

**HUMAN CREMATORY  
AIR GENERAL PERMIT REGISTRATION FORM**

**Part II. Notification to Permitting Office**

(Detach and submit to appropriate permitting office; keep copy onsite)

**Instructions:** To give notice to the Department of an eligible facility's intent to use this air general permit, the owner or operator of the facility must detach and complete this part of the Air General Permit Registration Form and submit it to the appropriate Department of Environmental Protection or local air pollution control program office which has permitting authority. Please type or print clearly all information, and enclose the appropriate air general permit registration processing fee pursuant to Rule 62-4.050, F.A.C. (\$100 as of the effective date of this form)

0990316-005

**Registration Type**

Check one:

**INITIAL REGISTRATION** – Notification of intent to:

- Construct and operate a proposed new facility.
- Operate an existing facility not currently using an air general permit (e.g., a facility proposing to go from an air operation permit to an air general permit).

**RE-REGISTRATION** (for facilities currently using an air general permit) - Notification of intent to:

- Continue operating the facility after expiration of the current term of air general permit use.
- Continue operating the facility after a change of ownership.
- Make an equipment change requiring re-registration pursuant to Rule 62-210.310(2)(e), F.A.C., or any other change not considered an administrative correction under Rule 62-210.310(2)(d), F.A.C.

**Surrender of Existing Air Operation Permit(s) - For Initial Registrations Only**

If the facility currently holds one or more air operation permits, such permit(s) must be surrendered by the owner or operator upon the effective date of this air general permit. In such case, check the first box, and indicate the operation permits being surrendered. If no air operation permits are held by the facility, check the second box.

- All existing air operation permits for this facility are hereby surrendered upon the effective date of this air general permit; specifically permit number(s):  
\_\_\_\_\_
- No air operation permits currently exist for this facility.

**General Facility Information**

Facility Owner/Company Name (Name of corporation, agency, or individual owner who or which owns, leases, operates, controls, or supervises the facility.)

Scobee-Combs-Bowden Funeral Home & Crematory, Inc.

Site Name (Name, if any, of the facility site; e.g., Plant A, Metropolis Plant, etc. If more than one facility is owned, a registration form must be completed for each.)

Scobee-Combs-Bowden Funeral Home & Crematory

Facility Location (Provide the physical location of the facility, not necessarily the mailing address.)

Street Address: US HWY 1 & NE 15th Avenue

City: Boynton Beach

County: Palm Beach

Zip Code: 33435

Facility Start-Up Date (Estimated start-up date of proposed new facility.) (N/A for existing facility)

N/A

**Owner/Authorized Representative**

Name and Position Title (Person who, by signing this form below, certifies that the facility is eligible to use this air general permit.)

Print Name and Title: Michael Bowden, President

Owner/Authorized Representative Mailing Address

Organization/Firm: Scobee-Combs-Bowden Funeral Home & Crematory, Inc.

Street Address: 1622 NE 4<sup>th</sup> Street

City: Boynton Beach

County: Palm Beach

Zip Code: 33435

Owner/Authorized Representative Telephone Numbers

Telephone: (561) 732-8151

Fax: (561) 732-8158

Cell phone (optional):

**Facility Contact (If different from Owner/Authorized Representative)**

Name and Position Title (Plant manager or person to be contacted regarding day-to-day operations at the facility.)

Print Name and Title: Michael Bowden, President

Facility Contact Mailing Address

Organization/Firm: Scobee-Combs-Bowden Funeral Home & Crematory

Street Address: 1622 NE 4<sup>th</sup> Street

City: Boynton Beach

County: Palm Beach

Zip Code: 33415

Facility Contact Telephone Numbers

Telephone: (561) 732-8151

Fax: (561) 732-8158

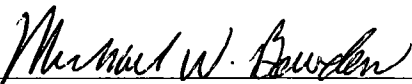
Cell phone (optional):

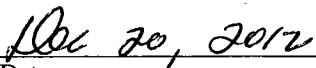
**Owner/Authorized Representative Statement**

This statement must be signed and dated by the person named above as owner or authorized representative

*I, the undersigned, am the owner or authorized representative of the owner or operator of the facility addressed in this Air General Permit Registration Form. I hereby certify, based on information and belief formed after reasonable inquiry, that the facility addressed in this registration form is eligible for use of this air general permit and that the statements made in this registration form are true, accurate and complete. Further, I agree to operate and maintain the facility described in this registration form so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof.*

*I will promptly notify the Department of any changes to the information contained in this registration form.*

  
Signature

  
Date

### Design Calculations

If this is an initial registration for a proposed new human crematory unit, provide design calculations to confirm a sufficient volume in the secondary chamber combustion zone to provide for at least a 1.0 second gas residence time at 1800 degrees F.

- Manufacturer's design calculations attached. - See Attachment 1 for compliance test report
- Registration is not for proposed new human crematory unit(s).

### Description of Facility

Below, or as an attachment to this form, provide a description of all crematory operations at the facility in sufficient detail to demonstrate the facility's eligibility for use of this air general permit and to provide a basis for tracking any future equipment or process changes at the facility. Describe all air pollutant-emitting processes and equipment at the facility, and identify any air pollution control measures or equipment used.

Scobee-Combs-Bowden Funeral Home & Crematory is replacing an Industrial Equipment Crematory with a U.S. Cremation Equipment Model "Classic" Crematory. The facility permit number is 0990316.

### Equipment Description

The "Classic" is a multi-chamber unit having an average 150 - 200 lbs/hr fired with natural gas. The primary chamber burner is rated at 500,000 Btu/hr, and the secondary chamber burner is rated at 1,500,000 Btu/hr, for a total of 2,000,000 Btu/hr. Control of air pollution is achieved through the design of the "Classic" crematory, including its ability to operate the secondary chamber between 1600 - 1850 degrees Fahrenheit at a residence time in excess of 1.0 second. The design also includes fully automatic PLC based controls, independent fuel/air systems, preheated combustion air, secondary chamber temperature monitor and recorder, primary burner temperature interlock (prevents primary burner from firing prior to the secondary chamber reaching its set point temperature), UV continuous scanning flame detectors on burners, and an opacity sensor which can temporarily suspend operation of the primary chamber burner. In attachment 2 we have include a copy of the crematory spec.

### Emissions Summary

Emission Summary and Calculations - Air pollution control is demonstrated through identical source stack testing. (see Attachment 1). See Attachment 3 for tabular summary of emissions. Criteria pollutant emissions values, except CO and PM are based on emission factors from AP-42, Table 2.1-12. The emission for CO and PM are derived from results of the identical source stack test.

### Retention Time

The retention time was measured on an identical unit at 1.75 seconds at 1800°F.



Friday, December 7, 2012

Florida Department of Environmental Protection  
FDEP Receipts  
PO Box 3070  
Tallahassee, FL 32315-3070

**Re: General Permit Application – Facility ID: 0990316**

To whom it may Concern:

Enclosed is one (1) copy of the above referenced application along with a check made payable to the Florida Department of Environmental Protection in the amount of \$100.00 for the application fee.

I trust this application is complete; however, should you have any questions or need any additional information for issuing the general permit, please contact me at (407) 574-2021 or e-mail at AI@CFL.RR.COM.

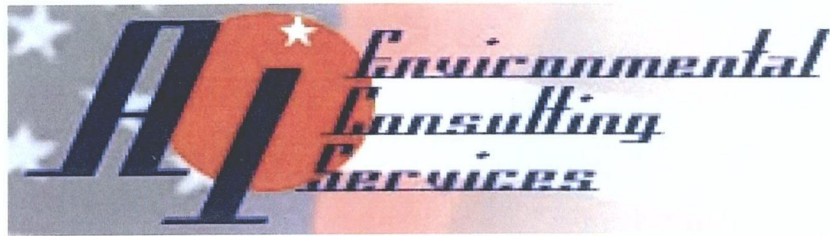
Respectfully submitted,  
AI ENVIRONMENTAL CONSULTING SERVICES

A handwritten signature in black ink, appearing to read 'Luis Llorens', is written over a horizontal line.

Luis Llorens  
President/Project Manager

Enclosures: One (1) Application and check

RECEIVED  
DEC 31 2012  
DEPARTMENT OF AIR  
RESOURCE MANAGEMENT



*General Permit Application  
Human Crematory*

*Prepared for:*

*Scobee-Combs-Bowden Funeral Home & Crematory  
Facility:0990316  
US Hwy 1 & NE 15th Ave  
Boynton Beach, FL 33435  
Palm Beach County*

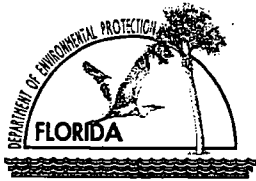
*Prepared By:*

*AI Environmental Consulting Services, Inc.  
598 Northlake Blvd, Ste. 1016  
Altamonte Springs, Florida 32701*

*Date: December 2012*

## *Application Contents*

Form 62-210.920(2)(c) General Permit Application  
Attachment 1 - Compliance Test Report  
Attachment 2 - Equipment Drawings and Brochures  
Attachment 3 - AP-42 Emissions Calculations  
Attachment 4 - Process Flow Diagram



# Department of Environmental Protection

## Division of Air Resource Management

### HUMAN CREMATORY AIR GENERAL PERMIT REGISTRATION FORM

#### Part I. Procedures and Conditions for Use of Air General Permit

The Department of Environmental Protection ("Department" or "DEP") has established an "air general permit" at Florida Administrative Code ("F.A.C.") Rule 62-210.310(5)(c) for human crematories. An air general permit is an authorization by rule to construct or operate a specific type of air pollutant emitting facility. Use of such authorization by any individual facility does not require action by the Department. The terms and conditions of the air general permit are set forth in the rule, rather than in a separately issued air construction or air operation permit.

The owner or operator of an eligible facility comprising one or more human crematories may register to use the air general permit at Rule 62-210.310(5)(c), F.A.C., by following the general procedures given at Rule 62-210.310(2), F.A.C., the text of which is provided below. The owner or operator shall notify the Department of the facility's intent to use this general permit by submitting Part II of this registration form to the appropriate Department of Environmental Protection or local air pollution control program office which has permitting authority. Questions concerning this air general permit or the registration process may be directed to any such office or to the Department's small business assistance program at 1-800-SBAP-HLP (1-800-722-7457).

The owner or operator of a facility who properly registers to use this air general permit, and who is not denied use of the air general permit by the Department, is authorized to construct and operate the facility in accordance with the general terms and conditions of Rule 62-210.310(3), F.A.C., and the specific terms and conditions of Rule 62-210.310(5)(c), F.A.C. The text of these two rules is also provided below, followed by definitions of words and phrases used in the rules and on this form. A facility using this air general permit shall not be entitled to use more than one air general permit for the facility.

#### **Rule 62-210.310(2), F.A.C.**

**(2) General Procedures.** This subsection sets forth general procedures for use of any of the air general permits provided at subsections 62-210.310(4) and (5), F.A.C.

**(a) Determination of Eligibility.** The owner or operator of a proposed new or existing facility shall determine the facility's eligibility to use an air general permit under this rule. A facility is eligible to use an air general permit under this rule if it meets any specific eligibility criteria given in the applicable air general permit at subsection 62-210.310(4) or (5), F.A.C., and the following general criteria.

1. The facility shall not emit nor have the potential to emit 10 tons per year or more of any hazardous air pollutant, 25 tons per year or more of any combination of hazardous air pollutants, or 100 tons per year or more of any other regulated air pollutant; be collocated with, or relocated to, such a facility; or create such a facility in combination with any other collocated facilities, emissions units, or pollutant-emitting activities, including any such facility, emissions unit, or activity that is otherwise exempt from air permitting.

2. The facility shall not contain any emissions units or activities not covered by the applicable air general permit, except:

a. Units and activities that are exempt from permitting pursuant to subsection 62-210.300(3), F.A.C., or Rule 62-4.040, F.A.C.; and

b. Units and activities that are authorized by another air general permit where such other air general permit and the air general permit of interest specifically allow the use of one another at the same facility.

**(b) Registration.** The owner or operator who intends to construct or operate an eligible facility under the authority of an air general permit shall complete and submit the proper registration form to the Department for the specific air general permit to be used, as provided in subsection 62-210.920(1) or (2), F.A.C. The registration form shall be accompanied by the appropriate air general permit processing fee pursuant to Rule 62-4.050, F.A.C. (*\$100 as of the effective date of this form*)

**1. Initial Registration.** Registration of a facility which is not currently authorized to construct or operate under the terms and conditions of an air general permit is classified as an initial registration. Any existing, individual air operation permit(s) authorizing operation of the facility must be surrendered by the owner or operator, effective upon the first day of use of the air general permit.

**2. Re-registration.** Registration of a facility which is currently authorized to operate under the terms and conditions of an air general permit is classified as a re-registration. An owner or operator shall re-register the facility in the following cases:

- a. Impending expiration of the term for air general permit use;
- b. Change of ownership of all or part of the facility;
- c. Proposed new construction, modification, or other equipment change that requires registration pursuant to paragraph 62-210.310(2)(e), F.A.C.; and
- d. Any other change not considered an administrative correction under paragraph 62-210.310(2)(d), F.A.C.

**(c) Use of Air General Permit.**

1. Unless the Department denies use of the air general permit, the owner or operator of an eligible facility may use the air general permit for such facility 30 days after giving notice to the Department. The first day of the 30-day time frame, day one, is the date the Department receives the proper registration form and processing fee. The last day of the 30-day time frame, day 30, is the date the owner or operator may use the air general permit, provided there is no agency action to deny use of the air general permit.

2. To avoid lapse of authority to operate, an owner or operator intending to use, or continue to use, an air general permit must submit the proper registration form and processing fee at least 30 days prior to expiration of the facility's existing air operation permit or air general permit.

**(d) Administrative Corrections.** Within 30 days of any minor changes requiring corrections to information contained in the registration form, the owner or operator shall notify the Department in writing. Such changes shall include:

1. Any change in the name, address, or phone number of the facility or authorized representative not associated with a change in ownership or with a physical relocation of the facility or any emissions units or operations comprising the facility; or
2. Any other similar minor administrative change at the facility.

**(e) Equipment Changes.** The owner or operator shall maintain records of all equipment changes. In the case of installation of new process or air pollution control equipment, alteration of existing process or control equipment without replacement, or replacement of existing process or control equipment with equipment substantially different in terms of capacity, method of operation, material processed, or intended use than that noted on the most recent registration form, the owner or operator shall submit a new and complete air general permit registration form for the facility with the appropriate fee pursuant to Rule 62-4.050, F.A.C. to the Department, provided, however, that any change that would constitute a new major stationary source, major modification, or modification that would be a major modification but for the provisions of paragraph 62-212.400(2)(a), F.A.C., shall require authorization by air construction permit.

**(f) Enforcement of Ineligibility.** If a facility using an air general permit at any time becomes ineligible for the use of the air general permit, or if any facility using an air general permit is determined to have been initially ineligible for use of the air general permit, it shall be subject to enforcement action for constructing or operating without an air permit under subsection 62-210.300(1) or (2), F.A.C., or Chapter 62-213, F.A.C., as appropriate.



**Rule 62-210.310(3), F.A.C.**

**(3) General Conditions.** All terms, conditions, requirements, limitations, and restrictions set forth in this subsection are “general permit conditions” and are binding upon the owner or operator of any facility using an air general permit provided at subsection 62-210.310(4) or (5), F.A.C.

(a) The owner or operator’s use of an air general permit is limited to five (5) years. Prior to the end of the five (5) year term, the owner or operator who intends to continue using the air general permit for the facility shall re-register with the Department pursuant to subparagraph 62-210.310(2)(b)2., F.A.C. To avoid lapse of authority to operate, the owner or operator must submit the proper registration form and processing fee at least thirty (30) days prior to expiration of the facility’s existing air general permit. The air general permit re-registration form shall contain all current information regarding the facility.

(b) Use of an air general permit is not transferable and does not follow a change in ownership of the facility. Prior to any sale, other change of ownership, or permanent shutdown of the facility, the owner or operator is encouraged to notify the Department of the pending action. The new owner or operator who intends to continue using the air general permit for the facility shall re-register with the Department pursuant to subparagraph 62-210.310(2)(b)2., F.A.C..

(c) The air general permit is valid only for the specific type of facility and associated emissions units and pollutant-emitting activities indicated.

(d) The air general permit does not authorize any demolition or renovation of the facility which involves asbestos removal. The air general permit does not constitute a waiver of any of the requirements of Chapter 62-257, F.A.C., or 40 CFR Part 61, Subpart M, National Emission Standard for Asbestos, adopted and incorporated by reference at Rule 62-204.800, F.A.C.

(e) The general permit does not authorize any open burning.

(f) The owner or operator shall not circumvent any air pollution control device or allow the emission of air pollutants without the proper operation of all applicable air pollution control devices.

(g) The owner or operator shall maintain the authorized facility in good condition. Throughout the term of air general permit use, the owner or operator shall ensure that the facility maintains its eligibility to use the air general permit and complies with all terms and conditions of the air general permit.

(h) The owner or operator shall allow a duly authorized representative of the Department access to the facility at reasonable times to inspect and test, upon presentation of credentials or other documents as may be required by law, to determine compliance with the air general permit and Department rules.

(i) If, for any reason, the owner or operator of any facility operating under an air general permit does not comply with or will be unable to comply with any condition or limitation of the air general permit, the owner or operator shall immediately provide the Department with the following information:

1. A description of and cause of noncompliance; and
2. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

(j) Use of an air general permit does not relieve the owner or operator of the facility from liability and penalties when the construction or operation of the authorized facility causes harm or injury to human health or welfare; causes harm or injury to animal, plant or aquatic life; or causes harm or injury to property. It does not allow the owner or operator to cause pollution in contravention of Florida law.

(k) The air general permit conveys no title to land or water, nor does it constitute state recognition or acknowledgment of title.

(l) The air general permit does not convey any vested rights or exclusive privileges, nor does it authorize any injury to public or private property or any invasion of personal rights. It does not authorize any infringement of federal, state, or local laws or regulations.

(m) Use of the air general permit shall be effective until suspended, revoked, surrendered, expired, or nullified pursuant to this rule and Chapter 120, F.S.

(n) Use of the air general permit does not eliminate the necessity for the owner or operator to obtain any other federal, state or local permits that may be required, or relieve the owner or operator from the duty to comply with any federal, state or local requirements that may apply.

**Rule 62-210.310(5)(c), F.A.C.**

**(c) Air General Permit for Facilities Comprising Human Crematories.**

1. A facility comprising one (1) or more human crematories shall be eligible to use this air general permit provided it meets the general eligibility criteria of paragraph 62-210.310(2)(a), F.A.C.

2. A facility using this air general permit shall comply with the general conditions given at subsection 62-210.310(3), F.A.C., and the following specific conditions.

a. The facility shall comply with all applicable provisions of subsection 62-296.401(5), F.A.C.

b. The owner or operator may use a human crematory air general permit and an animal crematory air general permit at the same facility, provided all human crematory units operate under a single human crematory air general permit and all animal crematory units operate under a single animal crematory air general permit.

**Rule 62-296.401(5), F.A.C.**

**(5) Human Crematories.**

(a) Applicability. The requirements of this subsection apply to all human crematory units.

(b) Emission Limiting Standards.

1. Visible emissions shall not exceed 5% opacity, six-minute average, except that visible emissions not exceeding 15% opacity shall be allowed for up to six minutes in any one-hour period.

(a) Particulate matter emissions shall not exceed 0.080 grains per dry standard cubic foot of flue gas, corrected to 7% O<sub>2</sub>.

(b) Carbon monoxide (CO) emissions shall not exceed 100 parts per million by volume, dry basis, corrected to 7% O<sub>2</sub> on an hourly average basis.

(c) Operating Temperatures.

1. The owner or operator of any proposed new crematory unit which submits either a complete application for a permit to construct the new unit or an initial air general permit registration for the new unit to the Department on or after August 30, 1989, shall provide design calculations to confirm a sufficient volume in the secondary chamber combustion zone to provide for at least a 1.0 second gas residence time at 1800 degrees Fahrenheit. This information shall be provided to the Department with the air construction permit application or air general permit registration form for the proposed new unit. The actual operating temperature of the secondary chamber combustion zone shall be no less than 1600 degrees Fahrenheit throughout the combustion process in the primary chamber. The primary chamber and stack volumes shall not be used in calculating this residence time. Except as provided in subparagraph 62-296.401(5)(c)2., F.A.C., cremation in the primary chamber shall not begin unless the secondary chamber combustion zone temperature is equal to or greater than 1600 degrees Fahrenheit.

2. The owner or operator of any crematory unit for which construction began or for which a complete application for a permit to construct was received by the Department prior to August 30, 1989, shall maintain the actual operating temperature of the secondary chamber combustion zone at no less than 1400 degrees Fahrenheit throughout the combustion process in the primary chamber. Cremation in the primary chamber shall not begin unless the secondary chamber combustion zone temperature is equal to or greater than 1400 degrees Fahrenheit.

(d) Allowed Materials. Human crematory units shall cremate only human or fetal remains with appropriate containers. The remains may be clothed. The containers shall contain no more than 0.5 percent by weight chlorinated plastics as demonstrated by the manufacturer's data sheet. If containers are incinerated, documentation from the manufacturers certifying that they are composed of 0.5 percent or less by weight chlorinated plastics shall be kept on-file at the site for the duration of their use and for at

least two (2) years after their use. No other material, including biomedical waste as defined in Rule 62-210.200, F.A.C., shall be incinerated.

(e) Equipment Maintenance. All human crematory units shall be maintained in proper working order in accordance with the manufacturer's specifications to ensure the integrity and efficiency of the equipment. If a crematory unit contains a defect that affects the integrity or efficiency of the unit, the unit shall be taken out of service. No person shall use or permit the use of that unit until it has been repaired or adjusted. Repair records on all crematory units shall be maintained onsite for at least two (2) years. A written plan with operating procedures for startup, shutdown and malfunction of each crematory unit shall be maintained and followed during those events. Each unit's burners shall be operated with a proper air-to-fuel ratio. If the unit so allows, the burners' flame characteristics shall be visually checked at least once during each operating shift and adjusted when warranted by the visual checks.

(f) Test Methods and Procedures. All emissions tests performed pursuant to the requirements of this subsection shall comply with the following requirements. All EPA reference test methods are described in 40 CFR Part 60, Appendix A, adopted and incorporated by reference at Rule 62-204.800, F.A.C.

1. The reference test method for visible emissions shall be EPA Method 9.

2. The reference test method for carbon monoxide shall be EPA Method 10.

3. The reference test method for oxygen shall be EPA Method 3.

4. The reference test method for particulate matter emissions shall be EPA Method 5. The minimum sample volume shall be thirty (30) dry standard cubic feet.

5. Test procedures shall conform to the procedures specified in Rule 62-297.310, F.A.C. All test results shall be reported to the Department in accordance with the provisions of Rule 62-297.310, F.A.C.

(g) Operation During Emissions Test. Testing of emissions shall be conducted with the unit operating at a capacity of one (1) adult-sized cadaver.

(h) Frequency of Testing.

1. The owner or operator of any human crematory unit using an air general permit shall have a performance test conducted for visible emissions no later than thirty (30) days after the unit commences operation, and annually thereafter.

2. The owner or operator of any human crematory unit operating under the authority of an air construction permit or air operation permit shall have a performance test conducted for visible emissions prior to submitting the application for an initial air operation permit, and annually thereafter.

3. The owner or operator of any human crematory unit shall not be required to have performance tests conducted for carbon monoxide and particulate matter, except as provided at paragraph 62-297.310(7)(b), F.A.C.

(i) Continuous Monitoring Requirements. Each crematory unit shall be equipped and operated with a continuous monitor to record temperature at the point or beyond where 1.0 second gas residence time is obtained in the secondary chamber combustion zone in accordance with the manufacturer's instructions. In addition, each crematory unit installed after February 1, 2007, shall be equipped and operated with a pollutant monitoring system to automatically control combustion based on continuous in-stack opacity measurement. Such system shall be calibrated to restrict combustion in the primary chamber whenever any opacity exceeding 15% opacity is occurring. A complete file of all temperature measurements; all continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring system performance evaluations; all continuous monitoring system or monitoring device calibration checks; and all adjustments, preventive maintenance, and corrective maintenance performed on these systems or devices, shall be recorded in a permanent legible form available for inspection. Continuous temperature monitoring documentation shall include operator name, operator indication of when cremation in the primary chamber was begun, date, time, and temperature markings. Pollutant monitoring system documentation shall include indication of when the opacity measurement system was cleaned and checked for proper operation in accordance with the manufacturer's recommended maintenance schedule. The file shall be retained for at least two (2) years following the recording of such measurements, maintenance, reports, and records.

**Rule 62-210.200, F.A.C., Definitions**

**"Biomedical Waste"** - Any solid or liquid waste which may present a threat of infection to humans, including nonliquid-tissue, body parts, blood, blood products, and body fluids from humans and other primates; laboratory and veterinary wastes which contain human disease-causing agents; and discarded sharps. The following are also included:

1. Used absorbent materials saturated with blood, blood products, body fluids, or excretions or secretions contaminated with visible blood; and absorbent materials saturated with blood or blood products that have dried.
2. Non-absorbent, disposable devices that have been contaminated with blood, body fluids, or secretions or excretions visibly contaminated with blood, but have not been treated by a method listed in Section 381.0098, F.S., or a method approved pursuant to Rule 64E-16, F.A.C.

**"Department" or "DEP"** - The State of Florida Department of Environmental Protection.

**"Emissions Unit"** - Any part or activity of a facility that emits or has the potential to emit any air pollutant.

**"Facility"** - All of the emissions units which are located on one or more contiguous or adjacent properties, and which are under the control of the same person (or persons under common control).

**"Human Crematory"** - Any combustion apparatus used solely for the cremation of either human or fetal remains

**"Owner" or "Operator"** - Any person or entity who or which owns, leases, operates, controls or supervises an emissions unit or facility

*Attachment 1*  
*Compliance Test Report*



## *Arlington Environmental Services, Inc.*

Post Office Box 657 ~ Okeechobee, Florida 34973  
605 SW Park Street, Suite 209 ~ Okeechobee, Florida 34974  
Telephone (863) 467-0555 ~ Facsimile (863) 357-0810  
[www.arlingtonenvironmental.com](http://www.arlingtonenvironmental.com)

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U.S. Cremation Equipment  
598 South Northlake Boulevard, Suite 1016  
Altamonte Springs, FL 32701

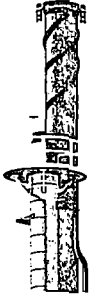
**RE: FID 0112701 – Guiding Light Cremations, LLC  
Emission Testing Conducted March 3 & 4, 2010  
Make: US Cremation Equipment  
Model: Classic Human Crematory**

To Whom It May Concern:

Emission testing for Particulate, Visible, Carbon Monoxide, and Hydrogen Chloride, EPA Methods 1-5, 9, 10, and 26A, was conducted on March 3 & 4, 2010 at the above referenced facility. The units tested were manufactured by US Cremation Equipment and both units were model Classic Human Crematory. In the event you have any questions please do not hesitate to contact me at (863) 467-0555.

Sincerely,

Noah A. Handley, P.E.  
Vice President, Principal Engineer,  
Arlington Environmental Services, Inc.



# Arlington Environmental Services, Inc.

"Specializing in Visible Emission and Stack Testing"

April 7, 2010

## ELECTRONIC CORRESPONDENCE

Broward County  
Air Quality Division  
1 North University Drive, Suite 203  
Plantation, Florida 33324

Re: Guiding Light Cremations LLC, Unit 2  
AIRS ID: 0112701

To Whom It May Concern:

On March 03 and 04, 2010, source tests for particulate, visible and carbon monoxide (EPA Methods 1-5, 9 and 10) were conducted on the exhaust stack servicing the crematory incinerator, Unit #2 at Guiding Light Cremations, LLC, ID 0112701 located at 2431 SW 56<sup>th</sup> Terrace in West Park, Florida.

The tests were performed in order to comply with the Broward County Department of Planning and Environmental Protection, Air Quality Division, Chapter 27 Article IV, Air Quality, Section 27-179(c)(2). The results comply with Florida's Human Crematory Rule 62-296.401(5), FAC.

The following emission point was tested:

- o EU002 Exhaust stack servicing the afterburner

To the best of my knowledge, this completes all of the required initial tests. If, for any reason, this is incorrect, please contact me as soon as possible.

Sincerely,

Debra Carter

/dc

Electronic Copy to: Geronimo Mena, Jr., Guiding Light Cremations LLC  
David Krohn, Guiding Light Cremations, LLC

---

Post Office Box 657 ~ Okeechobee, Florida 34973  
Telephone (863) 467-0555 ~ Facsimile (863) 357-0810  
Email [info@arlingtonenvironmental.com](mailto:info@arlingtonenvironmental.com) ~ Website [www.arlingtonenvironmental.com](http://www.arlingtonenvironmental.com)

**Source Test Report  
for  
Particulate, Visible and CO Emissions**

**EPA Methods 1-5, 9 and 10**

**Report 2985-S**

**March 03 and 04, 2010**

prepared for

**Guiding Light Cremations, LLC  
Unit #2  
Facility ID 0112701**



**Arlington Environmental Services, Inc.**

Post Office Box 657 ~ Okeechobee, Florida 34973 ~ Telephone 863.467.0555



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## 1.0 Introduction

Guiding Light Cremations LLC operates a human crematory located at 2431 SW 56<sup>th</sup> Terrace in West Park, FL. On March 03 and 04, 2010, source tests for particulate, visible and carbon monoxide emissions (EPA Methods 1-5, 9 and 10) were conducted on Unit #2 exhaust stack servicing the crematory incinerator.

The tests were performed in order to comply with the Broward County Department of Planning and Environmental Protection, Air Quality Division, Chapter 27 Article IV, Air Quality, Section 27-179(c)(2). The results comply with Florida's Human Crematory Rule 62-296.401(5), FAC.

Courtney Pitters of the Broward County Division of Environmental Protection, Air Quality Division was present for a portion of the tests.

The retention time for this unit during the test was 1.75 seconds. The substantiating calculations are presented in Appendix D.

The average particulate emission rate, as determined by EPA Method 5, was 0.0159 gr/dscf . (corrected to 7% O<sub>2</sub>). The allowable particulate emission rate is 0.080 gr./dscf . (corrected to 7% O<sub>2</sub>).

The average carbon monoxide emission rate as determined by EPA Method 10, was 0.86 ppm . (corrected to 7% O<sub>2</sub>). The allowable carbon monoxide emission rate is 100 ppm (corrected to 7% O<sub>2</sub>).

The average visible emission rate as determined by EPA Method 9, was 0.0%. The allowable visible emission rate (highest six minute average) is 5% with up to 15% allowed in a one hour period.

The results of this test verify compliance with the Florida Department of Environmental Protection Human Crematory Rule 62-296.401(5), Florida Administrative Code.

## 2.0 Certification of Test Results

Facility Tested: Guiding Light Cremations LLC  
2431 SW 56<sup>th</sup> Terrace  
West Park, FL 33325

Type Process - Human Crematory

Abatement Device - Afterburner

Report 2985-S

March 03 and 04, 2010

Run Numbers 1, 2 and 3

Actual Particulate Emissions - 0.0159gr/dscf (corrected to 7% O<sub>2</sub>)

Allowable Particulate Emissions - 0.0800 gr./dscf (corrected to 7% O<sub>2</sub>)

Actual Carbon Monoxide Emissions - 0.86 ppm (corrected to 7% O<sub>2</sub>)

Allowable Carbon Monoxide Emissions - 100 ppm (corrected to 7% O<sub>2</sub>)

Actual Visible Emissions - 0.0%

Allowable Visible Emissions - 5% with up to 15% allowed in a one hour period

All testing and analysis were performed in accordance with the Florida Department of Environmental Protection Human Crematory Rule 62-296.401(5), Florida Administrative Code.

I hereby certify that to my knowledge, all information and data submitted in this report is true and correct.



---

William D. Arlington  
Project Director

### **3.0 Allowable Emission Determination**

The allowable emissions were determined in accordance with 62.296.401(5) F.A.C. Substantiating data and calculations are presented in the Appendix D.

### **4.0 Cyclonic Flow Determination**

Due to the configuration of the system, cyclonic flow was considered to be non-existent at the sampling site.

**5.0 Summary of Results**

**Guiding Light Cremations, LLC**

**Unit #2**

**Report 2985-S**

	Run 1	Run 2	Run 3	Average
Date	3/3/2010	3/4/2010	3/4/2010	
Start Time	16:20	9:30	11:00	
Stop Time	17:23	10:33	12:05	
Process Rate (lbs.)	175	180	—	178
Particulate Emission Rate (gr./dscf @ 7% O <sub>2</sub> )	0.0188	0.0099	0.0189	0.0159
Allowable Particulate Emission Rate (gr./dscf @7% O <sub>2</sub> )	0.080	0.080	0.080	0.080
Visible Emission Rate (%) (highest six minute average)				0.00
Allowable Visible Emission Rate (%) (with up to 15% for 6 min. per hour)				5
Carbon Monoxide Emission Rate (ppm @7% O <sub>2</sub> )	0.79	1.04	0.74	0.86
Allowable Carbon Monoxide Emission Rate (ppm @7% O <sub>2</sub> )	100	100	100	100

6.0 Particulate Emission Results  
 Guiding Light Cremations, LLC  
 Unit #2  
 Report 2985-S

	Run 1	Run 2	Run 3
Area (square feet)	3.08	3.08	3.08
Stack Pressure (inches Hg)	29.88	30.07	30.07
Meter Pressure (inches Hg)	30.06	30.26	30.29
Sample Volume (Std. Cu. Ft.)	52.965	54.952	57.861
Water Vapor (Cubic Feet)	5.52	5.85	6.03
Sample Moisture (percent)	9.44	9.62	9.43
Saturation Moisture (percent)	100.00	100.00	100.00
Molecular Weight (lbs/lb Mole wet)	28.29	28.18	28.27
Velocity (fpm)	887	879	985
Volumetric Flow Rate (acfm)	2734	2710	3036
Volumetric Flow Rate (scfm)	891	933	963
Concentration (gr/dscf)	0.0101	0.0051	0.0104
Concentration@7% O2 (gr/dscf)	0.0188	0.0099	0.0189
Mass Emission Rate (lbs./hr.)	0.08	0.04	0.09
Percent Isokinetic	99.51	98.54	100.56

**7.0 Visible Emission Results**  
**Guiding Light Cremations, LLC**  
**Unit #2**  
**Report 2985-S**

Emission Point:	Allowable Emission Rate (highest six minute average)	Emission Rate (highest six minute average)	Average Opacity
Exhaust Stack	0	0.00	0.00

8.0 Carbon Monoxide Emission Results  
Guiding Light Cremations, LLC  
Unit #2  
Report 2985-S

	Run1	Run 2	Run 3	Average
Date	3/3/2010	3/4/2010	3/4/2010	
Start Time	16:20	9:30	11:00	
Stop Time	17:23	10:33	12:05	
Percent Oxygen	13.43	13.79	13.23	
Carbon Monoxide (PPM)	0.42	0.53	0.41	
Carbon Monoxide Emissions (PPM @ 7% O <sub>2</sub> )	0.79	1.04	0.74	0.86
Carbon Monoxide Allowable ( PPM@ 7% O <sub>2</sub> )	100	100	100	100



## 9.0 Overview of Field and Analytical Procedures

### 9.1 EPA Method 1 - Sample and Velocity Traverses for Stationary Sources

Principle - To aid in the representative measurement of pollutant emissions and/or total volumetric flow rate from a stationary source, a measurement site where the effluent stream is flowing in a known direction is selected and the cross-section of the stack is divided into a number of equal areas. A traverse point is then located within each of these equal areas. See Sampling Point Determination.

Applicability - This method is applicable to flowing gas streams in ducts, stacks and flues. This method cannot be used when: 1) flow is cyclonic or swirling 2) a stack is smaller than about 12 inches in diameter, or 0.071 cross-sectional area or 3) the measurement site is less than two stack or duct diameters downstream or less than a half diameters upstream from a flow disturbance. The procedures in this method were utilized in its entirety according to the procedures outlined in 40 CFR Part 60, Appendix A.

### 9.2 EPA Method 2 - Determination of Stack Gas Velocity and Volumetric Flow Rate

Principle - Type S Pitot Tube - The average gas velocity in a stack is determined from the gas density and from measurement of the average velocity head with a Type S pitot tube.

Applicability - This method is applicable for measurement of the average velocity of a gas stream and for quantifying gas flow.

This procedure is not applicable at measurement sites which fail to meet the criteria of Method 1. This method cannot be used for direct measurement in cyclonic or swirling gas streams. The procedures in this method were utilized in its entirety according to the procedures outlined in 40 CFR Part 60, Appendix A.

### 9.3 Method 3 - Gas Analysis for the EPA Determination of Dry Molecular Weight

Principle - A gas sample is extracted from a stack by one of the following methods 1) Single-point grab sampling 2) single-point, integrated sampling or 3) multi-point, integrated sampling, the gas sample is analyzed for percent CO<sub>2</sub>, percent O<sub>2</sub>, and if necessary for CO. For dry molecular weight determination, either an Orsat or a Fyrite analyzer may be used for the analysis.

Applicability - This method is applicable for determining carbon dioxide and oxygen concentrations and dry molecular weight of a sample from a gas stream of a fossil fuel combustion process. The method may also be applicable to other processes where it has been determined that compounds other than CO<sub>2</sub>, O<sub>2</sub>, CO, and nitrogen are not present in concentrations sufficient to affect the results. The procedures in this method were utilized in its entirety according to the procedures outlined in 40 CFR Part 60, Appendix A.

#### 9.4 EPA Method 4 - Determination of Moisture Content in Stack Gases

Principle - A gas sample is extracted at a constant rate from the source; moisture is removed from the sample stream and determined either volumetrically or gravimetrically.

Applicability - This method is applicable for determining the moisture content of stack gas. There are two procedures given to determine the moisture. The procedure for the reference method to determine the moisture content was used to calculate the emission data. The reference method was conducted simultaneously with the pollutant emission measurement run, calculation of percent isokinetic, pollutant emission rate, etc. for the run is based upon the results of the reference method or its equivalent. The procedures in this method were utilized in its entirety according to the procedures outlined in 40 CFR Part 60, Appendix A.

#### 9.5 EPA Method 5 - Determination of Particulate Emissions from Stationary Sources

Principle - Particulate matter is withdrawn isokinetically from the source and collected on a glass fiber filter maintained at a temperature in the range of 120 - 248° For such other temperature as specified by an applicable subpart of the standards or approved by the Administrator, U.S. Environmental Protection Agency, for a particular application.

The particulate mass which includes any material that condenses at or above the filtration temperature, is determined gravimetrically after removal of uncombined water.

Applicability - This method is applicable for the determination of particulate emissions from stationary sources. The procedures in this method were utilized in its entirety according to the procedures outlined in 40 CFR Part 60, Appendix A.

Diagram of EPA Method 5 Sampling Train

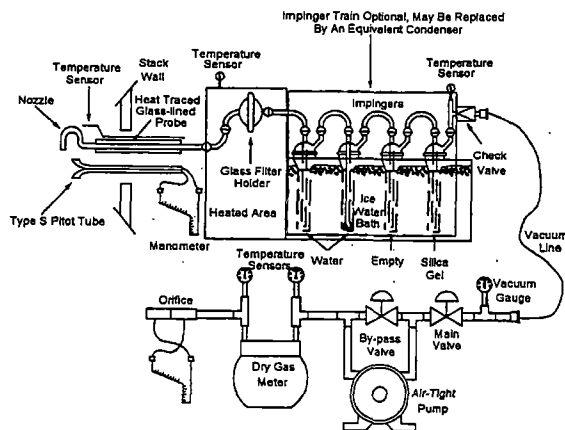


Figure F5-1. Particulate Sampling Train.

**9.6 EPA Method 9 - Visual Determination of the Opacity of Emissions from Stationary Sources**

Principle - The opacity of emissions from stationary sources is determined visually by a qualified observer.

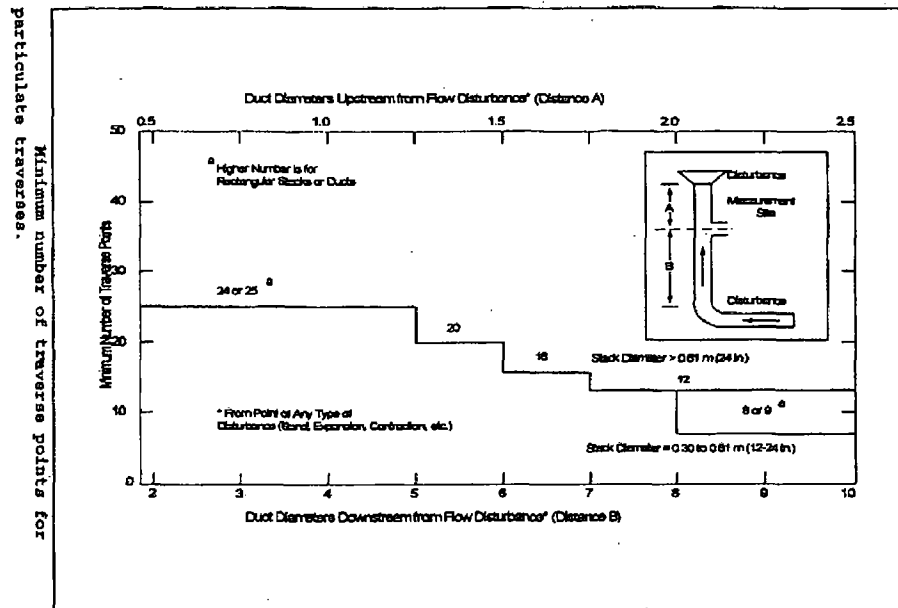
Applicability - This method is applicable for the determination of the opacity of emissions from stationary sources pursuant to 60.11(b) and for qualifying observers for visually determining the opacity of emissions.

**9.7 EPA Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources**

Principle - An integrated or continuous gas sample is extracted from a sampling point and analyzed for carbon monoxide (CO) content using a Luft-type nondispersive infrared analyzer or equivalent.

Applicability - This method is applicable for the determination of carbon monoxide emissions from stationary sources only when specified by the test procedures for determining compliance with new source performance standards. The procedures in this method were utilized in its entirety according to the procedures outlined in 40 CFR Part 60, Appendix A.

## 10.0 Sampling Point Determination Minimum Number of Sampling Points



### Per Particulate Traverse

#### Circular Stacks

The number of sampling points is selected according to the above diagram, with the number of points equaling the next higher multiple of four.

#### Rectangular Stacks

The number of sampling points is determined using the matrix below.

Number of Traverse Points	Subarea Layout Matrix
9	3 x 3
12	4 x 3
16	4 x 4
20	5 x 4
25	5 x 5
30	6 x 5
36	6 x 6
42	7 x 6
49	7 x 7

10.1 Sampling Point Determination

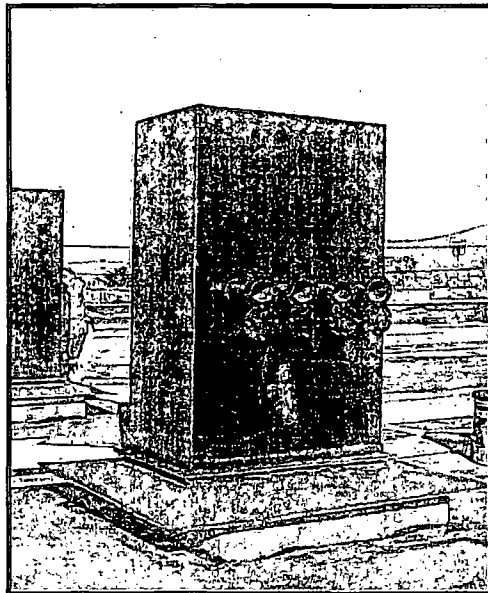
Guiding Light Cremations, LLC

Unit #2

Report 2985-S

Stack Configuration	Rectangular
Side 1 - with ports (inches)	24
Side 2 - (inches)	18.5
Equivalent Diameter	20.89
Distance A - Ports to Downstream Disturbance (inches)	24
Distance A - Ports to Downstream Disturbance (diameters)	1.15
Distance B - Ports to Upstream Disturbance (inches)	48
Distance B - Ports to Upstream Disturbance (diameters)	2.30
Number of Test Ports	6
Number of Sampling points per Traverse	5
Number of Points Sampled	25

Photograph of Stack



Traverse Point Location	
Traverse Point No.	Inches to Stack Wall
1	1.9
2	5.6
3	9.3
4	13.0
5	16.7

11.0 Summary of Field and Laboratory Data  
 Guiding Light Cremations, LLC  
 Unit #2  
 Report 2985-S

	Run 1	Run 2	Run 3
Date	3/3/2010	3/4/2010	3/4/2010
Start Time	16:20	9:30	11:00
Stop Time	17:23	10:33	12:05
CP	0.84	0.84	0.84
Y	0.9947	0.9947	0.9947
^Ha (inches H2O)	1.7304	1.7304	1.7304
Diameter of Nozzle (inches)	0.7503	0.7503	0.7503
Stack Diameter or Equivlant (inches)	20.89	20.89	20.89
Static Pressure (inches H2O)	-0.02	-0.02	-0.02
Barometric Pressure (inches Hg)	29.88	30.07	30.07
Test Time (minutes)	60	60	60
Meter Volume (cubic feet)	53.623	54.165	57.845
Square Root ^P (inches H2O)	0.156	0.159	0.171
Orifice Pressure ^H (inches H2O)	2.458	2.583	3.000
Average Meter Temperature (Deg. F)	74.0	63.4	71.4
Average Stack Temperature (Deg. F)	1004.4	931.5	1054.1
Particulate Sample Weight (grms)	0.0347	0.0181	0.0391
Water Collected (grms)	117.1	124.1	127.8
Percent CO2	5.1	4.5	5.0
Percent O2	13.4	13.8	13.2
Molecular Weight (lbs/lb Mole)	29.36	29.27	29.33
Nozzle Area (square feet)	0.00307	0.00307	0.00307

**Attachment A - Field Data**











Arlington Environmental Services, Inc.  
(863) 467-0555

VISIBLE EMISSION TEST

Method Used (Circle One)  
Method 9

203A 203B Report # 2985-S

Company Name Everglades Crematorium

Facility Name AIRS 0112701

Street Address 2431 SW 56 Terrace

City West Park FL Zip 33023

Phone No. (954) 381-8888

Process Human Crematory Unit # 2 Operating Mode N/180 lbs

Control Equipment After burner Operating Mode N/1625 °F

Describe Emission Point Rectangular Stack

Ht of Emis. Point ~20' Ht Rel to Observer ~15'

Distance to Emis. Pt. ~800' Direction to Emis. Pt (Degrees) ~330°

Verticle Angle to Obs. <18° Direction to Obs. Pt. (Degrees) ~330°

Distance and Direction to Obs. Pt from Emission Pt ~11' Above

Describe Emissions None

Emission Color Clear Water Droplet Plume None X

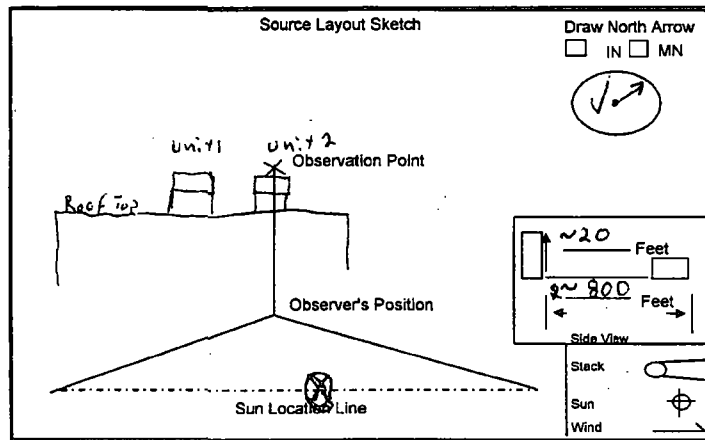
Attached Detached

Describe Plume Background SKY

Background Color Blue & White Sky Conditions Scattered

Wind Speed ~12-15 MPH Wind Direction NW

Ambient Temp. ~58°F Wet Bulb Temp. % RH



Latitude Longitude Declination

Comments

Min Sec	Observation Date 3-4-10				Start Time 0930				Stop Time 1030			
	0	15	30	45	Min Sec	0	15	30	45			
1	0	0	0	0	31	0	0	0	0			
2	0	0	0	0	32	0	0	0	0			
3	0	0	0	0	33	0	0	0	0			
4	0	0	0	0	34	0	0	0	0			
5	0	0	0	0	35	0	0	0	0			
6	0	0	0	0	36	0	0	0	0			
7	0	0	0	0	37	0	0	0	0			
8	0	0	0	0	38	0	0	0	0			
9	0	0	0	0	39	0	0	0	0			
10	0	0	0	0	40	0	0	0	0			
11	0	0	0	0	41	0	0	0	0			
12	0	0	0	0	42	0	0	0	0			
13	0	0	0	0	43	0	0	0	0			
14	0	0	0	0	44	0	0	0	0			
15	0	0	0	0	45	0	0	0	0			
16	0	0	0	0	46	0	0	0	0			
17	0	0	0	0	47	0	0	0	0			
18	0	0	0	0	48	0	0	0	0			
19	0	0	0	0	49	0	0	0	0			
20	0	0	0	0	50	0	0	0	0			
21	0	0	0	0	51	0	0	0	0			
22	0	0	0	0	52	0	0	0	0			
23	0	0	0	0	53	0	0	0	0			
24	0	0	0	0	54	0	0	0	0			
25	0	0	0	0	55	0	0	0	0			
26	0	0	0	0	56	0	0	0	0			
27	0	0	0	0	57	0	0	0	0			
28	0	0	0	0	58	0	0	0	0			
29	0	0	0	0	59	0	0	0	0			
30	0	0	0	0	60	0	0	0	0			

Number of Readings Above % were Average Opacity for Highest 6 Min Period 0

Range of opacity Readings Min 0 Max 0 Average Opacity for 2nd Highest 6 Min Period 0

Observers Name (Print) Steve Webb

Observers Signature Stephen C. Webb Date 3-4-10

Organization Arlington Environmental Services, Inc.

Certified By Whitlow Enterprises Date 1/15/10



**Whitlow Enterprises, LLC**

[www.smokeschool.net](http://www.smokeschool.net)

**Certifies that**

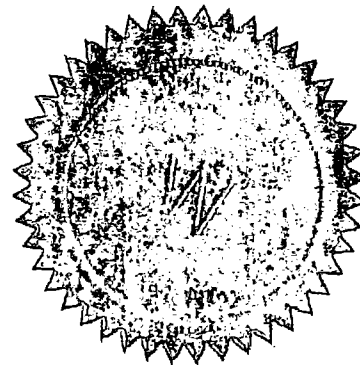
**Stephen Webb of Coastal Air Consulting**

**Has passed the certification test required by EPA Method 9  
40 CFR 60 Appendix A and is qualified as a visible emissions evaluator.**

**Certification Date: 1/15/2010 Location: Tampa/Mulberry, FL**

**George Whitlow**

**President**



TMFL011510-32

**Attachment B - Laboratory Data**

Particulate Laboratory Data  
Guiding Light Cremations, LLC  
Unit #2  
Report 2985-S

Run 1

Filter Number	1484	
	Final Weight	0.3891 grams
	Tare Weight	0.3713 grams
	Difference	0.0178 grams
Beaker Number	1C	
	Final Weight	114.0708 grams
	Tare Weight	114.0533 grams
	Difference	0.0175 grams
Filter Blank Number	1483	
	Final Weight	0.3700 grams
	Tare Weight	0.3699 grams
	Difference	0.0001 grams
Wash Down Blank		
	Volume of Rinse	70 mls
	Solution of Residue	0.00000784 grams/mls
	Total Residue	0.0005488 grams/mls
<b>Total Particulate Weight</b>		<b>0.0347 grams</b>
<b>Water Collected</b>		
	Final Impinger Water	309 MLS
	Initial Impinger Water	200 MLS
	Final Silica Weight	208.3 GRAMS
	Silica Tare Weight	200.0 GRAMS
<b>Total Water Collected</b>		<b>117.1 GRAMS</b>

Analyst \_\_\_\_\_

Particulate Laboratory Data  
Guiding Light Cremations, LLC  
Unit #2  
Report 2985-S

Run 2

Filter Number	1485	
	Final Weight	0.3827 grams
	Tare Weight	0.3704 grams
	Difference	0.0123 grams
Beaker Number	2C	
	Final Weight	117.5130 grams
	Tare Weight	117.5064 grams
	Difference	0.0066 grams
Filter Blank Number	1483	
	Final Weight	0.3700 grams
	Tare Weight	0.3699 grams
	Difference	0.0001 grams
Wash Down Blank		
	Volume of Rinse	95 mls
	Solution Residue	0.00000784 grams/ml
	Total Residue	0.0007448 grams/ml
<b>Total Particulate Weight</b>		<b>0.0181 grams</b>
<b>Water Collected</b>		
	Final Impinger Water	315 MLS
	Initial Impinger Water	200 MLS
	Final Silica Weight	209.3 GRAMS
	Silica Tare Weight	200.0 GRAMS
<b>Total Water Collected</b>		<b>124.1 grams</b>

Analyst \_\_\_\_\_

Particulate Laboratory Data  
Guiding Light Cremations, LLC  
Unit #2  
Report 2985-S

Run 3

Filter Number	1486	
	Final Weight	0.4004 grams
	Tare Weight	0.3677 grams
	Difference	0.0327 grams
Beaker Number	3C	
	Final Weight	114.4563 grams
	Tare Weight	114.4492 grams
	Difference	0.0071 grams
Filter Blank Number	1483	
	Final Weight	0.3700 grams
	Tare Weight	0.3699 grams
	Difference	0.0001 grams
Wash Down Blank		
	Volume of Rinse	75 mls.
	Solution Residue	0.00000784 grams/ml.
	Total Residue	0.000588 grams
<b>Total Particulate Weight</b>		<b>0.0391 grams</b>
<b>Water Collected</b>		
	Final Impinger Water	317 mls.
	Initial Impinger Water	200 mls.
	Final Silica Weight	211.0 grams
	Silica Tare Weight	200.0 grams
<b>Total Water Collected</b>		<b>127.8 grams</b>

Analyst



**Attachment C - Process Data**

# Emission Control Device and Process Data

Company Guiding Light Cremations

Installation Unit #2

Date 3-4-10 Report No. 2985-S

Type of Installation Crematory

Type of Material Processed Human Remains

Type(s) of Fuel Used Natural Gas

Type of Pollution Control System Afterburner

General Condition of Control Equipment Normal

Run No.	1	2	3
Start Time	3-3-10 16:20	3-4-10 9:30	3-4-10 11:00
Stop Time	17:23	10:33	12:05
Fuel Used	NG	NG	NG
Scrubber Water Flow Rate (GPM)	NA	NA	NA
Pressure Drop (in. H <sub>2</sub> O)	NA	NA	NA
Total Operating Temp °F	1680	1630	1720
Process Rate (lbs/Hr.)	175	- 180 -	
Percent Recycle	NA	NA	NA

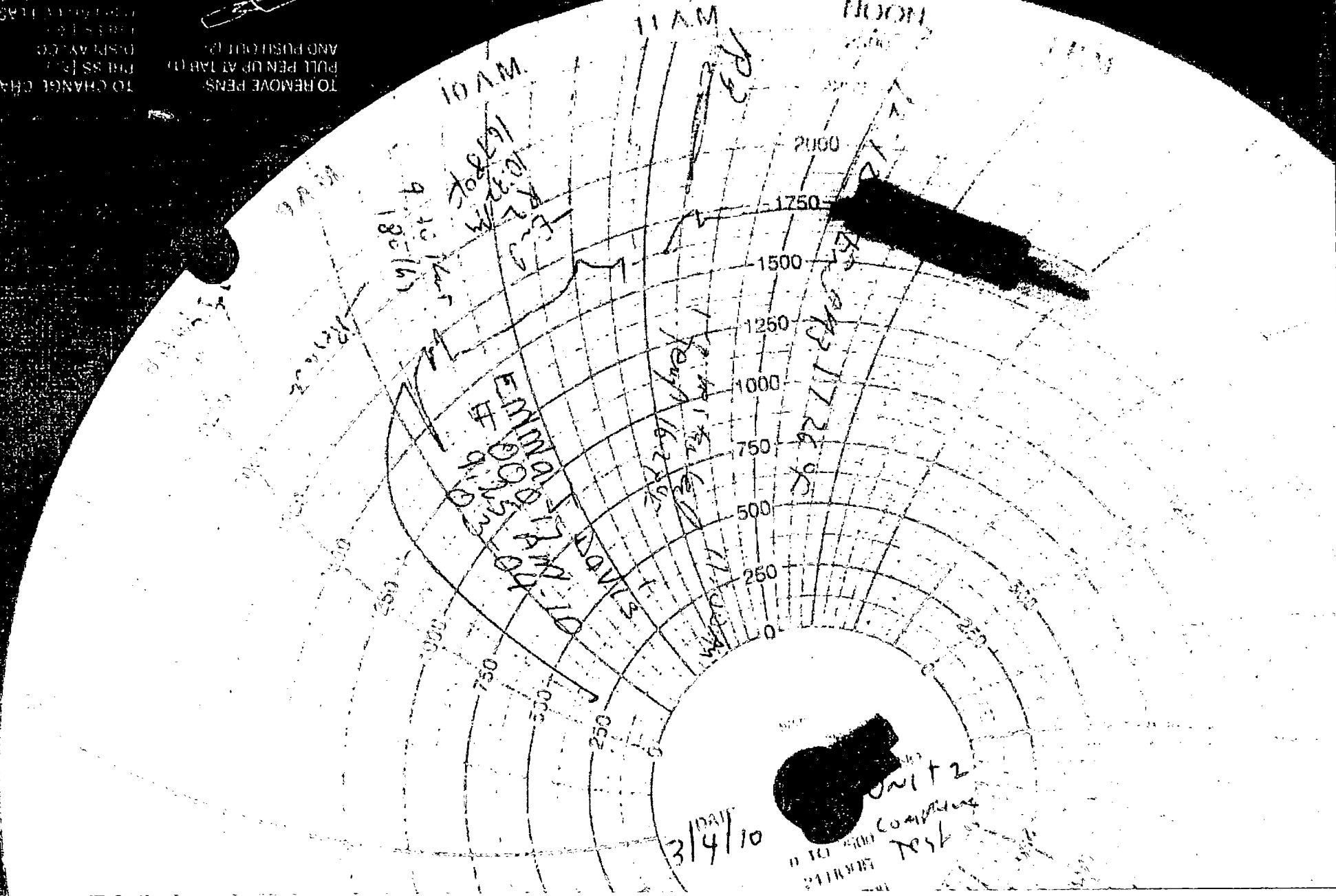
Signature *[Signature]* Title \_\_\_\_\_

Name \_\_\_\_\_  
(Please Print)

TO REMOVE PENS  
PULL PEN UP AT TAB (A)  
AND PUSH OUT B.  
TO CHANGE CHARTS  
PUSH TAB C  
DOWNTOWARD  
AND PUSH IN PLASERS  
OR UNSCALE  
CHANGING THE SCALE



START TIME



**Attachment D - Calculations for Run 1**

**STACK AREA**

$$\frac{(SIDE\ 1) \times (SIDE\ 2)}{144}$$

$$\frac{24.00 \times 18.50}{144} = 3.08\ \text{SQ.FT.}$$

**STACK PRESSURE**

BAROMETRIC PRESSURE + (STATIC PRESSURE/ 13.6)

$$29.88 + \left( \frac{-0.02}{13.6} \right) = 29.88\ \text{IN.HG}$$

**METER PRESSURE**

BAROMETRIC PRESSURE + (ORIFICE PRESURE/13.6)

$$29.88 + \left( \frac{2.46}{13.6} \right) = 30.06\ \text{IN.Hg}$$

**SAMPLE VOLUME**

$$\frac{17.64 \times (Y) \times \text{METER VOLUME} \times \text{METER PRESSURE}}{(\text{METER TEMP.} + 460)}$$

$$\frac{17.64 \times 0.9947 \times 53.623 \times 30.06}{(74.0 + 460)} = 52.965\ \text{STD.CU.FT.}$$

**WATER VAPOR VOLUME**

.04715 X WATER COLLECTED

$$0.04715 \times 117.1 = 5.52\ \text{STD.CU.FT.}$$

**SAMPLE MOISTURE**

100 X WATER VAPOR VOLUME / (WATER VAPOR VOLUME + SAMPLE VOLUME)

$$100 \times \frac{5.52}{5.52 + 52.965} = 9.44\ \%$$

**SATURATION MOISTURE**

100 X (VAPOR PRESSURE @ STACK TEMP. / STACK PRESSURE)

$$100 \times \left( \frac{\text{#####}}{29.88} \right) = 100.00\ \%$$

**STACK MOISTURE FRACTION**

(THE LESSER OF SAMPLE MOISTURE OR SATURATION MOISTURE) / 100

$$\frac{9.44}{100} = 0.094$$

**DRY MOLECULAR WEIGHT OF STACK GAS**

$$\frac{(.28 \times (100 - (5.14 + 13.43)) + (.44 \times \%CO_2) + (.32 \times \%O_2))}{.28 \times (100 - (5.14 + 13.43)) + (.44 \times 5.1) + (.32 \times 13.43)} = 29.36$$

**MOLECULAR WEIGHT OF STACK GAS**

$$\text{MOLECULAR WEIGHT} \times (1 - \text{MOISTURE}) + (18 \times \text{MOISTURE})$$

$$29.36 \times (1 - 0.094) + (18 \times 0.094)$$

28.29

**STACK VELOCITY**

$$85.49 \times \text{CP} \times 60 \times \text{SQ.}(\text{^P}) \times \text{SQ.}(\text{STACK TEMP} + 460) / \text{SQ.}(\text{STACK PRESSURE} \times \text{MOLECULAR WT.})$$

$$85.49 \times 0.840 \times 60 \times 0.156 \times \text{SQ.}(1004.4 + 460) / \text{SQ.}(29.88 \times 28.29)$$

887 FPM

**VOLUMETRIC FLOW RATE (ACFM)**

STACK AREA X STACK VELOCITY

$$3.08 \times 887$$

2734 ACFM

**VOLUMETRIC FLOW RATE (SCFM) DRY**

$$17.64 \times (\text{ACFM}) \times \text{STACK PRESSURE} \times (1 - \text{MOISTURE}) / (\text{STACK TEMP.} + 460)$$

$$17.64 \times 2734 \times 29.88 \times (1 - 0.094) / (1004.4 + 460)$$

891 SCFM (DRY)

**CONCENTRATION (gr/dscf)**

Total Particulate Weight X 15.43 / Sample Volume

$$0.0347 \times 15.43 / 52.96$$

0.0101

**CONCENTRATION@7% O2 (gr/dscf)**

Concentration X 13.9 / (20.9 - %o2)

$$0.0101 \times 13.9 / (20.9 - 13.43)$$

0.0188

**MASS EMISSION RATE (LBS./HR.)**

CONCENTRATION X (SCFM- DRY) X 60 / 7000

$$0.0101 \times 891 \times 60 / 7000$$

0.08 LBS/HR

**PERCENT ISOKINETIC**

$$.0945 \times (\text{STACK TEMP.} + 460) \times \text{SAMPLE VOLUME} \times 60$$

$$/ (\text{STACK PRES.} \times \text{VELOCITY} \times \text{NOZZLE AREA} \times \text{TEST TIME} \times (1 - \text{MOISTURE}))$$

$$0.0945 \times (1004.38 + 460) \times 52.96 \times 60$$

$$/ (29.88 \times 887 \times 0.00307 \times 60.00 \times (1 - 0.094))$$

99.51 %

<b>RESIDENCE TIME CALCULATION</b>			
<b>CORRECTION FOR QUENCHED AIR AT OUTLET</b>			
<b>PLANT:</b>	Guiding Light		
<b>SOURCE:</b>	Unit #2		
<b>LOCATION:</b>			
<b>DATE:</b>			
<b>STACK PRESSURE:</b>	30.07		
<b>CHARGE RATE:</b>			
<b>SOURCE PARAMETERS</b>			
	<b>OUTLET STACK</b>	<b>AMBIENT AIR</b>	<b>SECONDARY CHAMBER</b>
TEMPERATURE,F	1064	65	1624
AIR FLOW,ACFMD	2662		
AIR FLOW,ACFM	2826		
H2O FLOW,ACFM	164		
PRESSURE,PSI	14.77	14.77	14.77
AIR ENTHALPY,BTU/LB	375.5	125.4	528.0
H2O ENTHALPY,BTU/LB	709.8	231.2	1012.2
SCC VOLUME,CFT			71
HUMIDITY RATIO		0.02	
<b>EQUATIONS</b>			
1. MASS = PVM/RT	M = MOLECULAR WEIGHT		
	R = 1545 ft-lbf/lbm-mol-R		
MASS (lbm/min) =	$\frac{(\text{psia})(\text{ACFMD})(\text{lbm/lbm-mol}) \times (144 \text{ sq.in/sq.ft})}{(1545 \text{ ft-lbf/lbm-mol} \times \text{R})(\text{Temp. R})}$		
2. HEAT LOSS FROM SCC = HEAT GAINED BY AMBIENT AIR	M(AIR, SCC) = M(AIR, STACK) - (M(AIR, AMB.))		
	M(H2O, SCC) = M(H2O, STACK) - M(H2O, AMB.)		
<b>OUTLET FLOWS</b>			
M(DRY AIR) =	69.66	lb/min	
M(H2O) =	2.67	lb/min	
M(TOTAL) =	72.33	lb/min	
<b>RESIDENCE TIME CALCULATION</b>			

ResidenceTime Unit 2

<b>CORRECTION FOR QUENCHED AIR AT OUTLET</b>			
<b>SCC DRY AIR</b>			
$(M \times \text{ENTHALPY CHANGE})_{\text{scc}} = (M \times \text{ENTHALPY CHANGE})_{\text{amb}}$			
H(M <sub>scc</sub> ) =		152.5	BTU/lbm
H(M <sub>amb</sub> ) =		250.1	BTU/lbm
M(amb) =		0.610	x M(scc)
M(scc) + M(amb) =		69.660	lb/min
M(scc)AIR =		43.274	lb/min
<b>SCC H2O</b>			
$M(\text{scc})\text{H}_2\text{O} + M(\text{amb})\text{H}_2\text{O} = M(\text{outlet})\text{H}_2\text{O}$			
M(amb.) H2O =		0.02	lb/lb dry air
M(amb.) AIR =		26.39	lb/min
M(amb.) H2O =		0.53	lb/min
M(scc) H2O =		2.14	lb/min
<b>SCC VOLUMETRIC FLOW</b>			
V = MRT/PM	@	1624	F
		14.77	psi
<b>AIR:</b>	V =	2261.3	ACFM
<b>H2O:</b>	V =	179.9	ACFM
<b>TOTAL SCC:</b>	V =	2441.2	ACFM
<b>SCC RESIDENCE TIME</b>			
RESIDENCE TIME =		1.75	SECONDS



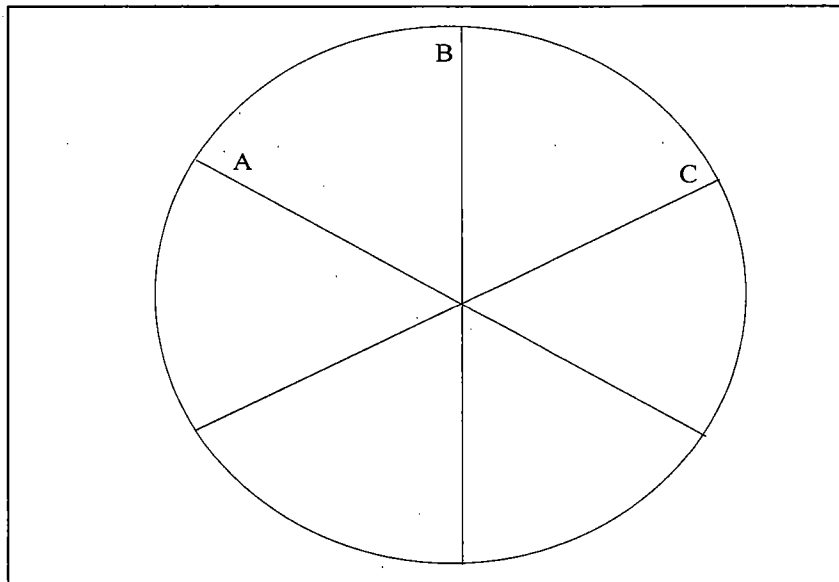
**Attachment E - Calibration Data**

ANNUAL METER CALIBRATION		METER NO. 002047		ORIFICE SET NO. JC40-73															
DATE	9/20/2009	Y=	0.9947	MAX % VARIATION	1.8562%	PASS													
BAROMETRIC PRESSURE	29.98	^Ha=	1.7304	MAX % VARIATION	1.2487%	PASS													
CRITICAL ORIFICE DATA																			
ORIFICE SERIAL NO.	ORIFICE K' FACTOR	ACTUAL VACUUM	^H (IN H2O)	TIME (MIN.)	AMBIENT TEMP INITIAL	AMBIENT TEMP. FINAL	METER TEMP. INITIAL	METER TEMP. FINAL	METER READING INITIAL	METER READING FINAL	VM (CU.FT.)	VM :ORRECTE	Vcr STD	Vcr NOMINAL	Y	VARIATION	^H (IN. H2O)	VARIATION	
40	0.2435	24.0	0.31	10	83	83	82	83	719.500	722.767	3.2670	3.1872	3.1328	3.2166	0.9829	0.0015	1.7327	0.0037	
40	0.2435	24.0	0.31	10	83	83	83	84	722.767	726.050	3.2830	3.1969	3.1328	3.2166	0.9799	-0.0015	1.7295	0.0005	
40	0.2435	24.0	0.31	10	83	83	85	85	726.050	729.337	3.2870	3.1920	3.1328	3.2166	0.9814	0.0000	1.7247	-0.0042	
AVERAGE															0.9814	0.0186	1.7290	0.0008	
48	0.3557	22.5	0.66	10	84	84	86	86	730.400	735.138	4.7380	4.5966	4.5721	4.7031	0.9947	-0.0030	1.7208	0.0005	
48	0.3557	22.5	0.66	10	84	84	86	87	735.138	739.858	4.7200	4.5749	4.5721	4.7031	0.9994	0.0017	1.7193	-0.0011	
48	0.3557	22.0	0.66	10	85	85	87	87	739.858	744.580	4.7220	4.5727	4.5679	4.7074	0.9980	0.0013	1.7208	0.0005	
AVERAGE															0.9977	0.0023	1.7203	0.0058	
55	0.4616	19.5	1.15	10	86	86	88	89	745.400	751.583	6.1830	5.9783	5.9224	6.1145	0.9907	-0.0057	1.7788	0.0268	
55	0.4616	18.0	1.15	10	87	87	90	90	751.583	757.678	6.0950	5.8771	5.9170	6.1201	1.0068	0.0105	1.7772	0.0252	
55	0.4616	18.0	1.10	10	88	88	91	91	757.678	763.873	6.1950	5.9620	5.9116	6.1257	0.9916	-0.0048	1.7000	-0.0520	
AVERAGE															0.9963	0.0037	1.7520	0.0125	
63	0.5916	20.5	1.85	10	88	88	91	92	765.300	773.178	7.8780	7.5887	7.5765	7.8509	0.9984	0.0020	1.7390	0.0021	
63	0.5916	20.5	1.85	10	88	88	92	92	773.178	781.096	7.9180	7.6203	7.5765	7.8509	0.9943	-0.0021	1.7375	0.0005	
63	0.5916	20.5	1.85	10	88	88	93	93	781.096	789.010	7.9140	7.6027	7.5765	7.8509	0.9966	0.0002	1.7343	-0.0026	
AVERAGE															0.9964	0.0036	1.7369	0.0038	
73	0.8234	17.5	3.55	10	88	88	93	94	790.000	800.963	10.9630	10.5659	10.5451	10.9270	0.9980	-0.0039	1.7164	0.0026	
73	0.8234	17.5	3.55	10	88	88	94	95	800.963	811.885	10.9220	10.5074	10.5451	10.9270	1.0036	0.0017	1.7133	-0.0005	
73	0.8234	17.5	3.55	10	88	88	95	95	811.885	822.812	10.9270	10.5028	10.5451	10.9270	1.0040	0.0021	1.7118	-0.0021	
AVERAGE															1.0019	0.0019	1.7139	0.0096	
SEMI ANNUAL CALIBRATION		DATE	3/21/2009		BAROMETRIC PRESSURE					30.12									
ORIFICE SERIAL NO.	ORIFICE K' FACTOR	ACTUAL VACUUM	^H (IN H2O)	TIME (MIN.)	AMBIENT TEMP INITIAL	AMBIENT TEMP. FINAL	METER TEMP. INITIAL	METER TEMP. FINAL	METER READING INITIAL	METER READING FINAL	VM (CU.FT.)	VM :ORRECTE	Vcr STD	Vcr NOMINAL	Y	VARIATION	^H (IN. H2O)	VARIATION	
55	0.4616	21.0	1.15	10	76	75	82	81	679.000	685.182	6.1820	6.0828	6.0082	6.0555	0.9877	-0.0086	1.7590	-0.0011	
55	0.4616	21.0	1.15	10	75	75	81	80	685.182	691.342	6.1600	6.0723	6.0110	6.0526	0.9899	-0.0054	1.7606	0.0005	
55	0.4616	21.0	1.15	10	75	74	80	80	691.342	697.478	6.1360	6.0543	6.0138	6.0498	0.9933	-0.0030	1.7606	0.0005	
AVERAGE															0.9903	-0.0060	1.7600	0.0171	
METER COMPARISON CHECK (Yqa)																			
		Y <sub>qa</sub> =		$(O / Vm) \times \text{sqrt}(.319 \times Tm \times 29 / (^Ha \times (Pb + (Havg / 13.6) \times Md))) \times \text{sqrt} ^H \text{ avg}$															
Y <sub>qa</sub>		Run 1	Run 2	Run 3	Average														
		0.9871	0.9884	1.0045	0.9934														
THERMOCOUPLE CALIBRATION		DATE	9/20/2009																
		TC-1 (DEG F)	ASTM THERMOMETER (DEG F)																
ICE		31	32																
BOILING H2O		211	212																
OIL		354	352																
NOZZLE CALIBRATION		DATE	3/4/2010																
READINGS IN (IN.)		AVERAGE																	
#24	0.750	0.750	0.751	0.7503															
PITOT TUBE		CP=84	ACCORDING TO DESIGN SPECIFICATIONS																

# Nozzle Calibration

Nozzle ID #24

A = 0.750  
B = 0.750  
C = 0.751  
Average 0.7503

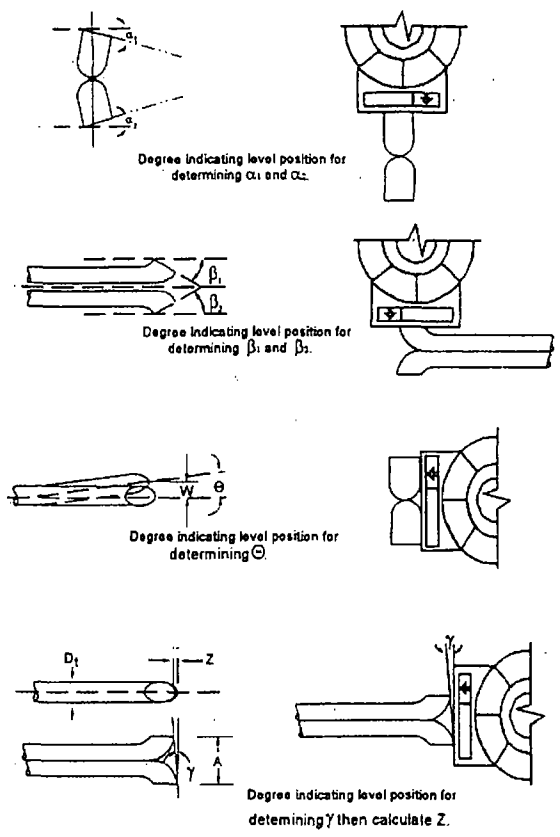


Calibration Date 3/4/2010

Calibrated by *AT*

# PITOT CALIBRATION

(Type S Pitot Tube Inspection)



Level and Perpendicular?	Yes
Obstruction?	No
Damaged?	No
$\alpha_1$ ( $-10^\circ \leq \alpha_1 \leq +10^\circ$ )	2
$\alpha_2$ ( $-10^\circ \leq \alpha_2 \leq +10^\circ$ )	0
$\beta_1$ ( $-5^\circ \leq \beta_1 \leq +5^\circ$ )	1
$\beta_2$ ( $-5^\circ \leq \beta_2 \leq +5^\circ$ )	1
$\gamma$	1
$\theta$	-2
$z = A \tan \gamma$ ( $\leq 0.125^\circ$ )	0.017
$w = A \tan \theta$ ( $\leq 0.03125^\circ$ )	-0.034
$D_t$ ( $3/16'' \leq D_t \leq 3/8''$ )	0.375
A	0.961
$A/2 D_t$ ( $1.05 \leq P_A / D_t \leq 1.51$ )	1.281

**Certification**

I hereby certify that type S pitot tube ID# P-5AC meets or exceeds all specifications, criteria and applicable design features, and is hereby assigned a pitot tube calibration factor of 0.84.

Certified by: *[Signature]*

Date: 9/20/09

Guiding Light Cremations, LLC

DATE: 3/3/2010  
 RUN: 1  
 UNIT: 2

AVG. ADJUSTED CO ppmvd @ 7% O2	0.79
CORRECTED O2 %	13.43
CORRECTED CO2 %	5.14
CORRECTED CO ppmvd	0.42

ANALYZER RESPONSE, SYSTEM BIAS AND SYSTEM DRIFT DATA

RANGE SETTING	CAL GASES	CERTIFIED GAS VALUE	ANALYZER VALUE	DIFFERENCE PPM	% SPAN	ANALYZER PRETEST VALUE	% SPAN	ANALYZER POSTTEST VALUE	% SPAN	% DRIFT	ANALYZER SERIAL #
25	% O2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	01420B153
		12.04	12.00	-0.04	-0.18	12.00	0.00	12.00	0.00	0.00	
20	% CO2	22.62	22.50	-0.12	-0.53						01410/B139
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		9.62	9.60	-0.02	-0.12	9.60	0.00	9.60	0.00	0.00	
100	PPM CO	17.27	17.30	0.03	0.17						48C-88845-361
		0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.0	0.0	
		48.5	48.4	-0.10	-0.1	48.30	-0.1	48.20	-0.2	-0.1	
		102.00	102.90	0.90	0.9						

UNCORRECTED RAW DATA

DATE & TIME	O2 %	CO2 %	CO PPM
16:20	12.78	6.17	0.70
16:21	12.53	5.92	0.60
16:22	13.07	5.18	0.60
16:23	13.48	5.00	0.65
16:24	13.45	5.04	0.50
16:25	13.34	5.10	0.60
16:26	13.28	5.12	0.45
16:27	13.28	5.05	0.55
16:28	13.39	4.93	0.50
16:29	13.61	4.76	0.45
16:30	13.86	4.65	0.45
16:31	13.96	4.67	0.30
16:32	13.78	4.82	0.35
16:33	13.51	4.95	0.30
16:34	13.43	4.95	0.55
16:35	13.63	4.84	0.65
16:36	13.91	4.72	0.80
16:37	13.96	4.80	0.50
16:38	13.68	5.00	0.45
16:39	13.46	5.04	0.50
16:40	13.52	4.94	0.60
16:41	13.82	4.78	0.60
16:42	13.91	4.84	0.75
16:43	13.66	4.93	0.75
16:44	13.63	4.91	0.90
16:45	13.78	4.77	1.00
16:46	13.97	4.73	0.90
16:47	13.92	4.88	0.55
16:48	13.23	5.44	0.60
16:49	12.81	5.31	0.65
16:50	13.48	4.94	0.70
16:51	13.68	5.10	0.75
16:52	13.10	5.17	1.00
16:53	13.49	5.07	0.80
16:54	13.46	4.97	0.20
16:55	13.78	4.89	0.10
16:56	13.49	5.19	0.10
16:57	12.91	5.39	0.15
16:58	13.13	5.02	0.20
16:59	13.91	4.69	0.05
17:00	13.82	5.05	0.15
17:01	13.01	5.39	0.15
17:02	12.96	5.31	0.20
17:03	13.01	5.49	0.20
17:04	13.25	5.39	0.25
17:05	13.14	5.61	0.20
17:06	12.69	5.69	0.30
17:07	12.75	5.51	0.30
17:08	13.31	5.19	0.20
17:09	13.48	5.32	0.15
17:10	12.92	5.57	0.25
17:11	12.84	5.42	0.25
17:12	13.41	5.06	0.05
17:13	13.63	5.18	0.00
17:14	13.03	5.52	0.05
17:15	12.77	5.48	0.25
17:16	13.20	5.13	0.15
17:17	13.73	4.95	0.00
17:18	13.40	5.34	0.05
17:19	12.73	5.55	0.15

MEAN ANALYZER VALUES

Avg. % O2	13.39
Avg. % CO2	5.13
Avg. CO ppmvd	0.42

Guiding Light Cremations, LLC

DATE: 3/4/2010  
 RUN: 2  
 UNIT: 2

AVG. ADJUSTED CO ppmvd @ 7% O2	1.04
CORRECTED O2 %	13.79
CORRECTED CO2 %	4.46
CORRECTED CO ppmvd	0.53

ANALYZER RESPONSE, SYSTEM BIAS AND SYSTEM DRIFT DATA

RANGE SETTING	CAL GASES	CERTIFIED GAS VALUE	ANALYZER VALUE	DIFFERENCE PPM	% SPAN	ANALYZER PRETEST VALUE	% SPAN	ANALYZER POSTTEST VALUE	% SPAN	% DRIFT	ANALYZER SERIAL #
25	% O2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	01420B153
		12.04	12.00	-0.04	-0.18	12.00	0.00	11.90	-0.44	-0.44	
		22.62	22.50	-0.12	-0.53						
20	% CO2	0.00	0.00	0.00	0.00	0.10	0.58	0.00	0.00	-0.58	01410/B139
		9.62	9.60	-0.02	-0.12	9.60	0.00	9.60	0.00	0.00	
		17.27	17.30	0.03	0.17						
50	PPM CO	0.00	0.00	0.00	0.0	0.10	0.1	0.00	0.0	-0.1	48C-68845-361
		48.50	48.40	-0.10	-0.1	48.60	0.2	48.10	-0.3	-0.5	
		102.00	102.90	0.90	0.9						

UNCORRECTED RAW DATA

DATE & TIME	O2 %	CO2 %	CO PPM
9:30	11.82	7.41	0.60
9:31	10.44	7.54	1.15
9:32	11.59	5.91	1.25
9:33	13.23	4.97	1.20
9:34	13.35	5.08	0.90
9:35	13.08	5.06	0.65
9:36	13.03	5.04	0.50
9:37	13.14	4.89	0.45
9:38	13.28	4.78	0.45
9:39	13.40	4.67	0.45
9:40	13.50	4.60	0.45
9:41	13.56	4.54	0.40
9:42	13.63	4.49	0.40
9:43	13.71	4.41	0.40
9:44	13.79	4.36	0.40
9:45	13.78	4.38	0.45
9:46	13.77	4.36	0.40
9:47	13.80	4.34	0.45
9:48	13.83	4.32	0.30
9:49	13.63	4.29	0.30
9:50	13.85	4.27	0.30
9:51	13.88	4.23	0.25
9:52	13.93	4.18	0.25
9:53	13.99	4.13	0.25
9:54	14.00	4.12	0.25
9:55	14.04	4.09	0.30
9:56	14.04	4.09	0.30
9:57	14.07	4.06	0.25
9:58	14.09	4.06	0.20
9:59	13.85	4.49	0.15
10:00	13.06	4.88	0.25
10:01	12.97	4.55	0.35
10:02	14.02	4.17	1.25
10:03	14.04	4.13	0.85
10:04	14.08	4.14	0.70
10:05	14.01	4.19	0.75
10:06	13.98	4.20	0.80
10:07	13.94	4.26	0.80
10:08	13.93	4.23	0.80
10:09	13.94	4.22	0.70
10:10	13.98	4.19	0.80
10:11	14.03	4.14	0.75
10:12	14.06	4.12	0.70
10:13	14.09	4.10	0.70
10:14	14.13	4.10	0.70
10:15	14.16	4.07	0.75
10:16	14.19	4.07	0.70
10:17	14.17	4.08	0.70
10:18	14.15	4.09	0.65
10:19	14.18	4.11	0.65
10:20	14.11	4.14	0.65
10:21	14.09	4.16	0.60
10:22	14.06	4.18	0.60
10:23	14.05	4.19	0.65
10:24	14.02	4.24	0.65
10:25	13.92	4.35	0.70
10:26	13.79	4.44	0.70
10:27	13.69	4.53	0.65
10:28	13.56	4.64	0.65
10:29	13.39	4.80	0.65

MEAN ANALYZER VALUES

Avg. % O2	13.69
Avg. % CO2	4.48
Avg. CO ppmvd	0.58

Guiding Light Cremations, LLC

DATE: 3/4/2010  
 RUN: 3  
 UNIT: 2

AVG. ADJUSTED CO ppmvd @ 7% O2	0.74
CORRECTED O2 %	13.23
CORRECTED CO2 %	5.03
CORRECTED CO ppmvd	0.41

ANALYZER RESPONSE, SYSTEM BIAS AND SYSTEM DRIFT DATA

RANGE SETTING	CAL GASES	CERTIFIED GAS VALUE	ANALYZER VALUE	DIFFERENCE PPM	% SPAN	ANALYZER PRETEST VALUE	% SPAN	ANALYZER POSTTEST VALUE	% SPAN	% DRIFT	ANALYZER SERIAL #
25	% O2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	01420B153
		12.04	12.00	-0.04	-0.18	11.90	-0.44	11.90	-0.44	0.00	
		22.62	22.50	-0.12	-0.53						
20	% CO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	01410/B139
		9.62	9.80	-0.02	-0.12	9.60	0.00	9.60	0.00	0.00	
		17.27	17.30	0.03	0.17						
50	PPM CO	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.0	0.0	48C-88845-361
		48.50	48.40	-0.10	-0.1	48.10	-0.3	47.80	-0.6	-0.3	
		102.00	102.90	0.90	0.9						

UNCORRECTED RAW DATA

DATE & TIME	O2 %	CO2 %	CO PPM
11:00	16.14	3.07	1.30
11:01	15.99	3.06	0.80
11:02	16.01	3.16	0.50
11:03	15.08	3.89	0.35
11:04	14.37	4.14	0.40
11:05	14.06	4.44	0.45
11:06	13.64	4.76	0.45
11:07	13.22	5.12	0.55
11:08	12.91	5.26	0.65
11:09	12.80	5.34	0.75
11:10	12.73	5.37	0.80
11:11	12.68	5.41	0.75
11:12	12.64	5.40	0.85
11:13	12.64	5.41	0.85
11:14	12.59	5.44	0.95
11:15	12.58	5.44	0.95
11:16	12.68	5.33	1.00
11:17	12.91	5.13	0.90
11:18	13.41	4.83	0.75
11:19	13.66	4.86	0.65
11:20	13.33	5.10	0.75
11:21	13.09	5.13	0.70
11:22	13.13	5.03	0.65
11:23	13.24	4.98	0.65
11:24	13.26	4.99	0.60
11:25	13.28	4.94	0.65
11:26	13.36	4.89	0.60
11:27	13.41	4.88	0.65
11:28	13.41	4.84	1.30
11:29	13.71	4.84	0.85
11:30	12.43	5.59	0.15
11:31	12.17	5.56	0.05
11:32	12.19	5.57	0.05
11:33	12.20	5.52	0.05
11:34	12.26	5.48	0.05
11:35	12.29	5.47	0.05
11:36	12.30	5.44	0.10
11:37	12.35	5.41	0.05
11:38	12.38	5.38	0.05
11:39	12.42	5.36	0.05
11:40	12.43	5.36	0.20
11:41	12.46	5.31	0.10
11:42	12.54	5.28	0.10
11:43	12.54	5.28	0.10
11:44	12.58	5.24	0.10
11:45	12.58	5.28	0.10
11:46	12.59	5.23	0.10
11:47	12.63	5.22	0.10
11:48	12.65	5.17	0.15
11:49	12.74	5.13	0.15
11:50	12.78	5.10	0.05
11:51	12.83	5.08	0.05
11:52	12.85	5.06	0.05
11:53	12.90	5.03	0.05
11:54	12.96	4.98	0.05
11:55	13.02	4.93	0.05
11:56	13.08	4.92	0.10
11:57	13.09	4.90	0.10
11:58	13.12	4.88	0.05
11:59	13.21	4.77	0.00

MEAN ANALYZER VALUES

Avg. % O2	13.07
Avg. % CO2	5.02
Avg. CO ppmvd	0.40

# Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

## Certificate of Analysis

### - EPA PROTOCOL GAS -

Customer Coastal Air Consulting (Deland, Florida)  
Date December 08, 2009  
Delivery Receipt DR-26962  
Gas Standard 9.00-10.0% CO<sub>2</sub>, 11.5-12.5% Oxygen/Nitrogen-EPA PROTOCOL  
Final Analysis Date December 08, 2009  
Expiration Date December 08, 2012

Component Carbon Dioxide, Oxygen  
Balance Gas Nitrogen

Analytical Data: DO NOT USE BELOW 150 psig  
EPA Protocol, Section No. 2.2, Procedure G-1

### Reported Concentrations

**Carbon Dioxide: 9.62% +/- 0.09%**

**Oxygen: 12.04% +/- 0.12%**

**Nitrogen: Balance**

### Reference Standards:

SRM/GMIS:	GMIS/GMIS	GMIS/GMIS
Cylinder Number:	CC-159026/CC-165377	CC-231332/CC-85458
Concentration:	5.14% CO <sub>2</sub> /N <sub>2</sub> -10.05% CO <sub>2</sub> /Nitrogen	10.1% O <sub>2</sub> /N <sub>2</sub> - 20.97% Oxygen/N <sub>2</sub>
Expiration Date:	03/31/11 - 04/06/11	03/04/11 - 04/15/11

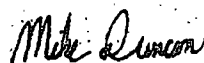
### Certification Instrumentation

Component:	Carbon Dioxide	Oxygen
Make/Model:	Agilent 7890A	Servomex 244a
Serial Number:	CN10736166	1847
Principal of Measurement:	GC-TCD	Paramagnetic
Last Calibration:	December 05, 2009	November 20, 2009

### Cylinder Data

Cylinder Serial Number: EB-0020405      Cylinder Outlet: CGA 590  
Cylinder Volume: 140 Cubic Feet      Cylinder Pressure: 2000 psig, 70°F  
Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by:



Mike Duncan

**Unmatched Excellence**



# Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

## Certificate of Analysis

### - EPA PROTOCOL GAS -

Customer Coastal Air Consulting (Deland, Florida)  
Date November 14, 2008  
Delivery Receipt DR-23098  
Gas Standard 17.0-18.0% CO<sub>2</sub>; 22.0-23.0% Oxygen/Nitrogen-EPA PROTOCOL  
Final Analysis Date November 14, 2008  
Expiration Date November 14, 2011

Component Carbon Dioxide, Oxygen  
Balance Gas Nitrogen

Analytical Data: **DO NOT USE BELOW 150 psig**  
EPA Protocol, Section No. 2.2, Procedure G-1

### Reported Concentrations

**Carbon Dioxide: 17.27% +/- 0.17%**

**Oxygen: 22.62% +/- 0.22%**

**Nitrogen: Balance**

### Reference Standards:

SRM/GMIS:	GMIS	GMIS/GMIS
Cylinder Number:	CC-79616	CC-125554/CC-85469
Concentration:	17.4% CO <sub>2</sub> /Nitrogen	20.99% O <sub>2</sub> /N <sub>2</sub> - 25.30% Oxygen/N <sub>2</sub>
Expiration Date:	12/01/12	04/02/11 - 08/09/10

### Certification Instrumentation

Component:	Carbon Dioxide	Oxygen
Make/Model:	Hewlett Packard 5890 II	Servomex 244a
Serial Number:	3336A59393	1847
Principal of Measurement:	TCD	Paramagnetic
Last Calibration:	November 05, 2008	November 10, 2008

### Cylinder Data

Cylinder Serial Number:	CC-231467	Cylinder Outlet:	CGA 590
Cylinder Volume:	140 Cubic Feet	Cylinder Pressure:	2000 psig, 70°F

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by:   
Date: November 14, 2008

**Unmatched Excellence**

# Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

## Certificate of Analysis

### - EPA PROTOCOL GAS -

Customer Coastal Air Consulting (Deland, Florida)  
Date July 22, 2009  
Delivery Receipt DR-25422  
Gas Standard 11-13 ppm Nitric Oxide, 23-27 ppm Carbon Monoxide/Nitrogen  
Final Analysis Date July 22, 2009  
Expiration Date July 22, 2011      **DO NOT USE BELOW 150 psig**

#### Analytical Data:

EPA Protocol, Section No. 2.2, Procedure G-1.

#### Reported Concentrations:

Nitric Oxide: 11.8 ppm +/- 0.11 ppm  
Carbon Monoxide: 25.7 ppm +/- 0.25 ppm  
Nitrogen: Balance  
Total NOx: 11.8 ppm

\*\* Total NOx for Reference Use Only \*\*

#### Reference Standards

<u>SRM/GMIS</u>	<u>GMIS/GMIS</u>	<u>GMIS/GMIS</u>
Cylinder Number:	CC-165557/CC-117924	CC-184197/CC-158976
Concentration:	5.22 ppm NO/19.48 ppm NO	10.07 ppm CO/25.1 ppm CO
Expiration Date:	12/03/10 - 12/11/10	06/15/10 - 08/04/10

#### Certification Instrumentation

Component:	Nitric Oxide	Carbon Monoxide
Make/Model:	Nicolet NEXUS 470	Nicolet-NEXUS 470
Serial Number:	AEP99000154	AEP99000154
Principal of Measurement:	FTIR	FTIR
Last Calibration:	July 04, 2009	July 02, 2009

#### Cylinder Data

Cylinder Number:	EB-0016054	Cylinder Volume:	140 Cubic Feet
Cylinder Outlet:	CGA 660	Cylinder Pressure:	2000 psig, 70°F
Expiration Date:	July 22, 2011		

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by:



Mike Duncan

**Unmatched Excellence**

# Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

## Certificate of Analysis

### - EPA PROTOCOL GAS -

Customer Coastal Air Consulting (Deland, Florida)  
Date October 27, 2009  
Delivery Receipt DR-26491  
Gas Standard 22-25 ppm NO, 45-50 ppm CO/Nitrogen - EPA PROTOCOL  
Final Analysis Date October 20, 2009  
Expiration Date October 20, 2011

Components Nitric Oxide, Carbon Monoxide  
Balance Gas Nitrogen

Analytical Data: **DO NOT USE BELOW 150 psig**  
EPA Protocol, Section No. 2.2, Procedure G-1

#### Reported Concentrations

**Nitric Oxide: 22.9 ppm +/- 0.22 ppm**  
**Carbon Monoxide: 48.5 ppm +/- 0.48 ppm**  
**Nitrogen: Balance**  
**Total Oxides of Nitrogen: 23.5 ppm**

\*\* Total NOX for Reference Use Only \*\*

#### Reference Standards:

SRM/GMIS:	GMIS	GMIS/GMIS
Cylinder Number:	CC-231538	CC-125604/CC-166617
Concentration:	24.41 ppm NO	25.5 ppm CO/51.0 ppm CO
Expiration Date:	06/24/11	02/27/10 - 09/18/10

#### Certification Instrumentation

Component:	Nitric Oxide	Carbon Monoxide
Make/Model:	Nicolet-NEXUS 470	Nicolet-NEXUS 470
Serial Number:	AEP99000154	AEP99000154
Principal of Measurement:	FTIR	FTIR
Last Calibration:	October 05, 2009	October 06, 2009

#### Cylinder Data

Cylinder Serial Number:	CC-233289	Cylinder Outlet:	CGA 660
Cylinder Volume:	140 Cubic Feet	Cylinder Pressure:	2000 psig, 70°F

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by:



Mike Duncan

**Unmatched Excellence**

# Liquid Technology Corporation

Industry Leader in Specialty Gases, Equipment and Service

## Certificate of Analysis - EPA PROTOCOL GAS -

Customer Coastal Air Consulting (Deland, Florida)  
Date July 22, 2009  
Delivery Receipt DR-25422  
Gas Standard 100.0 ppm Carbon Monoxide/Nitrogen - EPA PROTOCOL  
Final Analysis Date July 22, 2009  
Expiration Date July 22, 2012

Component Carbon Monoxide  
Balance Gas Nitrogen

Analytical Data: DO NOT USE BELOW 150 psig  
EPA Protocol, Section No. 2.2, Procedure G-1

Replicate Concentrations  
Carbon Monoxide: 102.0 ppm +/- 1.0 ppm  
Nitrogen: Balance

### Reference Standards:

SRM/GMS: GMS  
Cylinder Number: CC-233156  
Concentration: 104.91 ppm CO/Nitrogen  
Expiration Date: April 16, 2011

### Certification Instrumentation

Component: Carbon Monoxide  
Make/Model: Nicolet - NEXUS 470  
Serial Number: AEP99000154  
Principal of Measurement: FTIR  
Last Calibration: July 02, 2009

### Cylinder Data

Cylinder Serial Number: CC-233184      Cylinder Outlet: CGA 350  
Cylinder Volume: 140 Cubic Feet      Cylinder Pressure: 2000 psig, 70°F  
Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-97/121.

Certified by:



Mike Duncan

**Unmatched Excellence**

**Attachment F - Project Participants**

## **Project Participants**

### **Arlington Environmental Services, Inc.**

William Arlington  
Project Director

Rufus Rhoden  
Field Technician

Kaye Arlington  
Laboratory Analyst

Debra Carter  
Computer Analysis

### **Coastal Air Consultants, Inc**

Stephen Webb

### **Guiding Light Cremations, Unit 2**

Geronimo Mena  
Facility Manager

### **Broward County Environmental Management**

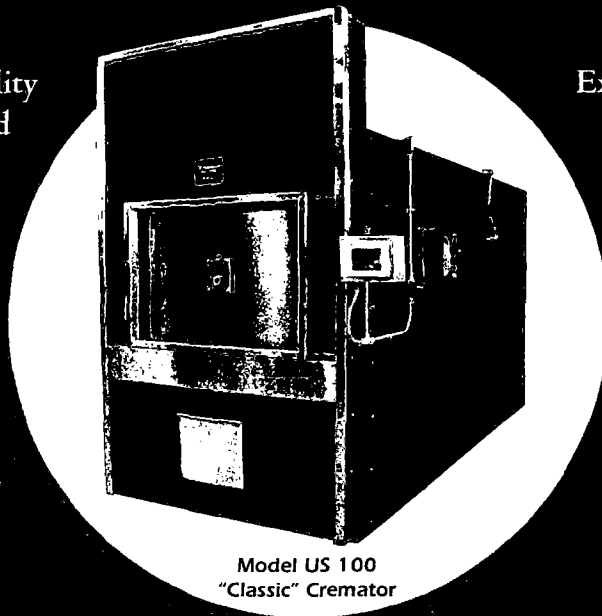
Courtney Pitters  
Inspector

*Attachment 2*  
*Equipment Drawings and Brochures*

# The "Classic" Cremator

## PERFORMANCE BEYOND EXPECTATIONS

BUILT to exacting quality and safety standards and backed by a two-year limited warranty, the fuel efficient "Classic" outperforms every other cremator in its price range. Take a look at some of the performance benefits the "Classic" offers!



Model US 100  
"Classic" Cremator

Exceptional standard features combine with professional expertise to deliver the product and service you demand. Unsurpassed in customer support, you can rely on U. S. Cremation Equipment's "Classic" to provide years of trouble-free operation.

### CLASSIC PERFORMANCE

- Cremate up to six bodies in a 10-hour work day
- Complete cremation every 60 - 90 minutes
- No cool down required between cremations
- Designed to cremate obese cases up to 800 lbs.
- Fully automatic PLC operating system

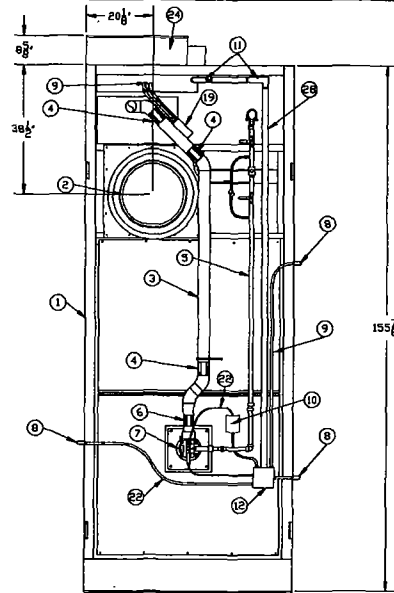
### CLASSIC FEATURES

- Power charging door//dual hydraulic cylinders
- Primary chamber viewport
- Secondary chamber temperature recorder
- Color touch screen control = standard
- Powder coat finish with stainless steel trim



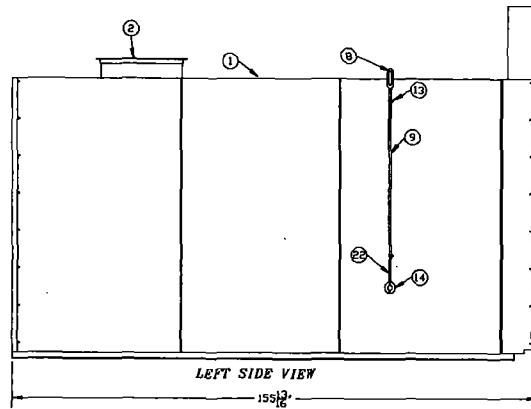
370 S. North Lake Boulevard, Suite 1004 • Altamonte Springs, FL 32701 • Ph: 321.282.7357 • Fax: 321.282.7358  
www.uscremationequipment.com • E-mail: info@uscremationequipment.com



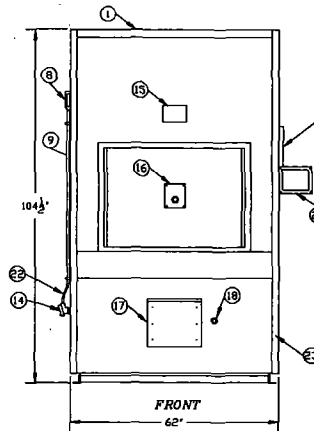


TOP

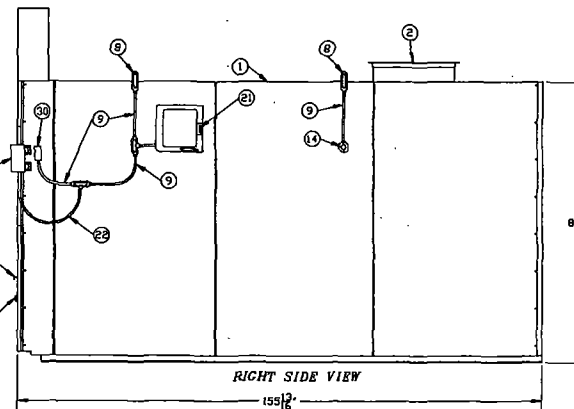
ITEM	QTY	DESCRIPTION
1	1	113 - FRAME ASSEMBLY
2	1	141 - STACK LAYOUT SMOKE SENSOR LOCATION
3	1	146 - MACHINE AIR SUPPLY
4	7	3" FERROD COUPLING
5	1	287 - GAS TRAIN 3 PIPING SYSTEM
6	1	2 1/2" FERROD COUPLING
7	1	TOP BURNER ECLIPS TJ50
8	3	1/2" ELECTRICAL LB
9	A/R	1/2" CONDUIT
10	2	BOGAN INTERCHANGEABLE IGNITOR TRANSFORMER AD6-SA6
11	3	1 1/2" ELECTRICAL LB
12	2	HOFFMAN ENCLOSURE ASG 6 X 6 X 4
13	A/R	1/2" CADDY BRACKETS
14	2	THERMOCOUPLE THERMAL EQUIP SYSTEM K11-16-BH-18-31
15	1	NAME PLATE SUPPLIED BY US CREMATION
16	1	135 - PEP SITE ASSEMBLY
17	1	250 - ASH BIN ASSEMBLY
18	1	LIQUID LEVEL SIGHTS P/N 1210K26 MCMASTER-CARR
19	3	BELIND LF120 US
20	1	SIEMENS TOUCH SCREEN
21	1	PARTLOW CHART RECORDER HRC5000
22	A/R	1/2" ELECTRICAL FLEX CONDUIT
23	1	134 - TRIM SS LAYOUT
24	1	581 - ASSEMBLY ELECTRICAL 30 X 30 CONTROL PANEL
25	1	AMERICAN FAN COMPANY P/N/ 24133 FAIRFIELD OHIO
26	2	UV SCANNER MODEL 560098A ECLIPS
27	1	BOTTOM BURNER ECLIPS TJ150
28	A/R	1 1/2" ELECTRICAL CONDUIT
29	1	WORLD WIDE ELECTRICAL CROP INDUSTRIAL FRACTIONAL MOTOR AT 15-18-56CB
30	1	SQUARE D SENSOR P/N 9007C4B2



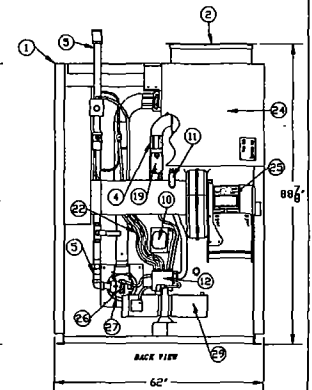
LEFT SIDE VIEW



FRONT



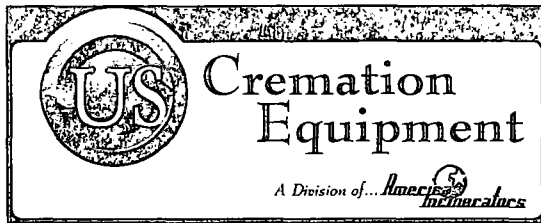
RIGHT SIDE VIEW



BACK VIEW

RELEASED TO SHOP DATE: \_\_\_\_\_

		US CREMATION EQUIPMENT	
MAIN ASSEMBLY W 30 X 30 ELECTRICAL CONTROL PANEL		CLASSIC	
584		3/14/98	



## HUMAN CREMATION CHAMBER SPECIFICATION

---

### EQUIPMENT:

US Cremation Equipment a division of American Incinerators Co. - Multiple Chambered human Crematory, Natural Gas, Propane (LP) or Oil fired.

### MANUFACTURER:

US Cremation Equipment a division of American Incinerators Corp.

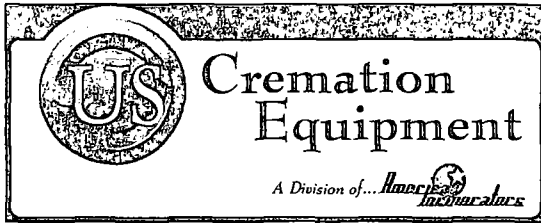
### CONSTRUCTION STANDARDS:

The American Incinerators cremation chamber shall be constructed of U.L./CSA listed components and will meet or exceed nationally accepted incinerator construction standards per the Incinerator Institute of America (IIA) publication guidelines; i.e.:

- A. Primary chamber will not exceed 60% of total furnace volumes. Flue connection shall not be considered part of furnace volume.
- B. Flame supervision through continuous ultraviolet scanning flame detectors on all burners.
- C. High temperature refractory construction with air-cooled walls to prevent excessive heat radiation.
- D. Exhaust gas temperature reduction.

### INCINERATION CHAMBER DIMENSIONS:

Chamber volumes:	Primary - 73 CF Secondary - 71 CF
Structural footprint:	12'0" (L) x 5'0" (W)
Over-all dimensions:	12'7" (L) x 6'0" (W) x 9'2" (H) w/std. hyd. door



**OPERATING TEMPERATURE:**

Temperatures are determined as a result of federal, state or local permitting authority operating standards.

Typical primary chamber setting: 1,000°F-1,200°F  
Typical secondary chamber setting: 1,400°F-1,800°F

**RETENTION TIME:**

In excess of 1 second.

**CAPACITY:**

One body and associated container per cremation cycle. 200 pounds per hour or 750 pounds per batch.

**DRAFT:**

Induced via refractory lined draft inducer.

**SHIPPING WEIGHT:**

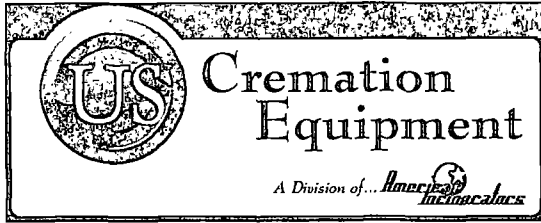
24,500 lbs.

**EMISSIONS:**

The American Incinerators cremation chamber shall meet or exceed federal, state and local environmental regulations.

**EMISSION CONTROL:**

Secondary chamber equipped with one, 1,500,000 BTU/HR burner. Also equipped with an electronic exhaust gas scanner system which temporarily suspends operation of the primary chamber burner.



### STEEL CONSTRUCTION SPECIFICATIONS:

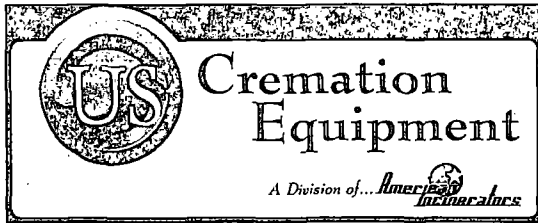
- A. The structure to be heavy 3" steel angle , square tube; 3/8" steel plate, seal welded construction.
- B. Subfloors to be 3/16" steel plate, seal welded construction.
- C. The exterior shell to be 12 gauge steel removable panels.
- D. Interior shell to be 10 gauge steel, seal welded construction.

### INSULATION & REFRACTORY SPECIFICATIONS:

- A. Hot Hearth: 3000°F abrasion resistant castable refractory, monolithic cast 7" - 13" thick, 1 -1/2" recessed top and rounded, stressed arched bottom.
- B. Chamber Floors: 3000°F abrasion resistant castable refractory, 5" thick on top of 2" 2400°F light weight insulating castable.
- C. Chamber Ceilings: 3000°F castable refractory, monolithic cast, rounded, stressed arched, 5"-9" thick, topped by 2" 2400°F light weight insulating castable.
- D. Interior Walls: 2800°F. alumina-silicate firebrick, 2 1/2" x 4 1/2" x 9", all chambers are backed by 4" of 1900°F ceramic fiber insulation
- E. Stack: Lined with 2" of 2200°F insulating refractory.

### SKIN TEMPERATURE CONTROL:

Integral dual casing, completely air-cooled design to prevent excessive heat radiation.



### COMBUSTION EQUIPMENT:

- A. Combustion Air - One, 3 phase, 208-230/460V, 17-15.5/7.6 amp 7 hp air-blower motor (1,400 CFM)
- B. Primary Chamber - One 500,000 BTU/HR nozzle mix, gas-fired burner. Eclipse, North American, or equal.
- C. Secondary Chamber - One, 1,500,000 BTU/HR modulating, nozzle mix, gas-fired burner. Eclipse, North American, or equal.
- D. Burner Flame Safeguard - Control supervision on each burner via a flame safeguard relay and ultra-violet light detector.
- E. Low Air Pressure Safety Switch - Interlocked to all burners.

### EXHAUST GAS TEMPERATURE REDUCTION:

Hot air duct operating exit temperature: 900°F

### HOT AIR DUCT:

10 gauge carbon steel, high temperature 2" refractory lining, pre-drilled flanges, 24" Outside Diameter, 28" at flanges.

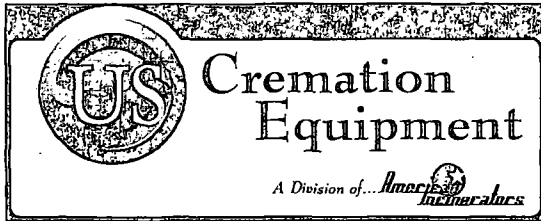
### UTILITY REQUIREMENTS:

#### A. GAS:

- 1. Pressure:
  - a) Natural Gas: 7" to 9" W.C.
  - b) Propane: 11" W.C.
- 2. Flow Rate: 2,000,000 BTU/HR

#### B. ELECTRICAL:

- 1. One, three phase, 208-230/460V, 17-15/8 amp connection for 5hp blower.



**CREMATION CHAMBER LOADING/CLEAN-OUT DOOR:**

Hydraulically operated, refractory lined, upward movement guillotine style door with gate view port.

**CREMATION PROCESS CONTROL:**

The cremation cycle is controlled by a programmable logic control (PLC) system. A visual confirmation of the system status is provided through control panel indicator lights and digital temperature display. Continuous fuel and air modulation is automatically controlled by a time/temperature actuated system. Operator interface is through two sets of simple push button controls and panel timer.

**EXTERIOR FINISH:**

The cremation chamber is finished with grey hi-resistance powder coating with stainless steel trim. Back of unit is coated with an epoxy type black coating.

*Attachment 2*  
*Emissions Calculations*

US Cremation Equipment  
Model "Classic"

Pounds Incinerated Per Hour (Average)	Hours Per Year	SO2 lb/ton	SO2 lb/hr	SO2 TPY	Nox lb/ton	Nox lb/hr	Nox TPY	TOC lb/ton	TOC lb/hr	TOC TPY
200	8760	2.5	0.25	1.095	3	0.3	1.314	3	0.3	1.314

CO=100 PPM @ 7% O2 MAX, Actual CO Emissions Measured at 3.49 PPM  
 CO = 100 PPM X 28 MW X 1700 DSCFM X 2.595E-09 X 60 min/hr = 0.74 lb/hr CO  
 0.74 lb/hr CO X 8760 hrs/yr X 1 ton/2000 lb = 3.24 TPY CO

Actual Emissions were measured at 0.04 gr/dscfm at 7% O2  
 PM = 0.08 gr/dscf X 1 pound/7000 gr X 1700 DSCFM X 60 min/hr = 1.17 lb/hr PM  
 1.17 lb/hr PM X 8760 hrs/yr X 1 ton/2000 lb = 5.12 TPY PM



*Attachment 4*  
*Process Flow Diagram*

