

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

**REPORT OF ANALYSIS**

For: (20352) ENCINA WASTEWATER AUTHORITY  
SAMPLE ANALYSIS

Analysis	Level Found		Reporting		Method	Analyst- Date	Verified- Date
	As Received	Units	Limit				
Sample ID: <b>EWA PELLETS</b>	Lab Number: <b>2517982</b>	Date Sampled: <b>2016-04-15 0711</b>					
Carbon nitrogen ratio C/N	6 : 1		0.1		Calculation *	Auto-2016/04/20	Auto-2016/04/26
Carbon (total)	37.87	%	0.050		ASTM D 5373 (mod) *	kmc4-2016/04/19	mgn8-2016/04/26
Nitrogen (total)	6.00	%	0.01		MWL WC PROC 55 *	kmc4-2016/04/19	mgn8-2016/04/26
Ammonium nitrogen (total)	0.234	%	0.001		AOAC 920.03 (mod) *	jar4-2016/04/20	mgn8-2016/04/26
Loss on ignition	68.8	%	0.01		MWL WC PROC 60 *	bjs0-2016/04/21	mgn8-2016/04/26
Bulk density (packed)	0.69	g/cm <sup>3</sup>	0.01		WT/VOL	eas2-2016/04/20	mgn8-2016/04/26
Magnesium (water soluble)	0.11	%	0.01		MWL ME PROC 26 *	mgn8-2016/04/26	mgn8-2016/04/26
Phosphate (total P205)	6.53	%	0.10		MWL ME PROC 26 *	Auto-2016/04/22	mgn8-2016/04/26
Mercury (total)	0.36	mg/kg	0.05		EPA 7471 *	ccm2-2016/04/21	bab2-2016/04/26
Phosphorus (total)	28840	mg/kg	5.0		EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Organic nitrogen	n.d.	%	0.01		Calculation *	Auto-2016/04/20	Auto-2016/04/26
Calcium (total)	37270	mg/kg	20.0		EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Boron (total)	19.4	mg/kg	5.00		EPA 6010 *	ras7-2016/04/22	bab2-2016/04/26
Humic acid	9.16	%	0.10		Calif 4A 4/JC *	acm2-2016/04/22	mgn8-2016/04/26
Manganese (water soluble)	n.d.	%	0.01		MWL ME PROC 26 *	mgn8-2016/04/26	mgn8-2016/04/26
Nitrate-nitrogen	n.d.	%	0.01		WC PROC 32 *	cad6-2016/04/20	mgn8-2016/04/26
Water insoluble nitrogen (WIN)	5.38	%	0.01		AOAC 945.01 *	jar4-2016/04/21	mgn8-2016/04/26
Water soluble nitrogen	0.27	%	0.01		Calculation *	Auto-2016/04/21	Auto-2016/04/26
Potash (K2O)	0.19	%	0.05		MWL ME PROC 26 *	Auto-2016/04/22	mgn8-2016/04/26

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Potash (K <sub>2</sub> O) (soluble)	0.16	%	0.01	MWL ME PROC 26 *	mgn8-2016/04/26	mgn8-2016/04/26
Salt index	2		1	SOIL CH ANLY JACKSON P.245	acm2-2016/04/20	mgn8-2016/04/26
Zinc (water soluble)	n.d.	%	0.01	MWL ME PROC 26 *	mgn8-2016/04/26	mgn8-2016/04/26
Bulk density (loose)	0.69	g/cm <sup>3</sup>	0.01	WT/VOL	eas2-2016/04/20	mgn8-2016/04/26
Arsenic (total)	n.d.	mg/kg	10.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Barium (total)	329	mg/kg	0.50	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Cadmium (total)	0.90	mg/kg	0.50	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Chromium (total)	18.1	mg/kg	1.00	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Cobalt (total)	3.48	mg/kg	1.00	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Copper (total)	434	mg/kg	1.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Copper (water soluble)	n.d.	%	0.01	MWL ME PROC 26 *	mgn8-2016/04/26	mgn8-2016/04/26
Iron (total)	28190	mg/kg	5.0	EPA 6010 *	ras7-2016/04/22	bab2-2016/04/26
Magnesium (total)	5798	mg/kg	5.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Molybdenum (total)	10.0	mg/kg	1.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Nickel (total)	16.3	mg/kg	1.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Potassium (total)	1537	mg/kg	10.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Silver (total)	5.5	mg/kg	1.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Sulfur (total)	18100	mg/kg	10.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Zinc (total)	795.4	mg/kg	2.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26

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	As Received		Limit	Method		
<b>Sample ID: EWA PELLETS</b>	Lab Number: <b>2517982</b> (con't)					
Sodium (total)	1123	mg/kg	5.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Manganese (total)	150	mg/kg	1.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Chloride	0.11	%	0.01	Soil Sci. & Plant Anal. 1970 *	acm2-2016/04/20	mgn8-2016/04/26
Percent solids	92.5	%	0.01	SM 2540 G-(1997)	bjs0-2016/04/21	cmw2-2016/04/25
Lead (total)	7.2	mg/kg	5.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Total organic carbon (TOC)	37.17	%	0.01	ASTM D 5373 (mod) *	jad9-2016/04/22	mgn8-2016/04/26
pH	7.06	S.U.	0.01	EPA 9045 *	bmn7-2016/04/19	mgn8-2016/04/26
Selenium (total)	n.d.	mg/kg	10.0	EPA 6010 *	ras7-2016/04/19	bab2-2016/04/26
Total Kjeldahl nitrogen (TKN)	5.65	%	0.01	AOAC 2001.11 *	jar4-2016/04/20	mgn8-2016/04/26

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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SAMPLE ANALYSIS**Detailed Method Description(s)****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.

**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.

**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.

**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

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13611 "B" Street • Omaha, Nebraska 68144-3693 • (402) 334-7770 • FAX (402) 334-9121  
www.midwestlabs.com**ENCINA WASTEWATER AUTHORITY  
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SAMPLE ANALYSIS**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.

**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.

**CALIF 4A 4/JC humic acid**

Sample analysis follows MWL WC 059 which is based the California 4A/JC 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 %.

**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

**AOAC 945.01 water insoluble nitrogen (WIN)**

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.

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**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.

**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

**AOAC 2001.11**

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

**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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