PLASMA
ENERGY GROUP, LLC

Thomas Rheaume
Permit Branch Manager
Arkansas Department of Environmental Quality
Air Division
5301 Northshore Drive
North Little Rock, AR 72118-5317

Dear Thomas:

Per your instructions and guidance, we have enclosed an Air Permit Application to register and request a permit to proceed with our Pilot Program to install and test our Plasma Arc Pyrolysis process designed for a mixed swine waste process demonstration. With an actual test that confirms the estimated emissions we would seek an exempt status for the process in an agricultural waste use.

The instruction did not describe an actual request for a "permit to test", or other authorization from ADEQ to install and test our Plasma Process for swine waste treatment in Arkansas. The unit will provide a "closed loop system" for the liquid waste and vaporize the solid waste to a manageable gas in vary low volume. The process is an all-electric process that has no combustion or fuel. We will also have a continuous emissions monitoring system installed in the test unit to give our engineers real time monitoring ability. One additional advantage of our plasma process is the generation of activated carbon is a by-product and controls heavy metals, such as mercury, lead, etc.

This Pilot Program unit is in production and we need to have ADEQ give us the permission to install and test for a final determination which should qualify for an exempt status for permit requirements or other ADEQ requirement needs for the process acceptance in the treatment of swine waste. Our timeline is based on having the unit installed before winter weather delays and tested before December. We believe the technology offers a solution for an ongoing waste problem in the Agricultural industry and Arkansas in particular. Could you please help us meet this schedule?

We appreciate all your efforts on our behalf and in helping move this project forward.

Thanks,

Murry A. Vance

Plasma Energy Group, LLC
8340 Donal Street
Port Richey, FL 34668
Phone: 727-807-7950, Fax: 727-807-7972
www.plasmaenergygroup.com

ADEQ

Arkansas Department of Environmental Quality

AIR DIVISION

AIR PERMIT APPLICATION FORMS

July 2014

GENERAL INFORMATION APPLICATION FORMS

(Complete this General Information section for all Registrations and Applications)

1. FACILITY PHYSICAL INFORMATION			
Facility Name:	**C & H HOG FARMS, INC.**		
Physical Address or Location:	**MIDDLE SECTION 26 P15N, 20E**		
City:	**MOUNT JUDEA**		
County:	**NEWTON**		
Zip:	**72655**		
Contact First Name:	**JASON**	Contact Last Name:	**HENSON**
Contact Position:	**PRESIDENT**		
Contact Phone:	**870-688-1318**	Contact FAX:	
Contact Email Address:	Jasonh_1995@yahoo.com		

2. FACILITY MAILING INFORMATION			
Organization Name:	**C & H HOG FARMS, INC.**		
Mailing Address :	**HC 72 BOX 10**		
City:	**MOUNT JUDEA**		
State:	**ARKANSAS**		
Zip:	**72655**		
Contact First Name:	**JASON**	Contact Last Name:	**HENSON**
Contact Phone:	**870-688-1318**	Contact FAX:	
Contact Email Address:	Jasonh_1995@yahoo.com		

3. INVOICE MAILING INFORMATION			
Organization Name:	**PLASMA ENERGY GROUP, LLC**		
Mailing Address:	**8340 DONAL STREET**		
City:	**PORT RICHEY**		
State:	**FLORIDA**		
Zip:	**34668**		
Invoice First Name:	**MURRY**	Invoice Last Name:	**VANCE**
Invoice Phone Number:	**727-807-7950**	Invoice FAX:	**727-807-7972**
Invoice Email Address:	mavance@plasmaenergygroup.com		

4. PERMIT APPLICATION CONTACT INFORMATION			
Organization Name:	**PLASMA ENERGY GROUP, LLC**		
Mailing Address:	**8340 DONAL STREET**		
City:	**PORT RICHEY**		
State:	**FLORIDA**		
Zip:	**34668**		
Applicant First Name:	**MURRY**	Applicant Last Name:	**VANCE**
Applicant Phone Number:	**727-807-7950**	Applicant FAX:	**727-807-7972**
Applicant Email Address:	mavance@plasmaenergygroup.com		

GENERAL INFORMATION APPLICATION FORMS

5. UTM COORDINATES OF CENTER OF PLANT						
UTM Zone (15 or 16)	**15**					
UTM North (to the nearest meter)	**3975383.5**					
UTM West (to the nearest meter)	**493362.05 east**					
Datum System (indicate only one)	**NAD 27**		**NAD 83**	**x**	**WGS 84**	

6. NAICS INFORMATION	
NAICS Number:	**112210**
NAICS Title:	**HOG AND PIG FARMING**

7. TYPE OF PERMIT (CHECK ONE):					
x	Air Permit Registration		Minor Source Permit		Title V/Major Source Permit

8. TYPE OF PERMIT APPLICATION (CHECK ONE):	
x	Initial (New) Permit (Includes changes between Minor, Title V, Registrations and General Permit types)
	Renewal Of Existing Permit (Title V Permits Only)
	Minor Modification (Title V Permits Only)
	De Minimis (Minor Source Permits Only)
	Significant Modification
	Administrative Amendment
	Name Change
	Transfer Of Ownership

9. CURRENT ACTIVE PERMIT NUMBER (IF APPLICABLE):	
Air Permit No.	N/A

10. DATE OF COMMENCEMENT OF CONSTRUCTION OR RECONSTRUCTION:	
Expected Date of Commencement of Construction or Reconstruction:	**10-30-2014**
Expected Date of Completion of Construction or Reconstruction:	**11-30-2014**
Anticipated Date of Operation:	**12-01-2014**

GENERAL INFORMATION APPLICATION FORMS

GENERAL APPLICATION QUESTIONS		
11. Disclosure Statement	**Yes**	**No**
Is this an Initial Permit, Registration, Renewal, or Change of Ownership? If yes, attach a disclosure statement.	**x**	
12. Federal Regulations		
Is any source, existing or new, subject to a NSPS (40 CFR Part 60) or NESHAP (40 CFR Part 61 or 63) requirement?		**x**
If yes, is a list of the source and subparts attached? (required)		
Is this application for a new or modified source affected by a subpart		**x**
If yes, is a list of the source and subparts attached? (required)		
Is this a Renewal application and are any sources affected by a subpart		**x**
If yes, is a list of the source and subparts attached? (required)		
13. Would you like to subscribe to the Air Permit Branch Email list? (A periodic email from the ADEQ Air Permit Branch of notable events and issues relating to air permits and permitting.)		**x**
If yes, list the email address(es) you wish to use: _____ (or you can email us at AirPermits@adeq.state.ar.us with "subscribe" (no quotation marks) in the subject box.		

14. ORGANIZATIONAL STATUS OF APPLICANT

a. Please check the box which appropriately describes the legal organization of the applicant.

	Solely Owned Proprietorship		Corporation
	General Partnership		Joint Venture
	Limited Partnership		Government Entity
x	LLC		Other (Specify)

b. Is the applicant currently registered to do business with the Arkansas Secretary of State?

YES (indicate SOS filing number) 811060928 NO ____

c. If the applicant is registered with the Arkansas Secretary of State, indicate if it is domestic (Arkansas) or a foreign (chartered outside of Arkansas).

GENERAL INFORMATION APPLICATION FORMS

Domestic [ ] Foreign [X]

d. Attach a Certificate of Good Standing for Arkansas and a Certificate of Good Standing from the State of Origin, if other than Arkansas

(Please note no permit will be issued to a corporation until the proper documents have been filed with the Secretary of State. Also, note that the name of the applicant must be identical to the name of the registered corporation.)

e. If the applicant is organized as a partnership, then list the names and addresses of all partners involved. Attach additional sheets if necessary.

MURRY VANCE 8340 DONAL ST. PORT RICHEY, FLORIA 34668 - LLC
STACY Y. PATRICK 8340 DONAL STREET PORT RICHEY, FLORIDA 34668 - LLC

f. If the applicant is organized as a joint venture, list the names and addresses of all of the principals involved. Attach additional sheets if necessary.

END OF GENERAL INFORMATION APPLICATION FORMS
GO TO REGISTRATION, MAJOR SOURCE APPLICATION FORMS OR EMISSION RATE TABLE AND OTHER FORMS

REGISTRATIONS

(Complete this section for Registration applications only. Otherwise, skip to the next section.)

15. Provide a description of the facility, processes and sources of air pollution emissions. Also include a Process Flow Diagram. Attach additional pages if necessary.

The purposed Pilot Program test unit is based on Plasma Energy Group's plasma arc process that utilizes the conductive and high thermal properties of Plasma in combination with a low pressure and low inert gas plasma flow. This unique Plasma Pyrolysis process allows for onsite processing of waste without the high volume of process gas usually associated with other plasma processes. We have compiled an estimated emissions summary for the process in a liquid swine waste application. For the process mixed liquid and solid waste will enter the Plasma Process unit and the high water content will be flashed off to steam and condensed back to sterile water to be re-injected into the waste handling process, forming a closed loop system for the water and liquid present in the operation.

The solid waste and compounds present in the liquid waste are treated with a Plasma Arc and Plasma Gas Cloud that is effective to break the molecular bonds of 100% of the treated material to basic elements and simple compounds. The off gas is then treated through a series of wet scrubbing and high temperature catalysis to further treat the off gas to insure an emission of minimal content. See the attached flow diagram 02-0055, and the attached PEG process description.

Considering the fact that swine waste has a varying chemical composition and is not well defined, ultimate analysis and determination of process flow is required to provide actual values and good emissions calculations. And an onsite testing of this pilot program unit will confirm the estimates or the variation of the estimates. These estimates are also based on the analysis of the actual waste stream to be processed, see the attached Swine Waste Analysis.

16. What are the total actual emissions from this facility?

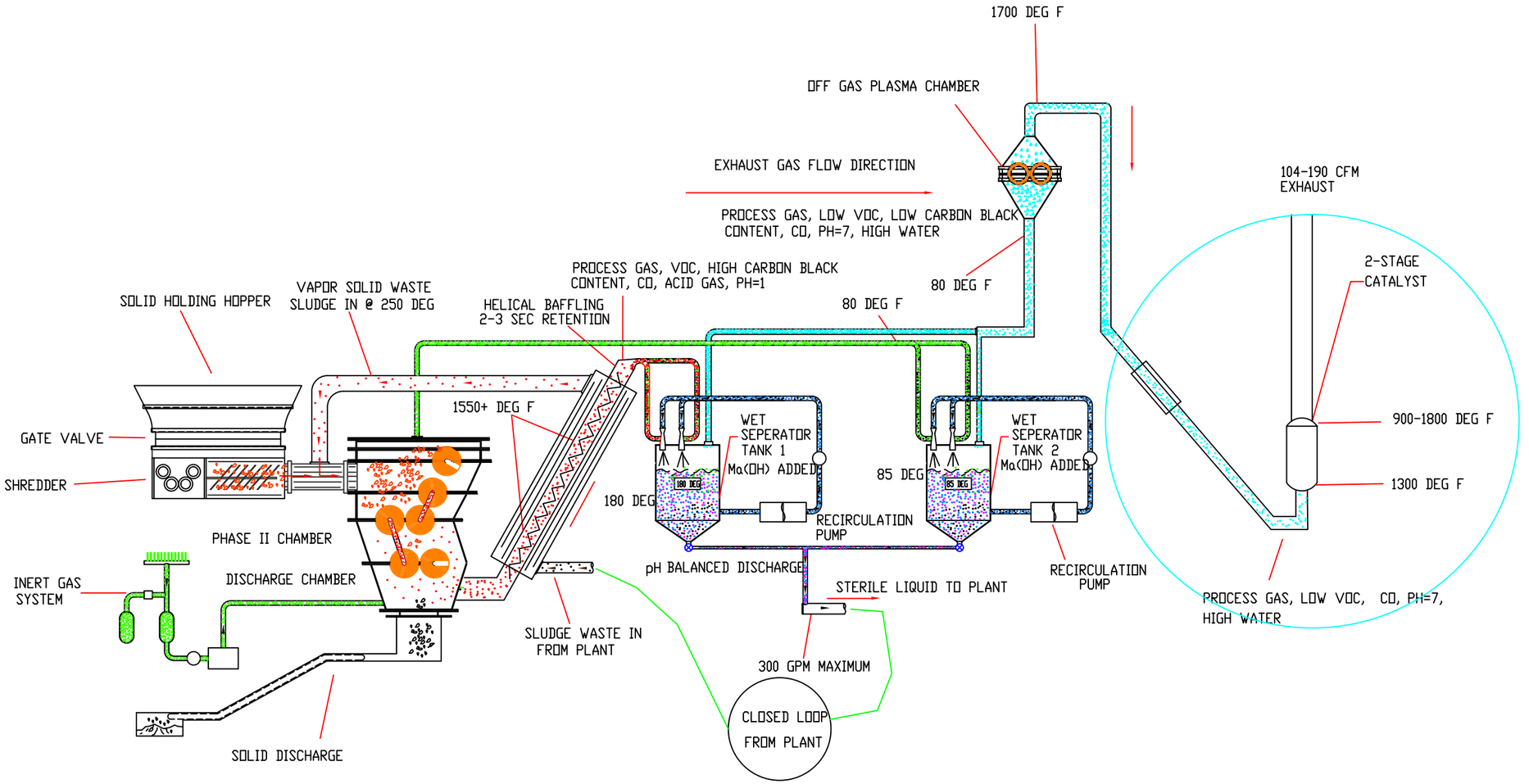
Pollutant	**Tons per year**	**Eligible TPY limits**
PM	0.01	$\geq$ 15 and < 25
PM_{10}	0.005	$\geq$10 and < 15
SO_2	0.01	$\geq$ 25 and < 40
VOC	0.06	$\geq$ 25 and < 40
CO	5.9	$\geq$ 40 and < 75
NO_X	0.009	$\geq$ 25 and <40
Single HAP	negligible	$\geq$ 1 and < 2
Combination HAP	negligible	$\geq$ 3 and < 5
Air Contaminants	N/A	< 25
Lead	negligible	< 0.5

17. Provide a detailed explanation of how the emissions estimate was determined e.g. AP-42, test information, etc. Attach additional pages if necessary.

SOURSE ENVIRONMENTAL TEST REPORTS – VANCE IDS 1995, 1997

ESTIMATED EMISSIONS FOR PLASMA PROCESSING OF LIQUID SWINE WASTE – PLASMA ENERGY GROUP, LLC 2014

REVISIONS			
LETTER	DESCRIPTION	DATE	APPD



DO NOT SCALE

TOLERANCES UNLESS OTHERWISE SPECIFIED		
DECIMAL	.XX	±.03
	.XXX	±.005
FRACTION		±1/16
ANGLES ±.5°		
UNSPECIFIED FILLETS .01 TO .03 R		

DWG.ORG.	DRN	JSB	DATE 9/12/2014
	CHKD		DATE
FIRST USED	APPD	MAV	DATE 9/12/2014
	SCALE	NA	PAGE 1 OF 1

MATERIAL	FILE NAME
xxx	
FINISH	SUPERCEDES
xxx	

PLASMA ENERGY GROUP, LLC

REMOVE ALL SHARP CORNERS

TITLE: SWINE MANURE PROCESS

SIZE: B

DWG NO: 02-0055

DESCRIPTION OF PEG DESIGN AND ADVANTAGES

Plasma Systems. Plasma systems utilize man-made lightning for processing. These systems use a plasma-torch for heating the feed stock to super high temperatures, up to 10,000°C. The process destroys wastes by breaking the molecules of the waste into its most basic form. Typically, this technology does not create any new toxic chemicals or ash as do many present incinerators and chemical processes. In addition, plasma systems can dispose of all types of waste, have no environmental effects, and have energy recovery and byproduct reuse capabilities. However users of competing plasma technologies reduce volume by less than 90% and have a complex operating system. **PLASMA PROCESSES OF THE PAST AND THE STORY THEY TELL, HAVE GIVEN "PLASMA" A HISTORY OF UNEQUALED PROCESSING ABILITY, BUT WITH EXTRAVAGANT CAPITAL AND OPERATING COST. NOW PLASMA ENERGY GROUP, LLC ARE REWRITING THE STORY WITH THE MOST COST EFFECTIVE SYSTEM OF ANY TECHNOLOGY.**

The Plasma Technology is also identified and described as a plasma process in many technical discussions. The technology and process ***differences are extreme*** in most areas. For instance, the PEG uses the ionization of a gas (plasma) within the process. Most other plasma processes were developed from the aerospace industry and wind tunnel research and are used for a heat source, unlike the PEG.

The Plasma Energy Group's patented system offers three unique components of the Plasma Disposal System that significantly distinguish it from alternative gasification treatments, creating the most technically advanced system available. These components, which are discussed below, are as follows: (1) the electron flow used to disrupt the feed material's molecular bonds in the process, (2) the use of an inert plasma cloud to give the feed material conductive properties, and (3) the low pressure inert atmosphere, which permits easy and economical control of the process while eliminating the harmful byproducts typical of other and competing processes.

- **Electron Flow.** The PEG utilizes multiple plasma arcs (electron flow through a plasma cloud) to transfer its primary energy source, electricity, into the feed stream for breakdown of the feed material into its most elemental form. The Plasma process has greater efficiency than other technologies because of its ability to use the primary energy source for gasification or destruction. Most, if not all, developing gasification/waste reduction processes use their secondary energy source (i.e., the heat of the plasma gas, the heat of a resistive chamber, the heat of a fuel), or their tertiary energy source (a molten metal or glass bath, or steam injection) for the actual process action. Within the PEG Plasma process, multiple electric arcs discharge electrons (primary energy source) through a conductive plasma cloud directly into the feed stock. This "plasma arc" simplifies the feed material's molecular bonds, and releases secondary energy, in the form of heat and light. This release of additional energy adds to the breakdown of additional waste/fuel stock, and also provides a source of heat for steam generation and heat recovery.

- **Inert Gas Plasma Cloud.** While the use of an inert gas and plasma is not unique to the Plasma process, the method in which Mr. Vance uses the inert gas plasma is proprietary to the PEG. During the Plasma process, multiple plasma gas sources (arc torches) are directed to the center of the plasma chamber where a distinct plasma cloud is formed. "Plasma" is defined as any ionized gas,

and the properties of this ionized gas make the plasma super conductive. Combining this conductive property with the inert properties of the source gas allows for magnetic control of the plasma gas. The feed material stream is placed within the conductive plasma cloud where the electric current (electrons) flow directly into the feed stream. As the feed stock is gasified, the conductive medium (plasma) cools to a non-ionized state (inert gas) and will not bond with any other molecules, thus, limiting the emissions generated during the process.

- **Low Pressure Inert Atmosphere.** Inert atmospheres are used in many processes for control of oxidation and chemical reactions. The PEG utilizes an inert atmosphere for both conductive properties and control of environmental sensitive emissions. The unique aspect of the Plasma process is the amount of and pressure at which the inert gas is used. During the Plasma process, the inert gas is primarily used for its conductive properties. Most, if not all, competing plasma processes use the plasma gas as a source of heat for processing. To transfer the amount of energy required for processing an equal amount of feed stock in other plasma systems requires very large volumes and pressures of plasma gas. Unlike most systems, the Plasma process uses minimal volumes and low-pressure inert plasma gas for processing. One advantage of minimal use of gas is the easy and economical control of the process. Another advantage is that the low gas pressure and flow allow for the conductive plasma properties, but do not require a pure gas to be used. Because an impure gas can be used, the Plasma plasma gas can be filtered and reused over again or generated direct from the atmosphere.

SOURCE TEST REPORT
FOR
PARTICULATE, VOC, CO, HCl, SO2, NOx, NH3, NITRATES, CYANIDE, FLUORIDE, SULFATES and MULTI-METALS

VANCE IDS
ALTAMONTE SPRINGS, FLORIDA

OCTOBER 12, 1995

PREPARED FOR:

VANCE IDS
1050 MILLER ROAD
ALTAMONTE SPRINGS, FLORIDA 32701

PREPARED BY:

AIR CONSULTING AND ENGINEERING, INC.
2106 NW 67TH PLACE, SUITE 4
GAINESVILLE, FLORIDA 32653

409-95-02

2.0 SUMMARY AND DISCUSSION OF RESULTS

The IDS operated normally at a process rate of 100 lb/hr of mixed medical waste during testing. Results for all pollutants are presented in Tables 1-3.

Sample calculations, stack volumetric flow data, field data sheets, laboratory data, quality assurance/chain of custody forms and project participants are presented in Appendices A, B, C, D, E, and G, respectively.

NOx and O2 strip charts, data logger records and calibration data are provided in Appendix F.

There was insufficient sample to test for nitrates in the alcohol/water impingers in the modified M-26A sample train. Reported nitrate values are for the last two impingers and represent minima.

There was also insufficient sample to test for sulfates in the alcohol/water impingers in the modified M-26A sample train for run 2. Sulfate values are reported for runs 1 and 3 only.

Argon emissions measured by T0014 analysis were 39 lbs/hr, and by gas balance (after subtraction of other gaseous components) resulted in a value of 90 lb/hr. Actual Argon usage during the tests was 63 lb/hr, which is close to the average value of both test methods of 64.5 lb/hr.

TABLE 1. VOC AND PERMANENT GASES EMISSION TEST RESULTS SUMMARY

VANCE IDS, Orlando, Florida
Incandescent Disposal System Wet Scrubber Outlet
Test Date: October 12, 1995
Prod Rate = 100 lbs/hr of medical waste

Stack flow rates used to calculate emission rates for runs 1-3, respectively: 21.7, 20.5 and 17.1 dscfm.
$\bar{x}$ = 19,767

SPECIES	% by Volume in Sample				AVERAGE EMISSION RATE		
	Run-1	Run-2	Run-3	Average	lb/hr	tons/yr	lb/ton of waste
Method 25							
VOC as Carbon							
Condensible (-78C)	15.018	12.507	14.382	13.969	5.16	22.6	103
*Non-condensible (-78°C)	7.678	13.928	15.015	12.207	4.42	19.4	88
Total VOC	22.696	26.435	29.397	26.176	9.58	42.0	192
Methane	10.450	8.885	5.504	8.280	4.19	18.3	84
Carbon Monoxide	7.334	7.835	5.118	6.762	5.92	25.9	118
Carbon Dioxide	1.841	1.766	1.784	1.797	2.44	10.7	49
Method 3A							
Oxygen	0.70	0.14	0.02	0.29	0.31	1.34	6.11
Method 7E							
NOx (ppm)	34.5	29.7	60.3	41.5	5.70E-03	0.025	0.11
Method 8							
SO2 (ppm)	<1	<1	<1	<1	<2.0E-06	<8.6E-06	<3.9E-05
Method T0014							
Argon	35	24		29	39	170	774
Hydrogen	<15	<15	<15	<15	<1	<4.4	<20
Residual Gas Balance							
Argon	66	76	80	74	90	396	1808

* Non-condensible hydrocarbons were identified by Method T0014 as C3 to C5 compounds including 2-butene, 2-methyl propene and methylene cyclobutane.

Air Consulting Engineering, Inc., 2106 NW 67th Place, S-4, Gainesville, FL 32653 Phone (352) 335-1889; Fax (352) 335-1891

TABLE 2. METHOD-29 (MULTI-METALS) EMISSION TEST RESULTS SUMMARY

VANCE IDS, Orlando, Florida

Incandescent Disposal System Wet Scrubber Outlet

Test Date: October 12, 1995

Prod Rate = 100 lbs/hr of medical waste

Values used to calculate emission rates for runs 1-3, respectively: Stack Flow Rates = 21.7, 20.5, 17.1 dscfm Metals, sample volumes = 33.20, 22.85, 28.07 dscf

METAL	Total µg in Sample				AVERAGE EMISSION RATE		
SPECIES	Run-1	Run-2	Run-3	Average	lb/hr	lb/yr	lb/ton of waste
Antimony	45	48	63	52	4.89E-06	4.28E-02	9.78E-05
Arsenic	5.1	1.9	3.1	3.4	3.05E-07	2.68E-03	6.11E-06
Barium	15	14	11	13	1.28E-06	1.12E-02	2.56E-05
Beryllium	<1.1	<1.1	<1.1	<1.1	<1.00E-07	<8.76E-04	<2.00E-06
Cadmium	2.2	1.0	0.9	1.4	1.27E-07	1.11E-03	2.54E-06
Chromium	368	69	14	150	1.37E-05	1.20E-01	2.74E-04
Copper	151	29	14	65	5.89E-06	5.16E-02	1.18E-04
Lead	57	26	136	73	6.32E-06	5.54E-02	1.26E-04
Manganese	41	17	6	21	2.03E-06	1.77E-02	4.05E-05
Mercury	844	330	2,273	1,149	9.84E-05	8.62E-01	1.97E-03
Nickel	170	31	<28	76	6.88E-06	6.02E-02	1.38E-04
Silver	0.5	0.4	1.0	0.6	5.71E-08	5.00E-04	1.14E-06
Thallium	<2	<2	<2	<2	<2.00E-07	<1.75E-03	<4.00E-06
Zinc	180	229	1,080	496	4.33E-05	3.79E-01	8.65E-04

Air Consulting and Engineering, Inc., 2106 NW 67th Place, S-4, Gainesville, FL 32653 Phone (352) 335-1889; Fax (352) 335-1891

TABLE 3. METHOD 26A (modified) ANIONS EMISSION TEST RESULTS SUMMARY

VANCE IDS, Orlando, Florida
Incandescent Disposal System Wet Scrubber Outlet
Test Date: October 12, 1995
Prod Rate = 100 lbs/hr of medical waste

Values used to calculate emission rates for runs 1-3, respectively: Stack Flow Rates = 21.7, 20.5, 17.1 dscfm Anions/PM, sample volumes = 30.70, 18.78, 22.22 dscf

SPECIES	Total µg in Sample				AVERAGE EMISSION RATE		
	Run-1	Run-2	Run-3	Average	lb/hr	lb/yr	lb/ton of waste
Anions							
HCl	10,310	14,510	24,850	16,557	1.86E-03	1.63E+01	3.73E-02
Cyanide	133	52	148	111	1.17E-05	1.02E-01	2.33E-04
Fluoride	512	167	260	313	3.28E-05	2.87E-01	6.56E-04
Ammonia	27,860	27,230	30,350	28,480	3.21E-03	2.81E+01	6.42E-02
*NO2 + NO3	140	192	55	129	1.55E-05	1.36E-01	3.09E-04
**SO4	297,640	LOST	305,540	301,590	2.95E-02	2.58E+02	5.89E-01
PM	21,800	15,600	38,400	25,267	2.73E-03	2.39E+01	5.47E-02

*These values must be considered minima since there was insufficient sample volume to analyze for nitrates in the first two impingers in the M-26A train.

**SO4 values are blank corrected for 13,460 µg of SO4 contamination in 200 ml of NaOH impinger solution used for each test.

Air Consulting and Engineering, Inc., 2106 NW 67th Place, S-4, Gainesville, FL 32653 Phone (352) 335-1889; Fax (352) 335-1891

Compliance Test

NOx, SO2, VOC, & CO Gases

INCANDESCENT WASTE DISPOSAL UNIT

VANCE IDS

Tulane Medical Center
New Orleans, Louisiana
September, 1997

Prepared By:

Technical Services, Inc.
2901 Danese Street
Jacksonville, Florida 32206
(904) 353 - 5761

Dane H. Gray

Dane H. Gray

II. Summary And Discussion Of Results

Results of the compliance tests are summarized in Tables I thru IV. The Complete emissions data along with supportive field data sheets are included in Appendices A and B.

Source	Allowable Emissions	Actual Emissions Mean of Runs 2,3,4
Incandescent Waste Disposal Unit Nitrogen Oxide (NOx)	to be determined	.0062 Lb. / Hr
Incandescent Waste Disposal Unit Sulfur Dioxide (SO2)	to be determined	.1569 Lb. / Hr
Incandescent Waste Disposal Unit VOC as Carbon	to be determined	17.66 Lb. / Hr
Incandescent Waste Disposal Unit Carbon Monoxide (CO)	to be determined	12.95 Lb. / Hr

Source	Emissions Run 1
Incandescent Waste Disposal Unit Nitrogen Oxide (NOx)	.0694 Lb. / Hr
Incandescent Waste Disposal Unit Sulfur Dioxide (SO2)	.2622 Lb. / Hr
Incandescent Waste Disposal Unit VOC as Carbon	20.29 Lb. / Hr
Incandescent Waste Disposal Unit Carbon Monoxide (CO)	12.13 Lb. / Hr

TABLE I

NITROGEN OXIDE (NOx) EMISSIONS SUMMARY

VANCE IDS

INCANDESCENT WASTE DISPOSAL UNIT
Tulane Medical Center
New Orleans, Louisiana

DATE	TIME	LEVEL	RUN No.	VOLUMETRIC FLOW ACFM	VOLUMETRIC FLOW SCFMD	OXYGEN %	NOx EMISSIONS PPM	NOx EMISSIONS LB / DSCF	NOx EMISSIONS LB / HR
09/23/97	14:06	MAX				19.73	2.17	2.587E-07	0.0126
	15:06	MIN	2			19.13	0.73	8.759E-08	0.0043
		AVG		932	813	19.45	1.17	1.397E-07	0.0068
09/23/97	15:46	MAX				19.64	1.64	1.955E-07	0.0096
	16:46	MIN	3			18.94	0.61	7.333E-08	0.0036
		AVG		940	816	19.33	0.96	1.147E-07	0.0056
09/23/97	17:39	MAX				19.84	1.95	2.325E-07	0.0114
	18:39	MIN	4			19.16	0.72	8.567E-08	0.0042
		AVG		964	820	19.51	1.06	1.260E-07	0.0062
		MEAN		**945**	**816**	**19.43**	**1.06**	**1.268E-07**	**0.0062**

F = 1.194 x E -7 x ppm
/ DSCF x SCFMD x 60 min / hr

TECHNICAL SERVICES INC.

TABLE II

SULFUR DIOXIDE (SO2) EMISSIONS SUMMARY

VANCE IDS

INCANDESCENT WASTE DISPOSAL UNIT
Tulane Medical Center
New Orleans, Louisiana

DATE	TIME	LEVEL	RUN No.	VOLUMETRIC FLOW ACFM	VOLUMETRIC FLOW SCFMD	OXYGEN %	SO2 EMISSIONS PPM	SO2 EMISSIONS LB / DSCF	SO2 EMISSIONS LB / HR
09/23/97	14:06	MAX				19.73	36.37	6.037E-06	0.2945
	15:06	MIN	2			19.13	9.33	1.549E-06	0.0756
		AVG		932	813	19.45	23.07	3.829E-06	0.1868
09/23/97	15:46	MAX				19.64	18.01	2.990E-06	0.1464
	16:46	MIN	3			18.94	11.31	1.877E-06	0.0919
		AVG		940	816	19.33	13.88	2.305E-06	0.1128
09/23/97	17:39	MAX				19.84	27.63	4.586E-06	0.2256
	18:39	MIN	4			19.16	15.58	2.587E-06	0.1273
		AVG		964	820	19.51	20.94	3.476E-06	0.1710
		MEAN		**945**	**816**	**19.43**	**19.30**	**3.203E-06**	**0.1569**

F = 1.194 x E -7 x ppm / DSCF x SCFMD x 60 min / hr

TABLE III

TOTAL HYDROCARBON (VOC) EMISSION SUMMARY

VANCE IDS

INCANDESCENT WASTE DISPOSAL UNIT

Tulane Medical Center

DATE	TIME	LEVEL	TOTAL HYDROCARBONS (VOC) EMISSIONS, PPM as Propane	TOTAL HYDROCARBONS (VOC) EMISSIONS, PPM as Carbon	VOLUMETRIC FLOW SCFM, wet	MASS EMISSIONS, LB / HR VOC as Propane	MASS EMISSIONS, LB / HR VOC as Carbon
09/23/97	14:06 - 15:06	MAX	7252.53	21757.58		43.30	35.39
		MIN	1684.16	5052.48		10.06	8.22
		AVG	3663.25	10989.76	869	21.87	17.88
09/23/97	15:46 - 16:46	MAX	5267.82	15803.45		31.71	25.92
		MIN	1284.96	3854.87		7.73	6.32
		AVG	2554.29	7662.86	876	15.37	12.57
09/23/97	17:39 - 18:39	MAX	6445.11	19335.33		39.77	32.50
		MIN	1791.70	5375.10		11.06	9.04
		AVG	4465.71	13397.12	898	27.55	22.52
	MEAN		3561.08	10683.24	881	21.60	17.66

SCFM = Standard Cuvic feet per minute, including moisture. Standard conditions are 68 F and 29.92 Hg.

LBS / HR = ppm * E -6 * ((lb / lb - mole) / 385 cu. ft) * 60 min / hr * SCFM

For Propane : lbs / hr = ppm * E -6 * ((44.09 / 385) * 60 * SCFM = ppm * E -6 * 6.871

For Carbon : lbs / hr = ppm * E -6 * ((12.01 / 385) * 60 * SCFM = ppm * E -6 * 1.872

TECHNICAL SERVICES INC.

TABLE IV

CARBON MONOXIDE (CO) EMISSIONS SUMMARY

VANCE IDS

INCANDESCENT WASTE DISPOSAL UNIT
Tulane Medical Center

DATE	TIME	LEVEL	RUN No.	VOLUMETRIC FLOW ACFM	VOLUMETRIC FLOW SCFMD	OXYGEN %	PPM	CO EMISSIONS LB / DSCF	CO EMISSIONS LB / HR
09/23/97	14:06	MAX				19.73	3472.43	0.00026807	13.08
	15:06	MIN	2			19.13	3393.68	0.00026199	12.78
		AVG		932	813	19.45	3441.86	0.00026571	12.96
09/23/97	15:46	MAX				19.64	3524.63	0.0002721	13.32
	16:46	MIN	3			18.94	3421.36	0.00026413	12.93
		AVG		940	816	19.33	3489.64	0.0002694	13.19
09/23/97	17:39	MAX				19.84	3540.86	0.00027335	13.45
	18:39	MIN	4			19.16	2192.90	0.00016929	8.33
		AVG		964	820	19.51	3343.41	0.00025811	12.70
		MEAN		**945**	**816**	**19.43**	**3424.97**	**0.00026441**	**12.95**

F = 1.194 x E -7 x ppm
/ DSCF x SCFMD x 60 min / hr

ESTIMATED EMISSIONS FOR PLASMA PROCESSING OF MIXED SWINE WASTE

It is anticipated that the main emission components in the off gases after plasma treatment of liquid swine waste are CO, CO_2, and NOx. Some particulates, acid gases, and VOCs are also present in the effluent but in very small quantities.

Assumption for emissions calculations below are based on literature data and emissions results from the past Vance IDS test reports:

- 30% of Carbon is in dry concentrate as well as 5% of hydrogen.
- 75% of carbon converts to gas (assuming this is CO2).
- 25% of Carbon converts to the solids at the end of the process.
- C:N dry basis is 50:1.
- CO/CO_2 ratio is 2.5.
- CO/NO ratio is 1000.
- CH4 and VOC are negligible.
- Negligible amount of PM in the flow after scrubbers.

Total amount of swine waste (solids +water + liquid waste):

- Water/urea - 10,750 gal x 3.78=40,640 L= 40.64 m^3 = 40,640 kg/day or 89,408 lb/day or 8,941 lb/hr
- Total amount - 8,941 lb/hr (water/urea) + 805 lb/hr (swine waste) = 9,746 lb/hr (~2,100,000 SCF a day)

Generated off gas after 1st plasma reactor and after scrubbing:

- N_2 + Ar – 7 SCFM x 1.608= 11.25 nm^3/hr
- CO and CO_2 – 805 lb/hr/ 2.2= 366 kg/hr x 0.3= 110 kg/hr of Carbon x 0.75=
- =82.3 kg/hr= 82.3/12=6.86 kmol/hr of Carbon converts to CO and CO_2.
- CO – 6.86 x 2.5/3.5= 4.9 kmol/hr x 22.4= 109.8 nm^3/hr
- CO_2 – 1.96 kmol/hr x 22.4 = 43.9 nm^3/hr
- H_2O - 148 lb/hr /2.2= 67.3 kg/hr /18=3.74 kmol/hr x 22.4= 83.7 nm^3/hr

Total amount off gas before the 2nd plasma reactor:

- 11.25 + 109.8 + 43.9 + 83.7 = 248.7 nm^3/hr = ~9,300 SCFH

Off gas composition:

- NOx – 109.8 nm3/hr CO /(1000 x 248.7 total gas)= 4.4 x 10^{-4} mol fraction
- x 100%= 0.044 vol.% = 440 ppmv
- CO - 100% x 109.8 /248.7= 44.1 vol%
- CO_2 - 100% x 43.9/248.7 = 17.7 vol%
- N_2 + Ar - 100% x 11.25/248.7= 4.5 vol%
- H_2O - 100% x 83.7/248.7 = 33.7 vol%

Catalytic treatment:

Based on the above off gas composition it is required to be treated by the dual bed catalyst.

Since amount of O_2 after the 2nd plasma chamber is negligible it is beneficial to use a nonselective catalytic reduction (NSCR).

NSCR is a NOx control technology for exhaust streams with low O_2 content. Nonselective catalytic reduction uses a catalyst reaction to simultaneously reduce NOx, CO, and hydrocarbon (HC) to water, carbon dioxide, and nitrogen.
The catalyst is usually a noble metal (preferably Rh). The conversion occurs in two sequential steps, as shown in the following equations:

Step 1 Reactions:
$NOx + CO = CO_2 + N_2$
$NOx + H_2 = H_2O + N_2$
$NOx + HC = CO_2 + H_2O + N_2$

Step 2 Reactions:
$2CO + O_2 = 2CO_2$
$2H_2 + O_2 = 2H_2O$
$HC + O_2 = CO_2 + H_2O$

Approximately less than 0.5 percent of O_2 is needed in the treated gas to ensure NOx reduction on the step 1 (Catalytic reactor 1). Plenty CO in the off gas is present to reduce NOx emissions.

The control efficiency achieved for NOx ranges from 80 to 90 percent. The NOx reduction efficiency is controlled by similar factors as for SCR, including the catalyst material and condition, the space velocity, and the catalyst bed operating temperature.

The operating temperatures for NSCR system in the 1st reactor range from approximately 700° to 1500°F, depending on the catalyst. For NOx reductions of 90 percent, the temperature should be between 800° to 1200°F.

The operating temperatures for the system in the 2st reactor range from approximately 400° to 1000°F, depending on the catalyst.

For double excess of O_2 to CO with injection of O_2:into the catalyst stream

- 4.9 kmol x 2= 9.8 kmol O_2 or 219.6 nm^3/hr O_2
- This requires of air in the amount:
- 219.6 x 4.78 = 1049.7 nm^3/hr air
- Total amount of gas coming into the 2nd catalytic reactor is
- 1049.7 + 248.7 = 1298.4 nm^3/hr
- CO - 100% x 109.8 /1298.4 = 8.5 vol%
- CO_2 - 100% x 43.9/1298.4 = 3.4 vol%
- N_2 + Ar - 100% x 841.3/1298.4= 64.7 vol%
- H_2O - 100% x 83.7/1298.4 = 6.5 vol%

- O_2 - 100% x 219.6/1298.4 = 16.9 vol%
- NOx - 100% x 0.11 nm^3/hr/1298.4 = $8.45x10^{-3}$ vol% = 84.6 ppmv
- With 90% reduction of NOx in the 1st reactor:
- 84.6 ppmv x 0.1 = 8.5 ppmv
- With 99% reduction of CO in the 2nd reactor:
- 85000 ppmv x 0.01 = 850 ppmv

For equal amount of O_2 and CO:

- 4.9 kmol O_2 or 109.8 nm^3/hr O_2
- 109.8 x 4.78 = 524.8 nm^3/hr air
- Total amount of gas coming into the 2nd catalytic reactor is
- 524.8 + 248.7 = 773.5 nm^3/hr
- CO - 100% x 109.8 /773.5 = 14.2 vol%
- CO_2 - 100% x 43.9/773.5 = 5.7 vol%
- N_2 + Ar - 100% x 426.9/773.5= 55.2 vol%
- H_2O - 100% x 83.7/773.5 = 10.8 vol%
- O_2 - 100% x 109.8/773.5 = 14.1 vol%
- With 90% reduction of NOx in the 1st reactor:
- 141.9 ppmv x 0.1 = 14.2 ppmv
- With 99% reduction of CO in the 2nd reactor:
- 142000 ppmv x 0.01 = 1420 ppmv

Emissions Rates:

- CO
  4.9 kmol/hr x 30 = 147 kg/hr x 0.01 = 1.47 kg/hr = 3.23 lb/hr =32.3 lb/day = 5.9 t/year
- NOx (as NO_2)
  0.0049 kmol/hr x 46 = 0.225 kg/hr x 0.1= 0.0225kg/hr = 0.0496 lb/hr = 0.496 lb/day = 0.009 t/year
- VOC
  Assuming that VOC is 100 times less than CO since most of carbon converts to CO and most of H converts to H_2O.
  5.9 / 100 = 0.06 t/year
- PM, SO2, HCl are removed in the scrubber with a high efficiency and each is less than 0.01 t/year

AMERICAN INTERPLEX CORPORATION
LABORATORIES

Arkansas Farm Bureau Federation
P.O. Box 31
Little Rock, AR 72203-0031

ANALYTICAL RESULTS

AIC No. 176743-1
Sample Identification: Lagoon 3-25-14 10:35

Analyte		Result	RL	Units	Qualifier
Total Nitrogen Calculation		**2300** Analyzed: 26-Mar-2014 1554 by 308	1	**mg/l** Batch: W47113	
Total Kjeldahl Nitrogen EPA 351.2	Prep: 25-Mar-2014 1635 by 308	**2300** Analyzed: 26-Mar-2014 1456 by 308	500	**mg/l** Batch: W47090	D Dil: 500
pH SM 4500-H+ B 2000		**7.3** Analyzed: 25-Mar-2014 1648 by 93		**Units** Batch: W47083	H
Ammonia as N SM 4500-NH3 G 1997	Prep: 27-Mar-2014 1136 by 302	**1900** Analyzed: 27-Mar-2014 1530 by 308	100	**mg/l** Batch: W47126	D Dil: 1000
Dissolved Phosphorus SM 4500-P B,F 1999	Prep: 26-Mar-2014 1538 by 308	**110** Analyzed: 27-Mar-2014 1754 by 308	30	**mg/l** Batch: W47108	
Total Phosphorus SM 4500-P B,F 1999	Prep: 25-Mar-2014 1634 by 308	**930** Analyzed: 28-Mar-2014 0813 by 308	40	**mg/l** Batch: W47089	D Dil: 1600
Reactive Phosphorus SM 4500-P F 1999	Prep: 26-Mar-2014 1538 by 308	**190** Analyzed: 27-Mar-2014 1754 by 308	5	**mg/l** Batch: W47108	
BOD 5-day SM 5210 B 2001	Prep: 27-Mar-2014 0819 by 271	**13000** Analyzed: 01-Apr-2014 1300 by 302	6000	**mg/l** Batch: W47118	
Carbonaceous BOD 5-day SM 5210 B 2001	Prep: 27-Mar-2014 0820 by 271	**12000** Analyzed: 01-Apr-2014 1300 by 271	6000	**mg/l** Batch: W47119	
Soluble BOD 5-day SM 5210 B 2001	Prep: 27-Mar-2014 0819 by 271	**4100** Analyzed: 01-Apr-2014 1300 by 302	1000	**mg/l** Batch: W47118	
Total Suspended Solids USGS 3765	Prep: 27-Mar-2014 0844 by 271	**21000** Analyzed: 27-Mar-2014 1233 by 271	1000	**mg/l** Batch: W47120	
Nitrate + Nitrite as N EPA 300.0	Prep: 25-Mar-2014 1614 by 07	**< 0.5** Analyzed: 25-Mar-2014 2300 by 07	0.5	**mg/l** Batch: C16563	D Dil: 10
Nitrate as N EPA 300.0	Prep: 25-Mar-2014 1614 by 07	**< 0.5** Analyzed: 25-Mar-2014 2300 by 07	0.5	**mg/l** Batch: C16563	D Dil: 10
Nitrite as N EPA 300.0	Prep: 25-Mar-2014 1614 by 07	**< 0.5** Analyzed: 25-Mar-2014 2300 by 07	0.5	**mg/l** Batch: C16563	D Dil: 10
Fecal Coliform SM 9222 D 1997		**43000** Analyzed: 25-Mar-2014 1617 by 21	10000	**/100ml** Batch: M4376	D Dil: 10000

AMERICAN INTERPLEX CORPORATION
LABORATORIES

Arkansas Farm Bureau Federation
P.O. Box 31
Little Rock, AR 72203-0031

ANALYTICAL RESULTS

AIC No. 176744-1
Sample Identification: Pit 03/25/14 11:10

Analyte		Result	RL	Units	Qualifier
Total Nitrogen Calculation		**1500** Analyzed: 26-Mar-2014 1554 by 308	1	**mg/l** Batch: W47113	
Total Kjeldahl Nitrogen EPA 351.2	Prep: 25-Mar-2014 1635 by 308	**1500** Analyzed: 26-Mar-2014 1435 by 308	300	**mg/l** Batch: W47090	D Dil: 250
pH SM 4500-H+ B 2000		**7.5** Analyzed: 25-Mar-2014 1648 by 93		**Units** Batch: W47083	H
Ammonia as N SM 4500-NH3 G 1997	Prep: 27-Mar-2014 1136 by 302	**1700** Analyzed: 27-Mar-2014 1602 by 308	300	**mg/l** Batch: W47126	D Dil: 2600
Dissolved Phosphorus SM 4500-P B, F 1999	Prep: 26-Mar-2014 1538 by 308	**100** Analyzed: 27-Mar-2014 1756 by 308	5	**mg/l** Batch: W47108	
Total Phosphorus SM 4500-P B,F 1999	Prep: 25-Mar-2014 1634 by 308	**280** Analyzed: 28-Mar-2014 0755 by 308	20	**mg/l** Batch: W47089	D Dil: 540
Reactive Phosphorus SM 4500-P F 1999	Prep: 26-Mar-2014 1538 by 308	**130** Analyzed: 27-Mar-2014 1756 by 308	5	**mg/l** Batch: W47108	
BOD 5-day SM 5210 B 2001	Prep: 27-Mar-2014 0819 by 271	**7800** Analyzed: 01-Apr-2014 1302 by 271	3000	**mg/l** Batch: W47118	
Carbonaceous BOD 5-day SM 5210 B 2001	Prep: 27-Mar-2014 0820 by 271	**7700** Analyzed: 01-Apr-2014 1306 by 271	3000	**mg/l** Batch: W47119	
Soluble BOD 5-day SM 5210 B 2001	Prep: 27-Mar-2014 0819 by 271	**4400** Analyzed: 01-Apr-2014 1304 by 271	1000	**mg/l** Batch: W47118	
Total Suspended Solids USGS 3765	Prep: 27-Mar-2014 0844 by 271	**9700** Analyzed: 27-Mar-2014 1233 by 271	1000	**mg/l** Batch: W47120	
Nitrate + Nitrite as N EPA 300.0	Prep: 25-Mar-2014 1614 by 07	**< 0.5** Analyzed: 25-Mar-2014 2327 by 07	0.5	**mg/l** Batch: C16563	D Dil: 10
Nitrate as N EPA 300.0	Prep: 25-Mar-2014 1614 by 07	**< 0.5** Analyzed: 25-Mar-2014 2327 by 07	0.5	**mg/l** Batch: C16563	D Dil: 10
Nitrite as N EPA 300.0	Prep: 25-Mar-2014 1614 by 07	**< 0.5** Analyzed: 25-Mar-2014 2327 by 07	0.5	**mg/l** Batch: C16563	D Dil: 10
Fecal Coliform SM 9222 D 1997		**64000** Analyzed: 25-Mar-2014 1617 by 21	10000	**/100ml** Batch: M4376	D Dil: 10000

EMISSION RATE TABLE AND OTHER FORMS

The following additional forms may be necessary for any air permit applications other than Registrations and Administrative Amendments.

- EMISSION RATE TABLE – All sources must have an Emission Rate Table. Each ERT should be accompanied by a calculation sheet and emission factor source sheet.
- HAPS EMISSION RATE TABLE – If the source also emits HAPs a HAPs Emission Rate Table must be completed.
- INSIGNIFICANT ACTIVITY LIST – Complete for all sources that are proposed to be classified as Insignificant in the permit.
- INTERNAL COMBUSTION ENGINE SUMMARY FORM – Complete for any engines included in the permit application.
- CONTROL EQUIPMENT OPERATING PARAMETERS – Complete for any air pollution control equipment included in the permit application.
- STORAGE TANK SUMMARY FORM – Complete for any storage tanks included in the permit application.

EMISSION RATE TABLE

EMISSION POINT NO.	YEAR INSTALLED	YEAR LAST MODIFIED	PROCESS DESCRIPTION (Descriptive Name)	SCC	STACK HEIGHT (FT)	INSIDE STACK DIMENSIONS (FT)	STACK GAS TEMP. (ºF)	STACK GAS VELOCITY (FT/SEC)	UTM COORDINATES	
									HORIZ. (E)	VERT. (N)
1			Plasma Processing of Liquid Swine Waste		25	.7	180	18	493362.05	3975383.51

MAXIMUM OPERATING HOURS			ARE THE HOURS OF OPERATION OF THE UNIT RELIED UPON TO LIMIT THE ANNUAL POTENTIAL EMISSIONS?	HEAT INPUT CAPACITY (Boiler, Dryer, Furnace, Etc.) MMBTU/HR	FUEL HEAT VALUE MMBTU/UNIT	FUEL % S
HRS/DAY	HRS/MTH	HRS/YR				
10		3650	YES ☐ NO **X**	NA	NA	NA

PROPOSED MAXIMUM PRODUCTION/OPERATION RATES					ARE THE HOURLY PRODUCTION/OPERATION RATES RELIED UPON TO LIMIT THE PROPOSED HOURLY MAXIMUM EMISSION RATES?
ANNUAL	MONTHLY	HOURLY	UNITS (gal, lb, ft, etc.)	RAW MATERIAL, PRODUCT, FUEL, ETC.	YES ☐ NO **X**
3,557,290	296,440	9746	lb	Swine waste	
					ARE THE ANNUAL PRODUCTION/OPERATION RATES RELIED UPON TO LIMIT THE PROPOSED ANNUAL MAXIMUM EMISSION RATES?
					YES ☐ NO **X**

POLLUTANT (Complete the HAPs EMISSION RATE TABLE for all HAP emissions)	PROPOSED MAXIMUM EMISSIONS		Regulations (NSPS, PSD, etc.)	EMISSION CONTROL EQUIPMENT		
	LBS/HOUR	TONS/YEAR		TYPE (Scrubber, Cyclone, Etc.)	EQUIPMENT MANUFACTURER AND MODEL NUMBER(S)	% CONTROL EFFICIENCY
PM	<0.006	<0.01		Scrubber	Plasma Energy Group	90
PM_{10}	<0.003	<0.005		Scrubber	Plasma Energy Group	90
SO_2	<0.006	<0.01		Scrubber	Plasma Energy Group	95
VOC	0.03	0.06		CO Catalyst	Sud Chemie Protech	90
CO	3.23	5.9		CO Catalyst	Sud Chemie Protech	95-99
NO_x	0.5	0.009		SCR		90
Other (list)						

CONTROL EQUIPMENT OPERATING PARAMETERS

Source No:		**Description:**	

Fabric Filter Operating Parameters:				
Gas/Cloth Ratio:				
Pressure Drop Across Baghouse:		in. H_2O (min)		in. H_2O (max)
Inlet Gas Temperature:		ºF (min)		ºF (max)
Outlet Gas Temperature:		ºF (min)		ºF (max)
Inlet Gas Flow Rate:				

Electrostatic Precipitator Operating Parameters:				
Pressure Drop:				
Inlet Gas Temperature:		ºF (min)		ºF (max)
Gas Velocity (through ESP):		ft/sec		
Conditioning Agent Additions:		gr/ft^3		
Voltage and Current Readings for each Transformer-Rectifier (T-R) Set:				
Example:	first 3 fields - 3 at 50 KVA (55 kV_p, 35 kV_{av}, 500 mA)			
	last 2 fields - 4 at 64 KVA (70 kV_p, 45 kV_{av}, 500 mA)			

Mechanical Collectors Operating Parameters:				
Gas Flow Rate:		ft^3/min		
Pressure Drop		in. H_2O (min)		in. H_2O (max)
Inlet Velocity:		ft/sec		
Inlet Gas Temperature:		ºF (min)		ºF (max)
Outlet Gas Temperature:		ºF (min)		ºF (max)

Scrubber Operating Parameters:					
Scrubbing Liquor:	**H2O**				
Gas Flow Rate	217	ft^3/min			
Liquor Flow Rate:	600	gal/min			
Gas Pressure Drop Across Unit:	2	in. H_2O (min)		in. H_2O (max)	
Liquid Pressure Drop Across Unit:	90	psi (min)		psi (max)	
Inlet Gas Temperature:	1500	ºF (min)		ºF (max)	
Outlet Gas Temperature:	80	ºF (min)		ºF (max)	
Solids Content of Recirculated Scrubber Water:		≤ 23		gr/gal	
pH of Recirculated Scrubber Water:		7.2	max	6.0	min

Oxidizer Operations				
Thermal Oxidizer Combustion Zone Temperature:		ºF (min)		ºF (max)
Catalytic Oxidizer	≤1300	Catalyst Bed Inlet ºF	≤1800	Outlet ºF

CERTIFICATION AND MAILING

Certifications

For all Registrations and applications complete the CERTIFICATION OF APPLICATION that follows.

Additionally, for all Title V permit applications, complete the CERTIFICATION OF COMPLIANCE that follows. If the Title V application is a Minor Modifications, then also complete the CERTIFICATION OF MINOR MODIFICATION.

Checklist

Review the checklist below for items to include in your registration or application.

The following are required information for an application:	Registration	Initial Permit (New or existing Facility)	Renewal	Significant, De Minimis or Minor Modifications	Administrative Amendment
General Information Forms	Yes	Yes	Yes	Yes	Yes
Emission Rate Tables	No	Yes	Yes	Yes	No
Calculations	Yes	Yes	Yes	Yes	Maybe
Control Equipment Operating Parameters	No	Yes	Yes	Yes	Not Applicable
Process Flow Diagram	Yes	Yes	Yes	Yes	No
Process Description	Yes	Yes	Yes	Yes	No
USGS (Area) Map	No	Yes	Yes	Maybe[1]	No
Plot Plan	No	Yes	Yes	Maybe[1]	No
Property Description	No	Yes	Yes	No	No
Operating Scenarios	No	Yes	Yes	Yes	No
Equipment Specifications	Yes	Yes	Yes	Maybe[1]	No
Compliance Plan and Schedule	No	Title V Only	Yes	Title V Only	No
Detailed NSPS and NESHAP/MACT Requirements	Maybe	Maybe	Maybe	Maybe	No
Additional Information	No	Yes	Yes	Yes	No
List of Insignificant Activities	No	Yes	Yes	Yes	Maybe
Disclosure Statement	Yes	Yes	Yes	No	No
Certificate of Good Standing, Domestic and Foreign	Yes	Yes	Yes	Yes	No
Certification of Application	Yes	Yes	Yes	Yes	Yes
Certification of Compliance	No	Title V Only	Yes	Title V Only	Title V Only
Certification of Minor Mod	No	No	No	Minor Mod Only	No

1 - Modifications involving new construction or modification of the manner in which the current process operates will require this attachment. Modifications involving production increases, hour of operation increases, etc. (i.e. do not involve the addition of any new equipment units or modification of the manner in which the current process operates) will not require this attachment.
2 - Disclosure statements are required for all new facilities and all transfers of ownership. If a disclosure statement has been previously submitted to the Air Division or any other Division, it is not necessary to submit another one unless there have been changes to the information contained therein.

CERTIFICATION AND MAILING

Copies and Mailing Instructions

Compile copies of your registration or application as follows:

Type of application	# of copies needed
Registration	Original Only
Minor Source	Original Only
Title V/Major	Original Only
PSD	Original Only
Confidential Applications	One Complete Application with all information, including confidential. One non-confidential original with confidential information redacted

Mail the completed Registration or application and required attachments to the address below. An electronic version of any or all of the application is not required, but is helpful in processing your permit. Please include with your application or email to AirPermits@adeq.state.ar.us.

Mail permit applications to:

Arkansas Department of Environmental Quality
Attention: Air Division
5301 Northshore Drive
North Little Rock, AR 72118-5317

Phone Number: (501) 682-0744
Fax Number: (501) 682-0880
Our Email Address is: AirPermits@adeq.state.ar.us

CERTIFICATION OF APPLICATION
COMPLETE FOR ALL REGISTRATIONS AND APPLICATIONS

"Responsible Official" means one of the following:

1) For a corporation: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

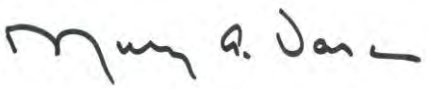
   (i) the facilities employ more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars); or

   (ii) the delegation of authority to such representative is approved in advance by the permitting authority (a copy of this delegation of authority must be attached);

(2) For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

(3) For a municipality, State, Federal, or other public agency: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of EPA).

I certify under penalty of law that this application and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

MURRY VANCE	PRESIDENT
typed/printed name of responsible official	title
	09/17/2014
signature of responsible official	date

(A copy of any delegation of authority must be attached)

MURRY VANCE	PLASMA ENERGY GROUP, LLC
typed/printed name of person preparing application	firm or company

CERTIFICATION OF APPLICATION

Address of preparer's firm 8340 DONAL STREET PORT RICHEY, FLORIDA 34668	telephone number (including area code) 727-807-7950

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY
DISCLOSURE STATEMENT

Instructions for the Completion of this Document:

A. Individuals, firms or other legal entities with no changes to an ADEQ Disclosure Statement, complete items 1 through 5 and 18.

B. Individuals who never submitted an ADEQ Disclosure Statement, complete items 1 through 4, 6, 7, and 16 through 18.

C. Firms or other legal entities who never submitted an ADEQ Disclosure Statement, complete 1 through 4, and 6 through 18.

Mail to:
ADEQ
DISCLOSURE STATEMENT
[*List Proper Division(s)*]
5301 Northshore Drive
North Little Rock, AR 72118-5317

Hand Deliver to:
ADEQ
DISCLOSURE STATEMENT
[*List Proper Division (s)*]
5301 Northshore Drive
North Little Rock, AR 72118-5317

1. APPLICANT: (Full Name) PLASMA ENERGY GROUP, LLC

2. MAILING ADDRESS (Number and Street, P.O.Box Or Rural Route) :
8340 DONAL STREET

3. CITY, STATE, AND ZIPCODE:
PORT RICHEY, FLORIDA 34668

4. (check all that apply.)

☐ Individual ☒ Corporate or Other Entity

☒ Permit ☐ License ☐ Certification ☐ Operational Authority

☒ New Application ☐ Modification ☐ Renewal Application (If no changes from previous disclosure statement, complete number 5 and 18.)

☒ Air ☐ Water ☐ Hazardous Waste ☐ Regulated Storage Tank ☐ Mining ☐ Solid Waste

☐ Environmental Preservation and Technical Service

5. Declaration of No Changes:
The violation history, experience and credentials, involvement in current or pending environmental lawsuits, civil and criminal, have not changed since the last Disclosure Statement I filed with ADEQ on _____

_____

Signature of Individual or Authorized Representative of Firm or Legal Entity
(Also complete #18.)

6. Describe the experience and credentials of the Applicant, including the receipt of any past or present permits, licenses, certifications or operational authorization relating to environmental regulation. (Attach additional pages, if necessary.)

SEE ATTACHMENT 1

7. List and explain all civil or criminal legal actions by government agencies involving environmental protection laws or regulations against the Applicant * in the last ten (10) years including:

1. **Administrative enforcement actions resulting in the imposition of sanctions;**
2. **Permit or license revocations or denials issued by any state or federal authority;**
3. **Actions that have resulted in a finding or a settlement of a violation; and**
4. **Pending actions.**

(Attach additional pages, if necessary.)

*** Firms or other legal entities shall also include this information for all persons and legal entities identified in sections 8-16 of this Disclosure Statement.**

PLASMA
ENERGY GROUP, LLC

Attachment 1

Plasma Energy Group, LLC, a development stage company, was founded by Murry A. Vance and established in Florida in 2013. The Company provides an innovative, environmentally sound technology to convert waste into a manageable, solid residue that can be captured for added value, gasification of organic material, reduction of inorganic material, and steam generation. The Company's patented Plasma Arc Gasification system ("PAG") physically alters the composition of any material, with limited air emissions, through a proprietary process utilizing an electrical discharge into the waste stream that is trapped within a conductive plasma cloud. The processing is achieved and controlled in an inert atmosphere process chamber. The technology has been proven to reduce the volume and weight of processed waste up to 95% with a substantial cost savings over the cost of other reduction processes, including incineration.

MURRY VANCE -

Prior to Founding PEG, Mr. Vance was a fore runner in the development of LED lighting for commercial use in the US, he was the founder and President of LED Lighting of America and LED Lighting Technologies Group, LLC. Both these LED companies were sold to allow for complete dedication to PEG. Prior to the LED companies Mr. Vance was Founder, President, and Chairman of the Board for Arc Technologies Group, Inc. and Bio Arc, Inc., companies that were the forerunners and developed the first of an innovative high-tech environmentally safe plasma waste disposal system for onsite disposal.

Founding the Company in 1992, Mr. Murry Vance built Arc Tech from a small "one-man" organization to a rapidly growing firm with a unique patented product and strong strategic alliances. In this regard, he was instrumental in the design and development of the incandescent disposal system, subsequently building a working test unit, which passed EPA testing requirements and validated initial patent claims. Mr. Vance continues to be involved with all phases of operations at the Company, including engineering, marketing, and administration.

His professional career began in Kansas City, Missouri at the Dart Truck Division of Pacific Car & Foundry (PACCAR), where he worked from 1978 to 1980. The Dart division designed and manufactured large mining equipment. In 1980, when this product line was dropped from PACCAR to focus on assembly-line type products, Mr. Vance formed National Chassis Corporation and National Refuelers, Inc. to continue the development of the truck chassis product line. National Chassis Corporation designed and manufactured six different truck chassis for Exxon USA. National Refuelers, purchased and remanufactured used aviation refueling equipment for resale worldwide. Mr. Vance sold the companies in 1983.

Mr. Vance attended Memphis State University from 1971 to 1974, where he initially studied business, accounting, and engineering. In 1974, he moved to the University of Missouri at Kansas City where he studied physics and chemistry until 1978. During his career Mr. Vance has been awarded 27 U.S. and International patents; 26 utility and 1 design.

Plasma Energy Group, LLC
8340 Donal Street
Port Richey, Florida 34668
Office: 727-807-7950, Fax: 727-807-7972

PLASMA ENERGY GROUP, LLC

Attachment 1

Dr. Anatoly Sobolevskiy, Ph.D.

Prior to joining PEG, Dr. Sobolevskiy was a Fellow Engineer at Siemens Energy, Inc. where he was responsible for development of novel post-combustion air pollution abatement systems for NOx, CO, and VOC reduction in the gas turbine exhaust for combined and simple cycle power plants. He developed new catalytic systems for emissions reduction in the high water and sulfur content environment for advanced hydrogen gas turbine program. Provided technical leadership in developing of novel SCR based catalysts for post combustion control of NOx emissions with negligible ammonia slip. At Siemens he provided technical guidance and support for Siemens activities in the area of combustion optimization, fuel delivery system performance, fuel analysis, etc. Conducted research in advanced gas turbine technology in the areas of combustion, Developed a new global reaction mechanism of partial oxidation of methane in the Siemens PG catalytic combustion process to achieve very low levels of NOx. He served as a lead emissions engineer conducted evaluation of existing and new methods of emission reduction in combustion processes and post combustion air pollution control devices, and prepare recommendations for their use. He was a member of Siemens PG Fuel Quality Team conducted evaluation and testing of different fuels for the dry low NOx combustors, participated in developing fuel specifications, analytical procedures, etc., served as a member of ASME Sub-committie 2 – Fuels and Environmental). Prior to Siemens, Dr. Sobolevskiy was a Air Compliance Manager/ Engineer, Florida Department of Environmental Protection, where he was responsible for air compliance of stationary, area, and mobile sources in Air Resources Management, Central District, FDEP. Performed technical evaluation and inspection of air pollution abatement equipment and continuous emission monitoring systems in power generating industry to determine their compliance status with US EPA and State of Florida requirements. Reviewed applications for air permits, engineering design, facility records, and performed engineering calculations for the technical examination of data related to the emissions of air pollutants into the atmosphere. Supervised three compliance engineers.

Before relocating to the US, Dr. Sobolevskiy was the Chief Research Scientist, Institute of High Temperatures of the Russian Academy of Science, Moscow, Russia. His determined directions of research and development in emission control technologies for coal fired power plants and internal combustion engines, including catalytic reduction systems to abate NOx emissions while burning solid fuels, natural gas and fuel oil. Studied the reaction phenomena in combustion chemistry. Responsibilities included field testing of post-combustion control systems in power generation applications, diesel and gasoline engines, and chemical manufacturing processes. Conducted research in physical chemistry of products derived from processes of gasification and liquefaction of solid fuels. Dr. Sobolevskiy began his scientific career as a Senior Research Scientist/ Engineer, Institute of Fossil Fuels, Moscow, Russia. Where he developed a manufacturing process and engineering design for zone purification of different classes of chemical substances. Investigated phase diagrams of aromatic

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compounds derived from high boiling point coal products in the range of 99.50 - 99.99 % of pure component.

Where he was promoted to the Sector Manager of the Fuel Thermal Treatment Processes, where he developed chemical-engineering principals of thermodestruction of solid fuels in the presence hydro-aromatic components of solvent. Studied heat and mass transfer between gaseous and solid phases during coal destruction. Invented a new high speed process for gas and solvent destructive extraction of solids including coal, oil shale and petroleum residues under elevated pressure and temperature conditions. Developed a pilot manufacturing process for economic, high speed solvent extraction of coal and oil shale under high pressure (50 bar). Conducted investigation of the composition and structure of petroleum residues in the liquefaction processes, including the stage of waste product treatment. Supervised three Ph.D., four MS collaborators, engineers, and technicians. Dr. Sobolevskiy's teaching experience includes: Professor of Postgraduate Studies in the area of physical chemistry and fuel technology. Institute of Fossil Fuels, Moscow, Russia., and Professor of Chemistry, Teaching courses in General Chemistry at Valencia State College, Orlando Florida. PUBLICATIONS AND AWARDS: Over sixty Scientific Journal Articles and Reports. Holder of 10 patents and a winner of the Silver Medal of the USSR State Exhibition in 1986. Siemens special performance awards in 2000, 2002, and 2007

8. List all officers of the Applicant. (Add additional pages, if necessary.)

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

9. List all directors of the Applicant. (Add additional pages, if necessary.)

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

10. List all partners of the Applicant. (Add additional pages, if necessary.)

NAME: _____ TITLE: SEE ATTACHMENT 2
STREET: _____
CITY, STATE, ZIP: _____

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

11. List all persons employed by the Applicant in a supervisory capacity or with authority over operations of the facility subject to this application.

NAME: MURRY VANCE TITLE: PRESIDENT
STREET: 8340 DONAL STREET
CITY, STATE, ZIP: PORT RICHEY, FLORIDA 34668

NAME: DR. ANATOLY SOBOLEVSKIY PH.D TITLE: _____
STREET: 2413 CYPRESS TRACE CIRCLE
CITY, STATE, ZIP: ORLANDO, FLORIDA 32825

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

PLASMA
ENERGY GROUP, LLC

Attachment 2

LIST OF PARTNERS

NAME	Mailing Address	City, State, & Zip
Bruce W. Allison	2719 County Road 265	Section, AL 35771
Kenneth H. Epps	266 County Road 336	Hollywood, AL 35752
Kathy M. Epps	165 Starkey Drive	Scottsboro, AL 35769
Candace L. Merrick	5218 Anderson St.	Shawnee, KS 66226
Johyne Hamra	8503 Overhill Road	Leawood, KS 66206
Terry D. Aiken	4236 Palm Tree Blvd.	Cape Coral, FL 33904
Sherry J. Aiken	25635 Oak Grove Road	Elkmont, AL 35950
Sheila D. McCarley	25775 Jay Bee Way	Elkmont, AL 35620
Cynthia L. Johnson	25775 Jay Bee Way	Elkmont, AL 35620
Stanley & Susan Droke	8646 Wood Mills Dr. W	Cordova, TN 38016

Plasma Energy Group, LLC
8340 Donal Street
Port Richey, Florida 34668
Office: 727-807-7950, Fax: 727-807-7972

12. List all persons or legal entities, who own or control more than five percent (5%) of the Applicant's debt or equity.

NAME: MURRY VANCE TITLE: PRESIDENT
STREET: 8340 DONAL STREET
CITY, STATE, ZIP: PORT RICHEY, FLORIDA 34668

NAME: STACY Y. PATRICK TITLE: VICE PRESIDENT
STREET: 8340 DONAL STREET
CITY, STATE, ZIP: PORT RICHEY, FLORIDA 34668

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

13. List all legal entities, in which the Applicant holds a debt or equity interest of more than five percent (5%).

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

NAME: _____ TITLE: _____
STREET: _____
CITY, STATE, ZIP: _____

14. List any parent company of the Applicant. Describe the parent company's ongoing organizational relationship with the Applicant.

NAME: _____
STREET: _____
CITY, STATE, ZIP: _____

Organizational Relationship:

15. List any subsidiary of the Applicant. Describe the subsidiary's ongoing organizational relationship with the Applicant.

NAME: _____
STREET: _____
CITY, STATE, ZIP: _____

Organizational Relationship:

16. List any person who is not now in compliance or has a history of noncompliance with the environmental laws or regulations of this state or any other jurisdiction and who through relationship by blood or marriage or through any other relationship could be reasonably expected to significantly influence the Applicant in a manner which could adversely affect the environment.

NAME: _____ TITLE: _____

STREET: _____

CITY, STATE, ZIP: _____

NAME: _____ TITLE: _____

STREET: _____

CITY, STATE, ZIP: _____

17. List all federal environmental agencies and any other environmental agencies outside this state that have or have had regulatory responsibility over the Applicant.

18. VERIFICATION AND ACKNOWLEDGEMENT

The Applicant agrees to provide any other information the director of the Arkansas Department of Environmental Quality may require at any time to comply with the provisions of the Disclosure Law and any regulations promulgated thereto. The Applicant further agrees to provide the Arkansas Department of Environmental Quality with any changes, modifications, deletions, additions or amendments to any part of this Disclosure Statement as they occur by filing an amended Disclosure Statement.

DELIBERATE FALSIFICATION OR OMISSION OF RELEVANT INFORMATION FROM DISCLOSURE STATEMENTS SHALL BE GROUNDS FOR CIVIL OR CRIMINAL ENFORCEMENT ACTION OR ADMINISTRATIVE DENIAL OF A PERMIT, LICENSE, CERTIFICATION OR OPERATIONAL AUTHORIZATION.

State of Florida

County of Pasco

I, Murry A. Vance **, swear and affirm that the information contained in this Disclosure Statement is true and correct to the best of my knowledge, information and belief.**

APPLICANT SIGNATURE: Murry A Vance

COMPANY TITLE: Plasma Energy Group, LLC Managing Member

DATE: 9/17/14

SUBSCRIBED AND SWORN TO BEFORE ME THIS 17 **DAY OF** Sept. **20** 14

Susan L Weisberg

NOTARY PUBLIC

MY COMMISSION EXPIRES:

Aug. 30, 2018

SUSAN L. WEISBERG
Notary Public - State of Florida
My Comm. Expires Aug 30, 2018
Commission # FF 118258

State of Florida
Department of State

I certify from the records of this office that PLASMA ENERGY GROUP, LLC, is a limited liability company organized under the laws of the State of Florida, filed on February 8, 2013, effective February 8, 2013.

The document number of this company is L13000020640.

I further certify that said company has paid all fees due this office through December 31, 2014, that its most recent annual report was filed on March 17, 2014, and its status is active.

Given under my hand and the Great Seal of the State of Florida at Tallahassee, the Capital, this the Thirteenth day of September, 2014

Ken Detzner

Secretary of State

Authentication ID: CU5377575508

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For service of process contact the Secretary of State's office.

Corporation Name	PLASMA ENERGY GROUP, LLC
Fictitious Names	
Filing #	811060928
Filing Type	Foreign Limited Liability Company
Filed under Act	Foreign LLC; 1003 of 1993
Status	Good Standing
Principal Address	
Reg. Agent	ROBERT ROSS
Agent Address	3501 OAKWOOD ROAD #2 LITTLE ROCK, AR 72202
Date Filed	09/16/2014
Officers	STACY Y PATRICK , Incorporator/Organizer
Foreign Name	N/A
Foreign Address	8340 DONAL ST PORT RICHEY, FL 34668
State of Origin	FL

Purchase a Certificate of Good Standing for this Entity

Pay Franchise Tax for this corporation