2006 ANNUAL SOURCE TEST REPORT

Tri-Cities Recycling and Disposal Facility
Landfill Gas Control - Flare - Source A-3
Facility Number 2246

Test Date: June 28, 2006

Submittal Date: August 21, 2006

Prepared for:

Tri-Cities Recycling and Disposal Facility
Waste Management of Alameda County
7010 Auto Mall Parkway
Fremont, CA 94538

For submittal to:

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109

Prepared by:

Shaw™ Shaw Environmental, Inc.
2360 Bering Drive
San Jose, California 95131-1121

Project 121112.01000000

2006 ANNUAL SOURCE TEST REPORT

Tri-Cities Recycling and Disposal Facility
Landfill Gas Control - Flare - Source A-3
Facility Number 2246

The material and data in this report were reviewed by the undersigned.

Shaw™ Shaw Environmental, Inc.

William Johnston
Manager, Source Testing

Richard Merrill
Senior Air Quality Engineer

SUMMARY OF 2006 SOURCE TEST INFORMATION

Source Location:	Waste Management, Inc. Tri-Cities Recycling and Disposal Facility 7010 Auto Mall Parkway Fremont, CA 94538 Facility Number 2246
Contact:	Mr. Alan Blake
Source Description:	LFG Specialties Model Number EF945I12, 75 MMBtu/hour, enclosed flare assembly with a total capacity of 2500 scfm.
Reference:	Major Facility Review Permit A2246 Condition Number 8366 Emission Limits: CO = 0.30 lb/MMBtu NOx = 0.6 lb/MMBtu NMOC = 30 ppmv at 3 percent O_2
Agency:	Bay Area Air Quality Management District 939 Ellis Street San Francisco, CA 94109
Source Test Contractor:	Shaw Environmental, Inc. 2360 Bering Drive San Jose, CA 95131
Contact:	Mr. William Johnston: 408-382-5800
Test Date:	June 28, 2006

Notes:
MMBtu/hour = million British thermal units per hour
scfm = standard cubic feet per minute
CO = carbon monoxide
O_2 = oxygen
NOx = oxides of nitrogen
NMOC = non-methane organic compounds
lb/MMBtu = pounds per million British thermal units

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Summary and Overview

1.1 Summary

Shaw Environmental, Inc. (Shaw) performed the source testing of the landfill gas (LFG) flare at the Tri-Cities Recycling and Disposal Facility (Tri-Cities) located in Fremont, California. This report presents the results of the test program. Table 1 summarizes the test results compared to the emission limits. The flare met all compliance criteria.

Table 1. Tri-Cities Landfill Gas Flare A-3
Source Test Summary
Test date: June 28, 2006

Parameter	Average Result	Emission Limit	Compliance Status
NOx (lb/MMBtu)	0.03	0.06	In Compliance
CO (lb/MMBtu)	0.002	0.3	In Compliance
NMOC (ppmv @ 3% O_2, dry as methane)	< 2	30	In Compliance

Notes:
NOx = oxides of nitrogen
lb/MMBtu = pounds per British Thermal Unit
CO = carbon dioxide
NMOC = non-methane organic compounds
ppmv @ 15% O_2 = parts per million by volume at fifteen percent oxygen

1.2 Overview

Shaw, an approved California Air Resources Board (ARB) source test contractor, performed the source test program. The Air Quality Group within Shaw reviewed the source test data and report. The test program was designed to demonstrate compliance with the Bay Area Air Quality Management District (BAAQMD) Major Review Facility Permit A2246, Condition Number 8366 (See Appendix A). The source test was performed on the flare exhaust to assess the emissions of NMOC, NOx, CO, and O_2. Additionally, a LFG sample was collected for gas characterization.

The source test was conducted on June 28, 2006. Sampling was performed by Mr. Bill Johnston of Shaw. The BAAQMD was notified of the test via a letter dated June 20, 2006 that included the Source Test Protocol. The BAAQMD did not have a representative present for the test. A copy of the Source Test Protocol is presented in Appendix B. Source test data are located in Appendix C. A copy of Shaw's ARB Independent Contractor Program certification is included in Appendix D.

The source test program for collecting the required performance data is discussed in Section 2; the source testing results are presented in Section 3; the source test procedures are presented in Section 4; and data review is discussed in Section 5. Supporting documentation is presented in the appendices.

1.3 Source Operating Conditions

The flare is an LFG Specialties Model Number EF945I12, 75 million British thermal units per hour (MMBtu/hour), enclosed flare assembly with a total capacity of 2500 standard cubic feet per minute (scfm). A data acquisition system (DAS) is used to continuously record flare temperatures and the LFG volumetric flow rate. The LFG volumetric flow rate is measured with a LFG mass flow meter. Three thermocouples are installed at the top, middle, and bottom of the flare exhaust stack to provide temperature indications for control of the combustion temperature. The flare was set an operating temperature of 1,525 degrees Fahrenheit (°F) measured at the top thermocouple for the source test. The measured average flare temperature was 1,526 °F with an average LFG flow rate of 1,528 scfm.

The flare was fired continuously with LFG. Process data from the DAS documenting the operation of the flare are contained in Appendix E.

2.0 Source Test Program

The objective of the flare source test was to demonstrate compliance with requirements of Condition Number 8366 for flare operating parameters, O_2, NOx, CO, NMOC emissions, and LFG constituents.

Measurements of the flare's emissions were conducted at the flare exhaust. LFG was sampled at the inlet header. Table 2 provides a test matrix of the parameters tested at each sample location. American Society for Testing and Materials (ASTM), U.S. Environmental Protection Agency (EPA), and BAAQMD source test methods were used. The source test program consisted of three 30-minute runs to measure gaseous emissions in the flare exhaust and one 30-minute run to measure LFG concentration at the inlet header. The continuous emission monitoring system (CEMS) equipment was leak-checked before sampling began. Each instrument was calibrated before and after each sampling run with EPA protocol calibrated gas standards and a gas dilution system. The CEMS data are presented in Appendix F.

Concurrent with the exhaust sampling, Shaw collected one integrated 1-liter Tedlar® bag sample of the inlet LFG for analysis of NMOC, Btu, Fuel Factor (F-Factor), and additional fixed gases. The analytical laboratory results are contained in Appendix G.

The flare operating temperature and LFG rate were recorded by the DAS and manually recorded on a field data sheet. The outlet volumetric flow rate was calculated using the fuel flow rate, Btu, exhaust gas O_2 content, and the F-Factor according to EPA Method 19.

Results of the emission tests for the LFG and flare exhaust are summarized in Section 3. Compliance for NMOC was demonstrated by verifying that the concentrations of NMOC were less than 30 ppmv at 3 percent O_2 as methane. The source test demonstrated that the flare operates with criteria pollutant emissions below the BAAQMD emission limits.

Table 2. Source Test Methods and Instrumentation

Method	Inlet (fuel) Analyte	Exhaust Analyte	Instrumentation/ Laboratory	Principle
ASTM D-1945/D-3588; EPA Method 25 C	Fixed Gases, Btu and F-Factor; NMOC	—	Atmospheric Analysis & Consulting, Inc.	Chromatographic Analysis GC/FID/TCA Analysis
BAAQMD Method ST-6	—	CO	Horiba VIA 510	IR
BAAQMD Method ST-7		THC/CH_4/NMOC	TECO Model 51	FID
BAAQMD Method ST-13A		NOx	Ecophysics Model 70E	Chemiluminescence
BAAQMD Method ST-14		O_2	Teledyne 326A	Fuel Cell
EPA Method 19		Flow rate, dscfm	—	Algorithm

Notes:
dscfm = dry standard cubic feet per minute
FID = flame ionization detection
GC = gas chromatography
TCA = thermal conductivity analyzer
THC = total hydrocarbon
IR = infrared
CH_4 = methane

3.0 Source Test Results

The source test was performed on the LFG fuel and flare exhaust. Table 3 presents the results of the LFG analysis and the flare operating conditions as recorded by the DAS. One LFG sample was drawn from the inlet header and was analyzed for Btu, F-Factor, and additional fixed gases. Table 4 presents the results of the source test. Triplicate 30-minute runs were performed on the flare exhaust to assess the NMOC, NOx, and CO emissions. Concurrent with each run, the O_2 content of the exhaust gas was also measured.

Table 3. Tri-Cities Landfill
Flare Operating Conditions and LFG Analysis
Test date: June 28, 2006

	Run 1	Run 2	Run 3	Average
Time	0926-0956	1006-1036	1046-1116	—
Flare Temperature (°F)	1,531	1,523	1,524	1,526
Recorded Fuel Flow Rate (cfm)	1,527	1,529	1,527	1,528
Heat Input MMBtu/day	1,137	1,138	1,137	1,137
Btu/cubic foot[1]	—	517	—	—
H_2S[1]	—	58	—	—
TRS[1]	—	60	—	—
O_2 (%)[1]	—	0.9	—	—
CO_2 (%)[1]	—	37	—	—
N_2 (%)[1]	—	11	—	—
Methane (%)[1]	—	51.0	—	—
NMOC (ppmv)[1]	—	1,267	—	—

[1] Only one sample of LFG was collected and analyzed for this value.
cfm = cubic feet per minute
MMBtu/day = million British thermal units per day
H_2S = hydrogen sulfide
TRS = total reduced sulfurs
CO_2 = carbon dioxide
N_2 = nitrogen

Table 4. Tri-Cities Landfill
Source Test Results — Landfill Flare Exhaust A-3
Test date: June 28, 2006

	Run 1	Run 2	Run 3	Average	Emission Limit
Time	0926-0956	1006-1036	1046-1116	—	—
Fuel Factor	9,296	9,296	9,296	9,296	—
Flare Temperature (°F)	1,531	1,523	1,524	1,526	—
LFG Fuel Flow Rate (cfm)	1,527	1,529	1,527	1,528	—
Exhaust Flow Rate (dscfm)	14,748	14,768	14.748	14,755	—
O_2 (%)	10.5	10.5	10.5	10.5	—
NOx					
NOx (ppmv)	14.2	14.2	14.6	14.3	—
NOx (ppmv @ 15% O_2)	8.1	8.1	8.3	8.1	—
NOx (lb/MMBtu)	0.032	0.02	0.032	0.032	0.06
CO					
CO (ppmv)	1.9	1.0	1.1	1.3	—
CO (ppmv @ 15% O_2)	1.1	0.6	0.6	0.8	—
CO (lb/MMBtu)	0.003	0.001	0.001	0.002	0.30
Hydrocarbons as Methane					
NMOC (ppmv)	< 1	< 1	< 1	< 1	—
NMOC (ppmv corrected to 3% O_2)	< 1.7	< 1.7	< 1.7	< 1.7	30
NMOC Removal Efficiency (%)[1]	—	> 99.2	—	—	—

[1] *Only one sample of LFG was analyzed for this value.*

4.0 Test Procedures

Shaw conducted the source test according to EPA and BAAQMD test methods as described below.

4.1 Continuous Emissions Monitoring

Shaw measured stack gas constituent concentrations, using its CEMS sampling van, according to BAAQMD methods for NMOC, NOx, CO, and O_2. Figure 1 is a schematic diagram of the Shaw CEMS.

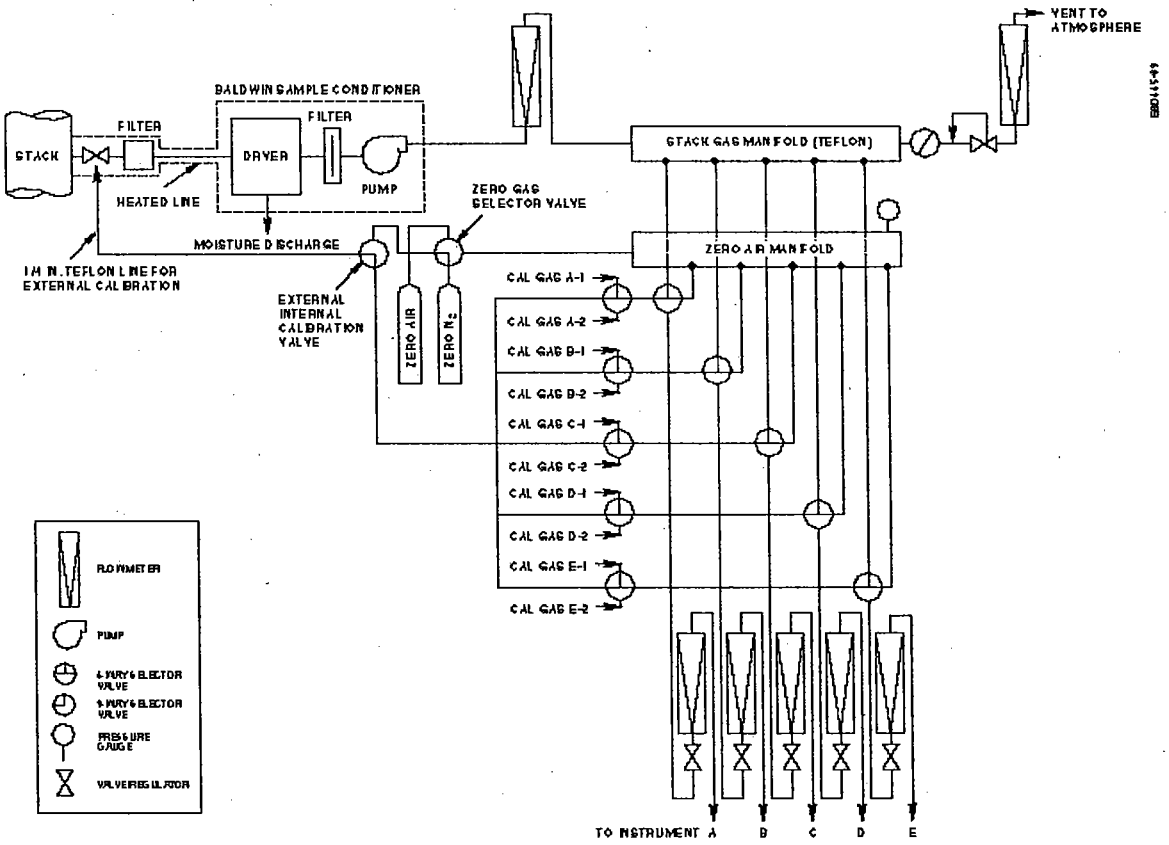


Figure 1. Schematic Diagram of the Shaw CEMS

In this source test, a sample pump was used to extract the sample gas continuously from each source through a stainless-steel sampling probe equipped with an in-stack filter, followed by a heated Teflon® sample line and a Baldwin sample conditioner. The sample line between the sample point and the sample conditioner was heated to 250°F to maintain the gas stream temperatures above the water dew point. Gas flow was controlled with a back-pressure regulator. The sample flow rate to each instrument was controlled with individual rotameters. Instrument output was recorded with a strip chart recorder and a digital data logger, the STRATA™ data acquisition system. Table 5 lists the specifications of the instruments used in the source test.

Table 5. CEMS Instrument Specifications

Gas	Analyzer/Manufacturer	Principle of Operation	Operating Range
O_2	Teledyne 326A	Fuel Cell	0-25%
THC	TECO Model 51	Flame Ionization	0-50 ppmv as CH_4
NOx	Ecophysics 70E	Chemiluminescence	0-50 ppmv
CO	Horiba VIA 510	NDIR	0-1000 ppmv

Note:
NDIR = nondispersive infrared

Before the start of testing, the sampling system was assembled at the site and leak-checked. Calibrations were performed on each of the instruments using certified calibration gases.

A span drift check was performed at the end of each run to measure analyzer drift. The drift check measurement uses a zero gas (N_2) and a high calibration gas. All of the instrument checks conducted for this source test were within the drift limit criterion of 3 percent, as specified in the test methods. Reported values include a correction for the recorded instrument drift, as specified in EPA Method 6C. Copies of data logger printouts, calibration data sheets, strip charts, and gas certificates of analysis are presented in Appendix F.

4.2 Landfill Gas

Shaw measured LFG constituent concentrations according to ASTM test methods. One sample was collected from a sample port located at the flare inlet header. The sample was collected in a 1-liter Tedlar® bag under positive pressure through Teflon® tubing. The sample line was purged with sample gas prior to sampling. The sample flow rate was controlled with rotameters to collect a 30-minute integrated sample. The sample was kept out of sunlight and was analyzed within the method holding times. Analytical results are presented in Appendix G.

5.0 Data Review

The Air Quality Group within Shaw performed a quality assurance review of the source test data and report. The review included the following activities:

- Review of the general text
- Check of calculation algorithms for correctness
- Review of CEMS data extraction
- Determination that all supporting documentation is present

A detailed manual review of the data was completed. Based on our data review, Shaw concludes the following:

- The source test procedures were followed, and all data were reduced and entered into the reporting spreadsheets properly.
- The instrument drift and other measures of instrument performance were deemed acceptable.

As a result, the data are considered to be acceptable.

Limitations

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, expressed or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

Appendix A
Major Facility Review Permit

Bay Area Air Quality Management District

939 Ellis Street
San Francisco, CA 94109
(415) 771-6000

FINAL

MAJOR FACILITY REVIEW PERMIT

Issued To:
TriCities Waste Management
Facility #A2246

Facility Address:
7010 Auto Mall Parkway
Fremont, CA 94538

Mailing Address:
7010 Auto Mall Parkway
Fremont, CA 94538

Responsible Official	**Facility Contact**
James Devlin	Brian Bowen
North Bay Market Area Manager	Environmental Protection Manager
(510) 430-8509	(916) 448-4675

Type of Facility:	Municipal Solid Waste Landfill	BAAQMD Permit Division Contact:
Primary SIC:	4953	Ted Hull, Air Quality Engineer II
Product:	Landfill Operations	

ISSUED BY THE BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Signed by Jack P. Broadbent — January 12, 2005
Jack P. Broadbent, Executive Officer/Air Pollution Control Officer — Date

VI. PERMIT CONDITIONS

Any condition that is preceded by an asterisk is not federally enforceable.

Condition # 8366
FOR S-1: LANDFILL WITH GAS COLLECTION SYSTEM AND A-3: LANDFILL GAS FLARE

1. The TriCities Landfill S-1 is permitted for a total refuse capacity of 19,271,000 cubic yards (approximately 13,489,700 tons), with a maximum refuse acceptance rate of 2,628 tons/day. Prior to increasing the design capacity of the landfill, the owner/operator of this site shall first apply for and receive from the District a modified permit to operate. (Basis: Cumulative Increase, Offsets, and Toxic Risk Management Policy)

2. The Permit Holder shall apply for and receive an Authority to Construct before modifying the landfill gas collection system described . Increasing or decreasing the number of wells or collectors, or significantly changing the length of collectors or the locations of wells or collectors are modifications that are subject to the Authority to Construct requirement.

   The Permit Holder has been issued a Permit to Operate for the landfill gas collection system components listed below. Well and collector locations, depths, and lengths are as described in detail in Permit Application # 3515.

	Required Components
Total Number of Vertical Wells:	25

   (Basis: Regulations 2-1-301, 8-34-301.1, and 8-34-305)

3. In order to demonstrate compliance with the above requirements, the S-1 Permit Holder shall maintain the following records:
   a. Monthly records of the quantity of refuse accepted and placed in the landfill.
   b. For areas of the landfill not controlled by a landfill gas collection system, the Permit Holder shall maintain a record of the date that waste was initially placed in the area or cell.
   c. The cumulative amount of waste placed in each uncontrolled area or cell on a monthly basis.
   d. If the Permit Holder plans to exclude an uncontrolled area or cell from the collection system requirement, the types and amounts of all non-decomposable waste placed in the area or cell shall be recorded. If non-decomposable waste makes up less than 100% of the contents of a given cell, that percentage shall be noted.
   e. The initial operation date for each new landfill gas well and collector.

VI. Permit Conditions

Condition # 8366
FOR S-1: LANDFILL WITH GAS COLLECTION SYSTEM AND A-3: LANDFILL GAS FLARE

f. An accurate map of the landfill that indicates the locations of all refuse boundaries and the locations of all wells and collectors as identified in the Collection and Control System Design Plan. Any areas containing only non-decomposable waste shall be clearly identified. This map shall be updated at least every six months to indicate changes in refuse boundaries and to include any newly installed wells and collectors.

These records shall be kept on-site and be made available for inspection to District personnel upon request for a period of five years from the date on which a record was made. (Basis: Cumulative Increase and Regulations 2-6-501 and8-34-304)

4. The landfill gas collection system described in Part 2 above shall be operated continuously. Wells shall not be disconnected or removed from operation nor shall isolation or adjustment valves be closed without written authorization from the District, unless the Permit Holder complies with all applicable requirements of Regulation 8, Rule 34, Sections 113, 116, 117, and 118. (Basis: Regulations 8-34-301 and 8-34-305)

5. All landfill gas collected by the gas collection system for S-1 shall be abated at all times by the Landfill Gas FlareA-3. Under no circumstances shall raw landfill gas be vented to the atmosphere. This limitation does not apply to unavoidable landfill gas emissions that occur during collection system installation, maintenance, or repair performed in compliance with Regulation 8, Rule 34, Sections 113, 116, 117, or 118 or to inadvertent component or surface leaks that do not exceed the limits specified in 8-34-301.2 or 8-34-303. (Basis: Regulation 8-34-301)

6. The combustion zone temperature of the flare shall be maintained at a minimum temperature of 1450 degrees F, averaged over any 3-hour period. If a source test demonstrates compliance with all applicable requirements at a different temperature, the APCO may revise this minimum temperature limit in accordance with the procedures identified in Regulation 2-6-414 or 2-6-415, based on the following criteria. The minimum combustion zone temperature for the flare shall be equal to the average combustion zone temperature determined during the most recent complying source test minus 50 degrees F, provided that the minimum combustion zone temperature is not less than 1400 degrees F. (Basis: Regulation 8-34-301, Toxic Risk Management Policy, RACT, and 40 CFR 60.758(c)(1)(i))

VI. Permit Conditions

Condition # 8366
FOR S-1: LANDFILL WITH GAS COLLECTION SYSTEM AND A-3: LANDFILL GAS FLARE

7. The Landfill Gas Flare A-3 shall be equipped with a combustion temperature readout monitor and continuous recorder to measure and record the temperature in the combustion zone. (Basis: Regulation 8-34-507)

8. Emissions of Nitrogen Oxides (NOx) from the Flare A-3 shall not exceed 0.06 pounds per million BTU (calculated as NO_2). (basis: RACT and Offsets)

9. Emissions of Carbon Monoxide (CO) from the Flare A-3 shall not exceed 0.3 pounds per million BTU. (basis: RACT and Offsets).

10. In order to demonstrate compliance with Regulation 8, Rule 34, Section 301.3, Regulation 9, Rule 1, Section 302, 40 CFR 60 .752(b)(2)(iii)(B), and the above requirements, the Permit Holder shall ensure that a District approved source test is conducted annually on the Landfill Gas Flare (A-3). The annual source test shall determine the following:
    a. Landfill gas flow rate to the flare (dry basis)
    b. Concentrations (dry basis) of methane (CH_4) and total non-methane organic compounds (NMOC) in the landfill gas;
    c. Stack gas flow rate from the flare (dry basis)
    d. Concentrations (dry basis) of nitrogen oxides (NOx), carbon monoxide (CO), CH_4, NMOC, and O_2 in the flare stack gas
    e. The NMOC destruction efficiency achieved by the flare
    f. The average combustion temperature in the flare during the test period.

    Annual source tests shall be conducted no sooner than 9 months and no later than 12 months after the previous source test. The Source Test Section of the District shall be contacted to obtain its approval of the source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. The source test report shall be submitted to the Compliance and Enforcement Division within 60 days after the test date. (Basis: Regulations 8-34-301.3 and 8-34-412 and 40 CFR 60.752(b)(2)(iii)(B))

VI. Permit Conditions

Condition # 8366
FOR S-1: LANDFILL WITH GAS COLLECTION SYSTEM AND A-3: LANDFILL GAS FLARE

11. The heat input to the A-3 Flare shall not exceed 1,800 million BTU per day or 657,000 million BTU per year. In order to demonstrate compliance with this part, the Permit Holder shall calculate and record on a monthly basis the maximum daily and total monthly heat input to the flare based on the landfill gas flow rate recorded pursuant to Part10, the average methane concentration in the landfill gas based on the most recent source test, and a high heating value for methane of 1013 BTU/scf. The records shall be retained for five years and shall be made available to the District staff upon request. (Basis: Regulation 2-1-301)

12. Total reduced sulfur compounds in the collected landfill gas shall be monitored as a surrogate for monitoring sulfur dioxide in control systems exhaust. The concentration of total reduced sulfur compounds in the collected landfill gas shall not exceed 1300 ppmv (dry). In order to demonstrate compliance with this part, the Permit Holder shall measure the total sulfur content in collected landfill gas on a quarterly basis using a draeger tube. The landfill gas sample shall be taken from the main landfill gas header. The Permit Holder shall follow the manufacturer's recommended procedures for using the draeger tube and interpreting the results. The Permit Holder shall conduct the first draeger tube test no later than 3 months after the issue date of the MFR Permit and quarterly thereafter.
(Basis: Regulations 9-1-302 and 2-6-503)

13. On rainless operating days, water shall be applied as necessary and at least 2 times per full operational day to all unpaved roadways and active soil removal and fill areas associated with this facility to suppress dust emissions. On operating days when rain has fallen in the last 24 hours, water shall be applied as necessary to prevent visible dust emissions. (Basis: Regulations 6-301 and 1-301)

14. Paved roadways at the facility shall be kept sufficiently clear of dirt and debris as to prevent visible particulate emissions from vehicle traffic or wind. (Basis: Regulations 6-301 and 1-301)

VI. Permit Conditions

Condition # 8366
FOR S-1: LANDFILL WITH GAS COLLECTION SYSTEM AND A-3: LANDFILL GAS FLARE

15. Visible dust emissions from any part of the facility shall not exceed Ringelmann 1.0 or result in fallout on adjacent property in such quantities as to cause a public nuisance. (Basis: Regulations 6-301 and 1-301)

16. In order to demonstrate compliance withParts 13 and 14, the operator of this facility shall keep records of all site watering and road cleaning activities in a District approved log. These records shall be kept on-site and be made available for inspection to District personnel upon request for a period of five years from the date on which the record was made. (Basis: Regulation 2-6-501)

17. The Permit Holder shall limit the quantity of VOC soil handled per day so that no more than 15 pounds of total carbon could be emitted to the atmosphere per day. VOC soil is any soil that contains volatile organic compounds, as defined in Regulation 8-40-213, at a concentration of 50 ppmw or less. Soil containing more than 50 ppmw of VOC is considered to be "contaminated soil" and is subject to Part 18 of these conditions. Soil containing only non-volatile hydrocarbons and meeting the requirements of Regulation 8-40-113 is not subject to Parts 17 and 18 of these conditions. In order to demonstrate compliance with this condition, the Permit Holder shall maintain the following records in a District approved log:
    a. Daily records of the amount of VOC soil handled at the landfill. The total amount (in pounds per day) represents Q in the equation in subpart 17c. (see below)
    b. Daily records of the VOC content of all soils handled at the landfill. The VOC content (C in the equation below) is expressed as parts per million by weight total carbon..
    c. Calculate and record on a daily basis the VOC Emission Rate (E) using the following equation:
    $E = Q \times C / 1{,}000{,}000$

    These records shall be maintained on-site or shall be made readily available to District staff upon request for at least 5 years from the date on which a record was made. (Basis: Regulation 8-2-301)

18. Handling Procedures for Soil Containing Volatile Organic Compounds
    a. The procedures listed below in subparts b-l do not apply if the following criteria are satisfied. However, the record keeping requirements in subpart m, below, are applicable.

Appendix B
Source Test Protocol

Shaw Environmental, Inc.
2360 Bering Drive
San Jose, California 95131
408-382-5800
FAX: 408-433-1912

Shaw™ Shaw Environmental, Inc.

VIA Fax 415-749-4922

To: Tim Underwood, Ken Kunaniec of BAAQMD Date: June 20, 2006
Subject: Source Test Protocol & Test Notification

SOURCE TEST PROTOCOL

TRICITIES WASTE MANAGEMENT FACILITY

FLARE A-3

Shaw Environmental, Inc. will perform compliance testing on a new flare (A-3) located at the Tri-Cities Waste Management Recycling and Disposal facility (TRDF) in Fremont, California. The purpose of the test is to demonstrate the performance of the landfill gas flare as specified by the Bay Area Air Quality Management District (BAAQMD) Title V permit and Regulation 8, Rule 34. This protocol is to inform the BAAQMD of the planned testing procedures.

Source Test Information

Test Location:	Tri-Cities Waste Management Recycling and Disposal Facility 7010 Auto Mall Parkway Fremont , CA BAAQMD Facility #A2246	Contact: Alan Baker Tel: 510-657-2425
Source Tested:	Flare (A-3)	
Test Objective:	Determine compliance with Title V and Regulation 8, Rule 34 Permit condition #8366	Emission Limits: NMOC: 30 ppm as methane @3% O_2 or 98% removal by weight NOx: < 0.06 lb/MMBtu CO: < 0.3 lb/MMBtu
Test Performed By:	Shaw Environmental, Inc. 2360 Bering Drive San Jose, CA 95131	Contact: William R. Johnston Tel: (408) 382-5822
Test date	June 28, 2006	
Test Parameters:	Inlet O_2, CO_2, N_2, BTU, HHV CH_4, NMOC, f-factor Volumetric flow rate	Outlet CH_4, NMOC, NOx, CO, O_2, Volumetric flow rate

SCOPE OF WORK

The source test will demonstrate the performance of the landfill gas flare as specified by the BAAQMD Title V permit condition #8366. The flare source test shall determine the following parameters to satisfy the permit requirements.

- Landfill gas flow rate (dry basis);
- The landfill gas shall be analyzed for Carbon Dioxide (CO_2), Nitrogen (N_2), Oxygen (O_2), Methane (CH_4), Non-methane Organic Compounds (NMOC), fuel factor All concentrations shall be reported on a dry basis;
- Stack gas flow rate from the flare, calculated from landfill gas analysis and f-factor;
- Concentrations (dry basis) of CH_4, NMOC, Carbon Monoxide (CO), Nitrogen Oxides (NO_x), and O_2 in the flare stack gas;
- NMOC destruction efficiency achieved by the flare;
- The average combustion temperature in the flare during the test period.

The source test will demonstrate the following limits from the flare exhaust.

- Emissions of NOx shall not exceed 0.06 pounds per million British Thermal Units (lb/MMBtu).
- Emissions of CO shall not exceed 0.30 lb/MMBtu.
- The flare destruction efficiency of NMOC shall not be less than 98 percent by weight, unless the outlet NMOC concentration is less than 30 ppmv, expressed as methane at 3 percent oxygen on a dry basis.

TEST PROCEDURES

The source test matrix identified below presents the test parameters and source test methods (each compliant with the requirements of the BAAQMD) that will be utilized to determine the emissions from the flare.

Landfill Gas Fuel Analysis

Integrated Tedlar bag samples will be collected at the inlet to the flare. Samples will be collected concurrently with the outlet sampling. Samples will be analyzed within 72 hours (48 hrs for sulfur.

Continuous Emission Monitoring

Single point sampling will be performed at the center of the stack. All analyzers will be checked for calibration before and after each run. Emission monitoring data will be recorded on strip charts and a data logger. Methane concentrations will be determined by passing sample gas through an activated carbon scrubber prior to the hydrocarbon analyzer. Hydrocarbon emissions will be measured and reported as methane.

Process Parameters

Flare process parameters including the fuel gas flow rate and the flare operating temperature will be measured and recorded during each run using the flare gas measurement system.

Test Matrix TriCities Landfill
LFG and Flare A-3

Sample Parameter	Test Method	Runs	Test Duration
LFG Parameters- Flare Inlet			
Gas flow rate	DAS & flow meter	3	Concurrent
Flare temperature	DAS & thermocouple	3	Concurrent
Fuel factor	EPA Method 19	1	30 Minutes
Fixed gases [1]	ASTM D1945, EPA Method 18	1	
NMOC	EPA Method 25 C	1	30 Minutes
Source Parameters-Flare Exhaust			
Volumetric flow rate	EPA Method 19	3	30 Minutes
O_2	BAAQMD ST-14	3	30 Minutes
NMOC	BAAQMD ST-7	3	30 Minutes
CO	BAAQMD ST-6	3	30 Minutes
NOx	BAAQMD ST-13A	3	30 Minutes

[1] Fixed gases include HHV, CO_2, N_2, O_2, and CH_4 .

[2] Only one sample will be analyzed for the test program.

REPORT

The final report is due to the BAAQMD 60 days after testing has occurred. The report will describe the tests that were conducted, the operating conditions of the source during the test, and the emission results. All raw data and sample calculations used to obtain the reported results will be included so that the accuracy of the reported results can be verified from the report. The flare process information will be submitted in the report.

Johnston, William

From: Tim Underwood [tunderwood@baaqmd.gov]

Sent: Wednesday, June 21, 2006 10:36 AM

To: Johnston, William

Subject: NST-837 Source Test Notification received

Notification of source testing to be done at plant A2246 on June 28 has been assigned number NST-837.

NST-837	A2246	Tri Cities Waste Management and Recycling	A-3	Flare	6/28/06

Appendix C
Source Test Data

Emission Rate Calculations
Stack Gas Flow Rate and Fuel Usage, EPA Method 19

EMISSION RATE CALCULATION

Facility: Tri-Cities
Source : Flare A-3
Test date: 6/28/2006

Temperature Std: 70
Pressure Std: 29.92
O2% correction: 15 NOx & CO
O2% correction: 3 NMOC

Time	0926-0956		1006-1036		1046-1116		Avg		Permit
	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Limits
Flare Temp (F)	1,531		1,523		1,524		1,526		
Fuel factor	9,296		9,296		9,296		9,296		
Oxygen (%)		10.5		10.5		10.5		10.5	
Flowrate (dscfm)	1,527	14,748	1,529	14,768	1,527	14,748	1,528	14,755	
Oxides of Nitrogen									
MW = 46									
NOx, ppm		14.2		14.2		14.6		14.3	
NOx, ppm corrected to 15% O2		8.1		8.1		8.3		8.1	
NOx, lb/hr		1.5		1.5		1.5		1.5	
NOx, lb/MMBtu		0.032		0.032		0.032		0.032	0.06
Carbon Monoxide									
MW = 28									
CO, ppm		1.9		1.0		1.1		1.3	
CO, ppm corrected to 15% O2		1.1		0.6		0.6		0.8	
CO, lb/hr		0.12		0.064		0.070		0.085	
CO, lb/MMBtu		0.003		0.001		0.001		0.002	0.3
Hydrocarbons as methane									
MW = 16									
THC, ppm		< 1.0		< 1.0		< 1.0		< 1.0	
NMOC, ppm		< 1.0	1267	< 1.0		< 1.0	1,267	< 1.0	
NMOC, ppm corrected to 3% O2		< 1.7		< 1.7		< 1.7		< 1.7	30
NMOC, lb/hr		< 0.037	4.8	< 0.037		< 0.037	< 4.8	< 0.037	
Efficiency %									
NMOC	NM		> 99.2%		NM			99.2%	98

Calculations

lb/hr = ppm x MW x Qs x 8.223x10-5 / (Tstd + 460)
ppm corrected @ O2 = ppm measured x [(20.9 - O2% correction) / (20.9% O2 - O2 measured)]
lb/MMBtu = F-factor x MW x [1.3711x10-6 / (Tstd + 460)] x [(20.9 /20.9 -O2%)] x ppm
Efficiency (%) = in (lb/hr)-out (lb/hr)/in (lb/hr) x 100
NM = not measured

Stack Gas Flow Rate ---- Fuel Usage

EPA Method 19

Facility Tri-Cities
Source Flare A-3
Date 6/28/2006

		Run 1	Run 2	Run 3	Average
Gross Caloric Value (Btu/ft3)	Btu/ft3	517	517	517	517
Stack Oxygen	%	10.5	10.5	10.5	10.5
Fuel factor @ 68 F	DSCF/MMBtu	9,296	9,296	9,296	9,296
Corrected Fuel Rate (SCFM) @ Tstd	SCFM	1,527	1,529	1,527	1,528
Fuel Flowrate (SCFH) @ Tstd	SCFH	91,620	91,740	91,620	91,660
Million Btu per minute	MMBtu/min	0.789	0.790	0.789	0.790
Heat Input (MMBtu/hr)	MMBtu/hr	47.4	47.4	47.4	47.4
Heat Input (MMBtu/day)	MMBtu/day	1136.8	1138.3	1136.8	1137.3
Stack Gas Flow Rate (dscfm)	dscfm	14,748	14,768	14,748	14,755

Calculations

SCFM = CFM * (Tstd + 460) * gas PSIA) / 14.7 / (gas F + 460)
SCFH = SCFM * 60
MMBtu/min = SCFM * Btu/ft3 / 1,000,000
MMBtu/hr = MMBtu/min * 60
DSCFM = Fuel factor * MMBtu/min * (20.9 / (20.9-O2%)) * (Tstd + 460) / 528

Notes
Corrected Fuel Rate (SCFM) @ Tstd data is from the system data aquistion

Appendix D
ARB Independent Contractor Program Certification

State of California

Air Resources Board

Approved Independent Contractor

Shaw Environmental, Inc.

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to section 91207, title 17, California Code of Regulations, until June 30, 2007 for those test methods listed below:

ARB Source Test Methods:
1, 2, 3, 4, 5, 8, 100 (CO, CO_2, NO_x, O_2, SO_2, THC)
Visible Emissions Evaluation

William V. Loscutoff, Chief
Monitoring and Laboratory Division

90 56165

Appendix E
Process Data

Data Acquisition System Printout
Field Data Sheet

TRI-CITIES SOURCE TEST 6/28/2006

		Temperature F		LFG Flow SCFM		
Date	Time	MIN	MAX	MIN	MAX	
2006/06/28	09:26:00	1496	1659	1504	1545	R1
2006/06/28	09:28:00	1496	1664	1503	1549	R1
2006/06/28	09:30:00	1501	1581	1509	1542	R1
2006/06/28	09:32:00	1515	1525	1512	1539	R1
2006/06/28	09:34:00	1515	1530	1506	1538	R1
2006/06/28	09:36:00	1515	1528	1509	1544	R1
2006/06/28	09:38:00	1521	1528	1512	1551	R1
2006/06/28	09:40:00	1518	1528	1505	1544	R1
2006/06/28	09:42:00	1517	1528	1508	1542	R1
2006/06/28	09:44:00	1519	1528	1512	1543	R1
2006/06/28	09:46:00	1518	1529	1514	1550	R1
2006/06/28	09:48:00	1519	1527	1512	1553	R1
2006/06/28	09:50:00	1518	1527	1504	1540	R1
2006/06/28	09:52:00	1520	1526	1514	1546	R1
2006/06/28	09:54:00	1517	1528	1513	1548	R1
2006/06/28	09:56:00	1519	1526	1513	1548	R1
	Avg	1514	1548	1509	1545	
		Avg	**1531**		**1527**	
2006/06/28	09:58:00	1519	1530	1512	1547	
2006/06/28	10:00:00	1519	1528	1511	1548	
2006/06/28	10:02:00	1516	1529	1504	1543	
2006/06/28	10:04:00	1518	1530	1504	1540	
2006/06/28	10:06:00	1519	1526	1509	1545	R2
2006/06/28	10:08:00	1519	1529	1506	1545	R2
2006/06/28	10:10:00	1519	1526	1512	1551	R2
2006/06/28	10:12:00	1519	1528	1509	1544	R2
2006/06/28	10:14:00	1517	1529	1512	1541	R2
2006/06/28	10:16:00	1518	1528	1511	1546	R2
2006/06/28	10:18:00	1518	1529	1511	1550	R2
2006/06/28	10:20:00	1521	1528	1510	1546	R2
2006/06/28	10:22:00	1517	1527	1507	1536	R2
2006/06/28	10:24:00	1518	1528	1507	1551	R2
2006/06/28	10:26:00	1519	1527	1517	1549	R2
2006/06/28	10:28:00	1519	1528	1513	1547	R2
2006/06/28	10:30:00	1519	1530	1514	1548	R2
2006/06/28	10:32:00	1517	1528	1519	1554	R2
2006/06/28	10:34:00	1517	1527	1512	1554	R2
2006/06/28	10:36:00	1519	1530	1516	1551	R2
	Avg	1518	1528	1512	1547	
		Avg	**1523**		**1529**	
2006/06/28	10:38:00	1520	1527	1520	1544	
2006/06/28	10:40:00	1514	1528	1505	1549	
2006/06/28	10:42:00	1519	1528	1510	1542	
2006/06/28	10:44:00	1519	1528	1516	1549	

TRI-CITIES SOURCE TEST 6/28/2006

		Temperature F		LFG Flow SCFM		
Date	Time	MIN	MAX	MIN	MAX	
2006/06/28	10:46:00	1519	1527	1513	1545	R3
2006/06/28	10:48:00	1519	1526	1506	1542	R3
2006/06/28	10:50:00	1518	1529	1512	1544	R3
2006/06/28	10:52:00	1521	1528	1510	1547	R3
2006/06/28	10:54:00	1518	1531	1512	1543	R3
2006/06/28	10:56:00	1519	1527	1507	1536	R3
2006/06/28	10:58:00	1518	1529	1510	1546	R3
2006/06/28	11:00:00	1518	1529	1513	1544	R3
2006/06/28	11:02:00	1521	1528	1505	1542	R3
2006/06/28	11:04:00	1520	1527	1507	1547	R3
2006/06/28	11:06:00	1518	1527	1504	1544	R3
2006/06/28	11:08:00	1519	1527	1510	1545	R3
2006/06/28	11:10:00	1518	1528	1515	1541	R3
2006/06/28	11:12:00	1520	1530	1507	1543	R3
2006/06/28	11:14:00	1519	1527	1509	1545	R3
2006/06/28	11:16:00	1518	1529	1516	1545	R3
	Avg	1519	1528	1510	1544	
		Avg	**1524**		**1527**	

Landfill Process Data Sheet

Landfill: Tri-cities

Test date: 6-28-06

Source: (Flare), IC Engine, Turbine
circle one

Landfill Gas Data	Run 1		Run 2		Run 3		Run 4
Time	0820		926		1006		1046
Methane (%)	51.3						
HHV based on methane							
F-factor based on methane							
O2 (%)	0.0						
Landfill Gas Rate (scfm)	1528		1541		1522		1537
Engine (KW)							
Condensate Rate (gpm)							
Flare Temp (F)	1652		1521		1524		1519

Thermocouple Measurement Location (Top) Middle ~~Bottom~~
circle one

HHV = methane (%) x 1018

R1 Bottom

R 2-4 Top

Appendix F
Continuous Emission Monitoring Data

Data Acquisition
Strip Chart Records
Calibration Gas Certificates of Analysis

Run averages corrected for bias

Operator: B Johnston

Plant Name: Tri-Cities

Location: Flare A3

Strata Run	Test Run	O2 %	CO ppm	THC ppm	NOx ppm	
1		10.9	24.4	1.1	13.5	Run was voided due to an incorect flare temp.
2	1	10.5	1.9	0.0	14.2	
3	2	10.5	0.9	0.0	14.2	
4	3	10.5	1.1	0.0	14.6	

STRATA Configuration Page 1
06-28-2006 07:28:52
File Name: C:\STRATA\TRICIT.STR

Operator:	B Johnston
Plant Name:	Tri-Cities
Location:	Flare A3
Run Length:	30 minutes
Sample Rate:	40 per minute
Average Calibration Results:	1 minutes
Automatic Sequence, Calibration Error:	No
Automatic Sequence, System Bias:	No
Max Response Time:	Manual
Max Response Time:	1 minutes
Traverse During Run:	No

Active	Chan.	Analyte Name	Units	Span Units	Span Volts	Offset Volts
Yes	1	O2	%	25	1	0
Yes	3	CO	ppm	100	1	0
Yes	4	THC	ppm	50	10	0
Yes	5	NOx	ppm	50	10	0

Measurement System Preparation Table

Gas Name	Reference Cylinder Numbers 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
O2	Z	H														
CO	Z		H													
THC	Z			H												
NOx	Z				H											

~~Run 1 820 - 850~~ Void

Run 2 0926 - 0956

Run 3 1006 - 1036

Run 4 1046 - 1116

Gas Name	Zero Reference Cylinder No.	Conc	ID Number	Low Reference Cylinder No.	Conc	ID Number
O2	1	0		99	999	
CO	1	0		99	999	
THC	1	0		99	999	
NOx	1	0		99	999	

Gas Name	Mid Reference Cylinder No.	Conc	ID Number	High Reference Cylinder No.	Conc	ID Number
O2	99	999		2	19.04	CC8445
CO	99	999		3	90.1	AAL19769
THC	99	999		4	45	AAL4576
NOx	99	999		5	44.8	AAL19769

Seq Num	Calibration Error Test Sequence O2	CO	THC	NOx
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Seq Num	Calibration Error Valve Sequence 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																

Seq Num	System Bias Check Sequence O2	CO	THC	NOx
1	Zero	Zero	Zero	Zero
2	High	High	High	High
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Seq Num	System Bias Valve Sequence 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	X															
2		X	X	X	X											
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																

STRATA Configuration End

Calibration Error Test, Run 1 STRATA Version 1.1
Operator: B Johnston
Plant Name: Tri-Cities
Location: Flare A3

Reference Cylinder Numbers

	Zero	Low-range	Mid-range	High-range
O2				CC8445
CO				AAL19769
THC				AAL4576
NOx				AAL19769

Date/Time 06-28-2006 07:56:36 PASSED

Analyte	O2	CO	THC	NOx
Units	%	ppm	ppm	ppm
Zero Ref Cyl				
Zero Avg				
Zero Error%				
Low Ref Cyl				
Low Avg				
Low Error%				
Mid Ref Cyl				
Mid Avg				
Mid Error%				
High Ref Cyl				
High Avg				
High Error%				

Calibration Error Test End

Initial System Bias Check, Run 1 STRATA Version 1.1

	O2	CO	THC	NOx
	%	ppm	ppm	ppm
06-28-2006 07:57:40	4.039	2.45	-0.099	2.736
06-28-2006 07:58:40	0.117	0.08	-0.098	0.002
06-28-2006 07:59:39	0.067	0.07	-0.098	0.002
06-28-2006 08:00:40	9.773	47.24	35.414	32.419
06-28-2006 08:01:39	18.584	90.06	44.796	45.194
06-28-2006 08:02:40	18.751	90.02	44.834	44.763
06-28-2006 08:03:40	18.950	90.16	44.800	44.798
06-28-2006 08:04:39	18.988	90.16	44.817	44.823

Initial System Bias Check for Run 1
Operator: B Johnston
Plant Name: Tri-Cities
Location: Flare A3

Reference Cylinder Numbers

	Zero	Span
O2		CC8445
CO		AAL19769
THC		AAL4576
NOx		AAL19769

Date/Time 06-28-2006 08:04:55 PASSED

Analyte	O2	CO	THC	NOx
Units	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.00	0.000	0.000
Zero Cal	0.000	0.00	0.000	0.000
Zero Avg	0.067	0.06	-0.098	0.002
Zero Bias%	0.3%	0.1%	0.2%	0.0%
Zero Drift%				
Span Ref Cyl	19.040	90.10	45.000	44.800
Span Cal	19.040	90.10	45.000	44.800
Span Avg	18.991	90.15	44.820	44.834
Span Bias%	0.2%	0.0%	0.4%	0.1%
Span Drift%				

System Bias Check End

STRATA Configuration Page 1
06-28-2006 08:11:42
File Name: C:\STRATA\TRICIT.STR

Operator:	B Johnston
Plant Name:	Tri-Cities
Location:	Flare A3
Run Length:	30 minutes
Sample Rate:	40 per minute
Average Calibration Results:	1 minutes
Automatic Sequence, Calibration Error:	No
Automatic Sequence, System Bias:	No
Max Response Time:	Manual
Max Response Time:	1 minutes
Traverse During Run:	No

Active	Chan.	Analyte Name	Units	Span Units	Span Volts	Offset Volts
Yes	3	CO	ppm	1000	1	0

Measurement System Preparation Table

Gas Name	Reference Cylinder Numbers 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CO	Z		H													

Gas Name	Zero Reference Cylinder No.	Conc	ID Number	Low Reference Cylinder No.	Conc	ID Number
CO	1	0		99	999	

Gas Name	Mid Reference Cylinder No.	Conc	ID Number	High Reference Cylinder No.	Conc	ID Number
CO	99	999		3	858	CC181169

Seq Num	Calibration Error Test Sequence CO
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Seq Num	Calibration Error Valve Sequence 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																

Seq Num	System Bias Check Sequence CO
1	Zero
2	High
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Seq Num	System Bias Valve Sequence 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	X															
2			X													
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																

Initial System Bias Check, Run 1 STRATA Version 1.1

	CO
	ppm
06-28-2006 08:13:54	0.3
06-28-2006 08:14:54	0.5
06-28-2006 08:15:54	259.1
06-28-2006 08:16:54	854.4
06-28-2006 08:17:54	858.7

Initial System Bias Check for Run 1

Operator:	B Johnston
Plant Name:	Tri-Cities
Location:	Flare A3

	Reference Cylinder Numbers	
	Zero	Span
CO		CC181169

Date/Time	06-28-2006	08:18:05	PASSED
Analyte	CO		
Units	ppm		
Zero Ref Cyl	0.0		
Zero Cal	0.0		
Zero Avg	0.5		
Zero Bias%	0.1%		
Zero Drift%			
Span Ref Cyl	858.0		
Span Cal	858.0		
Span Avg	858.8		
Span Bias%	0.1%		
Span Drift%			

System Bias Check End

Test Run 1 STRATA Version 1.1

	O2	CO	THC	NOx
	%	ppm	ppm	ppm
Begin calculating run averages				
06-28-2006 08:20:15	10.211	2.0	-0.097	15.921
06-28-2006 08:21:16	10.222	0.8	-0.095	15.336
06-28-2006 08:22:15	10.385	0.5	-0.095	14.760
06-28-2006 08:23:15	10.353	1.4	-0.095	15.007
06-28-2006 08:24:16	10.914	14.9	0.445	13.263
06-28-2006 08:25:15	11.105	37.5	1.147	13.364
06-28-2006 08:26:15	11.057	29.7	0.846	12.992
06-28-2006 08:27:14	10.794	9.9	0.037	13.802
06-28-2006 08:28:15	11.400	75.2	5.383	12.218
06-28-2006 08:29:16	11.367	60.3	3.071	12.267
06-28-2006 08:30:15	10.712	11.6	-0.023	14.281
06-28-2006 08:31:15	10.999	19.1	0.275	13.192
06-28-2006 08:32:16	11.267	66.9	3.561	12.447
06-28-2006 08:33:15	11.380	77.0	5.433	12.610
06-28-2006 08:34:15	10.866	5.9	-0.079	13.570
06-28-2006 08:35:14	10.710	13.7	0.150	14.392
06-28-2006 08:36:15	10.721	9.6	0.594	13.692
06-28-2006 08:37:16	11.423	72.0	2.916	12.185
06-28-2006 08:38:15	11.202	41.3	1.590	13.000
06-28-2006 08:39:15	10.446	0.8	-0.094	14.751
06-28-2006 08:40:16	10.638	4.3	-0.089	14.216
06-28-2006 08:41:15	10.918	13.5	0.699	13.221
06-28-2006 08:42:15	11.243	49.0	2.129	12.963
06-28-2006 08:43:14	11.032	19.2	0.086	13.171
06-28-2006 08:44:15	10.526	3.4	-0.090	14.677
06-28-2006 08:45:16	11.496	44.8	1.440	11.945
06-28-2006 08:46:15	11.197	35.2	1.671	12.708
06-28-2006 08:47:15	10.884	31.3	0.644	13.897
06-28-2006 08:48:16	10.483	2.3	-0.094	14.751
06-28-2006 08:49:15	10.535	0.0	-0.094	14.482
Run Averages	O2	CO	THC	NOx
	%	ppm	ppm	ppm
06-28-2006 08:50:03	10.891	25.1	1.040	13.596

Operator: B Johnston
Plant Name: Tri-Cities
Location: Flare A3
Test Run 1 End

Final System Bias Check, Run 1 STRATA Version 1.1

	O2	CO	THC	NOx
	%	ppm	ppm	ppm
06-28-2006 08:51:05	3.903	10.6	0.163	1.615
06-28-2006 08:52:06	0.155	1.0	-0.094	0.007
06-28-2006 08:53:06	0.099	1.0	-0.094	0.007
06-28-2006 08:54:06	11.145	664.5	35.392	34.512
06-28-2006 08:55:06	18.841	857.0	44.301	45.089
06-28-2006 08:56:05	18.935	857.3	44.316	45.171

Final System Bias Check for Run 1
Operator: B Johnston
Plant Name: Tri-Cities
Location: Flare A3

Reference Cylinder Numbers

	Zero	Span
O2		CC8445
CO		CC181169
THC		AAL4576
NOx		AAL19769

Date/Time 06-28-2006 08:56:15 PASSED

Analyte	O2	CO	THC	NOx
Units	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.0	0.000	0.000
Zero Cal	0.000	0.0	0.000	0.000
Zero Avg	0.099	1.0	-0.095	0.007
Zero Bias%	0.4%	0.1%	0.2%	0.0%
Zero Drift%	0.1%	0.0%	0.0%	0.0%
Span Ref Cyl	19.040	858.0	45.000	44.800
Span Cal	19.040	858.0	45.000	44.800
Span Avg	18.938	857.3	44.324	45.158
Span Bias%	0.4%	0.1%	1.4%	0.7%
Span Drift%	-0.2%	-0.2%	-1.0%	0.6%
Ini Zero Avg	0.067	0.5	-0.098	0.002
Ini Span Avg	18.991	858.8	44.820	44.834
Run Avg	10.891	25.1	1.040	13.596
Co	0.083	0.8	-0.096	0.004
Cm	18.965	858.1	44.572	44.996
Correct Avg	10.899	24.4	1.144	13.534

System Bias Check End

Test Run 2 STRATA Version 1.1

		O2 %	CO ppm	THC ppm	NOx ppm
06-28-2006	08:57:16	13.577	346.8	10.703	16.211
06-28-2006	08:58:17	11.218	50.5	2.332	13.198
06-28-2006	08:59:16	10.965	15.3	0.021	13.358
06-28-2006	09:00:16	10.116	0.5	-0.094	15.754
06-28-2006	09:01:15	10.221	0.4	-0.094	14.914
06-28-2006	09:02:16	10.425	0.4	-0.094	14.744
06-28-2006	09:03:17	10.986	31.7	0.697	13.194
06-28-2006	09:04:16	10.740	8.1	-0.077	13.731
06-28-2006	09:05:16	10.574	4.3	-0.094	14.556
06-28-2006	09:06:17	10.910	18.9	1.074	13.155
06-28-2006	09:07:16	11.116	70.4	4.428	13.020
06-28-2006	09:08:17	10.130	0.2	-0.094	15.350
06-28-2006	09:09:16	10.598	4.3	-0.094	14.179
06-28-2006	09:10:16	10.427	1.7	-0.094	14.526
06-28-2006	09:11:17	10.657	1.8	-0.094	14.134
06-28-2006	09:12:16	10.589	1.7	-0.094	14.144
06-28-2006	09:13:16	11.061	41.8	3.310	13.036
06-28-2006	09:14:17	10.238	0.5	-0.094	15.035
06-28-2006	09:15:16	10.663	4.4	-0.077	14.152
06-28-2006	09:16:17	10.515	3.6	-0.043	14.009
06-28-2006	09:17:16	11.427	84.9	4.368	12.133
06-28-2006	09:18:16	9.809	92.6	4.135	16.846
06-28-2006	09:19:17	10.201	137.5	1.826	13.649
06-28-2006	09:20:16	11.109	78.3	8.961	12.879
06-28-2006	09:21:16	10.983	10.5	-0.051	13.411
06-28-2006	09:22:17	10.348	0.0	-0.095	14.657
06-28-2006	09:23:16	10.807	4.9	-0.095	13.481
06-28-2006	09:24:17	10.421	4.2	-0.095	14.417
06-28-2006	09:25:16	10.492	2.2	-0.095	14.730
Begin calculating run averages					
06-28-2006	09:26:16	10.408	2.2	-0.095	15.432
06-28-2006	09:27:17	10.436	0.3	-0.095	14.511
06-28-2006	09:28:16	10.628	2.6	-0.095	13.985
06-28-2006	09:29:16	10.221	0.8	-0.095	15.059
06-28-2006	09:30:16	10.374	0.8	-0.095	14.582
06-28-2006	09:31:16	10.320	0.9	-0.095	14.729
06-28-2006	09:32:17	10.391	1.0	-0.095	14.478
06-28-2006	09:33:16	10.460	0.4	-0.095	14.411
06-28-2006	09:34:16	10.701	7.7	-0.008	13.504
06-28-2006	09:35:17	10.496	3.7	-0.096	14.613
06-28-2006	09:36:16	10.578	3.2	-0.096	13.929
06-28-2006	09:37:17	10.606	2.3	-0.096	13.984
06-28-2006	09:38:16	10.747	8.2	-0.084	13.678
06-28-2006	09:39:16	10.383	2.7	-0.096	14.373
06-28-2006	09:40:17	10.478	2.9	-0.096	14.449

Test Run 2 STRATA Version 1.1

		O2	CO	THC	NOx
		%	ppm	ppm	ppm
06-28-2006	09:41:16	10.343	0.2	-0.096	14.634
06-28-2006	09:42:17	10.510	-0.2	-0.096	14.232
06-28-2006	09:43:16	10.291	1.5	-0.096	14.729
06-28-2006	09:44:16	10.519	1.0	-0.096	14.232
06-28-2006	09:45:17	10.522	0.4	-0.096	14.376
06-28-2006	09:46:16	10.435	0.7	-0.096	14.470
06-28-2006	09:47:16	10.520	2.4	-0.096	14.145
06-28-2006	09:48:15	10.874	5.5	-0.096	13.443
06-28-2006	09:49:16	11.115	14.6	-0.008	12.808
06-28-2006	09:50:17	10.773	4.3	-0.097	13.832
06-28-2006	09:51:16	10.319	0.2	-0.097	14.796
06-28-2006	09:52:16	10.213	0.6	-0.097	14.782
06-28-2006	09:53:17	10.487	2.4	-0.097	14.351
06-28-2006	09:54:16	10.597	5.0	-0.097	13.966
06-28-2006	09:55:16	10.286	0.1	-0.097	14.953
Run Averages		O2	CO	THC	NOx
		%	ppm	ppm	ppm
06-28-2006	09:56:12	10.498	2.6	-0.090	14.292

Operator: B Johnston
Plant Name: Tri-Cities
Location: Flare A3
Test Run 2 End

Final System Bias Check, Run 2 STRATA Version 1.1

	O2	CO	THC	NOx
	%	ppm	ppm	ppm
06-28-2006 09:57:16	3.678	0.8	-0.097	1.854
06-28-2006 09:58:15	0.137	0.3	-0.097	0.003
06-28-2006 09:59:16	0.082	0.3	0.098	0.003
06-28-2006 10:00:15	12.881	706.9	43.863	39.198
06-28-2006 10:01:16	18.794	856.8	44.436	44.862

Final System Bias Check for Run 2
Operator: B Johnston
Plant Name: Tri-Cities
Location: Flare A3

	Reference Cylinder Numbers	
	Zero	Span
O2		CC8445
CO		CC181169
THC		AAL4576
NOx		AAL19769

Date/Time	06-28-2006		10:02:14		PASSED
Analyte	O2	CO	THC	NOx	
Units	%	ppm	ppm	ppm	
Zero Ref Cyl	0.000	0.0	0.000	0.000	
Zero Cal	0.000	0.0	0.000	0.000	
Zero Avg	0.085	0.3	-0.098	0.003	
Zero Bias%	0.3%	0.0%	0.2%	0.0%	
Zero Drift%	-0.1%	-0.1%	0.0%	0.0%	
Span Ref Cyl	19.040	858.0	45.000	44.800	
Span Cal	19.040	858.0	45.000	44.800	
Span Avg	18.872	856.9	44.501	44.936	
Span Bias%	0.7%	0.1%	1.0%	0.3%	
Span Drift%	-0.3%	0.0%	0.4%	-0.4%	
Ini Zero Avg	0.099	1.0	-0.095	0.007	
Ini Span Avg	18.938	857.3	44.324	45.158	
Run Avg	10.498	2.6	-0.090	14.292	
Co	0.092	0.7	-0.096	0.005	
Cm	18.905	857.1	44.413	45.047	
Correct Avg	10.532	1.9	0.006	14.210	

System Bias Check End

Test Run 3 STRATA Version 1.1

	O2	CO	THC	NOx
	%	ppm	ppm	ppm
06-28-2006 10:03:15	12.876	278.8	2.878	18.082
06-28-2006 10:04:15	10.774	2.5	-0.098	13.917
06-28-2006 10:05:14	10.450	-0.1	-0.098	14.346
Begin calculating run averages				
06-28-2006 10:06:15	10.528	5.4	-0.099	14.299
06-28-2006 10:07:14	10.345	-0.2	-0.099	14.664
06-28-2006 10:08:14	10.458	0.8	-0.099	14.333
06-28-2006 10:09:15	10.201	-0.7	-0.099	15.014
06-28-2006 10:10:14	10.407	2.1	-0.099	14.088
06-28-2006 10:11:15	10.389	0.6	-0.099	14.728
06-28-2006 10:12:14	10.431	0.4	-0.099	14.222
06-28-2006 10:13:14	10.443	1.6	-0.099	14.142
06-28-2006 10:14:15	10.388	-0.9	-0.099	14.545
06-28-2006 10:15:14	10.467	-0.4	-0.099	14.389
06-28-2006 10:16:15	10.490	-0.2	-0.099	14.180
06-28-2006 10:17:15	10.489	1.0	-0.097	14.110
06-28-2006 10:18:14	10.530	1.4	-0.088	14.209
06-28-2006 10:19:15	10.747	5.4	-0.099	13.657
06-28-2006 10:20:14	10.664	-0.1	-0.099	13.711
06-28-2006 10:21:14	10.600	1.4	-0.099	13.954
06-28-2006 10:22:15	10.665	2.3	-0.100	13.825
06-28-2006 10:23:14	10.552	1.1	-0.100	13.936
06-28-2006 10:24:15	10.097	-1.1	-0.099	15.159
06-28-2006 10:25:15	10.492	1.7	-0.100	13.959
06-28-2006 10:26:14	10.866	6.1	-0.082	13.235
06-28-2006 10:27:15	10.677	2.8	-0.100	13.958
06-28-2006 10:28:14	10.351	-0.8	-0.100	14.563
06-28-2006 10:29:14	10.456	0.8	-0.100	14.003
06-28-2006 10:30:15	10.072	0.7	-0.100	15.516
06-28-2006 10:31:14	10.248	0.5	-0.101	14.254
06-28-2006 10:32:15	10.304	-0.6	-0.101	14.702
06-28-2006 10:33:15	10.387	-0.4	-0.101	14.222
06-28-2006 10:34:14	10.659	0.9	-0.101	13.756
06-28-2006 10:35:15	10.409	0.8	-0.101	14.392
Run Averages	O2	CO	THC	NOx
	%	ppm	ppm	ppm
06-28-2006 10:36:03	10.456	0.9	-0.099	14.262

Operator: B Johnston
Plant Name: Tri-Cities
Location: Flare A3
Test Run 3 End

Final System Bias Check, Run 3 STRATA Version 1.1

	O2	CO	THC	NOx
	%	ppm	ppm	ppm
06-28-2006 10:37:10	3.587	-0.4	-0.101	1.991
06-28-2006 10:38:09	0.114	-0.4	-0.101	0.000
06-28-2006 10:39:10	0.069	-0.4	-0.101	0.000
06-28-2006 10:40:09	8.680	562.2	34.644	32.641
06-28-2006 10:41:09	18.698	855.6	44.832	45.160
06-28-2006 10:42:10	18.856	855.9	44.909	45.166

Final System Bias Check for Run 3

Operator: B Johnston
Plant Name: Tri-Cities
Location: Flare A3

Reference Cylinder Numbers

	Zero	Span
O2		CC8445
CO		CC181169
THC		AAL4576
NOx		AAL19769

Date/Time 06-28-2006 10:42:29 PASSED

Analyte	O2	CO	THC	NOx
Units	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.0	0.000	0.000
Zero Cal	0.000	0.0	0.000	0.000
Zero Avg	0.067	-0.4	-0.101	0.000
Zero Bias%	0.3%	0.0%	0.2%	0.0%
Zero Drift%	-0.1%	-0.1%	0.0%	0.0%
Span Ref Cyl	19.040	858.0	45.000	44.800
Span Cal	19.040	858.0	45.000	44.800
Span Avg	18.862	855.9	44.908	45.168
Span Bias%	0.7%	0.2%	0.2%	0.7%
Span Drift%	0.0%	-0.1%	0.8%	0.5%
Ini Zero Avg	0.085	0.3	-0.098	0.003
Ini Span Avg	18.872	856.9	44.501	44.936
Run Avg	10.456	0.9	-0.099	14.262
Co	0.076	0.0	-0.099	0.002
Cm	18.867	856.4	44.705	45.052
Correct Avg	10.518	0.9	0.001	14.181

System Bias Check End

Test Run 4 STRATA Version 1.1

		O2	CO	THC	NOx
		%	ppm	ppm	ppm
06-28-2006	10:43:30	12.734	292.6	2.987	18.197
06-28-2006	10:44:31	10.305	-0.6	-0.101	15.400
06-28-2006	10:45:30	10.455	-0.7	-0.101	14.552
Begin calculating run averages					
06-28-2006	10:46:30	10.368	0.7	-0.101	14.685
06-28-2006	10:47:29	10.535	2.0	-0.101	14.460
06-28-2006	10:48:30	10.404	-0.3	-0.101	14.762
06-28-2006	10:49:31	10.406	2.6	-0.098	14.869
06-28-2006	10:50:30	10.123	-1.3	-0.101	15.310
06-28-2006	10:51:30	10.511	0.6	-0.101	14.469
06-28-2006	10:52:31	10.386	-0.8	-0.101	14.883
06-28-2006	10:53:30	10.448	0.0	-0.101	14.532
06-28-2006	10:54:30	10.471	0.4	-0.101	14.734
06-28-2006	10:55:30	10.272	-0.3	-0.101	14.886
06-28-2006	10:56:30	10.357	-0.2	-0.101	14.862
06-28-2006	10:57:31	10.423	0.4	-0.101	14.844
06-28-2006	10:58:30	10.135	-1.5	-0.101	15.219
06-28-2006	10:59:30	10.467	1.8	-0.100	14.533
06-28-2006	11:00:31	10.210	-0.7	-0.101	15.116
06-28-2006	11:01:30	10.307	-0.1	-0.101	14.997
06-28-2006	11:02:31	10.607	4.5	-0.101	14.272
06-28-2006	11:03:30	10.419	0.9	-0.097	14.717
06-28-2006	11:04:30	10.304	-1.1	-0.101	14.952
06-28-2006	11:05:31	10.447	0.4	-0.101	14.584
06-28-2006	11:06:30	10.743	2.0	-0.101	13.823
06-28-2006	11:07:30	10.904	5.0	-0.101	13.706
06-28-2006	11:08:31	10.548	0.0	-0.101	14.401
06-28-2006	11:09:30	10.453	0.6	-0.101	14.633
06-28-2006	11:10:31	10.654	1.2	-0.101	13.966
06-28-2006	11:11:30	10.544	4.2	-0.064	14.556
06-28-2006	11:12:30	10.508	0.6	-0.101	14.545
06-28-2006	11:13:31	10.413	0.5	-0.102	14.454
06-28-2006	11:14:30	10.343	-1.2	-0.102	14.702
06-28-2006	11:15:30	10.479	0.8	-0.102	14.649
Run Averages		O2	CO	THC	NOx
		%	ppm	ppm	ppm
06-28-2006	11:16:02	10.440	0.7	-0.100	14.638

Operator: B Johnston
Plant Name: Tri-Cities
Location: Flare A3
Test Run 4 End

Final System Bias Check, Run 4 STRATA Version 1.1

	O2	CO	THC	NOx
	%	ppm	ppm	ppm
06-28-2006 11:17:05	3.529	-0.5	-0.102	1.851
06-28-2006 11:18:06	0.111	-0.5	-0.102	-0.001
06-28-2006 11:19:05	0.059	-0.5	-0.102	-0.001
06-28-2006 11:20:05	12.224	674.5	41.015	38.282
06-28-2006 11:21:06	18.783	855.4	44.993	44.922
06-28-2006 11:22:05	18.860	855.5	45.071	44.938
06-28-2006 11:23:05	18.872	855.6	45.241	44.893
06-28-2006 11:24:04	18.874	855.6	45.178	44.579
06-28-2006 11:25:05	18.878	855.6	45.195	44.488

Final System Bias Check for Run 4
Operator: B Johnston
Plant Name: Tri-Cities
Location: Flare A3

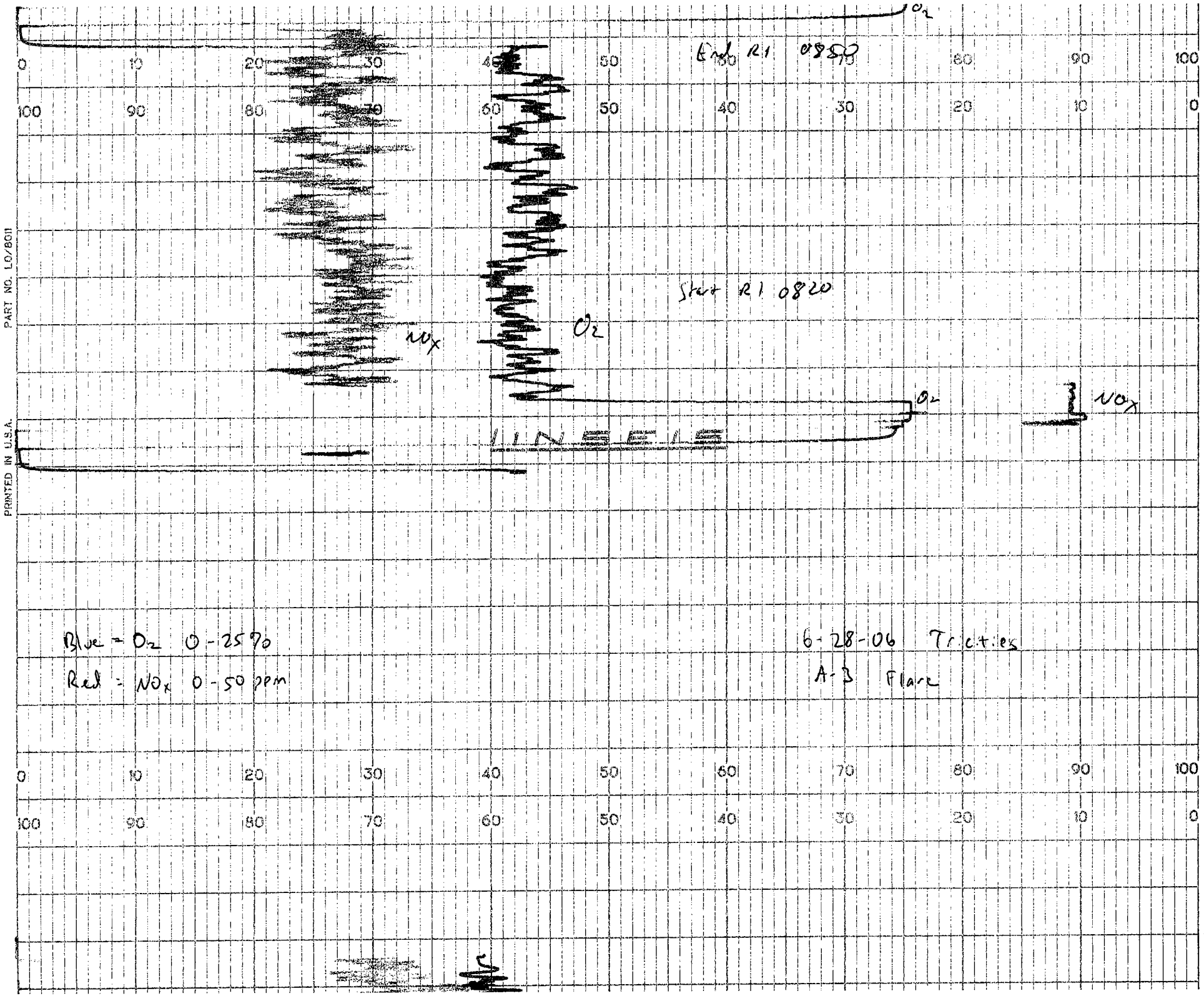
Reference Cylinder Numbers

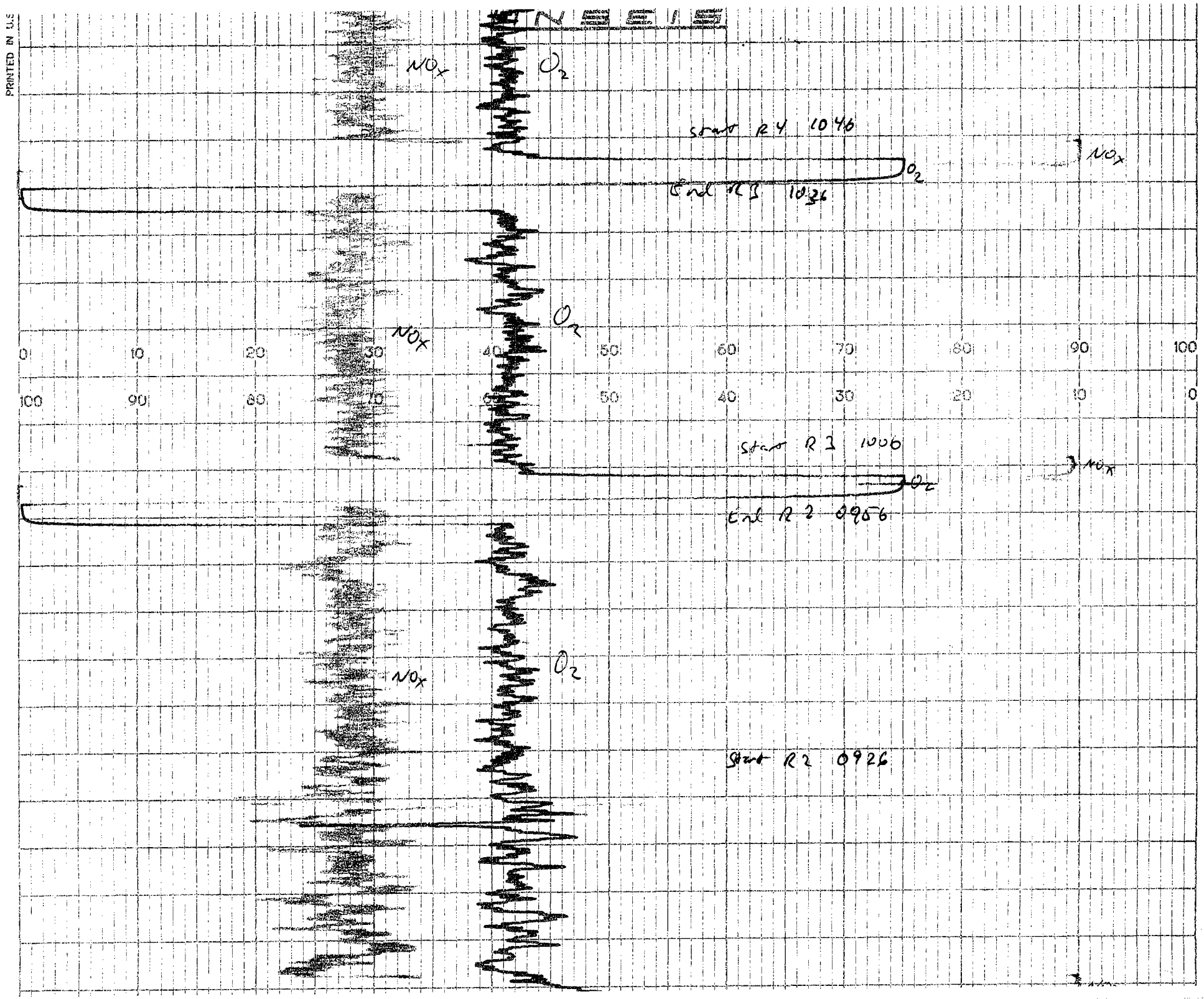
	Zero	Span
O2		CC8445
CO		CC181169
THC		AAL4576
NOx		AAL19769

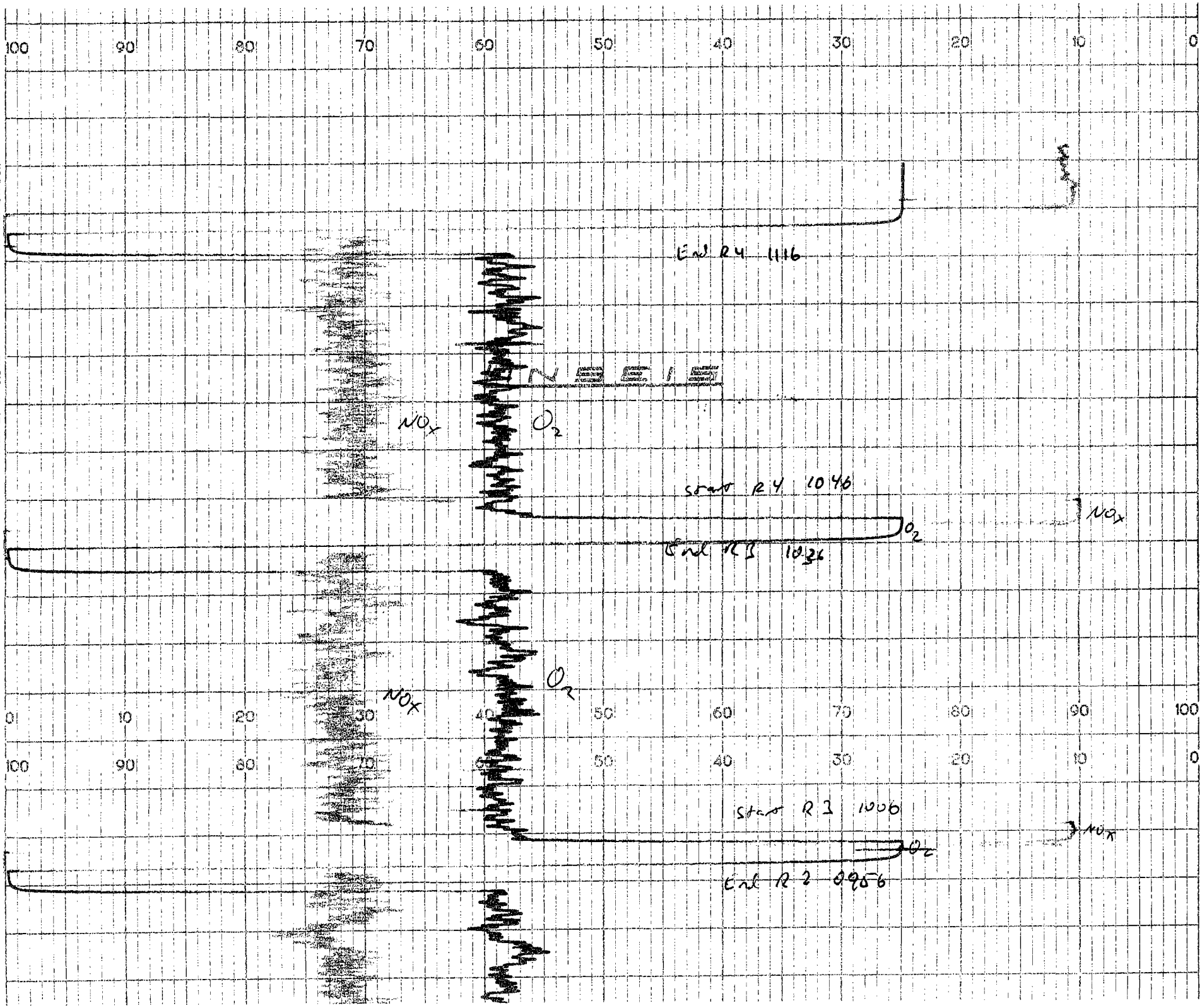
Date/Time 06-28-2006 11:25:24 PASSED

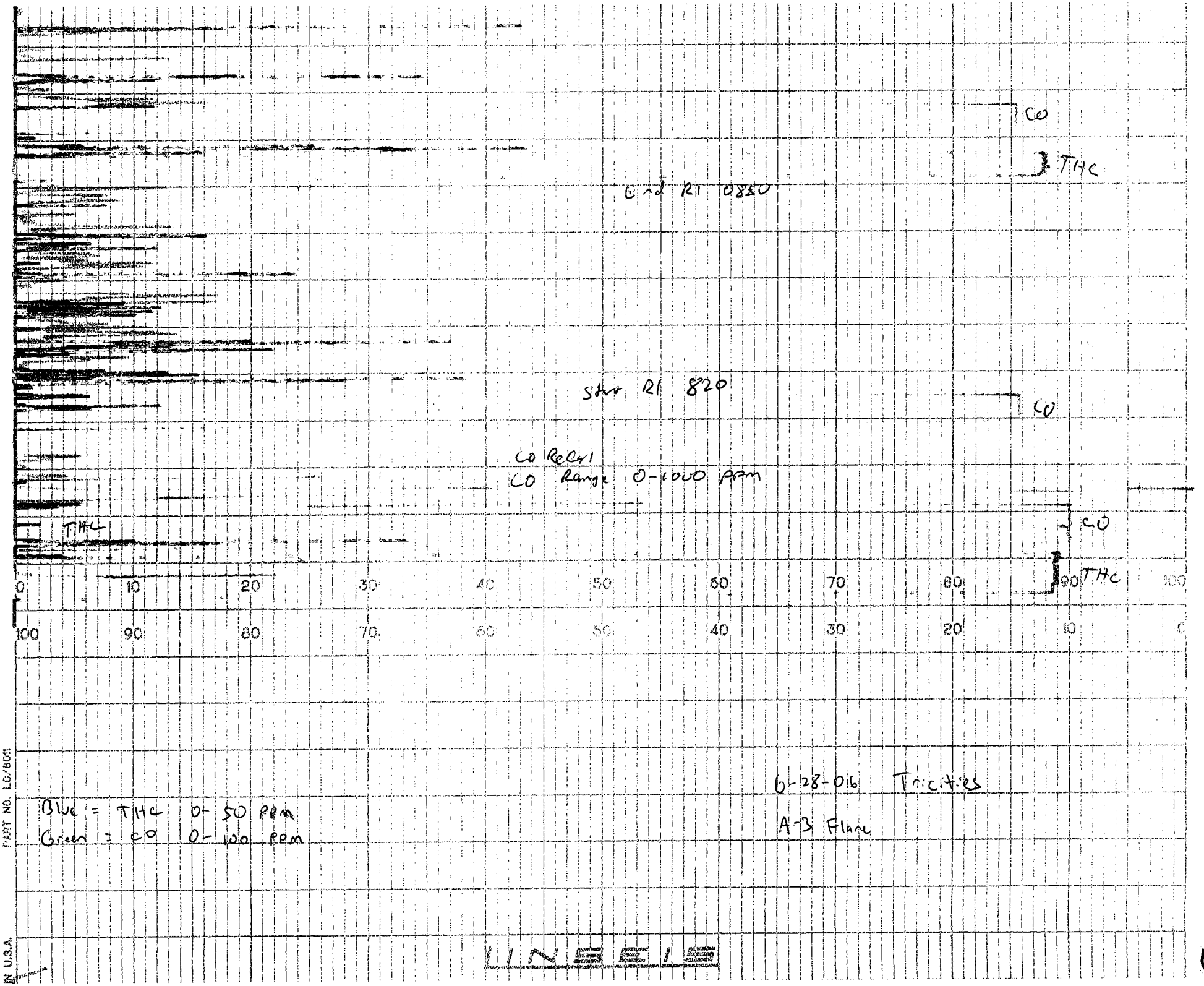
Analyte	O2	CO	THC	NOx
Units	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.0	0.000	0.000
Zero Cal	0.000	0.0	0.000	0.000
Zero Avg	0.062	-0.5	-0.102	-0.001
Zero Bias%	0.2%	0.1%	0.2%	0.0%
Zero Drift%	0.0%	0.0%	0.0%	0.0%
Span Ref Cyl	19.040	858.0	45.000	44.800
Span Cal	19.040	858.0	45.000	44.800
Span Avg	18.877	855.6	45.202	44.490
Span Bias%	0.7%	0.2%	0.4%	0.6%
Span Drift%	0.1%	0.0%	0.6%	-1.4%
Ini Zero Avg	0.067	-0.4	-0.101	0.000
Ini Span Avg	18.862	855.9	44.908	45.168
Run Avg	10.440	0.7	-0.100	14.638
Co	0.065	-0.5	-0.101	0.000
Cm	18.870	855.8	45.055	44.829
Correct Avg	10.505	1.1	0.002	14.629

System Bias Check End



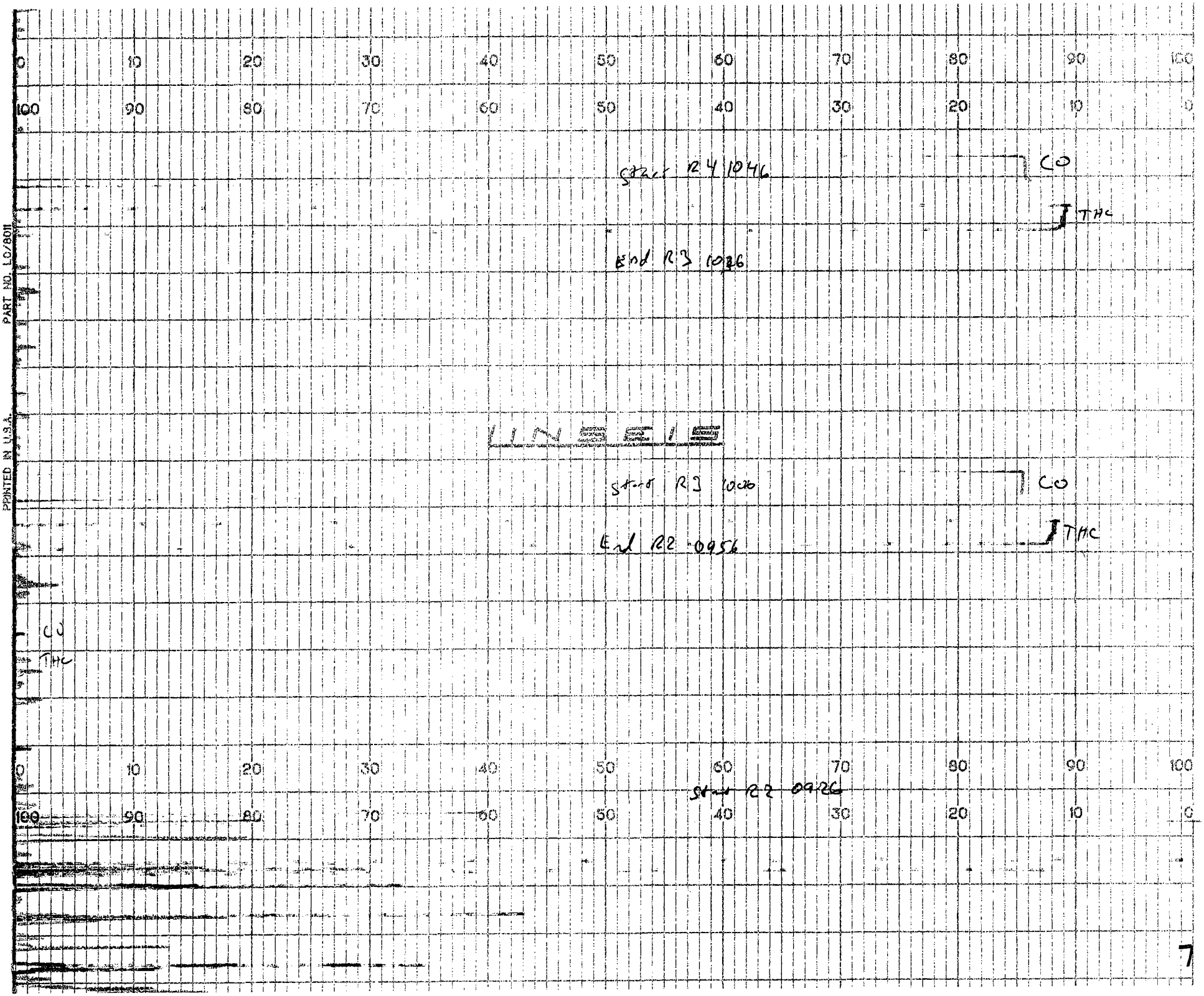

PRINTED IN U.S
NOx
O2
start R4 1046
end R3 1026
start R3 1006
end R2 0956
start R2 0926
0 10 20 30 40 50 60 70 80 90 100
100 90 80 70 60 50 40 30 20 10 0



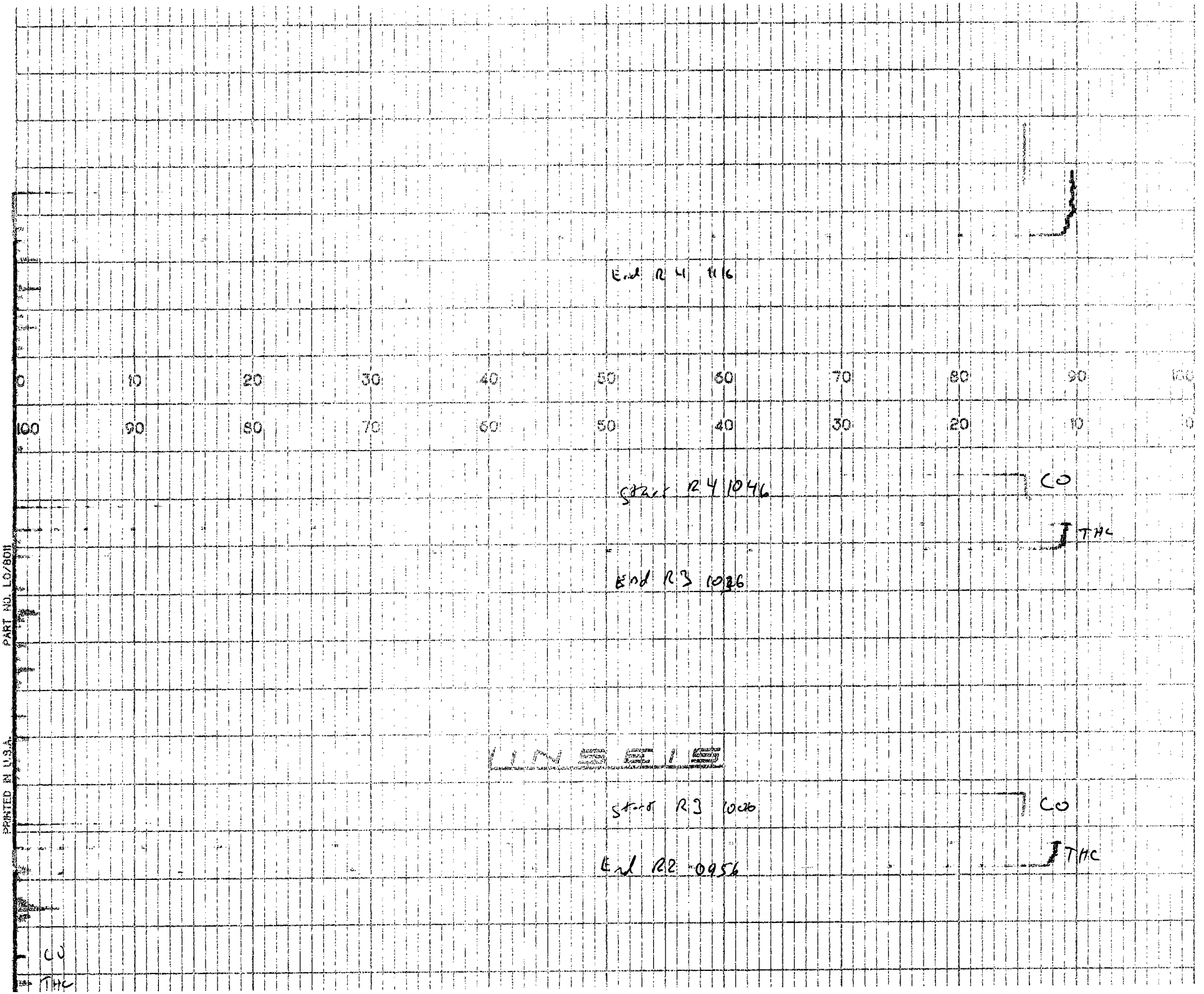


PART NO. LG/8011

N U.S.A.



PRINTED IN U.S.A. PART NO. LO/8011



PART NO. LG/8011

PRINTED IN U.S.A.

RATA CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases
500 WEAVER PARK RD,LONGMONT,CO 80501 Phone: 888-253-1635 Fax: 303-772-767

CERTIFICATE OF ACCURACY: Interference Free™ Multi-Component EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
500 WEAVER PARK RD
LONGMONT,CO 80501

P.O. No.: 101520
Project No.: 08-36059-001

Customer
SHAW ENVIRONMENTAL & INFRASTRUCTURE

BILL JOHNSTON
2360 BERING DRIVE
SAN JOSE CA 95131

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: AAL19769 **Certification Date:** 10May2006 **Exp. Date:** 09May2008
Cylinder Pressure*:** 1870 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ACCURACY**	TRACEABILITY
CARBON MONOXIDE	90.1	PPM	+/- 1%	Direct NIST and NMi
NITRIC OXIDE	44.7	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	44.8	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1679	02Apr2007	ALM030197	94.90 PPM	CARBON MONOXIDE
NTRM 1683	15Aug2009	AAL070639	49.82 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000929062	10May2006	FTIR
FTIR//000929062	08May2006	FTIR

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

First Triad Analysis | **Second Triad Analysis** | **Calibration Curve**

CARBON MONOXIDE

Date: 01May2006 Response Unit:PPM
Z1 = -0.01877 R1 = 95.10122 T1 = 90.59397
R2 = 95.12704 Z2 = 0.00010 T2 = 90.60740
Z3 = 0.02836 T3 = 90.63578 R3 = 95.16162
Avg. Concentration: 90.39 PPM

Date: 10May2006 Response Unit: PPM
Z1 = -0.02533 R1 = 95.68689 T1 = 90.52361
R2 = 95.79857 Z2 = -0.01272 T2 = 90.56149
Z3 = 0.03944 T3 = 90.72761 R3 = 95.90278
Avg. Concentration: 89.76 PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 9.99985E-1
Constants: A = 0.00000E+0
B = 7.18007E-1 C = 3.18000E-4
D = 0.00000E+0 E = 0.00000E+0

NITRIC OXIDE

Date: 01May2006 Response Unit:PPM
Z1 = -0.02773 R1 = 49.51237 T1 = 44.39455
R2 = 49.69193 Z2 = -0.01858 T2 = 44.81024
Z3 = 0.11894 T3 = 44.90252 R3 = 49.72640
Avg. Concentration: 44.86 PPM

Date: 10May2006 Response Unit: PPM
Z1 = -0.06655 R1 = 50.11168 T1 = 44.73440
R2 = 50.12921 Z2 = -0.05510 T2 = 44.78113
Z3 = -0.03373 T3 = 44.85699 R3 = 50.22003
Avg. Concentration: 44.50 PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 9.99993E-1
Constants: A = 0.00000E+0
B = 9.79296E-1 C = 1.73000E-4
D = 0.00000E+0 E = 0.00000E+0

Special Notes: PLEASE REPORT NOX

APPROVED BY: Jon Witzak

CERTIFIED MASTER CLASS

Single-Certified Calibration Standard

Scott Specialty Gases
500 WEAVER PARK RD,LONGMONT,CO 80501 Phone: 888-253-1635 Fax: 303-772-7673

CERTIFICATE OF ACCURACY: Certified Master Class Calibration Standard

Product Information
Project No.: 08-24834-001
Item No.: 08022711 PAL
P.O. No.: SUSAN M. POWERS

Cylinder Number: AAL4576
Cylinder Size: AL
Certification Date: 25May2005
Expiration Date: 25May2008

Customer

SHAW ENVIRONMENTAL & INFRASTRUCTURE
2360 BERING DRIVE
SAN JOSE, CA 95131

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
METHANE	45.0	PPM	2
AIR		BALANCE	

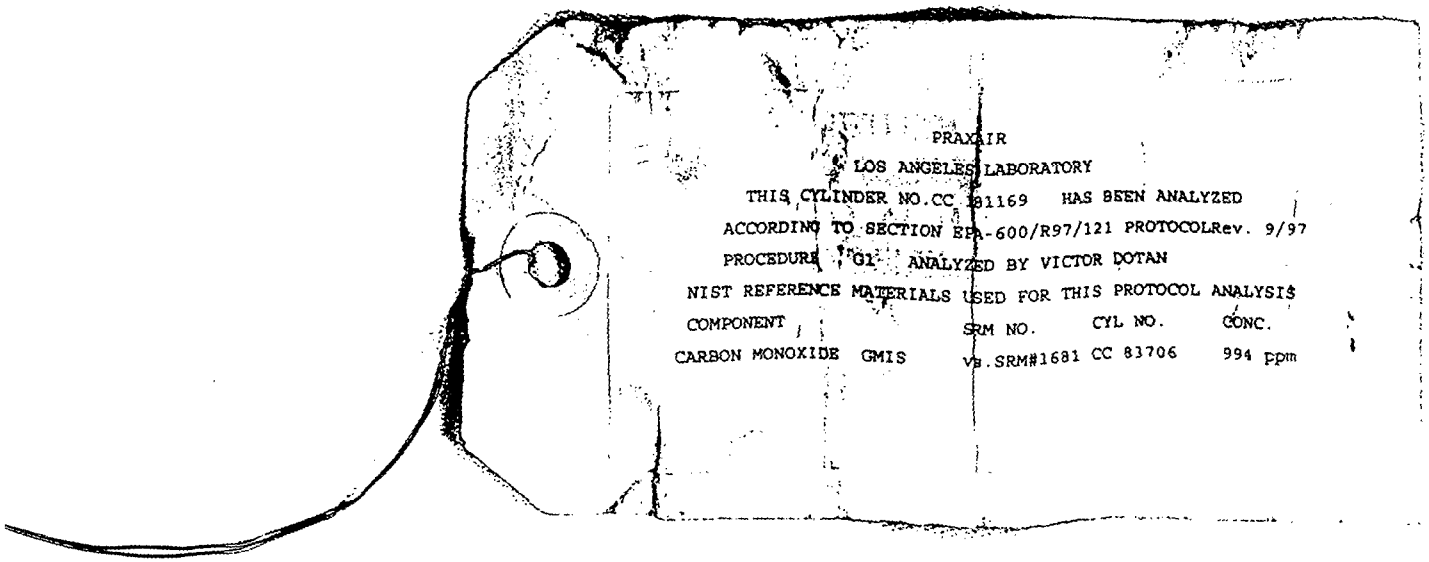
TRACEABILITY

Traceable To

NIST

APPROVED BY: _____ JON WITZAK

DATE: 5-25-05



PRAXAIR
LOS ANGELES LABORATORY
THIS CYLINDER NO.CC 181169 HAS BEEN ANALYZED
ACCORDING TO SECTION EPA-600/R97/121 PROTOCOLRev. 9/97
PROCEDURE G1 ANALYZED BY VICTOR DOTAN
NIST REFERENCE MATERIALS USED FOR THIS PROTOCOL ANALYSIS

COMPONENT	SRM NO.	CYL NO.	CONC.
CARBON MONOXIDE GMIS	vs.SRM#1681	CC 83706	994 ppm

PRAXAIR
EPA PROTOCOL GAS
CUSTOMER TIAX CORP
CERTIFICATION DATE 02/06/04
CYLINDER NO.CC 181769
CERTIFIED CONCENTRATION:
CARBON MONOXIDE 858 ppm
NITROGEN BALANCE
Values not valid below 150 psig
ACCURACY ± 1 % NIST TRACEABLE 2000 PSIG
EXPIRATION DATE 02/06/07 TERM 36 MONTHS

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER SHAW ENV. **P.O NUMBER**

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON DIOXIDE GMIS	vs.SRM#2745	CC 102004	19.73 %
OXYGEN GMIS	vs.SRM#2659	CC 95713	21.04 %

ANALYZER READINGS

R=REFERENCE STANDARD *Z=ZERO GAS* *C=GAS CANDIDATE*

1. **COMPONENT** CARBON DIOXIDE GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Ultramat 5E S/N A12-730
ANALYTICAL PRINCIPLE NDIR **LAST CALIBRATION DATE** 08/01/05
FIRST ANALYSIS DATE 08/08/05 **SECOND ANALYSIS DATE**

Z	0.00	R	19.74	C	17.82	CONC. 17.81	Z	R	C	CONC.
R	19.74	Z	0.00	C	17.80	CONC. 17.81	R	Z	C	CONC.
Z	0.00	C	17.80	R	19.74	CONC. 17.81	Z	C	R	CONC.

U/M % **MEAN TEST ASSAY** 17.81 U/M % **MEAN TEST ASSAY**

2. **COMPONENT** OXYGEN GMIS **ANALYZER MAKE-MODEL-S/N** Siemens Oxymat 5E S/N A12-839
ANALYTICAL PRINCIPLE Paramagnetic **LAST CALIBRATION DATE** 08/01/05
FIRST ANALYSIS DATE 08/08/05 **SECOND ANALYSIS DATE**

Z	0.00	R	21.04	C	19.04	CONC. 19.04	Z	R	C	CONC.
R	21.04	Z	0.00	C	19.04	CONC. 19.04	R	Z	C	CONC.
Z	0.00	C	19.04	R	21.04	CONC. 19.04	Z	C	R	CONC.

U/M % **MEAN TEST ASSAY** 19.04 U/M % **MEAN TEST ASSAY**

VALUES NOT VALID BELOW 150 PSIG.

THIS CYLINDER NO. CC 8445
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. REV 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 **% NIST TRACEABLE**
CYLINDER PRESSURE 2000 **PSIG**
CERTIFICATION DATE 08/08/05
EXPIRATION DATE 08/08/08 **TERM** 36 MONTHS

CERTIFIED CONCENTRATION

CARBON DIOXIDE	17.81 %
OXYGEN	19.04 %
NITROGEN	BALANCE

ANALYZED BY ISMAIL RANGSIYAWONG ***CERTIFIED BY*** HELENA TRAN

Appendix G
Analytical Results

Atmospheric Analysis & Consulting, Inc.

Atmospheric Analysis & Consulting, Inc.

CLIENT	: Shaw Environmental, Inc.
PROJECT NAME	: Tri Cities Landfill
AAC PROJECT NO.	: 060336
REPORT DATE	: 07/19/2006

On June 29, 2006, Atmospheric Analysis & Consulting, Inc. received two (2) Tedlar bags for BTU analysis which includes, Sulfur Analysis by ASTM D-5504, C1-C6+ analysis by EPA method 18, and fixed gas analysis by EPA 3C. Upon receipt the samples were assigned unique Laboratory ID numbers as follows:

Client ID	Lab No.
R2	060336-16150
R2 Duplicate	060336-16151

R2 Duplicate Sample was a backup for the R2 Sample.

ASTM D-5504 – Up to a 1ml aliquot of sample is injected into the GC/SCD for analysis following ASTM D-5504 as specified in the SOW.

EPA 18 Analysis - Up to a 1 ml aliquot of samples is injected into the GC/FID for analysis following EPA 18 as specified in the SOW.

EPA 3C Analysis - Up to a 1 ml aliquot of samples is injected into the GC/TCD for analysis following EPA 3C as specified in the SOW.

No problems were encountered during receiving, preparation and/ or analysis of these samples. The test results included in this report meet all requirements of the NELAC Standards and/or AAC SOP# AACI-ASTM D-5504, EPA 18 and EPA 3C.

I certify that this data is technically accurate, complete and in compliance with the terms and conditions of the contract. Release of the data contained in this hardcopy data package and its electronic data deliverable submitted on diskette has been authorized by the Laboratory Director or his designee, as verified by the following signature.

If you have any question or require further explanation of data results, please contact the undersigned.

Sucha S. Parmar, PhD
Technical Director

This report consists of 12 pages.

ACCREDITED IN ACCORDANCE WITH nelac Certificate #E87837

Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT : Shaw Environmental, Inc.
PROJECT NO. : 060336
MATRIX : GAS

RECEIVING DATE : **06/29/2006**
ANALYSIS DATE : **06/29-30/2006**
REPORT DATE : **07/19/2006**

	Client ID:	R2	Detection Limits
	AAC ID:	060336-16150	
Compounds, Units			
H_2S, ppmv		58	0.05ppmv
Carbonyl Sulfide, ppmv		ND	0.05ppmv
Methyl Mercaptan, ppmv		1.3	0.05ppmv
Ethyl Mercaptan, ppmv		ND	0.05ppmv
Propyl Mercaptan, ppmv		ND	0.05ppmv
Carbon Disulfide, ppmv		ND	0.05ppmv
Dimethyl sulfide, ppmv		1.1	0.05ppmv
Allyl Sulfide, ppmv		ND	0.05ppmv
Propyl Sulfide, ppmv		ND	0.05ppmv
Allyl Disulfide, ppmv		ND	0.05ppmv
Butyl Sulfide, ppmv		ND	0.05ppmv
Ethyl Methyl Sulfide, ppmv		ND	0.05ppmv
Thiophene, ppmv		ND	0.05ppmv
Dimethyl Disulfide, ppmv		ND	0.05ppmv
Butyl Mercaptan, ppmv		ND	0.05ppmv
Allyl mercaptan, ppmv		ND	0.05ppmv
C1 hydrocarbons, ppmv		510432	0.3 ppmv
C2 hydrocarbons, ppmv		<15	0.3 ppmv
C3 hydrocarbons, ppmv		26	0.3 ppmv
C4 hydrocarbons, ppmv		21	0.3 ppmv
C5 hydrocarbons, ppmv		22	0.3 ppmv
C6 hydrocarbons, ppmv		12	0.3 ppmv
C6 + hydrocarbons, ppmv		12	0.3 ppmv
CO_2, %		37	0.1 %
CO, %		ND	0.1 %
O_2, %		0.9	0.1 %
N_2, %		11	0.1 %
H_2, %		ND	0.1 %
F Factor(dscf Exhaust/MM Btu)		**9296**	
Total Wt.% Adjusted Sp. Gravity		**1.0**	
FUEL GAS BTU per LBM		**12191**	
FUEL GAS BTU per CU. FT		**517**	

* Due to the extremely high C1 concentration, the C2 concentration could not be measured below this PQL because of matrix interference.

Dr. Sucha Parmar
Technical Director

Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

Client:	**: Shaw Environmental, Inc.**	**Sampling Date**	**: 06/28/2006**
Project No.	**: 060336**	**Receiving Date**	**: 06/29/2006**
Matrix	**: air**	**Analysis Date**	**: 06/29/2006**
Units	**: %**	**Report Date**	**: 07/19/2006**

EPA Method 3C

Detection Limit: 0.1 %		Analyte					
Client ID	**AAC ID**	**Hydrogen**	**Oxygen**	**Nitrogen**	**CO**	**Methane**	**CO2**
R2	**060336-16150**	**ND**	**0.9**	**11.4**	**ND**	**50.6**	**37.1**

Dr. Sucha Parmar
Technical Director

Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

CLIENT:	**: Shaw Environmental, Inc.**	**Sampling Date**	**: 06/28/2006**
PROJECT NO.	**: 060336**	**Receiving Date**	**: 06/29/2006**
MATRIX	**: AIR**	**Analysis Date**	**: 06/30/2006**
UNITS	**: PPMV**	**Report Date**	**: 07/19/2006**

Client ID	AAC ID	*ANALYSIS METHOD*		*EPA Method 18*				
		Detection Limit		*0.3 ppmv*				
		C1	C2	C3	C4	C5	C6	C6+
Bag Sample	**060142-14572**	*	<15	26	21	22	12	12

*** C1 Value from EPA 3C Report**

** Due to the extremely high C1 concentration, the C2 concentration could not be measured below this PQL because of matrix interference.

Dr. Sucha Parmar
Technical Director

Atmospheric Analysis & Consulting, Inc.

LABORATORY ANALYSIS REPORT

CLIENT : Shaw Environmental, Inc.
PROJECT NO. : 060336
UNITS : PPMV

SAMPLING DATE : 06/28/2006
RECEIVING DATE : 06/29/2006
ANALYSIS DATE : 06/29/2006
REPORT DATE : 07/19/2006

Total Reduced Sulfur Compounds Analysis by ASTM D-5504

Compounds	Client ID.	R 2	MDL
	AAC ID	060336-16150	
Analysis Dilution Factor		1.0	
Can Dilution Factor		1.0	
H_2S		58	0.05
Carbonyl Sulfide		<PQL	0.05
SO2		<PQL	0.05
Methyl Mercaptan		1.3	0.05
Ethyl Mercaptan		<PQL	0.05
Dimethyl Sulfide		1.1	0.05
n-Butyl mercaptan		<PQL	0.05
Carbon Disulfide		<PQL	0.05
Allyl Sulfide		<PQL	0.05
Propyl Sulfide		<PQL	0.05
Allyl disulfide		<PQL	0.05
Isopropyl Mercaptan		<PQL	0.05
t-Butyl mercaptan		<PQL	0.05
Propyl Mercaptan		<PQL	0.05
Butyl Sulfide		<PQL	0.05
Ethyl methyl sulfide		<PQL	0.05
Thiophene		<PQL	0.05
Isobutyl mercaptan		<PQL	0.05
Dimethyl disulfide		<PQL	0.05
Allyl mercaptan		<PQL	0.05
3-Methylthiophene		<PQL	0.05
Tetrahydrothiophene		<PQL	0.05
Diethyl sulfide		<PQL	0.05
2-Ethylthiophene		<PQL	0.05
2,5-Dimethylthiophene		<PQL	0.05
Diethyl disulfide		<PQL	0.05
Total Unidentified Sulfurs as H_2S		<PQL	0.05
Total Reduced Sulfurs		60	0.05

PQL = Practical Quantitation Limit (MDL x Analysis Dilution factor)
All compounds concentrations expressed in terms of H_2S.

Dr. Sucha Parmar
Technical Director

Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

Date Analyzed: 6/29/2006
Analyst: SW

Instrument ID: TCD#1
Units: %

I - Method Blank-EPA Method 3C

AAC ID	Analyte	MB Concentration
Method Blank	Hydrogen	ND
	Oxygen	ND
	Nitrogen	ND
	CO	ND
	Methane	ND
	CO2	ND

II-Laboratory Control Spike & Duplicate - EPA Method 3C

AAC ID	Analyte	Spike Added	LCS Result	LCSD Result	LCS % Rec *	LCSD % Rec *	% RPD***
Lab Control Standards	Hydrogen	20.0	18.7	18.4	93.5	92.0	1.7
	Nitrogen	20.0	21.0	20.6	104.8	103.0	1.7
	CO	20.0	19.6	19.3	97.9	96.3	1.6
	Methane	20.0	22.2	21.8	110.8	109.0	1.7
	CO2	20.0	20.7	20.4	103.7	102.2	1.5

III - Duplicate Analysis - EPA Method 3C

AAC ID	Analyte	Sample Concentration	Duplicate Concentration	Mean	% RPD***
060336-16150	Hydrogen	0.0	0.0	0.0	0.0
	Oxygen	1.0	1.0	1.0	2.3
	Nitrogen	12.3	12.4	12.3	0.9
	CO	0.0	0.0	0.0	0.0
	Methane	54.9	54.7	54.8	0.3
	CO2	40.4	39.9	40.2	1.3

IV-Matrix Spike & Duplicate- EPA Method 3C

AAC ID	Analyte	Sample Concentration	Spike Added	MS Result	MSD Result	MS % Rec **	MSD % Rec **	% RPD***
060336-16150	Hydrogen	0.0	10.0	8.8	9.2	88	92	4.4
	Nitrogen	6.2	10.0	17.5	17.0	114	108	5.0
	CO	0.0	10.0	10.3	10.4	103	104	1.1
	Methane	27.4	10.0	35.5	35.9	81	85	4.4
	CO2	20.1	10.0	28.3	28.0	82	79	3.0

** Must be 85-115%*
*** Must be 75-125%*
**** Must be < 25%*

Dr. Sucha Parmar
Technical Director

Quality Control/Quality Assurance Report

Date Analyzed: 6/29/2006 **Instrument ID: TCD#1**

Analyst: SW **Calibration Date:** 4/3/2006

Opening Calibration Verification Standard

Analyte	xCF**	CF	%RPD*
Hydrogen	2147	2170	**1.1**
Oxygen* **	58602	58593	**0.0**
Nitrogen	65056	63655	**2.2**
Carbon Monoxide	72946	68022	**7.0**
Methane	60595	58938	**2.8**
Carbon Dioxide	97830	94480	**3.5**

Closing Calibration Verification Standard

Analyte	xCF**	CF	%RPD*
Hydrogen	2147	2243	**4.4**
Nitrogen	65056	64510	**0.8**
Carbon Monoxide	72946	69696	**4.6**
Methane	60595	60737	**0.2**
Carbon Dioxide	97830	96306	**1.6**

* Must be <15%

** Average Calibration Factor from Initial Calibration Curve

*** Oxygen from Lab Air

Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

Date Analyzed: 06/29/06 **Instrument ID: SCD#2**
Analyst: SW **Units: PPMV**

I - Method Blank - ASTM D-5504

AAC ID	Analyte	MB Conc.
Method Blank	H2S	ND

II-Laboratory Control Spike & Duplicate - ASTM D-5504

Analyte	Spike Added	LCS Result	LCSD Result	LCS % Rec *	LCSD % Rec *	% RPD**
H2S	10.00	9.7	10.1	97	101	4.4

IV - Duplicate Analysis - ASTM D-5504 (060336-16150)

Analyte	Sample Concentration	Duplicate Concentration	Mean	% RPD**
H2S	56.97	58.56	57.76	2.7

** Must be 85-115%*

*** Must be < 25%*

Dr. Sucha Parmar
Technical Director

Quality Control/Quality Assurance Report

Date Analyzed: 6/29/2006
Analyst: SW
Calibration Date: 6/19/2006

Instrument ID: SCD#2
Units: PPMV

Opening Calibration Verification Standard

Analyte	Std. Conc.	Result	%Recovery*
H2S	10.000	9.655	**97**

Closing Calibration Verification Standard

Analyte	Std. Conc.	Result	%Recovery*
H2S	10.0	8.5	**85**

* Must be 85-115%

Atmospheric Analysis & Consulting, Inc.

Quality Control/Quality Assurance Report

Date Analyzed: 6/30/2006
Analyst: SW

Instrument ID: FID#3
Units: PPMV

I - Method Blank-EPA Method 18

AAC ID	Analyte	MB Concentration
Method Blank	Methane	ND
	Ethane	ND
	Propane	ND
	Butane	ND
	Pentane	ND
	Hexane	ND

II-Laboratory Control Spike & Duplicate - EPA Method 18

AAC ID	Analyte	Spike Added	LCS Result	LCSD Result	LCS % Rec *	LCSD % Rec *	% RPD***
Lab Control Standards	Methane	100.2	95.9	98.7	95.7	98.5	2.9
	Ethane	100.6	97.2	99.6	96.6	99.0	2.4
	Propane	100.0	98.1	101.7	98.1	101.7	3.6
	Butane	99.6	96.8	99.5	97.2	99.9	2.7
	Pentane	99.6	95.2	97.6	95.6	98.0	2.5
	Hexane	97.6	91.6	92.8	93.8	95.1	1.3

III - Duplicate Analysis - EPA Method 18

AAC ID	Analyte	Sample Concentration	Duplicate Concentration	Mean	% RPD***
060338-16157 (5x)	Methane	224	205	200.0	9.8
	Ethane	2.1	2.2	2.1	3.3
	Propane	0.0	0.0	0.0	0.0
	Butane	0.0	0.0	0.0	0.0
	Pentane	0.0	0.0	0.0	0.0
	Hexane	0.0	0.0	0.0	0.0

IV-Matrix Spike & Duplicate- EPA Method 18

AAC ID	Analyte	Sample Concentration	Spike Added	MS Result	MSD Result	MS % Rec **	MSD % Rec **	% RPD***
060338-16157 (5x)	Methane	100.0	250.0	356.7	364.3	103	106	2.9
	Ethane	1.1	250.0	246.2	251.5	98	100	2.1
	Propane	0.0	250.0	246.9	252.8	99	101	2.4
	Butane	0.0	250.0	244.7	251.1	98	100	2.6
	Pentane	0.0	250.0	240.9	247.6	96	99	2.7
	Hexane	0.0	250.0	231.9	237.3	93	95	2.3

** Must be 85-115%*
*** Must be 75-125%*
**** Must be < 25%*

Dr. Sucha Parmar
Technical Director

Quality Control/Quality Assurance Report

Date Analyzed: 6/30/2006 **Instrument ID: FID#3**

Analyst: SW **Calibration Date:** 4/3/2006

Opening Calibration Verification Standard

Analyte	xCF**	CF	%RPD*
C1	679	650	**4.4**
C2	1349	1304	**3.4**
C3	1952	1914	**2.0**
C4	2591	2519	**2.8**
C5	3121	2982	**4.5**
C6	3601	3378	**6.4**

Closing Calibration Verification Standard

Analyte	xCF**	CF	%RPD*
C1	679	694	**2.1**
C2	1349	1378	**2.1**
C3	1952	2027	**3.8**
C4	2591	2679	**3.3**
C5	3121	3187	**2.1**
C6	3601	3650	**1.3**

* Must be <15%

** Average Calibration Factor from Initial Calibration Curve

Atmospheric Analysis & Consulting, Inc.

CLIENT:	**:Shaw Environmental**	**SAMPLING DATE**	**: 06/15/2006**
PROJECT NO.	**: 060286**	**RECEIVING DATE**	**: 06/16/2006**
MATRIX	**: AIR**	**ANALYSIS DATE**	**: 06/22/2006**
UNITS	**: PPMV**	**REPORT DATE**	**: 06/28/2006**

Tentatively Identified Compounds

Client ID	AAC ID	*ANALYSIS METHOD*		*EPA Method TO-15*	
		Detection Limit		*1.0 ppmv*	
		ethane	propane	butane	pentane
Outlet Gas	060286-15842	ND	ND	ND	ND

Dr. Sucha Parmar
Technical Director

1534 Eastman Avenue • Suite A • Ventura, California 93003 (805) 650-1642 • FAX (805) 650-1644

Atmospheric Analysis & Consulting, Inc.

Laboratory Analysis Report

Client	**: Shaw Environmental, Inc.**	**Sampling Date**	**: 06/28/2006**
Project No.	**: 060336**	**Receiving Date**	**: 06/29/2006**
Matrix	**: air**	**Analysis Date**	**: 07/26/2006**
Units	**: ppmv**	**Report Date**	**: 07/27/2006**

EPA Method 25C

Detection Limit:		0.3 ppmv
Client Sample ID	**AAC ID**	**NMHC****
Bag Sample	**060336-16151**	**1267**

****Non-Methane Hydrocarbons as methane**

Dr. Sucha Parmar
Technical Director

1534 Eastman Avenue • Suite A • Ventura, California 93003 (805) 650-1642 • FAX (805) 650-1644

Laboratory 060536

Shaw Environmental Chain Of Custody Record

AAC
1534 Eastman Ave. Suite A
Ventura, A 93003
(805) 650-1642 (805) 650-1644 fax

CLIENT: Tri Cities Landfill

DATE: 6-28-06

PAGE: 1 of 1

Page 12

SAMPLING COMPANY:	LOG CODE:	SITE ADDRESS (Street and City):	
Shaw Environmental, Inc.			
ADDRESS: 2360 Bering San Jose, CA 95131		EDF DELIVERABLE TO (Responsible Party or Designee):	PHONE NO.: / E-MAIL: / CONSULTANT PROJECT NO
PROJECT CONTACT (Hardcopy or PDF Report to): Bill Johnston		SAMPLER NAME(S) (Print):	
TELEPHONE: 408.382.5800	FAX: 408.433.1912	E-MAIL:	

TURNAROUND TIME (BUSINESS DAYS):
☐ 10 DAYS ☐ 5 DAYS ☐ 72 HOURS ☐ 48 HOURS ☐ 24 HOURS ☐ LESS THAN 24 HOURS

SPECIAL INSTRUCTIONS OR NOTES:

Report NMOC as Methane

REQUESTED ANALYSIS

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Fixed Gas, C_1-C_6, HHV, & F-Factor EPA 18, EPA 3C, EPA19	Landfill Gas AP-42 list of analysis: TO-15, Sulfurs, NMOC, F-Factor, HHV, fixed gases, C1-C6	Sulfur Species, TRS ASTM D5504	EPA M25C, NMOC as Methane			F-factor	BTU, HHV		Extra Compounds:			FIELD NOTES: Container/Preservative or PID Readings or Laboratory Notes
	RZ	6-29-06		Bag	1	X												Landfill Gas
	RZ Dup	↓		"	1	X												Analyze if O_2 is above 2%

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time: