ATTACHMENT 3

SOURCE TESTS

SCEC

2008 COMPLIANCE SOURCE TEST CENTRAL MAUI MUNICIPAL LANDFILL GAS COLLECTION AND CONTROL SYSTEM (FLARE)

PREPARED FOR:
SCS Field Services
3900 Kilroy Airport Way, Suite 100
Long Beach, CA 90806-6816

EQUIPMENT LOCATION:
Central Maui Municipal Solid Waste Landfill
Pulehu Road
Puunene, Maui 96784

Covered Source Permit (CSP) No. 0652-01-C

TEST DATE:
November 19, 2008

SUBMITTAL DATE:
January 7, 2009

PARAMETERS MEASURED:
NO_x, CO, and TGNMO Emissions, and Volume Flow

TESTED BY:
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Report No: 2170.3001.rpt1

Written By: _____
Aaron E. Lord

Reviewed By: _____
Leslie A. Johnson

TABLE OF CONTENTS

1.0 INTRODUCTION

SCEC was contracted to perform the 2008 source testing on one (1) landfill gas fired flare located at the Central Maui Landfill. The testing was performed to satisfy requirements delineated by the State of Hawaii Department of Health (HDOH) CSP No. 0652-01-C.

Measurements of the flare emissions and operating parameters were conducted at the flare exhaust and at the inlet (landfill gas) of the flare. Table 1-1 provides a test matrix of the parameters tested at each sample location.

The tests were conducted on November 19, 2008 and were performed by Leslie A. Johnson – Project Manager and Aaron E. Lord - Project Specialist, of SCEC. Michael P. Murphy of SCS Field Services coordinated the source test program. On-site flare operations were coordinated by Dave Fisher of SCS Field Services.

The results of the emission tests are summarized in Table 1-2. Table 1-2 presents all data as recorded during the test program. The source tests demonstrate that the flare operates with criteria pollutant emissions below the permit limits. Detailed test results are presented in Section 4.0. All raw data, laboratory results, calculations and QA/QC data can be found in the Appendices.

TABLE 1-1
TEST MATRIX
CENTRAL MAUI LANDFILL
November 19, 2008

Parameter	Inlet	Exhaust
Oxygen (O_2)	X	X
Carbon Dioxide (CO_2)	X	X
Carbon Monoxide (CO)		X
Nitrogen Oxides (NO_x)		X
Moisture (H_2O)	X	X
Flow Rate (dscfm)	X	X
Temperature (°F)	X	X
Total Gaseous Non-Methane Organics (TGNMO)	X	X

TABLE 1-2
SUMMARY OF TEST RESULTS
SCS Field Services
Central Maui Landfill
November 19, 2008

PARAMETER	INLET		EXHAUST	PERMIT LIMIT
O_2, %	0.54		14.73	
CO_2, %	38.70		5.85	
N_2, %	11.53		79.42	
Flow Rate, wscfm	525		-	
Flow Rate, dscfm	-		8,488	
Temperature, °F	106		1,481	>1,400
Btu/scf	476.7			
MMBtu/Hr	15.01			
NOx:				
ppm			9.9	
ppm @ 3% O_2			28.7	
lb/hr (as NO_2)			0.60	
lb/MMBtu (as NO_2)			0.040	0.06
CO:				
ppm			40.0	
ppm @ 3% O_2			116.0	
lb/hr			1.48	
lb/MMBtu			0.099	0.15
Hydrocarbons:				
CH_4, ppm	466,000	<	1	
TGNMO, ppm (as CH_4)	7,460		1.83	
TGNMO, lb/hr (as CH_4)	9.8		0.04	
TGNMO, ppm (as hexane)			0.30	
TGNMO, ppm @ 3% O_2 (as hexane)			0.88	<20 NSPS
TGNMO, lb/hr (as hexane)			0.03	
Destruction Eff. %			99.59	>98%

Notes:
The results in this table are the averages of all measurements.

2.0 TEST UNIT DESCRIPTION

The landfill gas control system and flare station at the Central Maui Landfill includes a gas collection system, gas wells, and an enclosed flare to incinerate the landfill gas.

The flare tested was manufactured by Perennial Energy, Inc. Model FL-132-36-E and is 123.25 inches inside diameter by 36.75 feet high; propane fueled pilot, two Houston Service Industries 700 scfm multi-stage direct drive centrifugal blowers, two 20 HP air compressors, condensate tank and transfer system for condensate injection into flare, and a UV flame sensor. The flare has four thermocouple reading locations and one full-time thermocouple sensor. The flare was set to operate at 1475 °F while being monitored from the middle thermocouple.

3.0 TEST DESCRIPTION

3.1 Test Conditions

The landfill gas flow rate averaged 525 scfm during the source testing. Given the present state of the landfill the flare was operated at maximum throughput. Temperature and fuel flow rate were monitored and recorded by the automatic operation control system throughout the test period. In addition, SCEC recorded the flare temperature, gas flow rate and landfill gas temperature during the test runs. These data can be found in Appendix A field data sheets.

3.2 Sample Locations

Samples were collected at the flare exhaust and at the inlet (landfill gas fuel) to the flare. The sample point calculations and a schematic drawing of the sample locations are included in Appendix G.

The flare has an inside diameter of 123.25 inches. The ports are 31 feet above the ground; the stack exit is 37 feet above ground. Sixteen traverse points were used on all flow rate and Continuous Emission Monitoring System (CEMS) tests.

At the outlet to the flare, two ports located approximately 71 inches (0.58 diameters) downstream and 370 inches (3.00 diameters) upstream of all flow disturbances was used. The gas inlet pipe size is 10 inches with a single port located several diameters upstream of the flame arrestor.

3.3 Test Procedures

The test procedures used for the inlet and flare exhaust measurements are summarized below in Tables 3-1 and 3-2, respectively. Brief discussions of each procedure are given below in Sections 3.3.1 through 3.3.3. Triplicate measurements of each parameter were performed.

3.0 TEST DESCRIPTION (Continued)

TABLE 3-1
FLARE INLET TEST PROCEDURES
CENTRAL MAUI MUNICIPAL LANDFILL
NOVEMBER 19, 2008

Parameter	Sample Medium	Analytical Technique	Reference Method	Number of Replicates
Methane and Total Gaseous Non-Methane Organics & Fixed Gases	Summa Canister	TCA/FID	EPA Method 25C	3
Fixed Gases, Btu/cf and F factor	Tedlar Bags	CG/FID	ASTM D-3588	3
Moisture	Thermocouple	Wet Bulb/Dry Bulb	EPA Methods 4	3
Flow Rate	On-site Meter	Differential Pressure	NA	Continuous

TABLE 3-2
FLARE EXHAUST TEST PROCEDURES
CENTRAL MAUI MUNICIPAL LANDFILL
NOVEMBER 19, 2008

Parameter	Sample Medium	Reference Method	Number of Replicates
Methane and Total Gaseous Non-Methane Organics	Summa Canister	EPA Method 25C	3
O_2	CEM	EPA Method 3A	3
CO_2	CEM	EPA Method 3A	3
NO_x	CEM	EPA Methods 7E and 10	3
CO	CEM	EPA Methods 7E and 10	3
Flow Rate	NA	EPA Method 19	3

3.0 TEST DESCRIPTION (Continued)

3.3.1 Methane and Total Gaseous Non-Methane Organics

Methane and total gaseous non-methane organics were measured following EPA Method 25C. The landfill gas samples were collected over an hour period in evacuated summa canisters. ATMAA, Inc., in Calabasas, California analyzed the samples following EPA Method 25C using TCA/FID.

The exhaust gas measurements were conducted using EPA Method 25C. The sample is collected using a stainless steel probe connected by Teflon tubing to an evacuated stainless steel tank. The probe and sample line are purged with flue gas continuously for 5 minutes before sampling. The exhaust sampling was conducted simultaneously with the collection of the inlet samples for the determination of destruction efficiency. The tank samples were analyzed by ATMAA, Inc. in Calabasas, CA, using TCA/FID.

3.3.2 Oxygen, Carbon Dioxide, Nitrogen, Carbon Monoxide, and Nitrogen Oxides

Measurements of NO_x, CO, O_2 and CO_2 at the exhaust were conducted using EPA Methods 3A, 7E, and 10 sampling with a CEMS.

These CEMS measurements were obtained using SCEC's continuous emissions monitoring system described in Appendix A. The system includes a stainless steel probe connected to a 25' Teflon line to extract the exhaust sample. The sample gas is then directed through a moisture knockout cooled with ice and water. A peristaltic pump continuously drains the knockout. The sample then travels to the ground using Teflon tubing to an additional conditioning and filtering system. Leak checks were conducted prior to and at the conclusion of compliance testing by operating the sample pump, plugging the probe inlet and all pressure side system exits except for one analyzer rotameter, then measuring the leakage rate on that rotameter.

A calibration error test was performed on each analyzer prior to testing. The calibration error test was conducted by spanning the instrument with zero and high span gas and then recording the as-found value when injecting zero, mid and high span gases.

EPA Protocol 1 Calibration Gases were used for all analyzer calibrations. In accordance with EPA Method procedures, a pre- and post-test system bias check was conducted for each test run. The system bias check was conducted by delivering zero and span gas to the CEM probe tip and recording the as-found concentration. No analyzer adjustments were made between these pre- and post-system bias checks. Calculations for the correction of measured system bias and instrument drift were then applied to each test run.

Triplicate emissions measurements were performed to determine the concentration of O_2, CO_2, CO, and NO_x. The average concentrations were determined during each test for a period of sixty minutes. This test average was then corrected for measured system bias and drift.

3.0 TEST DESCRIPTION (Continued)

3.3.3 Flow Rate

Landfill gas flow rate into the flare was set to specification using on-site instrumentation. The thermal capacity (MMBtu/scf) and expansion potential (EPA F factor) of the landfill gas was analyzed. Based on the on-site fuel meter and fuel quality analysis the exhaust volume flow was calculated. All results in the reported tables use EPA Method 19 calculated exhaust flow rate. The exhaust flow rate calculations are included in Appendix C.

4.0 RESULTS

The results of the source tests of the Central Maui Municipal Landfill flare show that the flare emissions are below HDOH permit limits. The flare exhaust TGNMO is well below both the 20 ppm_v @3% O_2 as hexane and the 98% DRE. Table 1-2 present the summarized test results and application permit limits. Table 4-1 present detailed test results of each parameter.

4.1 Test Critique

No sampling or analytical problems occurred during the test program. All calibration error and system bias checks were below their allowable tolerance, 2% and 5%. The on-site NO_2 converter check met the method 7e requirement.

4.0 RESULTS (Continued)

TABLE 4-1
GENERAL RESULTS
SCS Field Services
Central Maui Landfill
November 19, 2008

Parameter	INLET First Run	INLET Second Run	INLET Third Run	INLET Average	EXHAUST First Run	EXHAUST Second Run	EXHAUST Third Run	EXHAUST Average
O_2, %	0.51	0.55	0.56	0.54	14.57	14.80	14.81	14.73
CO_2, %	38.3	38.7	39.1	38.7	5.95	5.79	5.82	5.85
N_2, %	12.5	11.2	10.9	11.5	79.5	79.4	79.4	79.4
Flow Rate, wscfm	526	526	523	525	-	-	-	-
Flow Rate, dscfm	-	-	-	-	8,196	8,652	8,617	8,488
Temperature, °F	106	106	106	106	1,457	1,484	1,502	1,481
Btu/scf	469	479	482	477				
MMBtu/Hr	14.80	15.12	15.13	15.01				
NOx:								
ppm					10.17	9.55	9.98	9.90
ppm @ 3% O_2					28.7	28.1	29.3	28.7
lb/hr (as NO_2)					0.60	0.59	0.62	0.60
lb/MM Btu (as NO_2)					0.040	0.039	0.041	0.040
CO:								
ppm					39.7	45.3	35.0	40.0
ppm @ 3% O_2					112.1	133.2	102.8	116.0
lb/hr					1.418	1.711	1.314	1.481
lb/MM Btu					0.096	0.113	0.087	0.099
Hydrocarbons:								
CH_4, ppm	459,000	468,000	471,000	466,000	< 1	< 1	< 1	< 1
Ethane, ppm	< 10	< 10	< 10	< 10	< 1	< 1	< 1	< 1
TGNMO, ppm (as CH_4)	6,790	7,680	7,910	7,460	2.56	1.92	< 1	< 1.83
TGNMO, lb/hr (as CH_4)	8.90	10.06	10.31	9.76	0.05	0.04	0.02	0.04
TGNMO, ppm (as hexane)	1,132	1,280	1,318	1,243	0.43	0.32	0.17	0.30
TGNMO, ppm @ 3% O_2 (as hexane)	993	1,126	1,160	1,093	1.21	0.94	0.49	0.88
TGNMO, lb/hr (as hexane)	7.97	9.02	9.23	8.74	0.05	0.04	0.02	0.03
Destruction Eff. %					99.41	99.59	99.78	99.59

The exhaust volume flow values are based on EPA Method 19.

Appendices

Appendix A

NO_x, CO, CO_2, O_2 Data, Strip Charts and Visible Emission Data

SCS Field Services
Central Maui Landfill
November 19, 2008
RAW DAS DATA - COMPLIANCE RUN 1
TIME: 1212-1257

DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOx PPMVD	CO PPMVD
1	11/19	12:12:05	14.21	6.32	10.90	12.3
2	11/19	12:13:05	13.27	7.03	14.60	2.6
3	11/19	12:14:05	13.72	6.86	12.90	1.4
4	11/19	12:15:05	14.11	6.14	12.10	5.5
5	11/19	12:16:05	14.12	6.69	11.50	9.4
6	11/19	12:17:05	13.52	6.95	13.50	3.5
7	11/19	12:18:05	13.83	5.81	12.60	13.6
8	11/19	12:19:05	13.41	6.78	14.20	0.6
9	11/19	12:20:05	14.34	6.36	11.00	10.4
10	11/19	12:21:05	15.11	5.86	9.20	10.3
11	11/19	12:22:05	15.12	6.52	11.40	3.2
12	11/19	12:23:05	13.92	6.32	12.00	6.8
13	11/19	12:24:05	14.07	6.06	11.60	11.7
14	11/19	12:25:05	14.31	6.25	11.40	11.3
15	11/19	12:26:05	15.77	5.23	7.90	19.8
16	11/19	12:27:05	14.22	5.82	10.90	40.7
17	11/19	12:28:05	14.56	5.93	9.80	63.5
18	11/19	12:29:05	14.42	5.88	10.30	57.1
19	11/19	12:30:05	15.02	5.45	9.50	54.5
20	11/19	12:31:05	14.66	5.66	10.10	54.1
21	11/19	12:32:05	14.72	5.76	9.90	46.4
22	11/19	12:33:05	14.81	5.82	9.60	72.7
23	11/19	12:34:05	14.82	5.63	9.30	87.2
24	11/19	12:35:05	15.28	4.92	9.40	58.6
25	11/19	12:36:05	14.62	5.84	10.30	75.1
26	11/19	12:37:05	15.20	5.44	9.30	77.0
27	11/19	12:38:05	14.70	5.79	9.80	68.9
28	11/19	12:39:05	14.72	5.78	9.90	65.9
29	11/19	12:40:05	14.62	5.54	10.10	69.0
30	11/19	12:41:05	14.60	5.76	10.10	54.2
31	11/19	12:42:05	14.84	5.75	9.60	81.2
32	11/19	12:43:05	14.52	5.94	10.60	68.2
33	11/19	12:44:05	14.23	5.69	11.20	31.0
34	11/19	12:45:05	14.53	5.82	10.30	36.9
35	11/19	12:46:05	13.66	6.55	13.60	6.9
36	11/19	12:47:05	14.12	6.03	13.20	6.2
37	11/19	12:48:05	14.12	5.87	10.90	34.2
38	11/19	12:49:05	14.92	5.48	9.80	81.3
39	11/19	12:50:05	14.83	5.70	10.10	86.5
40	11/19	12:51:05	14.02	6.30	12.30	33.1
41	11/19	12:52:05	14.48	5.87	10.90	52.7
42	11/19	12:53:05	14.12	6.28	11.70	46.8
43	11/19	12:54:05	13.92	6.19	12.60	27.0
44	11/19	12:55:05	14.12	6.12	11.40	42.9
45	11/19	12:56:05	14.22	6.11	10.90	47.1
AVERAGES			**14.41**	**6.00**	**10.98**	**38.87**

SCS Field Services
Central Maui Landfill
November 19, 2008
RAW DAS DATA - COMPLIANCE RUN 2
TIME: 1312-1357

DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOx PPMVD	CO PPMVD
1	11/19	13:12:47	14.65	6.00	10.20	20.6
2	11/19	13:13:47	14.92	5.98	9.50	33.3
3	11/19	13:14:47	14.14	6.38	10.90	43.2
4	11/19	13:15:47	14.58	5.69	10.10	40.6
5	11/19	13:16:47	14.42	6.26	10.50	71.3
6	11/19	13:17:47	14.82	5.75	9.80	58.9
7	11/19	13:18:47	14.92	5.44	9.60	47.2
8	11/19	13:19:47	14.84	5.44	9.50	57.1
9	11/19	13:20:47	15.56	5.40	8.80	44.6
10	11/19	13:21:47	14.83	5.59	9.80	82.1
11	11/19	13:22:47	14.64	5.77	9.90	83.9
12	11/19	13:23:47	14.53	5.32	10.00	81.8
13	11/19	13:24:47	14.67	5.93	11.10	25.5
14	11/19	13:25:47	13.81	6.77	15.20	3.0
15	11/19	13:26:47	14.23	6.17	13.70	2.5
16	11/19	13:27:47	14.13	5.99	11.30	24.1
17	11/19	13:28:47	14.42	5.94	10.00	50.9
18	11/19	13:29:47	14.42	6.00	9.20	62.6
19	11/19	13:30:47	14.42	5.86	9.60	45.0
20	11/19	13:31:47	14.92	5.54	9.00	73.3
21	11/19	13:32:47	14.72	5.52	9.60	79.4
22	11/19	13:33:47	14.63	5.82	10.20	65.9
23	11/19	13:34:47	14.42	5.98	10.40	63.4
24	11/19	13:35:47	15.45	4.99	9.10	73.5
25	11/19	13:36:47	15.12	5.46	9.50	60.2
26	11/19	13:37:47	14.43	6.24	11.00	41.2
27	11/19	13:38:47	14.61	5.30	11.20	18.3
28	11/19	13:39:47	14.22	5.88	11.00	19.0
29	11/19	13:40:47	13.83	7.18	15.40	2.0
30	11/19	13:41:47	14.42	5.78	10.10	16.4
31	11/19	13:42:47	14.42	6.31	10.70	14.5
32	11/19	13:43:47	14.57	5.66	11.40	20.0
33	11/19	13:44:47	15.02	5.85	9.70	42.6
34	11/19	13:45:47	14.42	5.67	10.40	53.7
35	11/19	13:46:47	14.72	5.23	9.70	42.8
36	11/19	13:47:47	14.92	5.61	9.60	54.6
37	11/19	13:48:47	15.08	5.33	10.00	42.0
38	11/19	13:49:47	14.53	5.58	9.90	40.7
39	11/19	13:50:47	14.92	5.64	8.80	48.7
40	11/19	13:51:47	14.72	5.72	9.10	58.1
41	11/19	13:52:47	14.72	5.12	9.60	53.7
42	11/19	13:53:47	14.12	6.07	11.00	32.6
43	11/19	13:54:47	14.01	6.22	12.10	17.8
44	11/19	13:55:47	14.18	6.05	11.50	44.0
45	11/19	13:56:47	14.13	6.46	13.40	33.8
AVERAGES			**14.58**	**5.82**	**10.49**	**44.23**

SCS Field Services
Central Maui Landfill
November 19, 2008
RAW DAS DATA - COMPLIANCE RUN 3
TIME: 1422-1557

DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOx PPMVD	CO PPMVD
1	11/19	14:22:11	14.46	6.01	9.00	10.3
2	11/19	14:23:11	14.60	6.13	10.50	69.2
3	11/19	14:24:11	14.99	5.57	11.30	54.2
4	11/19	14:25:11	14.95	5.68	10.20	65.4
5	11/19	14:26:11	14.61	6.25	10.80	62.6
6	11/19	14:27:11	14.87	5.42	10.80	51.7
7	11/19	14:28:11	14.77	5.94	10.50	56.8
8	11/19	14:29:11	14.42	5.99	11.20	50.5
9	11/19	14:30:11	14.72	5.30	11.20	48.7
10	11/19	14:31:11	14.70	5.22	11.00	41.2
11	11/19	14:32:11	15.23	5.55	9.40	49.6
12	11/19	14:33:11	14.30	6.05	11.00	53.1
13	11/19	14:34:11	14.48	6.17	11.60	55.7
14	11/19	14:35:11	14.76	5.90	11.60	42.8
15	11/19	14:36:11	14.39	5.88	10.50	50.9
16	11/19	14:37:11	14.38	6.01	11.20	49.9
17	11/19	14:38:11	15.45	5.90	9.90	29.9
18	11/19	14:39:11	15.02	4.99	8.50	45.9
19	11/19	14:40:11	14.73	5.25	10.80	35.3
20	11/19	14:41:11	14.95	4.23	7.50	38.0
21	11/19	14:42:11	15.68	4.61	10.40	39.2
22	11/19	14:43:11	14.29	5.60	11.10	30.5
23	11/19	14:44:11	15.48	5.12	9.50	36.2
24	11/19	14:45:11	15.73	5.46	8.50	28.6
25	11/19	14:46:11	15.43	5.75	7.00	30.4
26	11/19	14:47:11	14.54	5.23	10.10	40.5
27	11/19	14:50:11	13.92	6.37	13.00	23.6
28	11/19	14:51:11	14.78	6.10	10.30	20.4
29	11/19	14:52:11	14.43	6.11	11.10	44.9
30	11/19	14:53:11	14.52	6.22	11.50	26.0
31	11/19	14:54:11	13.72	6.53	11.90	11.7
32	11/19	14:55:11	15.07	5.52	12.60	8.3
33	11/19	14:56:11	14.04	6.34	10.80	9.8
34	11/19	14:57:11	13.54	6.79	14.30	1.8
35	11/19	14:58:11	13.87	6.37	13.60	3.5
36	11/19	14:59:11	14.05	5.79	12.20	2.3
37	11/19	15:00:11	13.99	6.44	11.60	6.1
38	11/19	15:01:11	14.50	6.03	11.00	40.5
39	11/19	15:02:11	14.91	5.80	10.40	26.0
40	11/19	15:03:11	13.91	6.23	13.90	33.2
41	11/19	15:04:11	14.07	6.26	11.10	41.0
42	11/19	15:05:11	14.12	6.37	11.70	16.8
43	11/19	15:06:11	14.19	6.34	6.30	12.7
44	11/19	15:07:11	14.16	6.32	9.96	11.3
AVERAGES			**14.58**	**5.84**	**10.74**	**34.25**

SUMMARY OF CONTINUOUS MONITORING DATA

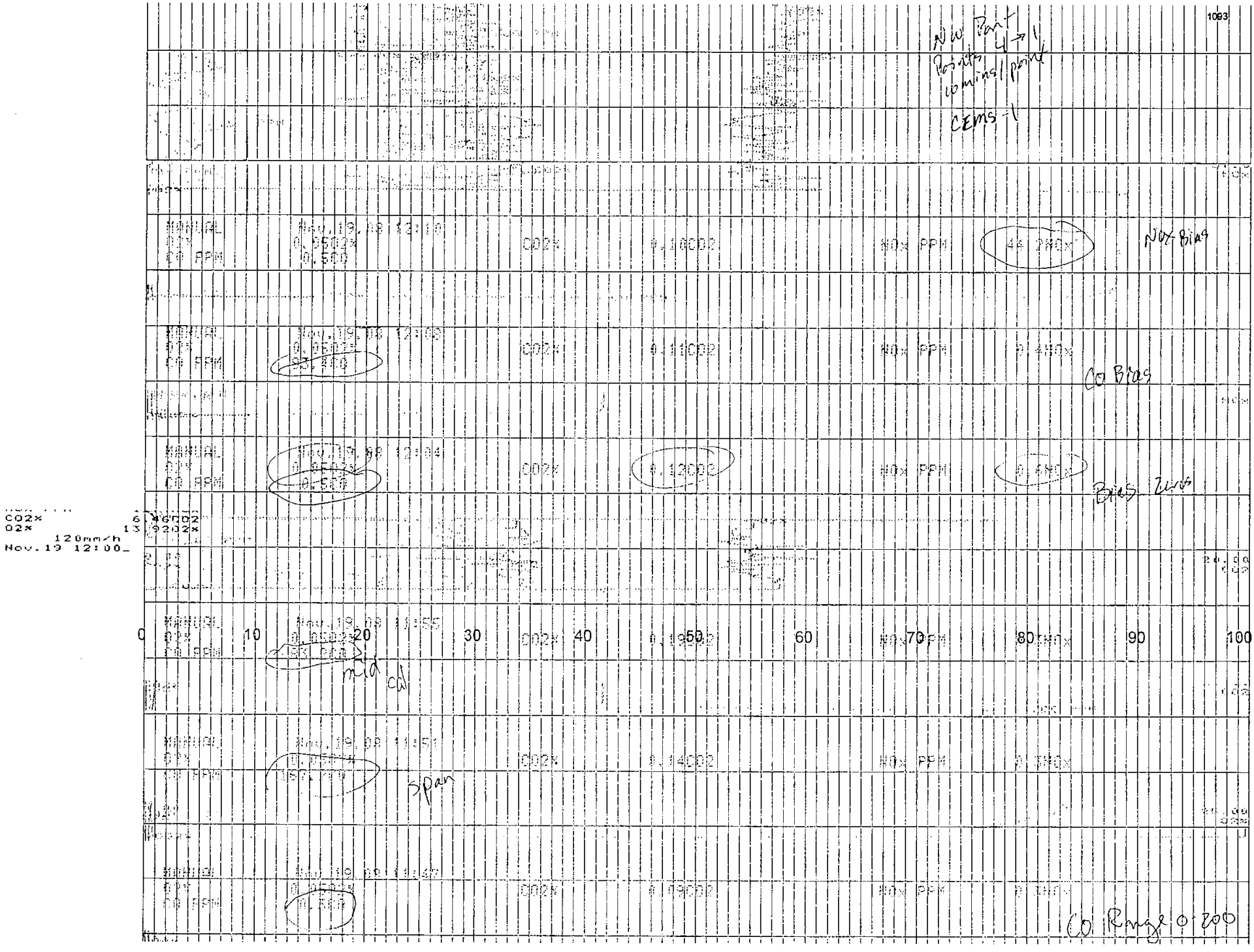
FACILITY:	SCS Field Services	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 1	
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:	11/19/08	TIME:	1212-1257
OPERATOR:	LAJ	PROJECT No.:	2170.1012		
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO_x PPMV,D	CO PPMV,D	SO_2 PPMV,D
INITIAL ZERO BIAS	0.05	0.12	0.60	0.50	NA
INITIAL SPAN BIAS	11.93	10.08	44.20	83.40	NA
FINAL ZERO BIAS	0.05	0.12	1.00	0.50	NA
FINAL SPAN BIAS	11.83	9.96	44.70	82.90	NA
AVERAGE ZERO BIAS	0.05	0.12	0.80	0.50	NA
AVERAGE SPAN BIAS	11.88	10.02	44.45	83.15	NA
BIAS GAS CONCENTRATION	12.00	10.02	43.60	85.45	NA
FULL SCALE RANGE	25	20	50	200	NA
UNCORRECTED CONC.	14.41	6.00	10.98	38.87	NA
CORRECTED CONC.	**14.57**	**5.95**	**10.17**	**39.67**	NA
PPMV @ 3 % O2			28.74	112.12	NA
LB/mmBTU BASED ON HEAT INPUT (MMBTU/HR)	14.80		0.040	0.096	NA
LB/HR BASED ON VOL FLOW (DSCFM)	8,196		0.60	1.42	NA

SUMMARY OF CONTINUOUS MONITORING DATA

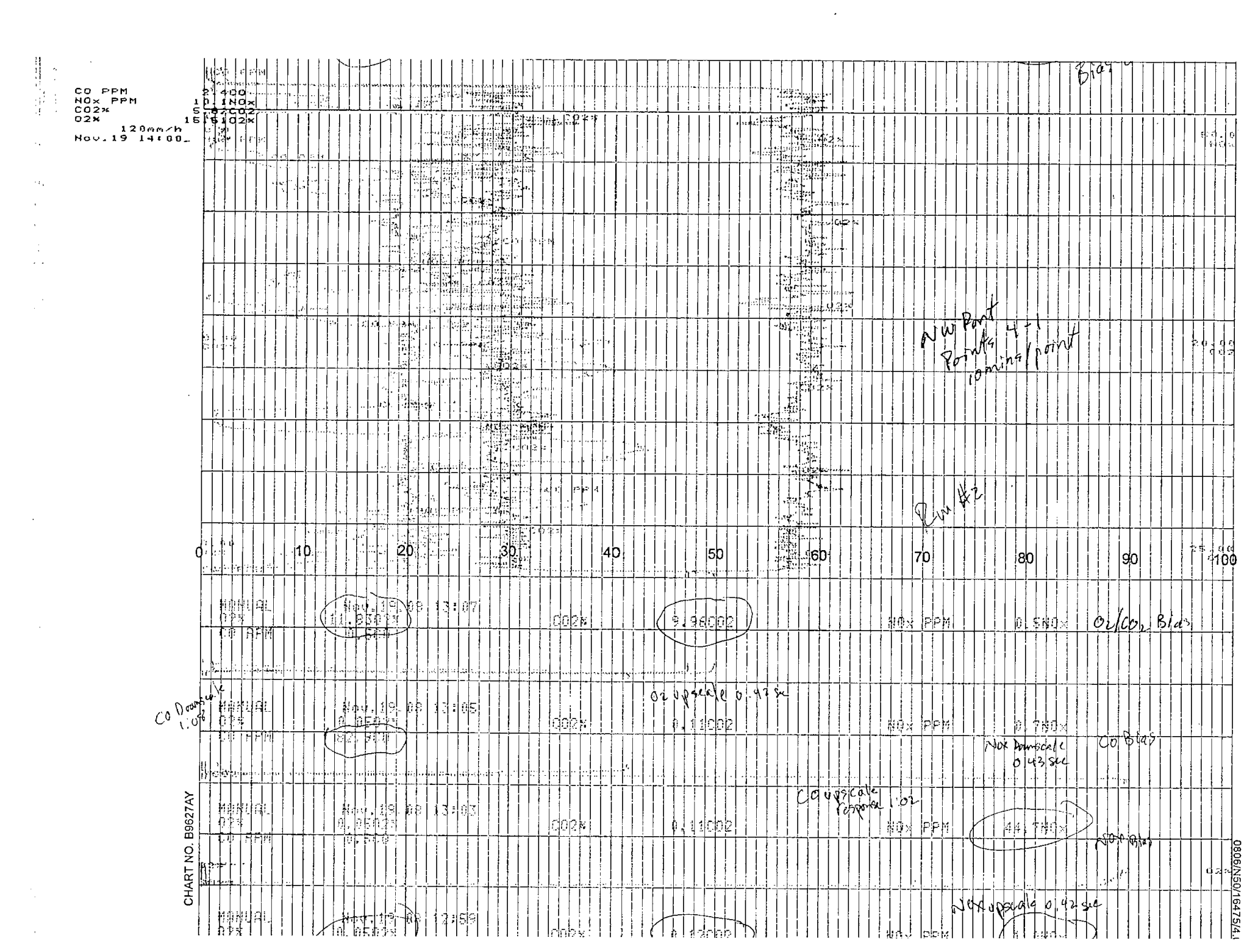
FACILITY:	SCS Field Services	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 2	
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:	11/19/08	TIME:	1312-1357
OPERATOR:	LAJ	PROJECT No.:	2170.1012		
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO_x PPMV,D	CO PPMV,D	SO_2 PPMV,D
INITIAL ZERO BIAS	0.05	0.12	1.00	0.50	NA
INITIAL SPAN BIAS	11.83	9.96	44.70	82.90	NA
FINAL ZERO BIAS	0.05	0.11	0.70	0.50	NA
FINAL SPAN BIAS	11.83	10.00	45.00	82.90	NA
AVERAGE ZERO BIAS	0.05	0.12	0.85	0.50	NA
AVERAGE SPAN BIAS	11.83	9.98	44.85	82.90	NA
BIAS GAS CONCENTRATION	12.00	10.02	43.60	85.45	NA
FULL SCALE RANGE	25	20	50	200	NA
UNCORRECTED CONC.	14.58	5.82	10.49	44.23	NA
CORRECTED CONC.	**14.80**	**5.79**	**9.55**	**45.35**	NA
PPMV @ 3 % O2			28.05	133.15	NA
LB/mmBTU BASED ON HEAT INPUT (MMBTU/HR)	15.12		0.039	0.113	NA
LB/HR BASED ON VOL FLOW (DSCFM)	8,652		0.59	1.71	NA

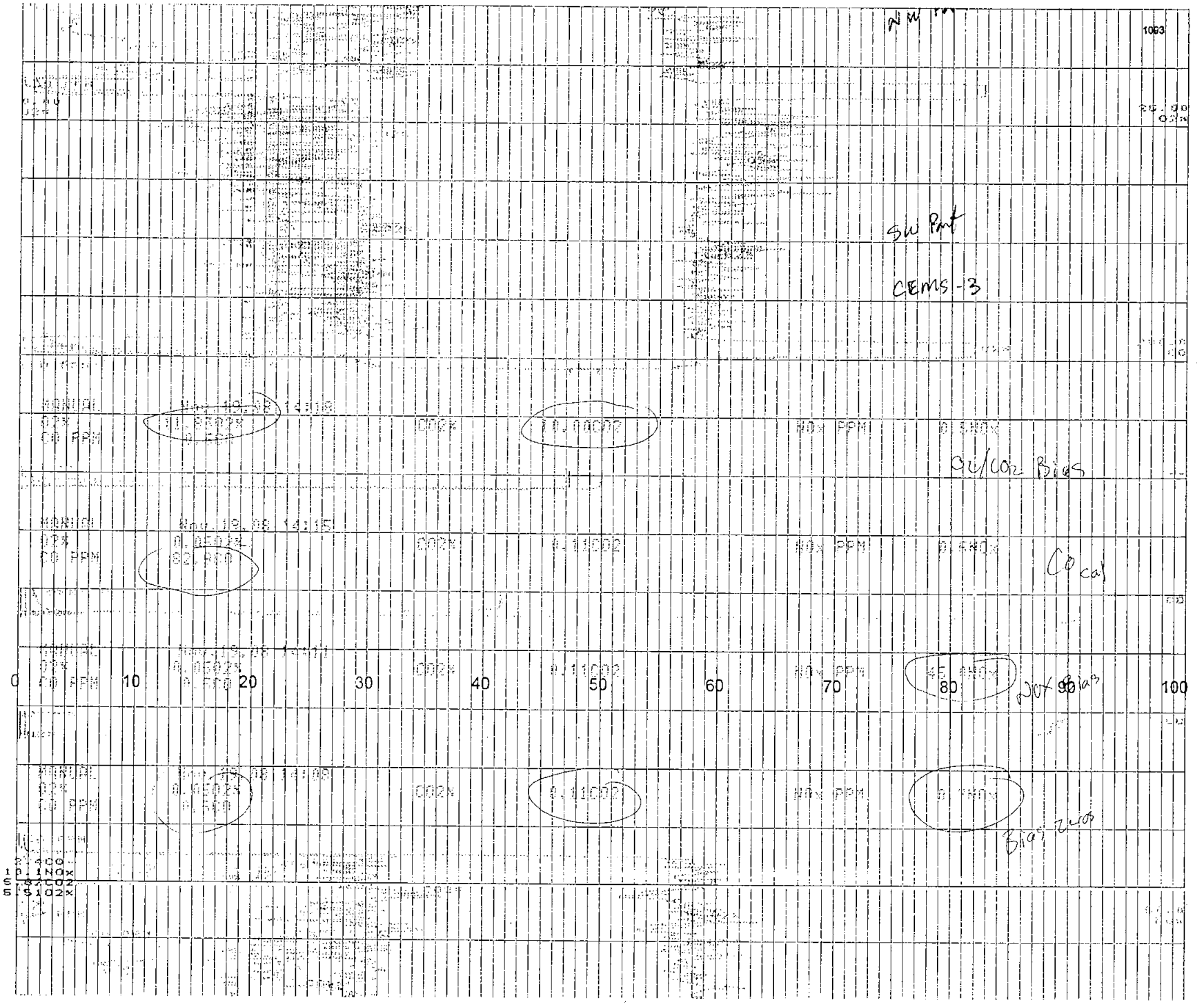
SUMMARY OF CONTINUOUS MONITORING DATA

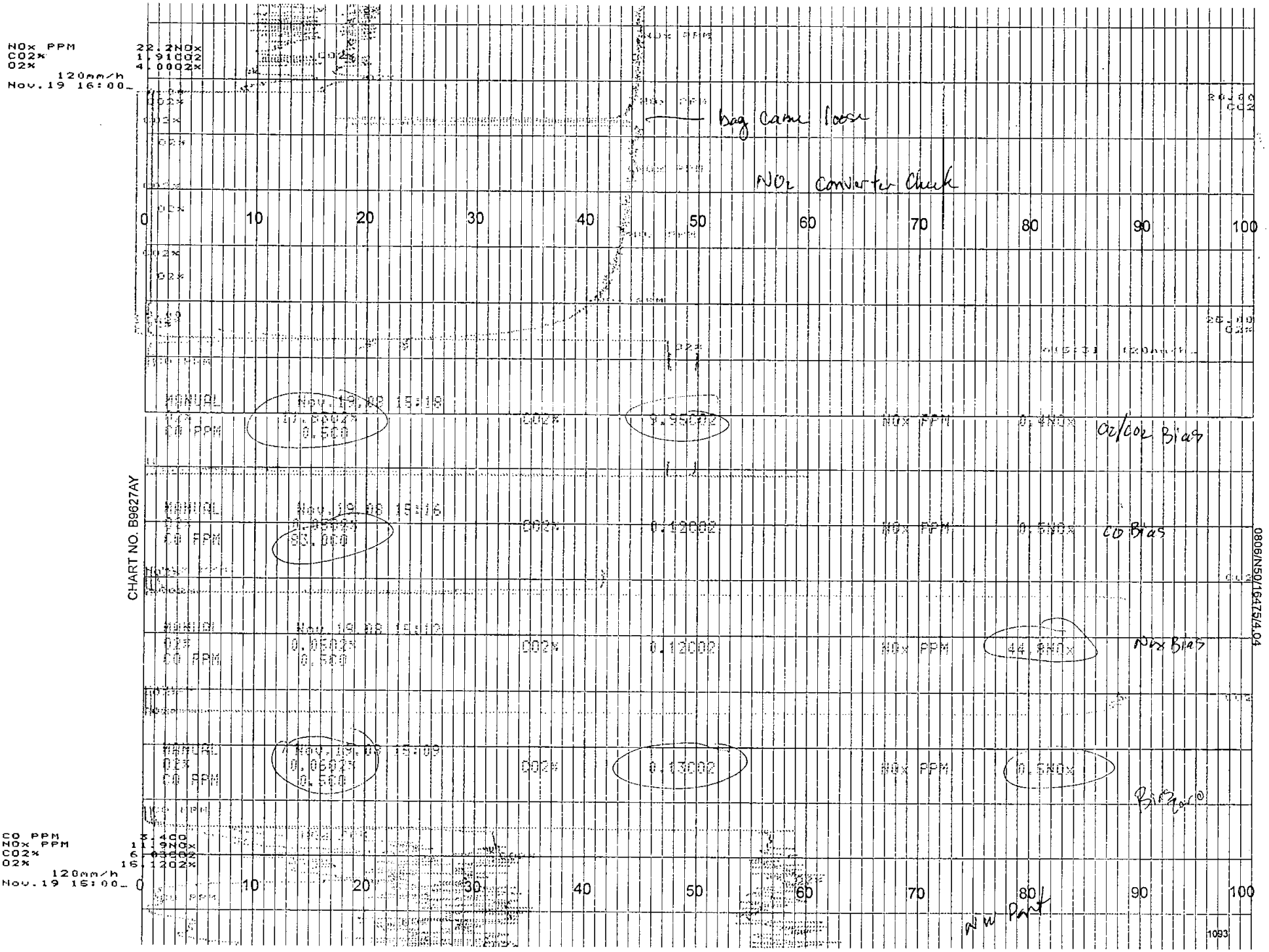
FACILITY:	SCS Field Services	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 3	
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:	11/19/08	TIME:	1422-1557
OPERATOR:	LAJ	PROJECT No.:	2170.1012		
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO_x PPMV,D	CO PPMV,D	SO_2 PPMV,D
INITIAL ZERO BIAS	0.05	0.11	0.70	0.50	NA
INITIAL SPAN BIAS	11.83	10.00	45.00	82.90	NA
FINAL ZERO BIAS	0.06	0.13	0.50	0.50	NA
FINAL SPAN BIAS	11.83	9.95	44.80	83.00	NA
AVERAGE ZERO BIAS	0.06	0.12	0.60	0.50	NA
AVERAGE SPAN BIAS	11.83	9.98	44.90	82.95	NA
BIAS GAS CONCENTRATION	12.00	10.02	43.60	85.45	NA
FULL SCALE RANGE	25	20	50	200	NA
UNCORRECTED CONC.	14.58	5.84	10.74	34.25	NA
CORRECTED CONC.	**14.81**	**5.82**	**9.98**	**34.98**	NA
PPMV @ 3 % O2			29.31	102.76	NA
LB/mmBTU BASED ON HEAT INPUT (MMBTU/HR)	15.13		0.041	0.087	NA
LB/HR BASED ON VOL FLOW (DSCFM)	8,617		0.62	1.31	NA


1093
NOx Bias
CO Bias
Bias Zero
CO2x
02x
120mm/h
Nov.19 12:00
0
10
20
30
40
50
60
70
80
90
100
mid cal
span
CEMS-1
CO Range 0-200

16475/4.04


CO PPM
NOx PPM
CO2%
O2%
120mm/h
Nov.19 14:00
CHART NO. B9627AY
0806/N60/16475/4
New Point
Points 4-1
10 mins/point
Run #2
O2/CO2 Bias
O2 upscale 0.97sec
CO Downscale
1.08
NOx Downscale
0.43sec
CO Bias
CO upscale
response 1.02
NOx Bias
NOx upscale 0.42sec


1093
SW Pmt
CEMS-3
O2/CO2 Bias
CO cal
NOx Bias
Bias 2nd
0
10
20
30
40
50
60
70
80
90
100
CO PPM
NOx PPM
CO2%
O2%
120mm/h
Nov.19 14:00

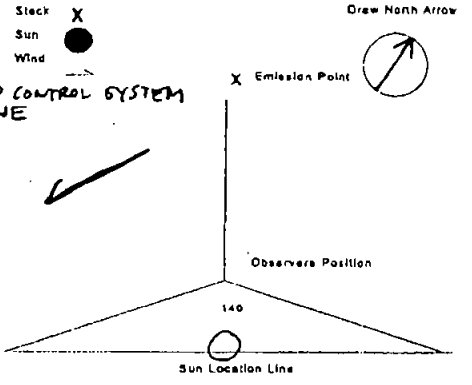

NOx PPM 22.2NOx
CO2x 1.91CO2x
O2x 4.00O2x
120mm/h
Nov.19 16:00
bag came loose
NO2 Converter Check
O2/CO2 Bias
CO Bias
NOx Bias
Bias Off
CO PPM 5.14CO
NOx PPM 11.9NOx
CO2x 6.61CO2x
O2x 16.13O2x
120mm/h
Nov.19 15:00
New Part
CHART NO. B9627AY
0806/N50/16475/4.04
1093

VISIBLE EMISSIONS FORM
STATE OF HAWAII
COVERED SOURCE PERMIT NO. 0652-01-C

Issuance Date: March 3, 2008 **Expiration Date:** March 2, 2013

Make Copies for Future Use For Each Equipment)

Permit No.: 0652-01-C
Company Name: SCEC
Equipment and Fuel: LANDFILL GAS COLLECTION AND CONTROL SYSTEM - METHANE
Site Conditions:



Stack height above ground (ft): 45'
Stack distance from observer (ft): 70'
Emission color (black or white): CLEAR
Sky conditions (% cloud cover): 35
Wind speed (mph): 15 - 20
Temperature (°F): 78
Observer Name: AARON LORD
Certified? (Yes/No): YES
Observation Date and Start Time: 11-19-08 / 10:23 am

SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%):					0

Observation Date and Start Time: 11-19-08 / 10:29am

SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%):					0

Appendix B

Lab Results

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Permanent Gases and TGNMO Analysis in SUMMA Canister Samples

Report Date: December 9, 2008
Client: SCEC
Site: SCS Field Services
Location: Central Maui Landfill
Client Project No.: 2170.3001

Date Received: November 24, 2008
Date Analyzed: December 1, - 4, 2008

ANALYSIS DESCRIPTION

Permanent gases are measured by thermal conductivity detection/gas chromatography (TCD/GC), EPA 3C. TGNMO is measured by Method 25 analysis, FID/TCA, total combustion analysis.

AtmAA Lab No.:	03298-10	03298-11	03298-12
Sample ID:	Inlet-R1	Inlet-R2	Inlet-R3
	374	171	286
	(Concentration in %v)		
Methane	45.9	46.8	47.1
Carbon Dioxide	38.3	38.7	39.1
Nitrogen	12.5	11.2	10.9
Oxygen	0.51	0.55	0.56
	(Concentration in ppmv)		
Ethane	<10	<10	<10
TGNMO	6790	7680	7910

TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC.
Ethane is reported as ppmvC.

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Site: Central Maui Landfill
Date Received: November 24, 2008
Date Analyzed: December 1, - 4, 2008

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
		(Concentration, ppmv)			
Methane	Exh. #1	<1	<1	---	---
	Exh. #2	<1	<1	---	---
	Exh. #3	<1	<1	---	---
Ethane	Exh. #1	<1	<1	---	---
	Exh. #2	<1	<1	---	---
	Exh. #3	<1	<1	---	---
TGNMO	Exh. #1	2.61	2.50	2.56	2.2
	Exh. #2	2.09	1.75	1.92	8.9
	Exh. #3	<1	<1	---	---

Three canister samples, laboratory numbers 03298-(13 - 15), were analyzed for methane, ethane, and TGNMO. Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 2 repeat measurements from three canister samples is 5.5%

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Methane, Ethane, and Total Gaseous Non-Methane Organics Analysis in SUMMA Canister Samples

Report Date: December 9, 2008
Client: SCEC
Site: SCS Field Services
Location: Central Maui Landfill
Client Project No.: 2170.3001

Date Received: November 24, 2008
Date Analyzed: December 1, - 4, 2008

ANALYSIS DESCRIPTION

Methane, ethane, and TGNMO were measured by Method 25, total combustion analysis, (FID/TCA).

AtmAA Lab No.:	03298-13	03298-14	03298-15
Sample ID:	Exh. #1 162	Exh. #2 147	Exh. #3 272
	(Concentration, ppmv)		
Methane	<1	<1	<1
Ethane	<1	<1	<1
TGNMO	2.56	1.92	<1

TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC.
Ethane is reported as ppmvC.

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Site: Central Maui Landfill
Date Received: November 24, 2008
Date Analyzed: December 1, - 4, 2008

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in %v)			
Methane	Inlet-R1	45.9	45.9	45.9	0.0
	Inlet-R2	46.8	46.8	46.8	0.0
	Inlet-R3	47.1	47.0	47.1	0.11
Carbon Dioxide	Inlet-R1	38.3	38.3	38.3	0.0
	Inlet-R2	38.8	38.6	38.7	0.26
	Inlet-R3	39.1	39.1	39.1	0.0
Nitrogen	Inlet-R1	12.4	12.6	12.5	0.80
	Inlet-R2	11.3	11.0	11.2	1.3
	Inlet-R3	11.0	10.8	10.9	0.92
Oxygen	Inlet-R1	0.43	0.59	0.51	16
	Inlet-R2	0.56	0.54	0.55	1.8
	Inlet-R3	0.57	0.54	0.56	2.7
		(Concentration in ppmv)			
Ethane	Inlet-R1	<10	<10	---	---
	Inlet-R2	<10	<10	---	---
	Inlet-R3	<10	<10	---	---
TGNMO	Inlet-R1	6810	6770	6790	0.29
	Inlet-R2	7650	7710	7680	0.39
	Inlet-R3	7900	7920	7910	0.13

Three SUMMA canister samples, laboratory numbers 03298-(10 - 12), were analyzed for permanent gases. and TGNMO. Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 15 repeat measurements from three SUMMA canister samples is 1.6%.

Calculated values for Specific Volume, BTU and F (factor)

Report Date: December 9, 2008
Client: SCEC
Project Location: Central Maui Landfill
Date Received: November 24, 2008
Date Analyzed: December 1, - 4, 2008
AtmAA Lab No.: 03298-10 Inlet R1

Specific volume, BTU, and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	45.92	26.29	Carbon	36.44
Carbon dioxide	38.27	60.26	Hydrogen	6.62
Nitrogen	12.50	12.52	Oxygen	44.38
Oxygen	0.49	0.56	Nitrogen	12.52
Argon	0.022	0.031	Argon	0.03
$(CH_2)_n$	0.679	0.340	Sulfur	0.00

Specific Volume	13.154	
BTU/ft^3	469	
BTU/ lb.	6172	
F (factor)	9915	10,068 at 68° F

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	21	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: December 9, 2008
Client: SCEC
Project Location: Central Maui Landfill
Date Received: November 24, 2008
Date Analyzed: December 1, - 4, 2008
AtmAA Lab No.: 03298-11 Inlet R2

Specific volume, BTU, and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	46.79	26.81	Carbon	37.07
Carbon dioxide	38.70	60.99	Hydrogen	6.76
Nitrogen	11.14	11.17	Oxygen	44.96
Oxygen	0.53	0.60	Nitrogen	11.17
Argon	0.023	0.033	Argon	0.03
$(CH_2)_n$	0.768	0.385	Sulfur	0.00

Specific Volume	13.171
BTU/ft^3	479
BTU/ lb.	6306
F (factor)	9865

10,017 at 68° F

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	21	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: December 9, 2008
Client: SCEC
Project Location: Central Maui Landfill
Date Received: November 24, 2008
Date Analyzed: December 1, - 4, 2008
AtmAA Lab No.: 03298-12 Inlet R3

Specific volume, BTU, and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	47.05	26.80	Carbon	37.15
Carbon dioxide	39.12	61.28	Hydrogen	6.76
Nitrogen	10.93	10.89	Oxygen	45.17
Oxygen	0.53	0.61	Nitrogen	10.89
Argon	0.024	0.034	Argon	0.03
$(CH_2)_n$	0.791	0.394	Sulfur	0.00

Specific Volume	13.156
BTU/ft^3	482
BTU/ lb.	6335
F (factor)	9814

9965 at 68°F

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	21	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Chain of Custody Record
Analytical Services Request

SCEC
1582-1 N. Batavia St. Orange, CA 92867
(714) 282-8240 phone, (714) 282-8247 fax

Client/Project Name	Client Project No.	ANALYSES REQUESTED	Laboratory Name
SCS Field Services	2170.3001		ATM-AA
Project Location: Central Mavi Landfill			Lab Contact: Mike Porter
Contact: Leslie Johnson	Sampler (Signature):		Lab Phone No.
			Turnaround Time: NTAT

Sample #	Description	SAMPLE Date	Time	Type	EPA 25C	ASTM D-3588					Remarks:
	Inlet #1 #374	11/19/08		Canisters	X	X					03298-10
	" #2 #171	"			X	X					-11
	" #3 #286	"			X	X					-12
	Exhaust #1 #162	"			X						-13
	" #2 #147	"			X						-14
	" #3 #272	"			X						-15

Relinquished by (Signature):	Company:	Date	Time	Received by (Signature):	Company:	Date:	Time:
				Michael Porter	ATM AA Inc	11/24/08	10:30
Relinquished by (Signature):	Company:	Date	Time	Received by (Signature):	Company:	Date:	Time:
Relinquished by (Signature):	Company:	Date	Time	Received by (Signature):	Company:	Date:	Time:

Appendix C

Exhaust Volume Flow Data and Field Data

SCS Field Services
Central Maui Landfill
November 19, 2008

SUMMARY OF EPA METHOD 19 SOURCE TEST DATA AND CALCULATIONS

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3
DATE		11/19/2008	11/19/2008	11/19/2008
FUEL FLOW - @ 68 DEG F	SCFM	526	526	523
CALORIFIC VALUE - @ 68 DEG F	BTU/CF	469	479	482
F FACTOR (Fd) - @ 68 DEG F	DSCF/MMBTU	10,068	10,017	9,965
EXHAUST O2 CONCENTRATION	%VD	14.57	14.80	14.81
HEAT INPUT - NATURAL GAS	MMBTU/MIN	0.2467	0.2520	0.2521
EXHAUST VOLUME FLOW RATE @ 68 DEG F	DSCFM	**8,196**	**8,652**	**8,617**

SCS Field Services
Central Maui Landfill
November 19, 2008
Flare Collected Field Data

Run #	Time	Stack Temp Deg. F	Inlet Flow scfm	Field Vac	Inlet Gas Deg. F
R1	1214	1439	526	59.6	106
R1	1236	1475	525	59.8	106
R2	1316	1479	529	59.6	106
R2	1332	1500	520	59.5	106
R2	1356	1474	528	59.6	106
R3	1419	1500	519	59.3	106
R3	1503	1503	527	58.9	106
R3	1530	1504	523	59.2	106

REACTIVE ORGANIC COMPOUNDS
EPA METHOD 25C
SCEC FIELD SAMPLING DATA SHEET

Job #: 2173.3001

Facility: Central Maui Landfill

Location: Stack Exhaust

Date: 11/19/08

Operator: _____

Control Device: Flare

Sample Location: Exhaust

Ambient Temperature: 78°F

Barometric Pressure: 30.07

SAMPLE A - Run 1

Tank # : ~~[illegible]~~ 162

Initial Vacuum: _____

Final Vacuum: _____

TIME	VACUUM ("Hg)
9:23a	-30
12:04p	-30
12:19	-26
12:42	-8

Leak Rate Pre: _____

Leak Rate Post: _____

SAMPLE B - Run 2

Tank # : 147

Initial Vacuum: 30

Final Vacuum: _____

TIME	VACUUM ("Hg)
1314	30
13:40	-26
13:55	-20
14:08	-8

Leak Rate Pre: _____

Leak Rate Post: _____

SAMPLE C - Run 3

Tank #: 272

Initial Vacuum: _____

Final Vacuum: _____

TIME	VACUUM ("Hg)
14:15	-30
14:30	-26
14:45	-20
15:00	-14
15:15	-8

Leak Rate Pre: _____

Leak Rate Post: _____

REACTIVE ORGANIC COMPOUNDS
EPA METHOD 25C
SCEC FIELD SAMPLING DATA SHEET

Job #: 2170.3001
Facility: Central Mavi Landfill
Location: Flare station
Date: 11/19/08
Operator: CAS

Control Device: Flare
Sample Location: Inlf
Ambient Temperature: 78°F
Barometric Pressure: 30.07

SAMPLE A

Tank # : 374
Initial Vacuum: 23
Final Vacuum: 6

TIME	VACUUM ("Hg)
923	23
932	19
936-1204 OFF - injection issues	
1204	14
1220	6

Leak Rate Pre: ✓ good
Leak Rate Post: ✓

SAMPLE B

Tank # : 171
Initial Vacuum: 22
Final Vacuum: 6

TIME	VACUUM ("Hg)
1316	22
1326	17
1352	6
~~1443~~	

Leak Rate Pre: ✓ good
Leak Rate Post: ✓

SAMPLE C

Tank #: 286
Initial Vacuum: 22
Final Vacuum:

TIME	VACUUM ("Hg)
1418	22
1443	10
1505	2

Leak Rate Pre:
Leak Rate Post:

Appendix D

Quality Assurance / Quality Control Data

CALIBRATION ERROR

FACILITY:	SCS Field Services	DATA FOR SAMPLING RUNS:		COMPLIANCE RUNS 1,2,3 (INITIAL)
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:		11/19/2008
OPERATOR:	LAJ	PROJECT No.:		2170.1012
PARAMETER	CYLINDER VALUE	ANALYZER CALIBRATION RESPONSE	ABSOLUTE DIFFERENCE	DIFFERENCE
UNITS	PPMV or % VOL	PPMV or % VOL	PPMV or % VOL	% OF GAS
O_2 - FULL SCALE	25			
O_2 - ZERO	0.00	0.05	-0.05	**-0.24**
O_2 - MID CAL	12.00	11.93	0.07	**0.33**
O_2 -HIGH CAL	20.99	20.81	0.18	**0.86**
CO_2 - FULL SCALE	20			
CO_2 - ZERO	0.00	0.13	-0.13	**-0.72**
CO_2 - MID CAL	10.020	10.11	-0.09	**-0.50**
CO_2 -HIGH CAL	17.95	18.08	-0.13	**-0.72**
NO_x - FULL SCALE	50			
NO_x - ZERO	0.00	0.20	-0.20	**-0.46**
NO_x - MID CAL	21.80	21.70	0.10	**0.23**
NO_x -HIGH CAL	43.70	43.70	0.00	**0.00**
CO - FULL SCALE	200			
CO - ZERO	0.00	0.30	-0.30	**-0.18**
CO - MID CAL	85.45	83.20	2.25	**1.34**
CO -HIGH CAL	167.60	167.20	0.40	**0.24**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	SCS Field Services	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 1		
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:			11/19/08	
OPERATOR:	LAJ	PROJECT No.:			2170.1012	
		INITIAL VALUES		FINAL VALUES		
PARAMETER	ANALYZER CALIBRATION RESPONSE	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	CALIBRATION DRIFT
UNITS	PPMV or % VOL	PPMV or % VOL	% OF SPAN	PPMV or % VOL	% OF SPAN	% OF SPAN
O_2 - ZERO	0.05	0.05	**0.00**	0.05	**0.00**	**0.00**
O_2 - SPAN	11.93	11.93	**0.00**	11.83	**0.48**	**0.48**
CO_2 - ZERO	0.13	0.12	**0.06**	0.12	**0.06**	**0.00**
CO_2 - SPAN	10.11	10.08	**0.17**	9.96	**0.84**	**0.67**
NO_x - ZERO	0.20	0.60	**-0.92**	1.00	**-1.83**	**-0.92**
NO_x - SPAN	43.70	44.20	**-1.15**	44.70	**-2.29**	**-1.15**
CO - ZERO	0.30	0.50	**-0.12**	0.50	**-0.12**	**0.00**
CO - SPAN	83.2	83.4	**-0.12**	82.9	**0.18**	**0.30**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	SCS Field Services	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 2		
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:			11/19/08	
OPERATOR:	LAJ	PROJECT No.:			2170.1012	
		INITIAL VALUES		FINAL VALUES		
PARAMETER	ANALYZER CALIBRATION RESPONSE	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	CALIBRATION DRIFT
UNITS	PPMV or % VOL	PPMV or % VOL	% OF SPAN	PPMV or % VOL	% OF SPAN	% OF SPAN
O_2 - ZERO	0.05	0.05	**0.00**	0.05	**0.00**	**0.00**
O_2 - SPAN	11.93	11.83	**0.48**	11.83	**0.48**	**0.00**
CO_2 - ZERO	0.13	0.12	**0.06**	0.11	**0.11**	**0.06**
CO_2 - SPAN	10.11	9.96	**0.84**	10.00	**0.61**	**-0.22**
NO_x - ZERO	0.20	1.00	**-1.83**	0.70	**-1.15**	**0.69**
NO_x - SPAN	43.70	44.70	**-2.29**	45.00	**-2.98**	**-0.69**
CO - ZERO	0.30	0.50	**-0.12**	0.50	**-0.12**	**0.00**
CO - SPAN	83.2	82.9	**0.18**	82.9	**0.18**	**0.00**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	SCS Field Services	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 3		
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:			11/19/08	
OPERATOR:	LAJ	PROJECT No.:			2170.1012	
		INITIAL VALUES		FINAL VALUES		
PARAMETER	ANALYZER CALIBRATION RESPONSE	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	CALIBRATION DRIFT
UNITS	PPMV or % VOL	PPMV or % VOL	% OF SPAN	PPMV or % VOL	% OF SPAN	% OF SPAN
O2 - ZERO	0.05	0.05	**0.00**	0.06	**-0.05**	**-0.05**
O2 - SPAN	11.93	11.83	**0.48**	11.83	**0.48**	**0.00**
CO2 - ZERO	0.13	0.11	**0.11**	0.13	**0.00**	**-0.11**
CO2 - SPAN	10.11	10.00	**0.61**	9.95	**0.89**	**0.28**
NOx - ZERO	0.20	0.70	**-1.15**	0.50	**-0.69**	**0.46**
NOx - SPAN	43.70	45.00	**-2.98**	44.80	**-2.52**	**0.46**
CO - ZERO	0.30	0.50	**-0.12**	0.50	**-0.12**	**0.00**
CO - SPAN	83.2	82.9	**0.18**	83.0	**0.12**	**-0.06**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

SCEC
CONTINUOUS EMISSIONS MONITORING SYSTEM TEST DATA

Test Number: CEMS 1-3
Client: SCS Field Services
Location: Central Maui Landfill
Unit: Flare

Date: 11/19/08
Condition: As Found
Operator: CAS
Barometric: 30.07

Gas Temperatures

Stack: 1475°F
Probe: +250°F
Heated Line: N/A

Stack Knockout: <40°F
Ambient: 79°F
Chiller: -

Chart recorder 8 minutes faster than CEMS time

	Analyzer Values				
	O_2 (%)	CO_2 (%)	NO_x (ppm)	CO (ppm)	SO_2 (ppm)
Analyzer Span Range	0-25	0-20	0-50	200	
Mid Span Cal Gas Value	12.00	10.02	@50% 21.8	~~@50%~~ ~~72~~ 85.45	
High Span Cal Gas Value	20.99	17.95	43.6	167.6	
	As Found Analyzer Readings				
Zero	0.05	0.13	0.2	0.3	
Mid Span	11.93	10.11	21.7	83.2	
High Span	20.81	18.08	43.7	167.2	
	Pre-Test Analyzer System Bias				
System Bias Zero	0.05	0.12	0.6	0.5	
System Bias Span	11.93	10.08	44.2	83.4	

Sample Point	Time		**Raw Test Data**				
	Start	Stop	O_2 (%)	CO_2 (%)	NO_x (ppm)	CO (ppm)	SO_2 (ppm)
NW Port	1212	1257	0.05	0.12	1.0	0.5	
			11.83	9.96	44.7	82.9	
NW →	1312	1357	0.05	0.11	0.7	0.5	
			11.83	10.0	45.0	82.9	
~~SW~~							
SW NW	1422	1557	0.06	0.13	0.5	0.5	
4-1 4-1			11.83	9.95	44.8	83.0	

	Post-Test Analyzer System Bias				
System Bias Zero					
System Bias Span					
	Post-Test Analyzer Calibration				
Zero					
Mid Span					
High Span					

	Test Results Summary				
	O_2 (%)	CO_2 (%)	NO_x (ppm)	CO (ppm)	SO_2 (ppm)
Raw Average					
Corrected Average					

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (951) 653-6780 • FAX (951) 653-2430

Report Of Analysis
EPA Protocol Gas Mixtures

SCEC01
TO: SCEC - Air Quality Specialists
Attn: Harry Johnson
98-030 Hekaha Street, Suite 1
Aiea, HI 96701
(808) 488-8113

REPORT NO: 52200-01
REPORT DATE: August 10, 2007
CUSTOMER PO NO: 232

CYLINDER NUMBER: CC67232 **CYLINDER SIZE:** 150A (141 std cu ft) **CYLINDER PRESSURE:** 2000 psig

COMPONENT	CONCENTRATION (v/v) ± EPA UNCERTAINTY	REFERENCE STANDARD	ANALYZER MAKE, MODEL, S/N, DETECTION	EXPIRATION DATE	REPLICATE ANALYSIS DATA
Carbon dioxide	17.95 ± 0.03 %	GMIS CYLINDER #: CC51172 @ 18.03 %	Varian Model 1860 Serial # None Thermal Conductivity Gas Chromatography LAST CAL DATE: 7/25/2007	8/7/2010	8/7/2007 17.94 % 17.94 % 17.98 % MEAN: 17.95 %
Oxygen	20.99 ± 0.22 %	GMIS CYLINDER #: ALM031591 @ 24.4 %	Varian Model 1860 Serial # None Thermal Conductivity Gas Chromatography LAST CAL DATE: 8/9/2007	8/9/2010	8/9/2007 20.98 % 21.03 % 20.97 % MEAN: 20.99 %
Nitrogen	Balance				

ppm = umole/mole **% = mole-%**

The above analyses were performed in accordance with Procedure G1 of the EPA Traceability Protocol, Report Number EPA-600/R97/121, dated September 1997.
The above analyses are invalid if the cylinder pressure is less than 150 psig.

ANALYST: M.S.Calhoun **APPROVED:** J. T. Marrin

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (951) 653-6780 • FAX (951) 653-2430

Report Of Analysis
EPA Protocol Gas Mixtures

SCEC01
TO: SCEC - Air Quality Specialists
Attn: Harry Johnson
98-030 Hekaha Street, Suite 1
Aiea, HI 96701
(808) 488-8113

REPORT NO: 52200-02
REPORT DATE: August 10, 2007
CUSTOMER PO NO: 232

CYLINDER NUMBER: CC12823 **CYLINDER SIZE:** 150A (141 std cu ft) **CYLINDER PRESSURE:** 2000 psig

COMPONENT	CONCENTRATION (v/v) ± EPA UNCERTAINTY	REFERENCE STANDARD	ANALYZER MAKE, MODEL, S/N, DETECTION	EXPIRATION DATE	REPLICATE ANALYSIS DATA
Carbon dioxide	10.02 ± 0.1 %	GMIS	Varian Model 1860	8/7/2010	8/7/2007
		CYLINDER #:	Serial # None		10.02 %
		CC83094	Thermal Conductivity		10.02 %
		@ 8.1 %	Gas Chromatography		10.02 %
			LAST CAL DATE: 7/25/2007	MEAN:	10.02 %
Oxygen	12.00 ± 0.11 %	GMIS	Varian Model 1860	8/9/2010	8/9/2007
		CYLINDER #:	Serial # None		11.96 %
		CC81204	Thermal Conductivity		12.00 %
		@ 9.89 %	Gas Chromatography		12.03 %
			LAST CAL DATE: 8/9/2007	MEAN:	12.00 %
Nitrogen	Balance				

ppm = umole/mole **% = mole-%**

The above analyses were performed in accordance with Procedure G1 of the EPA Traceability Protocol, Report Number EPA-600/R97/121, dated September 1997.

The above analyses are invalid if the cylinder pressure is less than 150 psig.

ANALYST: _____ **APPROVED:** _____

M.S.Calhoun J. T. Marrin

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

Airgas

Airgas Specialty Gases
11711 Alameda Street
Los Angeles, CA 90059-2130
(323) 357-6891
FAX: (323) 567-3686
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0501	Reference Number:	48-124090317-2
Cylinder Number:	CC12905	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Mar 26, 2007	Valve Outlet:	350

Expiration Date: Mar 26, 2010

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	85.00 PPM	85.45 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	980608	CC97683	98.0PPM CARBON MONOXIDE/	Feb 28, 2008

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet CO	FTIR	Mar 08, 2007

Triad Data Available Upon Request

Notes:

QA Approval

Airgas

Airgas Specialty Gases
11711 Alameda Street
Los Angeles, CA 90059-2130
(323) 357-3891
FAX: (323) 567-3686
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A1647	Reference Number:	48-124111939-9
Cylinder Number:	CC26998	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Oct 30, 2007	Valve Outlet:	660

Expiration Date: Oct 30, 2009

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainity
NITRIC OXIDE	42.00 PPM	42.27 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		42.30 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	60610	CC208053	49.38PPM NITRIC OXIDE/NITROGEN	Oct 02, 2008

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet NO	FTIR	Oct 18, 2007

Triad Data Available Upon Request

Notes:

QA Approval

Certificate of Analysis: EPA Protocol Gas Mixture

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
323.357.6891 fax: 323.567.3686
www.airgas.com

Cylinder Number:	SG9135017BAL	Reference Number:	48-124063854-2
Cylinder Pressure:	2000.6 PSIG	Expiration Date:	5/9/2009
Certification Date:	5/9/2006	Laboratory:	ASG - Los Angeles - CA

Certified Concentrations

Component	Concentration	Accuracy	Analytical Principle	Procedure
CARBON MONOXIDE	167.6 PPM	+/- 1%	FTIR	G1
NITROGEN	Balance			

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences.

Notes:

Do not use cylinder below 150 psig.

Approval Signature 

Reference Standard Information

Type	Balance Gas	Component	Cyl Number	Concentration
NTRM 81639		CARBON MONOXIDE	SG9198935B	244.7 PPM

Analytical Results

1st Component **CARBON MONOXIDE**

1st Analysis Date:	04/28/2006		
R 246.2	S 168.6	Z -0.027	Conc 167.6 PPM
S 169.4	Z -0.039	R 247.0	Conc 167.2 PPM
Z -0.042	R 246.4	S 169.3	Conc 168.1 PPM
			AVG: 167.6 PPM
2nd Analysis Date:	05/09/2006		
R 243.3	S 166.7	Z -0.070	Conc 167.7 PPM
S 166.9	Z -0.062	R 244.2	Conc 167.3 PPM
Z -0.057	R 243.2	S 167.0	Conc 168.1 PPM
			AVG: 167.7 PPM

Appendix E

Calculations

EMISSION CALCULATIONS

1. Sample Volume and Isokinetics

a. Sample gas volume, dscf

$$V_{m\,std} = 0.03342\ V_m \left(P_{bar} + \frac{H}{13.6} \right) \left(\frac{T_{ref}}{T_m} \right) (Y)$$

b. Water vapor volume, scf

$$V_{w\,std} = 0.0472\ V_{lc} \left(\frac{T_{ref}}{528°R} \right)$$

c. Moisture content, nondimensional

$$B_{wo} = \frac{V_{wstd}}{V_{mstd} + V_{wstd}}$$

d. Stack gas molecular weight, lb/lb mole

$$MW_{dry} = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2)$$

$$MW_{wet} = MW_{dry}(1 - B_{wo}) + 18(B_{wo})$$

e. Absolute stack pressure, in Hg

$$P_s = P_{bar} + \frac{P_{sg}}{13.6}$$

~~f. Stack velocity, ft/sec~~

N/A

$$V_s = 2.90 C_p \sqrt{\Delta P P_s} \sqrt{\left(\frac{29.92}{P_s} \right) \left(\frac{28.96}{MW_{wet}} \right)}$$

~~g. Actual stack flow rate, wacfm~~

$$Q = (V_s)(A_s)(60)$$

h. Standard stack gas flow rate, dscfm

$$Q_{sd} = Q(1 - B_{wo})\left(\frac{T_{ref}}{T_s}\right)\left(\frac{P_s}{29.92}\right)$$

i. Percent isokinetic

$$I = \left(\frac{17.32(T_s)(V_{mstd})}{(1 - B_{wo})(\theta)(V_s)(P_s)(D_n^2)}\right)\left(\frac{528°R}{T_{ref}}\right)$$

~~2. Particulate Emissions~~

2. EPA Method 19

~~a. Grain loading, gr/dscf~~

~~$C = 0.01543\left(\frac{M}{V_{mstd}}\right)$~~

$E = \frac{\text{Inlet Gas Flow}}{\text{Scfm}} \times \text{EPA F Factor} \times \frac{\text{mmbtu}}{\text{scf}}\left(\frac{20.9}{20.9 - O_{2\,exhaust}}\right)$

N/A

~~b. Grain loading at 12% CO_2, gr/dscf~~

~~$C_{12\%CO_2} = C\left(\frac{12}{\%CO_2}\right)$~~

~~c. Mass emissions, lb/hr~~

~~$M = C(Q_{sd})\left(\frac{(60\,min/hr)}{(7000\,gr/lb)}\right)$~~

3. Gaseous Emissions, lb/hr

$$M = (ppm)(10^{-6})\left(\frac{MW_i lb/lbmole}{SV}\right)(Q_{sd})(60\,\text{min}/hr)$$

where,

SV= specific molar volume of an ideal gas:

SV= 385.3 ft^3/lb mole for T_{ref} = 528°R

SV= 379.5ft^3/lb mole for T_{ref} = 520°R

4. Emissions Rates, lb/10^6 Btu

a. Fuel factor at 68°F, dscf/10^6 Btu at 0% O_2

$$F_{68} = \frac{10^6\left[3.64(\%H) - 1.53(\%C) - 0.14(\%N) - 0.57(\%S) - 0.46(\%O_2 fuel)\right]}{HHV, Btu/lb}$$

b. Fuel factor at 60°F

$$F_{60} = F_{68}\left(\frac{520°R}{528°R}\right)$$

c. Gaseous Emissions factor

$$\left(\frac{lb}{10^6 Btu}\right)_i = (ppm)_i\left(10^{-6}\right)\left(\frac{MW_i lb}{lbmole}\right)\left(\frac{1}{SV}\right)(F)\left(\frac{20.9}{20.9 - \%O_2}\right)$$

d. Particulate emission factor

$$\left(\frac{lb}{10^6 Btu}\right) = C\left(\frac{1lb}{7000gr}\right)(F)\left(\frac{20.9}{20.9 - \%O_2}\right)$$

Nomenclature:

A_s = stack area, ft^2

B_{wo} = flue gas moisture content

$C_{12\%CO_2}$ = particulate grain loading, gr/dscf corrected to 12% CO_2

C = particulate grain loading, gr/dscf

C_p = pitot calibration factor, dimensionless

D_n = nozzle diameter, in.

F = fuel F factor, dscf/10^6 Btu at 0% O_2

H = orifice pressure differential, iwg

I = % isokinetics

M_n = mass of collected particulate, mg

M_i = mass of emissions of species I, lb/hr

MW = molecular weight of flue gas

MW_i = molecular weight of species i:

NO_x	:	46
CO	:	28
SO_x	:	64
HC	:	16

θ = sample time, min.

ΔP = average velocity head, iwg = $\left(\overline{\sqrt{\Delta P}}\right)^2$

P_{bar} = barometric pressure, in.Hg

P_s = stack absolute pressure, in.Hg

P_{sg} = stack static pressure, iwg

Q = wet stack gas flow rate at actual conditions, wacfm

Q_{sd} = dry stack gas flow rate at standard conditions, dscfm

SV = specific molar volume of an ideal gas at standard conditions, ft^3/lb mole

T_m = meter temperature, °R

T_{ref} = reference temperature, °R

T_s = stack temperature, °R

V_s = stack velocity, ft/sec

V_{lc} = volume of liquid collected in impingers, ml

V_m = dry meter volume uncorrected, dcf

$V_{m\,std}$ = dry meter volume at standard conditions, dscf

$V_{w\,std}$ = volume of water vapor at standard conditions, scf

Y = meter calibration coefficient

SCEC

2009 COMPLIANCE SOURCE TEST CENTRAL MAUI MUNICIPAL LANDFILL GAS COLLECTION AND CONTROL SYSTEM (FLARE)

PREPARED FOR:
Cornerstone Environmental Group, LLC.
7600 Dublin Boulevard Suite 200
Dublin, California 94568

EQUIPMENT LOCATION:
Central Maui Municipal Solid Waste Landfill
Pulehu Road
Puunene, Maui 96784

Covered Source Permit (CSP) No. 0652-01-C

TEST DATE:
December 29, 2009

SUBMITTAL DATE:
February 26, 2010

PARAMETERS MEASURED:
NO_x, CO, and TGNMO Emissions, and Volume Flow

TESTED BY:
Harry J. Johnson
SCEC Hawaii
98-030
Orange, CA 92867

Report No: 2486.3001.rpt1

Written By: _____
Harry J. Johnson

Reviewed By: HJJ for LAJ
Leslie A. Johnson

TABLE OF CONTENTS

1.0 INTRODUCTION

SCEC was contracted to perform the 2009 source testing on one (1) landfill gas (LFG) fired flare located at the Central Maui Landfill (CML). The testing was performed to satisfy requirements delineated by the State of Hawaii Department of Health (HDOH) covered source permit (CSP) No. 0652-01-C.

Measurements of the flare emissions and operating parameters were conducted at the flare exhaust and at the inlet LFG of the flare. Table 1-1 provides a test matrix of the parameters tested at each sample location.

The tests were conducted on December 29, 2009 and were performed by Harry J. Johnson – Project Manager and Aaron E. Lord - Project Specialist, of SCEC. Michael Kehano of Maui County coordinated the source test program on-site. Off-site flare testing was coordinated by Kathleen Beresh of Cornerstone Environmental Group, LLC.

The results of the emission tests are summarized in Table 1-2. Table 1-2 presents all data as recorded during the test program. The source tests demonstrate that the flare operates with criteria pollutant emissions below the permit limits. Detailed test results are presented in Section 4.0. All raw data, laboratory results, calculations and quality assurance and quality control (QA/QC) data can be found in the Appendices.

TABLE 1-1
TEST MATRIX
CENTRAL MAUI LANDFILL
December 29, 2009

Parameter	Inlet	Exhaust
Oxygen (O_2)	X	X
Carbon Dioxide (CO_2)	X	X
Carbon Monoxide (CO)		X
Nitrogen Oxides (NO_x)		X
Moisture (H_2O)	X	X
Flow Rate (dscfm)	X	X
Temperature (°F)	X	X
Total Gaseous Non-Methane Organics (TGNMO)	X	X

TABLE 1-2
SUMMARY OF TEST RESULTS
Maui County
Central Maui Landfill
December 29, 2009

PARAMETER	INLET	EXHAUST	PERMIT LIMIT
O_2, %	2.27	12.50	
CO_2, %	30.93	6.51	
N_2, %	28.83	76.43	
Flow Rate, wscfm	635	-	
Flow Rate, dscfm	-	6,695	
Temperature, °F	102	1,515	>1,400
Btu/scf	342.3		
MMBtu/Hr	13.05		
Opacity		0	
NOx:			
ppm		9.54	
ppm @ 3% O_2		23.47	
lb/hr (as NO_2)		0.46	
lb/day (as NO_2)		11.0	
lb/MMBtu (as NO_2)		0.035	0.06
lb/MMCF (as NO_2)		12.03	
CO:			
ppm		4.2	
ppm @ 3% O_2		10.2	
lb/hr		0.12	
lb/day		2.9	
lb/MMBtu		0.009	0.15
lb/MMCF		3.19	
Hydrocarbons:			
CH_4, ppm	336,667	< 1	
TGNMO, ppm (as CH_4)	5,227	14.40	
TGNMO, ppm @ 3% O_2 (as methane)		30.68	
TGNMO, lb/hr (as CH_4)	8.3	0.23	
TGNMO, lb/MM Btu (as CH_4)	-	0.018	
TGNMO, lb/day (as CH_4)	198.6	5.61	
TGNMO, ppm (as hexane)		2.40	
TGNMO, ppm @ 3% O_2 (as hexane)		5.19	<20 NSPS
TGNMO, lb/hr (as hexane)		0.21	
Destruction Eff. %		97	>98%
lb/MMCF		5.49	

Notes:
The results in this table are the averages of all measurements.

2.0 TEST UNIT DESCRIPTION

The LFG control system and flare station at the CML includes a gas collection system (GCCS), gas wells, and an enclosed flare to incinerate the LFG.

The flare tested was manufactured by Perennial Energy, Inc. Model FL-132-36-E and is 123.25 inches inside diameter by 36.75 feet high; propane fueled pilot, two Houston Service Industries 700 scfm multi-stage direct drive centrifugal blowers, two 20 HP air compressors, condensate tank and transfer system for condensate injection into flare, and a UV flame sensor. The flare has four thermocouple reading locations and one full-time thermocouple sensor. The flare was set to operate at 1515 °F while being monitored from the middle thermocouple.

3.0 TEST DESCRIPTION

3.1 Test Conditions

The LFG flow rate averaged 635 standard cubic feet per minute (scfm) during the source testing. Given the present state of the landfill the flare was operated at maximum throughput. Temperature and fuel flow rate were monitored and recorded by the automatic operation control system throughout the test period. In addition, SCEC recorded the flare temperature, gas flow rate and LFG temperature during the test runs. These data can be found in Appendix A field data sheets.

3.2 Sample Locations

Samples were collected at the flare exhaust and at the inlet LFG to the flare. The sample point calculations and a schematic drawing of the sample locations are included in Appendix G.

The flare has an inside diameter of 123.25 inches. The ports are 31 feet above the ground; the stack exit is 37 feet above ground. Sixteen traverse points were used on all flow rate and Continuous Emission Monitoring System (CEMS) tests.

At the outlet to the flare, two ports located approximately 71 inches (0.58 diameters) downstream and 370 inches (3.00 diameters) upstream of all flow disturbances was used. The LFG inlet pipe size is 10 inches with a single port located several diameters upstream of the flame arrestor.

3.3 Test Procedures

The test procedures used for the inlet and flare exhaust measurements are summarized below in Tables 3-1 and 3-2, respectively. Brief discussions of each procedure are given below in Sections 3.3.1 through 3.3.3. Triplicate measurements of each parameter were performed.

TABLE 3-1
FLARE INLET TEST PROCEDURES
CENTRAL MAUI MUNICIPAL LANDFILL
DECEMBER 29, 2009

Parameter	Sample Medium	Analytical Technique	Reference Method	Number of Replicates
Methane and Total Gaseous Non-Methane Organics & Fixed Gases	Summa Canister	TCA/FID	EPA Method 25C	3
Fixed Gases, Btu/cf and F factor	Summa Canister	CG/FID	ASTM D-3588	3
Moisture	Thermocouple	Wet Bulb/Dry Bulb	EPA Methods 4	3
Flow Rate	On-site Meter	Differential Pressure	NA	Continuous

TABLE 3-2
FLARE EXHAUST TEST PROCEDURES
CENTRAL MAUI MUNICIPAL LANDFILL
DECEMBER 29, 2009

Parameter	Sample Medium	Reference Method	Number of Replicates
Methane and Total Gaseous Non-Methane Organics	Summa Canister	EPA Method 25C	3
O_2	CEM	EPA Method 3A	3
CO_2	CEM	EPA Method 3A	3
NO_x	CEM	EPA Methods 7E and 10	3
CO	CEM	EPA Methods 7E and 10	3
Flow Rate	NA	EPA Method 19	3

3.0 TEST DESCRIPTION (Continued)

3.3.1 Methane and Total Gaseous Non-Methane Organics

Methane and Total Gaseous Non-Methane Organics (TGNMO) were measured following EPA Method 25C. The LFG samples were collected over an hour period in evacuated summa canisters. ATMAA, Inc., in Calabasas, California analyzed the samples following EPA Method 25C using Total Carbon Analyzer / Flame Ionization Detector (TCA/FID).

The exhaust gas measurements were conducted using EPA Method 25C. The sample is collected using a stainless steel probe connected by Teflon tubing to an evacuated stainless steel tank. The probe and sample line are purged with flue gas continuously for 5 minutes before sampling. The exhaust sampling was conducted simultaneously with the collection of the inlet samples for the determination of destruction efficiency. The tank samples were analyzed by ATMAA, Inc. in Calabasas, CA, using TCA/FID.

3.3.2 Oxygen, Carbon Dioxide, Nitrogen, Carbon Monoxide, and Nitrogen Oxides

Measurements of Oxides of Nitrogen (NO_x), Carbon Monoxide (CO), Oxygen (O_2) and Carbon Dioxide (CO_2) at the exhaust were conducted using EPA Methods 3A, 7E, and 10 sampling with a CEMS.

These CEMS measurements were obtained using SCEC's continuous emissions monitoring system described in Appendix A. The system includes a stainless steel probe connected to a 25' Teflon line to extract the exhaust sample. The sample gas is then directed through a moisture knockout cooled with ice and water. A peristaltic pump continuously drains the knockout. The sample then travels to the ground using Teflon tubing to an additional conditioning and filtering system. Leak checks were conducted prior to and at the conclusion of compliance testing by operating the sample pump, plugging the probe inlet and all pressure side system exits except for one analyzer rotameter, then measuring the leakage rate on that rotameter.

A calibration error test was performed on each analyzer prior to testing. The calibration error test was conducted by spanning the instrument with zero and high span gas and then recording the as-found value when injecting zero, mid and high span gases.

EPA Protocol 1 Calibration Gases were used for all analyzer calibrations. In accordance with EPA Method procedures, a pre- and post-test system bias check was conducted for each test run. The system bias check was conducted by delivering zero and span gas to the Continuous Emissions Monitor (CEM) probe tip and recording the as-found concentration. No analyzer adjustments were made between these pre- and post-system bias checks. Calculations for the correction of measured system bias and instrument drift were then applied to each test run.

Triplicate emissions measurements were performed to determine the concentration of O_2, CO_2, CO, and NO_x. The average concentrations were determined during each test for a period of forty five minutes. This test average was then corrected for measured system bias and drift.

3.0 TEST DESCRIPTION (Continued)

3.3.3 Flow Rate

LFG flow rate into the flare was set to specification using on-site instrumentation. The thermal capacity million British thermal units per standard cubic foot (MMBtu/scf) and expansion potential Environmental Protection Agency (EPA F factor) of the landfill gas were analyzed. Based on the on-site fuel meter and fuel quality analysis the exhaust volume flow was calculated. All results in the reported tables use EPA Method 19 calculated exhaust flow rate. The exhaust flow rate calculations are included in Appendix C.

4.0 RESULTS

The results of the source tests of the CML flare show that the flare emissions are below HDOH permit limits. The flare exhaust TGNMO compliance is met by either the 20 parts per million by volume (ppm_v) @3% Oxygen (O_2) as hexane or the 98% Destruction Reduction Efficiency DRE. The flare demonstrated compliance based on the exhaust emissions standard. Table 1-2 present the summarized test results and application permit limits. Table 4-1 present detailed test results of each parameter.

4.1 Test Critique

No sampling or analytical problems occurred during the test program. All calibration error and system bias checks were below their allowable tolerance, 2% and 5%. The on-site Nitrogen Dioxide (NO_2) converter check met the method 7e requirement.

4.0 RESULTS (Continued)

TABLE 4-1
GENERAL RESULTS
Maui County
Central Maui Landfill
December 29, 2009

Parameter	INLET First Run	INLET Second Run	INLET Third Run	INLET Average	EXHAUST First Run	EXHAUST Second Run	EXHAUST Third Run	EXHAUST Average
O_2, %	1.03	4.65	1.13	2.27	11.90	12.80	12.80	12.50
CO_2, %	33.1	27.4	32.3	30.9	6.44	6.51	6.57	6.51
N_2, %	25.5	33.4	27.6	28.8	77.1	75.8	76.4	76.4
Flow Rate, wscfm	638	634	634	635	-	-	-	-
Flow Rate, dscfm	-	-	-	-	7,425	6,013	6,647	6,695
Temperature, °F	105	101	100	102	1,520	1,510	1,515	1,515
Btu/scf	376	314	337	342				
MMBtu/Hr	14.39	11.94	12.82	13.05				
NOx:								
ppm					10.27	9.75	8.59	9.54
ppm @ 3% O_2					25.5	23.7	21.2	23.5
lb/hr (as NO_2)					0.55	0.42	0.41	0.46
lb/MM Btu (as NO_2)					0.038	0.035	0.032	0.035
CO:								
ppm					4.4	4.2	3.9	4.2
ppm @ 3% O_2					10.8	10.3	9.7	10.2
lb/hr					0.141	0.111	0.113	0.122
lb/MM Btu					0.010	0.009	0.009	0.009
Hydrocarbons:								
CH_4, ppm	361,000	303,000	346,000	336,667	< 1	< 1	< 1	< 1
Ethane, ppm	< 10	< 10	< 10	< 10	< 1	< 1	< 1	< 1
TGNMO, ppm (as CH_4)	5,780	4,250	5,650	5,227	8.8	19.6	14.8	14.4
TGNMO, lb/hr (as CH_4)	9.19	6.71	8.92	8.27	0.16	0.29	0.25	0.23
TGNMO, ppm (as hexane)	963	708	942	871	1.47	3.27	2.47	2.40
TGNMO, ppm @ 3% O_2 (as hexane)	868	780	853	834	2.91	7.22	5.45	5.19
TGNMO, lb/hr (as hexane)	8.23	6.01	7.99	7.41	0.15	0.26	0.22	0.21
Destruction Eff. %					98.23	95.63	97.04	96.96

The exhaust volume flow values are based on EPA Method 19.

Appendices

Appendix A - NO_x, CO, CO_2, O_2 Data, Strip Charts and Visible Emissions Data

Appendix B - Lab Results

Appendix C - Exhaust Volume Flow Data and Field Data

Appendix D - Quality Assurance / Quality Control Data

Appendix E - Calculations

Appendix A

NO_x, CO, CO_2, O_2 Data, Strip Charts and Visible Emission Data

SUMMARY OF CONTINUOUS MONITORING DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 1	
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:	12/29/09	TIME:	1430-1515
OPERATOR:	HJJ	PROJECT No.:	2486.3001		
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO_x PPMV,D	CO PPMV,D	
INITIAL ZERO BIAS	0.26	0.12	0.20	0.00	
INITIAL SPAN BIAS	20.60	9.92	41.60	83.90	
FINAL ZERO BIAS	0.29	0.14	0.50	0.00	
FINAL SPAN BIAS	20.61	9.91	41.20	83.80	
AVERAGE ZERO BIAS	0.28	0.13	0.35	0.00	
AVERAGE SPAN BIAS	20.61	9.92	41.40	83.85	
BIAS GAS CONCENTRATION	20.88	9.95	41.97	84.48	
FULL SCALE RANGE	20.88	17.75	86.30	84.48	
UNCORRECTED CONC.	13.59	6.71	10.40	4.32	
CORRECTED CONC.	**13.68**	**6.69**	**10.27**	**4.35**	
PPMV @ 3 % O2			25.46	10.79	
LB/mmBTU BASED ON HEAT INPUT (MMBTU/HR)	14.39		0.038	0.010	
LB/HR BASED ON VOL FLOW (DSCFM)	7,425		0.55	0.14	

SUMMARY OF CONTINUOUS MONITORING DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 2	
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:	12/29/09	TIME:	1530-1615
OPERATOR:	HJJ	PROJECT No.:	2486.3001		
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO_x PPMV,D	CO PPMV,D	SO_2 PPMV,D
INITIAL ZERO BIAS	0.29	0.14	0.50	0.00	NA
INITIAL SPAN BIAS	20.61	9.91	41.20	83.80	NA
FINAL ZERO BIAS	0.21	0.15	0.40	0.00	NA
FINAL SPAN BIAS	20.66	9.95	41.60	84.00	NA
AVERAGE ZERO BIAS	0.25	0.15	0.45	0.00	NA
AVERAGE SPAN BIAS	20.64	9.93	41.40	83.90	NA
BIAS GAS CONCENTRATION	20.88	9.95	41.97	84.48	NA
FULL SCALE RANGE	25	20	100	100	NA
UNCORRECTED CONC.	13.48	6.79	9.96	4.19	NA
CORRECTED CONC.	13.55	6.76	9.75	4.22	NA
PPMV @ 3 % O2			23.73	10.26	NA
LB/mmBTU BASED ON HEAT INPUT (MMBTU/HR)	11.94		0.035	0.009	NA
LB/HR BASED ON VOL FLOW (DSCFM)	6,013		0.42	0.11	NA

SUMMARY OF CONTINUOUS MONITORING DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 3	
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:	12/29/09	TIME:	1630-1715
OPERATOR:	HJJ	PROJECT No.:	2486.3001		
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO_x PPMV,D	CO PPMV,D	SO_2 PPMV,D
INITIAL ZERO BIAS	0.21	0.15	0.40	0.00	NA
INITIAL SPAN BIAS	20.66	9.95	41.60	84.00	NA
FINAL ZERO BIAS	0.19	0.13	0.30	0.00	NA
FINAL SPAN BIAS	20.41	9.92	40.90	84.00	NA
AVERAGE ZERO BIAS	0.20	0.14	0.35	0.00	NA
AVERAGE SPAN BIAS	20.54	9.94	41.25	84.00	NA
BIAS GAS CONCENTRATION	20.88	9.95	41.97	84.48	NA
FULL SCALE RANGE	25	20	100	100	NA
UNCORRECTED CONC.	13.49	6.81	8.72	3.89	NA
CORRECTED CONC.	**13.65**	**6.77**	**8.59**	**3.91**	NA
PPMV @ 3 % O2			21.21	9.66	NA
LB/mmBTU BASED ON HEAT INPUT (MMBTU/HR)	12.82		0.032	0.009	NA
LB/HR BASED ON VOL FLOW (DSCFM)	6,647		0.41	0.11	NA

Maui County
Central Maui Landfill
December 29, 2009
RAW DAS DATA - COMPLIANCE RUN 1
TIME: 1430-1515

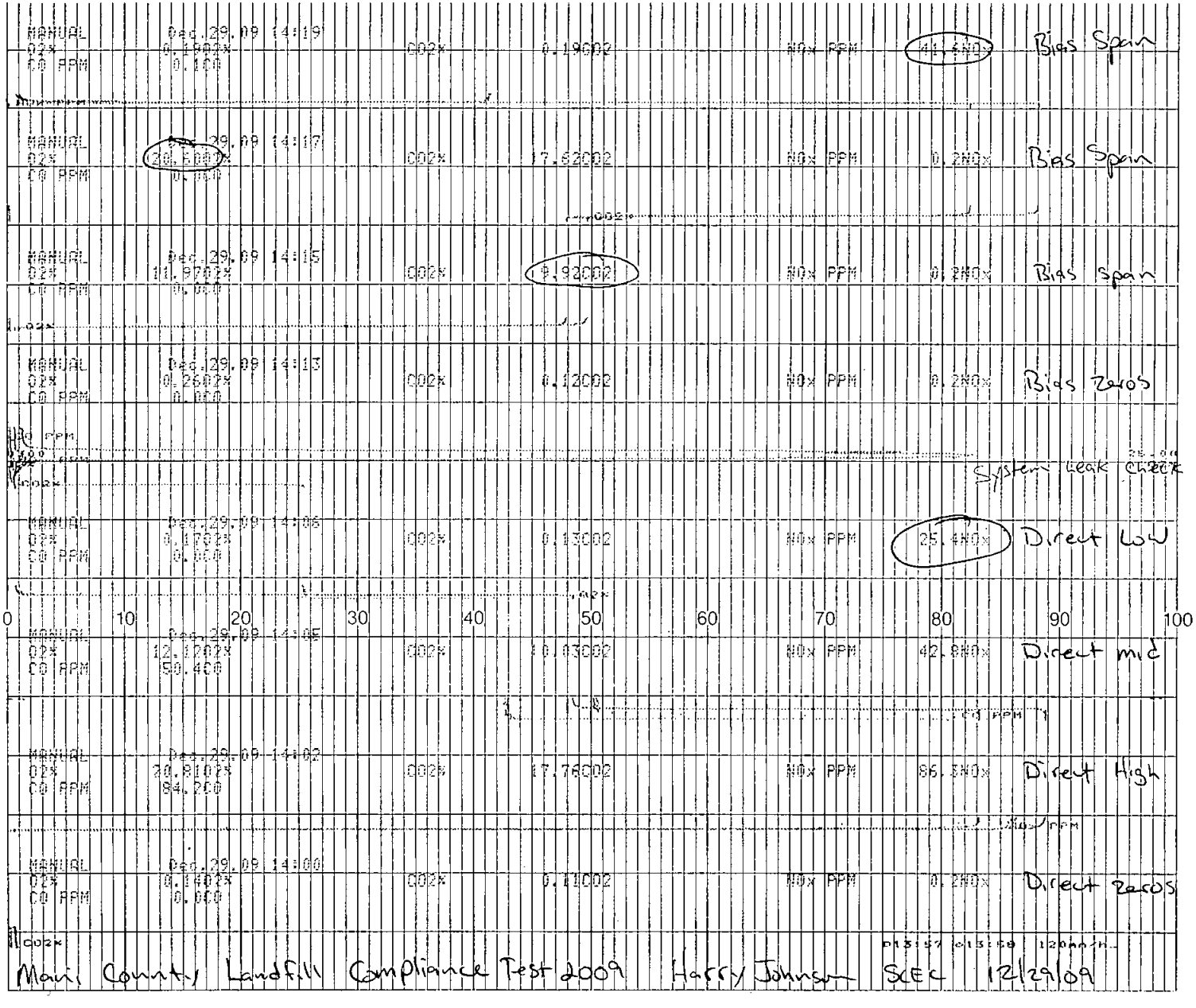
DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOx PPMVD	CO PPMVD
1	12/29/2009	14:30:17	12.73	7.45	11.70	3.5
2	12/29/2009	14:31:17	15.03	5.14	9.70	3.4
3	12/29/2009	14:32:17	13.91	6.40	10.20	3.4
4	12/29/2009	14:33:17	13.89	6.45	9.30	3.2
5	12/29/2009	14:34:17	13.56	6.81	10.80	2.9
6	12/29/2009	14:35:17	13.45	6.79	11.60	3.1
7	12/29/2009	14:36:17	14.73	5.45	9.60	3.0
8	12/29/2009	14:37:17	13.07	7.11	11.90	3.3
9	12/29/2009	14:38:17	13.49	6.91	10.70	3.6
10	12/29/2009	14:39:17	14.02	6.30	10.70	3.8
11	12/29/2009	14:40:17	13.30	7.03	10.50	3.6
12	12/29/2009	14:41:17	12.93	7.33	11.60	3.9
13	12/29/2009	14:42:17	12.60	7.59	11.90	4.3
14	12/29/2009	14:43:17	13.31	6.87	11.30	4.6
15	12/29/2009	14:44:17	13.36	6.79	11.30	4.7
16	12/29/2009	14:45:17	13.73	6.77	10.00	4.7
17	12/29/2009	14:46:17	13.07	7.18	11.00	4.4
18	12/29/2009	14:47:17	13.24	7.21	10.10	4.6
19	12/29/2009	14:48:17	13.05	7.34	10.60	4.4
20	12/29/2009	14:49:17	12.60	7.62	11.70	4.6
21	12/29/2009	14:50:17	13.02	7.19	11.60	4.8
22	12/29/2009	14:51:17	13.14	7.24	10.90	4.9
23	12/29/2009	14:52:17	12.85	7.33	11.60	5.0
24	12/29/2009	14:53:17	12.47	7.64	11.90	5.5
25	12/29/2009	14:54:17	12.74	7.40	11.60	5.8
26	12/29/2009	14:55:17	12.81	7.37	11.20	5.8
27	12/29/2009	14:56:17	12.44	7.64	11.90	5.9
28	12/29/2009	14:57:17	12.81	7.39	10.50	6.1
29	12/29/2009	14:58:17	12.99	7.22	10.80	5.8
30	12/29/2009	14:59:17	13.65	6.57	10.60	5.7
31	12/29/2009	15:00:17	13.11	7.24	10.70	5.4
32	12/29/2009	15:01:17	13.60	6.64	10.90	5.4
33	12/29/2009	15:02:17	14.50	5.66	10.00	5.1
34	12/29/2009	15:03:17	13.37	7.01	10.70	4.6
35	12/29/2009	15:04:17	14.08	6.20	10.00	4.4
36	12/29/2009	15:05:17	14.81	5.38	9.80	4.7
37	12/29/2009	15:06:17	14.20	6.30	8.70	3.2
38	12/29/2009	15:07:17	13.79	6.63	10.20	3.0
39	12/29/2009	15:08:17	14.76	5.82	7.80	2.9
40	12/29/2009	15:09:17	14.50	6.05	9.20	6.0
41	12/29/2009	15:10:17	15.09	5.48	7.50	2.6
42	12/29/2009	15:11:17	13.70	6.82	9.40	4.2
43	12/29/2009	15:12:17	15.42	5.08	7.00	4.1
44	12/29/2009	15:13:17	14.02	6.25	10.00	3.1
45	12/29/2009	15:14:17	14.69	5.83	7.20	3.5
AVERAGES			**13.59**	**6.71**	**10.40**	**4.32**

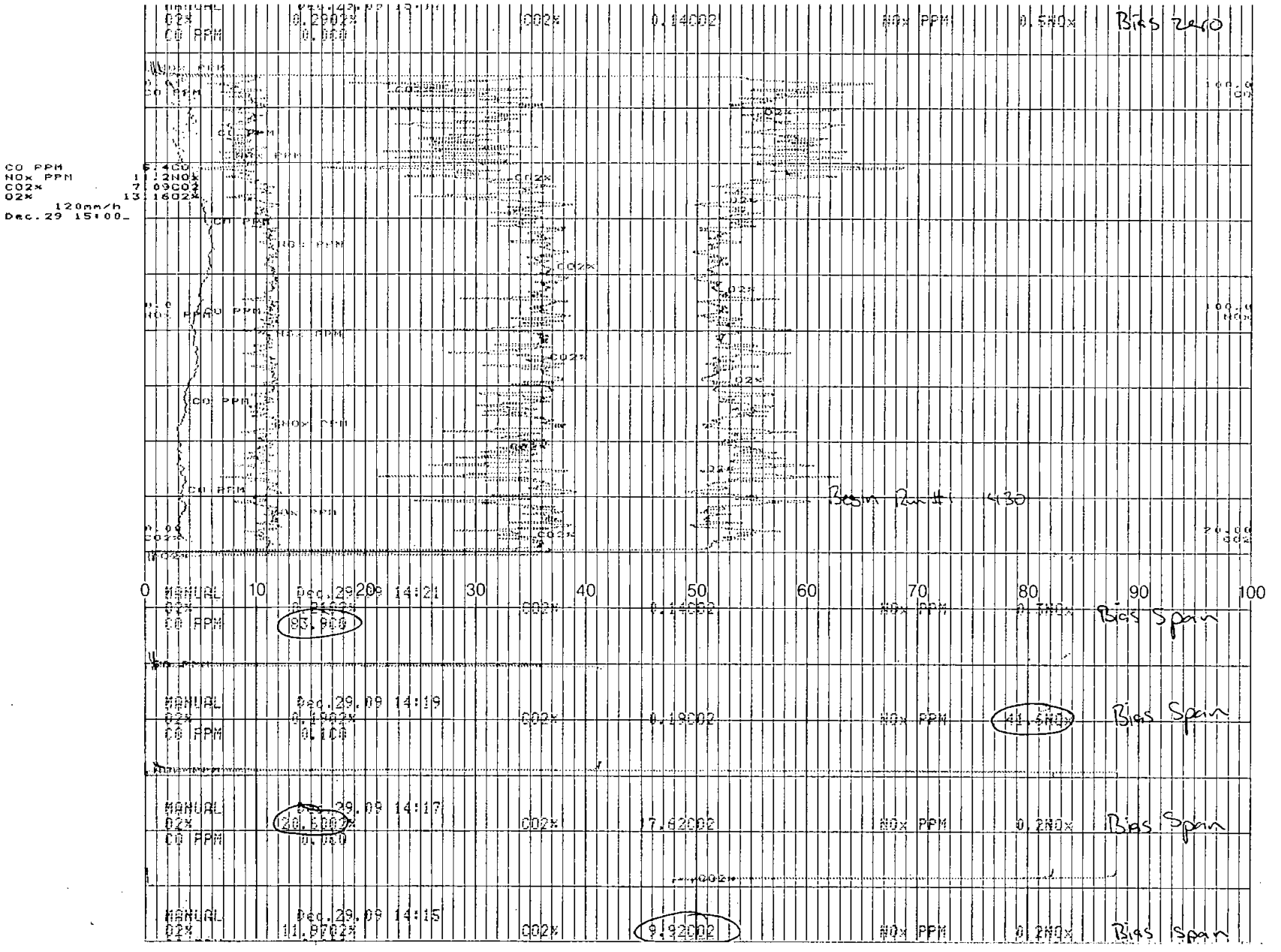
Maui County
Central Maui Landfill
December 29, 2009
RAW DAS DATA - COMPLIANCE RUN 2
TIME: 1530-1615

DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOx PPMVD	CO PPMVD
1	12/29/2009	15:30:29	13.29	6.71	10.20	6.4
2	12/29/2009	15:31:29	13.41	6.75	10.40	6.1
3	12/29/2009	15:32:29	12.99	7.12	10.70	6.0
4	12/29/2009	15:33:29	12.97	7.17	9.70	6.0
5	12/29/2009	15:34:29	13.34	6.94	9.90	5.4
6	12/29/2009	15:35:29	14.00	6.37	8.10	5.1
7	12/29/2009	15:36:29	13.06	7.16	10.30	4.8
8	12/29/2009	15:37:29	13.04	7.12	10.60	4.6
9	12/29/2009	15:38:29	13.24	6.89	11.40	4.5
10	12/29/2009	15:39:29	13.66	6.56	9.60	4.9
11	12/29/2009	15:40:29	13.55	6.82	10.00	4.4
12	12/29/2009	15:41:29	14.45	5.69	9.80	4.4
13	12/29/2009	15:42:29	13.69	6.58	10.00	4.2
14	12/29/2009	15:43:29	13.54	6.70	10.00	4.3
15	12/29/2009	15:44:29	13.66	6.61	10.20	4.4
16	12/29/2009	15:45:29	14.00	6.30	9.70	4.5
17	12/29/2009	15:46:29	13.09	7.18	10.20	4.1
18	12/29/2009	15:47:29	13.47	6.71	10.00	4.1
19	12/29/2009	15:48:29	13.19	6.99	11.00	4.2
20	12/29/2009	15:49:29	13.17	7.02	10.70	4.2
21	12/29/2009	15:50:29	13.32	6.91	10.00	4.2
22	12/29/2009	15:51:29	13.15	7.09	10.70	4.0
23	12/29/2009	15:52:29	13.13	7.10	9.90	4.0
24	12/29/2009	15:53:29	13.78	6.50	9.60	4.0
25	12/29/2009	15:54:29	13.53	6.73	10.40	3.9
26	12/29/2009	15:55:29	13.34	6.94	10.10	3.7
27	12/29/2009	15:56:29	13.21	7.01	10.30	3.8
28	12/29/2009	15:57:29	13.21	7.08	10.10	3.8
29	12/29/2009	15:58:29	13.35	6.92	10.00	3.9
30	12/29/2009	15:59:29	13.33	6.95	10.10	3.9
31	12/29/2009	16:00:29	14.09	6.34	8.20	3.9
32	12/29/2009	16:01:29	13.28	6.98	10.00	3.7
33	12/29/2009	16:02:29	13.00	7.26	10.40	3.7
34	12/29/2009	16:03:29	13.84	6.55	8.20	3.7
35	12/29/2009	16:04:29	13.27	7.07	9.80	3.6
36	12/29/2009	16:05:29	13.43	6.87	10.10	3.5
37	12/29/2009	16:06:29	13.50	6.91	9.90	3.5
38	12/29/2009	16:07:29	13.12	7.21	10.00	3.4
39	12/29/2009	16:08:29	13.72	6.61	10.00	3.3
40	12/29/2009	16:09:29	13.74	6.62	9.80	3.4
41	12/29/2009	16:10:29	13.82	6.67	9.30	3.9
42	12/29/2009	16:11:29	14.06	6.35	9.40	3.2
43	12/29/2009	16:12:29	14.08	6.22	9.80	3.2
44	12/29/2009	16:13:29	13.60	6.75	9.40	3.4
45	12/29/2009	16:14:29	13.67	6.63	10.30	3.2
AVERAGES			**13.48**	**6.79**	**9.96**	**4.19**

Maui County
Central Maui Landfill
December 29, 2009
RAW DAS DATA - COMPLIANCE RUN 3
TIME: 1630-1715

DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOx PPMVD	CO PPMVD
1	12/29/2009	16:30:31	13.85	6.46	8.50	2.4
2	12/29/2009	16:31:31	13.66	6.61	9.40	2.7
3	12/29/2009	16:32:31	13.25	7.02	9.80	3.2
4	12/29/2009	16:33:31	13.45	6.83	9.30	3.7
5	12/29/2009	16:34:31	13.43	6.79	9.40	4.2
6	12/29/2009	16:35:31	13.83	6.56	8.90	4.6
7	12/29/2009	16:36:31	13.25	7.01	9.80	5.0
8	12/29/2009	16:37:31	13.95	6.42	8.10	5.2
9	12/29/2009	16:38:31	14.00	6.26	9.10	5.2
10	12/29/2009	16:39:31	13.53	6.83	8.80	5.2
11	12/29/2009	16:40:31	13.59	6.74	9.40	4.9
12	12/29/2009	16:41:31	13.73	6.71	8.60	4.8
13	12/29/2009	16:42:31	13.36	6.99	8.30	4.9
14	12/29/2009	16:43:31	13.19	7.13	8.60	4.9
15	12/29/2009	16:44:31	13.00	7.36	8.80	5.0
16	12/29/2009	16:45:31	12.85	7.39	9.10	5.4
17	12/29/2009	16:46:31	13.24	7.05	9.10	5.4
18	12/29/2009	16:47:31	13.42	6.95	8.40	5.2
19	12/29/2009	16:48:31	12.68	7.57	8.90	5.1
20	12/29/2009	16:49:31	13.14	7.17	9.30	4.8
21	12/29/2009	16:50:31	13.64	6.74	8.60	4.7
22	12/29/2009	16:51:31	13.96	6.51	7.60	4.7
23	12/29/2009	16:52:31	12.94	7.34	9.30	3.9
24	12/29/2009	16:53:31	13.31	6.97	9.10	3.8
25	12/29/2009	16:54:31	13.74	6.43	8.70	3.9
26	12/29/2009	16:55:31	13.18	7.16	8.60	3.7
27	12/29/2009	16:56:31	14.05	6.39	7.90	3.6
28	12/29/2009	16:57:31	13.09	7.28	9.10	3.2
29	12/29/2009	16:58:31	13.16	7.15	9.00	3.4
30	12/29/2009	16:59:31	12.91	7.38	9.00	3.3
31	12/29/2009	17:00:31	14.04	6.35	7.40	3.2
32	12/29/2009	17:01:31	13.67	6.69	8.50	3.4
33	12/29/2009	17:02:31	13.99	6.32	7.60	2.8
34	12/29/2009	17:03:31	13.49	6.86	8.30	3.2
35	12/29/2009	17:04:31	14.20	6.12	7.30	3.0
36	12/29/2009	17:05:31	13.88	6.43	8.70	4.6
37	12/29/2009	17:06:31	13.51	6.73	9.30	2.3
38	12/29/2009	17:07:31	14.82	5.43	7.70	3.2
39	12/29/2009	17:08:31	13.32	6.98	9.00	2.6
40	12/29/2009	17:09:31	13.17	7.05	9.30	2.7
41	12/29/2009	17:10:31	13.30	6.97	8.80	3.0
42	12/29/2009	17:11:31	13.63	6.50	8.40	2.9
43	12/29/2009	17:12:31	14.04	6.13	8.10	2.8
44	12/29/2009	17:13:31	13.19	6.99	8.60	2.6
45	12/29/2009	17:14:31	12.49	7.59	9.10	2.8
AVERAGES			**13.49**	**6.81**	**8.72**	**3.89**

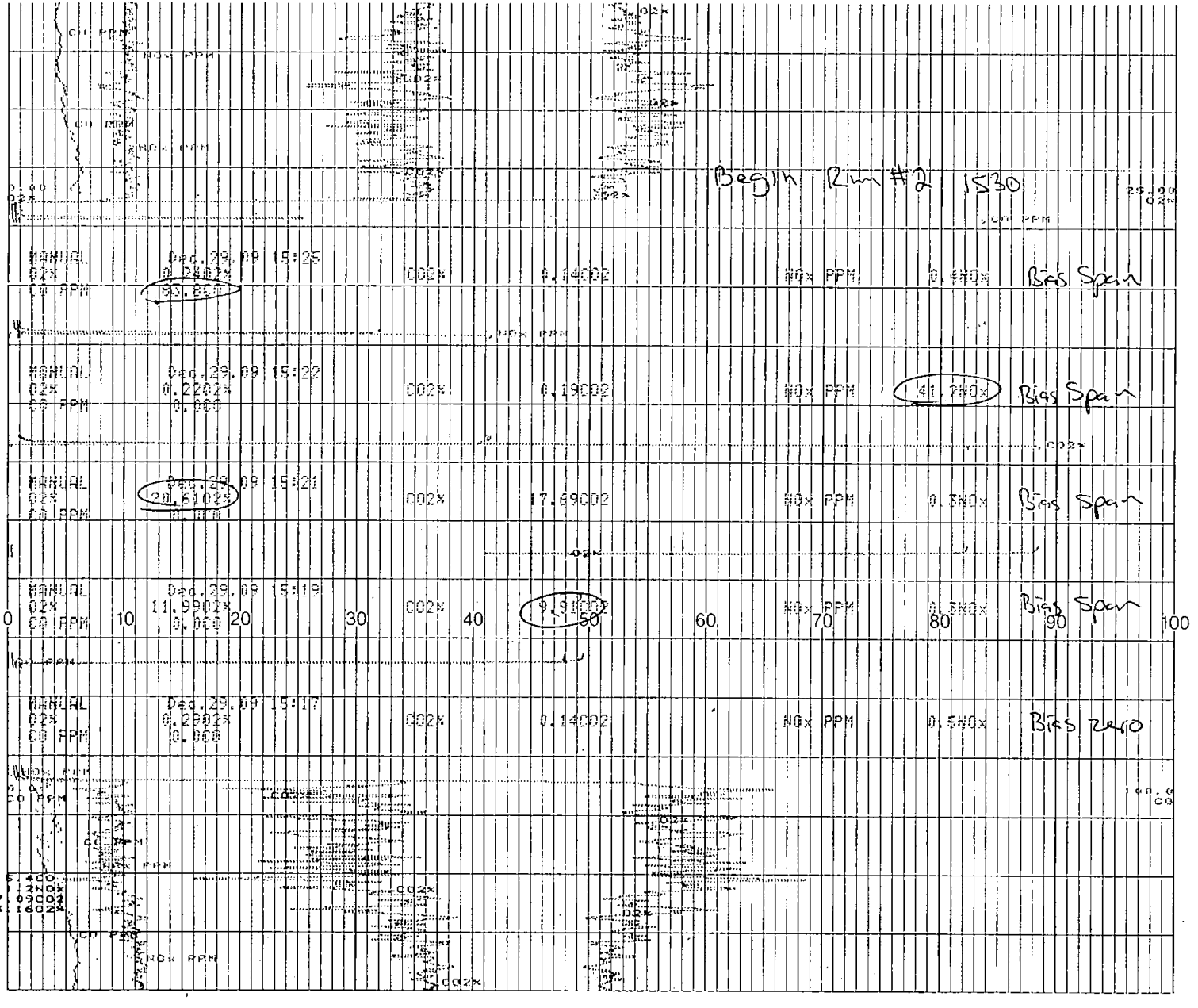

Bias Span
Bias Span
Bias Span
Bias Zeros
System Leak Check
Direct Low
Direct Mid
Direct High
Direct Zeros
0
10
20
30
40
50
60
70
80
90
100
Dec.29 14:00
Maui County Landfill Compliance Test 2009 Harry Johnson SCEC 12/29/09



KOKUSAI CHART

CHART NO. B9627AY

1380cm



CO PPM 5.4CO
NOx PPM 1.2NOx
CO2% 7.1CO2
O2% 13.1O2
120mm/h
Dec.29 15:00_

YOKOGAWA
KOKUSAI CHART
1365cm

KOKUSAI CHART

CHART NO. B9627AY

1350cm

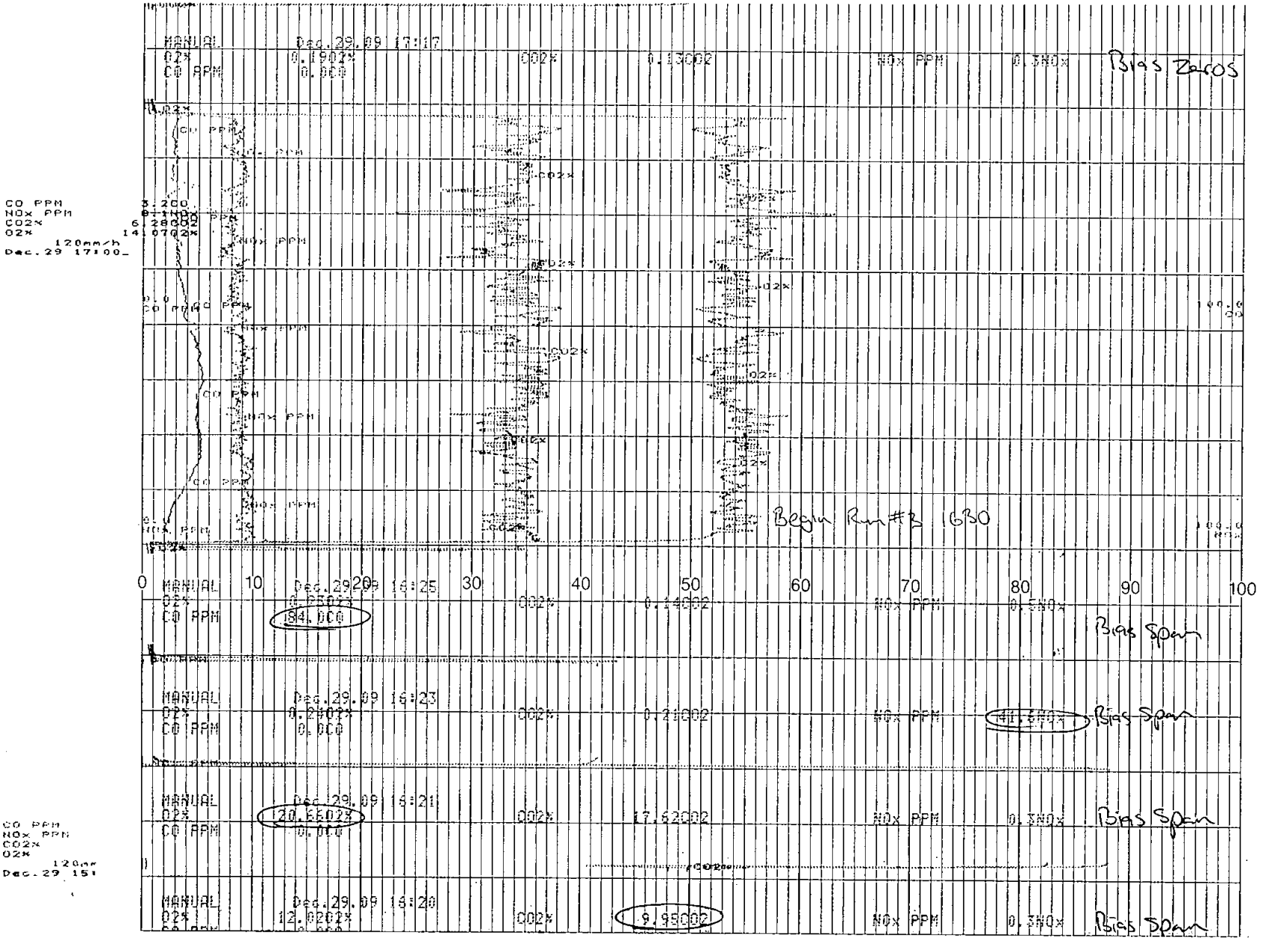

CO PPM 3.200
NOx PPM 81.1NOx
CO2x 6.28002
O2x 14.07002
120mm/h
Dec.29 17:00
MANUAL Dec.29.99 17:17
O2x 9.19002
CO PPM 0.0CO
CO2x
NOx PPM
0.1NOx
Bias Zeros
Begin Run #3 1630
0 10 20 30 40 50 60 70 80 90 100
MANUAL Dec.29.99 16:25
O2x 9.55002
CO PPM 84.0CO
0.14002
Bias Span
MANUAL Dec.29.99 16:23
O2x 9.82002
CO PPM 0.0CO
0.12002
Bias Span
MANUAL Dec.29.99 16:21
O2x 120.55002
CO PPM 0.0CO
17.62002
Bias Span
MANUAL Dec.29.99 16:20
O2x 12.82002
9.95002
Bias Span
CO PPM
NOx PPM
CO2x
O2x
120mm
Dec.29 15:
YOKOGAWA
1335cm
KOKUSAI CHART

CHART NO. B9627AY

SCEC
CEMS RM TEST DATA

Test No.:	Comp #1	Date:	12/29/09
Client:	Maui County - Cornerstone	Condition:	1519°F / 638 scfm
Location:	Maui SW Landfill	Operator:	HJ
Unit:	Flare	Barometric Pressure:	29.87

Gas Temperatures

Stack:	~1542	Knockout:	<68
Probe:	–	Ambient:	72
Heated Line:	–	Chiller:	41

	Expected Values					
	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Analyzer Span Range:	25	20	100	100		
Low Span Cylinder Value:			25.18			
Mid Span Cylinder Value:	11.98	9.95	41.97	50.69		
High Span Cylinder Value:	20.88	17.75	86.3	84.48		
	Direct Analyzer Calibration Values					
Zero Actual Value:	.14	.11	0.2	0.0		
Low Span Actual Value:			25.4			
Mid Span Actual Value:	12.12	10.03	42.8	50.4		
High Span Actual Value:	20.81	17.76	86.3	84.2		
	Pre-Test Analyzer System Bias Values					
System Bias Zero:	.26	.12	0.2	0.0		
System Bias Span:	20.60	9.92	41.6	83.9		
	Raw Test Data					

Sample Point	Time Start	Time Stop	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
	1430	1515	13.59	6.71	10.40	4.32		

	Post-Test Analyzer System Bias Values					
System Bias Zero:	.29	.14	0.5	0.0		
System Bias Span:	20.61	9.91	41.2	83.8		
	Post-Test Analyzer Calibration Values					
Zero Actual Value:						
Low Span Actual Value:						
Mid Span Actual Value:						
High Span Actual Value:						
	Test Results Summary					
	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Raw Average:	13.68	6.69	10.27	4.35		
O_2 3% Corrected Average:			25.46	10.79		
Lbs/Hr. Average:						

SCEC
CEMS RM TEST DATA

Test No.: Comp #2 Date: 12/29/09
Client: Maui County - Cornerstone Condition: 1511°F / 634 SCFM
Location: Maui Sld Can Fill Operator: HJ
Unit: Flare Barometric Pressure: 29.87

Gas Temperatures

Stack: ~1542 Knockout: <68
Probe: — Ambient: 72.4
Heated Line: — Chiller: 4.1

	Expected Values					
	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Analyzer Span Range:						
Low Span Cylinder Value:	See	Run	#1			
Mid Span Cylinder Value:						
High Span Cylinder Value:						
	Direct Analyzer Calibration Values					
Zero Actual Value:						
Low Span Actual Value:	See	Run	#1			
Mid Span Actual Value:						
High Span Actual Value:						
	Pre-Test Analyzer System Bias Values					
System Bias Zero:	.29	.14	0.5	0.0		
System Bias Span:	20.61	9.91	41.2	83.8		
	Raw Test Data					

Sample Point	Time Start	Time Stop	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
	1530	1615	13.48	6.79	9.96	4.19		

	Post-Test Analyzer System Bias Values					
System Bias Zero:	.21	.15	0.4	0.0		
System Bias Span:	20.66	9.95	41.6	84.0		
	Post-Test Analyzer Calibration Values					
Zero Actual Value:						
Low Span Actual Value:						
Mid Span Actual Value:						
High Span Actual Value:						
	Test Results Summary					
	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Raw Average:	13.55	6.76	9.75	4.22		
O_2 3% Corrected Average:			23.73	10.26		
Lbs/Hr. Average:						

SCEC
CEMS RM TEST DATA

Test No.:	Comp #3	Date:	12/29/09
Client:	Maui County - Cornerstone	Condition:	1555°F / 634 SCFM
Location:	Maui SW Landfill	Operator:	HJ
Unit:	Flare	Barometric Pressure:	29.87

Gas Temperatures

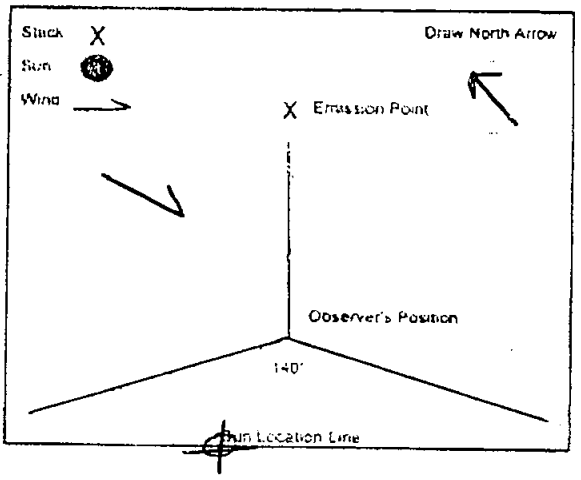
Stack:	~1542	Knockout:	<68
Probe:	—	Ambient:	71.8
Heated Line:	—	Chiller:	41.0

			Expected Values					
			O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Analyzer Span Range:								
Low Span Cylinder Value:			See	Run	#1			
Mid Span Cylinder Value:								
High Span Cylinder Value:								
			Direct Analyzer Calibration Values					
Zero Actual Value:								
Low Span Actual Value:			See	Run	#1			
Mid Span Actual Value:								
High Span Actual Value:								
			Pre-Test Analyzer System Bias Values					
System Bias Zero:			.21	.15	0.4	0.0		
System Bias Span:			20.66	9.95	41.6	84.0		
			Raw Test Data					
Sample Point	Time		O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
	Start	Stop						
	1630	1715	13.49	6.81	8.72	3.89		
			Post-Test Analyzer System Bias Values					
System Bias Zero:			.19	.13	.3	0.0		
System Bias Span:			20.41	9.92	40.9	84.0		
			Post-Test Analyzer Calibration Values					
Zero Actual Value:								
Low Span Actual Value:								
Mid Span Actual Value:								
High Span Actual Value:								
			Test Results Summary					
			O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Raw Average:			13.65	6.77	8.59	3.91		
O_2 3% Corrected Average:					21.21	9.66		
Lbs/Hr. Average:								

VISIBLE EMISSIONS
STATE OF HAWAII

(Make Copies for Additional Use)

Company Name: Maui County Landfill
Equipment/emission point description: Run #1
Landfill Gas/Vapor Flare
~~Primary Crusher Production (tons/hr)~~: _____
(during observation)



Site Conditions:
Stack height above ground (ft): 35'
Stack distance from observer (ft): 110'
Emission color (black or white): Clear
Sky conditions (% cloud cover): Clear
Wind speed (mph): 0-10 mph
Temperature (°F): 80
Observer Name: Harry Johnson
Certified? (Yes/No): Yes
Observation Date and Start Time: 12/29/09 1446

SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%)			0		

Observation Date and Start Time: 12/29/09 1452

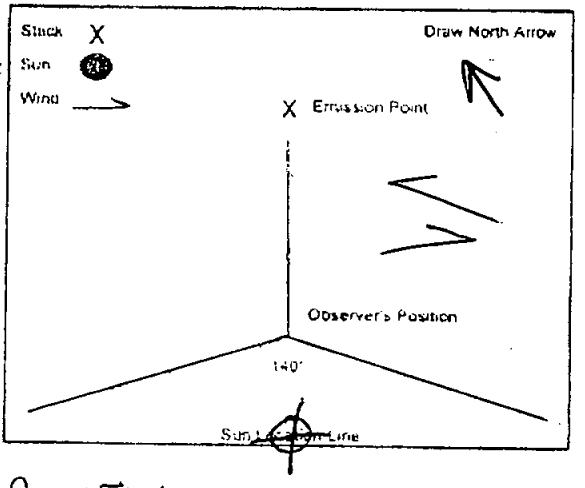
SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%)			0		

VISIBLE EMISSIONS
STATE OF HAWAII

(Make Copies for Additional Use)

Company Name: Maui County Landfill
Equipment/emission point description: Run #2 Landfill Gas/Vapor Flare
~~Primary Crusher Production (tons/hr)~~: _____
(during observation)

Site Conditions:
Stack height above ground (ft): 35'
Stack distance from observer (ft): 110'
Emission color (black or white): Clear
Sky conditions (% cloud cover): Clear
Wind speed (mph): 5-12
Temperature (°F): 79
Observer Name: Harry Johnson
Certified? (Yes/No): Yes
Observation Date and Start Time: 12/29/09 1546



SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%)			0		

Observation Date and Start Time: 12/29/09 1552

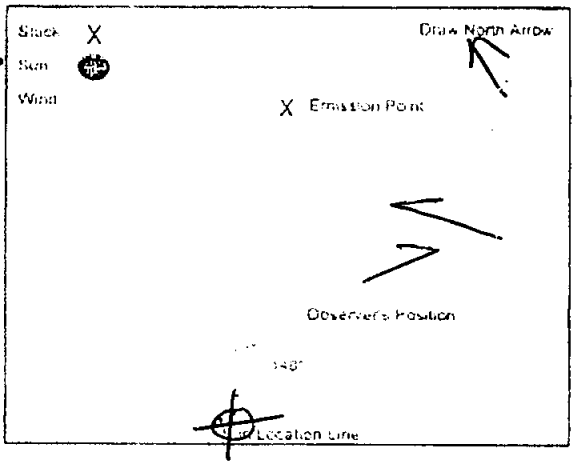
SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%)			0		

VISIBLE EMISSIONS
STATE OF HAWAII

(Make Copies for Additional Use)

Company Name: Maui County Landfill
Equipment/emission point description: Rm#3 Landfill Gas/Vapor Flare
~~Primary Crusher Production (tons/hr):~~ _____
(during observation)

Site Conditions:
Stack height above ground (ft): 35'
Stack distance from observer (ft): 110'
Emission color (black or white): Clear
Sky conditions (% cloud cover): Clear
Wind speed (mph): 5-11
Temperature (°F): 79
Observer Name: Harry Johnson
Certified? (Yes/No): Yes
Observation Date and Start Time: 12/29/09 1646



SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%):			0		

Observation Date and Start Time: 12/29/09 1652

SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%):			0		

Appendix B

Lab Results

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

January 18, 2010

LTR/023n/10

Harry Johnson
SCEC
98-030 Hekaha Street
Suite 1
Aiea, HI 96701

re: Central Maui LF

Dear Harry:

Please find enclosed the laboratory analysis reports, quality assurance summaries, and the original chain of custody form for six SUMMA canister samples received January 6, 2010.

The samples were analyzed for permanent gases, ethane, and TGNMO. BTU reports were prepared from these analysis results, as requested

Sincerely,

AtmAA, Inc.

Michael L. Porter
Laboratory Director

Encl.
MLP/krm

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Permanent Gases and TGNMO Analysis in SUMMA Canister Samples

Report Date: January 15, 200
Client: SCEC
Project Name: Central Maui Landfill
Location: Puunene, Maui, Hawaii
Project No.: 2486.3001

Date Received: January 6, 2010
Date Analyzed: January 8, & 12, 2010

ANALYSIS DESCRIPTION

Permanent gases are measured by thermal conductivity detection/gas chromatography (TCD/GC), EPA 3C. TGNMO was measured by Method 25 analysis, FID/TCA, total combustion analysis.

AtmAA Lab No.:	10060-2	10060-4	10060-6
Sample ID:	In R1 364	In R2 368	In R3 637
	(Concentration in %v)		
Methane	36.1	30.3	34.6
Carbon Dioxide	33.1	27.4	32.3
Nitrogen	25.5	33.4	27.6
Oxygen	1.03	4.65	1.13
	(Concentration in ppmv)		
Ethane	<10	<10	<10
TGNMO	5780	4250	5650

Results are reported on a wet basis.
TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC.
Ethane is reported as ppmvC.

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Site: Central Maui Landfill
Date Received: January 6, 2010
Date Analyzed: January 8, & 12, 2010

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in %v)			
Methane	In R1	36.2	36.0	36.1	0.28
	In R2	no repeat			
	In R3	no repeat			
Carbon Dioxide	In R1	33.1	33.1	33.1	0.0
	In R2	no repeat			
	In R3	no repeat			
Nitrogen	In R1	25.4	25.5	25.5	0.20
	In R2	no repeat			
	In R3	no repeat			
Oxygen	In R1	1.04	1.01	1.03	1.5
	In R2	no repeat			
	In R3	no repeat			
		(Concentration in ppmv)			
Ethane	In R1	<10	<10	---	---
	In R2	<10	<10	---	---
	In R3	<10	<10	---	---
TGNMO	In R1	5800	5770	5780	0.26
	In R2	4420	4080	4250	4.0
	In R3	5620	5680	5650	0.53

Three SUMMA canister samples, laboratory numbers 02679-(14 - 16), were analyzed for permanent gases and TGNMO. Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 15 repeat measurements from three canister samples is 0.33%.

Calculated values for Specific Volume, BTU and F (factor)

Report Date: January 18, 2010
Client: SCEC
Project Location: Central Maui Landfill
Date Received: January 6, 2010
Date Analyzed: January 8, & 12, 2010
AtmAA Lab No.: 10060-2 In R1 364

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	36.13	20.74	Carbon	30.04
Carbon dioxide	33.06	52.19	Hydrogen	5.23
Nitrogen	25.48	25.59	Oxygen	39.08
Oxygen	0.98	1.13	Nitrogen	25.59
Argon	0.044	0.062	Argon	0.06
$(CH_2)_n$	0.579	0.291	Sulfur	0.00

Specific Volume	12.993	
BTU/ft³	370 - @ 68°	376
BTU/ lb.	4801	
F (factor)	10535 - @ 68°	10,697

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *
Methane	23.35 (ft³/lb)
Carbon dioxide	8.59
Nitrogen	13.54
Oxygen	11.87
Argon	9.52
(CH2)n	21

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: January 18, 2010
Client: SCEC
Project Location: Central Maui Landfill
Date Received: January 6, 2010
Date Analyzed: January 8, & 12, 2010
AtmAA Lab No.: 10060-4 In R2 368

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	30.29	17.42	Carbon	25.07
Carbon dioxide	27.40	43.33	Hydrogen	4.39
Nitrogen	33.41	33.63	Oxygen	36.64
Oxygen	4.45	5.12	Nitrogen	33.63
Argon	0.197	0.284	Argon	0.28
$(CH_2)_n$	0.425	0.214	Sulfur	0.00

Specific Volume	13.025
BTU/ft^3	309 @68° 314
BTU/ lb.	4029
F (factor)	10466 @ 68° 10,627

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values * (ft^3/lb)
Methane	23.35
Carbon dioxide	8.59
Nitrogen	13.54
Oxygen	11.87
Argon	9.52
(CH2)n	21

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: January 18, 2010
Client: SCEC
Project Location: Central Maui Landfill
Date Received: January 6, 2010
Date Analyzed: January 8, & 12, 2010
AtmAA Lab No.: 10060-6 In R3 637

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S, Wt.%	
Methane	32.43	18.81	Carbon	27.33
Carbon dioxide	29.85	47.59	Hydrogen	4.74
Nitrogen	29.49	29.93	Oxygen	37.82
Oxygen	2.77	3.21	Nitrogen	29.93
Argon	0.123	0.178	Argon	0.18
$(CH_2)_n$	0.565	0.287	Sulfur	0.00

Specific Volume	12.992
BTU/ft^3	332 @ 68° 337
BTU/ lb.	4314
F (factor)	10632 @ 68° 10,795

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *
Methane	23.35 (ft^3/lb)
Carbon dioxide	8.59
Nitrogen	13.54
Oxygen	11.87
Argon	9.52
(CH2)n	21

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Permanent Gases and TGNMO Analysis in SUMMA Canister Samples

Report Date: January 15, 200
Client: SCEC
Project Name: Central Maui Landfill
Location: Puunene, Maui, Hawaii
Project No.: 2486.3001

Date Received: January 6, 2010
Date Analyzed: January 8, & 12, 2010

ANALYSIS DESCRIPTION

Permanent gases are measured by thermal conductivity detection/gas chromatography (TCD/GC), EPA 3C. TGNMO was measured by Method 25 analysis, FID/TCA, total combustion analysis.

AtmAA Lab No.:	10060-3	10060-5	10060-7
Sample ID:	Out R1	Out R2	Out R3
	147	139	152
	(Concentration in %v)		
Methane	<0.0001	<0.0001	<0.0001
Carbon Dioxide	6.44	6.51	6.57
Nitrogen	77.1	75.8	76.4
Oxygen	11.9	12.8	12.8
	(Concentration in ppmv)		
Ethane	<1	<1	<1
TGNMO	8.79	19.6	14.8

Results are reported on a wet basis.
TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC.
Ethane is reported as ppmvC.

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Site: Central Maui Landfill
Date Received: January 6, 2010
Date Analyzed: January 8, & 12, 2010

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in %v)			
Methane	Out R1	<0.0001	<0.0001	---	---
	Out R2	<0.0001	<0.0001	---	---
	Out R3	<0.0001	<0.0001	---	---
Carbon Dioxide	Out R1	6.40	6.47	6.44	0.5
	Out R2	no repeat			
	Out R3	no repeat			
Nitrogen	Out R1	77.3	76.8	77.1	0.32
	Out R2	no repeat			
	Out R3	no repeat			
Oxygen	Out R1	11.9	11.9	11.9	0.0
	Out R2	no repeat			
	Out R3	no repeat			
		(Concentration in ppmv)			
Ethane	Out R1	<1	<1	---	---
	Out R2	<1	<1	---	---
	Out R3	<1	<1	---	---
TGNMO	Out R1	8.58	8.99	8.79	2.3
	Out R2	20.0	19.1	19.6	2.3
	Out R3	15.3	14.2	14.8	3.7

Three SUMMA canister samples, laboratory numbers 10060-(3,5,7), were analyzed for permanent gases and TGNMO. Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 6 repeat measurements from three canister samples is 0.53%.

Calculated values for Specific Volume, BTU and F (factor)

Report Date: January 18, 2010
Client: SCEC
Project Location: Central Maui Landfill
Date Received: January 6, 2010
Date Analyzed: January 8, & 12, 2010
AtmAA Lab No.: 10060-3 Out R1 147

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	0.00	0.00	Carbon	2.70
Carbon dioxide	6.44	9.91	Hydrogen	0.00
Nitrogen	77.04	75.53	Oxygen	21.00
Oxygen	12.30	13.79	Nitrogen	75.53
Argon	0.546	0.764	Argon	0.76
$(CH_2)_n$	0.001	0.000	Sulfur	0.00

Specific Volume	12.788
BTU/ft^3	0.0081
BTU/ lb.	0.1032
F (factor)	48950565

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *
Methane	23.35 (ft^3/lb)
Carbon dioxide	8.59
Nitrogen	13.54
Oxygen	11.87
Argon	9.52
(CH2)n	21

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: January 18, 2010
Client: SCEC
Project Location: Central Maui Landfill
Date Received: January 6, 2010
Date Analyzed: January 8, & 12, 2010
AtmAA Lab No.: 10060-5 Out R2 139

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S, Wt.%	
Methane	0.00	0.00	Carbon	2.74
Carbon dioxide	6.51	10.05	Hydrogen	0.00
Nitrogen	75.77	74.42	Oxygen	22.02
Oxygen	13.11	14.71	Nitrogen	74.42
Argon	0.581	0.816	Argon	0.82
$(CH_2)_n$	0.002	0.001	Sulfur	0.00

Specific Volume	12.764
BTU/ft^3	0.0167
BTU/ lb.	0.2135
F (factor)	20997058

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *
Methane	23.35 (ft^3/lb)
Carbon dioxide	8.59
Nitrogen	13.54
Oxygen	11.87
Argon	9.52
(CH2)n	21

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: January 18, 2010
Client: SCEC
Project Location: Central Maui Landfill
Date Received: January 6, 2010
Date Analyzed: January 8, & 12, 2010
AtmAA Lab No.: 10060-7 Out R3 152

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH_4, CO_2, N_2, O_2, Ar, and $(CH_2)_n$). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	0.00	0.00	Carbon	2.74
Carbon dioxide	6.52	10.03	Hydrogen	0.00
Nitrogen	76.56	74.94	Oxygen	21.53
Oxygen	12.73	14.24	Nitrogen	74.94
Argon	0.564	0.789	Argon	0.79
$(CH_2)_n$	0.001	0.001	Sulfur	0.00

Specific Volume	12.774
BTU/ft^3	0.0129
BTU/ lb.	0.1646
F (factor)	28995601

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	21	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Chain of Custody Record
Analytical Services Request

SCEC
98-030 Hekaha Street, Suite 1, Aiea, HI 96701
Ph: (808) 488-8113 Fax: (808) 488-6859

Client/Project Name	Client Project No.	ANALYSES REQUESTED	Laboratory Name
CENTRAL MAUI LANDFILL	2486.3001		
Project Location: PUUNENE, MAUI, HAWAII			Lab Contact
Contact: HARRY JOHNSON	Sampler (Signature):		Lab Phone No.
			Turnaround Time: EXPEDITE !

Sample #	Description	SAMPLE Date	Time	Type	METHOD 25	NON-METHANE ORGANIC COMPOUNDS	ASTMD 3588	LANDFILL GAS ANL. BTU & FIXED GASES	Remarks:
R1	INLET / #00364	12/29/09	1430 –	1515	✓	✓	✓	✓	10060-2
R1	OUTLET / #00147	12/29/09	1430 –	1515	✓	✓	✓	✓	-3
R2	INLET / #00368	12/29/09	1530 –	1615	✓	✓	✓	✓	-4
R2	OUTLET / #00139	12/29/09	1530 –	1615	✓	✓	✓	✓	-5
R3	INLET / #00637	12/29/09	1630 –	1715	✓	✓	✓	✓	-6
R3	OUTLET / #00152	12/29/09	1630 –	1715	✓	✓	✓	✓	-7

	Company	Date	Time		Company	Date	Time
Relinquished by (Signature):	SCEC	1-5-10	2:10pm	Received by (Signature):	[illegible]	1-05-10	
Relinquished by (Signature):				Received by (Signature):			
Relinquished by (Signature):				Received by (Signature):	AIMAA	1/6/10	10:30

C:\DOCUME~1\Harry\LOCALS~1\Temp\Chain of Custody Record (Hawaii)

Appendix C

Exhaust Volume Flow Data and Field Data

Maui County
Central Maui Landfill
December 29, 2009

SUMMARY OF EPA METHOD 19 SOURCE TEST DATA AND CALCULATIONS

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3
DATE		12/29/2009	12/29/2009	12/29/2009
FUEL FLOW - @ 68 DEG F	SCFM	638	634	634
CALORIFIC VALUE - @ 68 DEG F	BTU/CF	376	314	337
F FACTOR (Fd) - @ 68 DEG F	DSCF/MMBTU	10,697	10,627	10,795
EXHAUST O2 CONCENTRATION	%VD	13.68	13.55	13.65
HEAT INPUT - NATURAL GAS	MMBTU/MIN	0.2399	0.1991	0.2137
EXHAUST VOLUME FLOW RATE @ 68 DEG F	DSCFM	**7,425**	**6,013**	**6,647**

Maui County
Central Maui Landfill
December 29, 2009
Flare Collected Field Data

Run #	Time hh:mm	Stack Temp Deg. F	Inlet Flow scfm	Field Vac "Hg	Inlet Gas Deg. F
R1	1430	1542	639	20	105
R1	1445	1509	633	20	105
R1	1500	1542	639	19.9	105
R1	1515	1486	639	20	105
R2	1530	1503	632	20	101
R2	1545	1509	639	20	101
R2	1600	1542	639	20	101
R2	1615	1486	627	20	101
R3	1630	1523	635	20	100
R3	1645	1509	628	20	100
R3	1700	1501	638	20	100
R3	1715	1528	636	20	100

Maui County
Central Maui Landfill
December 29, 2009
Suma Canister Field Data

Flare Inlet

Run #:	1		2		3	
Suma Canister ID:	00147		00139		00152	
	Time hh:mm	Pressure "Hg	Time hh:mm	Pressure "Hg	Time hh:mm	Pressure "Hg
	14:30	27	15:30	27	16:30	27
	14:45	19	15:45	19	16:45	19
	15:00	10	16:00	10	17:00	11
	15:15	3	16:15	5	17:15	6

Flare Outlet

Run #:	1		2		3	
Suma Canister ID:	00364		00368		00637	
	Time hh:mm	Pressure "Hg	Time hh:mm	Pressure "Hg	Time hh:mm	Pressure "Hg
	14:30	23	15:30	23	16:30	23
	14:45	17.5	15:45	17	16:45	17.5
	15:00	12	16:00	11	17:00	11.5
	15:15	6	16:15	6	17:15	6

Appendix D

Quality Assurance / Quality Control Data

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (951) 653-6780 • FAX (951) 653-2430

Report Of Analysis
EPA Protocol Gas Mixtures

SCEC01
TO: SCEC - AQ Specialists
Attn: Harry Johnson
98-030 Hekaha Street, Ste 1
Aiea, HI 96701
(808) 630-8005

REPORT NO: 56070-02
REPORT DATE: August 17, 2009
CUSTOMER PO NO: 311

CYLINDER NUMBER: CC101213 CYLINDER SIZE: 150A (141 std cu ft) CYLINDER PRESSURE: 2000 psig

COMPONENT	CONCENTRATION (v/v) ± EPA UNCERTAINTY	REFERENCE STANDARD	ANALYZER MAKE, MODEL, S/N, DETECTION	EXPIRATION DATE	REPLICATE ANALYSIS DATA
Carbon dioxide	9.95 ± 0.12 %	GMIS	Varian Model 3400	7/24/2012	7/24/2009
		CYLINDER #:	Serial # 10680		9.94 %
		CC83094	Thermal Conductivity		9.94 %
		@ 8.08 %	Gas Chromotography		9.98 %
			LAST CAL DATE: 7/7/2009	MEAN:	9.95 %
Oxygen	11.98 ± 0.06 %	GMIS	Varian Model 3800	7/24/2012	7/24/2009
		CYLINDER #:	Serial #		11.97 %
		CC81204	Thermal Conductivity		11.99 %
		@ 9.89 %	Gas Chromotography		11.97 %
			LAST CAL DATE: 7/23/2009	MEAN:	11.98 %
Nitrogen	Balance				

ppm = umole/mole % = mole-%

The above analyses were performed in accordance with Procedure G1 of the EPA Traceability Protocol, Report Number EPA-600/R97/121, dated September 1997.

The above analyses are invalid if the cylinder pressure is less than 150 psig.

ANALYST: _____ APPROVED: _____

M.S.Calhoun J. T. Marrin

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (951) 653-6780 • FAX (951) 653-2430

Report Of Analysis
EPA Protocol Gas Mixtures

SCEC01
TO: SCEC - AQ Specialists
Attn: Harry Johnson
98-030 Hekaha Street, Ste 1
Aiea, HI 96701
(808) 630-8005

REPORT NO: 56070-01
REPORT DATE: August 17, 2009
CUSTOMER PO NO: 311

CYLINDER NUMBER: CC50702 **CYLINDER SIZE:** 150A (141 std cu.ft) **CYLINDER PRESSURE:** 2000 psig

COMPONENT	CONCENTRATION (v/v) ± EPA UNCERTAINTY	REFERENCE STANDARD	ANALYZER MAKE, MODEL, S/N, DETECTION	EXPIRATION DATE	REPLICATE ANALYSIS DATA
Carbon dioxide	17.75 ± 0.03 %	GMIS	Varian Model 3400	7/24/2012	7/24/2009
		CYLINDER #:	Serial # 10680		17.74 %
		CC51172	Thermal Conductivity		17.75 %
		@ 18.01 %	Gas Chromotography		17.75 %
			LAST CAL DATE: 7/7/2009	MEAN:	17.75 %
Oxygen	20.88 ± 0.28 %	GMIS	Varian Model 3800	7/27/2012	7/27/2009
		CYLINDER #:	Serial #		20.83 %
		ALM031591	Thermal Conductivity		20.99 %
		@ 24.35 %	Gas Chromotography		20.82 %
			LAST CAL DATE: 7/23/2009	MEAN:	20.88 %
Nitrogen	Balance				

ppm = umole/mole **% = mole-%**

The above analyses were performed in accordance with Procedure G1 of the EPA Traceability Protocol, Report Number EPA-600/R97/121, dated September 1997.
The above analyses are invalid if the cylinder pressure is less than 150 psig.

ANALYST: M.S.Calhoun **APPROVED:** J. T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

Airgas

Airgas Specialty Gases
11711 South Alameda Street
Los Angles, CA 90059-2130
(323) 357-6891
Fax (323) 567-3686
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0904	Reference Number:	48-124158148-2
Cylinder Number:	CC276903	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Nov 24, 2008	Valve Outlet:	660

Expiration Date: Nov 24, 2010

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NITRIC OXIDE	85.00 PPM	86.30 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		86.30 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	061208	CC220047	95.96PPM NITRIC OXIDE/NITROGEN	Sep 01, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet NO	FTIR	Nov 04, 2008

Triad Data Available Upon Request

Notes:

QA Approval

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 Alameda Street
Los Angeles, CA 90059-2130
(323) 357-3891
FAX (323) 567-3686
www.airgas.com

Part Number: E02NI99E15A0501
Cylinder Number: SG9149078BAL
Laboratory: ASG - Los Angeles - CA
Analysis Date: Oct 30, 2007

Reference Number: 48-124112005-3
Cylinder Volume: 144 Cu.Ft.
Cylinder Pressure: 2015 PSIG
Valve Outlet: 350

Expiration Date: Oct 30, 2010

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	85.00 PPM	84.48 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	5120404	CC180127	99.49PPM CARBON MONOXIDE/	Feb 02, 2009

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet CO	FTIR	Oct 22, 2007

Triad Data Available Upon Request

Notes:

QA Approval

CALIBRATION ERROR

FACILITY:	Maui County	DATA FOR SAMPLING RUNS:		COMPLIANCE RUNS 1,2,3 (INITIAL)
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:		12/29/2009
OPERATOR:	HJJ	PROJECT No.:		2486.3001
PARAMETER	CYLINDER VALUE	ANALYZER CALIBRATION RESPONSE	ABSOLUTE DIFFERENCE	DIFFERENCE
UNITS	PPMV or % VOL	PPMV or % VOL	PPMV or % VOL	% OF GAS
O_2 - FULL SCALE	20.88			
O_2 - ZERO	0.00	0.14	-0.14	**-0.67**
O_2 - MID CAL	11.98	12.12	-0.14	**-0.67**
O_2 -HIGH CAL	20.88	20.81	0.07	**0.34**
CO_2 - FULL SCALE	17.75			
CO_2 - ZERO	0.00	0.11	-0.11	**-0.62**
CO_2 - MID CAL	9.95	10.03	-0.08	**-0.45**
CO_2 -HIGH CAL	17.75	17.76	-0.01	**-0.06**
NO_x - FULL SCALE	86.30			
NO_x - ZERO	0.00	0.20	-0.20	**-0.23**
NO_x - LOW CAL	25.18	25.40	-0.22	**-0.25**
NO_x - MID CAL	41.97	42.80	-0.83	**-0.96**
NO_x -HIGH CAL	86.30	86.30	0.00	**0.00**
CO - FULL SCALE	84.48			
CO - ZERO	0.00	0.00	0.00	**0.00**
CO - MID CAL	50.69	50.40	0.29	**0.34**
CO -HIGH CAL	84.48	84.20	0.28	**0.33**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 1		
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:			12/29/09	
OPERATOR:	HJJ	PROJECT No.:			2486.3001	
		INITIAL VALUES		FINAL VALUES		
PARAMETER	ANALYZER CALIBRATION RESPONSE	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	CALIBRATION DRIFT
UNITS	PPMV or % VOL	PPMV or % VOL	% OF SPAN	PPMV or % VOL	% OF SPAN	% OF SPAN
O_2 - ZERO	0.14	0.26	**-0.57**	0.29	**-0.72**	**-0.14**
O_2 - SPAN	20.81	20.60	**1.01**	20.61	**0.96**	**-0.05**
CO_2 - ZERO	0.11	0.12	**-0.06**	0.14	**-0.17**	**-0.11**
CO_2 - SPAN	10.03	9.92	**0.62**	9.91	**0.68**	**0.06**
NO_x - ZERO	0.20	0.20	**0.00**	0.50	**-0.35**	**-0.35**
NO_x - SPAN	42.80	41.60	**1.39**	41.20	**1.85**	**0.46**
CO - ZERO	0.00	0.00	**0.00**	0.00	**0.00**	**0.00**
CO - SPAN	84.2	83.9	**0.36**	83.8	**0.47**	**0.12**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 2		
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:			12/29/09	
OPERATOR:	HJJ	PROJECT No.:			2486.3001	
		INITIAL VALUES		FINAL VALUES		
PARAMETER	ANALYZER CALIBRATION RESPONSE	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	CALIBRATION DRIFT
UNITS	PPMV or % VOL	PPMV or % VOL	% OF SPAN	PPMV or % VOL	% OF SPAN	% OF SPAN
O_2 - ZERO	0.14	0.29	**-0.72**	0.21	**-0.34**	**0.38**
O_2 - SPAN	20.81	20.61	**0.96**	20.66	**0.72**	**-0.24**
CO_2 - ZERO	0.11	0.14	**-0.17**	0.15	**-0.23**	**-0.06**
CO_2 - SPAN	10.03	9.91	**0.68**	9.95	**0.45**	**-0.23**
NO_x - ZERO	0.20	0.50	**-0.35**	0.40	**-0.23**	**0.12**
NO_x - SPAN	42.80	41.20	**1.85**	41.60	**1.39**	**-0.46**
CO - ZERO	0.00	0.00	**0.00**	0.00	**0.00**	**0.00**
CO - SPAN	84.2	83.8	**0.47**	84.0	**0.24**	**-0.24**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 3		
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:			12/29/09	
OPERATOR:	HJJ	PROJECT No.:			2486.3001	
		INITIAL VALUES		FINAL VALUES		
PARAMETER	ANALYZER CALIBRATION RESPONSE	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	CALIBRATION DRIFT
UNITS	PPMV or % VOL	PPMV or % VOL	% OF SPAN	PPMV or % VOL	% OF SPAN	% OF SPAN
O2 - ZERO	0.14	0.21	**-0.34**	0.19	**-0.24**	**0.10**
O2 - SPAN	20.81	20.66	**0.72**	20.41	**1.92**	**1.20**
CO2 - ZERO	0.11	0.15	**-0.23**	0.13	**-0.11**	**0.11**
CO2 - SPAN	10.03	9.95	**0.45**	9.92	**0.62**	**0.17**
NOx - ZERO	0.20	0.40	**-0.23**	0.30	**-0.12**	**0.12**
NOx - SPAN	42.80	41.60	**1.39**	40.90	**2.20**	**0.81**
CO - ZERO	0.00	0.00	**0.00**	0.00	**0.00**	**0.00**
CO - SPAN	84.2	84.0	**0.24**	84.0	**0.24**	**0.00**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

Airgas

Airgas Specialty Gases
11711 South Alameda Street
Los Angles, CA 90059-2130
(323) 357-6891
Fax: (323) 567-3686
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI79E15A0927	Reference Number:	48-124162424-1
Cylinder Number:	CC14694	Cylinder Volume:	146 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Dec 29, 2008	Valve Outlet:	590

Expiration Date: Dec 29, 2011

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	21.00 %	21.14 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	060606	CC207779	22.51% OXYGEN/	May 01, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Siemens %O2	PARAMAGNETIC	Dec 18, 2008

Triad Data Available Upon Request

Notes:

QA Approval

CAPILLARY GAS BLENDER VERIFICATION CHECK

BLENDER NO: GD - HI-1

DATE: December 29, 2009

Analyzer:		Teledyne O2		Range:	25 %	
High Gas Value:		21.14		Cylinder:	CC14694	
Mid Gas Value:		12.68		Cylinder:	CC14694	
Point #	%	Expected	Test 1	Test 2	Test 3	Average
1	20	4.23	4.20	4.20	4.21	4.20
2	40	8.46	8.31	8.30	8.29	8.30
3	60	12.68	12.49	12.47	12.45	12.47
4	80	16.91	16.72	16.69	16.66	16.69
5	100	21.14	21.05	21.01	20.97	21.01
Mid Gas	----------	12.68	12.48	12.45	12.38	12.44

Point #	Deviation from Average			Deviation from Expected		Limit
	Test 1	Test 2	Test 3			
	%	%	%	%		%
1	-0.1	-0.1	0.2	-0.6		+/- 2
2	0.1	0.0	-0.1	-1.8		+/- 2
3	0.2	0.0	-0.2	-1.7		+/- 2
4	0.2	0.0	-0.2	-1.3		+/- 2
5	0.2	0.0	-0.2	-0.6		+/- 2
Mid Gas	0.3	0.1	-0.5	-1.9		+/- 2

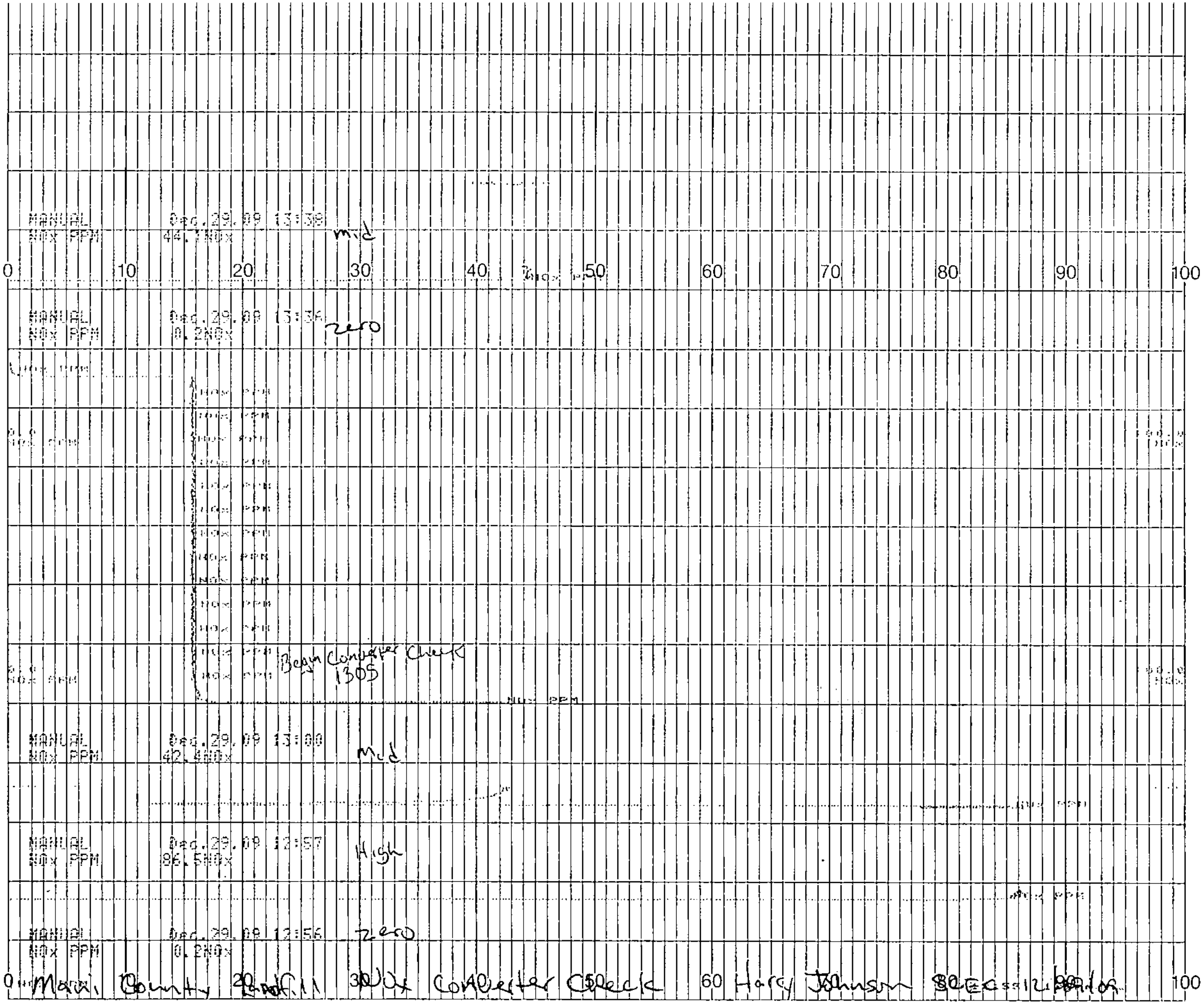
YOKOGAWA ◆ | 1455cm | ✖ KOKUSAI CHART | CHART NO. B9627AY

MAUI COUNTY LANDFILL COMPLIANCE
NOx CONVERTER CHECK

	Date	Time	NOx
Start Converter Check	12/29/2009	13:05:39	15.8
	12/29/2009	13:06:39	15.8
	12/29/2009	13:07:39	15.6
	12/29/2009	13:08:39	15.7
	12/29/2009	13:09:39	16.0
	12/29/2009	13:10:39	15.8
	12/29/2009	13:11:39	15.8
	12/29/2009	13:12:39	15.8
	12/29/2009	13:13:39	15.8
	12/29/2009	13:14:39	15.7
	12/29/2009	13:15:39	15.8
	12/29/2009	13:16:39	15.9
	12/29/2009	13:17:39	15.7
	12/29/2009	13:18:39	15.9
	12/29/2009	13:19:39	15.7
	12/29/2009	13:20:39	15.8
	12/29/2009	13:21:39	15.7
	12/29/2009	13:22:39	15.8
	12/29/2009	13:23:39	15.8
	12/29/2009	13:24:39	15.7
	12/29/2009	13:25:39	15.8
	12/29/2009	13:26:39	15.8
	12/29/2009	13:27:39	15.8
	12/29/2009	13:28:39	15.6
	12/29/2009	13:29:39	15.7
	12/29/2009	13:30:39	15.8
	12/29/2009	13:31:39	15.7
	12/29/2009	13:32:39	15.6
	12/29/2009	13:33:39	15.7
End Converter Check	12/29/2009	13:34:39	15.7

Peak	**16.0**
Final	**15.7**
Percent Difference	**-1.88**

The NOx concentrations dropped no more than 2 percent absolute from the peak value observed.
The NOx converter has met the criterion of the test.



YOKOGAWA ◆ 1425cm KOKUSAI CHART CHART NO. B9627AY

Table 7E-4 - Interference Response

Date of Test: 9/24/08
Analyzer Type: NOx - TEI
Model No.: 10s
Serial No: 10s-NOx-1-Hi
Calibration Span: 250

Test Gas Type	Concentration (ppm)	Analyzer Response
O_2 / CO_2	12% & 10.02%	.10
NO_2	19.25	—
NOx	89.53	—
CO	50.28	.10
CH_4	49.53	.10
SO_2	15.40	.10
	Sum of Responses	0
	% of Calibration Span	0

Table 7E-4 - Interference Response

Date of Test: 9/24/08
Analyzer Type: CO_2 - Milton Roy
Model No.: 3300
Serial No: N3C1909
Calibration Span: 20

Test Gas Type	Concentration (ppm)	Analyzer Response
O_2 / CO_2	12% & 10.02%	—
NO_2	19.25	.01
NOx	89.53	.01
CO	50.28	.01
CH_4	49.53	.01
SO_2	15.4	.01
Sum of Responses		0
% of Calibration Span		0

Appendix E

Calculations

EMISSION CALCULATIONS

1. Sample Volume and Isokinetics

a. Sample gas volume, dscf

$$V_{m\,std} = 0.03342\ V_m \left(P_{bar} + \frac{H}{13.6} \right) \left(\frac{T_{ref}}{T_m} \right) (Y)$$

b. Water vapor volume, scf

$$V_{w\,std} = 0.0472\ V_{lc} \left(\frac{T_{ref}}{528°R} \right)$$

c. Moisture content, nondimensional

$$B_{wo} = \frac{V_{wstd}}{V_{mstd} + V_{wstd}}$$

d. Stack gas molecular weight, lb/lb mole

$$MW_{dry} = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2)$$

$$MW_{wet} = MW_{dry}(1 - B_{wo}) + 18(B_{wo})$$

e. Absolute stack pressure, in Hg

$$P_s = P_{bar} + \frac{P_{sg}}{13.6}$$

~~f. Stack velocity, ft/sec~~

N/A

~~$V_s = 2.90 C_p \sqrt{\Delta P P_s} \sqrt{\left(\frac{29.92}{P_s}\right)\left(\frac{28.96}{MW_{wet}}\right)}$~~

~~g. Actual stack flow rate, wacfm~~

~~$Q_a = (V_s)(A_s)(60)$~~

h. Standard stack gas flow rate, dscfm

$$Q_{sd} = Q(1 - B_{wo})\left(\frac{T_{ref}}{T_s}\right)\left(\frac{P_s}{29.92}\right)$$

i. Percent isokinetic

$$I = \left(\frac{17.32(T_s)(V_{mstd})}{(1 - B_{wo})(\theta)(V_s)(P_s)(D_n^2)}\right)\left(\frac{528°R}{T_{ref}}\right)$$

~~2. Particulate Emissions~~

2. EPA Method 19

~~a. Grain loading, gr/dscf~~

~~$C = 0.01543\left(\frac{M_n}{V_{mstd}}\right)$~~

E = Inlet Gas Flow (scfm) × EPA F Factor (mmbtu/scf) × $\left(\frac{20.9}{20.9 - O_{2\,exhaust}}\right)$

N/A

~~b. Grain loading at 12% CO_2, gr/dscf~~

~~$C_{12\%CO_2} = C\left(\frac{12}{\%CO_2}\right)$~~

~~c. Mass emissions, lb/hr~~

~~$M = C(Q_{sd})\left(\frac{(60\,min/hr)}{(7000\,gr/lb)}\right)$~~

3. Gaseous Emissions, lb/hr

$$M = (ppm)(10^{-6})\left(\frac{MW_i\,lb/lbmole}{SV}\right)(Q_{sd})(60\,min/hr)$$

where,

SV= specific molar volume of an ideal gas:

SV= 385.3 ft^3/lb mole for T_{ref} = 528°R

SV= 379.5ft^3/lb mole for T_{ref} = 520°R

4. Emissions Rates, lb/10^6 Btu

a. Fuel factor at 68°F, dscf/10^6 Btu at 0% O_2

$$F_{68} = \frac{10^6\left[3.64(\%H) - 1.53(\%C) - 0.14(\%N) - 0.57(\%S) - 0.46(\%O_2 fuel)\right]}{HHV, Btu/lb}$$

b. Fuel factor at 60°F

$$F_{60} = F_{68}\left(\frac{520°R}{528°R}\right)$$

c. Gaseous Emissions factor

$$\left(\frac{lb}{10^6 Btu}\right)_i = (ppm)_i\left(10^{-6}\right)\left(\frac{MW_i lb}{lbmole}\right)\left(\frac{1}{SV}\right)(F)\left(\frac{20.9}{20.9 - \%O_2}\right)$$

d. Particulate emission factor

$$\left(\frac{lb}{10^6 Btu}\right) = C\left(\frac{1lb}{7000gr}\right)(F)\left(\frac{20.9}{20.9 - \%O_2}\right)$$

Nomenclature:

A_s = stack area, ft^2

B_{wo} = flue gas moisture content

$C_{12\%CO_2}$ = particulate grain loading, gr/dscf corrected to 12% CO_2

C = particulate grain loading, gr/dscf

C_p = pitot calibration factor, dimensionless

D_n = nozzle diameter, in.

F = fuel F factor, dscf/10^6 Btu at 0% O_2

H = orifice pressure differential, iwg

I = % isokinetics

M_n = mass of collected particulate, mg

M_i = mass of emissions of species I, lb/hr

MW = molecular weight of flue gas

MW_i = molecular weight of species i:

NO_X	:	46
CO	:	28
SO_X	:	64
HC	:	16

θ = sample time, min.

ΔP = average velocity head, iwg = $\left(\overline{\sqrt{\Delta P}}\right)^2$

P_{bar} = barometric pressure, in.Hg

P_s = stack absolute pressure, in.Hg

P_{sg} = stack static pressure, iwg

Q = wet stack gas flow rate at actual conditions, wacfm

Q_{sd} = dry stack gas flow rate at standard conditions, dscfm

SV = specific molar volume of an ideal gas at standard conditions, ft^3/lb mole

T_m = meter temperature, °R

T_{ref} = reference temperature, °R

T_s = stack temperature, °R

V_s = stack velocity, ft/sec

V_{lc} = volume of liquid collected in impingers, ml

V_m = dry meter volume uncorrected, dcf

$V_{m\,std}$ = dry meter volume at standard conditions, dscf

$V_{w\,std}$ = volume of water vapor at standard conditions, scf

Y = meter calibration coefficient

2010 COMPLIANCE SOURCE TEST
CENTRAL MAUI MUNICIPAL LANDFILL
GAS COLLECTION AND CONTROL SYSTEM
(ENCLOSED FLARE)

PREPARED FOR:
Cornerstone Environmental Group, LLC.
7600 Dublin Boulevard Suite 200
Dublin, California 94568

EQUIPMENT LOCATION:
Central Maui Municipal Solid Waste Landfill
Pulehu Road
Puunene, Maui 96784

Covered Source Permit (CSP) No. 0652-01-C

TEST DATE:
December 21, 2010

SUBMITTAL DATE:
February 14, 2011

PARAMETERS MEASURED:
NO_x, CO, and TGNMO Emissions, and Volume Flow

TESTED BY:
Harry J. Johnson
SCEC Hawaii
98-030
Orange, CA 92867

Report No: 2486.3002.rpt1

Prepared By: _____
Leslie J. Johnson

Reviewed By: _____
Wayne A. Johnson

TABLE OF CONTENTS

1.0 INTRODUCTION

SCEC was contracted to perform the 2010 source testing on one (1) landfill gas (LFG) fired enclosed flare located at the Central Maui Landfill (CML). The testing was performed to satisfy requirements delineated by the State of Hawaii Department of Health (HDOH) covered source permit (CSP) No. 0652-01-C.

Measurements of the flare emissions and operating parameters were conducted at the flare exhaust and at the inlet LFG of the flare. Table 1-1 provides a test matrix of the parameters tested at each sample location.

The tests were conducted on December 21, 2010 and were performed by Harry J. Johnson – Project Manager and Clayton Lee and Sharis Kikukawa - Project Specialists, of SCEC. Michael Kehano of Maui County coordinated the source test program on-site. Off-site flare testing was coordinated by Beth Shiverdecker of Cornerstone Environmental Group, LLC.

The results of the emission tests are summarized in Table 1-2. Table 1-2 presents all data as recorded during the test program. The source tests demonstrate that the flare operates with criteria pollutant emissions below the permit limits. Detailed test results are presented in Section 4.0. All raw data, laboratory results, calculations and quality assurance and quality control (QA/QC) data can be found in the Appendices.

TABLE 1-1
TEST MATRIX
CENTRAL MAUI LANDFILL
December 21, 2010

Parameter	Inlet	Exhaust
Oxygen (O_2)	X	X
Carbon Dioxide (CO_2)	X	X
Carbon Monoxide (CO)		X
Nitrogen Oxides (NO_x)		X
Moisture (H_2O)	X	X
Flow Rate (dscfm)	X	X
Temperature (^oF)	X	X
Opacity		X
Total Gaseous Non-Methane Organics (TGNMO)	X	X

TABLE 1-2
SUMMARY OF TEST RESULTS
Maui County
Central Maui Landfill
December 21, 2010

PARAMETER	INLET		EXHAUST	PERMIT LIMIT
O_2, %	1.13		13.56	
CO_2, %	36.63		6.90	
N_2, %	19.37		79.54	
Flow Rate, wscfm	504		-	
Flow Rate, dscfm	-		6,211	
Temperature, °F	89		1,512	>1,400
Btu/scf	421.3			
MMBtu/Hr	12.75			
Opacity			0	
NOx:				
ppm			14.3	
ppm @ 3% O_2			34.7	
lb/hr (as NO_2)			0.63	
lb/day (as NO_2)			15.1	
lb/MMBtu (as NO_2)			0.049	0.06
lb/MMCF (as NO_2)			20.79	
CO:				
ppm			1.1	
ppm @ 3% O_2			2.7	
lb/hr			0.03	
lb/day			0.7	
lb/MMBtu			0.002	0.15
lb/MMCF			0.98	
Hydrocarbons:				
CH_4, ppm	413,000	<	1	
TGNMO, ppm (as CH_4)	5,303		6.04	
TGNMO, ppm @ 3% O_2 (as methane)			14.73	
TGNMO, lh/hr (as CH_4)	6.66		0.09	
TGNMO, lb/MM Btu (as CH_4)	-		0.007	
TGNMO, lb/day (as CH_4)	159.93		2.27	
TGNMO, ppm (as hexane)			1.01	
TGNMO, ppm @ 3% O_2 (as hexane)			2.52	<20 NSPS
TGNMO, lb/hr (as hexane)			0.08	
Destruction Eff. %			98.6	>98%
lb/MMCF			2.80	

Notes:
The results in this table are the averages of all measurements.

2.0 TEST UNIT DESCRIPTION

The LFG control system and flare station at the CML includes a gas collection system (GCS), gas wells, and an enclosed flare to incinerate the LFG.

The flare tested was manufactured by Perennial Energy, Inc. Model FL-132-36-E and is 123.25 inches inside diameter by 36.75 feet high; propane fueled pilot, two Houston Service Industries 700 scfm multi-stage direct drive centrifugal blowers, two 20 HP air compressors, condensate tank and transfer system for condensate injection into flare, and a UV flame sensor. The flare has four thermocouple reading locations and one full-time thermocouple sensor. The flare was set to operate at 1515 °F while being monitored from the lowest thermocouple.

3.0 TEST DESCRIPTION

3.1 Test Conditions

The LFG flow rate averaged 504 standard cubic feet per minute (scfm) during the source testing. Given the present state of the landfill the flare was operated at maximum throughput. Temperature and fuel flow rate were monitored and recorded by the automatic operation control system throughout the test period. In addition, SCEC recorded the flare temperature, gas flow rate and LFG temperature during the test runs. These data can be found in Appendix A field data sheets.

3.2 Sample Locations

Samples were collected at the flare exhaust and at the inlet LFG to the flare. The sample point calculations and a schematic drawing of the sample locations are included in Appendix F.

The flare has an inside diameter of 123.25 inches. The ports are 31 feet above the ground; the stack exit is 37 feet above ground. Sixteen traverse points were used on all flow rate and Continuous Emission Monitoring System (CEMS) tests.

At the outlet to the flare, two ports located approximately 71 inches (0.58 diameters) downstream and 370 inches (3.00 diameters) upstream of all flow disturbances was used. The LFG inlet pipe size is 10 inches with a single port located several diameters upstream of the flame arrestor. Gas samples were collected from the vertical port.

3.3 Test Procedures

The test procedures used for the inlet and flare exhaust measurements are summarized below in Tables 3-1 and 3-2, respectively. Brief discussions of each procedure are given below in Sections 3.3.1 through 3.3.3. Triplicate measurements of each parameter were performed.

TABLE 3-1
FLARE INLET TEST PROCEDURES
CENTRAL MAUI MUNICIPAL LANDFILL
DECEMBER 21, 2010

Parameter	Sample Medium	Analytical Technique	Reference Method	Number of Replicates
Methane and Total Gaseous Non-Methane Organics & Fixed Gases	Summa Canister	TCA/FID	EPA Method 25C	3
Fixed Gases, Btu/cf and F factor	Summa Canister	CG/FID	ASTM D-3588	3
Flow Rate	On-site Meter	Differential Pressure	NA	Continuous

TABLE 3-2
FLARE EXHAUST TEST PROCEDURES
CENTRAL MAUI MUNICIPAL LANDFILL
DECEMBER 21, 2010

Parameter	Sample Medium	Reference Method	Number of Replicates
Methane and Total Gaseous Non-Methane Organics	Summa Canister	EPA Method 25C	3
O_2	CEM	EPA Method 3A	3
CO_2	CEM	EPA Method 3A	3
NO_x	CEM	EPA Method 7E	3
CO	CEM	EPA Method 7E	3
Opacity	NA	EPA Method 9	3
Flow Rate	NA	EPA Method 19	3

3.0 TEST DESCRIPTION (Continued)

3.3.1 Methane and Total Gaseous Non-Methane Organics

Methane and Total Gaseous Non-Methane Organics (TGNMO) were measured following EPA Method 25C. The LFG samples were collected over an hour period in evacuated summa canisters. ATMAA, Inc., in Calabasas, California analyzed the samples following EPA Method 25C using Total Carbon Analyzer / Flame Ionization Detector (TCA/FID).

The exhaust gas measurements were conducted using EPA Method 25C. The sample is collected using a stainless steel probe connected by Teflon tubing to an evacuated stainless steel tank. The probe and sample line are purged with flue gas continuously for 5 minutes before sampling. The exhaust sampling was conducted simultaneously with the collection of the inlet samples for the determination of destruction efficiency. The tank samples were analyzed by ATMAA, Inc. in Calabasas, CA, using TCA/FID.

3.3.2 Oxygen, Carbon Dioxide, Nitrogen, Carbon Monoxide, and Nitrogen Oxides

Measurements of Oxides of Nitrogen (NO_x), Carbon Monoxide (CO), Oxygen (O_2) and Carbon Dioxide (CO_2) at the exhaust were conducted using EPA Methods 3A, 7E, and 10 sampling with a CEMS.

These CEMS measurements were obtained using SCEC's continuous emissions monitoring system described in Appendix A. The system includes a stainless steel probe connected to a 25' Teflon line to extract the exhaust sample. The sample gas is then directed through a moisture knockout cooled with ice and water. A peristaltic pump continuously drains the knockout. The sample then travels to the ground using Teflon tubing to an additional conditioning and filtering system. Leak checks were conducted prior to and at the conclusion of compliance testing by operating the sample pump, plugging the probe inlet and all pressure side system exits except for one analyzer rotameter, then measuring the leakage rate on that rotameter.

A calibration error test was performed on each analyzer prior to testing. The calibration error test was conducted by challenging the instrument with zero and high span gas and then recording the as-found value when injecting zero, mid and high span gases.

EPA Protocol 1 Calibration Gases were used for all analyzer calibrations. In accordance with EPA Method procedures, a pre- and post-test system bias check was conducted for each test run. The system bias check was conducted by delivering zero and span gas to the Continuous Emissions Monitor (CEM) probe tip and recording the as-found concentration. No analyzer adjustments were made between these pre- and post-system bias checks. Calculations for the correction of measured system bias and instrument drift were then applied to each test run.

Triplicate emissions measurements were performed to determine the concentration of O_2, CO_2, CO, and NO_x. The average concentrations were determined during each test for a period of forty five minutes. This test average was then corrected for measured system bias and drift.

3.0 TEST DESCRIPTION (Continued)

3.3.3 Flow Rate

LFG flow rate into the flare was set to specification using on-site instrumentation. The thermal capacity million British thermal units per standard cubic foot (MMBtu/scf) and expansion potential Environmental Protection Agency (EPA F factor) of the landfill gas were analyzed in triplicate. Based on the on-site fuel meter and fuel quality analysis the exhaust volume flow was calculated. All results in the reported tables use EPA Method 19 calculated exhaust flow rate. The exhaust flow rate calculations are included in Appendix C.

4.0 RESULTS

The results of the source tests of the CML flare show that the flare emissions are below HDOH permit limits. The flare exhaust TGNMO compliance meets both the 20 parts per million by volume (ppm_v) @3% Oxygen (O_2) as hexane and the 98% Destruction Reduction Efficiency (DRE). The flare demonstrated compliance based on the exhaust emissions standard. Table 1-2 present the summarized test results and application permit limits. Table 4-1 present detailed test results of each parameter.

4.1 Test Critique

No sampling or analytical problems occurred during the test program. All calibration error and system bias checks were below their allowable tolerance, 2% and 5%. The on-site Nitrogen Dioxide (NO_2) converter check met the method 7E requirement.

4.0 RESULTS (Continued)

TABLE 4-1
GENERAL RESULTS
Maui County
Central Maui Landfill
December 21, 2010

Parameter	INLET First Run	INLET Second Run	INLET Third Run	INLET Average	EXHAUST First Run	EXHAUST Second Run	EXHAUST Third Run	EXHAUST Average
O_2, %	0.87	0.95	1.57	1.13	12.62	13.67	14.38	13.56
CO_2, %	36.6	36.9	36.4	36.63	7.71	6.81	6.18	6.90
N_2, %	17.7	18.8	21.6	19.37	79.67	79.52	79.44	79.54
Flow Rate, wscfm	506	503	505	504	-	-	-	-
Flow Rate, dscfm	-	-	-	-	5,593	6,265	6,776	6,211
Temperature, °F	89	89	89	89	1,513	1,519	1,505	1,512
Btu/scf	427	423	414	421				
MMBtu/Hr	12.95	12.76	12.53	12.75				
NOx:								
ppm					16.36	14.19	12.25	14.27
ppm @ 3% O_2					35.4	35.1	33.6	34.7
lb/hr (as NO_2)					0.66	0.64	0.59	0.63
lb/MM Btu (as NO_2)					0.051	0.050	0.047	0.049
CO:								
ppm					1.8	0.9	0.7	1.1
ppm @ 3% O_2					3.9	2.3	1.8	2.7
lb/hr					0.044	0.025	0.019	0.030
lb/MM Btu					0.003	0.002	0.002	0.002
Hydrocarbons:								
CH_4, ppm	418,000	415,000	406,000	413,000	< 1	< 1	< 1	< 1
Ethane, ppm	< 10	< 10	< 10	< 10	< 1	< 1	< 1	< 1
TGNMO, ppm (as CH_4)	5,780	4,910	5,220	5,303	4.98	5.65	7.49	6.04
TGNMO, lb/hr (as CH_4)	7.28	6.15	6.56	6.66	0.07	0.09	0.13	0.09
TGNMO, ppm (as hexane)	963	818	870	884	0.83	0.94	1.25	1.01
TGNMO, ppm @ 3% O_2 (as hexane)	861	734	806	800	1.80	2.33	3.43	2.52
TGNMO, lb/hr (as hexane)	6.52	5.51	5.88	5.97	0.06	0.08	0.11	0.08
Destruction Eff. %					99.05	98.57	98.10	98.57

The exhaust volume flow values are based on EPA Method 19.

Appendices

Appendix A - NO_x, CO, CO_2, O_2 Data, Strip Charts and Visible Emissions Data

Appendix B - Lab Results

Appendix C - Exhaust Volume Flow Data and Field Data

Appendix D - Quality Assurance / Quality Control Data

Appendix E – Calculations

Appendix F – Sample Point Locations

SCEC

Appendix A

NO_x, CO, CO_2, O_2 Data, Strip Charts and Visible Emission Data

SUMMARY OF CONTINUOUS MONITORING DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 1	
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:	12/21/10	TIME:	1610-1655
OPERATOR:	HJJ	PROJECT No.:			
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO_x PPMV,D	CO PPMV,D	
INITIAL ZERO BIAS	0.04	0.12	0.20	0.01	
INITIAL SPAN BIAS	20.77	8.11	41.90	41.04	
FINAL ZERO BIAS	0.00	0.14	0.20	0.01	
FINAL SPAN BIAS	20.90	8.10	42.10	41.06	
AVERAGE ZERO BIAS	0.02	0.13	0.20	0.01	
AVERAGE SPAN BIAS	20.84	8.11	42.00	41.05	
BIAS GAS CONCENTRATION	20.88	8.06	42.95	42.14	
FULL SCALE RANGE	20.88	17.75	84.50	42.14	
UNCORRECTED CONC.	12.60	7.75	16.12	1.78	
CORRECTED CONC.	**12.62**	**7.71**	**16.36**	**1.82**	
PPMV @ 3 % O_2			35.37	3.94	
LB/mmBTU BASED ON HEAT INPUT (MMBTU/HR)	12.95		0.051	0.003	
LB/HR BASED ON VOL FLOW (DSCFM)	5,593		0.66	0.04	

SUMMARY OF CONTINUOUS MONITORING DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 2	
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:	12/21/10	TIME:	1711-1756
OPERATOR:	HJJ	PROJECT No.:	2486.3002		
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO_x PPMV,D	CO PPMV,D	SO_2 PPMV,D
INITIAL ZERO BIAS	0.00	0.14	0.20	0.01	NA
INITIAL SPAN BIAS	20.90	8.10	42.10	41.06	NA
FINAL ZERO BIAS	0.04	0.16	0.20	0.01	NA
FINAL SPAN BIAS	20.90	8.15	42.10	40.89	NA
AVERAGE ZERO BIAS	0.02	0.15	0.20	0.01	NA
AVERAGE SPAN BIAS	20.90	8.13	42.10	40.98	NA
BIAS GAS CONCENTRATION	20.88	8.06	42.95	42.14	NA
FULL SCALE RANGE	20.88	17.75	84.50	42.14	NA
UNCORRECTED CONC.	13.69	6.89	14.04	0.92	NA
CORRECTED CONC.	**13.67**	**6.81**	**14.19**	**0.93**	NA
PPMV @ 3 % O_2			35.15	2.31	NA
LB/mmBTU BASED ON HEAT INPUT (MMBTU/HR)	12.76		0.050	0.002	NA
LB/HR BASED ON VOL FLOW (DSCFM)	6,265		0.64	0.03	NA

SUMMARY OF CONTINUOUS MONITORING DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 3	
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:	12/21/10	TIME:	1813-1912
OPERATOR:	HJJ	PROJECT No.:	2486.3002		
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO_x PPMV,D	CO PPMV,D	SO_2 PPMV,D
INITIAL ZERO BIAS	0.04	0.16	0.20	0.01	NA
INITIAL SPAN BIAS	20.90	8.15	42.10	40.89	NA
FINAL ZERO BIAS	0.03	0.16	0.10	0.01	NA
FINAL SPAN BIAS	20.88	8.18	42.20	40.94	NA
AVERAGE ZERO BIAS	0.04	0.16	0.15	0.01	NA
AVERAGE SPAN BIAS	20.89	8.17	42.15	40.92	NA
BIAS GAS CONCENTRATION	20.88	8.06	42.95	42.14	NA
FULL SCALE RANGE	25	20	100	50	NA
UNCORRECTED CONC.	14.40	6.29	12.13	0.64	NA
CORRECTED CONC.	**14.38**	**6.18**	**12.25**	**0.65**	NA
PPMV @ 3 % O_2			33.64	1.79	NA
LB/mmBTU BASED ON HEAT INPUT (MMBTU/HR)	12.53		0.047	0.002	NA
LB/HR BASED ON VOL FLOW (DSCFM)	6,776		0.59	0.02	NA

Maui County
Central Maui Landfill
December 21, 2010
RAW DAS DATA - COMPLIANCE RUN 1
TIME: 1610-1655

DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOx PPMVD	CO PPMVD
1	12/21/2010	16:10:57	12.58	7.67	17.50	0.9
2	12/21/2010	16:11:57	13.79	6.70	15.80	1.0
3	12/21/2010	16:12:57	11.86	8.50	15.20	0.9
4	12/21/2010	16:13:57	11.50	8.78	17.80	1.0
5	12/21/2010	16:14:57	11.87	8.48	17.60	1.1
6	12/21/2010	16:15:57	11.92	8.24	16.70	1.7
7	12/21/2010	16:16:57	14.81	5.68	12.90	1.9
8	12/21/2010	16:17:57	13.66	6.75	14.70	2.3
9	12/21/2010	16:18:57	13.00	7.38	14.50	2.1
10	12/21/2010	16:19:57	13.43	6.99	15.00	1.8
11	12/21/2010	16:20:57	13.83	6.86	14.20	1.8
12	12/21/2010	16:21:57	13.24	7.01	17.80	1.3
13	12/21/2010	16:22:57	12.07	8.13	16.30	1.4
14	12/21/2010	16:23:57	12.24	8.29	16.20	1.1
15	12/21/2010	16:24:57	13.87	6.67	13.30	1.3
16	12/21/2010	16:25:57	13.93	6.84	13.30	1.0
17	12/21/2010	16:26:57	11.12	9.11	18.30	0.9
18	12/21/2010	16:27:57	12.68	7.87	14.80	0.9
19	12/21/2010	16:28:57	12.48	7.80	14.40	1.2
20	12/21/2010	16:29:57	13.47	6.99	17.80	1.1
21	12/21/2010	16:30:57	12.55	7.86	15.90	1.5
22	12/21/2010	16:31:57	13.58	6.99	13.80	1.5
23	12/21/2010	16:32:57	12.64	8.06	13.90	1.5
24	12/21/2010	16:33:57	12.07	8.15	17.80	1.7
25	12/21/2010	16:34:57	11.95	8.27	16.60	1.7
26	12/21/2010	16:35:57	14.87	5.58	12.50	1.4
27	12/21/2010	16:36:57	12.36	8.10	15.00	1.9
28	12/21/2010	16:37:57	12.81	7.52	16.60	1.6
29	12/21/2010	16:38:57	12.95	7.51	15.70	1.6
30	12/21/2010	16:39:57	12.11	8.31	17.60	1.6
31	12/21/2010	16:40:57	13.01	7.26	18.20	1.7
32	12/21/2010	16:41:57	11.75	8.36	18.30	1.7
33	12/21/2010	16:42:57	11.26	9.06	17.60	1.7
34	12/21/2010	16:43:57	12.79	7.57	15.10	1.8
35	12/21/2010	16:44:57	13.22	7.04	14.00	2.3
36	12/21/2010	16:45:57	11.23	9.07	17.10	2.3
37	12/21/2010	16:46:57	13.29	7.15	16.60	2.0
38	12/21/2010	16:47:57	12.83	7.64	17.20	2.1
39	12/21/2010	16:48:57	11.64	8.47	18.10	2.4
40	12/21/2010	16:49:57	11.54	8.59	17.30	2.2
41	12/21/2010	16:50:57	12.65	7.59	16.90	2.5
42	12/21/2010	16:51:57	11.96	8.32	15.50	3.4
43	12/21/2010	16:52:57	11.20	8.84	17.80	3.7
44	12/21/2010	16:53:57	11.68	8.30	19.90	3.9
45	12/21/2010	16:54:57	11.91	8.44	16.20	4.2
AVERAGES			**12.60**	**7.75**	**16.12**	**1.78**

Maui County
Central Maui Landfill
December 21, 2010
RAW DAS DATA - COMPLIANCE RUN 2
TIME: 1711-1756

DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOx PPMVD	CO PPMVD
1	12/21/2010	17:11:07	10.69	9.20	19.60	2.4
2	12/21/2010	17:12:07	11.73	8.37	18.10	2.5
3	12/21/2010	17:13:07	13.14	7.07	14.90	2.4
4	12/21/2010	17:14:07	12.23	7.98	17.70	2.5
5	12/21/2010	17:15:07	13.25	7.06	15.60	2.5
6	12/21/2010	17:16:07	12.64	7.92	14.80	2.1
7	12/21/2010	17:17:07	13.04	7.31	16.50	1.7
8	12/21/2010	17:18:07	12.11	8.45	16.20	1.7
9	12/21/2010	17:19:07	14.02	6.67	11.90	1.6
10	12/21/2010	17:20:07	13.78	6.89	15.30	1.2
11	12/21/2010	17:21:07	13.24	7.34	15.50	1.1
12	12/21/2010	17:22:07	13.01	7.69	13.50	0.9
13	12/21/2010	17:23:07	12.42	8.10	16.40	0.7
14	12/21/2010	17:24:07	14.20	6.36	14.30	0.6
15	12/21/2010	17:25:07	14.35	6.32	11.50	0.6
16	12/21/2010	17:26:07	14.28	6.37	15.40	0.6
17	12/21/2010	17:27:07	15.82	4.59	11.70	1.6
18	12/21/2010	17:28:07	13.65	6.84	15.30	1.2
19	12/21/2010	17:29:07	14.02	6.44	14.90	0.6
20	12/21/2010	17:30:07	15.13	5.48	11.30	0.2
21	12/21/2010	17:31:07	13.83	6.88	11.90	0.2
22	12/21/2010	17:32:07	15.57	5.10	11.70	0.4
23	12/21/2010	17:33:07	15.99	4.43	8.90	0.2
24	12/21/2010	17:34:07	13.72	7.37	11.30	1.1
25	12/21/2010	17:35:07	13.10	7.80	11.80	0.3
26	12/21/2010	17:36:07	14.80	6.05	10.90	0.1
27	12/21/2010	17:37:07	14.37	5.99	12.80	0.0
28	12/21/2010	17:38:07	13.86	6.91	14.50	0.0
29	12/21/2010	17:39:07	14.78	5.93	14.80	0.9
30	12/21/2010	17:40:07	15.13	5.58	12.10	1.6
31	12/21/2010	17:41:07	15.00	5.91	12.20	2.2
32	12/21/2010	17:42:07	15.29	5.51	13.50	3.6
33	12/21/2010	17:43:07	13.52	7.35	10.60	1.4
34	12/21/2010	17:44:07	13.85	6.69	14.40	0.5
35	12/21/2010	17:45:07	13.59	7.10	14.40	0.0
36	12/21/2010	17:46:07	13.58	7.15	13.30	0.0
37	12/21/2010	17:47:07	13.54	6.79	14.80	0.0
38	12/21/2010	17:48:07	12.13	8.21	17.00	0.0
39	12/21/2010	17:49:07	13.42	7.01	13.20	0.0
40	12/21/2010	17:50:07	13.74	6.94	14.70	0.0
41	12/21/2010	17:51:07	13.19	7.53	15.60	0.0
42	12/21/2010	17:52:07	13.56	7.06	13.80	0.1
43	12/21/2010	17:53:07	13.78	6.78	13.50	0.0
44	12/21/2010	17:54:07	13.94	6.67	13.10	0.0
45	12/21/2010	17:55:07	12.13	8.65	16.80	0.0
AVERAGES			**13.69**	**6.89**	**14.04**	**0.92**

Maui County
Central Maui Landfill
December 21, 2010
RAW DAS DATA - COMPLIANCE RUN 3
TIME: 1813-1912

DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOx PPMVD	CO PPMVD
1	12/21/2010	18:13:01	13.56	7.01	14.50	0.0
2	12/21/2010	18:14:01	13.93	6.51	14.60	0.5
3	12/21/2010	18:15:01	13.51	6.99	12.90	0.2
4	12/21/2010	18:16:01	12.86	7.71	15.40	0.0
5	12/21/2010	18:17:01	13.19	7.21	15.50	0.0
6	12/21/2010	18:18:01	14.48	6.01	13.00	0.3
7	12/21/2010	18:19:01	13.77	6.70	10.90	0.0
8	12/21/2010	18:20:01	13.50	7.31	13.00	0.1
9	12/21/2010	18:21:01	13.11	7.72	12.20	0.9
10	12/21/2010	18:22:01	12.88	7.53	14.40	0.1
11	12/21/2010	18:23:01	13.56	6.82	13.80	0.0
12	12/21/2010	18:24:01	14.22	6.26	14.10	0.4
13	12/21/2010	18:25:01	13.60	7.05	15.50	0.2
14	12/21/2010	18:26:01	12.91	7.57	16.10	0.5
15	12/21/2010	18:27:01	14.35	6.26	14.40	1.5
16	12/21/2010	18:28:01	14.71	5.82	12.50	0.8
17	12/21/2010	18:29:01	13.86	6.56	14.00	1.3
18	12/21/2010	18:30:01	13.55	7.17	11.60	0.2
19	12/21/2010	18:31:01	13.51	7.17	12.40	0.2
20	12/21/2010	18:32:01	13.81	7.08	12.30	0.0
21	12/21/2010	18:33:01	15.39	5.33	9.90	0.6
22	12/21/2010	18:34:01	15.18	5.88	11.10	0.7
23	12/21/2010	18:35:01	15.69	5.09	10.80	0.7
24	12/21/2010	18:50:01	14.69	5.94	10.40	1.0
25	12/21/2010	18:51:01	15.37	5.48	9.40	0.2
26	12/21/2010	18:52:01	15.06	5.74	8.80	0.5
27	12/21/2010	18:53:01	14.51	6.41	10.00	0.3
28	12/21/2010	18:54:01	14.46	6.18	10.70	1.2
29	12/21/2010	18:55:01	15.68	5.20	7.90	3.7
30	12/21/2010	18:56:01	14.56	6.41	13.00	1.4
31	12/21/2010	18:57:01	14.87	5.87	12.20	0.7
32	12/21/2010	18:58:01	15.14	5.50	10.80	0.3
33	12/21/2010	18:59:01	15.11	5.59	12.60	0.7
34	12/21/2010	19:00:01	16.20	4.46	9.10	0.4
35	12/21/2010	19:01:01	14.21	6.86	10.50	0.9
36	12/21/2010	19:02:01	15.05	5.48	7.10	0.4
37	12/21/2010	19:03:01	15.54	5.20	11.60	1.9
38	12/21/2010	19:04:01	15.27	5.56	10.50	0.8
39	12/21/2010	19:05:01	15.01	5.85	11.90	0.5
40	12/21/2010	19:06:01	14.42	6.20	11.80	0.0
41	12/21/2010	19:07:01	15.59	5.13	13.30	2.7
42	12/21/2010	19:08:01	14.86	6.03	12.50	0.4
43	12/21/2010	19:09:01	14.33	6.68	12.80	0.9
44	12/21/2010	19:10:01	13.51	7.24	13.70	0.9
45	12/21/2010	19:11:01	15.32	5.38	10.50	0.1
AVERAGES			14.40	6.29	12.13	0.64

SCEC
CEMS RM TEST DATA

Test No.: Comp #1 — Date: 12/21/10
Client: Maui County - Cornerstone — Condition: 1500°F 1515°F set-up
Location: Maui Landfill — Operator: HS lowest T/C
Unit: flare — Barometric Pressure: 29.87

Gas Temperatures

Stack: ~1500 — Knockout: <68°
Probe: — — Ambient: 74.4
Heated Line: — — Chiller: 4.1

	Expected Values					
	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Analyzer Span Range:	25	20	100	50		
Low Span Cylinder Value:						
Mid Span Cylinder Value:	12.59	8.064	42.95	25.28 @ 60%		
High Span Cylinder Value:	20.88	17.75	84.50	42.14		
	Direct Analyzer Calibration Values					
Zero Actual Value:	.02	0.1	0.2	0.01		
Low Span Actual Value:						
Mid Span Actual Value:	12.67	8.15	43.5	25.07		
High Span Actual Value:	20.88	17.77	85.2	41.95		
	Pre-Test Analyzer System Bias Values					
System Bias Zero:	.04	.12	0.2	.01		
System Bias Span:	20.77	8.11	41.9	41.04		
	Raw Test Data					

Sample Point	Time Start	Time Stop	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
	1610	1655	12.6	7.75	16.12	1.78		

	Post-Test Analyzer System Bias Values					
System Bias Zero:	0.0	0.14	0.2	.01		
System Bias Span:	20.90	8.10	42.1	41.06		
	Post-Test Analyzer Calibration Values					
Zero Actual Value:						
Low Span Actual Value:						
Mid Span Actual Value:						
High Span Actual Value:						
	Test Results Summary					
	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Raw Average:	12.62	7.71	16.62			
3% O2 - Corrected Average:		35.95	3.94			
Lbs/Hr. Average:						

SCEC
CEMS RM TEST DATA

Test No.: Comp #2 Date: 12/21/10
Client: Maui County - Cornerstone Condition: 1505
Location: Maui Landfill Operator: HJ
Unit: Flare Barometric Pressure: 29.89

Gas Temperatures

Stack: 1500 Knockout: <680
Probe: — Ambient: 73.1
Heated Line: — Chiller: 4.1

	Expected Values					
	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Analyzer Span Range:						
Low Span Cylinder Value:	See	Run	#1			
Mid Span Cylinder Value:						
High Span Cylinder Value:						
	Direct Analyzer Calibration Values					
Zero Actual Value:						
Low Span Actual Value:	See	Run	#1			
Mid Span Actual Value:						
High Span Actual Value:						
	Pre-Test Analyzer System Bias Values					
System Bias Zero:	0.0	0.14	0.2	.01		
System Bias Span:	20.9	8.10	42.1	41.06		
	Raw Test Data					

Sample Point	Time Start	Time Stop	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
	1711	1756	13.69	6.89	14.04	0.92		

	Post-Test Analyzer System Bias Values					
System Bias Zero:	0.04	0.16	0.2	0.01		
System Bias Span:	20.9	8.15	42.1	40.89		
	Post-Test Analyzer Calibration Values					
Zero Actual Value:						
Low Span Actual Value:						
Mid Span Actual Value:						
High Span Actual Value:						
	Test Results Summary					
	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Raw Average:	13.67	6.81	14.27	0.93		
3% O2- Corrected Average:			35.34	2.31		
Lbs/Hr. Average:						

SCEC
CEMS RM TEST DATA

Test No.: Comp #3 Date: 12/21/10
Client: Maui County-Cornerstone Condition: 1505
Location: Maui Landfill Operator: HJ
Unit: Flare Barometric Pressure: 29.90

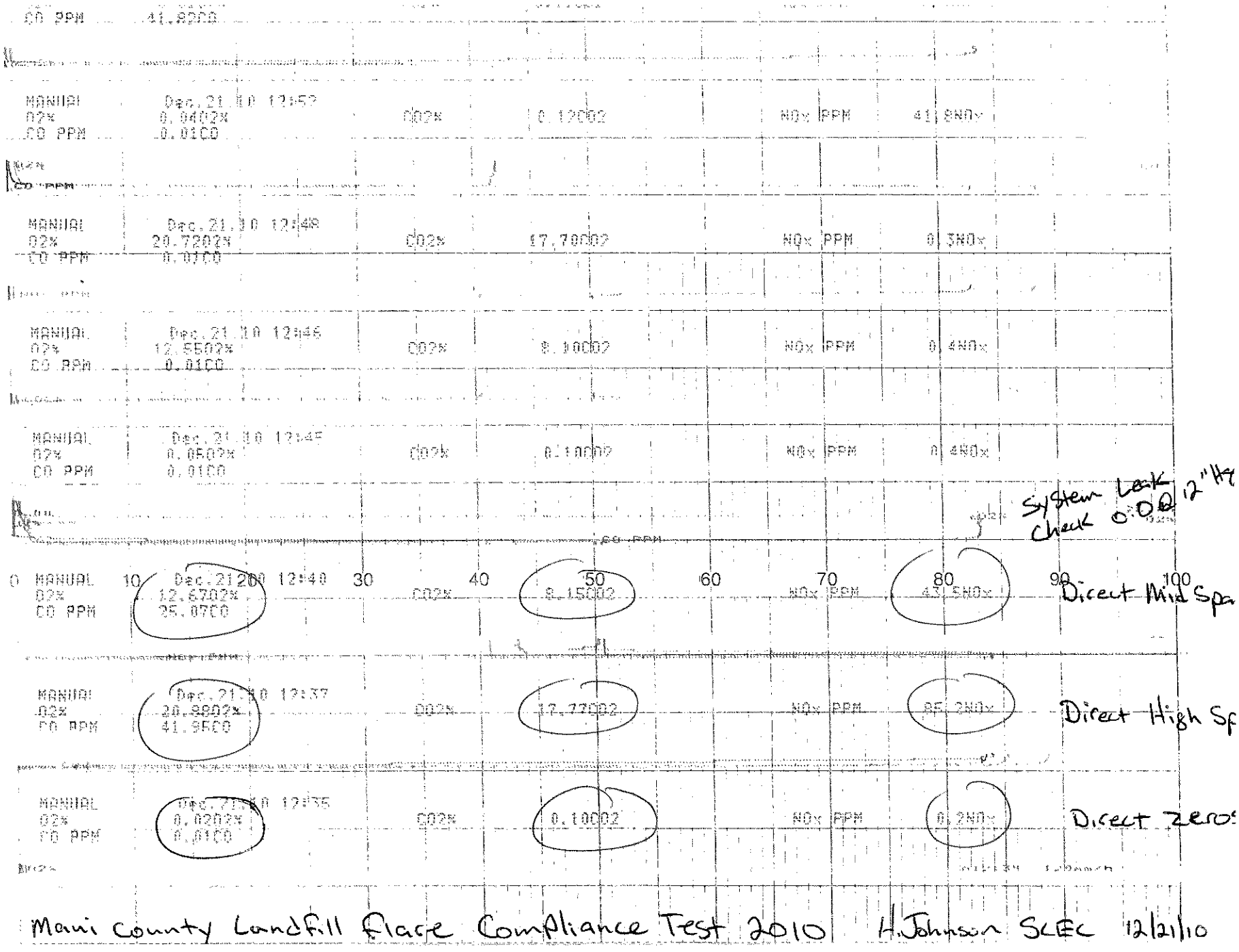
Gas Temperatures

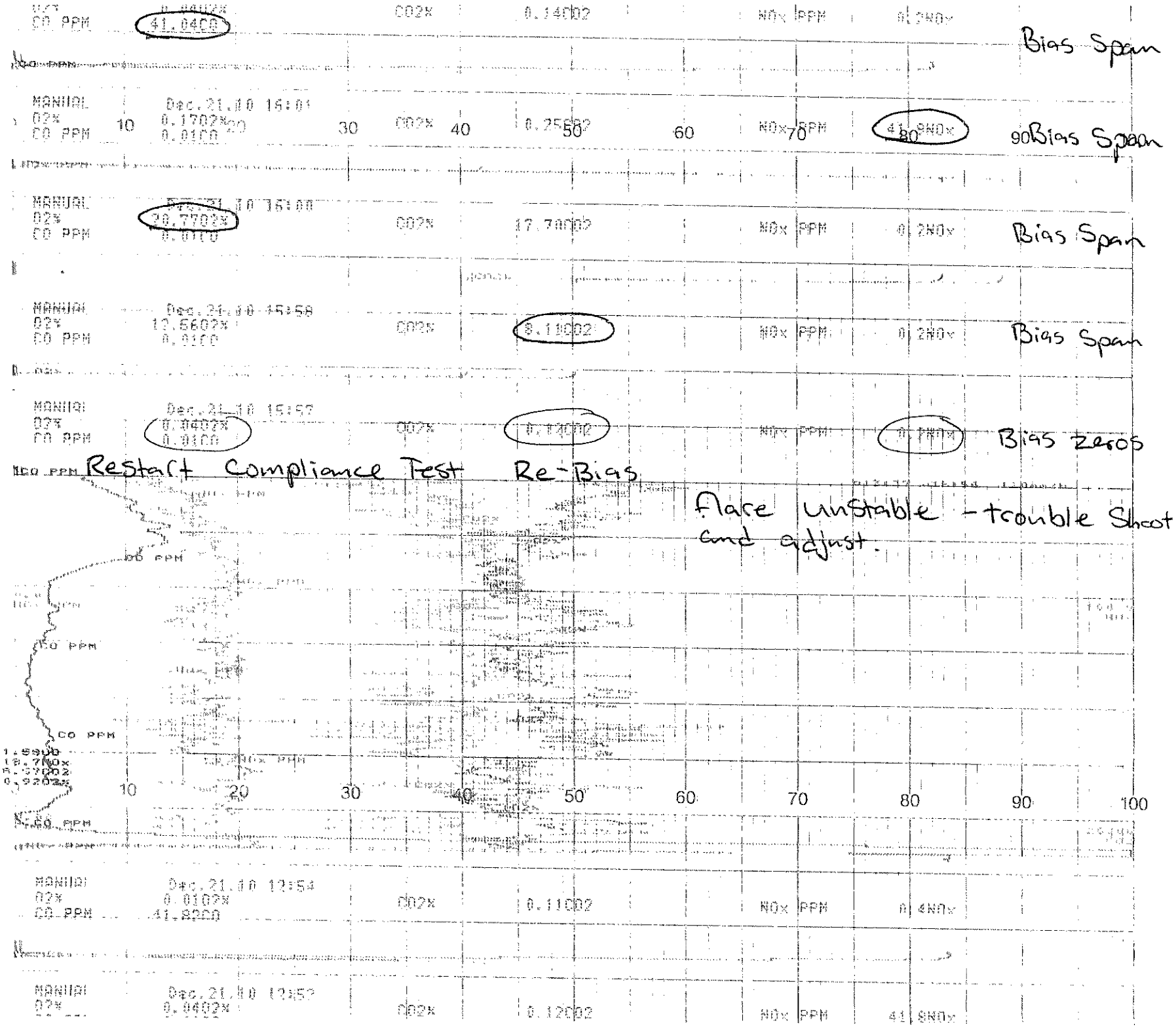
Stack: ~1500 Knockout: <68
Probe: — Ambient: 72.5
Heated Line: — Chiller: 4.1

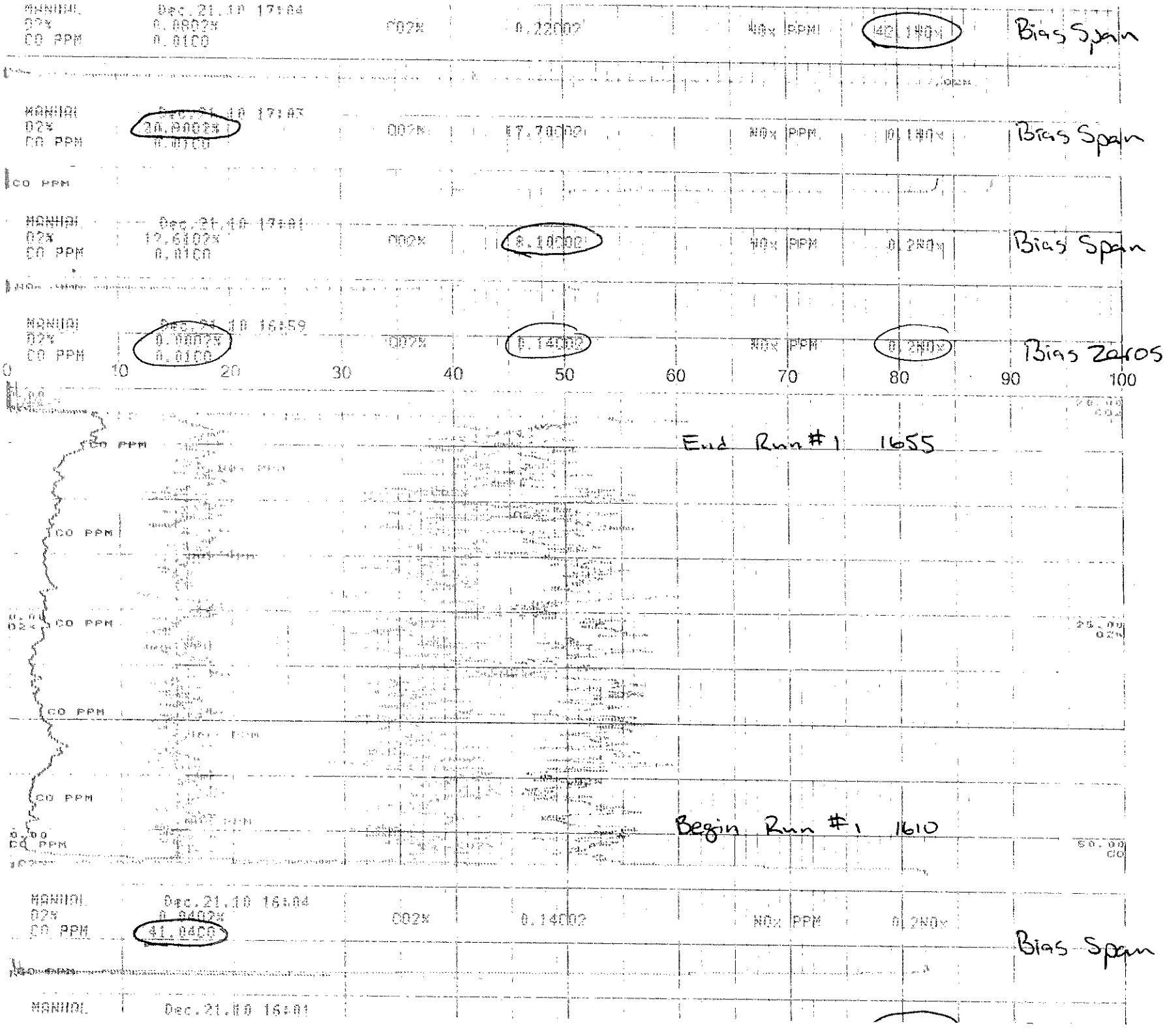
	Expected Values					
	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Analyzer Span Range:						
Low Span Cylinder Value:	See	Run	#1			
Mid Span Cylinder Value:						
High Span Cylinder Value:						
	Direct Analyzer Calibration Values					
Zero Actual Value:						
Low Span Actual Value:	See	Run	#1			
Mid Span Actual Value:						
High Span Actual Value:						
	Pre-Test Analyzer System Bias Values					
System Bias Zero:	.04	0.16	0.2	0.01		
System Bias Span:	20.9	8.15	42.1	40.89		
	Raw Test Data					

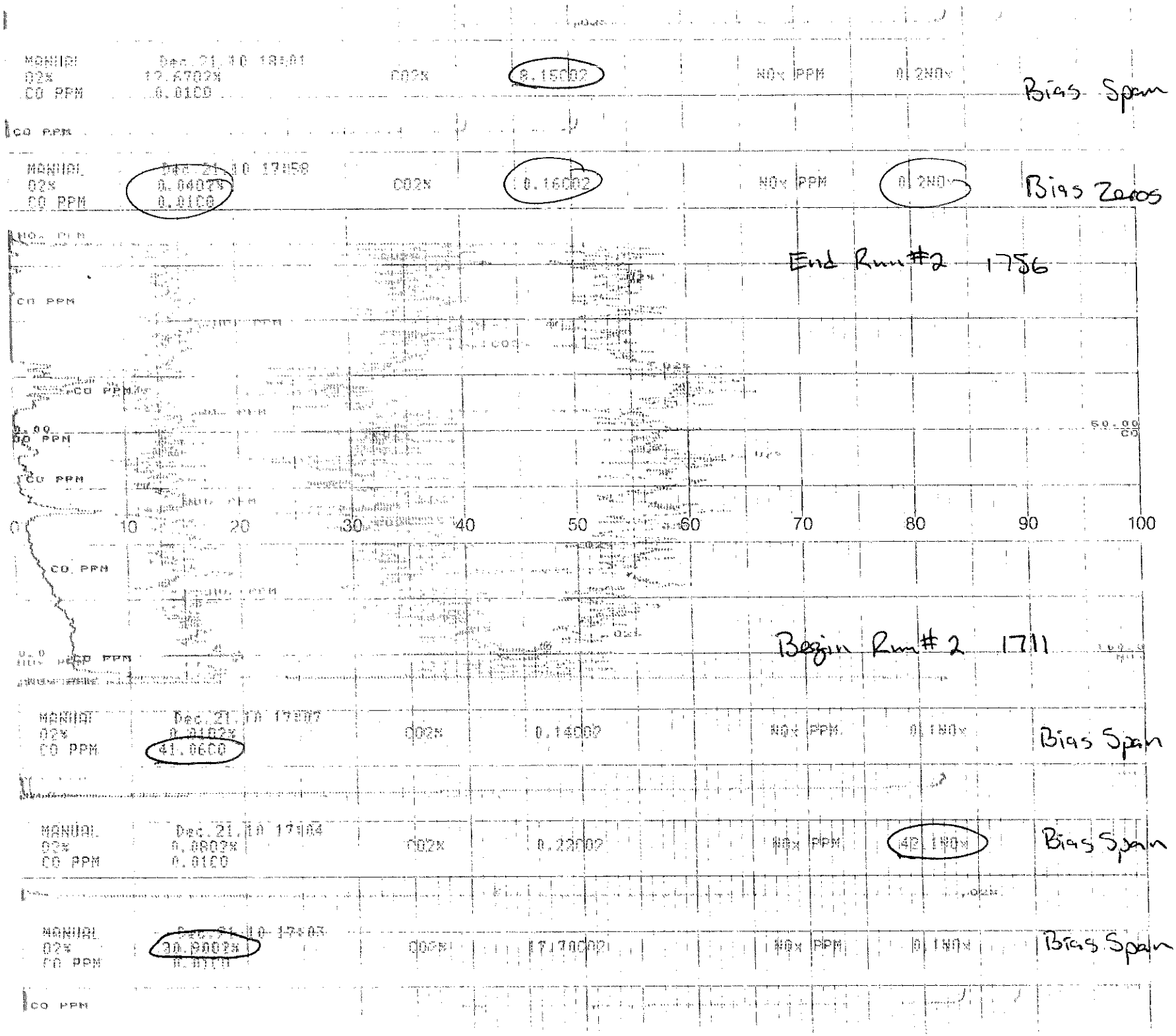
Sample Point	Time Start	Time Stop	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
	1813	1838	14.40	6.29	12.13	0.64		
	1850	1912						

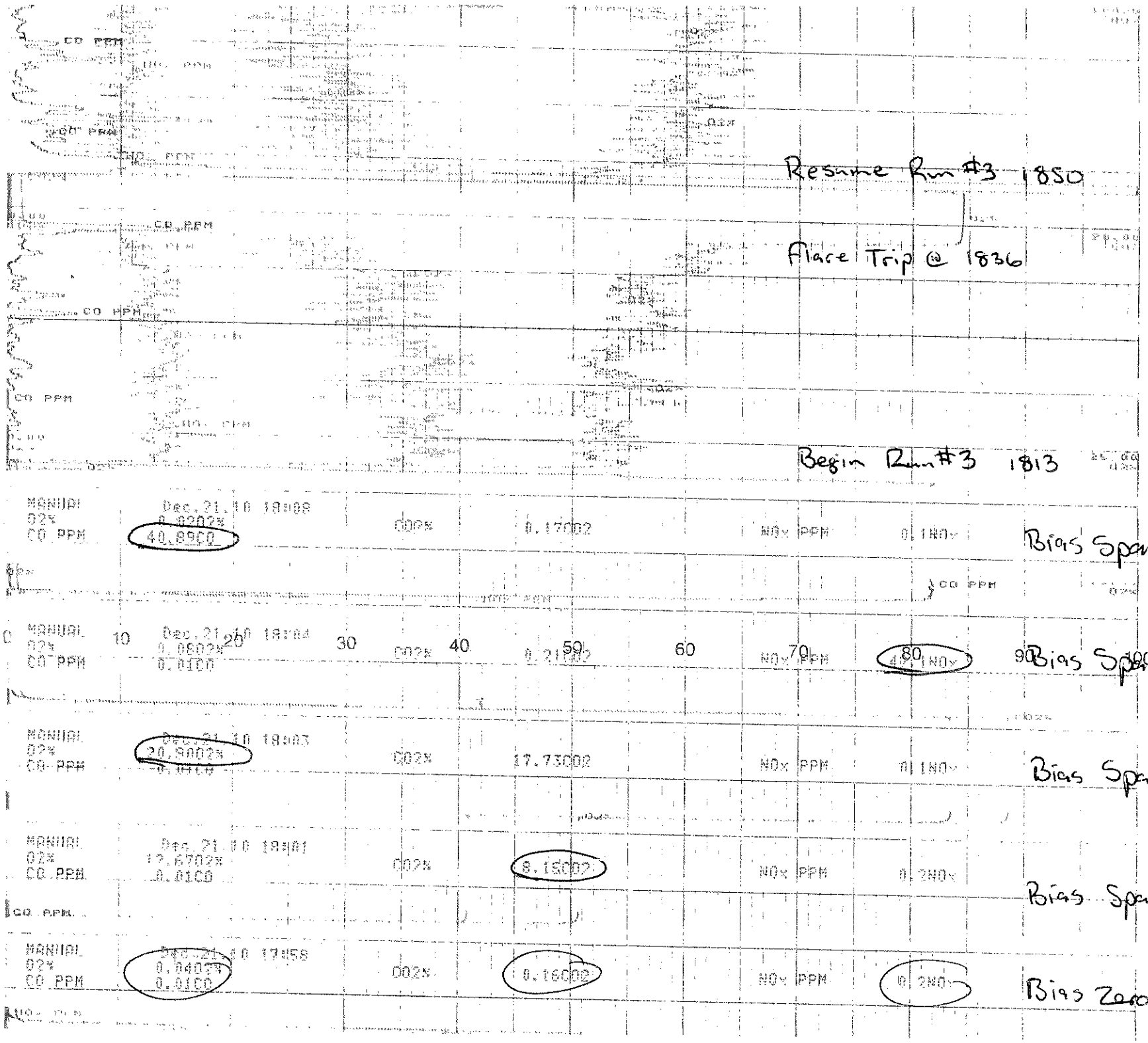
	Post-Test Analyzer System Bias Values					
System Bias Zero:	.03	0.16	0.1	0.01		
System Bias Span:	20.88	8.18	42.2	40.94		
	Post-Test Analyzer Calibration Values					
Zero Actual Value:						
Low Span Actual Value:						
Mid Span Actual Value:						
High Span Actual Value:						
	Test Results Summary					
	O2 (%)	CO2 (%)	NOx (PPM)	CO (PPM)	SO2 (PPM)	THC (PPM)
Raw Average:	14.38	6.18	12.41	0.65		
3% O2 Corrected Average:			34.07	1.79		
Lbs/Hr. Average:						

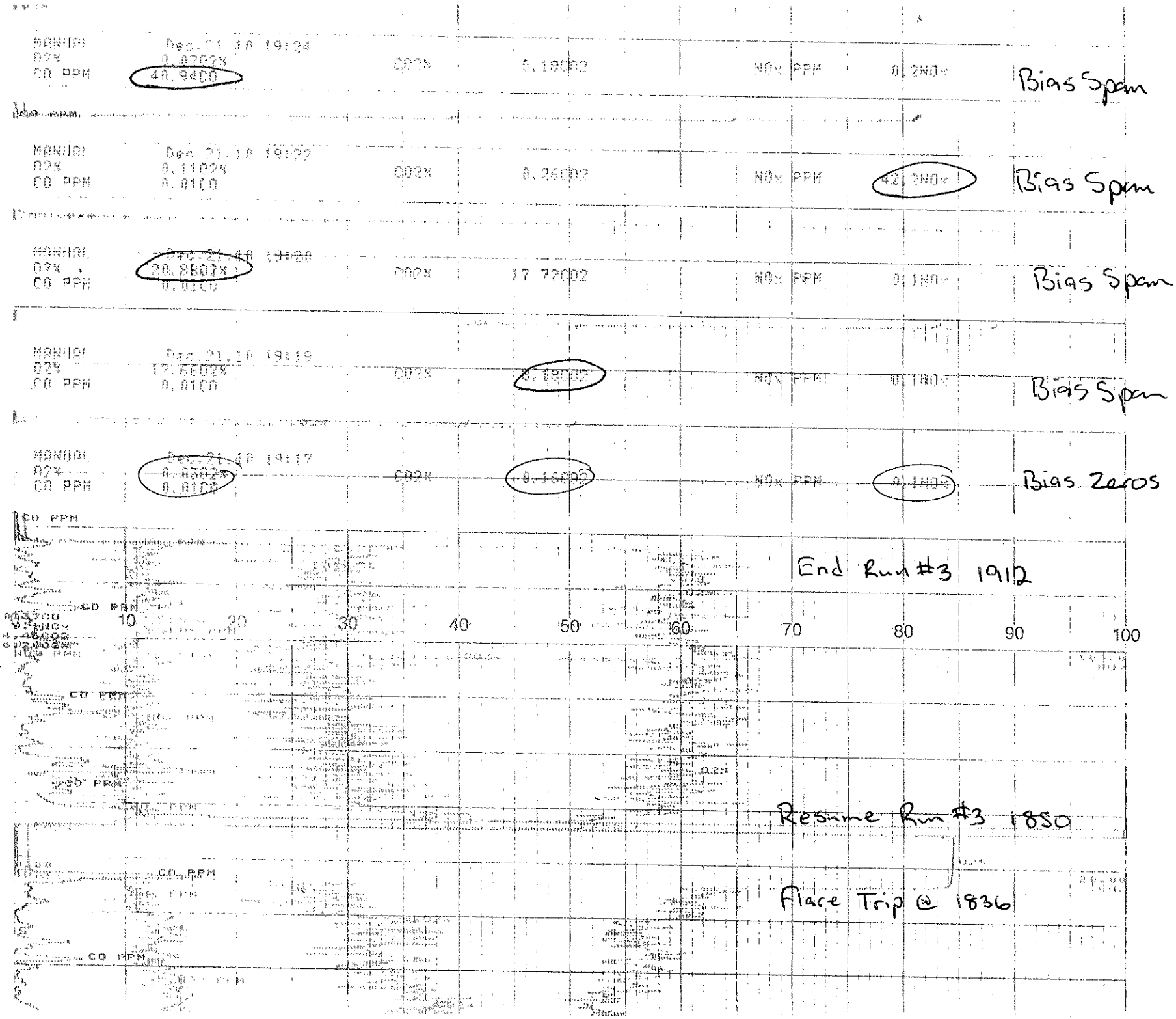

CO PPM 41.9CO
MANUAL Dec.21,10 12:52
02% 0.04O2%
CO PPM 0.01CO
CO2% 0.12CO2
NOx PPM 41.8NOx
MANUAL Dec.21,10 12:48
02% 20.72O2%
CO PPM 0.01CO
CO2% 17.70CO2
NOx PPM 0.3NOx
MANUAL Dec.21,10 12:46
02% 12.58O2%
CO PPM 0.01CO
CO2% 8.10CO2
NOx PPM 0.4NOx
MANUAL Dec.21,10 12:45
02% 0.05O2%
CO PPM 0.01CO
CO2% 0.10CO2
NOx PPM 0.4NOx
System Leak Check 0.0@ 12"Hg
CO PPM
0 MANUAL 10 Dec.21,10 12:40 30
02% 12.67O2%
CO PPM 25.0CO
40 50 60 70 80 90 100
CO2% 8.15CO2
NOx PPM 43.5NOx
Direct Mid Spa
MANUAL Dec.21,10 12:37
02% 20.98O2%
CO PPM 41.9CO
CO2% 17.77CO2
NOx PPM 85.2NOx
Direct High Sp
MANUAL Dec.21,10 12:35
02% 0.02O2%
CO PPM 0.01CO
CO2% 0.10CO2
NOx PPM 0.2NOx
Direct Zero
Maui County Landfill Flare Compliance Test 2010 H.Johnson SCEC 12/21/10


CO PPM 41.04CO
CO2% 0.14CO2
NOx PPM
0 2NOx
Bias Span
MANUAL Dec.21.10 16:01
O2% 0.1702%
CO PPM 0.0100
CO2% 0.25CO2
NOx PPM
41.8NOx
Bias Span
MANUAL
O2% 20.7702%
CO PPM 0.0100
CO2% 17.70CO2
NOx PPM
0 2NOx
Bias Span
MANUAL Dec.21.10 15:58
O2% 12.5602%
CO PPM 0.0100
CO2% 8.11CO2
NOx PPM
0 2NOx
Bias Span
MANUAL Dec.21.10 15:52
O2% 0.0402%
CO PPM 0.0100
CO2% 0.13CO2
NOx PPM
0 2NOx
Bias Zeros
Restart Compliance Test Re-Bias
flare unstable - trouble Shoot and adjust.
CO PPM 1.59CO
NOx PPM 18.7NOx
CO2% 5.37CO2
O2% 10.92O2%
MANUAL Dec.21.10 12:54
O2% 0.0102%
CO PPM 41.82CO
CO2% 0.11CO2
NOx PPM
0 4NOx
MANUAL Dec.21.10 12:52
O2% 0.0402%
CO2% 0.12CO2
NOx PPM
41 8NOx
10 20 30 40 50 60 70 80 90 100


MANUAL Dec.21,10 17:04
02% 0.0802%
CO PPM 0.01CO
CO2% 0.12002
NOx PPM 140 1H0%
Bias Span
MANUAL
02% 20.8002%
CO PPM 0.01CO
CO2% 17.7002
NOx PPM 0 1H0%
Bias Span
CO PPM
MANUAL Dec.21,10 17:01
02% 12.6102%
CO PPM 0.01CO
CO2% 8.1020
NOx PPM 0 2H0%
Bias Span
MANUAL Dec.21,10 16:59
02% 0.0802%
CO PPM 0.01CO
CO2% 0.1402
NOx PPM 0 2H0%
Bias Zeros
0 10 20 30 40 50 60 70 80 90 100
End Run #1 1655
Begin Run #1 1610
MANUAL Dec.21,10 16:04
02% 0.0402%
CO PPM 41.04CO
CO2% 0.1402
NOx PPM 0 2H0%
Bias Span
MANUAL Dec.21,10 16:01


MANUAL Dec.21,10 18:01
02% 12.6702%
CO PPM 0.0100
CO2% 0.15002
NOx PPM
0 2NOx
Bias Span
CO PPM
MANUAL Dec.21,10 17:58
02% 0.0402%
CO PPM 0.0100
CO2% 0.16002
NOx PPM
0 2NOx
Bias Zeros
End Run #2 1756
CO PPM
CO PPM
CO PPM
CO PPM
0 10 20 30 40 50 60 70 80 90 100
50.00 CO
Begin Run #2 1711
MANUAL Dec.21,10 17:07
02% 0.0102%
CO PPM 41.06C0
CO2% 0.14002
NOx PPM
0 1NOx
Bias Span
MANUAL Dec.21,10 17:04
02% 0.0802%
CO PPM 0.0100
CO2% 0.23002
NOx PPM
42 1NOx
Bias Span
MANUAL
02% 30.0002%
CO PPM
CO2%
NOx PPM
0 1NOx
Bias Span
CO PPM


Resume Run #3 1850
Flare Trip @ 1836
Begin Run #3 1813
MANUAL
O2%
CO PPM
Dec.21 10 18:08
0.0202%
40.89CO
CO2%
0.17002
NOx PPM
0.1NOx
Bias Span
MANUAL
O2%
CO PPM
Dec.21 10 18:04
0.0802%
0.01CO
CO2%
NOx PPM
0.1NOx
Bias Span
MANUAL
O2%
CO PPM
20.9802%
CO2%
17.73002
NOx PPM
0.1NOx
Bias Span
MANUAL
O2%
CO PPM
Dec.21 10 18:01
12.6702%
0.01CO
CO2%
8.15002
NOx PPM
0.2NOx
Bias Span
MANUAL
O2%
CO PPM
Dec.21 10 17:58
0.0402%
0.01CO
CO2%
0.18002
NOx PPM
0.2NOx
Bias Zeros


MONITOR Dec.21.10 19:24
O2% 0.0000%
CO PPM 48.9400
CO2% 0.1800?
NOx PPM 0.2NOx
Bias Span
MONITOR Dec.21.10 19:22
O2% 0.1102%
CO PPM 0.0100
CO2% 0.2600?
NOx PPM 42.2NOx
Bias Span
MONITOR Dec.21.10 19:20
O2% 20.9802%
CO PPM 0.0100
CO2% 17.7200?
NOx PPM 0.1NOx
Bias Span
MONITOR Dec.21.10 19:19
O2% 12.6602%
CO PPM 0.0100
CO2% 4.1800?
NOx PPM 0.1NOx
Bias Span
MONITOR Dec.21.10 19:17
O2% 0.0300%
CO PPM 0.0100
CO2% 0.1600?
NOx PPM 0.1NOx
Bias Zeros
CO PPM
End Run #3 1912
10 20 30 40 50 60 70 80 90 100
CO PPM
CO PPM
Resume Run #3 1850
CO PPM
Flare Trip @ 1836
CO PPM

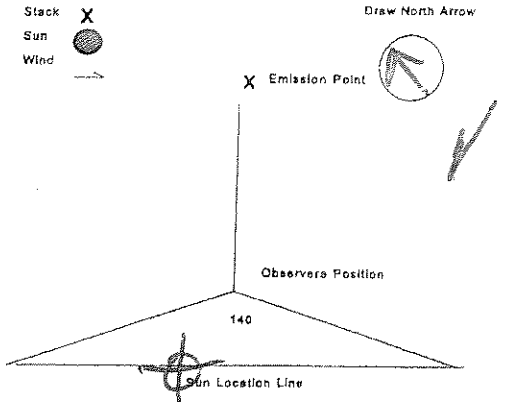
Flare #1

VISIBLE EMISSIONS FORM
STATE OF HAWAII
COVERED SOURCE PERMIT NO. 0652-01-C

Issuance Date: March 3, 2008 **Expiration Date:** March 2, 2013

Make Copies for Future Use For Each Equipment)

Permit No.: 0652-01-C
Company Name: Maui County Landfill
Equipment and Fuel: Flare LFG
Site Conditions:



Stack height above ground (ft): 35'
Stack distance from observer (ft): 110'
Emission color (black or white): Clear
Sky conditions (% cloud cover): Clear
Wind speed (mph): 0-3 mph
Temperature (°F): 79
Observer Name: Harry Johnson
Certified? (Yes/No): Yes
Observation Date and Start Time: 12/21/10 1630

SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%):					0

Observation Date and Start Time: 12/21/10 1636

SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%):					0

VISIBLE EMISSIONS FORM
STATE OF HAWAII
COVERED SOURCE PERMIT NO. 0652-01-C

Issuance Date: March 3, 2008 **Expiration Date:** March 2, 2013

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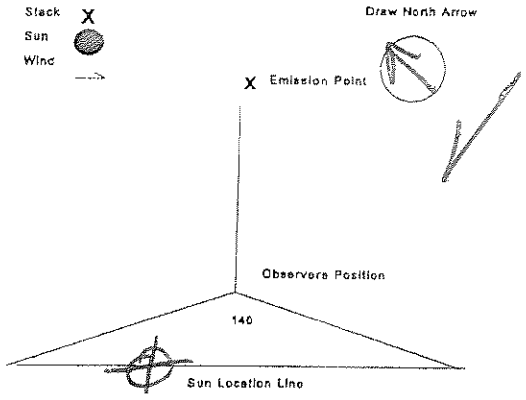
Permit No.: 0652-01-C
Company Name: Maui County Landfill
Equipment and Fuel: Flare LFG
Site Conditions:



Stack height above ground (ft): 35'
Stack distance from observer (ft): 110
Emission color (black or white): Clear
Sky conditions (% cloud cover): Clear
Wind speed (mph): 0-3 mph
Temperature (°F): 78
Observer Name: Hassy Johnson
Certified? (Yes/No): Yes
Observation Date and Start Time: 1720 12/21/10

SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%):					0

Observation Date and Start Time: 1726 12/21/10

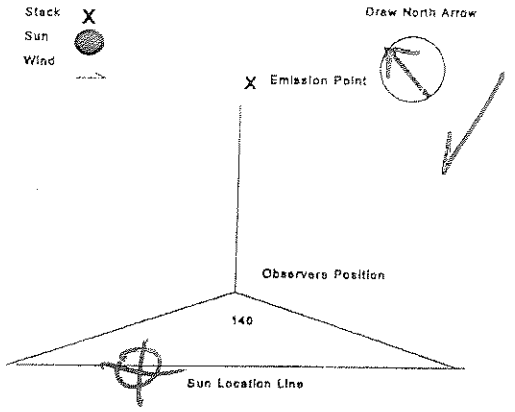
SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%):					

VISIBLE EMISSIONS FORM
STATE OF HAWAII
COVERED SOURCE PERMIT NO. 0652-01-C

Issuance Date: March 3, 2008 **Expiration Date:** March 2, 2013

Make Copies for Future Use For Each Equipment)

Permit No.: 0652-01-C
Company Name: Maui County Landfill
Equipment and Fuel: Flare LFG
Site Conditions:



Stack height above ground (ft): 35'
Stack distance from observer (ft): 110'
Emission color (black or white): Clear
Sky conditions (% cloud cover): Clear
Wind speed (mph): 0 - 1 mph
Temperature (°F): 77
Observer Name: Harry Johnson
Certified? (Yes/No): Yes
Observation Date and Start Time: 12/21/10 1815

SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%):					0

Observation Date and Start Time: 12/21/10 1821

SECONDS / MINUTES	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
Six (6) Minute Average Opacity Reading (%):					0

SCEC

Appendix B

Lab Results

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

January 11, 2011 LTR/003n/11

Harry Johnson
SCEC
98-030 Hekaha Street
Suite 1
Aiea, HI 96701

re: Central Maui LF

Dear Harry:

Please find enclosed the laboratory analysis reports, quality assurance summaries, and the original chain of custody form for eight SUMMA canister samples received December 23, 2010.

The samples were analyzed for permanent gases, ethane, and TGNMO. BTU reports were prepared from these analysis results, as requested

Sincerely,

AtmAA, Inc.

Michael L. Porter
Laboratory Director

Encl.
MLP/krm

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Permanent Gases and TGNMO Analysis in SUMMA Canister Samples

Report Date: January 11, 2011
Client: SCEC
Project Name: Central Maui Landfill
Location: Puunene, Maui, Hawaii
Project No.: 2486.3002

Date Received: December 23, 2010
Date Analyzed: January 3, - 5, 2011

ANALYSIS DESCRIPTION

Permanent gases are measured by thermal conductivity detection/gas chromatography (TCD/GC), EPA 3C. TGNMO was measured by Method 25 analysis, FID/TCA, total combustion analysis.

AtmAA Lab No.:	13570-1	13570-3	13570-5	13570-7
Sample ID:	In A1	In B1	In C1	In D1
	261	306	347	blank 377
	(Concentration in %v)			
Methane	41.8	41.5	40.6	---
Carbon Dioxide	36.6	36.9	36.4	na
Nitrogen	17.7	18.8	21.6	na
Oxygen	0.87	0.95	1.57	na
	(Concentration in ppmv)			
Ethane	<10	<10	<10	<1
TGNMO	5780	4910	5220	2.11

Results are reported on a wet basis.
TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC.
Ethane is reported as ppmvC.
na - not analyzed

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Site: Central Maui Landfill
Date Received: December 23, 2010
Date Analyzed: January 3, - 5, 2011

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in %v)			
Methane	In A1	41.8	41.8	41.8	0.0
	In B1	41.6	41.4	41.5	0.24
	In C1	40.5	40.6	40.6	0.12
Carbon Dioxide	In A1	36.5	36.7	36.6	0.27
	In B1	36.9	36.8	36.9	0.14
	In C1	36.3	36.4	36.4	0.14
Nitrogen	In A1	17.6	17.8	17.7	0.56
	In B1	18.7	18.9	18.8	0.53
	In C1	21.5	21.6	21.6	0.23
Oxygen	In A1	0.89	0.85	0.87	2.3
	In B1	0.97	0.92	0.95	2.6
	In C1	1.61	1.53	1.57	2.5
		(Concentration in ppmv)			
Ethane	In A1	<10	<10	---	---
	In B1	<10	<10	---	---
	In C1	<10	<10	---	---
TGNMO	In A1	5460	5390	5780	0.26
	In B1	4940	4880	4910	0.6
	In C1	5280	5170	5220	1.1

Four SUMMA canister samples, laboratory numbers 13570-(1,3,5,7), were analyzed for permanent gases and TGNMO. Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 15 repeat measurements from four canister samples is 0.67%.

Calculated values for Specific Volume, BTU and F (factor)

Report Date: January 11, 2011
Client: SCEC
Project Location: Central Maui Landfill
Date Received: December 23, 2010
Date Analyzed: January 3, - 5, 2011
AtmAA Lab No.: 13570-1 In A1 261

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S, Wt.%	
Methane	41.82	23.81	Carbon	33.71
Carbon dioxide	36.61	57.30	Hydrogen	5.99
Nitrogen	17.69	17.62	Oxygen	42.62
Oxygen	0.83	0.95	Nitrogen	17.62
Argon	0.037	0.053	Argon	0.05
$(CH_2)_n$	0.543	0.270	Sulfur	0.00

@ 68°F

Specific Volume	13.044
BTU/ft^3	427
BTU/ lb.	5566
F (factor)	10105

10260.5

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	21	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: January 11, 2011
Client: SCEC
Project Location: Central Maui Landfill
Date Received: December 23, 2010
Date Analyzed: January 3, - 5, 2011
AtmAA Lab No.: 13570-3 In B1 306

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S, Wt.%	
Methane	41.52	23.33	Carbon	33.22
Carbon dioxide	36.82	56.88	Hydrogen	5.87
Nitrogen	18.79	18.48	Oxygen	42.39
Oxygen	0.90	1.02	Nitrogen	18.48
Argon	0.040	0.056	Argon	0.06
$(CH_2)_n$	0.491	0.241	Sulfur	0.00

Specific Volume	13.014	
BTU/ft^3	423	@ 68°F
BTU/ lb.	5508	
F (factor)	10033	10187.4

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	21	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

Calculated values for Specific Volume, BTU and F (factor)

Report Date: January 11, 2011
Client: SCEC
Project Location: Central Maui Landfill
Date Received: December 23, 2010
Date Analyzed: January 3, - 5, 2011
AtmAA Lab No.: 13570-5 In C1 347

Specific volume, BTU(HHV), and F factor are calculated using labortatory analysis results for methane, carbon dioxide, nitrogen, oxygen, TGNMO, and sulfur compounds in equations that include assumed values for the specific volume of gases (CH4, CO2, N2, O2, Ar, and (CH2)n). The specific volume of gases were taken from the Scott Speciality Gases catalogue, 2001, and represents as is gas at 60° F and 1 atm. The F factor is calculated according to the equation in ASTM D-3588.B89

Component	Mole %	Wt %	C,H,O,N,S,	Wt.%
Methane	40.57	22.30	Carbon	31.93
Carbon dioxide	36.36	54.95	Hydrogen	5.61
Nitrogen	21.57	20.75	Oxygen	41.62
Oxygen	1.50	1.65	Nitrogen	20.75
Argon	0.067	0.092	Argon	0.09
$(CH_2)_n$	0.523	0.251	Sulfur	0.00

Specific Volume	12.997	
BTU/ft^3	414	@ 68°F
BTU/ lb.	5380	
F (factor)	9857	10,000

"as is" gas at 60° F, 1 atm, where CH4-1010, TGNMO-804 BTU/cu.ft.

Component	Specific volume reference values *	
Methane	23.35	(ft^3/lb)
Carbon dioxide	8.59	
Nitrogen	13.54	
Oxygen	11.87	
Argon	9.52	
(CH2)n	21	

* reference, Scott Specialty Gases Catalogue, 2001 adjusted to 60°F

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environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Permanent Gases and TGNMO Analysis in SUMMA Canister Samples

Report Date: January 11, 2011
Client: SCEC
Project Name: Central Maui Landfill
Location: Puunene, Maui, Hawaii
Project No.: 2486.3002

Date Received: December 23, 2010
Date Analyzed: January 3, - 5, 2011

ANALYSIS DESCRIPTION

Permanent gases are measured by thermal conductivity detection/gas chromatography (TCD/GC), EPA 3C. TGNMO was measured by Method 25 analysis, FID/TCA, total combustion analysis.

AtmAA Lab No.:	13570-2	13570-4	13570-6	13570-8
Sample ID:	Out A2	Out B2	Out C2	Out D2
	109	139	159	360
	(Concentration in %v)			
Methane	<0.0001	<0.0001	<0.0001	---
Carbon Dioxide	7.04	6.08	5.54	<0.1
Nitrogen	76.6	78.0	75.3	<0.1
Oxygen	11.8	13.9	14.4	<0.1
	(Concentration in ppmv)			
Ethane	<1	<1	<1	<1
TGNMO	4.98	5.65	7.49	1.95

Results are reported on a wet basis.
TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppmvC.
Ethane is reported as ppmvC.

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Site: Central Maui Landfill
Date Received: December 23, 2010
Date Analyzed: January 3, - 5, 2011

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in %v)			
Methane	Out A2	<0.0001	<0.0001	---	---
	Out B2	<0.0001	<0.0001	---	---
	Out C2	<0.0001	<0.0001	---	---
Carbon Dioxide	Out A2	7.05	7.03	7.04	0.14
	Out B2	6.10	6.06	6.08	0.33
	Out C2	5.51	5.56	5.54	0.45
Nitrogen	Out A2	76.2	76.9	76.6	0.46
	Out B2	77.4	78.5	78.0	0.71
	Out C2	75.2	75.3	75.3	0.07
Oxygen	Out A2	11.7	11.8	11.8	0.43
	Out B2	13.9	13.9	13.9	0.0
	Out C2	14.4	14.4	14.4	0.0
		(Concentration in ppmv)			
Ethane	Out A2	<1	<1	---	---
	Out B2	<1	<1	---	---
	Out C2	<1	<1	---	---
TGNMO	Out A2	5.00	4.96	4.98	0.40
	Out B2	5.77	5.53	5.65	2.1
	Out C2	7.71	7.26	7.49	3.0
	Out D2	2.20	1.69	1.95	13

Four SUMMA canister samples, laboratory numbers 13570-(2,4,6,8), were analyzed for permanent gases and TGNMO. Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 13 repeat measurements from four canister samples is 0.23%.

Chain of Custody Record
Analytical Services Request

SCEC
1582-1 N. Batavia St. Orange, CA 92867
(714) 282-8240 phone, (714) 282-8247 fax

Client/Project Name	Client Project No.	ANALYSES REQUESTED	Laboratory Name
Central Maui Landfill	2486.3002		ATMAA, Inc.
Project Location: Puunene Maui, Hawaii			Lab Contact: Mike Porter
Contact: Harry Johnson	Sampler (Signature):		Lab Phone No.: 818-223-3277
			Turnaround Time: Expedite!
			Remarks:

Sample #	Description	SAMPLE Date	Time	Type	Method 25c	ASTM ID 3588	Remarks
A1	Inlet 00261	12/21/10	1655	Summa	X	X	1
A2	Outlet 00109	12/21/10	1655	Summa	X		2
B1	Inlet 00306	12/21/10	1756	Summa	X	X	3
B2	Outlet 00139	12/21/10	1756	Summa	X		4
C1	Inlet 00347	12/21/10	1912	Summa	X	X	5
C2	Outlet 00159	12/21/10	1912	Summa	X		6
D1	Inlet Blank 00277	12/21/10	—	Summa	X	X	7
D2	Outlet Blank 00360	12/21/10	—	Summa	X		8

B = 10

	Company	Date	Time		Company	Date	Time
Relinquished by (Signature):	SCEC	12/22/10	1500	Received by (Signature):	SCEC	12/22/10	1035a
Relinquished by (Signature):	SCEC	12/22/10		Received by (Signature):	Fed Ex		
Relinquished by (Signature):				Received by (Signature):	ATMAA	12/23/10	11:00

C:\Users\HARRYS\AppData\Local\Temp\Chain of Custody Record

REACTIVE ORGANIC COMPOUNDS
EPA METHOD 25C
SCEC FIELD SAMPLING DATA SHEET

Job #: ~~1035~~ 2486.3002 Control Device: Flare

Facility: Maui County Landfill - Puunene Sample Location: Outlet

Location: ~~EPF~~ Maui Landfill Flare Ambient Temperature: 85

Date: Dec. 21, 2010 Barometric Pressure: 29.89

Operator: Clayton (SCEC)

SAMPLE A

inlet : 00261
outlet : 00109
Tank # :

Initial Vacuum: 25" Hg
initial time: 4:12pm
Final Vacuum: 9.9
final time: 4:57p

TIME (min.)	VACUUM ("Hg)
5min.	24.0
10	22.0
15	20.1
20	18.3
25	16.2
30	14.2
35	12.5
40	10.8
45	9.9

Leak Rate Pre: ✓

Leak Rate Post: ✓

SAMPLE B

inlet : 00306
outlet : 00139
Tank # :

Initial Vacuum: 25.8
initial time: ~~1711 (24)~~ 5:11p
Final Vacuum: 9.7
final time: 5:56p

TIME (min)	VACUUM ("Hg)	
5	~~25.~~	24.0
10	22.0	
15	20.3	
20	18.3	
25	16.1	
30	14.4	
35	12.4	
40	11.0	
45	9.7	

Leak Rate Pre: ✓

Leak Rate Post: ✓

SAMPLE C

inlet: ~~00347~~ 00306
outlet: 00159
Tank #:

Initial Vacuum: 26.0
initial time: 6:13p
Final Vacuum:
final time: ~~7:10p~~

TIME (min)	VACUUM ("Hg)	
5	24.3	
10	22.6	
15	20.4	
~~6:33p~~ 20	18.2	
~~6:50p~~ ~~25~~	6:36pm Flame out test ended 6:50p resumed	15.8
~~30~~		14.0
~~35~~		12.3
~~40~~		11.1
7:10p ~~45~~		9.8

Leak Rate Pre: ✓

Leak Rate Post: ✓

REACTIVE ORGANIC COMPOUNDS
EPA METHOD 25C
SCEC FIELD SAMPLING DATA SHEET

Job #: 2496.3002 Control Device: Flare

Facility: Maui County Landfill - Punnene Sample Location: Inlet

Location: ~~Test~~ Maui Landfill Flare Ambient Temperature: 85

Date: Dec. 21, 2010 Barometric Pressure: 29.89

Operator: x Sharis

SAMPLE A
(outlet ~~00109~~)
Tank # : inlet: 00261
0min Initial Vacuum: -22.5
initial time: 1610
Final Vacuum:
final time: 1655

TIME (min)	VACUUM ("Hg)
5	-20.5
10	-18.5
15	-16.5
20	-14.5
25	-12.5
30	-10.5
35	-8.5
40	-7
45	-6

Leak Rate Pre: ✓
Leak Rate Post: ✓

SAMPLE B
(outlet ~~00306~~) 00139
Tank # : inlet: 00306
0min Initial Vacuum: -22.5
initial time: 1711
Final Vacuum:
final time: 1756

TIME (min)	VACUUM ("Hg)
5	-20.5
10	-18.5
15	-16.5
20	-15.5
25	-12.5
30	-10.5
35	-9
40	-7.5
45	-6.5

Leak Rate Pre: ✓
Leak Rate Post: ✓

SAMPLE C
(outlet ~~00347~~ 00159)
Tank #: inlet: 00347
0min Initial Vacuum: -22.5
initial time: 1813
Final Vacuum:
final time: 1836/1915

TIME (min)	VACUUM ("Hg)
5	-20.5
10	-18.5
15	-16.5
20	-14
1850 25	-12.5
30	-11
35	-9.5
40	-8
45	-6.5

Leak Rate Pre: -5.5 ✓
Leak Rate Post: ✓

SCEC

Appendix C

Exhaust Volume Flow Data and Field Data

Maui County
Central Maui Landfill
December 21, 2010

SUMMARY OF EPA METHOD 19 SOURCE TEST DATA AND CALCULATIONS

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3
DATE		12/21/2010	12/21/2010	12/21/2010
FUEL FLOW - @ 68 DEG F	SCFM	506	503	505
CALORIFIC VALUE - @ 68 DEG F	BTU/CF	427	423	414
F FACTOR (Fd) - @ 68 DEG F	DSCF/MMBTU	10,261	10,187	10,119
EXHAUST O2 CONCENTRATION	%VD	12.62	13.67	14.38
HEAT INPUT - NATURAL GAS	MMBTU/MIN	0.2158	0.2127	0.2089
EXHAUST VOLUME FLOW RATE @ 68 DEG F	DSCFM	**5,593**	**6,265**	**6,776**

Maui County
Central Maui Landfill
December 21, 2010
Flare Colleeted Field Data

Run #	Time hh:mm	Stack Temp Deg. F	Inlet Flow scfm	Field Vac "Hg	Inlet Gas Deg. F
R1	1610	1505	504	8.5	89
R1	1625	1515	504	8.5	89
R1	1640	1506	499	8.5	89
R1	1655	1525	499	8.5	89
R2	1711	1526	503	8.5	89
R2	1726	1511	500	8.5	89
R2	1741	1517	503	8.5	89
R2	1756	1520	505	8.5	89
R3	1813	1500	502	8.5	89
R3	1828	1503	500	8.5	88
R3	1850	1530	507	8.5	88
R3	1857	1503	509	8.5	88
R3	1912	1490	505	8.5	88

503.1

Run #	Time	Stack Temp	Inlet flow	Field Vac	Inlet Temp
1	1610	1505	504	8.5	89
	1625	1515	504	8.5	89
	1640	1506	499	8.5	89
	1655	1525	499	8.5	89
2	1711	1526	503	8.5	89
	1726	1511	500	8.5	89
	1741	1517	503	8.5	89
	1756	1520	505	8.5	89
3	1813	1500	502	8.5	89
	1828	1503	500	8.5	88
1836 / rip	~~1843~~				
Resume	~~1858~~				
1850		1530	507	8.5	88
	1857	1503	509	8.5	88
	1912	1490	505	8.5	88

SCEC

Appendix D

Quality Assurance / Quality Control Data

VISIBLE EMISSIONS EVALUATOR

This is to certify that

HARRY JOHNSON

met the specifications of Federal Reference Method 9 and qualifies as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, NC. This certificate is valid for six months from date of issue.

386391
CERT NUMBER

8/11/2010
DATE OF SCHOOL

HONOLULU, HI
SCHOOL LOCATION

2/10/2011
CERTIFICATION EXP DATE

JOH231814
STUDENT ID NUMBER

Jody Monk
Director of Training

EASTERN TECHNICAL ASSOCIATES

HARRY JOHNSON

JOH231814 STUDENT ID NUMBER

met the specifications of Federal Reference Method 9 and qualifies as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, NC. This certificate is valid for six months from date of issue and expires on the date below.

HONOLULU, HI	8/11/2010	386391
SCHOOL LOCATION	DATE OF SCHOOL	CERT NUMBER
TMPS96	2/10/2011	
LAST LECTURE	CERTIFICATION EXP DATE	BEARER

Customer Support
Debbie Scalise
919-878-3188
www.eta-is-opacity.com

CALIBRATION ERROR

FACILITY:	Maui County	DATA FOR SAMPLING RUNS:		COMPLIANCE RUNS 1,2,3 (INITIAL)
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:		12/21/2010
OPERATOR:	HJJ	PROJECT No.:		2486.3002

PARAMETER	CYLINDER VALUE	ANALYZER CALIBRATION RESPONSE	ABSOLUTE DIFFERENCE	DIFFERENCE
UNITS	PPMV or % VOL	PPMV or % VOL	PPMV or % VOL	% OF GAS
O_2 - FULL SCALE	20.88			
O_2 - ZERO	0.00	0.02	-0.02	**-0.10**
O_2 - MID CAL	12.59	12.67	-0.08	**-0.38**
O_2 -HIGH CAL	20.88	20.88	0.00	**0.00**
CO_2 - FULL SCALE	17.75			
CO_2 - ZERO	0.00	0.10	-0.10	**-0.56**
CO_2 - MID CAL	8.064	8.15	-0.09	**-0.48**
CO_2 -HIGH CAL	17.75	17.77	-0.02	**-0.11**
NO_x - FULL SCALE	84.50			
NO_x - ZERO	0.00	0.2	-0.20	**-0.24**
NO_x - MID CAL	42.95	43.5	-0.55	**-0.65**
NO_x -HIGH CAL	84.50	85.2	-0.70	**-0.83**
CO - FULL SCALE	42.14			
CO - ZERO	0.00	0.01	-0.01	**-0.02**
CO - MID CAL	25.28	25.07	0.21	**0.50**
CO -HIGH CAL	42.14	41.95	0.19	**0.45**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 1		
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:			12/21/10	
OPERATOR:	HJJ	PROJECT No.:			2486.3002	
		INITIAL VALUES		FINAL VALUES		
PARAMETER	ANALYZER CALIBRATION RESPONSE	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	CALIBRATION DRIFT
UNITS	PPMV or % VOL	PPMV or % VOL	% OF SPAN	PPMV or % VOL	% OF SPAN	% OF SPAN
O_2 - ZERO	0.02	0.04	**-0.10**	0.00	**0.10**	**0.19**
O_2 - SPAN	20.88	20.77	**0.53**	20.90	**-0.10**	**-0.62**
CO_2 - ZERO	0.10	0.12	**-0.11**	0.14	**-0.23**	**-0.11**
CO_2 - SPAN	8.15	8.11	**0.23**	8.10	**0.28**	**0.06**
NO_x - ZERO	0.2	0.2	**0.00**	0.2	**0.00**	**0.00**
NO_x - SPAN	43.5	41.9	**1.89**	42.1	**1.66**	**-0.24**
CO - ZERO	0.01	0.01	**0.00**	0.01	**0.00**	**0.00**
CO - SPAN	41.95	41.04	**2.16**	41.06	**2.11**	**-0.05**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 2		
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:			12/21/10	
OPERATOR:	HJJ	PROJECT No.:			2486.3002	
		INITIAL VALUES		FINAL VALUES		
PARAMETER	ANALYZER CALIBRATION RESPONSE	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	CALIBRATION DRIFT
UNITS	PPMV or % VOL	PPMV or % VOL	% OF SPAN	PPMV or % VOL	% OF SPAN	% OF SPAN
O_2 - ZERO	0.02	0.00	**0.10**	0.04	**-0.10**	**-0.19**
O_2 - SPAN	20.88	20.90	**-0.10**	20.90	**-0.10**	**0.00**
CO_2 - ZERO	0.10	0.14	**-0.23**	0.16	**-0.34**	**-0.11**
CO_2 - SPAN	8.15	8.10	**0.28**	8.15	**0.00**	**-0.28**
NO_x - ZERO	0.2	0.2	**0.00**	0.2	**0.00**	**0.00**
NO_x - SPAN	43.5	42.1	**1.66**	42.1	**1.66**	**0.00**
CO - ZERO	0.01	0.01	**0.00**	0.01	**0.00**	**0.00**
CO - SPAN	41.95	41.06	**2.11**	40.89	**2.52**	**0.40**

NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	Maui County	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 3		
SOURCE ID/CONDITION:	Central Maui Landfill	DATE:			12/21/10	
OPERATOR:	HJJ	PROJECT No.:			2486.3002	
		INITIAL VALUES		FINAL VALUES		
PARAMETER	ANALYZER CALIBRATION RESPONSE	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	SYSTEM CALIBRATION RESPONSE	SYSTEM CALIBRATION BIAS	CALIBRATION DRIFT
UNITS	PPMV or % VOL	PPMV or % VOL	% OF SPAN	PPMV or % VOL	% OF SPAN	% OF SPAN
O2 - ZERO	0.02	0.04	**-0.10**	0.03	**-0.05**	**0.05**
O2 - SPAN	20.88	20.90	**-0.10**	20.88	**0.00**	**0.10**
CO2 - ZERO	0.10	0.16	**-0.34**	0.16	**-0.34**	**0.00**
CO2 - SPAN	8.15	8.15	**0.00**	8.18	**-0.17**	**-0.17**
NOx - ZERO	0.2	0.2	**0.00**	0.1	**0.12**	**0.12**
NOx - SPAN	43.5	42.1	**1.66**	42.2	**1.54**	**-0.12**
CO - ZERO	0.01	0.01	**0.00**	0.01	**0.00**	**0.00**
CO - SPAN	41.95	40.89	**2.52**	40.94	**2.40**	**-0.12**

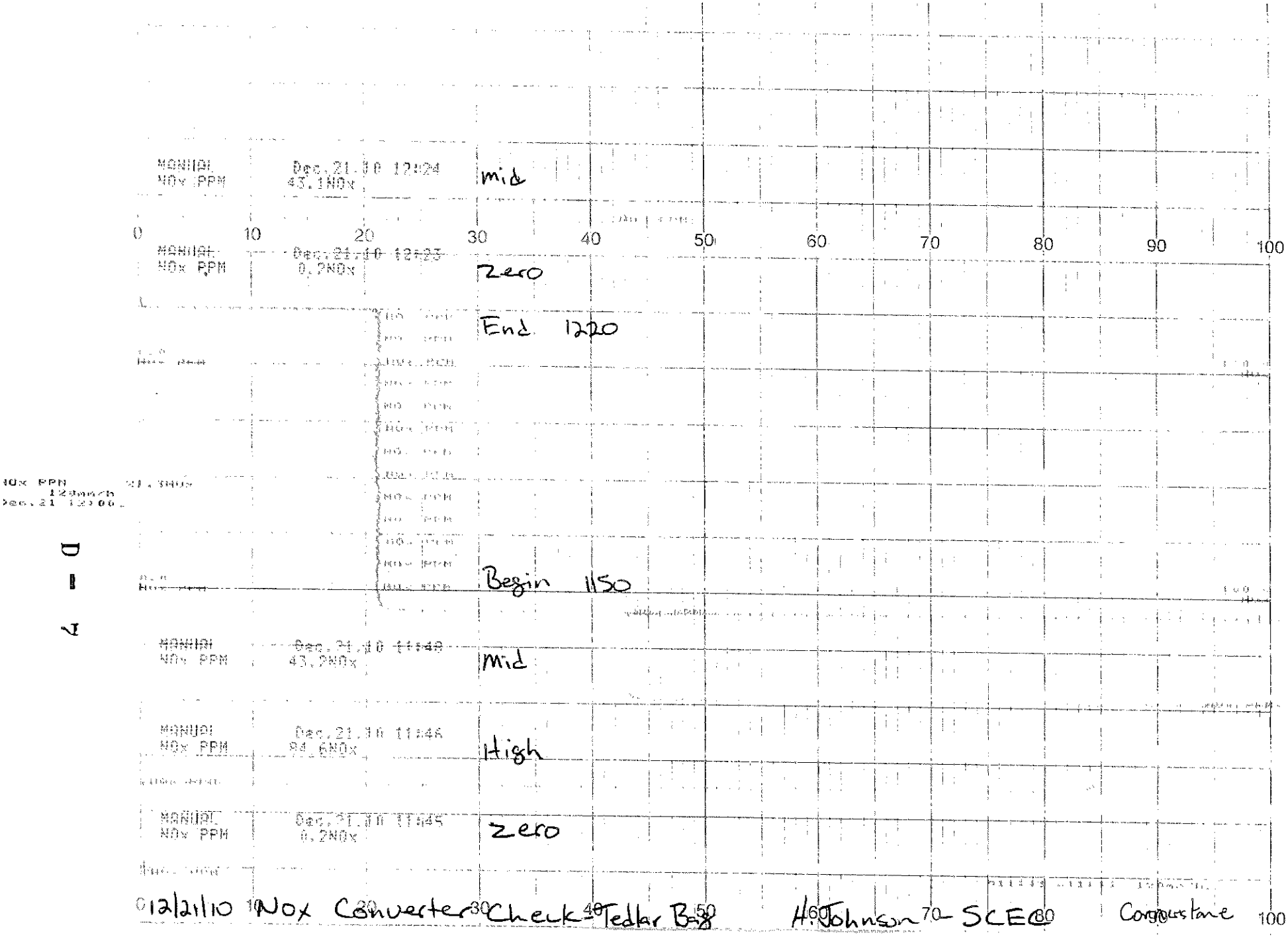
NOTE: CO2/O2 - % VOL AND NOx/CO - PPMV; ALL ON A DRY BASIS

MAUI COUNTY LANDFILL COMPLIANCE
NOx CONVERTER CHECK

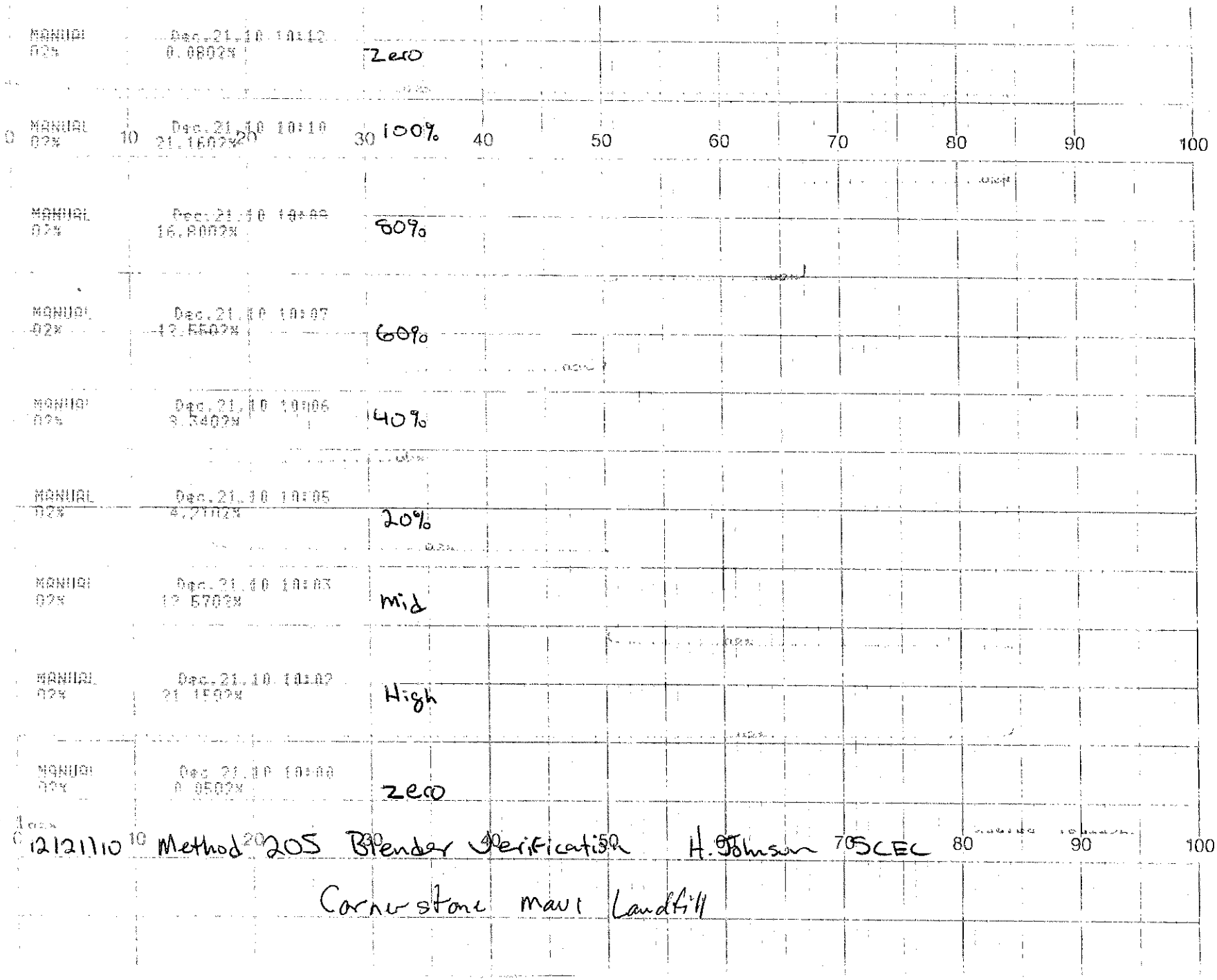
	Date	Time	NOx
Start Converter Check	12/21/2010	11:50:32	21.0
	12/21/2010	11:51:32	21.1
	12/21/2010	11:52:32	21.0
	12/21/2010	11:53:32	21.2
	12/21/2010	11:54:32	21.2
	12/21/2010	11:55:32	21.0
	12/21/2010	11:56:32	21.1
	12/21/2010	11:57:32	21.0
	12/21/2010	11:58:32	21.1
	12/21/2010	11:59:32	21.2
	12/21/2010	12:00:32	21.3
	12/21/2010	12:01:32	21.1
	12/21/2010	12:02:32	21.1
	12/21/2010	12:03:32	21.0
	12/21/2010	12:04:32	21.0
	12/21/2010	12:05:32	21.1
	12/21/2010	12:06:32	21.1
	12/21/2010	12:07:32	21.2
	12/21/2010	12:08:32	21.0
	12/21/2010	12:09:32	21.0
	12/21/2010	12:10:32	21.3
	12/21/2010	12:11:32	21.1
	12/21/2010	12:12:32	21.2
	12/21/2010	12:13:32	21.2
	12/21/2010	12:14:32	21.2
	12/21/2010	12:15:32	21.2
	12/21/2010	12:16:32	21.2
	12/21/2010	12:17:32	21.3
	12/21/2010	12:18:32	21.3
End Converter Check	12/21/2010	12:19:32	21.3

Peak	**21.3**
Final	**21.3**
Percent Difference	**0.00**

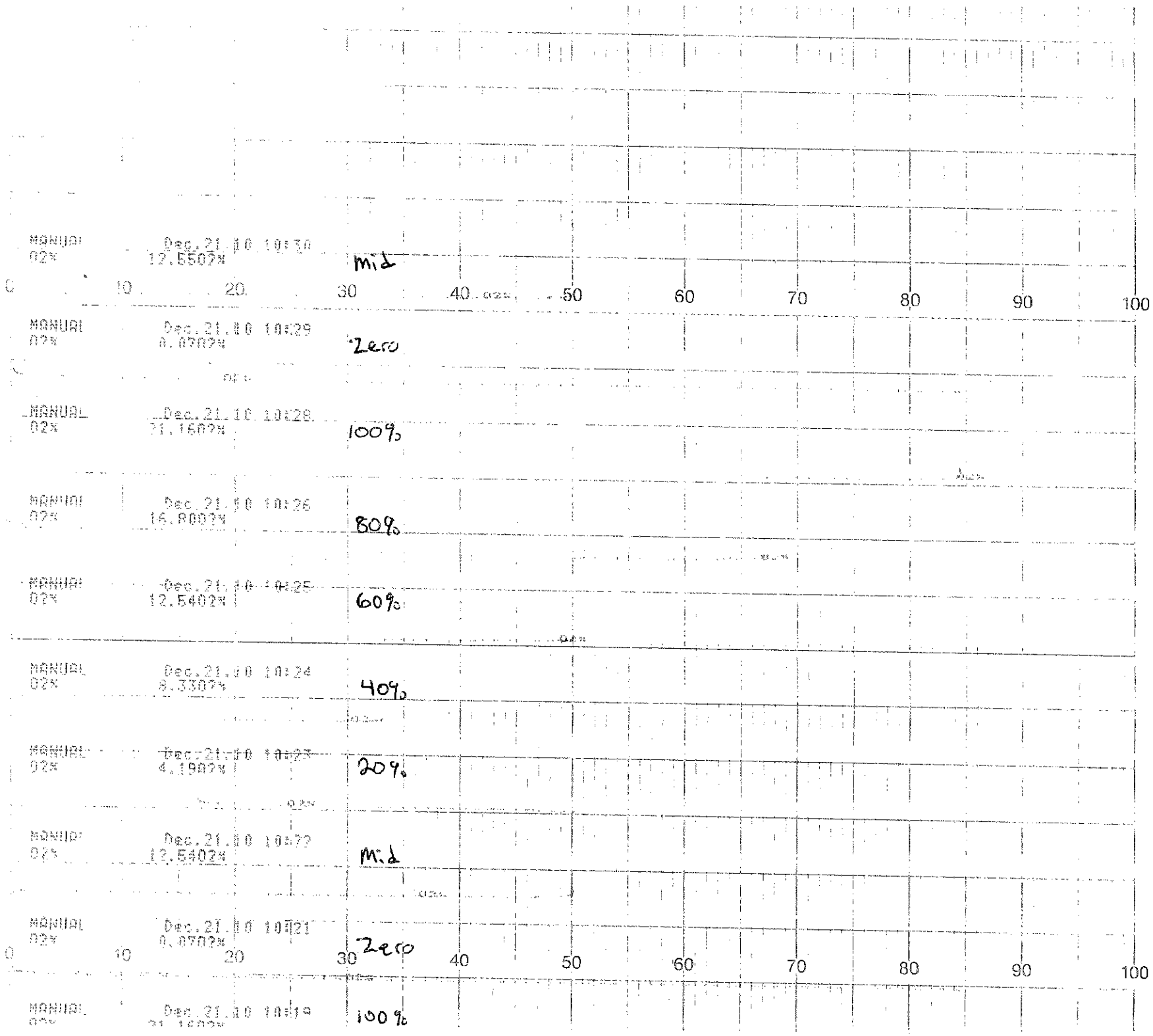
The NOx concentrations dropped no more than 2 percent absolute from the peak value observed.
The NOx converter has met the criterion of the test.


MONITOR
NOx PPM
Dec.21.10 12:24
43.1NOx
mid
0
10
20
30
40
50
60
70
80
90
100
MONITOR
NOx PPM
Dec.21.10 12:23
0.2NOx
Zero
End 1220
Begin 1150
MONITOR
NOx PPM
Dec.21.10 11:48
43.2NOx
mid
MONITOR
NOx PPM
Dec.21.10 11:46
94.6NOx
High
MONITOR
NOx PPM
Dec.21.10 11:45
0.2NOx
zero
12/21/10 Nox Converter Check Tedlar Bag H. Johnson SCE Compliance

D-7


MANUAL 02% Dec.21.10 10:12 0.0802%
Zero
MANUAL 03% Dec.21.10 10:10 21.1602%
100%
MANUAL 02% Dec.21.10 10:08 16.8802%
80%
MANUAL 02% Dec.21.10 10:07 12.5502%
60%
MANUAL 02% Dec.21.10 10:06 8.3402%
40%
MANUAL 02% Dec.21.10 10:05 4.2102%
20%
MANUAL 02% Dec.21.10 10:03 12.5702%
mid
MANUAL 02% Dec.21.10 10:02 21.1502%
High
MANUAL 02% Dec.21.10 10:00 0.0502%
zero
0 10 20 30 40 50 60 70 80 90 100
12121110 Method 205 Blender Verification H. Johnson SCEC
Cornerstone Maui Landfill

MANUAL
02%
Dec.21,10 10:12
4.1802%
20%
MANUAL
02%
Dec.21,10 10:12
12.6802%
M.P
MANUAL
02%
Dec.21,10 10:12
8.4802%
Zero
MANUAL
02%
Dec.21,10 10:12
31.1802%
100%
MANUAL
02%
Dec.21,10 10:12
15.7802%
60%
MANUAL
02%
Dec.21,10 10:12
12.6802%
60%
MANUAL
02%
Dec.21,10 10:12
8.3802%
40%
MANUAL
02%
Dec.21,10 10:12
4.1802%
20%
MANUAL
02%
Dec.21,10 10:12
12.6802%
M.P
MANUAL
02%
Dec.21,10 10:12
0.8802%
Zero
MANUAL
02%
Dec.21,10 10:12
21.1802%
100%
MANUAL
02%
Dec.21,10 10:12
16.8802%
60%
10
20
30
40
50
60
70
80
90
100


MANUAL Dec.21.10 10:30
02% 12.5502%
Mid
0 10 20 30 40 50 60 70 80 90 100
MANUAL Dec.21.10 10:29
02% 0.0702%
Zero
MANUAL Dec.21.10 10:28
02% 21.1602%
100%
MANUAL Dec.21.10 10:26
02% 16.8002%
80%
MANUAL Dec.21.10 10:25
02% 12.5402%
60%
MANUAL Dec.21.10 10:24
02% 8.3302%
40%
MANUAL Dec.21.10 10:23
02% 4.1902%
20%
MANUAL Dec.21.10 10:22
02% 12.5402%
Mid
MANUAL Dec.21.10 10:21
02% 0.0702%
Zero
0 10 20 30 40 50 60 70 80 90 100
MANUAL Dec.21.10 10:19
100%

CAPILLARY GAS BLENDER VERIFICATION CHECK

BLENDER NO: GD - HI-1

DATE: December 21, 2010

Analyzer:		TAI HI-1-O2		Range:	25 %	
High Gas Value:		21.14		Cylinder:	CC14694	
Mid Gas Value:		12.68		Cylinder:	CC14694	
Point #	%	Expected	Test 1	Test 2	Test 3	Average
1	20	4.23	4.21	4.18	4.19	4.19
2	40	8.46	8.34	8.33	8.33	8.33
3	60	12.68	12.55	12.54	12.54	12.54
4	80	16.91	16.80	16.79	16.80	16.80
5	100	21.14	21.16	21.16	21.16	21.16
Mid Gas	----------	12.68	12.55	12.54	12.55	12.55

Point #	Deviation from Average			Deviation from Expected		Limit
	Test 1	Test 2	Test 3			
	%	%	%	%		%
1	0.4	-0.3	-0.1	-0.8		+/- 2
2	0.1	0.0	0.0	-1.5		+/- 2
3	0.1	0.0	0.0	-1.1		+/- 2
4	0.0	0.0	0.0	-0.7		+/- 2
5	0.0	0.0	0.0	0.1		+/- 2
Mid Gas	0.0	-0.1	0.0	-1.1		+/- 2

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (951) 653-6780 • FAX (951) 653-2430

Report Of Analysis
EPA Protocol Gas Mixtures

SCEC01
TO: SCEC - AQ Specialists
Attn: Harry Johnson
98-030 Hekaha Street, Ste 1
Aiea, HI 96701
(808) 630-8005

REPORT NO: 56070-01
REPORT DATE: August 17, 2009
CUSTOMER PO NO: 311

CYLINDER NUMBER: CC50702 CYLINDER SIZE: 150A (141 std cu ft) CYLINDER PRESSURE: 2000 psig

COMPONENT	CONCENTRATION (v/v) ± EPA UNCERTAINTY	REFERENCE STANDARD	ANALYZER MAKE, MODEL, S/N, DETECTION	EXPIRATION DATE	REPLICATE ANALYSIS DATA
Carbon dioxide	17.75 ± 0.03 %	GMIS	Varian Model 3400	7/24/2012	7/24/2009
		CYLINDER #:	Serial # 10680		17.74 %
		CC51172	Thermal Conductivity		17.75 %
		@ 18.01 %	Gas Chromotography		17.75 %
			LAST CAL DATE: 7/7/2009	MEAN:	17.75 %
Oxygen	20.88 ± 0.28 %	GMIS	Varian Model 3800	7/27/2012	7/27/2009
		CYLINDER #:	Serial #		20.83 %
		ALM031591	Thermal Conductivity		20.99 %
		@ 24.35 %	Gas Chromotography		20.82 %
			LAST CAL DATE: 7/23/2009	MEAN:	20.88 %
Nitrogen	Balance				

ppm = umole/mole % = mole-%

The above analyses were performed in accordance with Procedure G1 of the EPA Traceability Protocol, Report Number EPA-600/R97/121, dated September 1997.
The above analyses are invalid if the cylinder pressure is less than 150 psig.

ANALYST: _____ APPROVED: _____
M.S.Calhoun J. T. Marrin

The only liability of this company for gas which fails to comply with this analysis shall be replacement or reanalysis thereof by the company without extra cost.

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
(323) 357-6891
Fax: (323) 567-3686
www.airgas.com

Part Number:	E03NI79E15A1083	Reference Number:	48-124215250-12
Cylinder Number:	CC330382	Cylinder Volume:	150 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Apr 20, 2010	Valve Outlet:	590

Expiration Date: Apr 20, 2013

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	8.000 %	8.064 %	G1	+/- 1% NIST Traceable
OXYGEN	12.50 %	12.59 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	991202	CC73606	14.84% OXYGEN/NITROGEN	Jan 01, 2013
NTRM	970510	SG9198971	10.818% CARBON DIOXIDE/NITROGEN	May 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS % CO2	NDIR	Apr 09, 2010
Siemens %O2	PARAMAGNETIC	Apr 09, 2010

Triad Data Available Upon Request

Notes:

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
(323) 357-6891
Fax: (323) 567-3686
www.airgas.com

Part Number:	E02NI99E15ACFX1	Reference Number:	48-124184125-2
Cylinder Number:	CC287588	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Jul 22, 2009	Valve Outlet:	660

Expiration Date: Jul 22, 2011

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NITRIC OXIDE	42.50 PPM	42.55 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		42.95 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	060610	CC206141	49.38PPM NITRIC OXIDE/NITROGEN	Feb 10, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 NO	FTIR	Jul 06, 2009

Triad Data Available Upon Request

Notes:

QA Approval

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
(323) 357-6891
Fax: (323) 567-3666
www.airgas.com

Part Number:	E02NI99E15A0916	Reference Number:	48-124206729-1
Cylinder Number:	CC7304	Cylinder Volume:	136 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	1900 PSIG
Analysis Date:	Jan 28, 2010	Valve Outlet:	660

Expiration Date: Jan 28, 2012

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NITRIC OXIDE	850.0 PPM	845.0 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		845.1 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	60603	CC255555	1025PPM NITRIC OXIDE/NITROGEN	May 01, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700A NO	FTIR	Jan 15, 2010

Triad Data Available Upon Request

Notes:

QA Approval

Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
(323) 357-6891
Fax: (323) 567-3686
www.airgas.com

Part Number:	E02NI99E15A1380	Reference Number:	48-124223697-4
Cylinder Number:	CC212478	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Jun 24, 2010	Valve Outlet:	350

Expiration Date: Jun 24, 2013

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	42.50 PPM	42.14 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	98050317	SG9197009B	50.46PPM CARBON MONOXIDE/NITROGEN	Oct 02, 2010

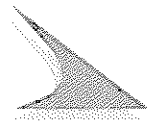
ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nocolet 6700 CO	FTIR	Jun 08, 2010

Triad Data Available Upon Request

Notes:

Approved for Release



Appendix E

Calculations

SCEC

EXAMPLE CALCULATIONS

CONTINUOUS MONITORING

Client : Cornerstone Environmental

Facility : Maui municipal Landfill Date : 12/21/10

Sample Location : Flare Exhaust Run No : 1

EFFLUENT GAS CONCENTRATION NOx

$$Cgas = \frac{(Cavg - Co)}{(Cm - Co)} * Cma$$

$$Cgas = \frac{(16.12 - 0.11)}{(42.00 - 0.11)} * (42.95)$$

Cgas = 16.41 ppmvd

EFFLUENT GAS CONCENTRATION - OXYGEN CORRECTION

$$Cgas(Corr) = Cgas * \frac{(20.9 - \%O2corr)}{(20.9 - \%O2stk)}$$

$$Cgas(Corr) = (16.41) * \frac{(20.9 - 3)}{(20.9 - 12.62)}$$

Cgas(Corr) = 35.49 ppmvd

DSCFM = Inlet flow(scfm) * Fd * mmBtu/hr * $\frac{20.9}{20.9 - \%O2}$

DSCFM = 506 * 10,261 * 0.000427 * $\frac{20.9}{20.9 - 12.62}$

DSCFM = 5,596 (rounding due to 5 sig figures)

EFFLUENT GAS MASS EMISSION RATE

E1 = Cgas * MW * Qsd * K1

E1 = (16.41) * (46.01) * (5,593) * (1.557E-07)

E1 = 0.66 LB/Hr

E2 = Cgas * MW * K2 * Fd * (20.9/(20.9- %O2stk))

E2 = (16.41) * (46.01) * (2.59E-09) * (10,260.5) * (20.9/(20.9- 12.62))

E2 = 0.0506 LB/mmBtu

NOMENCLATURE

		Units
Cavg	Average gas concentration of analyzer	ppmvd
Cgas	Effluent gas concentration	ppmvd
Cgas(Corr)	Effluent gas concentration, oxygen corrected	ppmvd
Co	Average of initial and final system bias checks for the zero gas	ppmvd
Cm	Average of initial and final system bias checks for the upscale gas	ppmvd
Cma	Actual concentration of the upscale calibration gas	ppmvd
E1	Mass Emission Rate based on volume flow rate	lb/hr
Qsd	Stack exhaust flow rate	DSCFM
Fd	Oxygen Based F-Factor (9190-Oil) 8710 - Dedicated	DSCF/mmBtu
K1	Conversion Factor (1.583 E-07, 1.557 E-07, 1.553 E-07 @ 60,68,70 deg F Std Temp	lb-mole*min/mg*dscf*Hr
K2	Conversion Factor (2.59 E-09 @ 68 deg F)	lb-mole/dscf*E-06
MW	Molecular Weight (Nox = 46.01, SO2 = 64.06, CO = 28)	lb/lb-mole
O2corr	Oxygen value to be corrected to	%
O2stk	Oxygen value of effluent	%
CO2stk	Carbon Dioxide value of effluent	%

SCEC

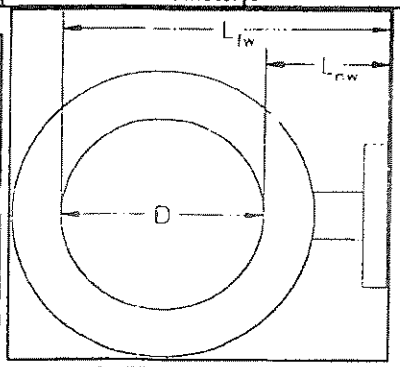
Appendix F

Sample Point Locations

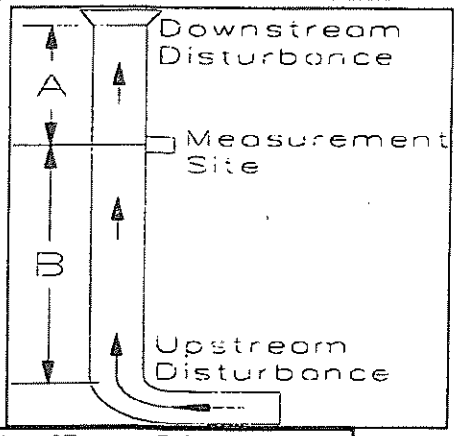
METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Central Maui Landfill	Date	11/18/08
Sampling Location	New Flare	Project #	2170.3001
Operator	LAJ	# of Ports Available	4
Stack Type	Circular	# of Ports Used	4
Stack Size	Large	Port Inside Diameter	3

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	123.25	in
Distance to Near Wall of Stack	(L_{nw})	0.00	in
(=Lfw - Lnw) Diameter of Stack	(D)	123.25	in
(=3.14(D/2/Cunits)2) Area of Stack	(A_s)	82.85	ft^2



Distance from Port to Disturbances			
Distance Upstream	(B)	370.00	in
(=B/D) Diameters Upstream	(B_D)	3.00	diameters
Distance Downstream	(A)	71.00	in
(=A/D) Diameters Downstream	(A_D)	0.58	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of[1] Traverse Points	
Up Stream	Down Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12[2]	8 or 12[2]
Upstream Spec		24	16
Downstream Spec		24	16
Traverse Pts Required		24	16

[1] Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.
[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
4	Ports by	4	Across
16	Pts Used	16	Required
☐	Particulate	☑	Velocity

Location of Traverse Points in Circular Stacks						
Traverse Point Number	(Fraction of Stack Diameter from Inside Wall to Traverse Point) Number of Traverse Points on a Diameter					
	2	4	6	8	10	12
1	.146	.067	.044	.032	.026	.021
2	.854	.250	.146	.105	.082	.067
3		.750	.296	.194	.146	.118
4		.933	.704	.323	.226	.177
5			.854	.677	.342	.250
6			.956	.806	.658	.356
7				.895	.774	.644
8				.968	.854	.750
9					.918	.823
10					.974	.882
11						.933
12						.979

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Nipple Length
		in	in
1	0.032	4	4
2	0.105	13	13
3	0.194	23 7/8	23 7/8
4	0.323	39 6/8	39 6/8
5			
6			
7			
8			
9			
10			
11			
12			