

**ENCINA WASTEWATER AUTHORITY
6200 AVENIDA ENCINAS
CARLSBAD CA 92011**

REPORT OF ANALYSIS

For: (20352) ENCINA WASTEWATER AUTHORITY
FERTILIZER ANALYSIS

Analysis	Level Found		Reporting		Analyst- Date	Verified- Date
	As Received	Units	Limit	Method		
Sample ID: EWA PELLETS	Lab Number: 2653281	Date Sampled: 2017-04-04 0850				
Carbon nitrogen ratio C/N	6 : 1		0.1	Calculation	Auto-2017/04/12	Auto-2017/04/18
Carbon (total)	38.53	%	0.050	ASTM D 5373 (mod)	tat9-2017/04/07	asl4-2017/04/18
Nitrogen (total)	6.01	%	0.01	MWL WC PROC 55	tat9-2017/04/07	asl4-2017/04/18
Ammonium nitrogen (total)	0.271	%	0.001	AOAC 920.03 (mod)	crn7-2017/04/11	asl4-2017/04/18
Bulk density (loose)	0.71	g/cm ³	0.01	WT/VOL *	rko9-2017/04/14	asl4-2017/04/18
Bulk density (packed)	0.75	g/cm ³	0.01	WT/VOL *	rko9-2017/04/14	asl4-2017/04/18
Humic acid	n.d.	%	0.10	Calif HA4/JC (rev. 2:3-11-09)	eas2-2017/04/11	asl4-2017/04/18
Loss on ignition	69.5	%	0.01	MWL WC PROC 60	bjs0-2017/04/10	asl4-2017/04/18
Magnesium (water soluble)	0.08	%	0.01	MWL ME PROC 26	asl4-2017/04/18	asl4-2017/04/18
Nitrate-nitrogen	n.d.	%	0.01	WC PROC 32	crn7-2017/04/13	asl4-2017/04/18
pH	6.95	S.U.	0.01	EPA 9045	rec6-2017/04/11	asl4-2017/04/18
Potash (K ₂ O)	0.20	%	0.05	MWL ME PROC 26	Auto-2017/04/12	asl4-2017/04/18
Salt index	3		1	SOIL CH ANLY JACKSON P.245 *	eas2-2017/04/11	asl4-2017/04/18
Potash (K ₂ O) (soluble)	0.16	%	0.01	MWL ME PROC 26	asl4-2017/04/18	asl4-2017/04/18
Total organic carbon (TOC)	37.14	%	0.01	ASTM D 5373 (mod)	tat9-2017/04/12	asl4-2017/04/18
Phosphate (total P ₂₀₅)	6.04	%	0.10	MWL ME PROC 26	Auto-2017/04/12	asl4-2017/04/18
Water soluble nitrogen	0.70	%	0.01	Calculation	Auto-2017/04/12	Auto-2017/04/18
Water insoluble nitrogen (WIN)	5.05	%	0.01	AOAC 945.01/2001.11	crn7-2017/04/12	asl4-2017/04/18
Copper (water soluble)	n.d.	%	0.01	MWL ME PROC 26	asl4-2017/04/18	asl4-2017/04/18

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Sample ID: EWA PELLETS	Lab Number: 2653281 (con't)					
Manganese (water soluble)	n.d.	%	0.01	MWL ME PROC 26	asl4-2017/04/18	asl4-2017/04/18
Zinc (water soluble)	n.d.	%	0.01	MWL ME PROC 26	asl4-2017/04/18	asl4-2017/04/18
Chloride	0.11	%	0.01	Soil Sci. & Plant Anal. 1970	aar7-2017/04/11	asl4-2017/04/18
Barium (total)	290	mg/kg	0.50	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Total Kjeldahl nitrogen (TKN)	5.75	%	0.01	AOAC 2001.11	crn7-2017/04/12	asl4-2017/04/18
Organic nitrogen	n.d.	%	0.01	Calculation	Auto-2017/04/12	Auto-2017/04/18
Percent solids	92.9	%	0.01	SM 2540 G-(1997) *	bjs0-2017/04/10	cmw2-2017/04/10
Silver (total)	4.0	mg/kg	1.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Arsenic (total)	n.d.	mg/kg	10.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Boron (total)	16.4	mg/kg	5.00	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Calcium (total)	34450	mg/kg	20.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Cadmium (total)	1.02	mg/kg	0.50	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Cobalt (total)	2.92	mg/kg	1.00	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Chromium (total)	18.8	mg/kg	1.00	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Copper (total)	438	mg/kg	1.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Iron (total)	26500	mg/kg	5.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Mercury (total)	0.51	mg/kg	0.05	EPA 7471	ccm2-2017/04/11	bab2-2017/04/13
Potassium (total)	1719	mg/kg	10.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Magnesium (total)	5286	mg/kg	5.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13

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Sample ID: EWA PELLETS	Lab Number: 2653281 (con't)					
Manganese (total)	172	mg/kg	1.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Molybdenum (total)	8.7	mg/kg	1.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Sodium (total)	1142	mg/kg	5.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Nickel (total)	14.3	mg/kg	1.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Phosphorus (total)	27990	mg/kg	5.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Lead (total)	9.4	mg/kg	5.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Sulfur (total)	16100	mg/kg	10.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Selenium (total)	n.d.	mg/kg	10.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Zinc (total)	759.6	mg/kg	2.0	EPA 6010	ras7-2017/04/11	bab2-2017/04/13
Phosphorus (total)	2.64	%	0.05	MWL ME PROC 26	cjm4-2017/04/11	asl4-2017/04/18
Potassium (total)	0.17	%	0.05	MWL ME PROC 26	cjm4-2017/04/11	asl4-2017/04/18

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REPORT NUMBER

17-108-4038

REPORT DATE
Apr 18, 2017

RECEIVED DATE
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20352



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ISSUE DATE
Apr 18, 2017

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FERTILIZER ANALYSIS

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

All results are reported on an AS RECEIVED basis., n.d. = not detected , ppm = parts per million, ppm = mg/kg

For questions please contact:

John McManis
Account Manager
john.mcmanis@midwestlabs.com (402)829-9887

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For: (20352) ENCINA WASTEWATER AUTHORITY
FERTILIZER ANALYSIS****Detailed Method Description(s)****ICP Analysis Fertilizers AOAC 985.01 (mod)**

Analysis follows MWL ME 026 which is based on AOAC 985.01. Samples have been prepared using MWL WC 056 which is based on AOAC 957.02 using mineral acids and heat. Sample analysis involves moving the sample extract into the ICP where it is nebulized and introduced into the high temperature plasma which energizes the electrons of the dissolved minerals/metals. As the energized electrons of the minerals/metals return to ground state, energy is released as light. The emitted wavelength(s) and light intensities are used to identify and quantitate the minerals/metals in the sample

AOAC 920.03 (mod)

Analysis follows WC 015 which is based on AOAC 920.03. A sample is placed in a distillation tube and a standard base added to convert ammonium to ammonia. The ammonia is distilled into an acid solution. The acid solution is titrated with a standard acid.

Calculation

Analytical results are entered into applicable formulas to provide a calculated result which is reported.

Carbon/nitrogen in coal ASTM D 5373 (mod)

Sample analysis follows MWL PR 263 which references ASTM D 5373 (modified). Samples are placed in a combustion instrument where carbon is oxidized in oxygen to produce carbon dioxide and nitrogen compounds are converted to elemental nitrogen and the levels determined. The modification indicated is the matrix analyzed is not part of the ASTM scope.

AOAC 993.13 (mod) manure

Analysis follows MWL WC 055 which is based on AOAC 993.13. Samples are ground to a fine, homogenous consistency and a small amount weighed and introduced into the instrument. The sample is burned in the presence of oxygen to release gases such as carbon dioxide, nitrogen, and hydrogen and the levels of a specific gas determined and reported.

humic acid

Sample analysis follows MWL WC 059 which is based the California HA4/JC(revision 2: 3-11-09 procedure. Samples are dissolved by treatment with 1 N sodium hydroxide and then precipitated with hydrochloric acid. The resultant precipitate is dried and weighed and the result posted in %.

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SM 2540 G

Analysis follows MWL WC 060 which is based on SM 2540 G. A sample is weighed placed in a vacuum drying oven to drive off the moisture and re-weighed. The sample is then placed in a muffle furnace at 550 degrees C, cooled, and re-weighed. The residue remaining is the ash and the mass lost is the volatile matter.

WC PROC 32

The extraction phase is based on ASA (American Society of Agronomy) chapter 38 and uses potassium chloride as the extracting solution. The extract is analyzed by automated cadmium reduction based on EPA 353.2

pH METER

Sample analysis follows MWL WC 061 which uses a pH meter, probe, and sample slurry. The sample is mixed with a pre-determined amount of water to make a slurry. The slurry is allowed to equilibrate and then a pH meter and probe is used to determine the pH

Nitrogen (water insoluble)

Sample analysis follows MWL WC 062 which is based on the sample preparation steps in AOAC 945.01 and the analysis of the filter residue by block digestion, distillation, and automated titration.

Chloride by Soil Sci. & Plant Anal. 1970

Sample analysis follows MWL WC 054 which is based on a method published in the 1970 volume of Soil Science and Plant Analysis pp 1-6. The sample is extracted with dilute sodium hydroxide and a silver chloride solution is used to titrate the extract to a potentiometric end point.

ME 042

Analysis follows MWL ME 042 which is based on EPA 6010b, Inductively Coupled Plasma (ICP).

A light emission technique where prepared samples are injected into a high energy plasma that forces the elements in the injected sample to emit light energies which are proportional to the level of minerals and metals present. The light is then detected and correlated to the levels of minerals and metals in the original sample.

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FERTILIZER ANALYSIS****Total Kjeldahl Nitrogen (TKN)**

Analysis follows MWL WC 048 which is based on AOAC 2001.11. Samples are placed in a Kjeldahl digest tube along with acid and a catalyst and placed in a hot block for digestion. After the samples are digested, they are placed on an automatic distillation/titration unit where ammonia-nitrogen levels are measured. The nitrogen result is multiplied by a factor (generally 6.25) to determine the level of protein in the sample

ME 067

Samples are analyzed for mercury using MWL ME 067 which is based upon EPA 7471, cold vapor atomic absorption (CVAA).

Samples are prepared via MWL ME 037 that uses a series of digestion steps involving hot mineral acids and oxidizers so as to destroy organic matter and solubilize mercury. The mercury is reduced by use of stannous chloride to elemental mercury that is then aerated to the light path of a mercury light of an atomic absorption spectrometer (AAS). The absorption of the mercury light at 253.7 nm is then correlated to the level of mercury present in the original sample.

Fertilizer Prep AOAC 957.02

Samples are prepared using a combination of nitric acid and heat. The heating takes place in a block digester

AOAC 957.02 (P2O5 preparation)

Samples are treated with hydrochloric acid and nitric acid on a hot plate to destroy organic material and dissolve phosphate.

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