0ES mpL 1.5** Flame AAS	mpl 0.000* ICP - 0ES 12/1420 mpl 0.03* ICP - 0ES 12/1420 mpl 2.5* Plane AAS 12/1200 mpl 5.0* Plane AAS 12/1200 mpl 75* Flane AAS 12/1200 mpl 0.05* ICP - 0ES 12/1400 mpl 0.05* ICP - 0ES 12/1400 mpl 0.05* ICP - 0ES 12/1400 >>> end of result set for Sample No. P00107991-03 <<<

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Test Description	Results	Units	MDL	Test Methods	Date Analyzed	By	84
-Metals-	-	-				-	-
Lead**	0.00	mail	0.0055	100.055	10/14/00	000	
Manganese**	0.4	mol	0.024	102-055	12/14/20	PPG	
Nickel**	0.02	mail	0.003*	109-058	12/14/20	PPG	
Zinc**	0.8	mail	0.03*	ICP - OILS	12/14/20	PPG	
Maonesium	67	mail	2.5**	Flame AAR	12/14/20	PPG .	
Potassium	24	mat	5.0*	Flame 445	12/12/02	MLSA.	
Sodium	466	mot.	75*	Flame AAS	12/12/20	MLSA MLSA	
Aluminum**	15	mail	0.5*	ICP. OFS	12/12/20	MLDA.	
Chromium**	0.02	mgit.	0.005*	ICP - OES	12/14/20	PPG	
		>>> end of resi	uit set for Sample N	0:P00107991-04 <<<			_
Sample No.: P00107991-05 Sample ID: EPSL - 2020 - 00005		D	ateSampled: Not 5	lupplied			
-Metals-			athix: Digestate				
Casarall							
Copper	1.1	mgr	0.06*	ICP - OES	12/14/20	PPG	
(aloum	82	mgit	1.5**	Flame AAS	12/10/20	MLSA	
Load	0.1	mg/L	0.005^	ICP - CES	12/14/20	PPG	
vianganese	0.2	mg/L	0.02*	ICP - OES	12/14/20	PPG	
The state of the s	0.01	mg/L	0.003*	ICP - OES	12/14/20	PPG	
Zing "	0.5	mg/L	0.03*	ICP - OES	12/14/20	PPG	
Determinen	56	mgiL	2.5**	Flame AAS	12/12/20	MLSA	
Codium	22	mg/L	5.0*	Flame AAS	12/10/20	MLSA	
Aluminum"	426	mgs	75*	Flame AAS	12/12/20	MLSA	
Chromium"	11	mgit	0.5*	ICP - OES	12/14/20	PPG	
	9.91	mgr.	0.005*	ICP - DES	12/14/20	PPG	
Sample No - P00107991.06		>>> end of resu	It set for Sample N	> P00107991-05 <<<			
Sample ID: EPSL - 2020 - 00006		M	iteSampled: Not S Itrix: Digestate	upplied			
-wetais-							
Copper"	0.4	mg/L	0.03*	ICP - OES	1301400		
Calcium	85	mg/L	1.5**	Flame AAS	12114020	PPG	
.ead**	0.1	mgit,	0.005*	ICP - DES	10/10/20	MLSA	
/anganese**	0.2	mpt.	0.02*	ICP - OES	12/14/20	PPG	
vicket"	0.01	mg/L	0.003*	ICP - DES	12/14/20	PPG	
cinc."	1.0	mg/L	0.05*	ICP - OES	12/14/20	000	
algridsum.	57	mg/l.	2.5**	Flame AAS	12/12/20	NI GA	
orange of the second se	21	mg/L	5.0*	Flame AAS	12/10/20	MIRA	
Augenies and **	405	mg/L	75*	Flame AAS	12/12/20	MIGA	
home "	13	mgit	0.5*	ICP - OES	12/14/20	880	
- WILLING	0.02	mgit	0.005*	ICP - DES	12/14/20	PPG	
ample No - D00107001 or		>>> end of result	set for Sample No	P00107991-06 <<<	and the second sec		
ample ID: EPSL - 2020 - 00007		Dat	eSampled: Not Su	pplied			
Motals-		Mat	vix: Digestate				
opper**	0.6	mg/L	0.034	102.003	00000000		
alcium	90	mg1.	1.5**	Dama Add	12/14/20	PPG	
ead"	0.5	mpil	0.03*	100 010	12/10/20	MLSA	
anganese"	0.5	mpt.	0.03*	100.003	12/14/20	PPG	
ickel**	0.02	mpt	0.003*	100.000	12/14/20	PPG	
nc**	2.0	mpil	0.1*	100 - 000	12/14/20	PPG	
agnesium	63	mpiL	2 5**	Flame LLC	12/14/20	PPS	
Massium	27	mg/L	5.0*	Flame ALS	12/12/20	MLSA	
dium	402	mg/L	75^	Fiame 115	12/10/20	MLSA	
uminum"	16	mg/L	0.5*	102.005	12/12/20	MLSA	
vomum	0.02	mgil,	0.005*	ICP - DES	12/14/20	PPG PPG	
	1	>>> end of result	set for Sample No.	P00107991-07 <<<			
imple No.: P00107991-08		Date	Sampled: Not Sur	mlied			
imple ID: EPSL - 2020 - 00008 Iotals-		Matr	ix: Digestate				
00011							
provent de la companya	0.8	mg/L	0.05*	ICP - OES	1011.000		
No. 1	46	mg/L	1.0**	Fiame AAS	12/14/20	PPG	
				1.000	12/10/20	VILSA .	



 Address: Bldg. 2 Berthaphil Compound 1, Berthaphil Inc. Industrial Park, Jose Abad Santos Ave. Clark Freeport Zone (CFZ), Pampanga, 2023 Philippines Tel: (6345) 599-3943 * (6345) 499-6529 * (632) 8552-5100 * Fax: (6345) 599-3963 Email: crl@crllabs.com * http://www.crllabs.com

Test Description	Results	Units	MDL	Test Methods	Date Analyzed	By
-Metals-						-
l ead**	0.05	-	0.0051			
Manazonara	0.05	mpr.	0.005	ICP - OES	12/14/20	PPG
kinkal**	0.2	mpt	0.02	ICP - DES	12/14/20	PPG
Zaatt	0.01	rept	0.003-	ICP - OES	12/14/20	PPG
Manadaum	0.7	mpt	0.03*	ICP - DES	12/14/20	PPG
Dagnesium	31	mpt	1.344	Flame AAS	12/12/20	MLSA
Potaksium	13	mpt	2.5*	Flame AAS	12/10/20	MLSA
Sodium	205	mgit	33*	Flame AAS	12/12/20	MLSA
Aluminum**	9.1	mail	0.5*	ICP - DES	12/14/20	PPG
Chromium"	0.01	mgl.	0.005*	ICP - OES	12/14/20	PPG
		>>> end of resi	uit set for Sample N	o.:P00107991-08 <<<		
Sample No.: P00107991-09 Sample ID: EPSL - 2020 - 00009		D	ateSampled: Not S	upplied		
-Metals-			acrix: Digestate			
Connert		-				
Calcum	0.4	mpt	0.02*	ICP - OES	12/14/20	PPG
additt	12	mgs.	1.5~	Flame AAS	12/10/20	MLSA
Managemente"	ND	ngt	0.005*	ICP - DES	12/14/20	PPG
Nickelli	0.04	mgt.	0.003*	ICP - OES	12/14/20	PPG
Teatt	0.006	mg/L	0.003*	ICP - OES	12/14/20	PPG
Citte	0.5	mgn.	0.03*	ICP - DES	12/14/20	PPG
Nagnesium	45	mg/L	1.744	Flame AAS	12/12/20	MLSA
Potassium	15	mg/L	3.1**	Flame AAS	12/10/20	MLSA
sodium	277	mp/L	50*	Flame AAS	12/12/20	MLSA
AJUMINUM"	10	mplL	0.5*	ICP - OES	12/14/20	PPG
unremium	0.007	mg/L	0.005*	ICP - DES	12/14/20	PPG
		>>> end of resu	It set for Sample No	.:P00107991-09 <<<		
Sample No.: P00107991-10		Du	teSampled: Not S	upplied		
Sample ID: EPSL - 2020 - 00010		M	strix: Digestate			
Metals-			and a general			
Cooper**		100				
Calcium	0.9	mgr.	C.06*	ICP - CES	12/14/20	PPG
ead"	86	mg/L	1.5**	Flame ALS	12/10/20	MLSA
lannanese"	0.1	mg/L	0.005*	ICP - CES	12/14/20	PPC
lickel**	0.3	mg/L	0.02*	ICP - OES	12/14/20	PPG
lact.	0.01	mgit.	0.003*	ICP - OES	12/14/00	PRG
laphesium	1.0	mgit	0.03*	ICP - CES	12/14/20	PPG
otassium	04	mgr	2.5**	Flame AAS	12/12/20	MLSA
odium	24	mg/L	3.1*	Flame AAS	12/10/20	MLSA
Juminum**	483	mg/L	50*	Fiame AAS	12/12/20	MLSA
hromium**	16	mg/L	0.5*	ICP - OES	12/14/20	PPG
	0.92	mgs.	0.005*	ICP - OES	12/14/20	PPG
ample No.: P00107991-11		>>> end of result	set for Sample No.	:P00107991-10 <<<		
ample ID: EPSL - 2020 - 00011		Uar	esampled: Not Su	pplied		
Vetals-		Mat	trix: Digestate			
opper**						
alcium	0.5	mg/L	0.03^	ICP - CES	12/14/20	880
kad**	89	mgit	1.5**	Flame AAS	12/10/20	MISA
ingapere"	0.03	mg/L	0.005*	ICP - DES	12/14/20	and a
ckel ¹¹	0.1	mg/L	0.006*	ICP - DES	12/14/20	000
ne ¹¹	0.01	mg/L	0.003*	ICP - OES	12/14/00	000
and an an	0.6	mg/L	0.05*	ICP - OES	12/14/00	PPG
agnesium	67	mg1.	2.5**	Flame AAS	12/14/20	PPG
nata anumi	21	mg/L	3.1*	Flame AAS	12/12/20	MLSA
	475	mpil.	50*	Flame AAS	12/10/20	MLSA
ummuth"	13	mgit.	0.5^	ICP - OES	12/12/20	MLSA
romum	0.01	mg/L	0.005*	ICP - OES	12/14/20	PPG
		>>> end of result	set for Sample No.3	P00107991-11 <<<		
imple No.: P00107991-12		Date	Sampled: Not Sur	aliad		
imple ID: EPSL - 2020 - 00012		Matr	ix: Digestate	pres		
etais-			a gestate			
pper"	1.3	mpiL.	0.06*	100 OC 8		
loum	89	mg/L	1.5**	Electronic State	12/14/20	PPG



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Test Description	Results	Units	MDL	Test Method	s Date Analyzed	By
-Metals-		-				
Lead**			0.0064			
Manganese"	0.3	mail	0.025	102-015	12/14/20	PPG
Nickel**	0.01	mail	0.003*	100.058	12/14/20	PPG
Zinc**	11	mail	0.15	ICP OCS	12/14/20	PPG
Magnesium	65	mat	2.6**	Filme 115	12/14/20	PPG
Potassium	25	mg/L	3.1*	Flame 445	1212220	MLSA
Sodium	459	mail	50*	Dame 145	12/10/20	MLan
Aluminum**	14	mol	0.5*	ICP - OES	1211202	MLSA
Chromium**	0.02	mol	0.005*	ICP - CES	12/14/20	PPG
		>>> end of res	ult set for Sample N	io:P00107991-12 <<<		
Sample No.: P00107991-13 Sample ID: EPSL - 2020 - 00013			ateSampled: Not	Supplied		
Matula.			fatrix: Digestate			
- and the second s						
Copper"	1.3	mg/L	0.06*	ICP - OES	12/14/20	PPG
Calcium	107	mg/L	1.9**	Flame AAS	12/10/20	MLSA
Lead	0.4	mg/L	0.05^	ICP - DES	12/14/20	PPG
Manganose"	0.7	mgit.	0.03*	ICP - OES	12/14/20	PPG
Techi Contra Con	0.02	mgit.	0.003*	ICP - OES	12/14/20	PPG
200	1.1	mg/L	0.05*	ICP - OES	12/14/20	PPG
Datation	72	mg/L	2.5**	Flame AAS	12/12/20	MLSA
Soferm	30	mgt.	3.1*	Fiame AAS	12/10/20	MLSA
Aluminum!!	495	mg/L	50*	Flame AAS	12/12/20	MLSA
Chandlesser	22	mg/L	1.0*	ICP - OES	12/14/20	PPG
unionium.	0.03	mg/L	0.005*	ICP - OES	12/14/20	PPG
Sample No.: P00107991.14		>>> end of resu	ult set for Sample N	0 P00107991-13 <<<		
Sample ID: EPSL - 2020 - 00014			atesampled: Not S	upplied		
-Metais-		M	atrix: Digestate			
Connection						
Copper	0.7	mpit.	0.03*	ICP - OES	12/14/20	000
ualoum	102	mg/L	1.9**	Flame AAS	12/10/20	110
Management 1	0.03	mgit.	0.005^	ICP - OES	12/14/20	BD0
Vianganese	0.4	mg/L	0.02*	ICP - OES	12/14/20	PPQ PPG
Time##	0.01	mg/L	0.003*	ICP - DES	12/14/20	800
danaei un	0.9	mg/l.	0.05^	ICP - OES	12/14/20	800
Potassium	68	mg/L	2.5**	Flame AAS	12/12/00	M SA
Sodium	25	mail	2.1*	Flame AAS	12/10/20	MISA
Vuminum**	498	mgl	50*	Fiame AAS	12/12/20	MISA
Chromium**	10	mg/L	0.5*	ICP - OES	12/14/20	PPG
	50.02	mgs.	0.005*	ICP - OES	12/14/20	PPG
Sample No.: P00107991-15		end or resul	I set for Sample No	:P00107991-14 <<<		
Sample ID: EPSL - 2020 - 00015		Da	teSampled: Not St	pplied		
Metals-		Ma	trix: Digestate			
(inner!)						
alcium	1.2	mg/L	0.06*	ICP - OES	12/14/20	
ead**	106	mgit.	1.9**	Fiame AAS	12/10/00	PPG
langanese''	0.2	mgr.	0.005*	ICP - QES	12/14/20	post.
ickel**	0.6	mpil	0.03*	ICP - OES	12/14/00	PPG
inc**	0.02	mgit	0.003^	ICP - DES	12/14/20	PPG
agnesium	1.4	mgi	0.05*	ICP - DES	12/14/20	PPG
otassium	90	mgr.	2.6^^	Flame AAS	12/12/20	MISA
odium	400	mgr.	3.1*	Flame AAS	12/10/20	MLSA
uminum**	10	- apr	50*	Flame AAS	12/12/20	MI SA
hramium**	18	mart.	1.0*	ICP - OES	12/14/20	ppn
	0.03	mgs.	0.005*	ICP - OES	12/14/20	PPG
ample No.: P00107991-16		Patrice of result	Sampled No.	P00107991-15 <<<		
ample ID: EPSL - 2020 - 00016		Date	reampled: Not Sup	plied		
fetais-		Mate	ix: Digestate			
coer**						
al minutes	1.0	mgil	0.06*	ICP - OES	12011	
	0.4	and a state of the			12/14/20	PPG
edgini	34	mge.	1.94	Flame AAS	10100.000	



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Test Description	Results	Units	MDL.	Test Methods	Date Analyzed	By R
-Metals-		-				
Lead**	0.09	mail	0.0054	109.055	101110	
Manganese**	0.2	mail	0.000	102-055	12/14/20	PPG
Nickel"	0.01	mail	0.0004	100-003	12/14/20	PPG
Zinc**	1.1	mail	0.10	100-000	12/14/20	PPG
Magnesium	69	mail	2 644	Elementaria	12/14/20	PPG
Potassium	21	mail	2.2	Fiame Avis	12/12/20	MLSA
Sodium	408	mark.	3.1-	Fiame AAS	12/10/20	MLSA
Aluminum''	490	mark.	15-	Filme AAS	12/12/20	MLSA
Chromium**	0.02	mgt	0.005*	ICP - OES	12/14/20	PPG PPG
		>>> end of res	uit set for Sample N	o P00107991-16 <<<		
Sample No.: P00107991-17		D	ateSampled: Not 8	upplied		
-Metals-		M	latrix: Digestate			
Copper**	2.7	mg/L	0.2*	ICP - DES	12/14/20	000
Calcium	94	mp1.	1.9**	Flame AAS	12/10/20	HI GA
Load"	0.6	mg/l.	0.1*	ICP - OES	12/14/20	MLSA ABC
Manganese**	0.7	mg/L	0.06*	ICP - OES	12/14/20	1440
Nickel**	0.04	mg/L	0.003*	ICP - OES	12/14/20	PPG .
Zinc**	1.6	mg/L	0.14	ICP - OFS	12/14/20	PPG
Magnosium	60	mg/L	2.5**	Filme AAS	12/14/20	PPG
Potassium	27	mg/L	3.1*	Flame AAS	12/12/20	MLSA
Sodium	482	mp/L	75^	Flame 445	12710/20	MLSA
Aluminum**	20	mg/L	1.0*	ICP - OES	12/12/20	MLSA
Chromium"	0.06	mg/L	0.005*	ICP - OES	12/14/20	PPG
		>>> end of resu	It set for Sample N	P00107991-17 <<<		
Sample No.: P00107991-18		Di	iteSampled: Not S	upplied		
Sample ID: EPSL - 2020 - 00018 -Metals-		M	atrix: Digestate			
Coppert		200 a C				
Calcium	1.3	mg/l.	0.06*	ICP - DES	12/14/20	PPG
Lead	96	mg/l,	1.9**	Flame AAS	12/10/20	MLSA
Mancanese"	0.2	mgit	0.005*	ICP - DES	12/14/20	PPG
Nickel ¹¹	0.5	mgit	0.03*	ICP - CES	12/14/20	PPG
Zinett	0.01	mgit.	0.003*	ICP - DES	12/14/20	PPG
Magnesium	1.4	mgt.	0.05*	ICP - OHS	12/14/20	PPG
Potassium	64	mgit	2.5**	Flame AAS	12/12/20	MLSA
Sodium	25	mgiL	3.1*	Flame AAS	12/10/20	MISA
Aluminum**	435	mgiL	75*	Flame AAS	12/12/20	MISA
Chromium"	15	mg/L	0.5*	ICP - DES	12/14/20	PPG
	0.00	>>> end of result	set for Samole No.	ICP - GES	12/14/20	PPG
Sample No.: P00107991-19		Dat	Remeled No. 6	P-00107991-18 <<<		
Sample ID: EPSL - 2020 - 00019		0.0	resampled: Not Su	ppiled		
Metals-		Ma	trix: Digestate			
Copper"	1.0	mail				
Calcium	92	mai	0.00*	ICP - CES	12/14/20	PPG
.ead**	0.1	mark.	1.94	Flame AAS	12/10/20	MLSA
Manganese**	0.5	mgr.	0.005*	ICP - OES	12/14/20	PPG
Vickel**	0.5	myr	0.03*	ICP - QES	12/14/20	PPG
Dine**	1.6	mgs.	0.003*	ICP - OES	12/14/20	PPC
Agnesium	73	mail	0.05*	ICP - OES	12/14/20	PPG
otassium	20	mgr	2.5**	Flame AAS	12/12/20	MISA
lodium	610	mail	2.1*	Flame AAS	12/10/20	MLSA
luminum**	24		15	Pierre AAS	12/12/20	MLSA
Chromium**	0.07	mpt	0.005*	ICP - GES ICP - GES	12/14/20	PPG
		>>> end of result	set for Sample No	P00107991-19 <<<	12/14/20	PPG
ample No.: P00107991-20		Date	Sampled: Net Sur	olied		
ample ID: EPSL - 2020 - 00020		Matr	ix: Digestate	price		
opper"	0.2	mgil,	0.02*	100.000		
opper" alcium	0.2	mgt. mgt.	0.02*	ICP - OES	12/14/20	PPG



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	Results	Units	MOL	Test Methods	Date Analyzed	By	Re
-Metals-						-	-
Lead"	0.2	mail	0.054	200.000	-		
Manganese''	0.4	mol	0.034	100-000	12/14/20	PPG	
Nickel**	0.01	mail	0.0001	100.000	12/14/20	PPG	
Zinc**	0.9	mol	0.054	100-005	12/14/20	PPG	
Magnesium	73	mol	2.544	Flama AAS	12/14/20	PPG	
Potassium	25	mail	3.14	Flame ALS	12/12/20	MLSA	
Sodium	506	mpl	75^	Flame ALS	12/10/20	MUSA	
Aluminum**	15	mail	0.5*	ICP - DES	12/14/20	MLSA 000	
Chromium**	0.02	mgit	0.005*	ICP - DES	12/14/00	PPG	
Parala Na Provinsi a		>>> end of resu	It set for Sample N	o.:P00107991-20 <<<			
Sample No.: P00107991-21		D	steSampled: Not \$	lupplied			
-Metals-		м	atrix: Digestate				
Copper**	1.0	mpit.	0.06*	ICP - GES	12/15/20	880	
Calcium	82	mp/L	1.9**	Flame AAS	12/10/20	10.01	
Load'"	0.06	mpiL	0.005*	ICP - OES	12/15/20	PPG.	
Manganese"	0.6	mg/L	0.03*	ICP - OES	12/15/20	PPG	
Nickel	0.04	mg/L	0.003^	ICP - DES	12/15/20	890	
Zinc	1.0	mgi.	0.05^	ICP - OES	12/15/20	PPO	
Magnesium	65	mgit	2.5**	Flame AAS	12/12/20	MISA	
Polassium	31	mg/L	3.1*	Flame AAS	12/10/20	MLSA	
Sodium	553	mg/L	75*	Flame AAS	12/12/20	MLSA.	
Aluminum"	22	mg/L	1.0^	ICP - OES	12/15/20	PPG	
unremium	0.06	mgiL	0.005*	ICP - DES	12/15/20	PPG	
		>>> end of resu	t set for Sample No	2.:P00107991-21 <<<			_
Sample No.: P00107991-22		Da	teSampled: Not S	upplied			
Sample ID: EPSL - 2020 - 00022		Ma	trix: Digestate				
Metals-							
Copper**	0.5	mail	0.031	100.000			
Calcium	100	mat	1.000	ICP - DES	12/15/20	PPG	
.cad"	0.09	mo/i.	0.0054	Plane Avia	12/10/20	MLSA	
Vanganese**	0.5	mort	0.03*	107-065	12/15/20	PPG	
Vickel"	0.007	mp/L	0.003*	00.000	12/15/20	PPG	
line**	0.5	mp1.	0.05*	102-015	12/15/20	PPG	
fagnesium	57	mp1.	2.5**	Elama A10	12/15/20	PPG	
otassium	26	mg/L	3.1*	Fame AAS	12/12/20	MLSA	
Sodium	472	mg/L	75*	Flame AAS	12/10/20	MLSA	
Uuminum**	16	mgrL	0.5*	ICP - DES	12/12/20	MLSA	
Chromium"	0.02	mg/L	0.005*	ICP - OES	12/15/20	PPG	
ample No - Debience - as		>>> end of result	set for Sample No.	:P00107991-22 <<<			
ample No.: P00107991-23		Dat	eSampled: Not Su	pplied			
Metais-		Mat	rix: Digestate				
lopper"	0.5	mat	0.001	100.000			
alcium	111	mail	1 044	RUP-DES	12/15/20	PPG	
ead**	0.1	mail	0.0061	Flame AAS	12/10/20	MLSA	
langanese**	0.5	mol	0.000	ICP - GES	12/15/20	PPC	
ickel**	0.02	mgt.	0.000*	ICP - OES	12/15/20	PPG	
ne"	0.4	mgt.	0.051	102.055	12/15/20	PPG	
agnesium	64	mg/L	2.5**	Firme 118	12/15/20	PPG	
ofassium	28	mg/L	3.1*	Fiame 23.0	12/12/20	MLSA	
odium	493	mpiL	75*	Flama A15	12/10/20	MLSA	
uminum"	16	mpt.	0.5*	100,000	12/12/20	MLSA	
hromium"	0.02	mpt.	0.005*	ICP - CES	12/15/20	PPG	
123000000000000000000000000000000000000	>	>> end of result r	et for Sample No.	P00107991-23 <<<	101000	PPG	
ample No.: P00107991-24		Date	Sampled: Not P	allad			
ample ID: EPSL - 2020 - 00024		the second se	Discourse of Sup	pried			
		Matri	x: Digestate				
letals-							
letais-							
etals- oper** /cium	1.0	mp/L	0.06*	ICP - DES	12/15/20		



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Test Description	Results	Units	MOL	Test Methods	Date Analyzed	By	R
-Metals-							-
Load"	0.2	mail	0.0051	100.005	12/16/20	880	
Mannanese"	0.7	mail	0.064	109-008	12/12/20	000	
Nickel"	0.02	mol	0.003*	102-065	12/10/20	PPG	
Zinc**	0.8	mail	0.1^	ICP. OFS	12/15/00	PPG PPG	
Magnesium	69	mol	2 5 4	Fiamo AAS	12/12/20	AN CA	
Potassium	30	mol	5.01	Flame AAS	12/12/20	MLDA	
Sodium	555	mol	754	Flame Add	12/12/20	MLSA MLSA	
Aluminum**	10	mol	1.01	ing one	12/12/20	MLSA	
Chromium"	0.03	mpiL	0.005*	ICP - OES	12/15/20	PPG	
		>>> end of resu	It set for Sample N	o:P00107991-24 <<<			-
Sample No.: P00107991-25		D	ateSampled: Not \$	upplied			
aampie 10: EP aL - 2020 - 00025		M	atrix: Digestate				
-Wetais-							
Copper"	0.03	mg1,	0.003*	ICP - OES	12/15/20	PPG	
Calcium	103	mg/L	1.9**	Fiame AAS	12/10/20	MLSA	
Lead"	0.009	mgiL.	0.005*	ICP - OES	12/15/20	PPC	
Manganese**	0.09	mg/L	0.003*	ICP - OES	12/15/20	PRO	
Nickel"*	0.005	mp1.	0.003^	ICP - DES	12/15/20	PRO	
Zinc**	0.07	mg/L	0.0051	ICP - DES	12/15/00	pag	
Magnesium	60	mpil.	2.5**	Flame AAS	12/12/20	141.01	
Potassium	22	mpl	5.0*	Flame AAS	12/10/00	MLDA	
Sodium	459	mgit.	75*	Flame AAS	12/12/20	MLSA.	
Aluminum"	11	mail.	0.51	109-075	10/10/20	MLSA	
Chromium**	0.01	mg/L	0.005*	ICP - CES	12/15/20	PPG	
		>>> end of resu	it set for Sample No	P00107991-25 <<<			-
Sample No.: P00107991-26		Da	teSampled: Not S	upplied			
Sample ID: EPSL - 2020 - 00026		Ma	trix: Digestate				
and a second sec							
Copper"	0.5	mg/L	0.03*	ICP - DES	12/15/20	PPG	
Calcium	104	mg/L	1.9**	Flame AILS	12/10/20	AR SA	
lead"	0.2	mp1.	0.005*	ICP - DES	12/15/20	PAC	
Manganese"	0.5	mg/L	0.03^	ICP - OES	12/15/20	PR/1	
Nickel ¹¹	0.01	mg/L	0.003*	ICP - DES	12/15/20	BBC	
Cinc**	6.3	mgit.	0.5^	ICP - OES	12/15/20	PPG	
Vagnesium	66	mgiL	2.5**	Flame AAS	12/12/20	10.54	
Potassium	27	mpiL	3.1^	Flame AAS	12/10/20	M CA	
Sodium	522	mg/L	75^	Flame AAS	12/12/20	10.0.1	
Numinum**	15	mgit	0.5*	ICP - CES	12/16/20	muges.	
Chromium"	0.02	mg/t,	0.005*	ICP - CES	12/15/20	PPG	
		>>> end of result	t set for Sample No	:P00107991-26 <<<			
sample No.: P00107991-27		Dat	leSampled: Not Su	pplied			
Sample ID: EPSL - 2020 - 00027 Metals-		Ma	trix: Digestate				
opper"	1.2	mat	0.000				
laloum	78	mail	0.06*	ICP - OES	12/15/20	PPG	
ead"	0.5	mail	1.90	Flame AAS	12/10/20	MLSA	
Nanganese**	0.2	mail	0.005*	ICP - OES	12/15/20	PPG	
licke!"	0.01	mail	0.02*	ICP - DES	12/15/20	PPG	
inc"	0.01	mpr.	0.003*	ICP - OES	12/15/20	PPG	
laonesium	6.5	and a	0.03*	ICP - OES	12/15/20	PPG	
ofassium	20	mgit	2.5**	Flame AAS	12/12/20	MLSA	
odium	411	mail	2.11	Flame AAS	12/10/20	MLSA	
luminum"*	15	mat	75*	Flame AAS	12/12/20	MLSA	
hromum**	0.02	mgi.	0.005*	ICP - DES	12/17/20	PPG	
		>>> end of result	set for Sample No.	P00107991-27 <<<	12/15/20	PPG	
ample No.: P00107991-28		Date	Sampled Not 7	and a second			
ample ID: EPSL - 2020 - 00028		Date	eampied: Not Sup	opned			
Aetais-		Matr	ix: Digestate				
in and in the second	10	1000					
APPEN .		10000					
icium	1.9		0.06~	ICP - OES	12/15/20	PPC	



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Test Description	Results	Units	MDL.	Test Methods	Date Analyzed	By	Ref
-Metais-							-
Lead**	0.3	mail	0.051	100.058	12/16/00	000	
Uannanese**	1.0	mail	0.00	102-065	12/15/20	PPG	
Mangaria an	1.0	and a	0.00	ICP - OES	12/15/20	PPG	
7.00.04	0.02	mail	0.055	ICP OES	12/15/20	PPG	
Magnasium	0.0	and a	3 324	ICP - OLS	12/15/20	PPG	
Detection	70	mgs.	3.3	Flame AAS	12/12/20	MLSA	
Potassium	34	mpt	5.0*	Flame AAS	12/10/20	MLSA	
soaum	632	mg/L	75^	Fiame AAS	12/12/20	MLSA	
Aluminum"	22	mgt,	1.04	ICP - OES	12/15/20	PPG	
Chromum	0.04	mgi	0.005*	ICP - OES	12/15/20	PPG	_
Samala Na - B00107001 20		>>> end of resu	At set for Sample N	0.;P00107991-28 <<<			
Sample No.: P00107991-29		0	iteSampled: Not S	upplied			
Metals-		M	atrix: Digestate				
Copper**	0.4	moil	0.03*	100.005	1204.00	-	
Calcium	113	mail	4.044	Elama A18	12/15/29	140	
cad**	0.05	mail	0.0054	riette rico	12/10/20	MLSA	
(anganese"	1.0	mail	0.000	ICP - OLS	12/15/20	PPG	
Nickel**	0.00	max.	0.00*	ICP - DES	12/15/20	PPG	
Zine"	0.02	- Provide State	0.003*	ICP - OES	12/16/20	PPG	
danaai m	0.6	mgr.	0.05*	ICP - DES	12/15/20	PPG	
Detassium	74	mgit	2.0**	Flame AAS	12/12/20	MLSA	
Sodium	35	mgr.	6.0*	Flame AAS	12/10/20	MLSA	
logmin.cov**	649	mg/L	75^	Flame AAS	12/12/20	MLSA	
Shanaji wati	25	mg/L	1.0^	ICP - OES	12/15/20	PPG	
under de la companya	0.04	mg/L	0.005*	ICP - OES	12/15/20	PPG	
		>>> end of result	It set for Sample No	:P00107991-29 <<<			-
Sample No.: P00107991-30		Da	teSampled: Not S	upplied			
Sample ID: EPSL - 2020 - 00030		Ma	trix: Digestate				
Metals-							
Copper**	1.0	and a					
Calcium	1.0	mgit	0.06*	ICP - OES	12/15/20	PPG	
ead"	100	mgr.	1.9**	Flame AAS	12/10/20	MLSA	
lannanase"	0.03	mgrL	0.005*	ICP - OES	12/15/20	PPG	
Srivel ¹¹	0.5	mgi.	0.03*	ICP - OES	12/15/20	PPG	
Sec.**	0.01	mg/L	0.003*	ICP - OES	12/15/20	PPG	
in a second s	1.0	mg/L	0.05*	ICP - CES	12/15/20	PPG	
Har in the second	68	mg1.	2.8**	Flame AAS	12/12/20	MISA	
orassiom	29	mg/L	5.0^	Flame AAS	12/10/20	MISA	
oaum	563	mg/L	75*	Flame AAS	12/12/20	10.0.1	
Juminum	17	mgiL	1.0*	ICP - OES	12/15/20	000	
nromum	0.02	mgl.	0.006*	ICP - CES	12/15/20	PPG	
ample No - DODISTON A		>>> end of result	set for Sample No	P00107991-30 <<<			
ample No.: P0010/991-31		Dat	eSampled: Not Su	pplied			
Intals.		Mat	rix: Digestate				
opper"			10000				
alcium	1.4	mor	0.06*	ICP - OES	12/15/20	PPC	
nad**	99	mgit	1.9**	Flame AAS	12/10/20	MLSA	
anganese"	0.1	mg/L	0.005*	ICP - OES	12/15/20	PRO	
ckel**	0.8	mpl	0.06*	ICP - DES	12/15/20	PRO	
A	0.02	mg/L	0.003*	ICP - DES	12/15/20	PRO	
anderium	1.6	mgit.	0.1*	ICP - CES	12/15/20	000	
dan ali un	76	mg/L	2.8^^	Flame AAS	12/12/20	MIN.	
necentiti Micros	31	mg/L	5.0*	Flame AAS	12/10/20	MLSA	
and the second sec	543	mg/L	75^	Flame AVS	12/13/20	WLDA	
	20	mp/L	1.0*	ICP - DES	12/18/00	MLSA	
iromuu	0.03	mgit.	0.005*	ICP - DES	12/15/20	PPG	
		>>> end of result :	set for Sample No	P00107991-31 <<<			
imple No.: P00107991-32		Date	Sampled: Not Sur	plied			
imple ID: EPSL - 2020 - 00032		Matr	ix: Digestate	press.			
etais-		1999					
pper"	0.6	mp/l.	0.03*	100.000			
pper** loum	0.6	mpil.	0.03*	ICP - DES	12/15/20	PPG	



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Test Description	Results	Units	MDL.	Test Methods	Date Analyzed	By	84
-Metals-						-	-
Lead"	0.3	mot	0.05*	ICP - OES	12/16/20	000	
Manganese"*	0.5	mail.	0.03^	ICP OES	12/15/00	800	
Nickel"	0.02	mg/L	0.003*	ICP - DES	12/15/20	PPC	
Zinc**	1.1	mgit	0.05^	ICP - OES	12/15/20	PPO	
Magnesium	75	mg/L	2.8**	Flame AAS	12/12/20	MLSA	
Potassium	27	mgit	5.0*	Flame AAS	12/10/20	MLSA	
Sodium	568	mgrt.	75*	Flame AAS	12/12/20	MLSA	
Aluminum"	17	mp/L.	1.0*	ICP - OES	12/15/20	PPG.	
Chromium**	0.02	mpl.	0.005*	ICP - OES	12/15/20	PPG	
Comple No - DODIOTOOI 35		>>> end of resu	ult set for Sample N	lo:P00107991-32 <<<			
Sample No.: P00107991-33		D	ateSampled: Not \$	Supplied			
-Metals-		M	atrix: Digestate				
Copper"*	0.4	mg/L	0.03*	ICP - OES	12/15/20	PPO	
Calcium	100	mg/L	1.9**	Flame AAS	12/10/20	MLSA	
Load**	0.08	mgiL	0.005^	ICP - OES	12/15/20	PPG	
Manganese''	0.5	mg/L	0.03*	IOP - OES	12/15/20	PPG	
Teche	0.01	mg/L	0.003*	ICP - OES	12/15/20	PPG	
Amu Maanaali m	1.2	mgit.	0.05*	ICP - OES	12/15/20	PPG	
Nagnesium	73	mg/L	2.8**	Flame AAS	12/12/20	MLSA	
Codium	29	mg/L	5.0*	Flame AAS	12/10/20	MLSA	
Auminum"	551	mgr.	75^	Flame AAS	12/12/20	MLSA.	
Channiam**	18	mg/L	1.0*	ICP - OES	12/15/20	PPG	
	0.03	mgs.	0.005*	ICP - OES	12/15/20	PPG	
Sample No - P00107991.34		>>> end of resu	It set for Sample N	0.:P00107991-33 <<<			
Sample ID: EPSL - 2020 - 00034		Da	nesampled: Not S	upplied			
Mataia.		Ma	strix: Digestate				
Copper"	0.5	mg/L	0.03^	ICP - OES	12/15/20	PPG	
Cardin .	89	mg/L	1.9**	Flame AAS	12/10/20	MLSA	
Manapase ¹¹	0.04	mpil.	0.005*	ICP - OES	12/15/20	PPG	
Minkal ¹⁴	0.2	mgn	0.02*	ICP - OES	12/15/20	PPG	
Zinc**	0.009	mgit	0.003^	ICP - OES	12/15/20	PPG	
Macnesium	0.8	mgit	0.05*	ICP - CES	12/15/20	PPG	
Potassium	22	mgs.	2.84	Flame AAS	12/12/20	MLSA	
Sodium	516	mol	241	Flame AAS	12/10/20	MLSA	
Numinum**	12	mort	0.61	Fiame AVS	12/12/20	MLSA	
Chromium**	0.01	mg/L	0.005^	ICP - DES	12/15/20	PPG PPG	
and N. Bassiens		>>> end of result	set for Sample No	:P00107991-34 <<<			-
Sample No.: P00107991-35		Dat	eSampled: Not Si	applied			
Metais-		Mat	trix: Digestate				
Copper**	1.0	mat	0.041	140.000			
alcium	89	mol	1.044	Dama AAR	12/15/20	PPG	
ead""	0.2	mg/L	0.064	Parte AAS	12/10/20	MLSA	
langanese"	0.7	mpil.	0.03*	109-068	12/15/20	PPG	
ickel**	0.02	mpt.	0.003^	ICP - OHS	12/15/20	PPG	
inc ¹¹	0.7	mgit.	0.05^	ICP - CES	12/15/20	PPG	
agnesium	63	mg/L	2.8**	Flame AAS	12/15/20	PPG	
viata anulti ordinate	28	mg/L	5.0^	Flame AAS	12112120	MLSA	
unio mit	514	mgil,	75*	Flame AAS	12/12/20	MLSA	
bolonium "	19	mg/L	1.0*	ICP - OES	12/16/00	MLSA .	
	0.03	mgit.	0.005^	ICP - OES	12/15/20	PPG	
mole No - P00107004 No	2	>> end of result :	set for Sample No	P00107991-35 <<<		-	
mole ID: EBS1 2020 00013		Date	Sampled: Not Sup	plied			
Intele ID: EPSL - 2020 - 00036		Matr	ix: Digestate				
0183-			VI. 1996 - 2006 - 2007 - 2007 - 2007 - 2007 - 2007 - 2007 - 2007 - 2007 - 2007 - 2007 - 2007 - 2007 - 2007 - 20				
opper "	0.9	mgit.	0.03*	108.018			
(Cium)	100	mail			12/15/20	PPG	
	192	anges.	1 8.4	Flame AAS			



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Test Description	Results	Units	MDL.	Test Methods	Date Analyzed	By
-Metais-						
Lead**	0.2	maß	0.05^	ICP. OFS	12/16/05	000
Manganese"	0.3	mail	0.03*	ICP - OFS	12/10/20	000
Nickel**	0.01	mail	0.003*	ICP - OES	12/10/20	PPG
Zinc"*	0.5	mal.	0.05*	ICR - 005	12/10/20	PPG
Magnosium	72	ma't.	2.8**	Flame 449	12/10/20	11.04
Potassium	25	mail.	5.01	Flame AAS	12/12/20	MLan.
Sodium	539	mail.	75*	Flame AAS	12/10/20	NLDA
Aluminum**	16	mail	0.5*	ICP - OFS	10/10/00	INCOA.
Chromium**	0.02	mgiL	0.005*	ICP - OES	12/15/20	PPG
Pamala Na		>>> end of resi	uit set for Sample N	o:P00107991-36 <<<		
Sample No.: P00107991-37		D	ateSampled: Not S	upplied		
-Metals-		м	atrix: Digestate			
Copper"	0.5	mgit,	0.00^	ICP - OES	12/15/20	880
Calcium	100	mg/L	1.9**	Flame AAS	12/10/20	MIRA
Lead"	0.01	mpiL	0.005*	ICP - DES	12/15/20	PBC.
Manganese**	0.1	mgi.	0.006*	ICP - OES	12/15/20	880
Nickel**	0.007	mgit.	0.005*	ICIP - OES	12/15/20	PPG
Zinc**	0.2	mpt.	0.01*	ICP - DES	12/15/00	PRO
Magnesium	72	mgit.	2.8**	Flame AAS	12/12/20	MI KA
Potassium	26	mgit,	5.0*	Fiame AAS	12/10/20	MISA
Sodium	532	mg/L	75^	Fiame AAS	12/12/20	MLSA
Aluminum**	13	mp/L	0.5*	ICP - OES	12/15/20	PPG
Chromum"	0.01	mg/L	0.005*	ICP - OES	12/15/20	PPG
		>>> end of resu	it set for Sample N	P00107991-37 <<<		
Sample No.: P00107991-38		Da	teSampled: Not S	upplied		
Sample ID: EPSL - 2020 - 00038		Ma	trix: Digestate			
Metals-						
Copper"*	0.6	mp1.	0.03*	ICP - OFS	12-12-00	
Calcium	103	mg/L	1.9**	Flame 445	12/15/20	PPG
.ead**	0.04	mgil.	0.005*	ICP - OFS	12/10/20	MLSA
/anganese**	0.2	mg/L	0.03*	ICP - OES	12/15/20	PPG
Wickel**	0.01	mg/L	0.003*	ICP - OILS	12/15/20	PPG .
one**	0.5	mg/L	0.05*	ICP - CES	12/13/20	PPG .
Aagnesium	71	mg/L	2.8**	Flame AAS	13/13/00	PProj.
rotassium	24	mg/L	5.0*	Flame AAS	12/10/20	MURA
sodium	519	mp/L	75*	Flame AAS	12/12/20	MLSA .
ouminum"	16	mg/L	0.5*	ICP - DES	12/16/00	MLSA 880
nromium".	0.02	mgt.	0.005^	ICP - OILS	12/15/20	PPG
ample No - 200107991 30		>>> end of result	set for Sample No	P00107991-38 <<<		
ample ID: EPSL - 2020 - 00039		Dat	eSampled: Not So	pplied		
Metals-		Mat	vix: Digestate			
opper**	1.2	mat	0.061	100 000		
alcium	110	mol	1.044	FUP - OES	12/15/20	PPG
ead**	0.3	mail	0.064	Flame AAS	12/10/20	MLSA
anganese"	0.8	mol	0.051	ICP - DES	12/15/20	PPG
ickel**	0.02	mot.	0.0034	ICP - DES	12/15/20	PPG
nc"	0.8	mot	0.054	107-065	12/15/20	PPG
agnesium	83	molt	3.3**	For the	12/15/20	PPG
Massium	34	mgit	5.0*	Fiame AAS	12/12/20	MLSA
Journ	594	mp/L	75^	Flame ALS	12/10/20	MLSA
uminum"	25	mpt.	1.0*	ICP. CER	12/12/20	MLSA
nomium	0.04	mgit.	0.005*	ICP - OES	12/15/20	PPG
male No Descent	1	>> end of result	set for Sample No.:	P00107991-39 <<<		
mple No.: P00107991-40		Date	Sampled: Not Sur	plied		
imple ID: EPSL - 2020 - 00040 letals-		Matr	ix: Digestate			
there are a second second	0.0	mail				
A PROPERTY AND A PROPERTY		and the second sec				
loum	0.6	myr	0.03*	ICP - OES	12/15/20	200



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Matao Lam Lam <thlam< th=""> <thlam< td<="" th=""><th>1 By</th><th>Date Analyzed</th><th>Test Methods</th><th>MOL.</th><th>Units</th><th>Results</th><th>Test Description</th></thlam<></thlam<>	1 By	Date Analyzed	Test Methods	MOL.	Units	Results	Test Description
Losef** 0.5 mp4 0.04* CP-CS 101400 Maganese** 0.01 mp4 0.04* CP-CS 101400 More 0.04* CP-CS 101400 101400 Magnese** 0.01 mp4 0.04* CP-CS 101400 Magnese** 0.01 mp4 0.04* CP-CS 101400 Magnese** 0.02 mp4 0.04* CP-CS 101400 Magnese** 0.02 mp4 0.04* CP-CS 101300 Solum 0.02 mp4 0.05* CP-CS 101300 Marea Deperf* 0.8 mp4 0.8* CP-CS 101500 Sample No: P00107991-41 Desember CP-CS 101500 101500 101500 Sample No: P00107991-41 Desember CP-CS 101500 101500 Sample No: P00107991-42 Desember CP-CS 101500 101500 Sample No: P00107991-42 Desember CP-CS 101500		1			harmon I.		-Metals-
Name Name <t< td=""><td>000</td><td>12/16/00</td><td>100 058</td><td>0.0051</td><td>mat</td><td></td><td>cad"</td></t<>	000	12/16/00	100 058	0.0051	mat		cad"
States O <td>PPQ</td> <td>12/10/20</td> <td>100.000</td> <td>0.005</td> <td>mai</td> <td>0.3</td> <td>Mananese"</td>	PPQ	12/10/20	100.000	0.005	mai	0.3	Mananese"
Chart D 0 Page D 0 Page AG D 0 PAGE AG D 1000 Magessum 20 Pot 3.2 Hame AG D 1000 Pagessum 20 Pot 3.2 Hame AG D 1000 Name, MA 10 Pot 12 Hame AG D 1000 Name, MA 10 Pot 10 Pot D 1000 Name, MA 10 Pot D 10 Pot D 1000 Name, MA D 10 Pot D 10 Pot D 1000 Name, MA D 20 Pot D 10 Pot D 1000 Name, MA D 20 Pot D 1000 Pot D 1000 D 1000 D 1000 D 1000 D 1000 D 1000 D 10000 D 10000<	PPG	12/10/20	107-008	0.0094	mail	0.01	Nickal ¹¹
μαρακτη μαρ μα	PPG	12/15/29		0.054	mail	1.0	7.00**
mage and material 0.9 mpc 1.2 material table and 3 totolog Solution 9.0 mpc 1.2 material table and 3 totolog Solution 9.0 mpc 1.2 material totolog totolog <t< td=""><td>hhC</td><td>12/15/20</td><td>ICF-UES</td><td>0.00</td><td>mage.</td><td>1.0</td><td>Managium</td></t<>	hhC	12/15/20	ICF-UES	0.00	mage.	1.0	Managium
Section Solution	MLSA	12/12/20	Fiame AAS	2.3	mpt	0.9	Decaseum
Documum*** Display Page	MLSA	12/10/20	Fiame AAS	3.0	ingr.	27	Codium
Non-markin 0.0 mpL 1.0 DP-1025 121500 b>> end of msult set for Sample No. P00107991.40 <	MLSA	12/12/20	Flame AAS	15-	mgr.	290	line at
Uninform U.22 mp4 Eth Coll	PPG	12/15/20	ICP - OES	1.0*	mgr.	16	Chamingin
Bample No.: P00107991-41 Sample No.: P00107991-41 Sample No.: P00107991-41 Sample No.: P00107991-41 Sample No.: P00107991-41 Sample No.: P00107991-42 Magnatum Batkin: Digestate Matrix: Digestate Matrix: Digestate Capper * Capper * Capper * Sample No.: P00107991-41 Sample No.: P00107991-42 Magnatum 0.8 mpl, 0.09 mpl, 0.09 mpl, 0.00 mpl, 0.00	PPG	12/15/20	ICP - OES	e oes-	mgs.	0.02	Guideniam
Data Mark No. POD 107 91 41 Data Mark No. Buggind			P00107991-40 <<<	It set for Sample No	>>> end of resu		Sample No - 000107001 41
Ample No.: P00107991-42 0.8 mpL 0.94 PD-005 1215.00 Coper** 0.8 mpL 0.94 PD-005 1295.00 Lead** 0.2 mpL 0.94 ID-005 1295.00 Lead** 0.9 mpL 0.94 ID-015 1295.00 Magneser* 0.9 mpL 0.97 ID-015 1295.00 Magneser* 0.9 mpL 0.97 ID-015 1295.00 Magneser* 0.7 mpL 0.97 Fame AAS 1295.00 Magneser* 0.7 mpL 0.97 Fame AAS 1295.00 Magneser* 0.03 mpL 0.03* ID* ID* ID* Vender/** 0.03 mpL 0.03* ID*			plied	tesampled: Not su			Sample ID: EDS1 - 3030 - 0044
Copper** 0.8 mpL 0.04* PC-05.5 137500 Capter 0.6 mpL 0.04* PC-05.5 137500 Lase** 0.0 mpL 0.04* PC-05.5 137500 Maganese** 0.0 mpL 0.05* PC-05.5 137500 Maganesum 0.0 mpL 0.05* PL<05.5				trix: Digestate	M		Metais-
Calcium 108 mpA 1 s+- Fune AAS 10000 Lead" 0.2 mpA 0.45 CP-ODS 1211000 Manganese" 0.0 mpA 0.05 CP-ODS 1211000 Manganese" 0.0 mpA 0.05 CP-ODS 1211000 Manganese" 0.7 mpA 0.05 CP-ODS 1211000 Manganese" 0.7 mpA 0.05 CP-ODS 1211000 Manganese" 0.7 mpA 0.05 CP-ODS 1211200 Manganese" 0.0 NPA 1.0 CP-ODS 1211200 Munimum" 2.1 mpA 1.0 CP-ODS 1211200 Munimum" 0.00 MPA CP-ODS 1211200 Manganese" 0.01 MPA CP-ODS 1211200 Manganese" 0.03 MPA CP-ODS 1211200 Manganese" 0.4 mpL CP-ODS 1211500 Manganese" 0.01	een:	12/15/20	ICP - CES	0.06*	mpfL	0.8	Copper**
c.ed ^{4**} 0.2 mg4 0.64* CP - OTS 121500 Waganese** 0.0 mg4 0.00* CP - OTS 121500 Water** 0.02 mg4 0.00* CP - OTS 121500 Water** 0.02 mg4 0.00* CP - OTS 121500 Water** 0.02 mg4 0.00* CP - OTS 121500 Water** 0.03 mg4 2.8* Flame AAS 1211200 Water** 0.03 mg4 0.05* Flame AAS 1211200 Water** 0.03 mg4 0.05* CP - OTS 1211500 Water** 0.04 mg4 0.05* CP - OTS 1211500 Water** 0.04 mg4 0.05* CP - OTS 1211500 Water** 0.04 mg4 0.05* CP - OTS 1211500 Water** 0.01 mg4 0.05* CP - OTS 1211500 Water** 0.01 mg4 0.05* C	MICA.	12/10/20	Flame AAS	1.9**	mp/L	106	Calcium
Manganest" 0.9 mgit 0.04 CP-OSS 121100 Valuet" 0.02 mgit 0.001 CP-OES 121150 Zine" 0.02 mgit 0.001 CP-OES 121150 Magnessum 34 mgit 2.8** Flame AAS 121120 Magnessum 34 mgit 72* Flame AAS 121120 Sodum 556 mgit 72* Flame AAS 121120 Numinum" 556 mgit 0.03 Part 1.0* CP-OES 121120 Numinum" 0.03 mgit 0.03* CP-OES 121150 121150 Stample No.: P00107991-42 Catesum set for Sample No.:P00107991-41 <<<	600	12/16/20	ICP - OFS	0.05*	mpt.	0.2	Lead**
Note:** 0.02 mg/s 0.00* CD*-CS 11/100 Magnesum 0.7 mg/s 0.00* CD*-CS 12/1500 Magnesum 5.9 mg/s 0.2*** Plane AAS 12/1500 Adagasum 3.4 mg/s 5.0* Plane AAS 12/1500 Duminum** 2.1 mg/s 0.05* CP*-CS 12/1500 Duminum** 2.1 mg/s 0.05* CP*-CS 12/1500 Duminum** 0.03 mg/s 0.05* CP*-CS 12/1500 Concert 0.04 mg/s 0.05* CP*-CS 12/1500 Concert 0.4 mg/s 0.05* CP*-CS 12/1500 Concert 0.4 mg/s 0.05* CP*-CS 12/1500 Concert 0.4 mg/s 0.05* CP*-CS 12/1500 Concert 0.04 mg/s 0.05* CP*-CS 12/1500 Concert 0.01 mg/s 0.02* CP*-C	PPU	12/10/20	ICP - OF S	0.06*	mpt.	0.9	/langanese**
One** 0.7 mp36 0.05 DP-DCB D11500 Agenesium 59 mp1 2.9** Plane ALS 101100 Magnesium 556 mp1 72* Filme ALS 101100 Magnesium 556 mp1 72* Filme ALS 10100 Markin 556 mp1 72* Filme ALS 10100 Markin 0.03 mp1 0.05* ID**0ES 101100 Markin 0.03 mp1 0.05* ID**0ES 101100 Markin Digestate DateSampled: No.1P00107991-41 <	PPG	12/10/20	102.055	0.003*	mat	0.02	vicker**
Agenesision 55 mg/L 24** Flame AAS 101000 Votassium 34 mg/L 50* Flame AAS 101000 Votassium 34 mg/L 50* Flame AAS 101000 Unminum** 21 mg/L 10* CP-OES 101100 Votassium 0.03 mg/L 10* CP-OES 101100 Votassium*** 0.03 mg/L 0.00* CP-OES 101100 Votassium**** 0.03 mg/L 0.00* CP-OES 1011500 Votassium***** 0.4 mg/L 0.00* CP-OES 1011500 Votassium***********************************	PPG	101000	ICP OFS	0.05*	mat.	0.7	ūne**
Add mpt 5.0 Films ALS 101009 Sodum 555 mpL 72 Films ALS 101009 Sodum 555 mpL 72 Films ALS 101009 Sodum 0.00 mpL 72 Films ALS 101009 Determum** 0.00 mpL 72 Films ALS 101009 Sample No:: P00107991-42 CM DatoSampled: No: Supplied Matrix: Digestate 101509 Sample No:: P00107991-42 Matrix: Digestate 101509 101509 101509 Sample No:: P00107991-42 0.04 mpL 5.9* Films ALS 121500 Sample No:: P00107991-42 0.4 mpL 0.03* CP - OES 121500 121500 Sample No:: P00107991-42 0.64 mpL 0.03* CP - OES 121500 121500 Sample No:: P00107991-43 Matrix: Digestate 121500 121500 121500 121500 121500 121500 121500 1215	PPG	12/15/20	Flame AAS	2 8**	mail	59	Magnesium
Sodum SSS mpL 20 Fame A33 121800 Summum" 21 mpL 1.0° ICP- ICS 121820 Streamum" 0.03 mpL 1.0° ICP- ICS 121820 Streamum" 0.03 mpL 0.05° 127- ICS 121820 Streamum" 0.03 mpL 1.0° ICP- ICS 121820 Streamum" 0.03 mpL 0.05° 127- ICS 121820 Streamum" 0.04 mpL 0.05° ICP- ICS 121820 Manaset* 0.04 mpL 0.05° ICP- ICS 121820 Angunese** 0.7 mpL 0.05° ICP- ICIS 121820 Incr** 0.1 mpL 0.05° ICP- ICIS 121820 Incr** 0.1 mpL 0.05° ICP- ICIS 121820 Incr** 0.7 mpL 0.05° ICP- ICIS 121820 Incr** 0.7 mpL 0.05° ICP- ICIS	MLSA	1012020	Elama AAS	5.00	mol	34	Potassium
Numium" 21 mp1 12 mp1	MLSA	12/10/20	Fiame And	264	mail	555	Sodium
Chromium*** D.03 mpt D.03 D.07 D.03	MLSA	12/12/20	Fiame Avia	1.04	mail	21	Auminum**
Instrument Instrument <thinstrument< th=""> Instrument Instrume</thinstrument<>	PPG	12/15/20	ICP - OES	0.0054	mol	0.03	Chromium**
Sample No.: P00107991.42 iample No.: P00107991.42 iample No.: P00107991.42 iample No.: P00107991.42 iample No.: P00107991.42 iample No.: P00107991.42 iample No.: P00107991.43 O.4 mpl, 19 mpl, 19 mpl, 19 mpl, 19 mpl, 19 mpl, 19 mpl, 1003 mpl, 0035 mpl, 1003	PPG	12/15/20	107-055	0.000	high and of out of	0.00	
International Hole: Pool of January Allower State DataSamplete: Not Supplied Matrix: Digestate Matrix: Digestate Versia- 0.4 mpL 0.01 SP - OES 12/15/20 Science 119 mpL 1.94 Plane AAS 12/15/20 Ianganese** 0.7 mpL 0.05* ICP - OES 12/15/20 Ianganese** 0.1 mpL 0.05* ICP - OES 12/15/20 Ianganese** 0.3 mpL 1.0* ICP - OES 12/15/20 Ianganese*** 0.5 mpL 0.05* ICP - OES 12/15/20 Ianganese*** 0.5 mpL 0.05* ICP - OES 12/15/20			00107991-41 <<<	set for Sample No.	>>> end of resul		ample No - 800107001.42
Sample No.: P00107991-43 Matrix: Digestate Angle No.: P00107991-43 0.4 mpl. 0.05* KOP - OES 521500 Angle No.: P00107991-43 0.4 mpl. 0.05* KOP - OES 521500 Angle No.: P00107991-43 0.7 mpl. 0.03* KOP - OES 521500 Angle No.: P00107991-43 0.7 mpl. 0.03* KOP - OES 521500 Angle No.: P00107991-43 78 mpl. 0.03* KOP - OES 5217500 Angle No.: P00107991-43 78 mpl. 5.0* Hame AAS 5217500 Angle No.: P00107991-43 78 mpl. 5.0* Hame AAS 5217500 Angle No.: P00107991-43 mpl. 1.0* KOP - OES 5217500 Angle No.: P00107991-43 mpl. 0.03* KOP - OES 521500 Angle No.: P00107991-43 mpl. 0.03* KOP - OES 521500 Angle No.: P00107991-43 mpl. 0.03* KOP - OES 521500 Angle No.: P00107991-43 mpl. 0.03*			plied	teSampled: Not Su	Da		ample 10. E001 2020 01042
Matsa- 0.4 mpl. 0.03* KP - OES 121500 Copper** 0.04 mpl. 0.03* KP - OES 121500 Angainese** 0.04 mpl. 0.03* CP - OES 121500 Angainese*** 0.01 mpl. 0.03* CP - OES 121500 Angainese*** 0.01 mpl. 0.03* CP - OES 121500 Sided*** 0.01 mpl. 0.04* CP - OES 121500 Sinc** 1.1 mpl. 0.04* CP - OES 121500 Sinc** 1.1 mpl. 0.64* CP - OES 121520 Vassium 35 mpl. 2.8** Pame AAS 121520 Vassium 0.63 mpl. 0.05* CP - OES 121520 Vassium* 0.63 mpl. 0.05* CP - OES 121520 Vassium* 0.63 mpl. 0.05* KP - OES 121520 Ample No.: PO0107991-43 mpl. 0.05*				trix: Digestate	Ma		sample ID: EPSL - 2020 - 00042
Doppen** 0.4 mpL 0.03* ICP - OES 191500 Daticum 119 mpL 1.5* Fume AAS 1211500 Anganese** 0.7 mpL 0.03* ICP - OES 1211500 Anganese*** 0.7 mpL 0.03* ICP - OES 1211500 Anganese*** 0.7 mpL 0.03* ICP - OES 1211500 inc*** 1.1 mpL 0.03* ICP - OES 1211500 inc*** 1.1 mpL 2.8** Pame AAS 1211500 inc*** 1.1 mpL 2.8** Pame AAS 1211500 idatasium 35 mpL 5.0* Pame AAS 1211500 idatasium 35 mpL 5.0* Pame AAS 1211500 iuminum** 2.2 mpL 1.0* ICP - OES 1211500 iuminum*** 0.03 mpL 0.00* ICP - OES 1211500 iample No.: PO0107991-43							Motals-
Saloum 119 mpL 1.94 Pame AAS 1210200 and" 0.64 mpL 0.025 121320 121520 Anganese" 0.01 mpL 0.025 121320 121520 Acket" 0.01 mpL 0.005 10P-0ES 121520 Acket" 0.01 mpL 0.005 10P-0ES 121520 Acket" 0.01 mpL 0.005 10P-0ES 121520 Acket" 0.01 mpL 2.84 Pame AAS 121520 Acket" 0.01 mpL 2.84 Pame AAS 121520 Acket" 0.03 mpL 5.0* Pame AAS 121520 Acket 0.03 mpL 0.05* 121520 121520	1.5	-	ICR. 055	0.03*	mol	0.4	Copper**
ead** 0.04 mpL 0.05* 10* 10* 10* Aarganese** 0.7 mpL 0.03* 10* 10* 121520 Aarganese** 0.7 mpL 0.03* 10* 121520 121520 inc** 1.1 mpL 0.05* 10* 015 121520 tagnesium 78 mpL 2.8** Pame AAS 121520 obassium 35 mpL 5.0* Pame AAS 121520 obassium 620 mpL 7.0* Pame AAS 121520 obassium 620 mpL 7.0* Pame AAS 121520 taminum** 2.2 mpL 1.0* 10* 121520 taminum** 2.2 mpL 0.05* 10* 121520 taminum*** 2.2 mpL 0.05* 10* 121520 taminum*** 2.0 0.05* 10* 121520 121520 tample No.: P00107991-43 Matrix: Dige	PPG	12/15/20	Dama AAS	1.944	mol	119	Calcium
Manganese** 0.7 mpL 0.03* ICP - 0ES 121520 icklef** 0.01 mpL 0.00* ICP - 0ES 121520 icklef** 0.01 mpL 0.05* ICP - 0ES 121520 tagnesium 1.1 mpL 0.05* ICP - 0ES 121520 tagnesium 35 mpL 2.8** Plane AAS 121520 ottassium 0.50 mpL 7.5* Plane AAS 121520 ottassium 0.50 mpL 1.0* ICP - 0ES 121520 itaminum** 0.03 mpL 0.05* ICP - 0ES 121520 itaminum** 0.03 mpL 0.05* ICP - 0ES 121520 itaminum** 0.63 mpL 0.05* ICP - 0ES 121520 itaminum** 0.63 mpL 0.05* ICP - 0ES 121520 itaminum** 0.5 mpL 0.05* ICP - 0ES 121520 itampL 0.03* ICP - 0ES	MLSA	12/10/20	100.000	0.0054	mol	0.04	ead**
édele** 0.01 mp1 0.00 ⁺ ICP-015 12/1520 inc** 1.1 mp1 0.05 ⁺ ICP-015 12/1520 inc** 1.1 mp1 2.8 ⁺⁺ Piane AAS 12/1520 idassium 35 mp1 2.8 ⁺⁺ Piane AAS 12/1520 odum 620 mp1 7.5 ⁺ Piane AAS 12/1520 idassium 620 mp1 7.5 ⁺ Piane AAS 12/1520 idassium 620 mp1 0.05 ⁺ ICP-0ES 12/1520 intrimum** 0.03 mp1 0.05 ⁺ ICP-0ES 12/1520 intrimum** 0.03 mp1 0.05 ⁺ ICP-0ES 12/1520 intrimum** 0.05 mp1 0.05 ⁺ ICP-0ES 12/1520 intrimum** 0.5 mp1 0.05 ⁺ ICP-0ES 12/1520 intrimum** 0.5 mp1 0.05 ⁺ ICP-0ES 12/1520 issair 0.05 mp1 0.0	PPG	12/15/20	100-003	0.035	mail	0.7	langanese**
inc** 0.00 mpL 0.000* ICP-085 121520 tagnesium 78 mpL 2.84* Plane AAS 121520 totasium 35 mpL 5.0* Plane AAS 121520 totasium 35 mpL 5.0* Plane AAS 121520 totasium 35 mpL 5.0* Plane AAS 121520 totasium 35 mpL 1.0* ICP+0ES 121520 totasium 0.03 mpL 0.05* 127520 121520 totasium*** 0.03 mpL 0.05* 127520 121520 totasium 0.03 mpL 0.05* 127520 121520 totasium 0.3 mpL 0.05* 127520 121520 totasium 103 mpL 0.05* 127520 127520 totasium 0.3 mpL 0.05* 127520 127520 totasium 0.3 mpL 0.05* 127520	PPG	12/15/20	ICP CES	0.0034	mail	0.01	äckel**
tagnesium 78 mpL 2.84 ^A Plane AAS 12/1520 totassium 35 mpL 5.0 ^A Plane AAS 12/1520 totassium 620 mpL 75 ^A Plane AAS 12/1520 luminum** 620 mpL 75 ^A Plane AAS 12/1520 luminum** 0.03 mpL 0.05 ^A 1CP - 0ES 12/1520 internum** 0.03 mpL 0.05 ^A 1CP - 0ES 12/1520 ample ID: EPSL - 2020 - 60043 DateSampled: Not Supplied 12/1520 12/1520 ample ID: EPSL - 2020 - 60043 Matrix: Digestate Matrix: Digestate 12/1520 opper** 0.5 mpL 1.9 ^A Flane AAS 12/1520 abum 103 mpL 1.9 ^A Flane AAS 12/1520 sad** 0.3 mpL 0.05 ^A 1CP - 0ES 12/1520 ckel** 0.01 mpL 0.03 ^A 1CP - 0ES 12/1520 optesum* 1.8 mpL 2.8	PPC	12/15/20	ICP - DES	0.065	mat	1.1	inc"
odassium 35 mpL 5.0° Plane AAS 12/1220 odum 620 mpL 75° Plane AAS 12/1520 Juminum** 22 mpL 1.0° ICP - 0ES 12/1520 Juminum** 22 mpL 1.0° ICP - 0ES 12/1520 Antomum** 0.0 0.005° ICP - 0ES 12/1520 Antomum** 0.0 0.005° ICP - 0ES 12/1520 Antomum** 0.0 DatoSampled: Not Supplied 12/1520 Anterial Matrix: Digestate 12/1520 12/1520 Actais- 0.5 mpL 0.03° ICP - 0ES 12/1520 Actais- 0.05 mpL 0.03° ICP - 0ES 12/1520 Actais- 0.05 mpL 0.03° ICP - 0ES 12/1520 Actais- 0.06 mpL 0.05° ICP - 0ES 12/1520 Adaptions 1.6 mpL 0.03° ICP - 0ES 12/1520 Adaptions <	PPG	12/15/20	ICP - DES	2 811	mai	78	lagnesium
odum 620 mpt 7.0° Plane AAS 12/1020 Juminum** 22 mpL 1.0° KDP - OES 12/1520 Internum** 0.03 mpL 0.05° IDP - OES 12/1520 Internum** 0.03 mpL 0.05° IDP - OES 12/1520 ample No.: P00107991-43 DateSampled: Not Supplied Matrix: Digestate IDP - OES 12/1520 ample No.: P00107991-43 DateSampled: Not Supplied Matrix: Digestate IDP - OES 12/1520 ample No.: P00107991-43 0.5 mgL 0.09° IDP - OES 12/1520 ample No.: P00107991-43 0.5 mgL 0.09° IDP - OES 12/1520 asarum 103 mgL 0.09° IDP - OES 12/1520 anganese** 0.01 mgL 0.03° IDP - OES 12/1520 asarum 29 mgL 0.04° IDP - OES 12/1520 asarum 29 mgL 0.05° IDP - OES 12/1520 <t< td=""><td>MLSA</td><td>12/12/20</td><td>FIRME AAS</td><td>5.00</td><td>mai</td><td>35</td><td>otassium</td></t<>	MLSA	12/12/20	FIRME AAS	5.00	mai	35	otassium
Juminum** D2 mpL 10° ICP - 0ES 12/1520 Internum** 0.03 mpL 0.005* ICP - 0ES 12/1520 >>> end of result set for Sample No. P00107991-42 <<<	MLSA	12/10/20 8	Plane AAS	264	mai	620	odium
Informum** I.I. Inpl I.U. ICP - 015 12/15/20 Imple No.: P00107991-43 ample ID: EPSL - 2020 - 00043 >>> end of result set for Sample No.:P00107991-42 <<	MLSA	12/12/20 5	Flame AAS	13-	mat	22	Juttinum"
>>> end of result set for Sample No.:P00107991-42 <<< ample ID: EPSL - 2020 - 00043 DateSampled: Not Supplied Matrix: Digestate detais- 0.5 mg4. 0.0* ICP - DES 12/1500 anganese** 0.5 mg4. 0.0* ICP - DES 12/1500 anganese** 0.3 mg4. 0.05* ICP - DES 12/1500 anganese** 0.3 mg4. 0.05* ICP - DES 12/1500 ockef** 0.01 mg4. 0.05* ICP - DES 12/1500 anganese 0.3 mg4. 0.05* ICP - DES 12/1500 ockef** 0.01 mg4. 0.05* ICP - DES 12/1500 agresium 74 mg4. 2.8** Filme AAS 12/1520 obum 632 mg4. 5.0* Filme AAS 12/1520 obum 632 mg4. 5.0* Filme AAS 12/1520 obum 632 mg4. 0.05* ICP - OES 12/1520 o	PPG	12/15/20	ICP - OES ICP - OES	0.005*	mp/L	0.03	hromium**
ample No.: P00107991-43 ample ID: EPSL - 2020 - 00043 Aetais- DateSampled: Not Supplied Matrix: Digestate Aetais- Matrix: Digestate 107 - 0ES 101500 abum 103 mgl. 0.03* ICP - 0ES 101900 abum 103 mgl. 0.03* ICP - 0ES 101900 abum 103 mgl. 0.05* ICP - 0ES 101900 abum 0.3 mgl. 0.05* ICP - 0ES 101500 abum 0.3 mgl. 0.05* ICP - 0ES 101500 ckel** 0.01 mgl. 0.05* ICP - 0ES 101500 abum 74 mgl. 2.8** Filme AAS 101200 bassium 29 mgl. 5.6* Filme AAS 101200 abum 632 mgl. 1.0* ICP - 0ES 101500 ddum 632 mgl. 1.0* ICP - 0ES 101500 ddum 632 mgl. 1.0* ICP - 0ES 101500	110		00107991-42 <<<	set for Sample No.	>>> end of result		
ample IDC EPSL - 2020 - 60043 Matrix: Digestate Aretais- 0.5 mpl. 0.03* ICP - 0ES 12/15/00 alcium 103 mpl. 0.05* ICP - 0ES 12/15/00 alcium 103 mpl. 0.05* ICP - 0ES 12/15/00 alcium 0.3 mpl. 0.05* ICP - 0ES 12/15/00 alcium 0.3 mpl. 0.05* ICP - 0ES 12/15/00 ckel** 0.01 mpl. 0.00* ICP - 0ES 12/15/00 nc** 1.6 mpl. 0.00* ICP - 0ES 12/15/00 nc** 1.6 mpl. 0.06* ICP - 0ES 12/15/00 stassium 2.9 mpl. 5.0* Fame AAS 12/12/00 dium 63.2 mpl. 1.0* ICP - 0ES 12/15/00 vamum*** 18 mpl. 1.0* ICP - 0ES 12/15/00 vamum*** 0.02 mpl. 0.05* ICP - 0ES 12/15/00 <td></td> <td></td> <td>lied</td> <td>Sampled: Not Sup</td> <td>Dat</td> <td></td> <td>ample No.: P00107991-43</td>			lied	Sampled: Not Sup	Dat		ample No.: P00107991-43
opper** 0.5 mpL 0.03* ICP - DES 12/15/20 alcium 103 mpL 1.9^A Flame AAS 12/15/20 additim 0.09 mpL 0.054 ICP - DES 12/15/20 adganese** 0.09 mpL 0.054 ICP - DES 12/15/20 idele** 0.01 mpL 0.03* ICP - DES 12/15/20 inc** 0.01 mpL 0.03* ICP - DES 12/15/20 inc** 0.01 mpL 0.03* ICP - DES 12/15/20 inc** 1.6 mpL 0.00* ICP - DES 12/15/20 inc** 1.6 mpL 2.6** Flame AAS 12/12/20 idum 632 mpL 5.6* Flame AAS 12/12/20 idum 632 mpL 0.05* ICP - DES 12/15/20 idum 0.22 mpL 0.05* ICP - DES 12/15/20 idum 0.20 mpL 0.05*				rix: Digestate	Mat		ample ID: EPSL - 2020 - 00043 /letais-
akoum 103 mpt 0.05 kP Plane AAS 12/1500 sad" 0.09 mpt 0.05^ 10P 0CS 12/1500 sad" 0.09 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.3 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.3 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.3 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.01 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.01 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.01 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.02 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.01 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.01 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.01 mpt 0.05^ 10P 0CS 12/1500 ckel" 0.02 mpt 0.05^ 10P 0CS 12/1500 ckel 0.02 mpt 0.005^ 10P 0CS 12/1500 ckel 0.005^ 10P 0CS 12/1500 ckel 0.005^ 10P 0CS 12/1500 ckel 0.005^ 10P 0CS 12/1500 ck			100 044	0.000	mat	0.5	opper**
bad" 0.0 mpl 1.0** Fame AAS 12/10/0 anganese"* 0.3 mpl 0.05* 10P - 0ES 12/15/0 ckel** 0.01 mpl 0.03* 10P - 0ES 12/15/0 nc** 0.01 mpl 0.03* 10P - 0ES 12/15/0 agnesium 74 mpl 0.05* 10P - 0ES 12/15/0 agnesium 74 mpl 2.8** Filme AAS 12/12/0 blassum 29 mpl 5.0* Filme AAS 12/12/0 obum 632 mpl 75* Filme AAS 12/12/0 uminum** 0.02 mpl 0.05* 60* - 0ES 12/15/0 versmum** 0.02 mpl 0.05* 60* - 0ES 12/15/0 versmum** 0.02 mpl 0.05* 60* - 0ES 12/15/0 versmu** 0.02 mpl 0.05* 60* - 0ES 12/15/0 versmu** 0.02 mpl 0.05* <td< td=""><td>PPG</td><td>12/15/20 p</td><td>ich - Ces</td><td>1.000</td><td>mail</td><td>103</td><td>alcium</td></td<>	PPG	12/15/20 p	ich - Ces	1.000	mail	103	alcium
anganese** 0.3 mpt 0.000* 10P - 0ES 12/15/20 ckel** 0.01 mpt 0.03* 10P - 0ES 12/15/20 nc** 1.6 mpt 0.05* 12/15/20 12/15/20 appesium 74 mpt 0.05* 12/15/20 12/15/20 stassum 29 mpt 5.0* Flame AAS 12/15/20 odum 632 mpt 75* Flame AAS 12/15/20 umnum** 18 mpt 1.0* 6/2* - 0ES 12/15/20 umnum** 0.02 mpt 5.0* Flame AAS 12/15/20 umnum** 0.02 mpt 1.0* 6/2* - 0/2S 12/15/20 versmum** 0.02 mpt 0.05* 12/* 0/2* 12/15/20	MLSA	12/10/20 M	France AAS	0.0000	mol	0.09	sad**
Oxel** 0.01 mpt 0.02* 10°- 0.05 121520 nc** 1.6 mpt 0.05* 10°- 0E5 121520 nc** 1.6 mpt 0.05* 10°- 0E5 121520 spresium 74 mpt 2.8** Filme AAS 121200 daum 632 mpt 75* Filme AAS 1217020 ummum** 632 mpt 1.0* 10°- 0.25 1217200 ummum** 0.02 mpt 1.0* 10°- 0.55 1217200 vecmum** 0.02 mpt 1.0* 10°- 0.55 121520 vecmum** 0.02 mpt 0.05* 10°- 0.5 121520	PPG	12/15/20 p	KOP - OCS	0.005	mod	0.3	anganese"
nc** 0.03* mpt 0.003* iCP - 0ES 12/1500 spnesium 74 mpt 2.8** Filmer AAS 12/1500 stassium 29 mpt 5.6* Filmer AAS 12/1520 stassium 632 mpt 75* Filmer AAS 12/1520 uminum** 18 mpt 1.0* iCP - 0ES 12/1520 uminum** 0.02 mpt 0.005* iCP - 0ES 12/1520 >>> end of result set for Sample No.:P00107991-43 <<< th>12/1520 t2/1520 t2/152 t2/1520 t2/1520 t2/1520 t2/1520 t2/1520 t2/1520 t2/1520 t2	PPG	12/15/20 P	ICP - OES	0.03*	mol	0.01	ckel**
apnesium 174 mpt 0.00° 10°-0.65 12/1500 ttassium 29 mpt 5.0° Flame AAS 12/1220 dium 632 mpt 75° Flame AAS 12/1220 dium 632 mpt 75° Flame AAS 12/1220 ummum** 18 mpt 1.0° 10°-0.65 12/1220 tromum** 0.02 mpt 0.005° 10°-0.65 12/1500 >>> end of result set for Sample No.:P00107991-43 <<< ample No.: P00107991-44 DateSampled: Not Supplied mpte ID: EPSL - 2020 - 00044 Matrix: Digestate	PPG	12/15/20 P	ICP - CES	0.003-	mod	16	nc""
Stassium 2.9" Flame AAS 12/1220 odum 632 mpL 56" Flame AAS 12/1020 ummum* 632 mpL 75" Flame AAS 12/1020 ummum* 18 mpL 1.0" ICP - CES 12/1520 tremum** 0.02 mpL 0.05" iCP - OES 12/1520 ample No.: P00107991-44 OatoSampled: Not Supplied ISTS20 ISTS20 mple ID: EPSL - 2020 - 00044 Matrix: Digestate Gase ISTS20	PPG	12/15/20 p	ICP - DES	2.855	mat	74	agnesium
bd/um 5.0° Fame AAS 12/10/20 ummum** 63/2 mp/L 75° Fame AAS 12/10/20 ummum** 18 mp/L 1.0° ICP- OES 12/15/20 internum** 0.02 mp/L 0.05° iCP- OES 12/15/20 internum** 0.02 mp/L 0.05° iCP- OES 12/15/20 imple No.: P00107991-44 DateSampled: Not Supplied mple ID: EPSL - 2020 - 00044 Matrix: Digestate	MLSA	12/12/20 M	Fierre AAS	2.0	mail	29	stassium
umainum** 18 mpL 75° Flame AAS 12/12/20 tromum** 0.02 mpL 1.0^ ICP - OES 12/15/20 >>> end of result set for Sample No.:P00107991-43 <<< mple No.: P00107991-44 DateSampled: Not Supplied mple ID: EPSL - 2020 - 00044 Matrix: Digestate	MLSA.	12/10/20 M	Fiame AAS	5.0*	mai	632	dium
womum** 1.0°	MLSA	12/12/20 M	Flame AAS	75	mail	10	uminum**
0.02 mpL 0.005 ICP - OES 12/15/20 >>> end of result set for Sample No.: P00107991-43 <<<	PPG	12/15/20 P	ICP - OES	1.0*	mgi.	10	nomium"
>>> end of result set for Sample No.: P00107991-44 DateSampled: Not Supplied mple ID: EPSL - 2020 - 00044 Matrix: Digestate crais- coeff	PPG	12/15/20 p	ICP - OES	0.005*	mgr.	0.02	
mple INU. F90 107 391-44 DatoSampled: Not Supplied mple ID: EPSL - 2020 - 00044 Matrix: Digestate coals- coart**			0107991-43 <<<	et for Sample No.:P	>> end of result :	,	mole No - Desteros
mpre m2: EPSL - 2020 - 00044 Matrix: Digestate			ied	Sampled: Not Supp	Date		mple No.: P00107991-44
etais-			1910	x: Digestate	Mate		imple ID: EPSL - 2020 - 00044
noer**				- ground			etais-
				1000		0.7	oper**
cium 0, man 0.03* iCP055 12/15/20	PPG	12/15/20 pt	ICP - OES	0.03*	mge.	0.7	lolum
94 mpt 19 ⁴⁴ Flame AAS 13/10/20	MISA	12/10/20	Flame AAS	1.9**	mpc.	24	C (1997) 24



 Address: Bldg. 2 Berthaphil Compound 1, Berthaphil Inc. Industrial Park, Jose Abad Santos Ave. Clark Freeport Zone (CFZ), Pampanga, 2023 Philippines Tel: (6345) 599-3943 * (6345) 499-6529 * (632) 8552-5100 * Fax: (6345) 599-3963 Email: erl@crllabs.com * http://www.crllabs.com

Test Description	Results	Units	MDL	Test Methods	Date Analyzed	By	Re
-Metals-	1						-
Lead**	0.06	mail	0.0054	109.055	13115.000		
Manganese"	0.6	mat	0.035	ICP . 055	12/15/20	PPG	
Nickel**	0.02	mail	0.0034	109-065	12/10/20	PPG	
Zinc**	0.6	mail	0.05*	100.055	12/15/20	PPG	
Magnesium	74	mail	2.8**	Elama AAS	12/10/20	PPG	
Potassium	33	mot	5.0*	Fiame 110	1,01,0100	MLSA	
Sodium	602	mail	76*	Flame 145	12710/20	NLSA	
Aluminum**	23	mat	1.00	100.005	12/12/20	MLSA.	
Chromium**	0.03	mgi.	0.005*	ICP - OES	12/15/20	PPG	
		>>> end of resu	It set for Sample N	:P00107991-44 <<<			-
Sample No.: P00107991-45		Di	deSampled: Not S	upplied			
Sample ID: EPSL - 2020 - 00045 -Metals-		M	atrix: Digestate				
Copper"	0.7	mg/L	0.03*	ICP - DES	12/15/20	0.00	
Calcium	87	mpl.	1.9^^	Flame AAS	12/10/20	AR CA	
Load**	0.05	mg/L	0.005*	ICP - CES	12/16/20	80.00	
Manganose"	0.6	mg/L	0.03^	ICP - CES	12/16/20	800	
Nickel**	0.01	mg/L	0.003*	ICP - OES	12/15/20	000	
Zinc**	0.7	mg/L	0.05^	ICP - OES	12/15/20	000	
Magnesium	42	mg/L	2.0**	Flame AAS	12/12/20	PPUS	
Potassium	24	mg/L	5.0^	Flame AAS	12/10/20	MLDA	
Sodium	459	mg/L	75^	Flame AAS	12/13/00	MLSA N	
Aluminum"	11	mp/L	0.5^	ICP - DES	12/15/00	80.00	
Chromium**	0.02	ngt	0.005^	ICP - OES	12/15/20	PPG	
		>>> end of result	t set for Sample No	.:P00107991-45 <<<			-
Sample No.: P00107991-46		Da	teSampled: Not S	applied			
Sample ID: EPSL - 2020 - 00046		Ma	trix: Digestate				
Metals-							
Copper**	0.03	mail	0.0004	100 000			
Calcium	121	mail	1.645	ICP - DES	12/15/20	PPG	
Lead**	0.01	mat	0.0044	Plane AAS	12/10/20	MLSA	
Manganese**	0.1	ma/L	0.0065	ICP - GES	12/15/20	PPG	
Nickel**	0.006	mol	0.0004	ICP - CES	12/15/20	PPG	
Zinc**	0.2	mail	0.0054	107-018	12/15/20	PPG	
Magnesium	74	mg/L	2 844	Elama ATR	12/15/20	PPG	
Potassium	25	mail	5.0*	Fiend AllS	12/12/20	MLSA	
Sodium	532	mpl	75*	Fiame AAR	12/10/20	MLSA.	
Vuminum**	13	mpl	0.5*	10.000	12/12/20	MLSA	
Chromium**	0.01	mgil.	0.005*	ICP-015	12/15/20	PPG PPG	
		>>> end of result	set for Sample No.	P00107991-45 <<<			-
Sample No.: P00107991-47		Dat	eSampled: Not Su	pplied			
Motais-		Mat	rix: Digestate				
lopper"	0.7	mail					
aloium	101	mail	0.06*	ICP - OES	12/15/20	PPG	
ead**	0.2	mot	0.064	Fiamo AAS	12/10/20	MLSA.	
langanese"	0.6	mat	0.051	ICP - CES	12/15/20	PPC	
ickel**	0.02	mail.	0.000	OF OES	12/15/20	PPG	
inc**	1.6	mail	0.10	ICP - DES	12/15/20	PPG	
agnesium	65	mpl	2.8**	Elime Are	12/15/20	PPG	
	28	mail.	5.01	Filme Ard	12/12/20	MLSA	
otassium	511	mg1.	75*	Finne Avg	12/10/20	MLSA	
otadisium odium		mg/L	1.04	102.005	12/12/20	MLSA	
ofielsium odium uminum**	20		0.0044	ICP - DES	12/15/20	PPG	
otasium odium uminum** hromium**	0.03	mgit.	0.000-		12/14/00		
otasium odium uminum** hromium**	0.03	mpi.	et for Sample No	P00107991-47 <<<	12/15/20	mu	_
otasium odium uminum'' hromium'' ample No.: P00107991-48	0.03	mgil. >>> end of result : Date	et for Sample No :	P00107991-47 <<<	12/15/20		
otastium odium uminum'" hromium'" ample No.: P00107991-48 umple ID: EPSL - 2020 - 00048	0.03	mgil. >> end of result r Date	set for Sample No	P00107991-47 <<< plied	12/15/20		-
otasium odium luminum'* heomum'* ample No.: P00107991-48 ample ID: EPSL - 2020 - 00048 fetais-	0.03	mpil. >> end of result : Date Matr	set for Sample No Sampled: Not Sup ix: Digestate	P00107991-67 <<< plied	12/15/20		
otastium odium wminum** hromium** ample No.: P00107991-48 mple ID: EPSL - 2020 - 00048 letals- unger**	0.03	mpi. >> end of result r Date Matr	set for Sample No Sampled: Not Sup ix: Digestate	P00107991-47 <<< plied	12/15/20		
otastium odium uminum'* hromium'* ample No.: P00107991-48 imple ID: EPSL - 2020 - 00048 letais- isper'*	0.03	mpl. >> end of result r Date Matr mpt.	et for Sample No : Sampled: Not Sup ix: Digestate	P00107991-47 <<< plied	12/15/20	r v	
otastium odium uminum'" hromium'" ample No.: P00107991-48 imple ID: EPSL - 2020 - 00048 letats- ipper" iloum	0.6 102	mgi. >> end of result : Date Matr mgi. mgi.	et for Sample No : Sampled: Not Sup ix: Digestate 0.03* 1.9**	P00107991-47 <<< plied ICP - OES Flame AAS	12/15/20	PPG	



 Address: Bldg. 2 Berthaphil Compound 1, Berthaphil Inc. Industrial Park, Jose Abad Santos Ave. Clark Erceport Zone (CEZ), Pampanga. 2023 Philippines Tel: (6345) 599-3943 * (6345) 499-6529 * (632) 8552-5100 * Fax: (6345) 599-3963 Email: erl@crilabs.com * http://www.erllabs.com

Test Description	Results	Units	MDL.	Test Methods	Date Analyzed	By
-Metals-	1					
ead"		mad	0.061	100 010		
Jannanese''	0.0	mail	0.00	100-005	12/15/20	PPG
inangan rese Jinkal	0.00	engel.	0.03*	ICP - DES	12/15/20	PPG
E-content Z-acontent	0.02	enger.	0.003-	ICP - DES	12/15/20	PPG
Manager and American	0.0	mgn.	0.03*	ICP - DES	12/15/20	PPG
Protection of the second	62	mgr.	2.8%	Flame AAS	12/12/20	MLSA
-otassium	33	mpt	5.0*	Flame AAS	12/10/20	MLSA.
sodium	573	mgs.	75*	Flame AAS	12/12/20	MLSA
Auminum"	23	mar	1.0*	ICP - OES	12/15/20	PPG
Chromium	0.03	mgit	0.005	ICP - CES	12/15/20	PPG
		>>> end of resu	It set for Sample No	o.:P00107991-48 <<<		
Sample No.: P00107991-49		D	iteSampled: Not S	upplied		
sample ID: EPSL - 2020 - 00049		M	atrix: Digestate			
Metals-						
Sanaar**					10 mar	
hicium	0.0	ingra	0.06*	ICP - DES	12/15/20	PPG
and**	97	mpt	1.94	Flame AAS	12/10/20	MLSA
(accanese)	0.1	mpit	0.005*	ICP - OES	12/15/20	PPG
deteal 1	0.4	mpr.	0.03*	ICP - OES	12/15/20	PPG
woker Soott	0.3	mg/L	0.03^	ICP - CES	12/15/20	PPG
one	1.9	mg/L	0.1*	ICP - CES	12/15/20	PPG
lagnesium	77	mg/L	2.8**	Fiame AAS	12/12/20	MLSA.
Actassium	32	mg/L	5.0*	Flame AAS	12/10/20	MLSA.
sodium	554	mg/L	75*	Flame AAS	12/12/20	MLSA
Vuminum"	18	mgit.	1.0*	ICP - OES	12/15/20	PPG
chromum**	0.02	mg/L	0.005*	ICP - GES	12/15/20	PPG
		>>> end of result	t set for Sample No	:P00107991-49 <<<		
Sample No.: P00107991-50		Da	teSampled: Not Su	upplied		
Sample ID: EPSL - 2020 - 00050		Ma	trix: Digestate			
Metals-			inter orgentate			
Anna II						
halpinen	0.8	mg/L	0.06*	ICP - CES	12/15/20	PPG
and the	97	mgr	1.9**	Flame AAS	12/10/20	MLSA
eac la	0.05	mg/L	0.005*	ICP - OES	12/15/20	PPG
vanganese."	0.2	mgit.	0.02*	ICP - OFS	12/15/20	PPG
acke	0.1	mgit.	0.003*	ICP - DES	12/15/20	PPG
inc"	0.8	mg/L	0.06*	ICP - DES	12/15/20	PPG
agnesium	63	mpt.	2.8**	Flame AAS	12/12/20	MI SA
otassium	28	mg/L	5.0*	Flame AAS	12/10/20	and deal
						MLSA
iodium	574	mg1.	75^	Flame AAS	12/12/00	MLSA
iodium Juminum**	574 16	mgt. mgt	75*	Flame AAS ICP - CES	12/12/20	MLSA MLSA
odium luminum** hromium**	574 16 0.01	mgit. mgit,	75* 1.0* 0.005*	Flame AAS ICP - OES ICP - OES	12/12/20 12/15/20 12/15/20	MLSA MLSA PPG PPG
iodium Iuminum** ihromium**	674 16 0.01	mg/L mg/L >>> end of result	75* 1.0* 0.005* set for Sample No.	Flame AAS ICP - CES ICP - CES ICP - CES	12/12/20 12/15/20 12/15/20	MLSA MLSA PPG PPG
iodium Iumnum** Ihiomium** ample No.: P00107991-51	574 18 0.01	mgt, mgt, >>> end of resul	75* 1.0* 0.005* set for Sample No.	Fame AAS IOP - OES IOP - OES IP00107991-50 <<< polled	12/12/20 12/15/20 12/15/20	MLSA MLSA PPG PPG
iodium Juminum** Ihromium** ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051	574 16 0.01	mgt, mgt, >>> end of resul Dat	75* 1.0* 0.005* set for Sample No. eSampled: Not Su	Fiame AAS ICP - DES ICP - DES ICP - DES ICP - DES ICP - DES ICP - DES ICP - DES	12/12/20 12/15/20 12/15/20	MLSA MLSA PPG PPG
iodium iuminum** ihromium** ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 Iletais-	574 18 0.01	mgt, mgt, >>> end of resul Dat Mar	75* 1.0* 0.005* I set for Sample No. eSampled: Not Su trix: Digestate	Fiame AAS ICP - DES ICP - DES ICP - DES ICP - DES ICP - DES ICP - DES	12/12/20 12/15/20 12/15/20	MLSA MLSA PPG PPG
odium luminum** hiomium** ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 /etais-	574 18 0.01	mgL mgL mgL >>> end of resul Dat Mar	75* 1.0* 0.005* I set for Sample No. I set for Sampled: Not Su trix: Digestate	Fiame AAS ICP - DES ICP - DIS IP00107991-50 <<< pppfied	13/12/20 12/15/20 12/15/20	MLSA MLSA PPG PPG
odium umnum** hiomium** ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 /etais- opper**	574 18 0.01	mgL mgL mgL >>> end of resul Dat Mar	75* 1.0* 0.005* set for Sample No. #Sampled: Not Su trix: Digestate 0.02*	Fiame AAS ICP - OES ICP - OES P00107991-50 <<< pplied	12/12/20 13/15/20 12/15/20	MLSA MLSA PPG PPG
odium uminum** hiomium** ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 fetais- opper** alcium	574 16 0.01 0.2 120	mgL mgL >>> end of result Dat Mar mgL mgL	754 1.0° 0.005* I set for Sample No. #Sampled: Not Su trix: Digestate 0.02* 1.9**	Fiame AAS ICP - DES ICP - DES :P00107991-50 <<< pplied ICP - DES Fiame AAS	12/12/20 12/15/20 12/15/20 12/15/20 12/15/20	MLSA MLSA PPG PPG
odium uminum" hiomium"" ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 fetais- opper" aldum ad"	574 18 0.01 0.2 120 0.03	mg/L mg/L >>> end of result Dat Mar mg/L mg/L mg/L	75* 1.0* 0.005* I set for Sample No. II set for Sampled: Not Su trix: Digestate 0.02* 1.5** 0.005*	Fiame AAS ICP - OES ICP - OIS IP00107991-50 <<< ppplied ICP - OES Fiame AAS ICP - OES	12/12/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20	MLSA MLSA PPG PPG MLSA BPG
odium umnum** hiomium** ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 /etais- opper** aldum sad** ampaese**	574 16 0.01 0.2 120 0.03 0.2	mgiL mgiL >>> end of resul Dat Mar mgiL mgiL mgiL	75* 1.0* 0.005* iset for Sample No. #Sampled: Not Su #Sampled: Not Su 0.02* 1.5** 0.005* 0.005* 0.02*	Fiame ALS ICP - OES ICP - OES P00107991-50 <<< pplied ICP - OES Fiame ALS ICP - OES ICP - OES	12/12/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20	MLSA MLSA PPG PPG MLSA PPG
odium uminum"* hiomium"* ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 fetals- opper** alicium sad** anganese** ckel**	574 16 0.01 120 0.03 0.2 0.03 0.2 0.08	mgL mgL >>> end of result Dat Mar mgL mgL mgL mgL mgL	75* 0.005* set for Sampled: Not Su trix: Digestate 0.02* 1.5** 0.005* 0.02* 0.005*	Fiame AAS ICP - OES ICP - OES ICP - OES Fiame AAS ICP - OES ICP - OES ICP - OES ICP - OES	12/12/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20	MLSA MLSA PPG PPG MLSA PPG PPG
odium uminum** hiomium** ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 fetals- opper ** nickum tad** anganese** ckel**	574 16 0.01 0.2 120 0.03 0.2 0.03 0.2 0.08 1.0	mgL mgL >>> end of result Dat Mar mgL mgL mgL mgL mgL mgL	75* 10* 0.005* iset for Sampled: Not Su trix: Digestate 0.02* 1.9** 0.005* 0.005* 0.005* 0.005*	Fiame AAS ICP - OES ICP - OES P00107991-50 <<< ppplied ICP - OES ICP - OES	12/12/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20	MLSA MLSA PPG PPG MLSA PPG PPG PPG
odium umnum** hisomium** ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 /etais- opper** alcum sad** anganese** ckel** ct** legnesium	574 16 0.01 0.2 120 0.03 0.2 0.08 1.0 71	mgL mgL >>> end of result Dat Mar mgL mgL mgL mgL mgL mgL mgL	75* 1.0* 0.005* iset for Sampled: Not Su iset for Sampled: Not Su iset* 0.02* 1.5** 0.02* 0.05* 0.02* 0.05* 0.05* 0.05*	Fiame AAS ICP - OES ICP - OES P00107991-50 <<< pplied ICP - OES Fiame AAS ICP - OES ICP - O	12/12/20 13/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20	MLSA MLSA PPG PPG MLSA PPG PPG PPG PPG PPG
odium luminum"* hiomium"* ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 letais- opper** alcium sad** anganese** ckel** cc** Agnesium Assium	574 16 0.01 120 0.03 0.2 0.08 1.0 71 31	mgL mgL mgL Dat Mar mgL mgL mgL mgL mgL mgL mgL mgL mgL	75* 0.005* set for Sampled: Not Su trix: Digestate 0.02* 1.5** 0.005* 0.02* 0.005* 0.02* 0.005* 0.005* 0.005*	Fiame AAS ICP - OES ICP - OES P00107991-50 <<< pplied ICP - OES Fiame AAS ICP - OES ICP - OES ICP - OES ICP - OES ICP - OES Fiame AAS Fiame AAS Fiame AAS	12/12/20 13/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20	MLSA MCSA PPG PPG MLSA PPG PPG PPG PPG MLSA
odium ummum** hiomium** ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 fetals- opper** alcium anganese** ckel** agnesum tassium dium	574 16 0.01 0.2 120 0.03 0.2 0.08 1.0 71 31 680	mgL mgL mgL >>> end of result Dat Mar mgL mgL mgL mgL mgL mgL mgL mgL mgL mgL	75* 10* 0.005* Iset for Sampled: Not Su trix: Digestate 0.02* 1.9** 0.005* 0.0	Fiame AAS ICP - OES ICP - OES ICP - OES PD0107991-50 <<< ppfied ICP - OES ICP - O	12/12/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20	MLSA MLSA PPG PPG MLSA PPG PPG PPG MLSA MLSA
odium ummum"* hisomium** ample No.: P00107991-51 ample ID: EPSL - 2020 - 00051 letais- opper** alcium sad** anganese** ckel** nc** legnesium tassium dium uminum**	574 16 0.01 0.2 120 0.03 0.2 0.08 1.0 71 31 680 16	mgt. mgt. >>> end of result Dat Mar mgt. mgt. mgt. mgt. mgt. mgt. mgt. mgt.	75* 10° 0.005* iset for Sampled: Not Su iset for Sampled: Not Su iset for Sampled: Not Su 0.02* 0.02* 0.05	Fiame AAS ICP - OES ICP - OES P00107991-50 <<< pplied ICP - OES Fiame AAS ICP - OES ICP - O	12/12/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20 12/15/20	MLSA MLSA PPG PPG MLSA PPG PPG PPG PPG MLSA MLSA MLSA

>>> end of result set for Lab No. (P00107991; Total no. of samples analyzed; 51 <<<

"Reporting Limit/s

"PAB approved parameter/s MDL = Method Detection Limit/s



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Results are reported "as received basis". ND = Not Detected (Below Reporting Limits) ^DLR = Detection Limit's for Reporting (MDL x Dilution Factor) ICP - OES = Inductively Coupled Plasma - Optical Emission Spectroscopy Shimadzu Analytical Methods, Atomic Absorption Spectrophotometry (AAS) Test Methods for Evaluating Solid Wastes, Vol 1A, USEPA, Third Edition



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Date: 2/2/20

Man Date:

Morrow Date:

SN: F00078693.001

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APPENDIX 3: RESIDUAL HISTOGRAM AND OBSERVED/PREDICTED SCATTER PLOT OF PMF FACTOR SPECIES







APPENDIX 4: SOURCE APPORTIONMENT OF AIR PARTICULATE MATTER (EPSL-SAAPM)

ENVIRON FOLLUTS STUDIES Libora Arregod	NMENTAL ION S TORY scientism		SOURCE APPORTION	IMENT OF AIR PAR (EPSL-SAAPM)	TICULATE MATTER		
US EPA PMF v5	TEST #:EPS	SL-SAAPM-2020-001	Date of Model Run	December 19, 2020			
NAME	EMB-Region	13					
Location	Intercity Sta	tion, Wakas, Bocaue, Bulacan					
Sample type	Air Particula	te Matter as Total Suspended Particulat	es (TSP), sampled in Glass fiber filter				
Number of Filters submitted	51						
Phase 1: PMF Model Run r	results				Descriptive statistics		
**** Input Data Statistics ***			ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Species	Category	S/N	Min	25th	Median	75th	Max
TSP	Strong	4	7.9432	19.2945	31.1202	39.8179	366.1678
Ca	Strong	9	0.0009	0.0140	0.0204	0.0292	1.4598
Ph	Strong	9	0.0003	0.0012	0.0029	0.0058	0.0175
Mn	Strong	9	0.0026	0.0058	0.0131	0.0175	0.0292
Ni	Strong	9	0.0001	0.0003	0.0004	0.0006	0.0088
Zn	Strong	9	0.0020	0.0197	0.0263	0.0328	0.1839
Mg	Strong	4	0.7591	1.7517	1.9269	2.1094	2.4232
ĸ	Strong	9	0.3795	0.7007	0.7883	0.8759	1.0218
Na	Strong	4	3.6494	5.9850	7.2696	8.3864	11.1818
Ĉ,	Strong	9	0.0003	0.0006	0.0006	0.0009	0.0020
**** Base Run Summary ****	•						
Species	Intercept	Slope	SE	r^2	Stat	P Value	Remarks
ISP	22.3232	-0.0034	8.1283	0.0007	0.1254	0.4115	PASSED
Ca	0.0014	0.9272	0.1463	0.9662	0.0952	0.7551	PASSED
Pb	0.0001	0.9713	0.0004	0.9909	0.1928	0.0485	PASSED
Mn	0.0005	0.9236	0.0024	0.8892	0.1068	0.6189	PASSED
Ni	0.0001	0.9073	0.0001	0.9942	0.3071	0.0002	PASSED
Zn	0.0178	0.3173	0.0095	0.4229	0.2191	0.0164	PASSED
Mg	0.5584	0.6528	0.2933	0.3327	0.1009	0.6888	PASSED
K	-0.0819	1.0889	0.1052	0.6502	0.1711	0.1071	PASSED
AI	0.1868	0.0900	0.1142	0.0169	0.0466	0.4228	PASSED
G.	0.0003	0.5058	0.0002	0.5953	0.1212	0.4545	PASSED
Rese model sus sumber	4	Resolved TSP	factor sources				
Number of Energy rung:	5	Factor 2	2.86				
Number of factors:	ĕ	Factor 2	4.33				
Extra modeling uncertainty	(*0	Factor 4	6.49				
Fpeak #	·-1	Factor 5	1.76				
Converged	Yes	Factor 6	6.28				
Phase 2: Profiles and Con	tributions	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
Indicator for	Ratio	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
vehicles only	Cu/Cr	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
vehicles only	Cu/Mg	25% chance vehicle	25% chance vehicle	25% chance vehicle	25% chance vehicle	25% chance vehicle	25% chance vehicle
vehicles only	Cu/Ni	50% chance Gasoline vehicle (MC)	Not applicable	100% chance Diesel vehicles	25% chance Diesel vehicles	Not applicable	100% chance Diesel vehicles
ALL ONLY	Mg/Al	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Gas(4W) BB RD only	Mg/Cr	100% chance Road dust	100% chance Road dust	100% chance Road dust	100% chance Road dust	100% chance Road dust	100% chance Road dust
Gas(4W), BB, RD only	Mn/Mg	25% chance Biomass	25% chance Biomass	25% chance Biomass	25% chance Biomass	25% chance Biomass	25% chance Biomass
BB, RD only	Mn/Na	25% chance Biomass burning	25% chance Biomass burning	50% chance biomass burning	25% chance Biomass burning	25% chance Biomass burning	25% chance Biomass burning
BB, RD only	Na/Al	Not applicable	Not applicable	50% chance Biomass Burning	Not applicable	Not applicable	Not applicable
ALL except Gas (4W)	Na/Cr	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
vehicles only	Ni/Cr	Not applicable	25% chance vehicle	50% chance vehicle	25% chance vehicle	25% chance vehicle	25% chance vehicle
BB only	Pb/Xg Pb/Zc	25% chance Gasoline vehicles (4W) 25% chance Biomere	25% chance Gasoline vehicles (4W) 25% chance Biomere	100% chance Biomass Burning	20% chance Gasoline vehicles (4W) 50% chance Biomass Burning	20% chance Gasoline vehicles (4W) 25% chance Biomere	20% chance Gasoline vehicles (4W) 50% chance Biomass Burging
	1 0/2/1	20 /0 change Biolitass	20 re chance Diolitass		Lo // change bronade Builling	20 yr charlos Diolilass	A Grance Diomass Bulling

Analysed by: Mylene G. Cayetano RCh. PhD Active Science Control (1997) Cate: December 28, 2020 Head, Environmental Pollution Studies Laboratory Page 1 of 2

page 2 of 2									
DIAGNOSTICS			Contribution to TSP		Percentage of TSP				
Percentage	TSP	Biomass Burning Source	Road Dust Source	Vehicle Emission Sources	Biomass Burning Source	Road Dust Source	Vehicle Emission Sources		
Factor 1	0.53	0.2	0.1	0.2	33%	28%	39%		
Factor 2	2.86	10	0.8	11	33%	28%	39%		
Factor 3	4.33	1.6	1.0	1.8	36%	23%	41%		
Factor 4	6.49	1.7	2.0	2.8	26%	30%	43%		
Factor 5	1.76	0.7	0.4	0.6	42%	21%	37%		
Factor 6	6.28	1.8	1.5	3.0	29%	24%	48%		
Description		Highest percentage	Mixed with	Strong indicator for		Diesel vehicles	Gasoline véhicles		
Factor 1		Biomass Burning	RD						
Factor 2		Vehicle Emissions	RD	Gasoline (4W) vehicles	Frankis and Malakaka Basadard		26%		
Factor 3		Vehicle Emissions	BB, RD	Diesel Vehicles	Fraction of Venicles Resolved	41%	0		
Factor 4		Vehicle Emissions	RD	Gasoline & Diesel vehicles		14%	10%		
Factor 5		Biomass Burning	RD						
Factor 6		Vehicle Emissions	RD	Gasoline & Diesel vehicles		38%	10%		
		Les a la constante de la consta	Percentage in TSP	Sub-percentage			and March		
01/50411		Biomass burning	33%				TT Sulling		
OVERALL		Road dust	26%		and the second se				
		Venicle emissions	4176	289/	1000 1000				
		Cosoline unhides		120/	///////////////////////////////////////	(helded)	addiass /		
TSP: Total Suspended Par	ticulates: S/N: !	Signal to Noise Ratio: SE: Sta dard Erro	or BB' Biomass Burning	13 /6	Gasoline	amirrion	335		
RD: Road Dust: 4W: Four-W	Wheeler vehicle	s: VES: Vehicle Emission Source			Venices .	415			
					13%	S1177771111			
					Diesel				
					vehicles //		111111111111111111111111111111111111111		
					×//////////280%//		8//////////////////////////////////////		
					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Road dust		
							26%		
		10/00/0000 107					24441111111111111111111111111111111111		
Analysed by: Mylene G. Ca	yetano RCh, P	hD 222020-197	Date: December 28, 2020						
Head, Environme	ntal Pollution S	tudies Laboratory	Page 2 of 2						

#### APPENDIX 5: TIME SERIES OF SOURCE CONTRIBUTION



Factor 1: Biomass Burning emissions mixed with Road dust

Factor 2:Vehicle Emissions mixed with Road dust



Factor 3: Vehicle Emissions (Diesel) mixed with Biomass Burning emissions and Road dust



Factor 4:Vehicle Emissions (Diesel and Gasoline) mixed with Road dust





Factor 5: Biomass Burning emissions mixed with Road dust

Factor 6:Vehicle Emissions (Gasoline and Diesel) mixed with Road dust

