TELOGIA POWER LLC

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October 30, 2012

Florida Department of Environmental Protection
Air Programs
160 Governmental Center
Pensacola, FL 32502

Reference: Telogia Power, LLC, Facility No. 0770009, Permit No. 0770009-011-AV

Please find enclosed Fourth Quarter 2012 Results for Opacity Performance Audit monitoring as required.

Regards,

Jay Moon
Plant Manager

OPACITY PERFORMANCE AUDIT

FOR

Telogia Power LLC

Telogia, FL

Unit(s): Main

MONITORING SOLUTIONS, INC.
MODEL CEMOP-290 OPACITY CEMS

Fourth (4th) Quarter Results – 2012

PREPARED BY:

Monitoring | Solutions

Leaders in Environmental Monitoring Systems & Services

TABLE OF CONTENTS

I. Introduction

Monitoring Solutions, Inc. was contracted by Telogia Power LLC of Telogia, FL to conduct an opacity performance audit on a Durag Model CEMOP-290 opacity system. The testing was performed on October 4, 2012 by Brian Stultz of Monitoring Solutions, Inc. The performance testing consists of:

1. Zero and Span Check
2. Transmissometer Dust Accumulation Check
3. Optical Alignment Check
4. Calibration Error Check

Procedures from U.S. EPA "Performance Audit Procedures for Opacity Monitors" were followed and are covered in Section 2. All raw data, calculated data and final summary are presented. The results indicate compliance for all specifications.

Reviewed by: _____

Date: 10-17-12

Revision: July, 2009

PERFORMANCE AUDIT PROCEDURES FOR THE MONITORING SOLUTIONS, INC. OPACITY MONITOR

II. Monitoring Solutions, Inc. Model CEMOP-290

The instrument is manufactured by the Durag Corporation and distributed and serviced by Monitoring Solutions, Inc.

A. CEMS Description

The Monitoring Solutions, Inc. CEMOP-290 opacity monitoring system consists of four major components: the Transmissometer, the terminal control box, the air-purging system and the remote control unit and data acquisition equipment. The Transmissometer component consists of an optical transmitter/receiver (transceiver) unit mounted on one side of a stack or duct and a retro reflector unit mounted on the opposite side. The transceiver unit contains the light source, the photodiode detector, and the associated electronics. The transceiver uses a single-lamp, single detector system to determine effluent opacity. An LED light source is modulated electronically at 2 KHz to eliminate any ambient light interference. The modulated beam is configured to alternately produce reference and measurement signals so that the effects of variations in the optical and electronic components of the CEMS are minimized.

The display terminal control box mounted beside the transceiver unit provides on-stack readout of the opacity output from the transceiver and can be used as a diagnostic tool.

The air purging system serves a threefold purpose: 1) it provides an air window to keep exposed optical surfaces clean; 2) it protects the optical surfaces from condensation of stack gas moisture; and 3) it minimizes thermal conduction from the stack to the instrument. A standard installation has one air-purging system for each the transceiver and the retro reflector units.

The remote control unit communicates with the remote display unit via an RS 422 cable.

The opacity monitor measures the amount of light transmitted through the effluent from the transceiver to the retro reflector and back again. The control unit uses the effluent transmittance to calculate the optical density of the effluent at the monitor location, or the "path" optical density. In order to provide stack exit opacity data, the path optical density must be corrected. The correction factor is expressed as the ratio of the stack exit inside diameter to the inside diameter of the stack at the Transmissometer location. This ratio is called the "stack correction factor" (SCF) by Monitoring Solutions, Inc. The following equations illustrate the relationship between this ratio, path optical density, and stack exit opacity.

L_X/L_t = stack correction factor

where: L_X = stack exit inside diameter (in)

L_t = the stack inside diameter (or the duct width) at the monitor location (in)

$$OP_X = 1-(1-\frac{Opacity}{100})^{corr.factor}$$

OP_X = stack exit opacity (%)

B. Performance Audit Procedures

Preliminary Data

1. Obtain the stack exit inside diameter (in feet) and the stack inside diameter at the monitor location (in feet). Record these values in Blanks 1 and 2 of the Monitoring Solutions, Inc. CEMOP-Performance Audit Data Sheet.

   Note: Effluent handling system dimensions may be acquired from the following sources listed in descending order of reliability: 1) physical measurements, 2) construction drawings, 3) opacity monitor installation/certification documents, and 4) source personnel recollections.

2. Calculate the stack correction factor (divide the value in Blank 1 by the value in Blank 2). Record the result in Blank 3.

3. Record the source-cited stack correction factor in Blank 4.

   Note: The stack correction factor is preset by the manufacturer using information supplied by the source. The value recorded in Blank 4 should be the value source personnel agree should be set inside the monitor.

4. Obtain the reference zero and span calibration values. Record these values in Blank 5 and Blank 6, respectively.

   Note: The reference zero and span calibration values may not be the same as the values recorded during instrument installation and/or certification. The zero and span values recorded in Blank 5 and Blank 6 should be the reference values recorded during the most recent clear-path calibration of the CEMS.

Error Checks

The following steps describe the error codes for the Monitoring Solutions, Inc. CEMOP-290 remote control unit. Unless otherwise noted, the audit can continue with error codes being present, provided the source has been informed of the fault conditions.

Error code 100 = Transceiver blower fault
Error code 200 = Transceiver filter plugged
Error code 300 = Reflector blower fault
Error code 400 = Reflector filter plugged

Note: If a FAULT occurred, an error code should be displayed on the stack mounted display and on the remote display. An explanation of the error codes can be found in the manual.

Instrument Range Check

5. Check the opacity CEMS measurement range by pressing the MOD button (the LED on the button will light up) and using the PLUS button to cycle through the displays.

6. Record the instrument range in Blank 11.

Reference Signal, Zero and Span Checks

7. Initiate the calibration cycle by pressing the arrow and plus buttons simultaneously and holding for approximately 5 seconds.

   Note: The opacity monitor will automatically cycle through the internal zero (zero point check), external zero (window check), span and stack taper ratio modes. Approximately 6 minutes for a complete cycle.

8. Record the milliamp value shown for the internal zero (zero point check) displayed on the control panel display in Blank 12.

   Note: The internal zero checks the instrument reference signal. Since the instrument provides a full scale output of 4 to 20 milliamps, a value of 4 milliamps displayed on the control unit display represents a zero condition. After 1 ½ minutes in the internal zero mode, the monitor will automatically switch to the external zero mode.

9. Record the milliamp value shown for the external zero (window check) displayed on the control panel display in Blank 13. Also record the external zero value (in percent opacity) displayed on the opacity data recorder in Blank 14.

   Note: During the zero calibration check, the zero mirror is moved into the path of the measurement beam by a servomotor. The zero mechanism is designed to present the transceiver with a simulated clear-path condition. The daily zero check does not test the actual clear-path zero, nor does it provide a check of cross-stack parameters such as the optical alignment of the Transmissometer or drift in the reflectance of the retro reflector. The actual clear-path zero can only be checked during clear-stack or off-stack calibration of the CEMS. In addition to simulating the instrument clear-path zero, the zero mechanism allows the amount of dust on the transceiver optics (primary lens and zero mirror) to be quantified. After 1 ½ minutes in the external zero mode, the CEMS will automatically enter the span mode.

10. Record in Blank 15 the span value (in milliamps) displayed on the control panel display. Also record the span value (in percent opacity) displayed on the data recorder in Blank 16. Go to the Transmissometer location.

    Note: During the span calibration check, a servomotor moves an internal span filter into the path of the measurement beam while the zero mirror is in place. The span mechanism is designed to provide an indication of the upscale accuracy of the CEMS relative to the simulated clear-path zero. **Note:** The opacity monitor display will output its stack correction factor (SCF) for 1 ½ minutes when the span portion of the calibration cycle is completed. The CEMS automatically returns to the measurement mode when the SCF portion of the calibration cycle is complete.

Retro reflector Dust Accumulation Check

11. Record the effluent opacity prior to cleaning the retroreflector optics in Blank 17.
12. Open the transceiver housing, inspect and clean the retroreflector optics, and close the housing.
13. Record the post-cleaning effluent opacity in Blank 18. Go to the transceiver location.

Transceiver Dust Accumulation Check

14. Record the pre-cleaning effluent opacity in Blank 19.
15. Open the transceiver, clean the optics (primary window and zero mirror) and close the transceiver.
16. Record the post-cleaning effluent opacity in Blank 20.

Alignment Check

17. Determine the monitor alignment by looking through the alignment port of the side of the transceiver.
18. Observe whether the image is centered in the cross hairs and record this information (YES or NO) in Blank 21.

Calibration Reset

19. To remove any internal compensation for dirty optics, initiate another calibration cycle by pressing the arrow and plus buttons simultaneously and hold for approximately 5 seconds. **NOTE:** This should be completed prior to the Calibration Error Check.

Calibration Error Check

The calibration error check is performed using three neutral density filters. Performing the calibration error check on-stack using the filters determines the linearity of the instrument response relative to the current clear-path zero setting. This calibration error check does not determine the accuracy of the actual instrument clear-path zero or the status of any cross-stack parameters. A true calibration check is performed by moving the on-stack components to a location with minimal ambient opacity, making sure that the proper path length and alignments are attained, and then placing the calibration filters in the measurement path.

20. Put the monitor in Filter Audit mode.

21. Wait approximately two minutes or until a clear "zero" value has been recorded and displayed on the data recorder.

22. Record the audit filter serial numbers and opacity values in Blanks 22, 23, and 24.

23. Remove the filters from their protective covers, inspect and if necessary, clean them.

24. Insert the low range neutral density filter into the filter slot located in front of the heated lens.

25. Wait approximately two minutes or until a clear value has been recorded and displayed on the data recorder.

    Note: The audit data should be taken from a data recording/reporting device that presents instantaneous opacity (or opacity data with the shortest available integration period).

26. Record the CEMS response to the low range neutral density filter.

27. Remove the low range filter and insert the mid range neutral density filter.

28. Wait approximately two minutes and record the CEMS response to the mid range neutral density filter.

29. Remove the mid range filter and insert the high range filter.

30. Wait approximately two minutes and record the CEMS response to the high range neutral density filter.

31. Remove the high range filter, wait approximately two minutes, and record the zero value (if applicable).

32. Repeat steps 23 through 30 until a total of five opacity readings are obtained for each neutral density filter.

33. If six-minute integrated opacity data are recorded, repeat steps 20 through 30 once more, changing the waiting periods to 13 minutes.

34. Record the six-minute integrated data.

Note: In order to acquire valid six-minute averaged opacity data, each filter must remain in for at least two consecutive six-minute periods; the first period will be invalid because it was in progress when the filter was inserted. A waiting period of 13 minutes is recommended. You should have a "starting zero" reading and an "ending zero" reading.

35. When the calibration error check is complete, return the monitor to measuring mode. Close the transceiver head and the weather cover, and return to the CEMS control unit.

Final Control Unit Adjustment Reset

36. Return to the control unit location and reset the opacity instrument range to its original setting (Blank 11) <u>if necessary</u>.

37. Obtain a copy of the audit data from the data recorder.

38. Transcribe the calibration error response data from the data recorder to Blanks 25 through 50 of the audit form and complete the audit data calculations.

C. Interpretation of Audit Results

This section is designed to help the auditor interpret the CEMOP-290 performance audit results.

Error codes / fault analysis

Error codes are typically associated with parameters that the monitor manufacturer feels are critical to CEMS function, and to the collection of valid opacity data. The parameters associated with each of the error codes are found in the manufacturer's manual. With the exception of alarms that warn of elevated opacity levels (alarm or warning lamps), the error codes indicate that the CEMS is not functioning properly. An error or failure indication will be represented by a "YES" in Blanks 7 - 10.

Stack Exit Correlation Error Check

The path length correction error in Blank 51 should be within ±2%. This error exponentially affects the opacity readings, resulting in over - or - underestimation of the stack exit opacity. The most common error in computing the optical path length correction factor is the use of the flange-to-flange distance in place of the stack/duct inside diameter at the monitor location. This error will result in underestimation of the stack exit opacity and can be identified by comparing the monitor optical path length to the flange-to-flange distance; the flange-to-flange distance should be greater by approximately two to four feet.

Control Panel Meter Error (Optional)

The accuracy of the control panel meter is important at sources using the meter during monitor adjustment and calibration. The accuracy of the control panel meter (Blank 52 and Blank 54) is determined by comparing the zero and span reference values to the panel meter output recorded during the CEMS calibration check.

NOTE: Some installations utilize a different "Instrument Range Setting" than the normal 100% range. The panel meter span error must be corrected for the different range in order to provide an accurate error result. Use the following equation to calculate the span error corrected for "Instrument Range":

Panel Meter span error in % opacity =

$$6.25 \times ((((\text{Blank } 15 - 4) \div 16) \times \text{Blank } 11) - \text{Blank } 6)$$

Zero and Span Checks

The CEMOP-290 internal zero or "zero point check" (Blank 12 should be set to indicate 0% opacity (equivalent to 3.7 - 4.3 mA). An external zero error or "window check" (Blank 53) greater than 4% opacity is usually due to excessive dust accumulation on the optical surfaces, electronic drift or an electronic/mechanical offset of the data recorder. Excessive dust on the optical surfaces sufficient to cause a significant zero error would be indicated by the difference in the internal and external zero values and/or window alarm. Instrument span error (Blank 55) may be caused by the same problems that cause zero errors and may be identified in a similar fashion. A span error may also be caused by an inaccurately named span filter.

If the zero and span errors are due to a data recorder offset, both errors will be in the same direction and will be of the same magnitude.

The external zero displayed on the control unit panel meter also indicates the level of dust accumulation on the zero retroreflector and transceiver measurement window. The difference between the internal and external zero responses should equal the amount of dust found on the transceiver optics (Blank 57). To convert the zero responses to a value that represents lens dusting in percent opacity, use the following equation.

Meter response in % opacity = 6.25 [(Blank 13) - (Blank 12)]

Optical Alignment Check

When the transceiver and retroreflector are misaligned, a portion of the measurement beam that should be returned to the measurement detector is misdirected, resulting in a positive bias in the data reported by the CEMS. One of the most common causes of misalignment is vibration which may cause the on-stack components to shift slightly on the instrument mounting flanges. Another common cause of misalignment is thermal expansion and contraction of the structure on which the transmissometer is mounted. If the CEMS is being audited while the unit is off-line (cold stack), the results of the alignment analysis may not be representative of the alignment of the instrument when the stack or duct is at normal operating temperature. The alignment beam should be centered.

Optical Surface Dust Accumulation Check

The results of the dust accumulation check (Blank 58) should not exceed 4%. A dust accumulation value of more than 4% opacity indicates that the air flow of the purge system and/or the cleaning frequency of the optical surfaces are inadequate. When determining the optical surface dust accumulation, the auditor should note whether the effluent opacity is relatively stable (within ±2% opacity) before and after cleaning the optical surfaces. If the effluent opacity is fluctuating by more that ±2%, the dust accumulation analysis should be omitted.

Calibration Error

Calibration error results (Blanks 68, 69 and 70) in excess of ±3% are indicative of a non-linear or miss calibrated instrument. However, the absolute calibration accuracy of the monitor can be determined only when the instrument clear-path zero value is known. If the zero and span data are out-of-specification, the calibration error data will often be biased in the direction of the zero and span errors. Even if the zero and span data indicate that the CEMS is calibrated properly, the monitor may still be inaccurate due to error in the clear-path zero adjustment. The optimum calibration procedure involves using neutral density filters during clear-stack or off-stack CEMS calibration. This procedure would establish both the absolute calibration accuracy and linearity of the CEMS. If this procedure is impractical, and it is reasonable to assume that the clear-path zero is set correctly, the monitor's calibration can be set using either the neutral density filters or the internal zero and span values.

APPENDIX A
MODEL CEMOP-290 AUDIT DATA FORMS

AUDIT DATA SHEET

MONITORING SOLUTIONS MODEL CEMOP-290 OPACITY CEMS

Corporation:	Telogia Power LLC	Plant / Site:	Telogia, FL
Process Unit/Stack ID:	Main		
Auditor:	Brian Stultz	Representing:	Monitoring Solutions, Inc.
Attendees:	N/A	Representing:	N/A
Remote serial number:	1207237		
Transceiver serial number:	1207229	Flange to flange distance (in inches):	104
Reflector serial number:	1207229		
Date:	10/4/2012		

Preliminary Data

1	Stack exit inside diameter (in feet) = Lx	86.000
2	Stack inside diameter at the transmissometer location (in feet) = Lt	86.000
3	Calculated optical path length correction factor = Lx/Lt	1.000
4	Source-cited optical path length correction factor	1
5	Source-cited zero automatic calibration value (% opacity)	0.00 %
6	Source-cited span automatic calibration value (% opacity)	40.00 %

[GO TO CONTROL UNIT / DATA RECORDER LOCATION]

[INSPECT DATA RECORDING SYSTEM AND MARK WITH "OPACITY AUDIT," AUDITOR'S NAME, AFFILIATION, DATE, SOURCE, PROCESS UNIT/STACK IDENTIFICATION, AND THE TIME OF DAY.]

Error codes / faults	YES - or - NO
7 Blower [Loss of purge air from blower - Error 100, 300]	NO
8 Filter [Air filter restriction - Error 200, 400]	NO
9 Window [Excessive dirt on transceiver window - Error 001]	NO
10 Fault [Additional CEMS fault has occurred. Note fault code on panel meter and consult the instrument manual.]	NO

Instrument Range Check

11	Instrument range setting	80 %

Zero Check

12	Internal zero value in "milliamps" (Zero Point Check) [Wait for two minutes for automatic change to external zero mode.]	4.00 mA
13	Panel meter zero calibration value in "milliamps" (Window Check)	4.01 mA
14	Opacity data recorder zero calibration value in "% Op" (Window Check) [Wait two minutes for automatic change to external span mode.]	0.10 %

AUDIT DATA SHEET
MONITORING SOLUTIONS MODEL CEMOP-290 OPACITY CEMS
(Continued)

Span Check

15	Panel meter span calibration value in "milliamps" (Span Check)	12.09 mA
16	Opacity data recorder span calibration value in "% Op" (Span Check)	40.40 %
	[Go to transmissometer location.]	

Retroreflector Dust Accumulation Check

17	Pre-cleaning effluent opacity (% Op)	5.80 %
	[Inspect and clean optical surface.]	
18	Post-cleaning effluent opacity (% Op)	5.20 %
	[Go to transceiver location.]	

Transceiver Dust Accumulation Check

19	Pre-cleaning effluent opacity (% Op)	5.20 %
	[Inspect and clean optical surface.]	
20	Post-cleaning effluent opacity (% Op)	4.80 %

Optical Alignment Check (Optional)

[LOOK THROUGH ALIGNMENT SIGHT AND DETERMINE IF BEAM IMAGE IS CENTERED.]

21 Is the image centered?

YES - or - NO
YES

[Record audit filter data.]

Filter	Serial NO.	% Opacity	SCF%
22 LOW	YC61	17.50	17.50
23 MID	YC62	26.60	26.60
24 HIGH	YG00	57.80	57.80

[Remove the audit filters from the protective covers, inspect, and clean each filter.]

[Insert a filter, wait approximately 3 minutes, and record the opacity value reported by the opacity data recorder. Repeat the process 5 times for each filter.]

ZERO	LOW	MID	HIGH	ZERO
0.00	17.40	26.70	57.70	N/A
	17.40	26.70	57.70	N/A
	17.40	26.70	57.70	N/A
	17.40	26.70	57.70	N/A
	17.40	26.70	57.70	0.00

[If six-minute integrated data are also available, allow 13 minutes each for an additional run of the ZERO, LOW, MID, HIGH, and ZERO readings.]

ZERO	LOW	MID	HIGH	ZERO
0.00	17.40	26.70	57.70	0.10

[Close the transceiver head and the weather cover.]

[Return to control unit location.]

[Obtain a copy of the audit data from the opacity data recorder, and ensure that the data can be clearly read and interpreted.]

[Read and transcribe final calibration error data.]

	ZERO		LOW		MID		HIGH		ZERO
25	0.00	26	17.40	27	26.70	28	57.70	29	N/A
		30	17.40	31	26.70	32	57.70	33	N/A
		34	17.40	35	26.70	36	57.70	37	N/A
		38	17.40	39	26.70	40	57.70	41	N/A
		42	17.40	43	26.70	44	57.70	45	0.00

[Six-minute average data, if applicable.]

	ZERO		LOW		MID		HIGH		ZERO
46	0.00	47	17.40	48	26.70	49	57.70	50	0.10

Calculation of Audit Results

Stack exit correlation error (%):

51 $\left[\frac{\text{Blank 4}^{1}}{\text{Blank 3}} - \frac{\text{Blank 3}^{1}}{\text{Blank 3}^{1}}\right] * 100 =$ 0

Zero Error (% Op.):

52	Panel Meter	6.25 * (Blank 13 4.01 ---- 4.0)	--- Blank 5 0	===	0.06 %
53	Opacity Data Recorder	Blank 14 0.1	------ Blank 5 0	===	0.10

Span Error (% Op.):

54	Panel Meter 6.25 *	((((Blank 15 12.09 - 4.0) ÷ 16) × Blank 11 80)	--- Blank 6) 40.00	===	2.81 %
55	Opacity Data Recorder	Blank 16 40.4	------ Blank 6 40	===	0.40

Optical Surface Dust Accumulation (% OP):

56	Retroreflector	Blank 17 5.8	---------- Blank 18 5.2	===	0.60 %
57	Transceiver	Blank 19 5.2	---------- Blank 20 4.8	===	0.40 %
58	Total	Blank 56 0.6	+ Blank 57 0.4	===	1.00 %

Optical Path length Correction Factor of Audit Filters:

59 LOW:	(1---	(1---	$\frac{17.5 \text{ Blank } 4^{1}}{100)}$	*	100	=	17.50 %
60 MID:	(1---	(1---	$\frac{26.6 \text{ Blank } 4^{1}}{100)}$	*	100	=	26.60 %
61 HIGH:	(1---	(1---	$\frac{57.8 \text{ Blank } 4^{1}}{100)}$	*	100	=	57.80 %

Auditor Brian Stultz Date 10/04/12
Source Telogia Power LLC Unit Main

PARAMETER		Blank No.	Audit Results	Specifications
Error Codes/Faults				
Blower failure		7	NO	NO
Filter Block		8	NO	NO
Window		9	NO	NO
Fault		10	NO	NO
Stack Exit Correlation Error		51	0.00	+/- 2% Op
Internal Zero Error	Panel	52	0.06	+/- 4% Op
	Data	53	0.10	+/- 4% Op
Internal Span Error	Panel	54	2.81	+/- 4% Op
	Data	55	0.40	+/- 4% Op
Optical Alignment Analysis		21	YES	YES = Centered
Optical Surface Dust Accumulation				
Retroreflector		56	0.60	<= 2% Op
Transceiver		57	0.40	<= 2% Op
Total		58	1.00	<= 4% Op
Calibration Error Analysis				
Arithmetic Mean Difference				
LOW		62	-0.10	
	6-minute	71a	-0.10	
MID		63	0.10	
	6-minute	72a	0.10	
HIGH		64	-0.10	
	6-minute	73a	-0.10	
Confidence Coeffecient				
	Low	65	0.00	
	Mid	66	0.00	
	High	67	0.00	
Calibration Error				
	Low	68	0.10	<= 3% Op
	Mid	69	0.10	<= 3% Op
	High	70	0.10	<= 3% Op

Revision: July, 2009

OPACITY LOW FILTER AUDIT

Accuracy Determination

Telogia Power LLC | Telogia, FL | Main | 10/4/2012

LOW FILTER RUN	OPACITY OUTPUT FROM RECORDING DEVICE	Audit Filters NEUTRAL DENSITY FILTER SCF Filter VALUES	(FILTER-MONITOR) Difference	Difference^2
		RM	(X_i)	X_i^2
1	17.40	17.50	-0.10	0.0100
2	17.40	17.50	-0.10	0.0100
3	17.40	17.50	-0.10	0.0100
4	17.40	17.50	-0.10	0.0100
5	17.40	17.50	-0.10	0.0100

n = 5

t(0.975) = 2.776

Mean Ref. Method Value	**17.5000**	***RM***
Sum of Differences	**-0.5000**	***Xi***
Arithmetic Mean Difference	**-0.1000**	***Xi ave***
Sum of Differences Squared	**0.0500**	***Xi^2***
Standard Deviation	**0.0000**	***sd***
2.5% Error Conf.Coef	**0.0000**	***CC***
Calibration Error	**0.1000**	***percent***

OPACITY MID FILTER AUDIT
Accuracy Determination

Telogia Power LLC | Telogia, FL | Main | 10/4/2012

MID FILTER RUN	OPACITY OUTPUT FROM RECORDING DEVICE	Audit Filters NEUTRAL DENSITY FILTER SCF Filter VALUES	(FILTER-MONITOR) Difference	Difference^2
		RM	(Xi)	(Xi^2)
1	26.70	26.60	0.10	0.0100
2	26.70	26.60	0.10	0.0100
3	26.70	26.60	0.10	0.0100
4	26.70	26.60	0.10	0.0100
5	26.70	26.60	0.10	0.0100

n = 5

t(0.975) = 2.776

Mean Ref. Method Value	**26.6000**	***RM***
Sum of Differences	**0.5000**	***Xi***
Arithmetic Mean Difference	**0.1000**	***Xi ave***
Sum of Differences Squared	**0.0500**	***Xi^2***
Standard Deviation	**0.0000**	***sd***
2.5% Error Conf.Coef	**0.0000**	***CC***
Calibration Error	**0.1000**	***percent***

OPACITY HIGH FILTER AUDIT

Accuracy Determination

Telogia Power LLC | Telogia, FL | Main | 10/4/2012

HIGH FILTER RUN	OPACITY OUTPUT FROM RECORDING DEVICE	Audit Filters NEUTRAL DENSITY FILTER SCF Filter VALUES	(FILTER-MONITOR) Difference	Difference^2
		RM	(Xi)	(Xi^2)
1	57.70	57.80	-0.10	0.0100
2	57.70	57.80	-0.10	0.0100
3	57.70	57.80	-0.10	0.0100
4	57.70	57.80	-0.10	0.0100
5	57.70	57.80	-0.10	0.0100

n = 5

t(0.975) = 2.776

Mean Ref. Method Value	**57.8000**	***RM***
Sum of Differences	**-0.5000**	***Xi***
Arithmetic Mean Difference	**-0.1000**	***Xi ave***
Sum of Differences Squared	**0.0500**	***Xi^2***
Standard Deviation	**0.0000**	***sd***
2.5% Error Conf.Coef	**0.0000**	***CC***
Calibration Error	**0.1000**	***percent***

Telogia Power
Unit #1

Created: 10/04/12 14:02
Unit 1

Hourly One Minute Report
For 10/4/2012, Hour 11:00

Minute	FAN OPERATION 1-Min	Stat	OPACITY % 1-Min	Stat
0	1.00	SVC	9.4	SVC
1	1.00	SVC	9.5	SVC
2	1.00	SVC	8.8	SVC
3	1.00	SVC	8.9	SVC
4	1.00	SVC	12.5	SVC
5	1.00	SVC	9.9	SVC
6	1.00	SVC	8.2	SVC
7	1.00	SVC	10.3	SVC
8	1.00	SVC	12.1	SVC
9	1.00	SVC	9.0	SVC
10	1.00	SVC	8.2	SVC
11	1.00	SVC	10.3	SVC
12	1.00	SVC	11.3	SVC
13	1.00	SVC	10.7	SVC
14	1.00	SVC	10.1	SVC
15	1.00	SVC	10.6	SVC
16	1.00	SVC	10.1	SVC
17	1.00	SVC	8.6	SVC
18	1.00	SVC	10.2	SVC
19	1.00	SVC	11.1	SVC
20	1.00	SVC	10.6	SVC
21	1.00	SVC	9.6	SVC
22	1.00	SVC	9.4	SVC
23	1.00	SVC	10.2	SVC
24	1.00	SVC	8.3	SVC
25	1.00	SVC	11.4	SVC
26	1.00	SVC	8.6	SVC
27	1.00	SVC	8.3	SVC
28	1.00	SVC	9.0	SVC
29	1.00	SVC	10.8	SVC
30	1.00	SVC	13.3	SVC
31	1.00	SVC	0.0	NSA
32	1.00	SVC	1.5	ZER
33	1.00	SVC	31.3	SPN
34	1.00	SVC	40.4	SPN
35	1.00	SVC	16.5	NSA
36	1.00	SVC	7.8	SVC
37	1.00	SVC	11.9	MOS
38	1.00	SVC	12.6	MOS
39	1.00	SVC	7.9	MOS
40	1.00	SVC	8.9	MOS
41	1.00	SVC	10.0	MOS
42	1.00	SVC	9.0	MOS
43	1.00	SVC	40.1	MOS
44	1.00	SVC	54.7	MOS
45	1.00	SVC	7.8	MOS
46	1.00	SVC	8.2	MOS
47	1.00	SVC	32.6	MOS
48	1.00	SVC	63.1	MOS
49	1.00	SVC	10.3	MOS
50	1.00	SVC	0.0	MOS
51	1.00	SVC	0.1	MOS
52	1.00	SVC	8.2	MOS
53	1.00	SVC	40.4	MOS
54	1.00	SVC	19.7	MOS
55	1.00	SVC	11.2	MOS
56	1.00	SVC	0.0	MOS
57	1.00	SVC	0.0	MOS
58	1.00	SVC	0.0	MOS
59	1.00	SVC	13.8	MOS

Zero

----------Explanation for Status Code----------
MOS = MONITOR OUT OF SERVICE
SPN = SPAN CALIBRATION
ZER = ZERO CALIBRATION
NSA = NO SAMPLE AVAILABLE

Telogia Power
Unit #1

Created: 10/04/12 14:03
Unit 1

Hourly One Minute Report
For 10/4/2012, Hour 12:00

Minute	FAN OPERATION 1-Min	Stat	OPACITY % 1-Min	Stat	
0	1.00	SVC	17.4	MOS	L1
1	1.00	SVC	17.4	MOS	
2	1.00	SVC	22.4	MOS	
3	1.00	SVC	26.7	MOS	
4	1.00	SVC	26.7	MOS	M1
5	1.00	SVC	37.3	MOS	
6	1.00	SVC	57.7	MOS	
7	1.00	SVC	57.7	MOS	H1
8	1.00	SVC	50.2	MOS	
9	1.00	SVC	17.4	MOS	
10	1.00	SVC	17.4	MOS	L2
11	1.00	SVC	17.3	MOS	
12	1.00	SVC	26.0	MOS	
13	1.00	SVC	26.7	MOS	M2
14	1.00	SVC	26.6	MOS	
15	1.00	SVC	47.8	MOS	
16	1.00	SVC	57.7	MOS	H2
17	1.00	SVC	57.7	MOS	
18	1.00	SVC	35.6	MOS	
19	1.00	SVC	17.4	MOS	
20	1.00	SVC	17.4	MOS	L3
21	1.00	SVC	19.6	MOS	
22	1.00	SVC	26.7	MOS	
23	1.00	SVC	26.7	MOS	M3
24	1.00	SVC	28.1	MOS	
25	1.00	SVC	57.7	MOS	H3
26	1.00	SVC	57.8	MOS	
27	1.00	SVC	57.8	MOS	
28	1.00	SVC	22.0	MOS	
29	1.00	SVC	17.4	MOS	
30	1.00	SVC	17.4	MOS	L4
31	1.00	SVC	23.0	MOS	
32	1.00	SVC	26.7	MOS	
33	1.00	SVC	26.7	MOS	M4
34	1.00	SVC	39.0	MOS	
35	1.00	SVC	57.7	MOS	H4
36	1.00	SVC	57.8	MOS	
37	1.00	SVC	48.2	MOS	
38	1.00	SVC	17.4	MOS	
39	1.00	SVC	17.4	MOS	L5
40	1.00	SVC	17.3	MOS	
41	1.00	SVC	26.2	MOS	
42	1.00	SVC	26.7	MOS	
43	1.00	SVC	26.7	MOS	M5
44	1.00	SVC	49.3	MOS	
45	1.00	SVC	57.7	MOS	
46	1.00	SVC	57.7	MOS	H5
47	1.00	SVC	25.6	MOS	
48	1.00	SVC	0.0	MOS	
49	1.00	SVC	0.0	MOS	Zero
50	1.00	SVC	0.0	MOS	
51	1.00	SVC	0.0	MOS	
52	1.00	SVC	0.0	MOS	
53	1.00	SVC	0.0	MOS	
54	1.00	SVC	0.0	MOS	
55	1.00	SVC	0.0	MOS	
56	1.00	SVC	0.0	MOS	
57	1.00	SVC	0.0	MOS	
58	1.00	SVC	0.0	MOS	
59	1.00	SVC	0.0	MOS	

----------Explanation for Status Code----------
MOS = MONITOR OUT OF SERVICE

Telogia Power
Unit #1

Created: 10/04/12 14:05
Unit 1

Hourly One Minute Report
For 10/4/2012, Hour 13:00

Minute	FAN OPERATION 1-Min	Stat	OPACITY % 1-Min	Stat
0	1.00	SVC	0.0	MOS
1	1.00	SVC	0.0	MOS
2	1.00	SVC	0.0	MOS
3	1.00	SVC	5.5	MOS
4	1.00	SVC	17.5	MOS
5	1.00	SVC	17.4	MOS
6	1.00	SVC	17.4	MOS
7	1.00	SVC	17.4	MOS
8	1.00	SVC	17.4	MOS
9	1.00	SVC	17.4	MOS
10	1.00	SVC	17.4	MOS
11	1.00	SVC	17.4	MOS
12	1.00	SVC	17.4	MOS
13	1.00	SVC	17.4	MOS
14	1.00	SVC	17.4	MOS
15	1.00	SVC	17.4	MOS
16	1.00	SVC	18.0	MOS
17	1.00	SVC	26.7	MOS
18	1.00	SVC	26.7	MOS
19	1.00	SVC	26.7	MOS
20	1.00	SVC	26.7	MOS
21	1.00	SVC	26.7	MOS
22	1.00	SVC	26.7	MOS
23	1.00	SVC	26.7	MOS
24	1.00	SVC	26.7	MOS
25	1.00	SVC	26.7	MOS
26	1.00	SVC	26.7	MOS
27	1.00	SVC	26.7	MOS
28	1.00	SVC	26.7	MOS
29	1.00	SVC	26.7	MOS
30	1.00	SVC	53.5	MOS
31	1.00	SVC	57.7	MOS
32	1.00	SVC	57.7	MOS
33	1.00	SVC	57.7	MOS
34	1.00	SVC	57.7	MOS
35	1.00	SVC	57.7	MOS
36	1.00	SVC	57.7	MOS
37	1.00	SVC	57.7	MOS
38	1.00	SVC	57.7	MOS
39	1.00	SVC	57.7	MOS
40	1.00	SVC	57.7	MOS
41	1.00	SVC	57.7	MOS
42	1.00	SVC	57.8	MOS
43	1.00	SVC	18.6	MOS
44	1.00	SVC	0.1	MOS
45	1.00	SVC	0.1	MOS
46	1.00	SVC	0.1	MOS
47	1.00	SVC	0.0	MOS
48	1.00	SVC	0.0	MOS
49	1.00	SVC	0.1	MOS
50	1.00	SVC	0.1	MOS
51	1.00	SVC	0.1	MOS
52	1.00	SVC	0.1	MOS
53	1.00	SVC	0.1	MOS
54	1.00	SVC	0.1	MOS
55	1.00	SVC	0.1	MOS
56	1.00	SVC	4.0	MOS
57	1.00	SVC	14.0	MOS
58	1.00	SVC	18.8	MOS
59	1.00	SVC	17.3	MOS

----------Explanation for Status Code----------
MOS = MONITOR OUT OF SERVICE

OPACITY FILTER AUDIT

*** 6-minute Averages ***

Accuracy Determination

Telogia Power LLC | Telogia, FL | Main | 10/4/2012

6 Minute Averages	OPACITY OUTPUT FROM RECORDING DEVICE	Audit Filters NEUTRAL DENSITY FILTER SCF Filter VALUES	(FILTER-MONITOR) Difference	OPACITY ERROR
		RM	(Xi)	
ZERO	0.00	0.00	0.00	**0.00**
LOW	17.40	17.50	-0.10	**0.10**
MID	26.70	26.60	0.10	**0.10**
HIGH	57.70	57.80	-0.10	**0.10**
ZERO	0.10	0.00	0.10	**0.10**

Telogia Power
Unit #1

Created: 10/04/12 14:06
Unit 1

Daily Opacity Report
For 10/4/2012

Hour	Opac. % Minutes 0 - 5	Opac. % Minutes 6 - 11	Opac. % Minutes 12 - 17	Opac. % Minutes 18 - 23	Opac. % Minutes 24 - 29	Opac. % Minutes 30 - 35	Opac. % Minutes 36 - 41	Opac. % Minutes 42 - 47	Opac. % Minutes 48 - 53	Opac. % Minutes 54 - 59
0	8.9 SVC	9.1 SVC	8.4 SVC	8.5 SVC	8.7 SVC	9.6 SVC	10.5 SVC	8.2 SVC	9.3 SVC	7.8 SVC
1	5.3 SVC	12.4 SVC	30.2 SVC	35.6 SVC	29.0 SVC	24.5 SVC	24.9 SVC	23.2 SVC	19.8 SVC	16.8 SVC
2	15.1 SVC	13.7 SVC	12.7 SVC	12.5 SVC	12.3 SVC	11.8 SVC	14.9 SVC	16.6 SVC	12.4 SVC	6.5 SVC
3	3.3 SVC	3.4 SVC	4.1 SVC	6.8 SVC	3.8 SVC	5.7 SVC	3.6 SVC	5.3 SVC	7.2 SVC	7.0 SVC
4	6.7 SVC	7.3 SVC	7.1 SVC	6.7 SVC	6.6 SVC	7.2 SVC	6.5 SVC	6.9 SVC	6.4 SVC	8.3 SVC
5	11.7 SVC	24.2 SVC	8.8 SVC	8.1 SVC	8.9 SVC	7.9 SVC	7.4 SVC	14.5 SVC	16.5 SVC	12.7 SVC
6	14.1 SVC	14.8 SVC	15.3 SVC	10.1 SVC	15.0 SVC	9.6 SVC	9.2 SVC	7.8 SVC	8.7 SVC	8.9 SVC
7	8.5 SVC	9.2 SVC	8.5 SVC	8.5 SVC	8.8 SVC	9.1 SVC	8.9 SVC	8.4 SVC	9.2 SVC	8.9 SVC
8	8.7 SVC	9.2 SVC	8.6 SVC	8.9 SVC	8.0 SVC	8.9 SVC	8.9 SVC	10.3 SVC	9.5 SVC	9.3 SVC
9	9.2 SVC	10.2 SVC	10.8 SVC	10.7 SVC	11.3 SVC	10.9 SVC	10.8 SVC	10.9 SVC	10.5 SVC	9.8 SVC
10	9.8 SVC	9.7 SVC	10.0 SVC	9.8 SVC	9.7 SVC	9.2 SVC	9.7 SVC	9.6 SVC	10.2 SVC	9.4 SVC
11	9.8 SVC	9.7 SVC	10.2 SVC	10.2 SVC	9.4 SVC	SPN	10.3 MOS	25.4 MOS	20.4 MOS	7.5 MOS
12	24.7 MOS	36.3 MOS	40.4 MOS	23.9 MOS	40.1 MOS	31.8 MOS	30.7 MOS	40.6 MOS	0.0 MOS	0.0 MOS
13	6.7 MOS	17.4 MOS	19.1 MOS	26.7 MOS	26.7 MOS	57.0 MOS	57.7 MOS	12.8 MOS	0.1 MOS	9.1 MOS
14	14.1 SVC	COS	COS	COS	COS	COS	COS	COS	COS	COS
15	COS	COS	COS	COS	COS	COS	COS	COS	COS	COS
16	COS	COS	COS	COS	COS	COS	COS	COS	COS	COS
17	COS	COS	COS	COS	COS	COS	COS	COS	COS	COS
18	COS	COS	COS	COS	COS	COS	COS	COS	COS	COS
19	COS	COS	COS	COS	COS	COS	COS	COS	COS	COS
20	COS	COS	COS	COS	COS	COS	COS	COS	COS	COS
21	COS	COS	COS	COS	COS	COS	COS	COS	COS	COS
22	COS	COS	COS	COS	COS	COS	COS	COS	COS	COS
23	COS	COS	COS	COS	COS	COS	COS	COS	COS	COS

The average opacity period average for the day was 10.7% for 116 periods of valid data.

The Fan was in operation for 141 periods.

The maximum opacity period average for the day was 35.6%.

There were 124 periods of invalid data.

Status Code Definitions

MOS = MONITOR OUT OF SERVICE

COS = CEMDAS OUT OF SERVICE

APPENDIX B
FILTER DATA AND FIELD CERTIFICATION SHEETS

Monitoring Solutions

Leaders in Environmental Monitoring Systems & Services

4440 S. High School Rd., Suite D, Indianapolis, Indiana 46241 Tel: 317.856.9400

REPORT OF CERTIFICATION OF NEUTRAL DENSITY AUDIT FILTERS

Date of Filter Certification: **August 6, 2012**

Date of Filter Expiration: **February 7, 2013** **Filter Set - K**

Audit Device / Filter Slot Angle of Incidence **10** Degrees

Path-Length Correction **1.000** (Straight Stack)

Table 1: Individual Filter Certification Data

Serial Number	Opacity Value (%)	Transmittance (%)	Previous Opacity (%)	Change in Opacity (%)
YC60	8.6	91.4	8.6	0.0
YC61	17.5	82.5	17.4	0.1
YC62	26.6	73.4	26.3	0.3
YC63	45.8	54.2	45.6	0.2
YG00	57.8	42.2	57.8	0.0
YG02	86.4	13.6	86.3	0.1

Laboratory-Based Transmissometer Operator

See second page for Instrument Information and Details of Certification