SCEC

September 20, 2004

Mr. Ken Ayster
SCS Engineers
3711 Long Beach Blvd.
9th Floor
Long Beach, CA 90807

Subject: **Final Source Test Report – Otay Landfill John Zink Flare**
SCEC Job No. 2170.1005

Dear Mr. Ayster:

Enclosed please find one copy of the Final Source Test Report for your review.

Please call (714) 282-8240 if you have any questions, comments or require additional information.

Sincerely,
SCEC

David Evans

Mr. David E. Evans
Project Scientist

2170.1005.ltr6.doc

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SCEC

OTAY LANDFILL FLARE STATION COMPLIANCE SOURCE TEST REPORT

PREPARED FOR:
SCS ENGINEERS
3711 Long Beach Blvd. 9th Floor
Long Beach, CA 90807

EQUIPMENT LOCATION:
Otay Landfill
1700 Maxwell Rd.
Chula Vista, CA
91910-0000

TEST DATE:
July 29, 2004

ISSUE DATE:
September 6, 2004

PARAMETERS MEASURED:
NO_x, CO and NMOC Emissions

TESTED BY:
David E. Evans
SCEC
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Project No: 2170.1005

Tested By: David E. Evans
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1.0 Executive Summary

SCS Engineers retained SCEC to perform compliance testing on one landfill gas flare station located at the Otay Landfill facility in Chula Vista, California. Source testing was conducted to demonstrate compliance with the San Diego Air Pollution Control District (SCAPCD) Authority to Construct Application Number 979036. SCEC determined emissions of oxide of nitrogen (NO_x) carbon monoxide (CO) and non-methane organic compounds (NMOC) from the flare exhaust. Inlet NMOC was also measured. Flare destruction efficiency was calculated for NMOC. The flare station was tested at current maximum conditions. The source test was performed on July 29, 2004

Testing was conducted in accordance with the source test protocol prepared and submitted on June 30, 2004 by SCEC and approved by SDAPCD prior to the test event

The results are shown below in Table 1-1 and are the average of triplicate runs. Mass emissions rates are based on EPA Method 19, inlet flow and calculated EPA F factor.

TABLE 1-1
SUMMARY OF TEST RESULTS
OTAY LANDFILL FLARE STATION
July 29, 2004

PARAMETER	UNITS	INLET		EXHAUST	LIMITS
O_2	%	4.00		12.61	
CO_2	%	34.27		7.57	
N_2	%	29.87		79.59	
H_20	%	2.17		9.61	
FLOW RATE	WSCFM	2342		-	
FLOW RATE [1]	DSCFM	1,949		19,748.6	<5,000 inlet
FLOW RATE [2]	DSCFM	-		28,821	
EXHAUST TEMPERATURE	deg F	-		1,444.9	
COMBUSTION ZONE TEMPERATURE [3]	deg F	-		1650	
CALORIFIC VALUE	BTU/SCF	401.6		-	
EPA F FACTOR	DSCF/MMBTU	10,004.4		-	
NO_x	PPMV	-		14.51	
	PPMV @ 3 $\%O_2$	-		31.21	
	LB/HR AS NO_2 [3]	-		2.05	
	LB/MMBTU	-		0.038	0.06 BACT
CO	PPMV	-		3.03	
	PPMV @ 3 $\%O_2$	-		6.49	
	LB/HR [4]	-		0.26	
	LB/MMBTU	-		0.006	0.02 BACT
TGNMO as HEXANE	PPMV	247.26	<	0.23	
	PPMV @ 3 $\%O_2$	261.56	<	0.50	<20 ppm
	LB/HR [4]	6.48	<	0.06	
	LB/MMBTU	0.68	<	0.0013	
DESTRUCTION EFFICIENCY	%	-	>	99.05	>98%

[1] Volume flow rate calculated by EPA Method 19.

[2] Volume flow rate measured by EPA Methods 1-4.

[3] Combustion set point.

[4] Mass emission rate calculated utilizing volume flow rate calculated by EPA Method 19.

2.0 Introduction

2.0 Introduction

The following test methods were used:

TABLE 2-1
Testing Methodologies

Parameter	Test Method
$NO_x/CO/O_2/CO_2$	SDAPCD Method 100
NMOC	EPA 18
Speciated Organics	EPA TO-15
Volume Flow Rate	EPA Methods 1 to 4, EPA Method 19

All raw data was reduced and used to calculate the final results as listed in Appendix A. The calculations were performed by computer programs that have passed quality control inspections. Detailed results (computer spreadsheet data) and raw data are provided in Appendix A, strip chart copies are located in Appendix B, quality assurance documentation is contained in Appendix C, laboratory reports are provided in Appendix D, and Authority to Construct is provided in Appendix E.

The testing program was coordinated by Mr. Ken Ayster, SCS Engineers.. The testing was performed by Mr. David E. Evans - Project Manager, and Mr. Robert Conklin - Technician from SCEC. The test program was observed by SDAPCD representative Mr. Larry Owusu.

3.0 Equipment and Process Description

The landfill operates a gas blower collection system that maintains a negative pressure on the landfill. The landfill gas is collected from extraction wells and is then incinerated in a John Zink flare. The flare is rated at 150 MMBtu/hr and is equipped with an optical flame detector, automatic shut-off valve, stack thermocouple, flame arrestor and sampling ports. The stack is approximately thirteen (13) feet in diameter and fifty (50) feet in height. The flare is equipped with a propane gas pilot and a control system to retain combusted landfill gas for 0.3 seconds at a temperature of 1,500 °F. A flame arrestor is provided between the flare and the landfill gas supply piping. A safety control system shuts down the supply landfill gas valve and blower power in cases of flame-out, excess flare temperature or excess pressure in the piping system. Scrubbers are used for removing moisture and particulates from the landfill gas. Three blowers are used to create vacuum to pull landfill gas through piping from the landfill's gas collection system.

4.0 Discussion of Results

The testing was performed according to the reference methods. All system bias checks were less than 5%, all system bias drifts were less than 2%, and all internal calibrations were less than 2%. In addition, all checks of NO_2 system loss were less than 15% and all NO_2 converter checks were above 90% efficiency.

All exhaust samples were collected while traversing the stack to minimize stratification effects. The number of traverse points used to measure the stratification/concentration values was sixteen (16). The sampling location meets the minimum requirements of 0.5 diameters upstream and 2.0 diameters downstream of the nearest flow disturbance.

5.0 Sampling Methodology

The field sampling procedures that were used for this test program are described in this section. The purpose of this section is to provide an overview of the sampling methods.

5.1 SDAPCD Method 100 - Continuous Gaseous Emissions Sampling

A continuous sample was extracted from the stack through a stainless steel probe, coarse filter, heated Teflon line, sample conditioner (condensate system) and a electronic chiller and then drawn via 3/8" Teflon line to the Mobile Emissions Laboratory (MEL). The condensation system consisted of three 500 ml short steam glass impingers connected in a series and immersed in a ice/water mixture. Peristaltic pumps were installed on the first two impingers to continuously remove condensed water from the impinger. The sample was filtered again through a fine Balston filter and finally introduced to the analyzers through the sample manifold and dedicated flow meters. A schematic of the sample manifold is provided below.

Prior to beginning the test, a system leak check was performed. The leak check was accomplished by plugging the probe tip and drawing >25" Hg vacuum on the entire sampling system. When all flow meters indicated 0.000 scfh flow, the system was proven to be free of all leaks.

Three-point analyzer calibration error checks were performed before each triplicate run. System bias checks (using the mid gas of the three-point calibration) were performed before and after each run. In addition, a converter check, a NO zero and NO calibration error check were performed between each run. At the end of each triplicate, mid-point calibration error checks were performed.

The analyzer calibration error checks are performed by delivering calibration gases directly to analyzers. The system bias checks were performed by delivering zero and mid-point calibration gas through the entire sample line and recording the as-found concentration.

5.0 Sampling Methodology (Continued)

5.1 SDAPCD Method 100 - Continuous Gaseous Emissions Sampling (Cont.)

All concentrations from the NO_x, CO, CO_2, and O_2 analyzers were collected by a computer data acquisition system (DAS). For the NO_x analyzer, all parameters (NO, NO_2 and NO_x) were measured and recorded by the DAS. The flare's NO_x emissions were adjusted for NO_2 losses by the equations listed in SDAPCD Method 100, Section 7.2.3 for "High NO_2 Sites".

Equations:

$$\text{NO ppm} = (\text{NO Conc} - \text{Average Zero Bias}) \times \frac{\text{NO Cal Gas Value}}{\text{Average NO Span Bias} - \text{Average NO Zero Bias}}$$

ppm @ 3% O_2 = ppm obsv. x 17.95/(20.95-%O_2 obsv.)
ppm @ 15% O_2 = ppm obsv. x 5.95/(20.95-%O_2 obsv.)

5.0 Sampling Methodology (Continued)

CONTINUOUS MONITORING LAB - TVII

O_2 ANALYZER, CELL TYPE	AMI MODEL 320A S/N 113160
Response Time (0-90%)	< 10 Seconds
Accuracy	+/- 1% of scale at constant temperatures; +/- 1% of scale or +/- 5% of reading, whichever is greater, over the operating temperature range
Output	0-1V
Range	0-5%, 0-25%, 0-100%
CO GAS FILTER CORRELATION Non-Dispersive Infrared	THERMO ELECTRON MODEL 48H S/N 48H-35546-250
Response Time (0-95%)	10 seconds
Span Drift	+/- 1% full scale in 24 hours
Zero Drift	+/- 0.2 ppm in 24 hours
Linearity	+/- 1% full scale, all ranges
Accuracy	+/- 0.1 ppm
Output	0-10mV, 0-100mV, 0-1V, 0-5V, 0-10V
Range	100, 200, 500, 1000, 2000, 5000, 10000, 20000, and 50000 ppm

5.0 Sampling Methodology (Continued)

CONTINUOUS MONITORING LAB - TVII (cont.)

NO_x CHEMILUMINESCENT ANALYZER	THERMO ELECTRON MODEL 42H S/N 42H-49814-284
Response Time (0-90%)	2.5 seconds in NO mode 5.0 seconds in NO_x mode
Noise	25 PPB
Zero Drift (24 hrs)	50 PPB
Detection Limit	50 PPB
Span Drift (24 hrs)	+/- 1% of full scale
Linearity	+/- 1% of full scale
Sample Flow Rate	25 cc/min.
Bypass Flow Rate	250 to 1100 cc/min.
Output	NO, NO_2, NO_x, 0-10V, Selectable Voltage 4-20 mA, RS-232
Ranges	0-10 ppm, 0-20 ppm, 0-100 ppm, 0-200 ppm, 0-500 ppm, 0-1000 ppm, 0-2000 ppm, 0-5000 ppm
CO_2 NON-DISPERSIVE INFRARED	HORIBA MODEL PIR 2000
Span Drift	+/- 1% per 24 hours at full scale
Zero Drift	+/- 1% per 24 hours at full scale
Response Time	Selectable 0.5 - 1.2 seconds
Repeatability	+/- 0.5% of full scale
Output	0-10mV, 0-100mV, 0-1V, 0-5V
Range	0-2%, 0-10%, 0-20%

5.0 Sampling Methodology (Continued)

CONTINUOUS MONITORING LAB - TVI (continued)

STRIP CHART RECORDER	YOKOGAWA MODEL HR2400
Scan Cycle Time	1-60 seconds
Scanning Rate	60ms/Channel
Input Impedance	More than 10 M ohms for 2V or lower ranges, approximately 1 M ohms on 6V or higher ranges
Input Bias	Less than 10mA
Temperature Spread on Terminals	0.3% among input terminals
Temperature Coefficient	Zero drift 0.01% of range/°C Full span 0.01% of range/°C
Max. Allowable Input Voltage	60 VDC
Chart Speed	1-15,000 mm/hr
Recording Accuracy	+/- 0.1% of effective
Chart Speed Accuracy	+/- 0.1% for recordings greater than 1m
Data Acquisition System (DAS)	Varilink Software

MOBILE EMISSIONS LABORATORY

Fully Insulated

Air Conditioned

On-Board Computer System
(IBM Compatible)

5.0 Sampling Methodology (Continued)

5.2 EPA Method 19 - Calculated Stack Gas Flow Rate by F-Factor

The calculated dry standard volume flow rate (DSCFM) was determined by F-factor calculation using the fuel flow rate and gross calorific value according to the equation below. Since the source was fired on landfill gas and the parameters were measured on a dry basis, the oxygen-based F-factor (F_d) published in EPA Method 19 was used.

Equation:

DSCFM = [MMBtu/hr] [F-Factor (DSCF/MMBtu)] [hr/60 min.] [20.9/20.9-% O_2]

MMBtu/hr = [Fuel SCFM] [GCV (Btu/SCF)] [MMBtu/1x10^6 Btu] [60 hr./min.]

Where: GCV = gross calorific value

5.3 EPA Method 18/TO-15 – Speciated Volatile Organic Compounds

The principles of Method 18/TO-15 were utilized to collect volatile organic compounds in six-liter summa canisters.

The apparatus consisted of a stainless steel probe connected by Teflon line to a summa canister. A uniform sample flow rate was maintained utilizing a critical orifice.

On completion of each run, the summa canister was sealed and immediately transported to the laboratory. Sample is then drawn through a septum and injected into the GC with a Flame Ionization Detector (FID) for speciation of C_2- C_{5+} compounds. Further speciation of the AP-42 list was accomplished following the guidelines of EPA TO-15. These compounds were presented as a total NMOC value based on their carbon count.

Equation:

$$\frac{lb}{hr} = ppmv \times DSCFM \times (1.557 \times 10^{-7}) \times MW$$

Where:

ppmv = Parts Per Million (Volume)
DSCFM = Dry Standard Cubic Feet Per Minute
MW = Molecular Weight of Specific Hydrocarbon
1.557×10^{-7} = Conversion Factor

5.0 Sampling Methodology (Continued)

5.4 Measured Stack Gas Flow Rate by EPA Methods 1 to 4

A 16-point velocity traverse was performed in conjunction with a moisture according to EPA Methods 1 to 4 for each run to determine the standard flow rate (DSCFM) of the stack gas. The measured DSCFM was used to calculate NO_x and CO emission rates in units lbs/hr according to the following equation.

$$lb/hr = [ppmv]\ [1.558 \times 10^{-7}]\ [MW_{pollutant}]\ [DSCFM]$$

Where: ppmv = pollutant concentration
$Mw_{pollutant}$ = Molecular weight of pollutant

EPA METHOD 1 - SAMPLING AND VELOCITY TRAVERSE FOR STATIONARY SOURCES

A preliminary source test site assessment was performed prior to the source test in order to determine applicable testing port locations and sample point traverse locations. The stack diameter, and the distance from sample ports to disturbances, i.e. bends, flanges, etc., both upstream and downstream, were measured. This information was utilized to determine the minimum number of sampling points per traverse, and the distance from the inner stack wall to each sample point location. Additionally, this method takes into account cyclonic flow patterns and in-situ stratified pollutant concentrations.

EPA METHOD 2 - VELOCITY AND VOLUMETRIC FLOW RATE

The velocity of the gas stream was determined by using an "S" type pitot tube, a inclined manometer and type "K" thermocouple with a digital temperature measuring device. The calibrated pitot tube was connected to the manometer and leak checked. A temperature and velocity pressure (delta P) was obtained at each traverse point, and a duct static pressure was measured and recorded. The dry volumetric flow rate was determined from the gas velocity data, stack pressure, stack gas moisture content, stack gas molecular weight, and cross-sectional area of duct.

EPA METHOD 3 - GAS ANALYSIS FOR DRY MOLECULAR WEIGHT AND EXCESS AIR

Flare exhaust volume fractions of O_2 and CO_2 expressed in percent were determined using continuous emission analyzers following SDAPCD Method 100. Inlet O_2 and CO_2 results were determined by GC. These values were used for calculating the dry molecular weight of the flue gas.

5.0 Sampling Methodology (Continued)

5.4 Measured Stack Gas Flow Rate by EPA Methods 1 to 4 (Continued)

EPA METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Moisture content was determined using a sampling train consisting of a stainless steel probe, Teflon line, four impingers in an ice water bath, leak free pump, vacuum gauge, and temperature compensated dry gas meter. Prior to sampling a leak check of the sampling train was performed to insure system integrity. Additionally, tare weights of the charged individual impingers were recorded using a triple beam balance capable of weighing to the nearest 0.1 grams or less.

After sampling, the final weights of each impinger were determined and recorded. Percent moisture content was calculated from the weight of water collected and the dry gas volume sampled.

Equations:

$$\text{Moisture } (B_w) = \frac{Vwstd}{Vmstd + Vwstd} \times 100$$

$$\text{Where: } Vwstd = \frac{0.0464\ ft^3}{ml} \times \text{Vol. } H_2O \text{ Collected (ml)}$$

$$Vmstd = Y \text{ Meter} \times \frac{528\ ^\circ R}{29.92\ in\ Hg} \times \frac{\text{Vol. Metered}}{\text{Meter}} \times \text{Meter Pressure}$$

List of Appendices

Appendix A

Detailed Results and Raw Data

SUMMARY OF CONTINUOUS MONITORING DATA

FACILITY:	OTAY	DATA FOR SAMPLING RUN:			COMPLIANCE RUN 1	
SOURCE ID:	FLARE	DATE:	07/29/04		TIME:	1249-1349
OPERATOR:	DEE	PROJECT No.:	2170.1005			
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO PPMV,D	NO2 PPMV,D	NOx PPMV,D	CO PPMV,D
INITIAL ZERO BIAS	0.10	0.02	0.05	0.02	-	-1.50
INITIAL SPAN BIAS	12.78	8.14	16.91	36.84	-	86.60
FINAL ZERO BIAS	0.08	0.03	0.05	0.07	-	-1.50
FINAL SPAN BIAS	12.77	8.11	17.05	36.99	-	86.80
AVERAGE ZERO BIAS	0.09	0.03	0.05	0.05	-	-1.50
AVERAGE SPAN BIAS	12.78	8.13	16.98	36.92	-	86.70
BIAS GAS CONCENTRATION	12.80	8.11	17.29	39.30	-	86.57
FULL SCALE RANGE	25.00	20.00	50.00	50.00	-	200.00
UNCORRECTED CONC.	12.79	7.38	13.73	-	-	0.17
CORRECTED CONC.	**12.81**	**7.37**	**13.97**	**0.48**	**14.45**	**1.64**
PPMV @ 3 % O2			30.81	1.06	31.87	3.61
LB/MMBTU			0.043	0.001	0.045	0.003
LB/HR BASED ON EPA 19 (DSCFM)	20,679		2.07	0.07	2.14	0.15
LB/HR BASED ON PITOT (DSCFM)	28,724		2.87	0.10	2.97	0.21

SUMMARY OF CONTINUOUS MONITORING DATA

FACILITY:	OTAY	DATA FOR SAMPLING RUN:			COMPLIANCE RUN 2	
SOURCE ID:	FLARE	DATE:	07/29/04		TIME:	1436-1536
OPERATOR:	DEE	PROJECT No.:	2170.1005			
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO PPMV,D	NO2 PPMV,D	NOx PPMV,D	CO PPMV,D
INITIAL ZERO BIAS	0.08	0.03	0.05	0.07	-	-1.50
INITIAL SPAN BIAS	12.77	8.11	17.05	36.99	-	86.80
FINAL ZERO BIAS	0.11	0.03	0.05	0.02	-	-1.50
FINAL SPAN BIAS	12.77	7.98	16.75	37.04	-	86.60
AVERAGE ZERO BIAS	0.10	0.03	0.05	0.05	-	-1.50
AVERAGE SPAN BIAS	12.77	8.05	16.90	37.02	-	86.70
BIAS GAS CONCENTRATION	12.80	8.11	17.29	39.30	-	86.57
FULL SCALE RANGE	25.00	20.00	50.00	50.00	-	200.00
UNCORRECTED CONC.	12.58	7.50	13.70	-	-	3.47
CORRECTED CONC.	**12.61**	**7.56**	**14.01**	**-0.08**	**13.92**	**4.88**
PPMV @ 3 % O2			30.14	-0.18	29.96	10.50
LB/MMBTU			0.042	0.000	0.042	0.009
LB/HR BASED ON EPA 19 (DSCFM)	19,711		1.98	-0.01	1.97	0.42
LB/HR BASED ON VOL FLOW (DSCFM)	29,881		3.00	-0.02	2.98	0.64

SUMMARY OF CONTINUOUS MONITORING DATA

FACILITY:	OTAY	DATA FOR SAMPLING RUN:			COMPLIANCE RUN 3	
SOURCE ID:	FLARE	DATE:	07/29/04		TIME:	1545-1645
OPERATOR:	DEE	PROJECT No.:	2170.1005			
PARAMETER UNITS	O_2 % VOL DRY	CO_2 % VOL DRY	NO PPMV,D	NO2 PPMV,D	NOx PPMV,D	CO PPMV,D
INITIAL ZERO BIAS	0.11	0.03	0.05	0.02	-	-1.50
INITIAL SPAN BIAS	12.77	7.98	16.75	37.04	-	86.60
FINAL ZERO BIAS	0.11	0.05	-0.01	0.03	-	-1.10
FINAL SPAN BIAS	12.76	8.12	16.91	37.53	-	87.20
AVERAGE ZERO BIAS	0.11	0.04	0.02	0.03	-	-1.30
AVERAGE SPAN BIAS	12.77	8.05	16.83	37.29	-	86.90
BIAS GAS CONCENTRATION	12.80	8.11	17.29	39.30	-	86.57
FULL SCALE RANGE	25.00	20.00	50.00	50.00	-	200.00
UNCORRECTED CONC.	12.37	7.73	14.70	-	-	1.31
CORRECTED CONC.	**12.40**	**7.79**	**15.10**	**0.03**	**15.13**	**2.56**
PPMV @ 3 % O2			31.68	0.07	31.75	5.37
LB/MMBTU			0.044	0.000	0.027	0.005
LB/HR BASED ON EPA 19 (DSCFM)	18,856		2.04	0.00	2.04	0.21
LB/HR BASED ON VOL FLOW (DSCFM)	27,390		2.96	0.01	2.97	0.31

SUMMARY OF VOLUME FLOW SOURCE TEST DATA AND CALCULATIONS

EXHAUST FLOW

Facility:	OTAY					
Source ID:	FLARE					
MEASURED SOURCE PARAMETERS	**SYMBOL**	**UNITS**	**RUN 1**	**RUN 2**	**RUN 3**	**AVERAGE**
DATE			07/29/04	07/29/04	07/29/04	
TIME			1249-1349	1436-1536	1545-1645	
STACK DIAMETER	Ds	IN	156.00	156.00	156.00	156.00
STACK AREA	Ds	FT^2	132.73	132.73	132.73	132.73
BAROMETERIC PRESSURE	Pbar	IN. Hg	29.85	29.85	29.85	29.85
STATIC PRESSURE	Pstat	IN. H2O	-0.06	-0.06	-0.06	-0.06
STACK PRESSURE	Ps	IN. Hg	29.85	29.85	29.85	29.85
AVERAGE STACK TEMPERATURE	Ts	DEG. F	1446.6	1442.1	1445.9	1444.9
AVERAGE SQ. ROOT VELOCITY PRESSURE	dP	IN. H2O	0.1378	0.1456	0.1334	0.1389
SAMPLING PARAMETERS						
STANDARD TEMPERATURE	Tstd	DEG. F	68.0	68.0	68.0	68.0
STANDARD PRESSURE	Pstd	IN. Hg	29.92	29.92	29.92	29.92
PERCENT CARBON DIOXIDE	CO2	%	7.37	7.56	7.79	7.57
PERCENT OXYGEN	O2	%	12.81	12.61	12.40	12.61
PITOT CORRECTION FACTOR	Cp		0.816	0.816	0.816	0.816
SAMPLING TIME	t	MIN.	30.0	30.0	32.0	30.7
GAS VOLUME SAMPLED	Vm	DCF	24.742	26.525	26.193	25.820
WATER VAPOR COLLECTED	Vlc	GRAMS	47.2	62.6	60.5	56.8
DRY GAS METER CORRECTION FACTOR	Y		0.9970	0.9970	0.9970	0.9970
DRY GAS METER TEMPERATURE	Tm	DEG. F	82.3	82.8	82.3	82.5
ORIFICE PRESSURE	dH	IN. H2O	2.000	2.000	2.000	2.000
CALCULATED RESULTS						
CORRECTED GAS VOLUME SAMPLED	Vmstd	DSCF	24.078	25.789	25.490	25.119
VOLUME OF WATER CONDENSED	Vwstd	SCF	2.23	2.95	2.86	2.68
MOISTURE CONTENT OF FLUE GAS	Bws	%	8.47	10.28	10.07	9.61
DRY MOLECULAR WEIGHT OF FLUE GAS	MWdry	lb/lb-mol	29.69	29.71	29.74	29.72
WET MOLECULAR WEIGHT OF FLUE GAS	MWwet	lb/lb-mol	28.70	28.51	28.56	28.59
FLUE GAS VELOCITY	Vs	ft/sec	14.34	15.19	13.92	14.48
FLUE GAS FLOW RATE (ACTUAL CONDITIONS)	ACFM	ACFM	114,216	120,941	110,821	115,326
FLUE GAS FLOW RATE (STD. CONDITIONS)	SDCFM	SDCFM	28,879	30,045	27,540	28,821
PERCENT EXCESS AIR	% EA	%	155.1	148.9	142.9	149.0

SUMMARY OF VOLUME FLOW SOURCE TEST DATA AND CALCULATIONS
INLET FLOW

Facility:	OTAY
Source ID:	FLARE

MEASURED SOURCE PARAMETERS	SYMBOL	UNITS	RUN 1	RUN 2	RUN 3	AVERAGE
DATE			07/29/04	07/29/04	07/29/04	
TIME			1249-1349	1436-1536	1545-1645	
STACK DIAMETER	Ds	IN	16.00	16.00	16.00	16.00
STACK AREA	Ds	FT^2	1.40	1.40	1.40	1.40
BAROMETERIC PRESSURE	Pbar	IN. Hg	29.85	29.85	29.85	29.85
STATIC PRESSURE	Pstat	IN. H2O	3.00	3.00	3.00	3.00
STACK PRESSURE	Ps	IN. Hg	30.07	30.07	30.07	30.07
AVERAGE STACK TEMPERATURE	Ts	DEG. F	122.0	125.0	131.0	126.0
AVERAGE SQ. ROOT VELOCITY PRESSURE	dP	IN. H2O	0.4855	0.4824	0.4726	0.4802
SAMPLING PARAMETERS						
STANDARD TEMPERATURE	Tstd	DEG. F	68.0	68.0	68.0	68.0
STANDARD PRESSURE	Pstd	IN. Hg	29.92	29.92	29.92	29.92
PERCENT METHANE	CH4	%	39.10	39.80	39.80	39.57
PERCENT CARBON DIOXIDE	CO2	%	31.40	32.40	32.20	32.00
PERCENT OXYGEN	O2	%	3.50	4.60	3.90	4.00
PITOT CORRECTION FACTOR	Cp		0.827	0.827	0.827	0.827
SAMPLING TIME	t	MIN.	30.0	30.0	30.0	30.0
GAS VOLUME SAMPLED	Vm	DCF	26.632	24.771	27.579	26.327
WATER VAPOR COLLECTED	Vlc	GRAMS	43.1	47.6	49.2	46.6
DRY GAS METER CORRECTION FACTOR	Y		0.9880	0.9880	0.9880	0.9880
DRY GAS METER TEMPERATURE	Tm	DEG. F	93.3	90.8	85.5	89.9
ORIFICE PRESSURE	dH	IN. H2O	2.200	2.200	2.200	2.200
CALCULATED RESULTS						
CORRECTED GAS VOLUME SAMPLED	Vmstd	DSCF	25.185	23.531	26.455	25.057
VOLUME OF WATER CONDENSED	Vwstd	SCF	2.03	2.25	2.32	2.20
MOISTURE CONTENT OF FLUE GAS	Bws	%	7.47	8.72	8.07	8.09
DRY MOLECULAR WEIGHT OF FLUE GAS	MWdry	lb/lb-mol	29.57	29.78	29.72	29.69
WET MOLECULAR WEIGHT OF FLUE GAS	MWwet	lb/lb-mol	28.71	28.75	28.77	28.74
FLUE GAS VELOCITY	Vs	ft/sec	28.18	28.05	27.62	27.95
FLUE GAS FLOW RATE (ACTUAL CONDITIONS)	ACFM	ACFM	2,361	2,350	2,314	2,342
FLUE GAS FLOW RATE (STD. CONDITIONS)	SDCFM	SDCFM	1,992	1,946	1,910	1,949
PERCENT EXCESS AIR	% EA	%	25.6	38.2	30.1	31.3

SUMMARY OF NMOC DATA
OTAY LANDFILL
July 29, 2004

FLARE INLET RESULTS

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	AVERAGE
Oxygen	%vd	3.50	4.60	3.90	4.00
Volume Flow Rate	DSCFM	1,992	1,946	1,910	1,949
NMOC as Methane	ppmv	1,706.30	1,410.10	1,334.30	1,483.57
NMOC as Hexane	ppmv	284.38	235.02	222.38	247.26
NMOC as Hexane	ppmv @ 3 % O2	292.53	258.02	234.12	261.56
NMOC as Hexane	lb/hr	7.60	6.14	5.70	6.48
NMOC as Hexane	lb/mmbtu	0.76	0.67	0.61	0.68

FLARE EXHAUST RESULTS

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	AVERAGE
Oxygen	%vd	12.81	12.61	12.40	12.61
Volume Flow Rate	DSCFM	20,678.88	19,710.84	18,856.03	19,748.58
NMOC as Methane	ppmv	1.4	1.4	1.4	1.4000
NMOC as Hexane	ppmv	0.23	0.23	0.23	0.23
NMOC as Hexane	ppmv @ 3 % O2	0.51	0.50	0.49	0.50
NMOC as Hexane	lb/hr	0.06	0.06	0.06	0.06
NMOC as Hexane	lb/mmbtu	0.0013	0.0013	0.0013	0.0013

FLARE DESTRUCTION EFFICIENCY

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	AVERAGE
NMOC as Hexane	%	99.15	98.99	98.96	99.05

FUEL ANALYSIS CALCULATIONS
LFG SAMPLE
July 29, 2004

FUEL COMPONENT	MOL. WT	DENSITY	C	H	EXPANSION FACTOR	COMPONENT MOLE %	MOLE FRACTION	EXHAUST DSCF PER SCF FUEL	CHONS WEIGHT PERCENT	
METHANE	16.04	0.0423	1	4	8.57	39.567	0.396	3.391	CARBON	30.15
ETHANE	30.07	0.0792	2	6	15.25	0.0007	0.000	0.000	HYDROGEN	5.60
PROPANE	44.10	0.1162	3	8	21.92	0.006	0.000	0.001	OXYGEN	35.84
ISO-BUTANE	58.12	0.1532	4	10	28.6	0.0228	0.000	0.007	NITROGEN	23.93
NORM-BUTANE	58.12	0.1532	4	10	28.6	0.000	0.000	0.000	SULFUR	0.00
ISO-PENTANE	72.15	0.1902	5	12	35.28	0.0075	0.000	0.003		
NORM-PENTANE	72.15	0.1902	5	12	35.28	0.000	0.000	0.000		
HEXANE +	95.96	0.2529	6	14	41.95	0.000	0.000	0.000		
N2	28.01	0.0738	-	-	1	24.400	0.244	0.244		
O2	31.99	0.0843	-	-	1	4.000	0.040	0.040		
CO2	44.01	0.1160	-	-	1	32.000	0.320	0.320		
TOTALS						**100.00**	**1.00**	**4.005**		

CALCULATIONS

4.005	EXPANSION FACTOR DSCF EXHAUST PER SCF OF FUEL GAS AT ZERO % OXYGEN
361.8	LOWER DRY HEAT VALUE BTU/SCF OF FUEL GAS
401.6	UPPER DRY HEAT VALUE BTU/SCF OF FUEL GAS
0.075	DENSITY LB/SCF
28.567	MOLECULAR WEIGHT LB/LB-MOLE
9852.8	F-Factor (Fd) @ 60 DEGREES F
10004.4	F-Factor (Fd) @ 68 DEGREES F

SUMMARY OF EPA METHOD 19 SOURCE TEST DATA AND CALCULATIONS
OTAY FLARE EXHAUST
July 29, 2004

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3
DATE		7/29/04	7/29/04	7/29/04
FUEL FLOW	SCFM	1885.8	1843.9	1808.7
CALORIFIC VALUE	BTU/CF	401.611	401.611	401.611
F FACTOR (Fd) - LFG	DSCF/MMBTU	10004.4	10004.4	10004.4
EXHAUST O2 CONCENTRATION	%VD	12.81	12.61	12.40
HEAT INPUT	MMBTU/MIN	0.75735	0.74053	0.7264
EXHAUST VOLUME FLOW RATE	**DSCFM**	**19,577**	**18,675**	**17,859**

SCEC
CONTINUOUS EMISSIONS MONITORING SYSTEM TEST DATA

st Number: 1-CEM-Out
Client: SCS Eng.
Location: OTAY
Unit: Zink
DAS File: —
el Meter St: —

Date: 7/29/04
Condition: Norm
Operator: DE
Barometric: 29.85
Fuel Meter End: —

Gas Temperatures

Stack: 1650 bottom T.C.
Probe: —
eated Line: —

Stack Knockout: 410 F
Ambient: 85° F
Chiller: 12 °C

$NO_2 = 39.3$

	Analyzer Values				NO_2
	O_2 (%)	CO_2 (%)	NO_M (ppm)	CO (ppm)	~~SO_2~~ (ppm)
Analyzer Span Range	25	20	50	200	50
Mid Span Cal Gas Value	12.8	~~8.11~~ 8.111	(17.29) 17.4	86.57	
High Span Cal Gas Value	20.95	15.9	(43) 43.4	170.00	~~43.3~~ 39.3
	As Found Analyzer Readings				
Zero	.08	-.05	-.01	-1.1	.02
Mid Span	12.84	8.17	~~16.9~~ 16.9	87.0	~~16.77~~ 16.77
High Span	20.92	15.95	~~43.04~~ 43.04	170.7	43.48
	Pre-Test Analyzer System Bias				
System Bias Zero	0.10	.02	.05	-1.5	~~.07~~ .07
System Bias Span	12.78	8.14	16.91	86.6	~~39.18~~ 39.18

Sample Point	Time Start	Time Stop	Raw Test Data O_2 (%)	CO_2 (%)	NO_x (ppm)	CO (ppm)	SO_2 (ppm)
PAS.	1249						-2.34 ~~.84~~ 56
ACT-	1247						

	Post-Test Analyzer System Bias				
System Bias Zero	.08	.03	.05	-1.5	~~-2.07~~ -2.07
System Bias Span	12.77	8.11	17.05	86.8	39.49
	Post-Test Analyzer Calibration				~~-2.5~~ -2.5
Zero			.06		.08
Mid Span		17.1 → ~~8.11~~ 8.11			~~44.39~~ 44.39
High Span		43.76 ~~17.11~~			~~44.49~~ 44.5
	Test Results Summary				*Larry OK
	O_2 (%)	CO_2 (%)	NO_x (ppm)	CO (ppm)	SO_2 (ppm)
Raw Average					44.5
Corrected Average					-1.26

1127 4

SCEC
CONTINUOUS EMISSIONS MONITORING SYSTEM TEST DATA

Test Number: 2-CEM-Out
Client: SCS Engineers
Location: OTAY
Unit: Zink
DAS File: —
Fuel Meter St: —

Date: 7/29/04
Condition: Norm
Operator: DE
Barometric: 29.85
Fuel Meter End: —

Gas Temperatures

Stack: 1650 lower TC.
Probe: — (bottom)
Heated Line: —

Stack Knockout: 40°F
Ambient: 85°F
Chiller: 0.2°C

	Analyzer Values				NO2
	O_2 (%)	CO_2 (%)	NO_x (ppm)	CO (ppm)	~~SO2~~ (ppm)
Analyzer Span Range					
Mid Span Cal Gas Value	12.8	8.111	17.4	86.57	
High Span Cal Gas Value	20.95	15.9	43.4	170.1	39.3
	As Found Analyzer Readings				NO2
Zero			-.01	~~-1.5~~	-.01 0.0
Mid Span		Recal →	16.85		~~16.68~~
High Span			43.05		NO2 = 43.44
	Pre-Test Analyzer System Bias				NO2 43.24
System Bias Zero	0.08	0.02	-.01	-1.5	-.08
System Bias Span	12.77	8.11	16.70	86.8	~~39.14~~

Sample Point	Time		**Raw Test Data**				-2.25
	Start	Stop	O_2 (%)	CO_2 (%)	NO_x (ppm)	CO (ppm)	SO_2 (ppm)
DAS	1436						

	Post-Test Analyzer System Bias				
System Bias Zero	.11	.03	.05	-1.5	.02
System Bias Span	12.77	7.98	16.75	86.6	39.04
	Post-Test Analyzer Calibration				-2.00
Zero					37.04
Mid Span					
High Span					

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

SCEC
CONTINUOUS EMISSIONS MONITORING SYSTEM TEST DATA

est Number: 3-CEM-Out
Client: SCS Engineers
Location: OTAY
Unit: Zink
DAS File: —
el Meter St: —

Date: 7/29/04
Condition: Norm.
Operator: DE
Barometric: 29.85
Fuel Meter End: —

Gas Temperatures

Stack: 1650 bottom T-C.
Probe: —
leated Line: —
Stack Knockout: 50° F
Ambient: 85° F
Chiller: 2° C

	Analyzer Values				NO2
	O_2 (%)	CO_2 (%)	NO_x (ppm)	CO (ppm)	~~SO_2~~ (ppm)
Analyzer Span Range	25	20	50	200	
Mid Span Cal Gas Value	12.8	8.11	17.29	86.57	
High Span Cal Gas Value	20.95	15.90	43.4	120.1	39.3
	As Found Analyzer Readings				
Zero					
Mid Span					
High Span					
	Pre-Test Analyzer System Bias				
System Bias Zero	.11	.03	.05	-1.5	.07
System Bias Span	12.77	7.98	16.75	86.6	39.04

Sample Point	Time Start	Time Stop	Raw Test Data O_2 (%)	CO_2 (%)	NO_x (ppm)	CO (ppm)	~~SO_2~~ (ppm)
	1545						

-2.00

	Post-Test Analyzer System Bias				
System Bias Zero	0.11	.05	-.01	-1.1	.03
System Bias Span	12.76	8.12	16.91	87.2	39.39
	Post-Test Analyzer Calibration				-1.86
Zero	.06	0.12	-.01	-1.1	.08
Mid Span	12.81	8.24	16.85	87.6	~~16.73~~
High Span	20.88	15.89	43.15	171.1	~~43.44~~
	Test Results Summary @39.3				44.15
	O_2 (%)	CO_2 (%)	NO_x (ppm)	CO (ppm)	~~SO_2~~ (ppm)
Raw Average					1.11
Corrected Average					43.04

OTAY FLARE
July 29, 2004
RAW DAS DATA - COMPLIANCE RUN 1

DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOX PPMVD	CO PPMVD	NO PPMVD
1	07/29	12:48:47	12.36	7.29	26.87	-2.5	12.55
2	07/29	12:49:47	12.37	7.82	16.03	-3.9	14.90
3	07/29	12:50:47	12.33	7.86	16.23	-4.1	15.14
4	07/29	12:51:47	13.08	7.00	14.63	-3.3	13.51
5	07/29	12:52:47	12.51	7.81	13.89	-2.5	13.26
6	07/29	12:53:47	12.42	7.85	14.83	-3.3	14.00
7	07/29	12:54:47	11.93	7.92	15.23	-3.9	14.71
8	07/29	12:55:47	10.98	8.85	17.17	-4.1	16.85
9	07/29	12:56:47	10.91	9.15	18.49	-4.1	18.16
10	07/29	12:57:47	12.92	7.05	14.68	5.5	13.55
11	07/29	12:58:47	17.76	0.43	13.53	30.5	12.91
12	07/29	12:59:47	20.92	0.08	0.71	-1.3	0.35
13	07/29	13:00:47	20.93	0.10	0.52	-1.5	0.25
14	07/29	13:01:47	13.15	7.13	13.18	-1.7	13.85
15	07/29	13:02:47	13.15	7.03	14.14	-2.9	13.91
16	07/29	13:03:47	12.93	7.39	14.49	-3.5	14.11
28	07/29	13:04:47	12.21	8.04	16.29	-4.1	16.10
29	07/29	13:05:47	12.09	7.94	17.13	-3.9	16.70
30	07/29	13:06:47	13.61	6.59	14.63	10.5	13.85
31	07/29	13:07:47	13.54	6.86	12.43	48.1	11.11
32	07/29	13:08:47	12.10	8.15	14.64	6.1	15.35
33	07/29	13:09:47	13.08	7.19	15.88	-3.9	15.99
34	07/29	13:10:47	13.58	6.65	12.90	11.5	10.81
35	07/29	13:11:47	15.89	2.09	12.64	9.7	12.61
36	07/29	13:12:47	20.92	0.06	0.62	-1.3	0.31
37	07/29	13:13:47	20.93	0.12	0.37	-1.3	0.20
38	07/29	13:14:47	20.93	0.02	0.32	-1.3	0.15
39	07/29	13:15:47	20.93	-0.03	0.27	-1.5	0.15
40	07/29	13:16:47	20.93	-0.07	0.22	-1.3	0.10
41	07/29	13:17:47	20.93	0.04	0.27	-1.3	0.15
42	07/29	13:18:47	20.93	0.05	0.22	-1.3	0.11
43	07/29	13:19:47	20.94	0.02	0.17	-1.4	0.11
44	07/29	13:20:47	17.40	5.88	0.17	-1.5	0.05
45	07/29	13:21:47	13.31	6.97	11.32	-3.7	11.75
46	07/29	13:22:47	13.60	6.78	11.37	-2.9	10.96
47	07/29	13:23:47	12.55	7.45	12.38	-3.9	12.35
48	07/29	13:24:47	12.14	7.92	13.89	-4.1	14.07
49	07/29	13:25:47	13.70	6.42	12.09	-3.1	11.51
50	07/29	13:26:47	14.23	6.12	9.28	9.7	7.92
51	07/29	13:27:47	14.65	4.95	9.42	-1.7	10.01
52	07/29	13:28:47	14.19	5.89	9.92	-3.5	9.76
53	07/29	13:29:47	14.12	6.59	9.83	-3.2	9.36
54	07/29	13:30:47	17.19	2.46	9.02	-3.1	8.12

OTAY FLARE
July 29, 2004
RAW DAS DATA - COMPLIANCE RUN 3

DATA PT	DATE	TIME	O2 % VD	CO2 % VD	NOX PPMVD	CO PPMVD	NO PPMVD
1	07/29	15:45:35	12.89	7.19	15.13	-3.5	14.21
2	07/29	15:46:35	13.05	7.01	14.14	-1.7	13.20
3	07/29	15:47:35	12.90	7.26	13.58	-2.3	13.41
4	07/29	15:48:35	12.84	7.36	13.48	-2.3	13.15
5	07/29	15:49:35	11.31	8.62	16.48	-3.7	16.19
6	07/29	15:50:35	11.76	8.39	15.08	-3.5	14.91
7	07/29	15:51:35	11.27	9.00	15.98	-3.9	15.50
8	07/29	15:52:35	11.10	9.04	17.13	-3.9	16.46
9	07/29	15:53:35	11.31	8.66	16.69	-3.5	16.06
10	07/29	15:54:35	12.09	7.97	16.19	-3.7	15.20
11	07/29	15:55:35	20.89	0.04	0.57	-2.1	0.25
12	07/29	15:56:35	20.91	0.08	0.22	-1.1	0.11
13	07/29	15:57:35	12.24	7.87	16.24	-3.1	16.05
14	07/29	15:58:35	12.58	7.53	16.48	-3.7	15.95
15	07/29	15:59:35	12.86	7.33	14.98	-3.5	14.71
16	07/29	16:00:35	12.33	7.79	14.59	-3.1	15.19
25	07/29	16:01:35	12.58	7.51	15.98	-3.5	15.50
26	07/29	16:02:35	12.42	7.84	15.29	-2.7	14.95
27	07/29	16:03:35	11.91	8.18	16.29	-3.5	16.30
28	07/29	16:04:35	11.37	8.73	16.63	-3.7	17.15
29	07/29	16:05:35	12.22	7.70	17.89	-3.9	17.31
30	07/29	16:06:35	11.92	8.14	17.29	-3.5	17.15
31	07/29	16:07:35	20.89	0.06	0.47	-1.7	0.20
32	07/29	16:08:35	20.91	0.02	0.17	-1.3	0.10
33	07/29	16:09:35	20.92	0.05	0.13	-1.3	0.06
34	07/29	16:10:35	20.92	0.07	0.17	-0.9	0.11
35	07/29	16:11:35	20.92	0.09	0.07	-1.1	0.05
36	07/29	16:12:35	20.92	0.05	0.07	-1.3	0.05
37	07/29	16:13:35	20.92	0.07	0.02	-1.1	-0.01
38	07/29	16:14:35	20.92	0.01	0.02	-1.3	-0.01
39	07/29	16:15:35	20.92	0.01	-0.04	-1.1	-0.01
40	07/29	16:16:35	20.92	0.08	-0.04	-0.9	-0.01
42	07/29	16:17:35	20.92	0.06	-0.04	-1.1	-0.01
43	07/29	16:18:35	20.92	0.03	-0.04	-1.1	-0.01
44	07/29	16:19:35	20.93	0.10	-0.03	-1.3	0.00
45	07/29	16:20:35	20.91	0.01	-0.09	-1.3	-0.01
46	07/29	16:21:35	16.82	6.35	-0.14	-1.3	0.40
47	07/29	16:22:35	11.50	8.31	16.09	-3.5	16.06
48	07/29	16:23:35	12.42	7.47	15.03	-3.7	15.06
49	07/29	16:24:35	14.03	6.20	11.63	4.5	10.72
50	07/29	16:25:35	14.02	6.38	8.68	117.4	8.42
51	07/29	16:26:35	12.54	7.56	14.34	13.5	13.91
52	07/29	16:27:35	13.23	6.79	13.34	-3.7	12.80

53	07/29	16:28:35	13.70	6.48	10.57	4.9	10.52
54	07/29	16:29:35	13.69	6.61	10.76	2.1	10.61
55	07/29	16:30:35	12.75	7.25	12.03	-2.5	12.26
56	07/29	16:31:35	20.77	0.08	3.86	-3.0	4.80
57	07/29	16:32:35	19.60	2.64	0.12	-0.9	0.10
58	07/29	16:33:35	13.35	6.88	10.27	40.6	10.57
59	07/29	16:34:35	12.19	7.90	15.23	3.7	15.55
60	07/29	16:35:35	12.11	8.00	15.74	-3.7	15.70
61	07/29	16:36:35	11.99	7.99	17.34	-3.5	16.66
62	07/29	16:37:35	12.80	7.23	13.89	3.1	13.72
63	07/29	16:38:35	12.51	7.57	14.64	-0.3	14.21
64	07/29	16:39:35	11.86	8.30	15.78	-2.7	15.50
65	07/29	16:40:35	12.25	7.72	15.58	-3.1	15.14
66	07/29	16:41:35	11.78	8.30	15.24	-2.9	16.25
67	07/29	16:42:35	11.55	8.72	16.78	-3.7	16.85
68	07/29	16:43:35	20.82	0.07	3.42	-2.7	2.75
			12.37	7.73	14.95	1.31	14.70

SCEC

Method 1: SAMPLE POINT LOCATION

Client/Facility: SCS Field Services / Otay
Sample Location: Otay Lanfill
Unit ID: John Zink

Date: 6/30/04
Data By: LHS
Barometric (in Hg): -

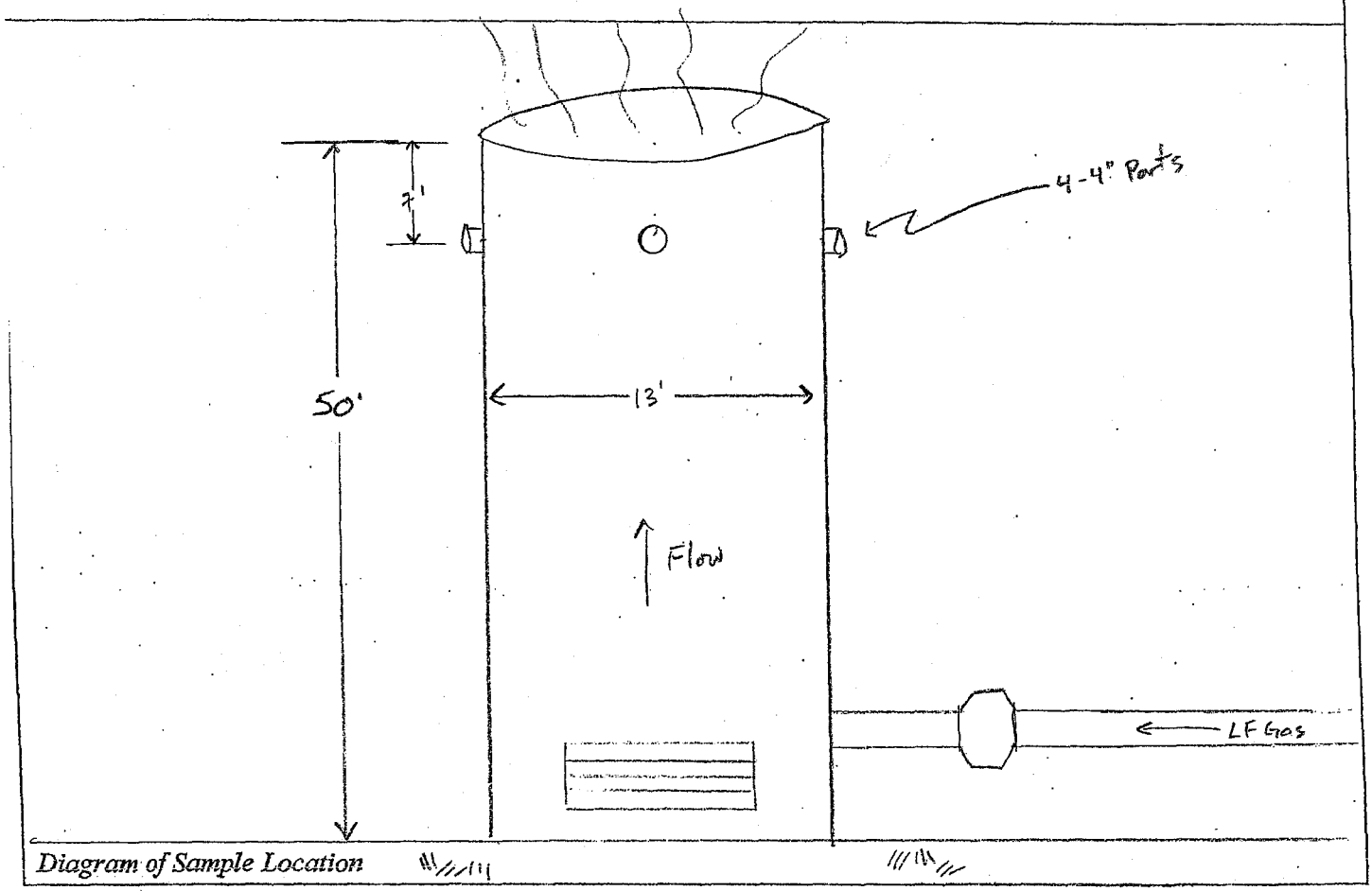

Diagram of Sample Location

Duct Dimension: 13'
Duct Area: 132.7 ft²
Upstream Dst/Dia: (1) 7' / 0.5 dia
Downstream Dst/Dia: (2) 43' / 3.3 dia
Port Length: (3)
Port Diameter: 4"
Number of Points: 16
Number of Points Per Port: 4

Sample Point	% of Stack Diameter	Position in Stack (in)	Inches from Outside of Port
1	3.2	5.0	
2	10.5	16.4	
3	19.4	30.3	
4	32.3	50.4	
5			
6			
7			
8			
9			
10			
11			
12			

From sample point to disturbance in direction of flow
From disturbance to sample point in direction of flow
Measurement from inner stack wall to end of port

Method 1: Sample Point Location For Circular Stacks:

Test No.: 1-H2O-Out	Date: 7/29/04		
Client: SCS Eng. ~~Zink~~	Barometric: 29.85		
Test Location: OKAY-~~New~~	Meter ID: ~~CB#8~~		
Test Condition: norm	Meter Yd: ~~CB#8~~ 0.997		
Test Method: ~~EPA~~ 4	Meter ^H @: ~~1.716~~ 1.716		
Stack Diameter: 13'	Pitot ID: ~~34~~ F#34		
No. of Points: sing/e	Pitot Coef.: ~~.842~~ .842		
Sample Time: 30 min	Probe Length/Mat'l: 9'/glass		
Per-Point: 30	Nozzle Diameter/Mat'l: n/a		
Isokinetic Factor: ∅	Assumed Stack Temp.: 150°		
	Assumed Meter Temp.: 83		

IMPINGER DATA

Imp. #	Mat'l	Final Wt.	Int. Wt.	Net Wt.
1	H2O	592.1	550.7	
2	H2O	570.9	570.0	
3	—	487.9	487.3	
4	SG	816.7	812.4	
5				
6				
7				
Total				
Filter No.:				

SAMPLE TRAIN LEAK CHECK

	CFM	Vac	By:
Meter Pre-Test	.003	10	BC
Meter Post-Test	.003	10	
	Check	Press.	By:
Pitot Pre-Test	✓		
Pitot Post-Test	✓		

SAMPLE TRAIN PRE-TEST CHECK

	Time	^H	Meter Reading		Temp.
Intial					
Final					

TEST DATA

SAMPLE POINT	TIME	METER CONDITIONS ^P	^H	METER READING	TEMPERATURES, °F STACK	METER INLET	METER OUTLET	IMP. OUT	PROBE	OVEN	VAC	O_2	STATIC PRESS.
1248 W ~~000~~	000		2.0	318.118	±	83	81	14			3		
	1000		11	326.3		84	81	64			3		
	2000		4	334.7		84	81	04			3		
	3000			342.860									

SAMPLE TRAIN OPERATION

Operator: BC
Assistant:
Imp. Setup/Recovery:
Comments:

TEST SUMMARY

Calculated by: DE
Time:
Static:
Stack Temp.:
^P In. H_2O:
O_2/CO_2:
Meter Vol. (acf): 24.742
Meter Temp.: 82.33
Meter Press: 2.0
Liquid Vol: ~~H2O~~ 47.2

A - 20

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(6)

STACK GAS VELOCITY AND TEMPERATURE DATA SHEET

FACILITY	OTAYLF	MOISTURE CONTENT	3%
SOURCE	BNC FLARE	STACK DIAMETER	-.06 13'
DATE	7/29/04	STATIC PRESSURE	
RUN NO.	1	DRY MOLECULAR WEIGHT	
PROJECT NO.	2170.1003	PITOT COEFFICIENT	.812
BAROMETRIC PRESSURE	29.85	TEST TIME: START	0
TOTAL TRAVERSE POINTS	16	END	30

	SAMPLE POINT	DELTA P (INCHES H2O)	STACK TEMPERATURE (DEGREE F)
44 (NW)	1 4	.024	1412
	2 3	.028	1468
	3 2	.014	1459
	4 1	.014	1468
56 (N)	5 4	.020	1479
	6 3	.022	1438
	7 2	.020	1504
	8 1	.020	1524
20 (E)	9 4	.015	1457
	10 3	.014	1447
	11 2	.016	1381
	12 1	.016	1384
32 (E)	13 4	.018	1338
	14 3	.024	1493
	15 2	.020	1422
	16 1	.022	1418
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12	$\sqrt{\Delta P}$ = 0.13796	
	AVERAGE	.0190	1446.63

Test No.: 2 - H2O - Out	Date: 7/29/04	IMPINGER DATA					SAMPLE TRAIN LEAK CHECK							
Client: SGS Eng.	Barometric: 29.85	Imp. #	Mat'l	Final Wt.	Int. Wt.	Net Wt.		CFM		Vac	By:			
Test Location: OTAY Flare Stk	Meter ID: CB #3	1	H2O	663.5	609.1		Meter Pre-Test	.001		10"	BC			
Test Condition: nora	Meter Yd: .997 ~~1.000~~ 1.006	2	H2O	656.9	654.7		Meter Post-Test	.001		0				
Test Method: epa 4	Meter ^H @: 1.716	3	—	453.2	452.5			Check		Press.	By:			
Stack Diameter: 13'	Pitot ID: F #34	4	SG	790.7	785.4		Pitot Pre-Test							
No. of Points: 10	Pitot Coef.: .812	5					Pitot Post-Test							
Sample Time: 30 min	Probe Length/Mat'l: 9'/quartz	6					SAMPLE TRAIN PRE-TEST CHECK							
Per-Point: 3	Nozzle Diameter/Mat'l: n/a	7						Time	^H	Meter Reading		Temp.		
Isokinetic Factor: n/a	Assumed Stack Temp.: 1500	Total					Intial							
	Assumed Meter Temp.: 83	Filter No.:					Final							

TEST DATA

SAMPLE POINT	TIME	METER CONDITIONS ^P	^H	METER READING	TEMPERATURES, °F STACK	METER INLET	METER OUTLET	IMP. OUT	PROBE	OVEN	VAC	O_2	STATIC PRESS.
	000		2.0	342.970		82	81	106			3		
	1000		11	350.4		84	81	"			3		
	2000			~~360.1~~ 359.1		86	81	"			3		
	3000			369.495									

SAMPLE TRAIN OPERATION

Operator: BC

Assistant:

Imp. Setup/Recovery:

Comments:

TEST SUMMARY

Calculated by: DE

Time:

Static:

Stack Temp.:

^P In. H_2O:

O_2/CO_2:

Meter Vol. (acf): 26.525

Meter Temp.: 82.83

Meter Press: 2.0

Liquid Vol: 62.6

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(2)

STACK GAS VELOCITY AND TEMPERATURE DATA SHEET

FACILITY	OTAY LF	MOISTURE CONTENT	3%
SOURCE	FLNC	STACK DIAMETER	15'
DATE	7/28/04	STATIC PRESSURE	-.04
RUN NO.	2	DRY MOLECULAR WEIGHT	
PROJECT NO.	2170.1005	PITOT COEFFICIENT	.817
BAROMETRIC PRESSURE	29.85	TEST TIME: START	0
TOTAL TRAVERSE POINTS	16	END	30

	SAMPLE POINT	DELTA P (INCHES H2O)	STACK TEMPERATURE (DEGREE F)
36 (E)	~~1~~ 4	.027	1350
	~~2~~ 3	.030	1453
	~~3~~ 2	.026	1464
	~~4~~ 1	.022	1462
17 (S)	~~5~~ 4	.012	1392
	~~6~~ 3	.008	1411
	~~7~~ 2	.010	1412
	~~8~~ 1	.015	1443
16 (W)	~~9~~ 4	.022	1433
	~~10~~ 3	.028	1443
	~~11~~ 2	.028	1492
	~~12~~ 1	.027	1522
17 (N)	~~1~~ 4	.022	1446
	~~2~~ 3	.025	1429
	~~3~~ 2	.024	1494
	~~4~~ 1	.029	1428
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12	~~0.0456~~	
	AVERAGE	.0212	1442.13

Test No.: 3-H2O-Out	Date: 7/29/04		
Client: SCS Engineers	Barometric: 29.85		
Test Location: OTAY Zink	Meter ID: CB#8		
Test Condition: Norm	Meter Yd: ~~1.0~~ .997		
Test Method: epa 4	Meter ^H @: 1.716		
Stack Diameter: 13'	Pitot ID: E#34		
No. of Points: 1	Pitot Coef.: .812		
Sample Time: 30 min	Probe Length/Mat'l: 9'/quartz		
Per-Point: 30	Nozzle Diameter/Mat'l: n/a		
Isokinetic Factor: n/a	Assumed Stack Temp.: 1500		
	Assumed Meter Temp.: 83		

IMPINGER DATA

Imp. #	Mat'l	Final Wt.	Int. Wt.	Net Wt.
1	H2O	645.7	592.1	
2	H2O	573.4	570.9	
3	—	488.5	487.9	
4	SG	820.5	816.7	
5				
6				
7				
Total				

Filter No.:

SAMPLE TRAIN LEAK CHECK

	CFM	Vac	By:
Meter Pre-Test	.000	10"	BC
Meter Post-Test	.000	10"	
	Check	Press.	By:
Pitot Pre-Test			
Pitot Post-Test			

SAMPLE TRAIN PRE-TEST CHECK

	Time	^H	Meter Reading	Temp.
Intial				
Final				

TEST DATA

SAMPLE POINT	TIME	METER CONDITIONS ^P	^H	METER READING	TEMPERATURES, °F STACK	METER INLET	METER OUTLET	IMP. OUT	PROBE	OVEN	VAC	O_2	STATIC PRESS.
	000		2.0	369.567		81	81	105			4		
	1000			377.3		82	84	64			4		
	2000			385.1		82	84	64			7		
	~~3000~~			395.760									
	3200												

SAMPLE TRAIN OPERATION

Operator: BC

Assistant:

Imp. Setup/Recovery:

Comments:

TEST SUMMARY

Calculated by: DE

Time:

Static:

Stack Temp.:

^P in. H_2O:

O_2/CO_2:

Meter Vol. (acf): 26.193

Meter Temp.: 82.33

Meter Press: 2.0

Liquid Vol: 60.5

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(3)

STACK GAS VELOCITY AND TEMPERATURE DATA SHEET

FACILITY	OTAY	MOISTURE CONTENT	3%
SOURCE	ZINC	STACK DIAMETER	13
DATE	7/21/04	STATIC PRESSURE	-.06
RUN NO.	3	DRY MOLECULAR WEIGHT	
PROJECT NO.	2170 1005	PITOT COEFFICIENT	.812
BAROMETRIC PRESSURE	29.85	TEST TIME: START	0
TOTAL TRAVERSE POINTS	12	END	30

BC

	SAMPLE POINT	DELTA P (INCHES H2O)	STACK TEMPERATURE (DEGREE F)
PORT (W)	4	.020	1460
	3	.030	1433
	2	.015	1470
	1	.012	1509
(N)	4	.024	1427
	3	.025	1475
	2	.028	1404
	1	.015	1415
(S) 20	4	.010	1447
	3	.010	1493
	2	.005	1436
	1	.005	1403
(E)	4	.024	1432
31	3	.029	1429
	2	.026	1450
	1	.025	1395
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12		
	AVERAGE	.0178	1445.88

SAMPLING POINT LOCATION DATA - EPA METHOD 1

PLANT: OTAY Zink Flare DATA BY: DE

DATE: 7/29/04

TEST LOCATION: Inlet

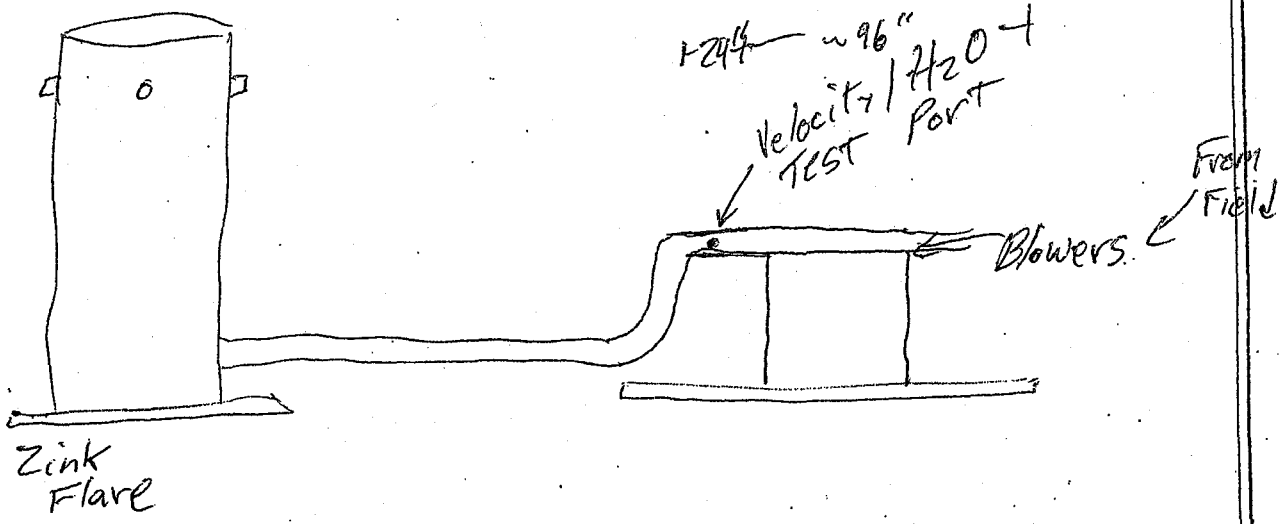

Diagram of Sampling Location

UPSTREAM DIST./DIA.: 24" / 1.5

DOWNSTREAM DIST./DIA.: 96" / 6

COUPLING LENGTH: 1"

NO. OF SAMPLING PTS.: 12 6/dia

STACK DIMENSION: 16"

STACK AREA, FT²: 1.3963

SAMPLE POINT	% OF DIAMETER	IN. FROM NEAR WALL	IN. FROM NOZZLE*
1	4.4	.70 (1)	2
2	14.6	2.33	3.33
3	29.6	4.736	5.736
4	70.4	11.26	12.26
5	85.4	13.66	14.66
6	95.6	15.29 (15)	16

*INCHES FROM WALL PLUS COUPLING LENGTH

Test No.:	1-H2O-In	Date:	7/29/04
Client:	SCS Eng.	Barometric:	29.85
Test Location:	OTAY Zink Flare	Meter ID:	CB6
Test Condition:	Norm	Meter Yd:	.988
Test Method:	4	Meter ^H @:	60-1.632 / 68-1.655
Stack Diameter:	16"	Pitot ID:	10
No. of Points:	1	Pitot Coef.:	~~.814~~ .827
Sample Time:	30	Probe Length/Mat'l:	—
Per-Point:	30	Nozzle Diameter/Mat'l:	—
Isokinetic Factor:	—	Assumed Stack Temp.:	—
		Assumed Meter Temp.:	—

IMPINGER DATA

Imp. #	Mat'l	Final Wt.	Int. Wt.	Net Wt.
1	H_2O	580.2	553.6	
2	H_2O	586.3	583.2	
3	—	485.4	482.9	
4	SG	784.0	773.1	
5				
6				
7				
Total				

Filter No.:

SAMPLE TRAIN LEAK CHECK

	CFM	Vac	By:
Meter Pre-Test	.006	10	DE
Meter Post-Test	.004	10	DE

	Check	Press.	By:
Pitot Pre-Test	✓	1.0	DE
Pitot Post-Test	✓		

SAMPLE TRAIN PRE-TEST CHECK

	Time	^H	Meter Reading	Temp.
Intial				
Final				

TEST DATA

SAMPLE POINT	TIME	METER CONDITIONS ^P	^H	METER READING	TEMPERATURES, °F STACK	METER INLET	METER OUTLET	IMP. OUT	PROBE	OVEN	VAC	O_2	STATIC PRESS.
	0		2.2	333.033		89	89	ICED			1		
	10			343.251		96	95	51			1		
	20			352.215		97	96	65			1		
	30			359.665									

SAMPLE TRAIN OPERATION

Operator: DE

Assistant:

Imp. Setup/Recovery:

Comments:

TEST SUMMARY

Calculated by: DE

Time:

Static:

Stack Temp.:

^P In. H_2O:

O_2/CO_2:

Meter Vol. (acf): 26.632

Meter Temp.: 93.33

Meter Press: 2.2

Liquid Vol: 43.1

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STACK GAS VELOCITY AND TEMPERATURE DATA SHEET

FACILITY	OTAY SCSEng.	MOISTURE CONTENT	
SOURCE	Flare	STACK DIAMETER	16"
DATE	7/29/04	STATIC PRESSURE	3
RUN NO.	1	DRY MOLECULAR WEIGHT	
PROJECT NO.	2170.1005	PITOT COEFFICIENT	8514 .827
BAROMETRIC PRESSURE	29.85	TEST TIME: START	
TOTAL TRAVERSE POINTS	4	END	

2129 SCFM
Meter
2056
Meter

SAMPLE POINT	DELTA P (INCHES H2O)	STACK TEMPERATURE (DEGREE F)
1	.18	122
2	.22	122
3	.27	122
4	.28	122
5		
6		
7		
8		
9		
10		
11		
12		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
AVERAGE	.2357	122

$\sqrt{.4855}$

Test No.:	2-H2O-In.	Date:	7/29/04
Client:	SCS Eng.	Barometric:	
Test Location:	OtAy Zink Flare	Meter ID:	See Test One
Test Condition:	Norm	Meter Yd:	
Test Method:	4	Meter ^H @:	
Stack Diameter:	16"	Pitot ID:	
No. of Points:	1	Pitot Coef.:	
Sample Time:	30	Probe Length/Mat'l:	
Per-Point:	30	Nozzle Diameter/Mat'l:	
Isokinetic Factor:	—	Assumed Stack Temp.:	
		Assumed Meter Temp.:	

IMPINGER DATA

Imp. #	Mat'l	Final Wt.	Int. Wt.	Net Wt.
1	H2O	609.4	577.1	
2	H2O	585.2	581.1	
3	–	530.1	528.3	
4	SG	679.6	670.2	
5				
6				
7				
Total				
Filter No.:				

SAMPLE TRAIN LEAK CHECK

	CFM	Vac	By:
Meter Pre-Test	.008	11	DE
Meter Post-Test	.006	10	DE
	Check	Press.	By:
Pitot Pre-Test			
Pitot Post-Test			

SAMPLE TRAIN PRE-TEST CHECK

	Time	^H	Meter Reading	Temp.
Initial				
Final				

TEST DATA

SAMPLE POINT	TIME	METER CONDITIONS ^P	^H	METER READING	TEMPERATURES, °F STACK	METER INLET	METER OUTLET	IMP. OUT	PROBE	OVEN	VAC	O_2	STATIC PRESS.
	0		2.2	359.783		89	89	ICED			1		
	10		2.2	369.512		93	89	59			1		
	20			375.625		95	90	55			1		
	30			384.554									

SAMPLE TRAIN OPERATION

Operator: DE

Assistant:

Imp. Setup/Recovery:

Comments:

TEST SUMMARY

Calculated by: DE

Time:

Static:

Stack Temp.:

^P in. H_2O:

O_2/CO_2:

Meter Vol. (acf): 24.771

Meter Temp.: 90.83

Meter Press: 2.2

Liquid Vol: 47.6

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STACK GAS VELOCITY AND TEMPERATURE DATA SHEET

FACILITY	OTAY SCS Engr	MOISTURE CONTENT	wet
SOURCE	Link	STACK DIAMETER	16"
DATE	7/29/04	STATIC PRESSURE	3
RUN NO.	2	DRY MOLECULAR WEIGHT	
PROJECT NO.	2170 1005	PITOT COEFFICIENT	.827
BAROMETRIC PRESSURE	29.85	TEST TIME: START	
TOTAL TRAVERSE POINTS	4	END	

SAMPLE POINT	DELTA P (INCHES H2O)	STACK TEMPERATURE (DEGREE F)
1	.18	125
2	.20	125
3	.28	125
4	.28	125
5		
6		
7		
8		
9		
10		
11		
12		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
AVERAGE	.2328	125

√.4824

Test No.:	3-H2O-In	Date:	7/29/04
Client:	SCS Engineers	Barometric:	
Test Location:	OTAY Zink	Meter ID:	
Test Condition:	Norm	Meter Yd:	See
Test Method:		Meter ^H @:	Test
Stack Diameter:		Pitot ID:	
No. of Points:		Pitot Coef.:	
Sample Time:		Probe Length/Mat'l:	One
Per-Point:		Nozzle Diameter/Mat'l:	
Isokinetic Factor:		Assumed Stack Temp.:	
		Assumed Meter Temp.:	

IMPINGER DATA

Imp. #	Mat'l	Final Wt.	Int. Wt.	Net Wt.
1	H2O	618.9	580.2	
2	H2O	588.8	586.3	
3	–	487.2	485.4	
4	SG	790.2	784.0	
5				
6				
7				
Total				

Filter No.:

SAMPLE TRAIN LEAK CHECK

	CFM	Vac	By:
Meter Pre-Test	.008	10	DE
Meter Post-Test	.002	10	DE
	Check	Press.	By:
Pitot Pre-Test	✓	1.0	DE
Pitot Post-Test	✓	1.0	DE

SAMPLE TRAIN PRE-TEST CHECK

	Time	^H	Meter Reading	Temp.
Initial				
Final				

TEST DATA

SAMPLE POINT	TIME	METER CONDITIONS ^P	^H	METER READING	TEMPERATURES, °F STACK	METER INLET	METER OUTLET	IMP. OUT	PROBE	OVEN	VAC	O_2	STATIC PRESS.
	0		2.2	384.682		84	84	51			1		
	10			392.911		89	83	55			1		
	20			404.521		89	84	53			1		
	30			412.261									

SAMPLE TRAIN OPERATION

Operator: DE

Assistant:

Imp. Setup/Recovery:

Comments:

TEST SUMMARY

Calculated by: DE

Time:

Static:

Stack Temp.:

^P in H_2O:

O_2/CO_2:

Meter Vol. (acf): 27.579

Meter Temp.: 85.5

Meter Press.: 2.2

Liquid Vol: 49.[illegible]

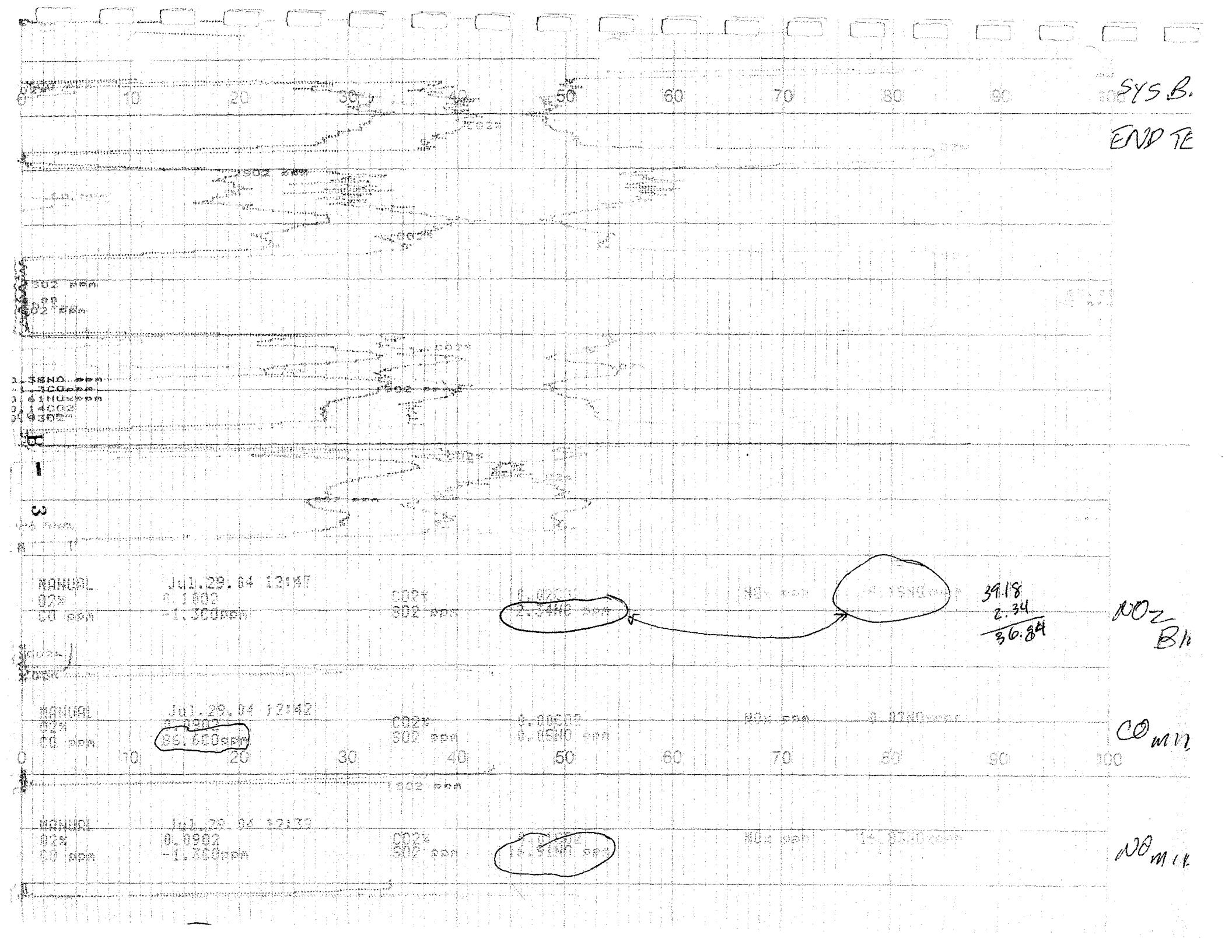
Appendix B

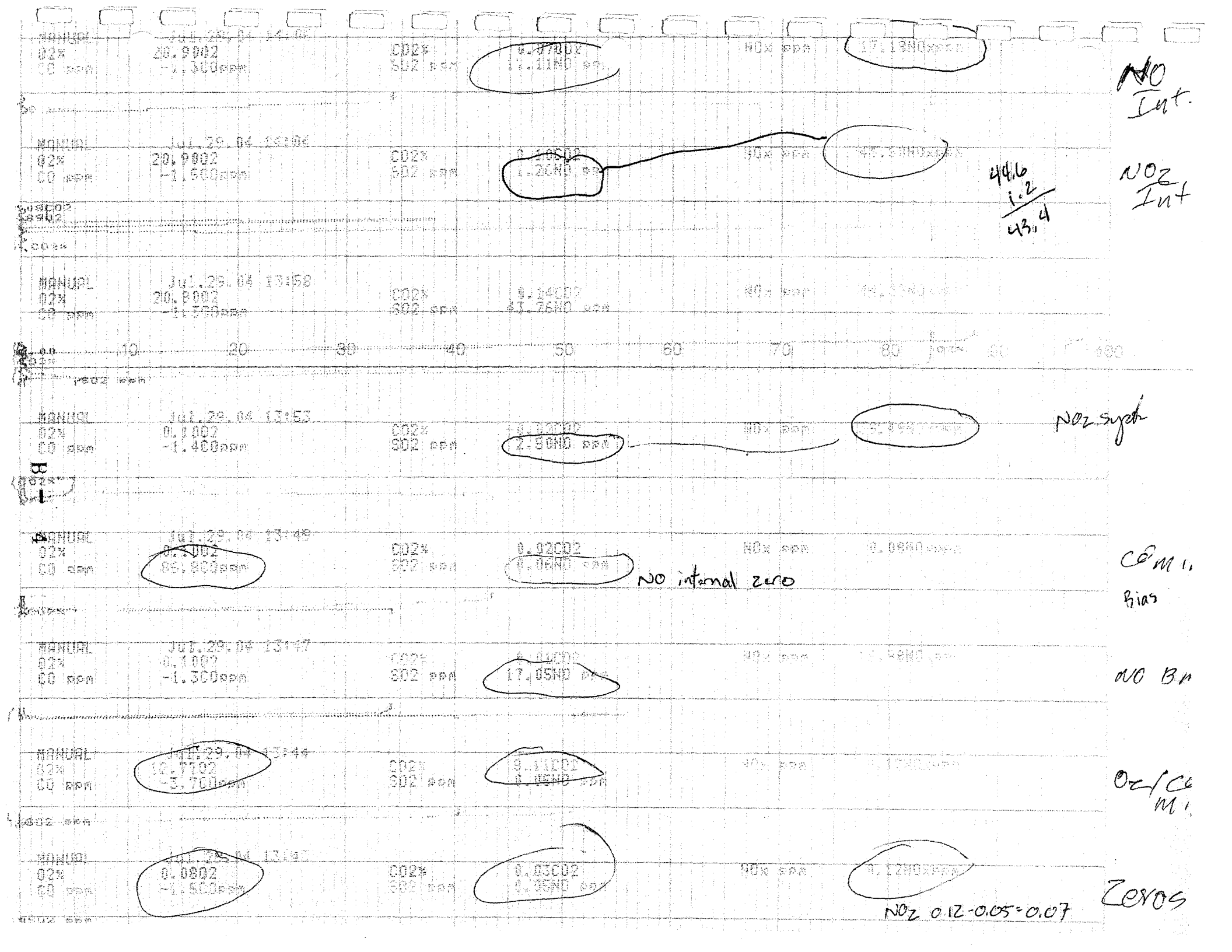
Strip Chart Copies

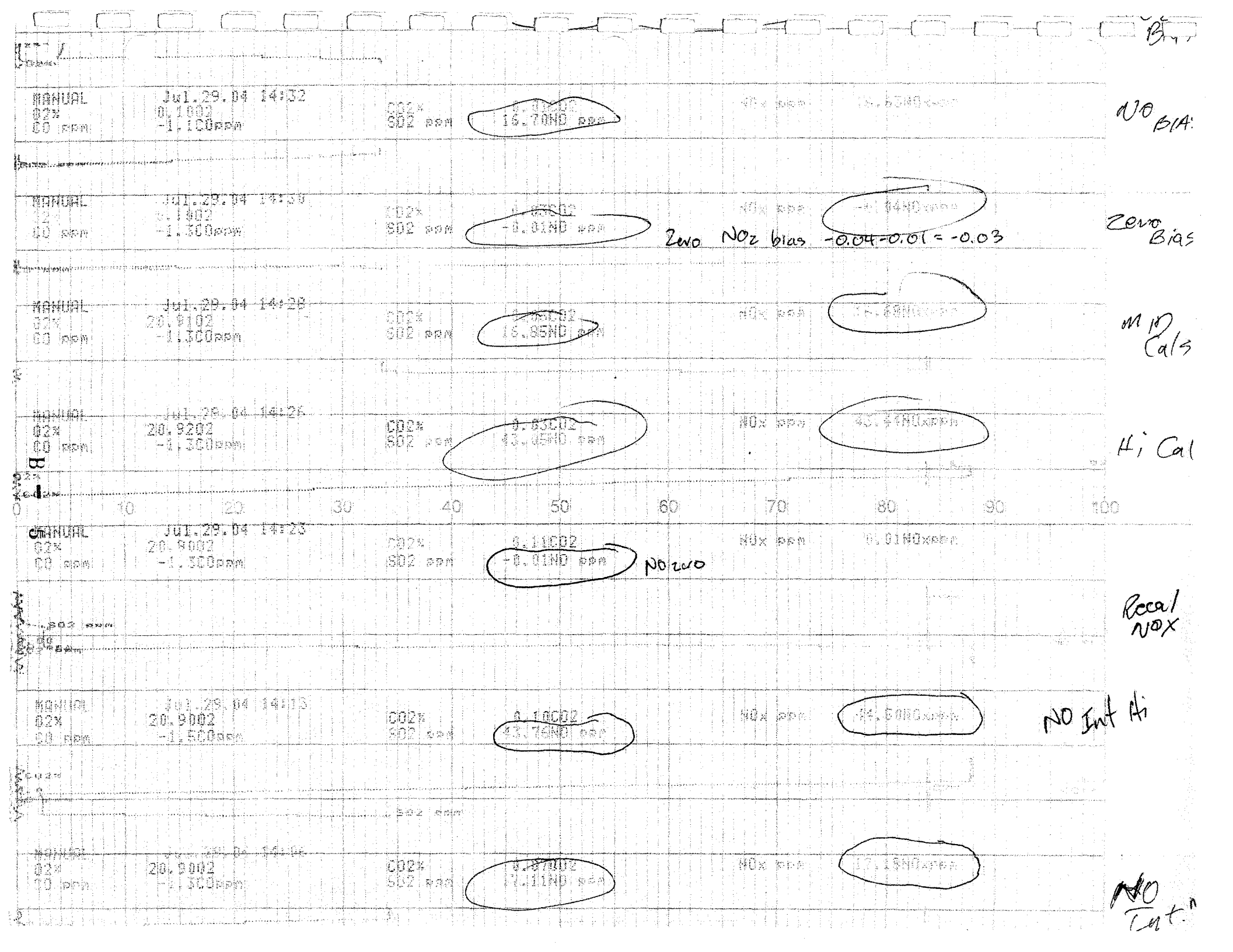
QTAY Flare - Zink

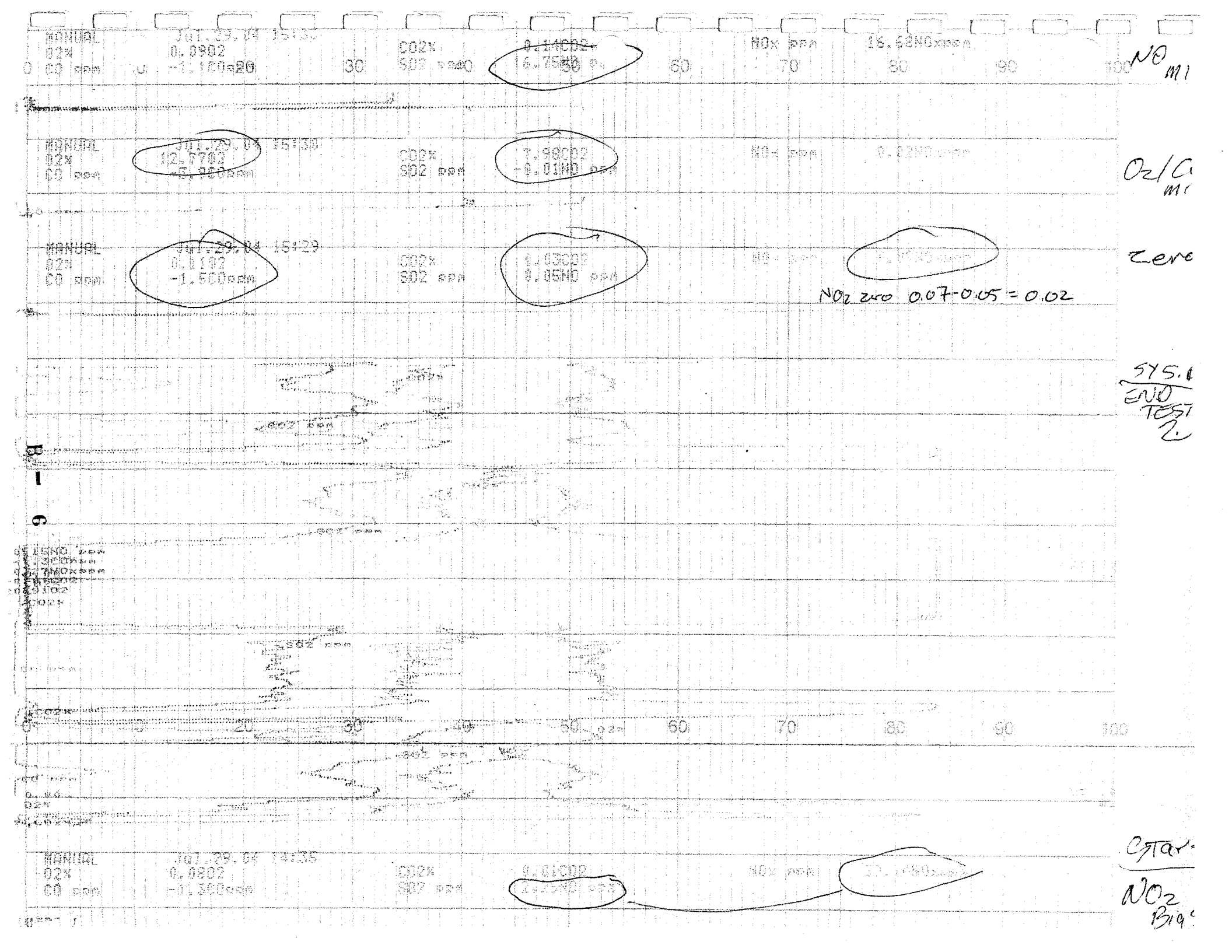
SCS Engineers 7/29/04 OE/BL O_2-25 CO_2-20 NOX-50 CO-200

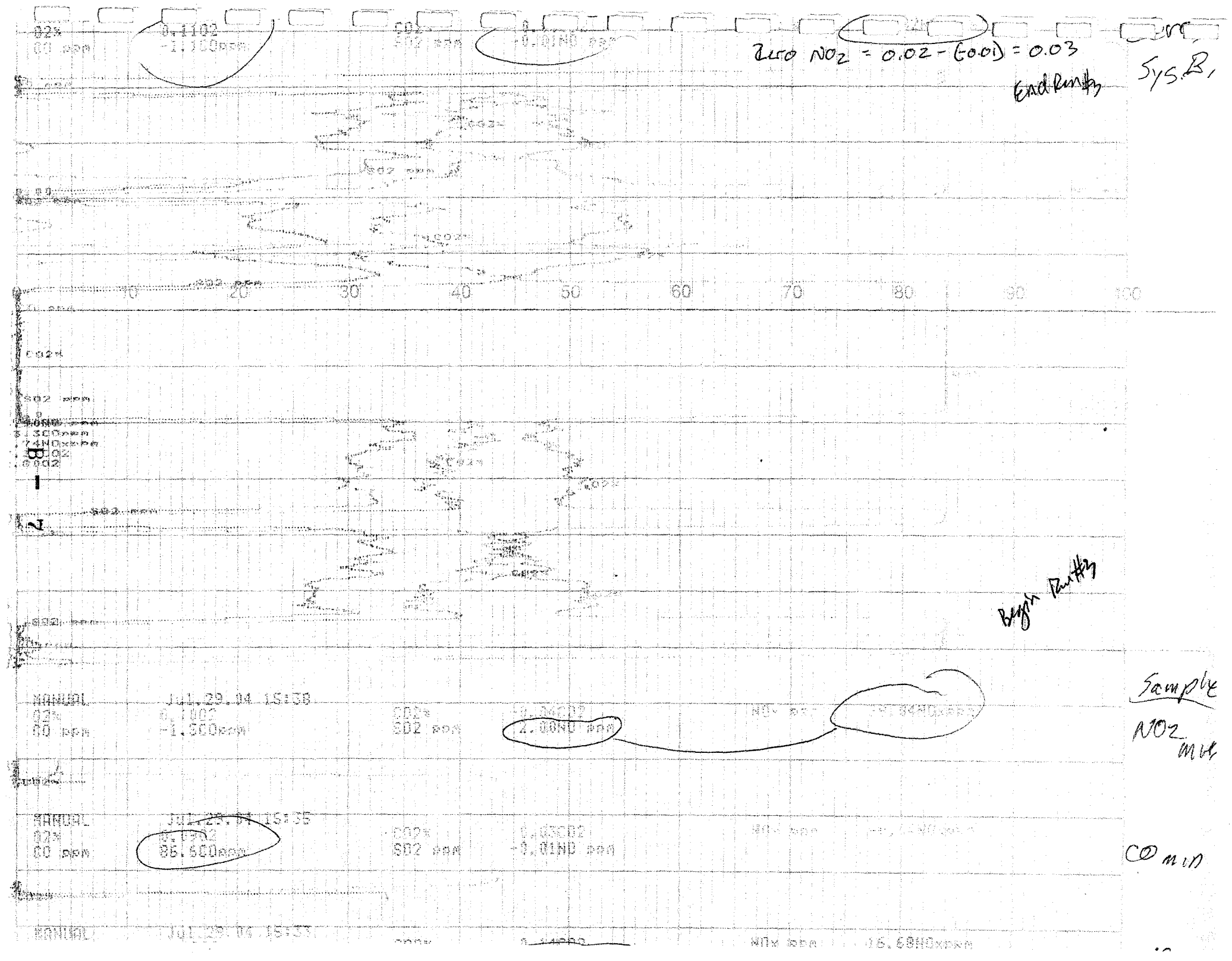
(+ 5% of the end of stated value)

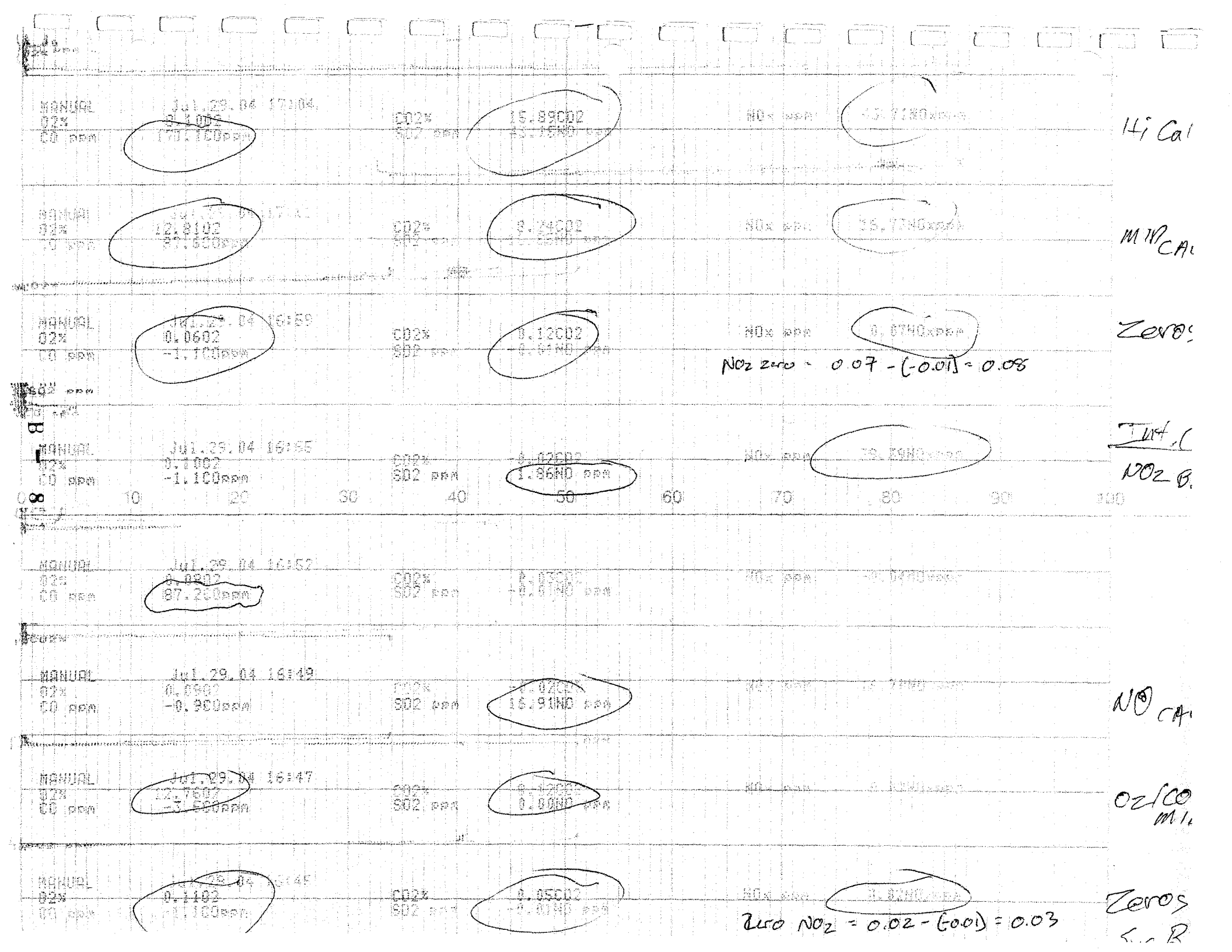

SYS B.
END TE
MANUAL Jul.29.04 13:47
02% 0.1902
CO ppm -1.300ppm
39.18
2.34
36.84
NO2 Bl
MANUAL Jul.29.04 12:42
02% 0.0902
CO ppm 86.600ppm
CO min
MANUAL Jul.29.04 12:39
02% 0.0902
CO ppm -1.300ppm
NO min
0 10 20 30 40 50 60 70 80 90 100


NO Int.
NO2 Int
44.6
1.2
43.4
NO2 synth
CO M
Bias
NO Bi
O2/C
M
Zeros
NO internal zero
NO2 0.12-0.05=0.07


MANUAL Jul.29.04 14:32
02% 0.1002
CO ppm -1.1C0ppm
CO2% 0.11CO2
SO2 ppm 16.70ND ppm
NOx ppm
NO Bias
MANUAL Jul.29.04 14:30
02% 0.1002
CO ppm -1.3C0ppm
CO2% 0.07CO2
SO2 ppm -0.01ND ppm
NOx ppm -0.04ND ppm
Zero NO2 bias -0.04-0.01 = -0.03
Zero Bias
MANUAL Jul.29.04 14:28
02% 20.9102
CO ppm -1.3C0ppm
CO2% 0.10CO2
SO2 ppm 16.95ND ppm
NOx ppm 19.89ND ppm
MID Cals
MANUAL Jul.29.04 14:26
02% 20.9202
CO ppm -1.3C0ppm
CO2% 0.83CO2
SO2 ppm 43.05ND ppm
NOx ppm 45.44ND ppm
Hi Cal
0 10 20 30 40 50 60 70 80 90 100
MANUAL Jul.29.04 14:23
02% 20.9002
CO ppm -1.3C0ppm
CO2% 0.11CO2
SO2 ppm -0.01ND ppm
NOx ppm 0.01NOx ppm
No zero
Recal NOx
MANUAL Jul.29.04 14:19
02% 20.9002
CO ppm -1.5C0ppm
CO2% 0.10CO2
SO2 ppm 43.76ND ppm
NOx ppm 44.80ND ppm
NO Int Hi
MANUAL Jul.29.04 14:16
02% 20.9002
CO ppm -1.3C0ppm
CO2% 0.07CO2
SO2 ppm 17.11ND ppm
NOx ppm 17.15ND ppm
NO Int


MANUAL
02%
CO ppm
CO2%
SO2 ppm
NOx ppm
0 10 20 30 40 50 60 70 80 90 100
NO mi
Oz/C
mi
Zero
NO2 zro 0.07-0.05 = 0.02
SYS.
ENO
TEST
2.
Big
Cstar
NO2
Big


Zero NO2 = 0.02 - (0.01) = 0.03
End Run #3
Sys. B,
Begin Run #3
Sample
NO2 min
CO min
MANUAL
Jul 29 04 15:30
02%
0.11O2
CO ppm
-1.5OOppm
SO2 ppm
2.00ND ppm
MANUAL
02%
0.13O2
CO ppm
86.6OOppm
SO2 ppm
-0.01ND ppm
MANUAL
Jul 29 04 15:37
NOx ppm
16.68NOxppm


MANUAL Jul.29.04 17:04
O2% 5.10O2
CO ppm 70.1COppm
CO2% 15.89CO2
SO2 ppm 73.1SO2
NOx ppm 43.21NOxppm
Hi Cal
MANUAL Jul.29.04 17:12
O2% 12.81O2
CO ppm 31.6COppm
CO2% 8.24CO2
SO2 ppm 0.0SO2
NOx ppm 35.77NOxppm
Mid Cal
MANUAL Jul.29.04 16:59
O2% 0.06O2
CO ppm -1.1COppm
CO2% 0.12CO2
SO2 ppm -0.6SO2
NOx ppm 0.07NOxppm
Zeros
NO2 zero = 0.07 - (-0.01) = 0.08
MANUAL Jul.29.04 16:55
O2% 0.10O2
CO ppm -1.1COppm
CO2% 0.02CO2
SO2 ppm 1.86SO2
NOx ppm 39.85NOxppm
Test Gas
NO2 Bottle
MANUAL Jul.29.04 16:52
O2% 0.08O2
CO ppm 87.2COppm
CO2% 0.07CO2
SO2 ppm -0.6SO2
NOx ppm -0.04NOxppm
MANUAL Jul.29.04 16:49
O2% 0.06O2
CO ppm -0.9COppm
CO2% 0.02CO2
SO2 ppm 16.91SO2
NO Cal
MANUAL Jul.29.04 16:47
O2% 12.76O2
CO ppm -3.5COppm
CO2% 8.19CO2
SO2 ppm 0.0SO2
O2/CO Mid
MANUAL Jul.29.04 16:45
O2% 0.11O2
CO ppm -1.1COppm
CO2% 0.05CO2
SO2 ppm -0.6SO2
NOx ppm 0.02NOxppm
Zero O2 = 0.02 - (-0.01) = 0.03
Zeros for B
10 20 30 40 50 60 70 80 90 100

Appendix C

Quality Assurance

CALIBRATION ERROR

FACILITY:	OTAY	DATA FOR SAMPLING RUNS:	RUN 1 INITIAL
SOURCE ID:	FLARE	DATE:	7/29/04
OPERATOR:	DEE	PROJECT No.:	2170.1005

PARAMETER	CYLINDER VALUE	ANALYZER CALIBRATION RESPONSE	ABSOLUTE DIFFERENCE	DIFFERENCE
UNITS	PPMV or % VOL	PPMV or % VOL	PPMV or % VOL	% OF SPAN
O_2 - FULL SCALE	25.00			
O_2 - ZERO	0.00	0.08	-0.08	**-0.32**
O_2 - MID CAL	12.80	12.84	-0.04	**-0.16**
O_2 -HIGH CAL	20.95	20.92	0.03	**0.12**
CO_2 - FULL SCALE	20.00			
CO_2 - ZERO	0.00	-0.05	0.05	**0.25**
CO_2 - MID CAL	8.11	8.17	-0.06	**-0.29**
CO_2 -HIGH CAL	15.90	15.95	-0.05	**-0.25**
NO - FULL SCALE	50.00			
NO - ZERO	0.00	-0.01	0.01	**0.02**
NO - MID CAL	17.29	16.90	0.39	**0.78**
NO -HIGH CAL	43.00	43.04	-0.04	**-0.08**
NO2 - FULL SCALE	50.00			
NO2 - ZERO	0.00	0.02	-0.02	**-0.04**
NO2 - MID CAL	39.30	43.24	-3.94	**-7.88**
CO - FULL SCALE	200.00			
CO - ZERO	0.00	-1.10	1.10	**0.55**
CO - MID CAL	86.57	87.00	-0.43	**-0.22**
CO -HIGH CAL	170.00	170.70	-0.70	**-0.35**

NOTE: CO2/O2 - % VOL AND NO/NO2/CO - PPMV; ALL ON A DRY BASIS

CALIBRATION ERROR

FACILITY:	OTAY	DATA FOR SAMPLING RUNS:		RUN 1 FINAL/RUN 2 INITIAL
SOURCE ID:	FLARE	DATE:		7/29/04
OPERATOR:	DEE	PROJECT No.:		2170.1005
PARAMETER	CYLINDER VALUE	ANALYZER CALIBRATION RESPONSE	ABSOLUTE DIFFERENCE	DIFFERENCE
UNITS	PPMV or % VOL	PPMV or % VOL	PPMV or % VOL	% OF SPAN
O_2 - FULL SCALE	25.00			
O_2 - ZERO	0.00	0.08	-0.08	**-0.32**
O_2 - MID CAL	12.80	12.84	-0.04	**-0.16**
O_2 -HIGH CAL	20.95	20.92	0.03	**0.12**
CO_2 - FULL SCALE	20.00			
CO_2 - ZERO	0.00	-0.05	0.05	**0.25**
CO_2 - MID CAL	8.11	8.17	-0.06	**-0.29**
CO_2 -HIGH CAL	15.90	15.95	-0.05	**-0.25**
NO - FULL SCALE	50.00			
NO - ZERO	0.00	0.01	-0.01	**-0.02**
NO - MID CAL	17.29	16.85	0.44	**0.88**
NO -HIGH CAL	43.00	43.05	-0.05	**-0.10**
NO2 - FULL SCALE	50.00			
NO2 - ZERO	0.00	0.02	-0.02	**-0.04**
NO2 - MID CAL	39.30	43.24	-3.94	**-7.88**
CO - FULL SCALE	200.00			
CO - ZERO	0.00	-1.10	1.10	**0.55**
CO - MID CAL	86.57	87.00	-0.43	**-0.22**
CO -HIGH CAL	170.00	170.70	-0.70	**-0.35**

NOTE: CO2/O2 - % VOL AND NO/NO2/CO - PPMV; ALL ON A DRY BASIS

CALIBRATION ERROR

FACILITY:	OTAY	DATA FOR SAMPLING RUNS:		RUN 2 FINAL/RUN 3 INITIAL
SOURCE ID:	FLARE	DATE:		7/29/04
OPERATOR:	DEE	PROJECT No.:		2170.1005
PARAMETER	CYLINDER VALUE	ANALYZER CALIBRATION RESPONSE	ABSOLUTE DIFFERENCE	DIFFERENCE
UNITS	PPMV or % VOL	PPMV or % VOL	PPMV or % VOL	% OF SPAN
O_2 - FULL SCALE	25.00			
O_2 - ZERO	0.00	0.08	-0.08	**-0.32**
O_2 - MID CAL	12.80	12.84	-0.04	**-0.16**
O_2 -HIGH CAL	20.95	20.92	0.03	**0.12**
CO_2 - FULL SCALE	20.00			
CO_2 - ZERO	0.00	-0.05	0.05	**0.25**
CO_2 - MID CAL	8.11	8.17	-0.06	**-0.29**
CO_2 -HIGH CAL	15.90	15.95	-0.05	**-0.25**
NO - FULL SCALE	50.00			
NO - ZERO	0.00	-0.01	0.01	**0.02**
NO - MID CAL	17.29	16.90	0.39	**0.78**
NO -HIGH CAL	43.00	43.04	-0.04	**-0.08**
NO2 - FULL SCALE	50.00			
NO2 - ZERO	0.00	0.02	-0.02	**-0.04**
NO2 - MID CAL	39.30	43.24	-3.94	**-7.88**
CO - FULL SCALE	200.00			
CO - ZERO	0.00	-1.10	1.10	**0.55**
CO - MID CAL	86.57	87.00	-0.43	**-0.22**
CO -HIGH CAL	170.00	170.70	-0.70	**-0.35**

NOTE: CO2/O2 - % VOL AND NO/NO2/CO - PPMV; ALL ON A DRY BASIS

CALIBRATION ERROR

FACILITY:	OTAY	DATA FOR SAMPLING RUNS:		RUN 3 FINAL
SOURCE ID:	FLARE	DATE:		7/29/04
OPERATOR:	DEE	PROJECT No.:		2170.1005
PARAMETER	CYLINDER VALUE	ANALYZER CALIBRATION RESPONSE	ABSOLUTE DIFFERENCE	DIFFERENCE
UNITS	PPMV or % VOL	PPMV or % VOL	PPMV or % VOL	% OF SPAN
O_2 - FULL SCALE	25.00			
O_2 - ZERO	0.00	0.06	-0.06	**-0.24**
O_2 - MID CAL	12.80	12.81	-0.01	**-0.04**
O_2 -HIGH CAL	20.95	20.88	0.07	**0.28**
CO_2 - FULL SCALE	20.00			
CO_2 - ZERO	0.00	0.12	-0.12	**-0.60**
CO_2 - MID CAL	8.11	8.24	-0.13	**-0.64**
CO_2 -HIGH CAL	15.90	15.89	0.01	**0.05**
NO - FULL SCALE	50.00			
NO - ZERO	0.00	-0.01	0.01	**0.02**
NO - MID CAL	17.29	16.85	0.44	**0.88**
NO -HIGH CAL	43.00	43.15	-0.15	**-0.30**
NO2 - FULL SCALE	50.00			
NO2 - ZERO	0.00	0.08	-0.08	**-0.16**
NO2 - MID CAL	39.30	43.04	-3.74	**-7.48**
CO - FULL SCALE	200.00			
CO - ZERO	0.00	-1.10	1.10	**0.55**
CO - MID CAL	86.57	87.60	-1.03	**-0.52**
CO -HIGH CAL	170.00	171.10	-1.10	**-0.55**

NOTE: CO2/O2 - % VOL AND NO/NO2/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	OTAY	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 1		
SOURCE ID:	FLARE	DATE:			07/29/04	
OPERATOR:	DEE	PROJECT No.:			2170.1005	
		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	0.08	0.10	**-0.08**	0.08	**0.00**	**0.08**
O_2 - SPAN	12.84	12.78	**0.24**	12.77	**0.28**	**0.04**
CO_2 - ZERO	-0.05	0.02	**-0.35**	0.03	**-0.40**	**-0.05**
CO_2 - SPAN	8.17	8.14	**0.15**	8.11	**0.30**	**0.15**
NO - ZERO	-0.01	0.05	**-0.12**	0.05	**-0.12**	**0.00**
NO - SPAN	16.90	16.91	**-0.02**	17.05	**-0.30**	**-0.28**
NO2 - ZERO	0.02	0.02	**0.00**	0.07	**-0.10**	**-0.10**
NO2 - SPAN	43.24	36.84	**12.80**	36.99	**12.50**	**-0.30**
CO - ZERO	-1.10	-1.50	**0.20**	-1.50	**0.20**	**0.00**
CO - SPAN	87.00	86.60	**0.20**	86.80	**0.10**	**-0.10**

NOTE: CO2/O2 - % VOL AND NO/NO2/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	OTAY	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 2		
SOURCE ID:	FLARE	DATE:			07/29/04	
OPERATOR:	DEE	PROJECT No.:			2170.1005	
		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	0.08	0.08	**0.00**	0.11	**-0.12**	**-0.12**
O_2 - SPAN	12.84	12.77	**0.28**	12.77	**0.28**	**0.00**
CO_2 - ZERO	-0.05	0.03	**-0.40**	0.03	**-0.40**	**0.00**
CO_2 - SPAN	8.17	8.11	**0.30**	7.98	**0.95**	**0.65**
NO - ZERO	0.01	0.05	**-0.08**	0.05	**-0.08**	**0.00**
NO - SPAN	16.85	17.05	**-0.40**	16.75	**0.20**	**0.60**
NO2 - ZERO	0.02	-0.03	**0.10**	0.02	**0.00**	**-0.10**
NO2 - SPAN	43.24	36.89	**12.70**	37.04	**12.40**	**-0.30**
CO - ZERO	-1.10	-1.50	**0.20**	-1.50	**0.20**	**0.00**
CO - SPAN	87.00	86.80	**0.10**	86.60	**0.20**	**0.10**

NOTE: CO2/O2 - % VOL AND NO/NO2/CO - PPMV; ALL ON A DRY BASIS

SYSTEM CALIBRATION BIAS AND DRIFT DATA

FACILITY:	OTAY	DATA FOR SAMPLING RUN:		COMPLIANCE RUN 3		
SOURCE ID:	FLARE	DATE:			07/29/04	
OPERATOR:	DEE	PROJECT No.:			2170.1005	
		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	0.08	0.11	**-0.12**	0.11	**-0.12**	**0.00**
O_2 - SPAN	12.84	12.77	**0.28**	12.76	**0.32**	**0.04**
CO_2 - ZERO	-0.05	0.03	**-0.40**	0.05	**-0.50**	**-0.10**
CO_2 - SPAN	8.17	7.98	**0.95**	8.12	**0.25**	**-0.70**
NO - ZERO	-0.01	0.05	**-0.12**	-0.01	**0.00**	**0.12**
NO - SPAN	16.90	16.75	**0.30**	16.91	**-0.02**	**-0.32**
NO2 - ZERO	0.02	0.02	**0.00**	0.03	**-0.02**	**-0.02**
NO2 - SPAN	43.24	37.04	**12.40**	37.53	**11.42**	**-0.98**
CO - ZERO	-1.10	-1.50	**0.20**	-1.10	**0.00**	**-0.20**
CO - SPAN	87.00	86.60	**0.20**	87.20	**-0.10**	**-0.30**

NOTE: CO2/O2 - % VOL AND NO/NO2/CO - PPMV; ALL ON A DRY BASIS

RECEIVED JUN 2 5 2004

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (909) 653-6780 • FAX (909) 653-2430

REPORT OF ANALYSIS

SCEC01 DATE: 6/22/04

TO: Bipul Saraf
SCEC, Air Quality Specialists
1582-1 N Batavia St
Orange CA 92867

CUSTOMER ORDER NUMBER: 3167

CYLINDER NUMBER : CC114789

COMPONENT	CONCENTRATION(v/v)	NIST TRACEABLE REFERENCE STANDARD
Nitrogen Dioxide	39.3 ± 0.8 ppm	SRM 1683a
Nitrogen	Balance	

Reanalysis
Shelf life = 6 months
ppm = μmole/mole % = mole-%
Cylinder Pressure: 1400 psig

The above analyses are traceable to the National Institute of Standards and Technology by intercomparison with the reference standards listed above.
Where indicated, volumetric and gravimetric reference standards are traceable thru use of our analytical balance NIST Weight Report No. MMAP 232.09/202491.

ANALYST _____ B.M. Marrin **APPROVED** _____ for J.T. Marrin

Airgas

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

Certificate of Analysis EPA Protocol Gas Mixture

Cylinder No:	CC46715	Reference Number:	48-68896800-002
Cylinder Pressure:	2,014 psig	Expiration Date:	12/22/2006
Certification Date:	12/22/2003	Laboratory:	ASG - LA

Certified Concentrations

Component	Concentration	Accuracy	Analytical Principle	Procedure
Oxygen	7.996 %	+/- 1%	PARAMAG	G1
Carbon Dioxide	15.90 %	+/- 1%	NDIR	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.

Approved for Release

Reference Standard Information

Type	Component	Cyl. Number	Concentration
NTRM 82745	Carbon Dioxide	CC55225	22.06 PERCENT
NTRM 40212	Oxygen	CC109004	10.00 PERCENT

Analytical Results

1st Component Oxygen

1st Analysis Date: 12/22/2003

R	96.80	S	77.40	Z	0.0000	Conc	7.996 %
S	77.40	Z	0.0000	R	96.80	Conc	7.996 %
Z	0.0000	R	96.80	S	77.40	Conc	7.996 %
						AVG:	7.996 %

2nd Component Carbon Dioxide

1st Analysis Date: 12/22/2003

R	98.00	S	70.60	Z	0.0000	Conc	15.90 %
S	70.60	Z	0.0000	R	98.00	Conc	15.90 %
Z	0.0000	R	98.00	S	70.60	Conc	15.90 %
						AVG:	15.90 %

Airgas

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

Certificate of Analysis EPA Protocol Gas Mixture

Cylinder No:	CC12956	Reference Number:	48-77033000-001
Cylinder Pressure:	2,013 psig	Expiration Date:	02/25/2007
Certification Date:	02/25/2004	Laboratory:	ASG - LA

Certified Concentrations

Component	Concentration	Accuracy	Analytical Principle	Procedure
Carbon Dioxide	8.111 %	+/- 1%	NDIR	G1
Oxygen	12.80 %	+/- 1%	PARAMAG	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.

Approved for Release

Reference Standard Information

Type	Component	Cyl. Number	Concentration
NTRM 40311	Oxygen	CC96415	20.01 PERCENT
NTRM 404	Carbon Dioxide	CC113747	7.061 PERCENT

Analytical Results

1st Component Carbon Dioxide

1st Analysis Date: 02/25/2004

R	64.20	S	73.75	Z	0.0000	Conc	8.111 %
S	73.75	Z	0.0000	R	64.20	Conc	8.111 %
Z	0.0000	R	64.20	S	73.75	Conc	8.111 %
						AVG:	8.111 %

2nd Component Oxygen

1st Analysis Date: 02/25/2004

R	90.00	S	57.55	Z	0.0000	Conc	12.80 %
S	57.55	Z	0.0000	R	90.00	Conc	12.80 %
Z	0.0000	R	90.00	S	57.55	Conc	12.80 %
						AVG:	12.80 %

Airgas

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

Certificate of Analysis EPA Protocol Gas Mixture

Cylinder No:	CC171401	Reference Number:	48-68896500-002
Cylinder Pressure:	2,013 psig	Expiration Date:	12/31/2006
Certification Date:	12/31/2003	Laboratory:	ASG - LA

Certified Concentrations

Component	Concentration	Accuracy	Analytical Principle	Procedure
Carbon Monoxide	170.0 PPM	+/- 1%	NDIR	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.

Approved for Release

Reference Standard Information

Type	Component	Cyl. Number	Concentration
NTRM 81639	Carbon Monoxide	SG9196935B	244.7 PPM

Analytical Results

1st Component Carbon Monoxide

1st Analysis Date:			12/23/2003				
R	96.90	S	67.00	Z	0.0000	Conc	169.2 PPM
S	67.00	Z	0.0000	R	96.90	Conc	169.2 PPM
Z	0.0000	R	96.90	S	67.00	Conc	169.2 PPM
						AVG:	169.2 PPM
2nd Analysis Date:			12/31/2003				
R	96.50	S	67.30	Z	0.0000	Conc	170.7 PPM
S	67.30	Z	0.0000	R	96.50	Conc	170.7 PPM
Z	0.0000	R	96.50	S	67.30	Conc	170.7 PPM
						AVG:	170.7 PPM

Airgas

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
Tel: 323.567.6801 Fax: 323.567.3686
www.airgas.com

Certificate of Analysis EPA Protocol Gas Mixture

Cylinder No:	CC97580	Reference Number:	48-75558300-004
Cylinder Pressure:	2,013 psig	Expiration Date:	02/17/2007
Certification Date:	02/17/2004	Laboratory:	ASG - LA

Certified Concentrations

Component	Concentration	Accuracy	Analytical Principle	Procedure
Carbon Monoxide	86.57 PPM	+/- 1%	NDIR	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.

Approved for Release

Reference Standard Information

Type	Component	Cyl. Number	Concentration
GMIS 6	Carbon Monoxide	CC16173	195.8 PPM

Analytical Results

1st Component Carbon Monoxide

1st Analysis Date:			02/10/2004				
R	96.80	S	42.80	Z	0.0000	Conc	86.57 PPM
S	42.80	Z	0.0000	R	96.80	Conc	86.57 PPM
Z	0.0000	R	96.80	S	42.80	Conc	86.57 PPM
						AVG:	86.57 PPM
2nd Analysis Date:			02/17/2004				
R	96.80	S	42.80	Z	0.0000	Conc	86.57 PPM
S	42.80	Z	0.0000	R	96.80	Conc	86.57 PPM
Z	0.0000	R	96.80	S	42.80	Conc	86.57 PPM
						AVG:	86.57 PPM

rgas
pecialty Gases
Alameda Street
les, CA 90059-2130
'-6891
) 567-3686

Certificate of Analysis: E.P.A. Protocol Gas Mixture

Customer:	Airgas West Inc.	P.O.	374326-Long Beach
Cylinder No :	CC71800	Order No.	437194-01
Cylinder Pressure:	2000 PSIG	Expiration Date:	7/14/05
Certification Date	7/14/03	Laboratory:	LOS ANGELES

Reference Standard Information:

Type	Component	Cyl. Number	Concentration
NTRM 01040303	Nitric oxide	CC18409	96.4 PPM

Instrumentation:

Instrument/Model/Serial No.	Analytical Principle
Siemens/Ultramat 5E	NDIR

Analytical Methodology does not require correction for analytical interferences.

Certified Concentrations:

Component	Concentration		Accuracy	Procedure
Nitric oxide	43.0	PPM	+/- 1%	G1
NOx	43.4	PPM		
Nitrogen	Balance			

Analytical Results:

1st Component: Nitric oxide

1st Analysis Date: 7/7/03

R	96.400	S	43.200	Z	0.000	Conc	43.200 PPM
S	43.200	Z	0.000	R	96.400	Conc	43.200 PPM
Z	0.000	R	96.400	S	43.200	Conc	43.200 PPM
						AVG:	43.200 PPM

2nd Analysis Date: 7/14/03

R	96.400	S	42.800	Z	0.000	Conc	42.800 PPM
S	42.800	Z	0.000	R	96.400	Conc	42.800 PPM
Z	0.000	R	96.400	S	42.800	Conc	42.800 PPM
						AVG:	42.800 PPM

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed.

Do not use cylinder below 150 psig.

Approved for Release

Airgas

Airgas Specialty Gases
12722 South Wentworth Avenue
Chicago, IL 60628
773.785.3000 Fax: 773.785.1928
www.airgas.com

Certificate of Analysis: E.P.A. Protocol Gas Mixture

Certification performed in accordance with "EPA Traceability Protocol (Sept.1997)" using assay procedures listed.

Cylinder No:	SG9152011BAL	Order No:	279319-00
Certification Date:	03/24/2003	Expiration Date:	03/24/2005
Cylinder Pressure:	2000	Part No:	E02NI99E15AC240

*Do not use cylinder below 150 psig.

Component	Certified Concentration	Unit of Measure	Accuracy	Procedure	Analytical Principle
Nitric Oxide	17.29	ppm	1%	G1	Chemiluminescence
Nitrogen	Balance				

Nox (Reference Value Only) 17.40 ppm

Reference Standard Information

Type	Component	Concentration	Unit	Cylinder Number
NTRM	Nitric Oxide	18.14	ppm	SG9170149BAL

Analytical Data

Component 1 Nitric Oxide

1st Analysis Date: 03/17/2003

Zero	0.000	Cand	16.880	Ref	17.850
Zero	0.000	Cand	16.950	Ref	17.880
Zero	0.000	Cand	16.930	Ref	17.830

2nd Analysis Date: 03/24/03

Zero	0.000	Cand	17.180	Ref	17.830
Zero	0.000	Cand	17.150	Ref	17.880
Zero	0.000	Cand	17.100	Ref	17.900

Analyzed by: S. Burke 2/17/04

SEMI-ANNUAL METER BOX CALIBRATION DATA AT STANDARD TEMPERATURE OF 60 DEG F

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: N:\Source Test\QAQC info\CONTROL BOX (CB) CAL USING CRITICAL ORIFICE\2004 Second Half Calibrations\[CB 8.xls]SCAQMD at 60 Deg c
File Modified From: APEX 522 Series Meter box Calibration
Revised: 4/7/2004

Model #: Nutech
ID #: CB 8
Date: 06 14 04
Bar. Pressure: 29.92 (In. Hg)
Performed By: TT

Theoretical Critical Vacuum = 14.12

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
					Initial Temps.		Final Temps.					Ambient Temperature		
dH (In H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (In Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.27	19.00	406.89	412.77	5.88	81.00	79.00	83.00	80.00	40	0.233	21.00	79.00	80.00	79.50
0.27	18.00	412.77	418.34	5.57	83.00	80.00	84.00	81.00	40	0.233	21.00	80.00	80.00	80.00
0.27	18.00	418.34	423.94	5.60	84.00	81.00	84.00	82.00	40	0.233	21.00	80.00	81.00	80.50
0.63	13.00	432.00	437.98	5.98	75.00	74.00	77.00	75.00	48	0.347	19.00	73.00	73.00	73.00
0.63	14.00	437.98	444.42	6.44	77.00	75.00	78.00	75.00	48	0.347	19.00	73.00	73.00	73.00
0.63	13.00	444.42	450.40	5.97	78.00	75.00	79.00	76.00	48	0.347	19.00	73.00	73.00	73.00
1.80	8.00	450.40	456.43	6.03	79.00	76.00	80.00	76.00	63	0.566	16.00	73.00	73.00	73.00
1.80	8.00	456.44	462.45	6.01	80.00	76.00	81.00	77.00	63	0.566	16.00	73.00	73.00	73.00
1.80	8.00	462.45	468.46	6.01	81.00	77.00	82.00	77.00	63	0.566	16.00	73.00	73.00	73.00
3.30	6.00	468.46	474.62	6.16	81.00	77.00	83.00	77.00	73	0.792	12.00	73.00	73.00	73.00
3.30	6.00	474.62	480.80	6.18	83.00	77.00	85.00	78.00	73	0.792	12.00	73.00	73.00	73.00
3.30	6.00	480.80	486.96	6.16	85.00	78.00	86.00	78.00	73	0.792	12.00	73.00	73.00	73.00

DRY GAS METER		ORIFICE			DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR	Individual Run	Individual Orifice	Orifice Average	Orifice Average
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	Y Value (number)	dH@ Value (in H2O)	0.95 < Y < 1.05?	Ymax - Ymin < 0.010?	0.98 < Y/Yd < 1.02?	dH@ - dH@ av < 0.155?
5.738	162.5	5.693	161.2	5.906	0.992	1.632	Pass			
5.430	153.8	5.391	152.7	5.598	0.993	1.631	Pass			
5.447	154.3	5.388	152.6	5.601	0.989	1.629	Pass			
				Average	0.991	1.631		Pass	Pass	Pass
5.902	167.1	5.853	165.8	5.999	0.992	1.703	Pass			
6.352	179.9	6.303	178.5	6.461	0.992	1.701	Pass			
5.882	166.6	5.853	165.8	5.999	0.995	1.700	Pass			
				Average	0.993	1.701		Pass	Pass	Pass
5.947	168.4	5.865	166.1	6.012	0.986	1.830	Pass			
5.919	167.6	5.865	166.1	6.012	0.991	1.828	Pass			
5.908	167.3	5.865	166.1	6.012	0.993	1.826	Pass			
				Average	0.990	1.828		Pass	Pass	Pass
6.077	172.1	6.159	174.4	6.313	1.014	1.708	Pass			
6.081	172.2	6.159	174.4	6.313	1.013	1.708	Pass			
6.052	171.4	6.159	174.4	6.313	1.018	1.704	Pass			
				Average	1.015	1.706		Pass	Pass	Pass

Average Yd: 0.997 dH@: 1.716
Q @ dH = 1: 0.672

SIGNED: Tom Tagl Date: 6/16/04

IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

SEMI-ANNUAL METER BOX CALIBRATION DATA AT STANDARD TEMPERATURE OF 68 DEG F

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: N:\Source Test\QAQC Info\CONTROL BOX (CB) CAL USING CRITICAL ORIFICE\2004 Second Half Calibrations\[CB 6.xls]EPA at 68 Deg dH
File Modified From: APEX 522 Series Meter box Calibration
Revised: 4/7/2004

Model #: Nutech
ID #: CB 6
Date: 7/23/2004
Bar. Pressure: 29.90 (in. Hg)
Performed By: TT

Theoretical Critical Vacuum = 14.11

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
					Initial Temps.		Final Temps.					Ambient Temperature		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.27	18.00	63.837	69.437	5.600	79.0	78.0	80.0	79.0	40	0.233	23.0	77.0	77.0	77.0
0.27	18.00	69.437	75.048	5.611	80.0	79.0	81.0	79.0	40	0.233	23.0	77.0	77.0	77.0
0.27	18.00	75.048	80.663	5.615	81.0	79.0	81.0	80.0	40	0.233	23.0	77.0	77.0	77.0
0.60	13.00	80.663	86.704	6.041	81.0	80.0	82.0	80.0	48	0.347	21.0	77.0	77.0	77.0
0.60	13.00	86.704	92.773	6.069	82.0	80.0	82.0	81.0	48	0.347	21.0	77.0	77.0	77.0
0.60	13.00	92.773	98.818	6.045	82.0	81.0	83.0	81.0	48	0.347	21.0	77.0	77.0	77.0
1.60	9.00	98.818	105.662	6.844	83.0	81.0	84.0	82.0	63	0.566	19.0	77.0	77.0	77.0
1.60	8.00	105.662	111.743	6.081	84.0	82.0	85.0	82.0	63	0.566	19.0	77.0	77.0	77.0
1.60	8.00	111.743	117.827	6.084	85.0	82.0	85.0	82.0	63	0.566	19.0	77.0	77.0	77.0
3.20	6.00	136.852	143.138	6.286	82.0	82.0	82.0	82.0	73	0.792	16.0	79.0	79.0	79.0
3.20	6.00	143.138	149.423	6.285	82.0	82.0	83.0	82.0	73	0.792	16.0	79.0	80.0	79.5
3.20	6.00	149.423	155.688	6.265	83.0	82.0	84.0	82.0	73	0.792	16.0	80.0	80.0	80.0

DRY GAS METER		ORIFICE			DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR	Individual Run	Individual Orifice	Orifice Average	Orifice Average
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	Y Value (number)	dH@ Value (in H2O)	0.95 < Y < 1.05?	Ymax - Ymin < 0.010?	0.98 < Y/Yd < 1.02?	dH@ - dH@ av < 0.155?
5.483	155.3	5.402	153.0	5.500	0.985	1.652	Pass			
5.487	155.4	5.402	153.0	5.500	0.985	1.651	Pass			
5.485	155.3	5.402	153.0	5.500	0.985	1.649	Pass			
				Average	0.985	1.651		Pass	Pass	Pass
5.901	167.1	5.827	165.0	5.933	0.987	1.641	Pass			
5.923	167.7	5.827	165.0	5.933	0.984	1.640	Pass			
5.894	166.9	5.827	165.0	5.933	0.989	1.638	Pass			
				Average	0.987	1.640		Pass	Pass	Pass
6.680	189.2	6.569	186.0	6.888	0.983	1.646	Pass			
5.927	167.9	5.839	165.4	5.945	0.985	1.645	Pass			
5.927	167.9	5.839	165.4	5.945	0.985	1.645	Pass			
				Average	0.985	1.645		Pass	Pass	Pass
6.165	174.6	6.121	173.3	6.255	0.993	1.684	Pass			
6.161	174.5	6.118	173.3	6.258	0.993	1.685	Pass			
6.136	173.8	6.115	173.2	6.261	0.997	1.687	Pass			
				Average	0.994	1.685		Pass	Pass	Pass

Average Yd: 0.988 dH@: 1.655
Q @ dH = 1: 0.583

SIGNED: Tom Tagl Date: 7/23/04

IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

S-TYPE PITOT TUBE CALIBRATION

DATE:	04/07/04
PITOT TUBE ID:	PT-34
CALIBRATED BY:	TT
PHYSICAL DESCRIPTION:	103 inch Flare Probe

SIDE "A" CALIBRATION

Run No.	Std. Pitot dP (in Hg)	S-Type dP (in Hg)	Cp(S)	Deviation Cp(S) - Cp(A)
1	0.77	1.13	0.825	0.009
2	0.77	1.17	0.811	-0.005
3	0.77	1.17	0.811	-0.005

Side "A" average, Cp(A) = 0.816
Average deviation, d = 0.006
Is d ≤ 0.01 Yes

SIDE "B" CALIBRATION

Run No.	Std. Pitot dP (in Hg)	S-Type dP (in Hg)	Cp(S)	Deviation Cp(S) - Cp(B)
1	0.77	1.17	0.811	0.003
2	0.77	1.20	0.801	-0.007
3	0.77	1.17	0.811	0.003

Side "B" average, Cp(B) = 0.808
Average deviation, d = 0.005
Is d ≤ 0.01 Yes

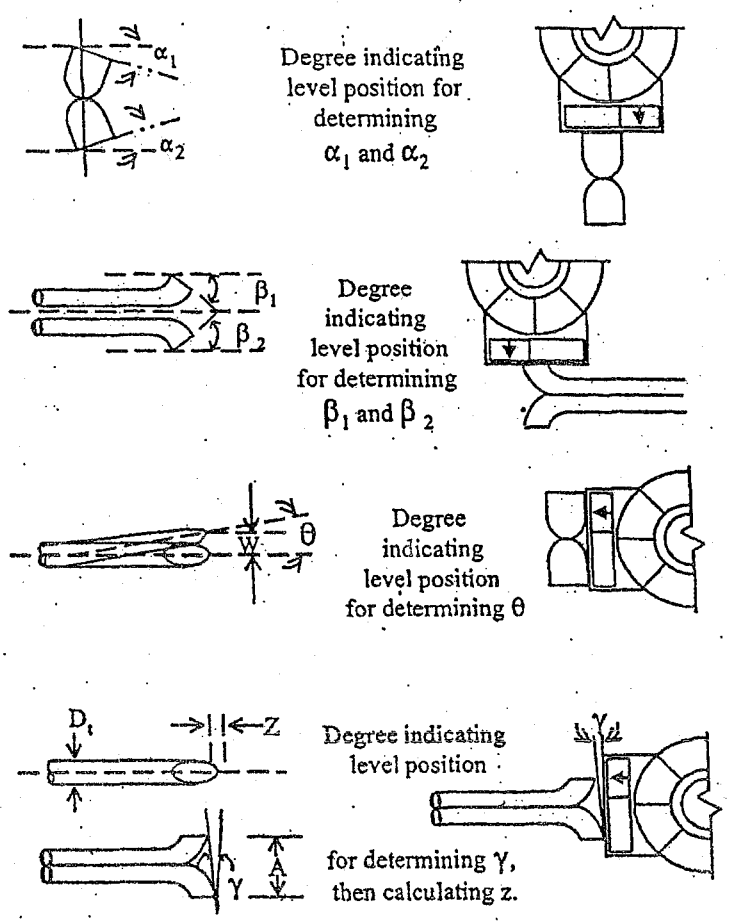
AMS Temp. (degrees F)	68
Barometric Pressure	30.15
Actual Calculated Pitot Coef.	**0.812**

Difference between sides "A" and "B", D = |Cp(A) - Cp(B)| = 0.008
Is D ≤ 0.01 Yes

Table 2G-1. Type S Probe Inspection Sheet

Note: Method 2 provides the criteria for an acceptably constructed Type S pitot tube. However, the procedure for making the necessary measurements is not specified. One approach is given below.

1. Use a vise with parallel and perpendicular faces. Use an angle-measuring device (analog or digital) for this check.
2. Place the pitot tube in the vise, and level the pitot tube horizontally using the angle-measuring device.
3. Place the angle-measuring device as shown below.
4. Measure distance A, which is P_A plus P_B. Method 2 specifies that $P_A = P_B$, but provides no tolerance for this measurement. Because this measurement is very difficult, it is suggested that $P_A = P_B = A/2$.
5. Measure the external tube diameter (D_t) with a micrometer, machinist's rule, or internal caliper.
6. Record all data as shown on the form below.
7. Calculate dimensions w and z as shown below.



Level and perpendicular?		yes
Obstruction?		No
Damaged?		No
α_1	($-2° \le \alpha_1 \le +2°$)	0°
α_2	($-2° \le \alpha_2 \le +2°$)	-.5°
β_1	($-2° \le \beta_1 \le +2°$)	.5°
β_2	($-2° \le \beta_2 \le +2°$)	-.5°
γ		.5°
θ		0°
$z = A(\tan\gamma)$	[≤ 0.5 mm (0.02 in.)]	.008
$w = A(\tan\theta)$	[≤ 0.5 mm (0.02 in.)]	0
D_t	[≥ 9.5 mm (3/8 in.)]	.375
A		.953
$A/2D_t$	($1.05 \le P_A/D_t \le 1.5$) *	1.27
* Recommended dimensions		

QA/QC Check

Completeness ✓ Legibility ✓ Accuracy ✓

Specifications ✓ Reasonableness ✓

Certification

I certify that the Type S probe ID 34 meets or exceeds all specifications, criteria, and applicable design features.

Certified by: Dan Jorgensen Date: 4/15/04

(492-9212)

S-TYPE PITOT TUBE CALIBRATION

DATE:	2/6/04
PITOT TUBE ID:	PT-10
CALIBRATED BY:	TT/GS
PHYSICAL DESCRIPTION:	1.5' Pitot Tube

SIDE "A" CALIBRATION

Run No.	Std. Pitot dP (in Hg)	S-Type dP (in Hg)	Cp(S)	Deviation Cp(S) - Cp(A)
1	0.70	1.05	0.816	-0.013
2	0.70	1.00	0.837	0.007
3	0.70	1.00	0.837	0.007

Side "A" average, Cp(A) = 0.830
Average deviation, d = 0.009
Is d ≤ 0.01 Yes

SIDE "B" CALIBRATION

Run No.	Std. Pitot dP (in Hg)	S-Type dP (in Hg)	Cp(S)	Deviation Cp(S) - Cp(B)
1	0.70	1.00	0.837	0.012
2	0.70	1.05	0.816	-0.009
3	0.71	1.05	0.822	-0.003

Side "B" average, Cp(B) = 0.825
Average deviation, d = 0.008
Is d ≤ 0.01 Yes

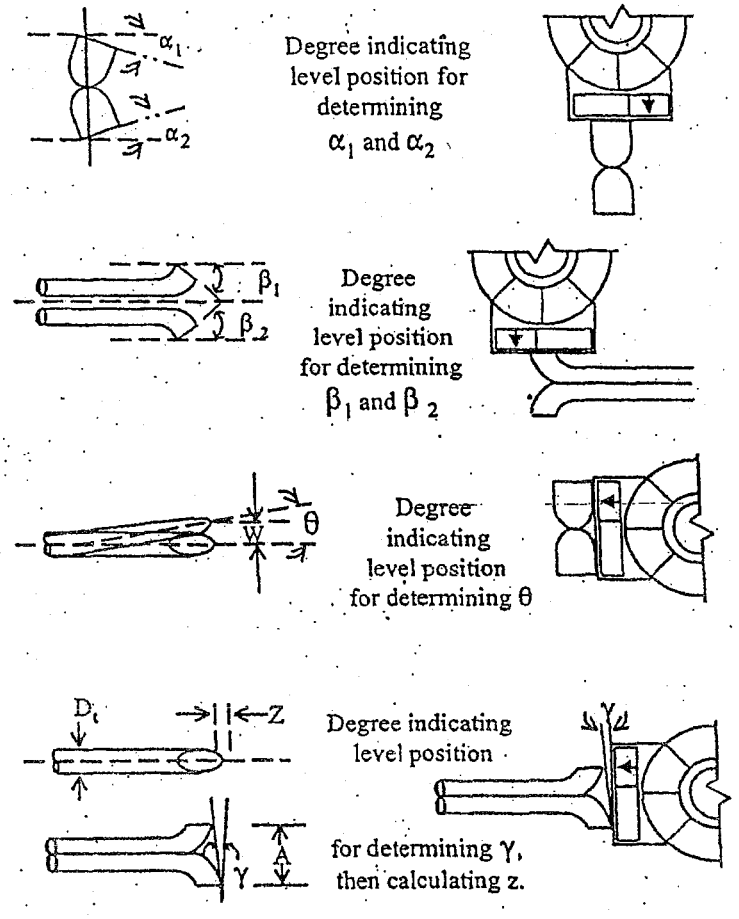
AMS Temp. (degrees F)	68
Barometric Pressure	29.92
Actual Calculated Pitot Coef.	**0.827**

Difference between sides "A" and "B", D = |Cp(A) - Cp(B)| 0.005
Is D ≤ 0.01 Yes

Table 2G-1. Type S Probe Inspection Sheet

Note: Method 2 provides the criteria for an acceptably constructed Type S pitot tube. However, the procedure for making the necessary measurements is not specified. One approach is given below.

1. Use a vise with parallel and perpendicular faces. Use an angle-measuring device (analog or digital) for this check.
2. Place the pitot tube in the vise, and level the pitot tube horizontally using the angle-measuring device.
3. Place the angle-measuring device as shown below.
4. Measure distance A, which is P_A plus P_B. Method 2 specifies that $P_A = P_B$, but provides no tolerance for this measurement. Because this measurement is very difficult, it is suggested that $P_A = P_B = A/2$.
5. Measure the external tube diameter (D_t) with a micrometer, machinist's rule, or internal caliper.
6. Record all data as shown on the form below.
7. Calculate dimensions w and z as shown below.



Level and perpendicular?	Yes
Obstruction?	NO
Damaged?	NO
α_1 $(-2° \le \alpha_1 \le +2°)$	.5°
α_2 $(-2° \le \alpha_2 \le +2°)$	1°
β_1 $(-2° \le \beta_1 \le +2°)$	1°
β_2 $(-2° \le \beta_2 \le +2°)$	-1°
γ	0°
θ	0°
$z = A (\tan\gamma)$ [≤ 0.5 mm (0.02 in.)]	0
$w = A (\tan\theta)$ [≤ 0.5 mm (0.02 in.)]	0
D_t [≥ 9.5 mm (3/8 in.)]	.275
A	.578
$A/2D_t$ $(1.05 \le P_A/D_t \le 1.5)$ *	1.05
* Recommended dimensions	

QA/QC Check

Completeness ✓ Legibility ✓ Accuracy ✓

Specifications ✓ Reasonableness ✓

Certification

I certify that the Type S probe ID 10 meets or exceeds all specifications, criteria, and applicable design features.

Certified by: Brian Tapp Date: 4/15/04

SCEC

Appendix D

Laboratory Reports

ECA
EXPERT • CHEMICAL • ANALYSIS
10366 ROSELLE STREET, #C • SAN DIEGO, CALIFORNIA 92121
TEL: 858.535.9979 • FAX: 858.535.9978 • E-MAIL: ECAINC@ADNC.COM
WWW.ECALAB.COM

Analytical Testing Report

David Evans
SCEC
1582-1 North Batavia
Orange, CA 92867

8-31-04

ECA #04279

The analysis of the gas sample(s) has been completed. The sample information is given below. The results are in the tables on the following pages.

Sample Information:

Customer Sample Id.:	1. Otay Flare/Inlet #1			
	2. Otay Flare/Inlet #2			
	3. Otay Flare/Inlet #3			
	4. APCD Audit Sample			
	4. Otay Flare/Exhaust #1			
	5. Otay Flare/Exhaust #2			
	6, Otay Flare/Exhaust #3			
ECA Sample #:	1. 04279a	2. 04279b	3. 04279c	
	4. 04279d	5. 04279e	6. 04279f	7. 04279g
Date Received:	7-30-04			
Method Reference:	EPA Method 18/ EPA TO-15			

If you have any questions concerning these results, please call us at (858) 535-9979.
We appreciate your business!

Sincerely,

Jim Polansky
Scientist

Q.C. Officer

ECA
EXPERT CHEMICAL ANALYSIS
10366 Roselle Street, #C • San Diego, California 92121
Tel: 858.535.9979 • Fax: 858.535.9978 • E-mail: ecainc@adnc.com
www.ecalab.com

Results of Analysis

Otay Flare Inlet

All results in ppmV unless otherwise stated

ID.	C1	C2	C3	C4	C5+	Oxygen	CO_2	Nitrogen	as C1
Otay Flare/ Inlet #1	39.1 %	8.0 as C1 16	57.6 172.8	289.5 1158	71.9 359.5	3.5 %	31.4 %	balance	1706.3
Otay Flare/ Inlet #2	39.8 %	9.7 19.4	65.4 196.2	202.0 808	77.3 386.5	4.6 %	32.4 %	balance	1410.1
Otay Flare/ Inlet #3	39.8 %	3.7 7.4	57.6 172.8	193.4 773.6	76.1 380.5	3.9 %	32.2 %	balance	1334.3

Otay Flare Exhaust

All results in ppmV unless otherwise stated

ID.	C1	C2	C3	C4	C5+	as C1
Otay Flare/ Exhaust #1	< 50 ppm	< 0.1 ppm .2	< 0.1 ppm .3	< 0.1 ppm .4	<0.1ppm .5	1.4
Otay Flare/ Exhaust #2	< 50 ppm	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm	< 0.1 ppm	1.4
Otay Flare/ Exhaust #3	< 50 ppm	< 0.1 ppm	< 0.1 ppm	<0.1 ppm	< 0.1 ppm	1.4

SDAPCD Audit Sample

ID.	Methane	Acetylene	Ethylene	Ethane	Propyne
SDAPCD Audit Sample	< 50 ppm	0.38 ppm	0.28 ppm	0.50 ppm	0.57 ppm
ID.	**Propylene**	**Propane**	**2-methyl propane**	**Butane**	
SDAPCD Audit Sample	0.63 ppm	0.53 ppm	0.60 ppm	0.60 ppm	

ECA
EXPERT CHEMICAL ANALYSIS
10366 Roselle Street, #C • San Diego, California 92121
Tel: 858.535.9979 • Fax: 858.535.9978 • E-mail: ecainc@adnc.com
www.ecalab.com

Results of Testing using EPA TO-15/Otay Flare Inlet Samples

Compounds identified by GC-MS (TO-15) in all of the Otay Flare Inlet Samples.
The compounds that are AP-42 compounds are both underlined and in **bold lettering.** Other halogenated compounds that may be of interest are listed in **bold** only.

2-methyl propane
butane
2-methyl butane
pentane
ethanol
methyl acetate
dichloromethane
hexane
1,1-dichloroethane
2-methyl furan
ethyl acetate
tetrahydrofuran
2-methyl hexane
cyclohexane
3-methyl hexane
2-methyl-1-propanol
benzene
heptane
3-methyl-2-butane
2-methyl propanoic acid
methyl ester
1-butanol
trichloroethene
methyl cyclohexane
propyl acetate
methyl butanoate
2-methyl -1-pentanol
2-methyl heptane
2-hexanone
1,1,1 trimethyl
cyclopentane
toluene
2-hexanol
1,2 dimethylcyclohexane
ethyl butanoate
butyl acetate
ethyl cyclohexane
isopropyl butanoate
1,3,5-trimethyl
cyclohexane
3-methyl octane
2-methyl propanoic acid
propyl ester
1-chloro-4-
difluoromethyl benzene
nonane
o-xylene
2-azido-2-methyl pentane
propyl butanoate
m-xylene
1-ethyl-2-methyl cis-
cyclohexane
3-methyl nonane
camphene
propyl benzene
decane
1,3,5-trimethyl benzene
beta-pinene
hexyl butanoate
delta-3-carene
l-limonene
1,8-cineole
2-methylbutyl butanoate
gamma terpinene
undecane
decahydronaphthalene
propyl hexanoate
1,2-dibromo-2-methyl
undecane
dodecane
butyl hexanoate
camphor
azulene

SCEC

Appendix E

Authority to Construct

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

May 6, 2004

ROBERT FIFAREK
ENVIRONMENTAL MANAGER
OTAY LANDFILL INC
8514 MAST BLVD
SANTEE CA 92071

EQUIPMENT ADDRESS: **1700 MAXWELL ROAD, CHULA VISTA, CA 91911**

Dear Mr. Fifarek:

After examination of your Applications No. 979036 and No. 980160 for an Authority to Construct and Permit to Operate an expansion of the existing non-hazardous solid waste facility and the addition of a 150 mmBTU/hr flare to the current gas collection system at the Otay landfill, the District has decided on the following action:

The application is complete and Authority to Construct is granted pursuant to Rule 20 of the Air Pollution Control District Rules and Regulations. The modified facility will consist of:

an existing non-hazardous solid waste landfill with a revised elevation limit of 725 ft Mean Sea Level resulting in a total post-project revised capacity of ~60,000,000 cubic yards;

an existing 48 mmBTU/hr enclosed ground flare (dimensions 10 ft in diameter x 32 ft in height) equipped with an optical flame detector, automatic shut-off valve, stack thermocouple, flame arrestor, and sampling ports;

a new 150 mmBTU/hr enclosed John Zink ground flare (dimensions 3 ft diameter and 50 ft in height) equipped with an optical flame detector, automatic shut-off valve, stack thermocouple, flame arrestor, sampling ports, and provisions for 3 blowers;

an existing landfill gas collection system consisting of extraction wells, condensate traps, piping, sampling ports, shut-off valves, and other associated equipment including a limited connection to the existing Pacific Recovery Corporation gas combustion equipment (Permit to Operate No. 40247);

9150 Chesapeake Drive • San Diego • California 92123-1096 • (858) 650-4700
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Otay Landfill Inc.
Application No. 979036

May 6, 2004

an existing offsite gas migration probe monitoring system which comp lies with the design, spacing, and operational requirements of the State Integ ated Waste Management Board;

an existing flare station equipment with provisions for two (2) Lamso landfill gas blowers, fittings, valves, piping, a condensate knockout trap, an in-lin landfill gas oxygen analyzer, a landfill gas flow meter, and a backup fuel supply, an d,

an existing landfill gas condensate collection, storage, and injection sy stem include an air compressor, piping, sumps, holding tank, and pumps.

This Authority to Construct is granted with the following conditions:

1. Except as otherwise required by these conditions, the equipment fo which this Authority to Construct is granted shall be as described above and installed in accordance with the specifications and drawings submitted with the app lications.

2. In the event the District determines that additional landfill gas collecti on or control equipment is appropriate to ensure compliance with applicable emissi n limits, the applicant shall promptly submit all necessary applications and install the specified equipment on either a temporary or permanent basis as required.

3. Except as otherwise required by the conditions herein, the applicant shall comply with the emission limits, operating requirements, monitoring procedur s, inspection activities, and reporting provisions specified in Permit to Operate No. 71112.

4. All equipment shall be properly maintained and kept in good operatin condition at all times. Except during equipment installation and repair, there shall be no hydrocarbon leaks along the gas transfer path (i.e., collection wells, l eader piping, flanges, valves, blowers, flame arrestor, etc.) which result in landfill gas emissions of 1,375 ppmv or greater as methane.

5. Water shall be applied to all on-site paved and unpaved haul roads fo dust control purposes at intervals of no more than 4 hours unless the road surface a pears visibly wet or the facility is not open for business. In addition, such watering must, except for non-repeatable momentary readings, prevent visible emissions gr t feet above the road surface from exceeding 10 percent (%) opacity. (Regulation ... ?) Opacity ... ?)

6. Prior to installation, the applicant shall submit a detailed, final schema ic of the new flare which demonstrates that it has been sized to provide a minimu 0.3 second retention. The dimensions of the final flare design should be approxi ately 13 feet in diameter and 50 feet in height. This flare shall be equipped w th a circular exhaust stack, 4-inch test ports, and provisions for personnel access uring source testing.

Prior to installation AS-Builts Has this been Done? IF So Why have this in here?

Otay Landfill Inc.
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May 6, 2004

7. The new flare shall be equipped with an automatic shut-off valve that activates under conditions of flame-out, low stack gas temperature (<1,500°F), high stack gas temperature (>1,800°F), and excessive oxygen (>3.5% oxygen by volume in the landfill gas header piping at the flare station).

8. The total landfill gas collection rates shall not exceed the BTU capacity of each installed flare. This equates to approximately 1800 scfm for the existing flare and 5000 scfm for the new flare. The applicant shall not remove the smaller flare from operation until testing of the new unit is completed. Additionally, the applicant may choose to leave the existing flare on site for emergency and/or back-up purposes. OK - Good

9. Excavated waste brought to the surface during regrading, repairs and/or equipment installation shall be managed to prevent odors detectable beyond the property line of the disposal site. All material transported to other disposal sites shall be covered to reduce odors to the maximum extent possible. Leachate Loop open to flare in parallel

10. The applicant shall take all corrective actions necessary to prevent leachate from reaching any surface where odors, toxic air contaminants or reactive organic compounds may evaporate into the atmosphere.

11. Access, facilities and utilities for source testing required by the Air Pollution Control Officer shall be provided when such testing is performed by the District. Specifically, temporary scaffolding, man lifts, and electrical outlets which comply with District Monitoring and Technical Services Division specifications must be provided when deemed necessary.

12. The applicant shall conduct testing of the installed landfill gas flare(s) as required in District Rule 59.1, the Federal Title V program, and subpart WWW of the Federal Register. The applicant shall submit a proposed source test protocol for review and approval within 60 days of the initial flare start up which complies with the minimum federal testing requirements. All testing must be conducted under normal operating conditions within 60 days of receiving an approved source test protocol from the District and be witnessed by District staff. Proposals 60 Days from Rx approval

13. A final report which provides all of the source test results shall be submitted to the District for approval approximately 90 days following completion of the testing. 90 Days after testing - Final Report

14. Within 90 days of completing construction, the applicant shall submit an Operations and Maintenance Manual for this landfill gas collection, monitoring and flare system. This manual shall specify the minimum recommended inspection procedures and maintenance frequencies. The manual shall include an as-built drawing of the final gas collection system as well as the location of all approved State Integrated Waste Board offsite gas migration probes. 90 Days O&M manual + As-Builts

N/A (On-Site?)

Otay Landfill Inc.
Application No. 979036

May 6, 2004

This is not the Permit to Operate document. Operation of the modifie l equipment without written authority (District Startup Authorization, Permit to Ope ate, Hearing Board Variance, etc.) is a violation of Rule 10(b) subject to civil penalties o up to $1,000 per day.

This Authority to Construct does not relieve the holder from obtainin ; permits or authorizations which may be required by other governmental agencies. A copy of this Authority to Construct shall be posted or kept readily available at the site of construction. This Authority to Construct will expire on **May 6, 2005.**

Within ten days of receiving this Authority to Construct, the applicant ma petition the Hearing Board for a hearing on any condition imposed herein in accordance vith Rule 25. If you have any questions regarding this action, please contact me at (858) 6 0-4623.

Sincerely,

DAVID BYRNES
Associate Air Pollution Control Engineer

DB:el

cc: Kerry McNeil, San Diego County Department of Environmental Health LEA)
Carol Tamaki, Regional Water Quality Control Board
Gary Hartnett, SDAPCD Compliance Division
Stan Romelczyk, SDAPCD Title V Program

SAN DIEGO AIR POLLUTION CONTROL DISTRICT
9150 CHESAPEAKE DRIVE
SAN DIEGO, CA. 92123

01/88176A
Sector/ID

980160
Application No.

(new)
BEC

revised May 21, 2004

START-UP AUTHORIZATION

05/12/2004
Date of Issuance

OTAY LANDFILL INC.
1700 MAXWELL ROAD, CHULA VISTA CA 91910

may operate the following equipment for shakedown and source testing purposes:

A NEW LANDFILL GAS FLARE SYSTEM

located at the existing OTAY LANDFILL

until JULY 12, 2004 pursuant to Rule 21 of the Rules and Regulations of the Air Pollution Control District, subject to the conditions of existing Permit to Operate No. 971112 and the following requirements:

1. Continue to operate the gas collection and dual flare system in a manner that safely mitigates off-site gas migration (>5% methane at the property line) and prevents excessive surface emissions (>500 ppmv as methane) as required by District Rule 59.1.

2. Continue to inspect the landfill surface and quantify the methane content of each gas migration probe on a minimum quarterly basis.

3. The landfill gas flow rate shall not exceed 1800 scfm to the existing Perennial flare or 5000 scfm to the new John Zink flare at any time. The flares may be operated simultaneously at or below these maximum flow rates provided the LFG oxygen content remains below 3.5% at the flare station.

4. Except during an ignition and warm up period not to exceed 15 minutes, landfill gas shall not be incinerated in either flare unless exhaust gas temperature is maintained between 1500 F and 1800 F as measured by the stack thermocouple most representative of a 0.3 second retention time.

5. Submit the written documentation (i.e.; manufacturer's suggested procedure, chart, etc.) that will be used in the field to establish the proper combination of parameters (LFG flow rate / selected thermocouple / exhaust gas temperature set point) necessary to ensure the exhaust gas temperature is maintained between 1500 F and 1800 F for a minimum 0.3 second retention time. Provide this information by **July 12, 2004.**

6. Make all necessary corrections to the high oxygen (>3.5%) safety shutdown device. The time delay between the instrument reading and the activation of the automatic shutoff valve should be minimal.

7. Continue to maintain, adjust, and repair all gas collection equipment so that there are no hydrocarbon leaks along the gas transfer path in excess of 1375 ppmv as methane (per District Rule 59.1).

Otay Landfill Inc.
Start Up Authorization

May 12, 2004
revised May 21, 2004
App. No.s 979036 and 980160

8. Do not allow leachate or condensate to reach any surface where odors, reactive organic compounds, or toxic air contaminants may evaporate into the atmosphere as per District Rules 59.1 and 51.

9. Submit the manufacturer's specifications for the condensate injection system and specifically identify the maximum condensate injection rate at which the flare may operate properly. If the injection rate is dependent upon the LFG flow rate, identify the proper operating parameters. Provide this information by **July 12, 2004**.

10. Submit a final detailed schematic of the installed John Zink flare as specified in condition (6) of the Authority to Construct granted for this equipment. Provide this information by **July 12, 2004**.

11. Submit a proposed source test protocol which complies with Federal subpart WWW requirements as specified in condition (12) of the Authority to Construct granted for this equipment. Provide this information by **July 12, 2004**.

Operation is authorized only for the purposes of allowing operation of this equipment prior to the issuance of a District Permit to Operate.

THIS IS NOT AN AUTHORIZATION TO EXCEED ANY APPLICABLE EMISSION STANDARD. THIS AUTHORIZATION IS SUBJECT TO CANCELLATION IF ANY EMISSION STANDARD OR CONDITION IS VIOLATED. IF THERE ARE ANY QUESTIONS ABOUT THIS AUTHORIZATION, PLEASE CONTACT THE UNDERSIGNED AT (858) 650-4623.

Signed: _____
Print Name: Dave Byrnes
for Richard J. Smith, Air Pollution Control Officer

copy to: Compliance Division
file

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
9150 CHESAPEAKE DRIVE, SAN DIEGO, CA 92123-1096
(858)650-4700 FAX(858)650-4659

CONTROL NO.
243271

PERMIT NO
971112
EXPIRES
JUNE 1, 2005

PERMIT TO OPERATE

THE FOLLOWING IS HEREBY GRANTED A PERMIT TO OPERATE THE ARTICLE,MACHINE,EQUIPMENT OR CONTRIVANCE DESCRIBED BELOW. THIS PERMIT IS NOT TRANSFERABLE TO A NEW OWNER NOR IS IT VALID FOR OPERATION OF THE EQUIPMENT AT ANOTHER LOCATION, EXCEPT AS SPECIFIED. THIS PERMIT TO OPERATE OR A COPY MUST BE POSTED ON OR WITHIN 25 FEET OF THE OF THE EQUIPMENT, OR READILY AVAILABLE, ON THE OPERATING PREMISES.

PERMITTEE	EQUIPMENT ADDRESS
OTAY LANDFILL INC	OTAY LANDFILL INC
8364 CLAIREMONT MESA BL	1700 MAXWELL RD
SAN DIEGO CA 92111-0000	CHULA VISTA CA 91910-0000

EQUIPMENT DESCRIPTION
AN ACTIVE NON-HAZARDOUS WASTE LANDFILL OPERATION THAT INCLUDES QUARRYING, MUNICIPAL WASTE DISPOSAL, WASTE COMPACTION, COVER MATERIAL APPLICATION, AND HAUL ROAD ACTIVITIES AND ASSOCIATED LANDFILL GAS COLLECTION AND CONTROL SYSTEM CONSISTING OF: LANDFILL GAS (LFG) COLLECTION WELLS WITH ASSOCIATED FITTINGS, PIPING AND INDIVIDUAL WELL SHUT OFF VALVES; OFFSITE LFG MIGRATION PROBES WITH ASSOCIATED FITTINGS AND SAMPLING PORTS; 2 LFG BLOWERS WITH ASSOCIATED FITTINGS, VALVES AND PIPING; FLAME ARRESTOR; ONE LIQUID KNOCKOUT VESSEL; 48 MM BTU/HR ENCLOSED GROUND FLARE (APPROXIMATELY 6 FT DIA X 30 FT HIGH) EQUIPPED WITH OPTICAL FLAME DETECTOR, AUTOMATIC SHUTOFF VALVE AND AUXILIARY FUEL. THE FLARE IS EQUIPPED WITH CONDENSATE INJECTION ATOMIZING GUN, STACK TEMPERATURE PROBE, IN-LINE LFG OXYGEN ANALYZER, AND LFG FLOW METER AT FLARE STATION

Sector#:17 ID#:88176A PO#:971112 BEC#:11173
Fee Schedules: 48C01

EVERY PERSON WHO OWNS OR OPERATES THIS EQUIPMENT IS REQUIRED TO COMPLY WITH THE CONDITIONS LISTED BELOW AND ALL APPLICABLE REQUIREMENTS AND DISTRICT RULES, INCLUDING BUT NOT LIMITED TO RULE(S) 53, 59.1.

FAILURE TO OPERATE IN COMPLIANCE IS A MISDEMEANOR SUBJECT TO CIVIL AND CRIMINAL PENALTIES.

A. FEDERALLY-ENFORCEABLE AND DISTRICT-ENFORCEABLE CONDITIONS

1. THE PERMITTEE SHALL COMPLY WITH THE FOLLOWING APPLICABLE REQUIREMENTS: RULE 53 AND RULE 59.1.
RULE(S):59.1.

2. THE COLLECTED LANDFILL GAS TEMPERATURE SHALL BE MAINTAINED AT LESS THAN 55 DEG.C AT EACH WELL AND THE OXYGEN LEVEL SHALL BE LESS THAN OR EQUAL TO 5 PERCENT OR THE NITROGEN LEVEL SHALL BE LESS THAN OR EQUAL TO 20 PERCENT.
RULE 59.1

1 Permit Conditions Continued

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RULE(S):59.1.

3. TEMPERATURE GAUGE MAINTENANCE AND CALIBRATION RECORDS SHALL BE MAINTAINED FOR AT LEAST FIVE YEARS AND MADE AVAILABLE TO THE DISTRICT UPON REQUEST. RULE 59.1.
RULE(S):59.1.

4. THE PERMITTEE SHALL MAINTAIN A NEGATIVE PRESSURE WITHIN EACH GAS EXTRACTION WELL. AN OPERATING PRESSURE GAUGE WITH AN ACCURACY OF 1 PERCENT OF THE PRESSURE MEASURED SHALL BE PROVIDED TO THE DISTRICT UPON REQUEST FOR VERIFYING THE PRESSURE. THE PRESSURE GAUGE SHALL BE MAINTAINED AND CALIBRATED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
RULE(S):59.1.

5. THE PERMITTEE SHALL ROUTE ALL THE COLLECTED LANDFILL GAS TO THE LANDFILL GAS DESTRUCTION SYSTEM. RULE 59.1.
RULE(S):59.1.

6. THE LANDFILL GAS DESTRUCTION SYSTEM SHALL BE OPERATED TO REDUCE NON-METHANE ORGANIC COMPOUNDS (NMOCS) BY 98 WEIGHT PERCENT OR REDUCE THE NMOC OUTLET CONCENTRATION TO LESS THAN 20 PPMV, DRY BASIS AS HEXANE AT 3 PERCENT OXYGEN.
RULE(S):59.1.

7. THE PERMITTEE SHALL MONITOR THE FLARE EXHAUST GAS TEMPERATURE. THE GAS TEMPERATURE MONITORING DEVICE SHALL BE EQUIPPED WITH A CONTINUOUS RECORDER WHICH HAS AN ACCURACY OF +/- 1 PERCENT OF THE TEMPERATURE BEING MEASURED. RULE 59.1.
RULE(S):59.1.

8. THE PERMITTEE SHALL MONITOR AND RECORD GAS FLOW FROM THE COLLECTION SYSTEM TO THE FLARE AT LEAST ONCE EVERY 15 MINUTES. ALTERNATIVELY WHEN USING A CAR-SEAL OR A LOCK-AND-KEY TYPE CONFIGURATION TO SECURE THE BYPASS LINE VALVE IN A CLOSED POSITION, THE PERMITTEE SHALL VERIFY THAT THE BYPASS LINE VALVES ARE SECURED IN A CLOSED POSITION EACH MONTH.
RULE(S):59.1.

9. THE SYSTEM SHALL BE CONTINUOUSLY MONITORED FOR THE PRESENCE OF A FLARE FLAME.
RULE(S):59.1.

10. THE PERMITTEE SHALL IMPLEMENT A PROGRAM TO MONITOR FOR LANDFILL COVER INTEGRITY AS REQUIRED IN 40 CFR PART 60.753 (D) AND IMPLEMENT COVER REPAIRS AS NECESSARY ON A MONTHLY BASIS.
RULE(S):59.1.

2 Permit Conditions Continued

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
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11. THE PERMITTEE SHALL ON A MONTHLY BASIS MONITOR OR CONDUCT TESTING TO VERIFY COMPLIANCE AS FOLLOWS:
MONITOR THE COVER INTEGRITY, VISUALLY INSPECT THE BYPASS VALVE TO ENSURE THAT IT IS CLOSED, AND MEASURE THE GAGE PRESSURE AND MONITOR THE TEMPERATURE AND NITROGEN OR OXYGEN CONTENT AT EACH WELL HEAD. THE NITROGEN LEVEL SHALL BE DETERMINED USING EPA METHOD 3C OR EPA-APPROVED FIELD INSTRUMENT, OR THE OXYGEN LEVEL SHALL BE DETERMINED USING EPA METHOD 3A EXCEPT THAT: 1) THE SPAN SHALL BE SET SO THE REGULATORY LIMIT IS BETWEEN 20 AND 50 PERCENT OF THE SPAN; 2) A DATA RECORDER IS NOT REQUIRED; 3) ONLY TWO CALIBRATION GASES ARE REQUIRED, A ZERO AND A SPAN, AND AMBIENT AIR MAY BE USED AS THE SPAN; 4) A CALIBRATION ERROR CHECK IS NOT REQUIRED; AND 5) 5) THE ALLOWABLE SAMPLE BIAS, ZERO DRIFT, AND CALIBRATION DRIFT ARE +/- 10 PERCENT.
RULE(S):59.1.

12. THE METHANE CONCENTRATION AT THE LANDFILL SURFACE SHALL BE MAINTAINED AT LESS THAN 500 PPM ABOVE BACKGROUND. THE PERMITTEE SHALL MONITOR SURFACE CONCENTRATIONS OF METHANE AT DISCRETE SAMPLING POINTS ALONG THE ENTIRE PERIMETER OF THE COLLECTION AREA AND ALONG A PATTERN THAT TRAVERSES THE LANDFILL AT 30 METER INTERVALS FOR EACH COLLECTION AREA ON A QUARTERLY BASIS USING AN ORGANIC VAPOR ANALYZER, FLAME IONIZATION DETECTOR OR OTHER PORTABLE MONITOR MEETING THE SPECIFICATIONS PROVIDED IN 40 CFR PART 60.755 (D).
SURFACE EMISSION MONITORING SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 4.3.1 OF EPA METHOD 21 EXCEPT THAT THE PROBE INLET SHALL BE PLACED WITHIN 5 TO 10 CENTIMETERS OF THE GROUND. THE CALIBRATION PROCEDURES PROVIDED IN SECTION 4.2 OF EPA METHOD 21 SHALL BE FOLLOWED IMMEDIATELY BEFORE COMMENCING A SURFACE MONITORING SURVEY, AND THE CALIBRATION GAS SHALL BE METHANE DILUTED TO A NOMINAL CONCENTRATION OF 500 PPM. ANY READING OF 500 PPM OR MORE ABOVE BACKGROUND AT ANY LOCATION SHALL BE RECORDED AS A
RULE(S):59.1.

13. CONT. FROM ABOVE
MONITORED EXCEEDANCE. THE BACKGROUND CONCENTRATION SHALL BE DETERMINED BY MOVING THE PROBE INLET UPWIND AND DOWNWIND OUTSIDE THE BOUNDARY OF THE LANDFILL AT A DISTANCE OF AT LEAST 30 METERS FROM THE PERIMETER WELLS. A MONITORED EXCEEDANCE IS NOT A VIOLATION OF THE ABOVE REQUIREMENT AS LONG AS THE FOLLOWING SPECIFIED ACTIONS ARE TAKEN:
A) THE LOCATION OF EACH MONITORED EXCEEDANCE SHALL BE MARKED AND THE LOCATION RECORDED.
B) COVER MAINTENANCE OR ADJUSTMENTS TO THE VACUUM OF THE ADJACENT WELLS TO INCREASE THE GAS COLLECTION IN THE VICINITY OF EACH EXCEEDANCE SHALL BE MADE AND THE LOCATION SHALL BE RE-MONITORED WITHIN 10 CALENDAR DAYS OF DETECTING THE EXCEEDANCE; AND
C) IF THE RE-MONITORING OF THE LOCATION SHOWS A SECOND EXCEEDANCE, ADDI-

3 Permit Conditions Continued

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TIONAL CORRECTIVE ACTION SHALL BE TAKEN AND THE LOCATION SHALL BE MONITORED AGAIN WITHIN 10 DAYS OF THE SECOND EXCEEDANCE. IF THE RE-MONITORING SHOWS
RULE(S):59.1.

14. CONT. FROM ABOVE
A THIRD EXCEEDANCE FROM THE SAME LOCATION, THE ACTION SPECIFIED IN SECTION E OF THE CONDITION SHALL BE TAKEN.
D) ANY LOCATION THAT INITIALLY SHOWED AN EXCEEDANCE BUT HAS A METHANE CONCENTRATION LESS THAN 500 PPM ABOVE BACKGROUND AT THE 10-DAY RE-MONITORING SPECIFIED IN SECTION B OR C OF THIS CONDITION SHALL BE RE-MONITORED 1 MONTH FROM THE INTITIAL EXCEEDANCE. IF THE 1-MONTH RE-MONITORING SHOWS A CONCENTRATION <500 PPM ABOVE BACKGROUND, NO FURTHER MONITORING IS REQUIRED UNTIL THE NEXT QUARTERLY MONITORING PERIOD. IF THE 1-MONTH RE-MONITORING SHOWS AN EXCEEDANCE, THE ACTIONS SPECIFIED IN SECTION C OR D OF THIS CONDITION SHALL BE TAKEN.
E) FOR ANY LOCATION WHERE MONITORED METHANE CONCENTRATION EQUALS OR EXCEEDS 500 PPM ABOVE BACKGROUND THREE TIMES WITHIN A QUARTERLY PERIOD, A NEW WELL OR OTHER COLLECTIONS DEVICE SHALL BE INSTALLED WITHIN 120 CALENDAR DAYS OF THE INITIAL EXCEEDANCE. AN ALTERNATIVE REMEDY TO THE EXCEEDANCE
RULE(S):59.1.

15. CONT. FROM ABOVE
AND A CORRESPONDING TIME LINE FOR INSTALLATION MAY BE SUBMITTED TO THE DISTRICT FOR APPROVAL. RULE 59.1.
RULE(S):59.1.

16. THE PERMITTEE SHALL MAINTAIN THE FOLLOWING RECORDS:
A) RECORDS OF THE MAXIMUM DESIGN CAPACITY, THE CURRENT AMOUNT OF SOLID WASTE IN PLACE, THE YEAR-BY-YEAR WASTE ACCEPTANCE RATE;
B) PLOT MAP WITH EXISTING AND PLANNED WELLS IN THE GAS COLLECTION SYSTEM;
C) INSTALLATION DATE AND LOCATION OF ALL NEWLY INSTALLED WELLS;
D) DESCRIPTION, LOCATION, AMOUNT, AND PLACEMENT DATE OF ALL NONDEGRADABLE REFUSE INCLUDING ASBESTOS AND DEMOLITION REFUSE PLACE IN LANDFILL AREAS WHICH ARE EXCLUDED FROM LANDFILL GAS COLLECTION AND CONTROL AS PROVIDED BY 40 CFR PART 60.759(A)(3)(II); AND
E) RECORD OF MAXIMUM EXPECTED GAS FLOW, ETC. FROM THE INITIAL PERFORMANCE TEST.
RULE(S):59.1.

17. THE PERMITTEE SHALL RECORD ALL FLARE MONITORING DATA AND SHALL KEEP A RECORD OF ALL PERIODS WHEN THE FLARE IS NON-OPERATIONAL.
RULE(S):59.1.

18. THE PERMITTEE SHALL RECORD ALL VALUES WHICH EXCEED THE OPERATION

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STANDARDS SPECIFIED IN 40 CFR PART 60.753, AND SHALL INCLUDE THE OPERATING VALUE FROM THE NEXT SUBSEQUENT MONITORING PERIOD AND THE LOCATION OF EACH EXCEEDANCE.
RULE(S):59.1.

19. IN THE EVENT THAT THE GAS COLLECTION SYSTEM OR THE GAS THAT THE GAS COLLECTION SYSTEM OR THE GAS COMBUSTION DEVICE IS INOPERABLE, THE GAS MOVER SYSTEM SHALL BE SHUT DOWN AND ALL VALVES IN THE COLLECTION SYSTEM AND GAS COMBUSTION DEVICE CONTRIBUTING TO VENTING OF THE GAS TO THE ATMOSPHERE SHALL BE CLOSED WITHIN 1 HOUR OR THE LANDFILL GAS VENTED TO THE FLARE. THIS PROVISION DOES NOT APPLY TO THE GAS COMBUSTION DEVICE DURING PERIODS OF START-UP, SHUTDOWN, OR MALFUNCTION PROVIDED THE DURATION OF START-UP, SHUTDOWN, OR MALFUNCTION DOES NOT EXCEED 1 HOUR.
RULE(S):59.1.

20. IF THE GAS COLLECTION SYSTEM IS EQUIPPED WITH A VALVE TO BYPASS THE GAS TURBINE, THIS BYPASS VALVE MUST BE IN A CLOSED POSITION WITH A CAR-SEAL OR A LOCK-AND-KEY TYPE OF CONFIGURATION. RULE 59.1.
RULE(S):59.1.

21. THE PERMITTEE SHALL MAINTAIN, READILY ACCESSIBLE RECORDS FOR THE LIFE OF THE CONTROL EQUIPMENT, THE CONTROL DEVICE VENDOR SPECIFICATIONS, AND THE FOLLOWING DATA AS MEASURED DURING THE INITIAL PERFORMANCE TEST OR COMPLIANCE DETERMINATION:
THE MAXIMUM EXPECTED GAS GENERATION FLOW RATE AS CALCULATED IN 40 CFR PART 60.755(A)(1); AND THE DENSITY OF WELLS, HORIZONTAL COLLECTORS, SURFACE COLLECTORS, OR OTHER GAS EXTRACTION DEVICES DETERMINED USING THE PROCEDURES SPECIFIED IN 40 CFR PART 60.759 (A)(1).
RULE(S):59.1.

22. THE PERMITTEE SHALL SUBMIT AN ANNUAL REPORT WITH THE INITIAL REPORT DUE NO LATER THAN JUNE 30, 2001 WITH THE FOLLOWING REQUIRED INFORMATION:
A) THE VALUE AND LENGTH OF TIME FOR EXCEEDANCES OF APPLICABLE PARAMETERS MONITORED AS REQUIRED IN 40 CFR PART 60.753; AND
B) A DESCRIPTION AND THE DURATION OF ALL PERIODS WHEN THE GAS STREAM IS DIVERTED FROM THE GAS TURBINE; AND
C) A DESCRIPTION AND THE DURATION OF ALL PERIODS WHEN THE GAS TURBINE WAS NOT OPERATING FOR ANY PERIOD EXCEEDING 1 HOUR AND THE LENGTH OF TIME THE GAS TURBINE WAS NOT OPERATING; AND
D) ALL PERIODS WHEN THE COLLECTION SYSTEM WAS NOT OPERATING IN EXCESS OF FIVE DAYS; AND
E) THE LOCATION AND CONCENTRATION OF EACH EXCEEDANCE OF THE SURFACE METHANE CONCENTRATION LIMIT AS MONITORED BY CONDITION 12; AND
F) THE DATE OF INSTALLATION AND THE LOCATION OF EACH WELL OR COLLECTION
RULE(S):59.1.

5 Permit Conditions Continued

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EXPIRES
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23. CONT. FROM ABOVE
SYSTEM EXPANSION ADDED PURSUANT TO CONDITION 12(E).
IN ADDITION TO THE ABOVE, THE INITIAL REPORT SHALL INCLUDE:
G) THE MOST RECENT PERFORMANCE TEST RESULTS; AND
H) A DIAGRAM OF THE COLLECTION SYSTEM SHOWING COLLECTION SYSTEM POSITIONING INCLUDING ALL WELLS, HORIZONTAL COLLECTORS, SURFACE COLLECTORS, OR OTHER GAS EXTRACTION DEVICES, INCLUDING THE LOCATIONS OF ANY AREAS EXCLUDED FROM COLLECTION AND THE PROPOSED SITES FOR THE FUTURE COLLECTION SYSTEM EXPANSION; AND
I) THE DATA UPON WHICH THE SUFFICIENT DENSITY OF WELLS, HORIZONTAL COLLECTORS, SURFACE COLLECTORS, OR OTHER GAS EXTRACTION DEVICES AND THE GAS MOVER EQUIPMENT SIZING ARE BASED; AND
J) THE DOCUMENTATION OF THE PRESENCE OF ASBESTOS OR NONDEGRADABLE MATERIAL FOR EACH AREA FROM WHICH COLLECTION WELLS HAVE BEEN EXCLUDED BASED ON THE PRESENCE OF ASBESTOS OR NONDEGRADABLE MATERIAL; AND
RULE(S):59.1.

24. CONT. FROM ABOVE
K) THE SUM OF GAS GENERATION FLOW RATES FOR ALL AREAS FROM WHICH COLLECTION WELLS HAVE BEEN EXCLUDED BASED ON NONPRODUCTIVITY AND THE CALCULATIONS OF GAS GENERATION FLOW RATE FOR EACH EXCLUDED AREA; AND
L) THE PROVISIONS FOR INCREASING GAS MOVER EQUIPMENT CAPACITY WITH INCREASED GAS GENERATION FLOW RATE, IF THE PRESENT GAS MOVER EQUIPMENT IS INADEQUATE TO MOVE THE MAXIMUM FLOW RATE EXPECTED OVER THE LIFE OF THE THE LANDFILL; AND
M) THE PROVISIONS FOR THE CONTROL OF OFF-SITE MIGRATION. RULE 59.1.
RULE(S):59.1.

25. THE PERMITTEE SHALL SUBMIT AN EQUIPMENT REMOVAL REPORT TO THE DISTRICT 30 DAYS PRIOR TO REMOVAL OR CESSATION OF OPERATION OF THE LANDFILL GAS CONTROL EQUIPMENT. THE EQUIPMENT REMOVAL REPORT SHALL CONTAIN THE FOLLOWING:
A) A COPY OF THE CLOSURE REPORT FOR THE LANDFILL; AND
B) A COPY OF THE INITIAL PERFORMANCE TEST REPORT DEMONSTRATING THAT THE 15 YEAR MINIMUM CONTROL PERIOD HAS EXPIRED; AND
C) DATED COPIES OF THREE SUCCESSIVE ANNUAL NMOC EMISSION RATE REPORTS DEMONSTRATING THAT THE LANDFILL IS NO LONGER PRODUCING 50 MEGAGRAMS OR GREATER OF NMOC PER YEAR. RULE 59.1.
RULE(S):59.1.

26. SHOULD THE DISTRICT, SAN DIEGO COUNTY HEALTH DEPARTMENT, OR ANY HEALTH AGENCY OF THE STATE OF CALIFORNIA DETERMINE THAT AN IMMINENT, LIFE ENDANGERING THREAT TO HUMAN LIFE REQUIRING IMMEDIATE ACTION EXISTS ON SITE, THE OWNER/OPERATOR SHALL TAKE WHATEVER ACTIONS ARE DEEMED NECESSARY

6 Permit Conditions Continued

CONTROL NO. 243271

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
9150 CHESAPEAKE DRIVE, SAN DIEGO, CA 92123-1096
(858)650-4700 FAX(858)650-4659

PERMIT NO 971112
EXPIRES JUNE 1, 2005

PERMIT TO OPERATE

BY THE DISTRICT AND/OR THE HEALTH AGENCY TO PROTECT HUMAN HEALTH.
RULE(S):51.

27. EXCEPT DURING MAINTENANCE OR REPAIR, THE PERMITTEE SHALL SUBMIT AN APPLICATION AND OBTAIN WRITTEN AUTHORIZATION FROM THE DISTRICT BEFORE ALTERING ANY PORTION OF THE GAS COLLECTION OR FLARE SYSTEM, OR BEFORE INSTALLING NON-IDENTICAL PARTS IN A MANNER WHICH MAY AFFECT EMISSIONS FROM THE FACILITY.
RULE(S):1421.

28. THE SULFUR CONTENT OF ANY GASEOUS FUEL BURNED SHALL NOT EXCEED 0.05% BY WEIGHT.
RULE(S):53.

29. PARTICULATE EMISSIONS SHALL NOT EXCEED 0.10 GRAINS PER DRY STANDARD CUBIC FOOT OF GAS WHICH IS STANDARDIZED TO 12 PERCENT OF CARBON DIOXIDE BY VOLUME.
RULE(S):53.

30. PARTICULATE EMISSIONS SHALL BE MEASURED IN ACCORDANCE WITH DISTRICT METHOD 5.
RULE(S):53.

31. THE SULFUR CONTENT OF FUEL SHALL BE MEASURED IN ACCORDANCE WITH ASTM TEST METHOD D-3246.
RULE(S):53.

32. THE EQUIPMENT SHALL BE PROPERLY MAINTAINED IN GOOD OPERATING CONDITION AT ALL TIMES. CALIBRATION AND MAINTENANCE RECORDS REQUIRED BY THIS PERMIT SHALL BE RETAINED FOR AT LEAST THREE (3) YEARS AND BE MADE AVAILABLE TO THE DISTRICT ON REQUEST.
RULE(S):59.1.

33. THERE SHALL BE NO LEAKS OF LANDFILL GAS FROM THE COLLECTION SYSTEM AND FLARE EQUIPMENT IN EXCESS OF 1375 PPMV (AS METHANE) EXCEPT DURING MAINTENANCE, REPAIR, OR SAMPLING ACTIVITIES.
RULE(S):59.1.

34. THE PERMITTEE SHALL INSPECT EACH OFFSITE GAS MIGRATION PROBE WITH A COMBUSTIBLE GAS INDICATOR FOR THE PRESENCE OF METHANE ON A MINIMUM QUARTERLY BASIS AND RETAIN RECORDS. INSPECTION RECORDS SHALL BE MADE AVAILABLE TO THE DISTRICT ON REQUEST.
RULE(S):59.1.

35. THE FLOW RATE OF LANDFILL GAS INTO THE FLARE SHALL NOT EXCEED 1800 SCFM.

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A METER SHALL BE INSTALLED AT THE FLARE STATION WHICH MEASURES AND DISPLAYS THE LANDFILL GAS FLOW RATE. PERMITTEE SHALL CALIBRATE THIS METER AT LEAST BIENNIALLY.
RULE(S):59.1.

36. A SHUT-OFF VALVE SHALL BE IN PLACE AND MAINTAINED AT EACH WELL HEAD.
RULE(S):59.1.

37. EXCEPT FOR A FLARE IGNITION AND STARTUP NOT TO EXCEED 15 MINUTES, PERMITTEE SHALL ENSURE COMPLETE COMBUSTION OF LANDFILL GASES DURING OPERATION BY MAINTAINING THE STACK GAS EXIT TEMPERATURE AT NO LESS THAN 1500 F OR AS OTHERWISE SPECIFIED BY THE FLARE MANUFACTURER. SUPPLEMENTAL FUEL (NATURAL GAS OR PROPANE) SHALL BE ADDED AS NECESSARY TO MAINTAIN THE REQUIRED STACK GAS EXIT TEMPERATURE.
RULE(S):59.1.

38. AN AUTOMATIC SHUTOFF DEVICE SHALL STOP THE FLOW OF LANDFILL GAS TO THE FLARE WHENEVER CONDITIONS OF FLAME-OUT, EXCESSIVE EXHAUST GAS TEMPERATURE (>1800 F), ,OR EXCESSIVE LANDFILL GAS OXYGEN CONTENT (>3.5% BY VOLUME) OCCUR.
RULE(S):59.1.

39. A THERMOCOUPLE, DESIGNED TO BE ACCURATE TO +/- 50 F AT 1500 F, SHALL BE INSTALLED IN THE FLARE STACK AND MAINTAINED IN GOOD WORKING CONDITION. THE TEMPERATURE OF THE EXHAUST GAS IN THE FLARE STACK SHALL BE DISPLAYED AT THE FLARE STATION DURING INCINERATION.
RULE(S):59.1.

40. THE PERMITTEE SHALL OPERATE, ADJUST, AND MAINTAIN THE GAS COLLECTION SYSTEM TO PREVENT EXCESSIVE QUANTITIES OF AIR FROM BEING DRAWN INTO THE LANDFILL. AN OXYGEN ANALYZER, DESIGNED TO BE ACCURATE TO +/- 0.5% BY VOLUME, SHALL BE INSTALLED IN THE COLLECTION PIPING AT THE FLARE STATION, MAINTAINED IN GOOD WORKING CONDITION, AND CALIBRATED AT LEAST BIENNIALLY. THE CONCENTRATION OF OXYGEN IN LANDFILL GAS AT THE FLARE STATION SHALL NOT EXCEED 3.5% BY VOLUME.
RULE(S):59.1.

41. THERE SHALL BE NO RELEASE OF DUST FROM ANY PART OF THE LANDFILL, ASSOCIATED LANDFILL OPERATIONS, OR ON-SITE EQUIPMENT WHICH EXCEED THE APPLICABLE VISIBLE EMISSION STANDARDS SPECIFIED IN THE DISTRICT RULES AND AND REGULATIONS.
RULE(S):50.

42. THERE SHALL BE NO RELEASE OF LEACHATE OR CONDENSATE FROM ANY PART OF THE LANDFILL, LANDFILL GAS COLLECTION SYSTEM, OR FLARE STATION WHICH RESULTS IN

8 Permit Conditions Continued

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THE DISCHARGE OF NON-METHANE ORGANIC COMPOUNDS TO THE ATMOSPHERE.
RULE(S):59.1.

43. THE ACTIVE WASTE DISPOSAL OPERATION SHALL NOT EXCEED THE MAXIMUM ELEVATION (480 FT MSL) AND SIZE (463 ACRES) LIMITS SPECIFIED IN THE STATE INTEGRATED WASTE MANAGEMENT BOARD PERMITS NOS. 37-AA-0009 AND 37-AA-0010. THESE LIMITS ARE EQUIVALENT TO A TOTAL DESIGN CAPACITY OF APPROXIMATELY 23,750,000 CUBIC YARDS.
RULE(S):NSR.

B. DISTRICT-ONLY--ENFORCEABLE CONDITIONS

44. THIS AIR POLLUTION CONTROL DISTRICT PERMIT DOES NOT RELIEVE THE HOLDER FROM OBTAINING PERMITS OR AUTHORIZATIONS REQUIRED BY OTHER GOVERNMENTAL AGENCIES.

45. THE PERMITTEE, SHALL UPON DETERMINATION OF APPLICABILITY AND WRITTEN NOTIFICATION BY THE DISTRICT, COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE AIR TOXICS 'HOT SPOTS' INFORMATION AND ASSESSMENT ACT (CALIFORNIA HEALTH AND SAFETY CODE SECTION 44300 ET.SEQ.).