EMISSION TESTING AT GILROY ENERGY COMPANY

July 10 and 11, 1990

Prepared for

Gilroy Energy Company
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Report PS-90-2235/Project 6849-90

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SECTION 1

INTRODUCTION

At the request of Gilroy Energy Company, Pape & Steiner Environmental Services conducted a series of emission tests at their plant on July 10 and 11, 1990. The purposes of these tests were to determine the reduction efficiency of the CO catalyst and to determine emissions of aldehydes and benzene from the HRSG stack for the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB2588).

Sequential CO testing was performed using EPA Method 20 upstream of the CO catalyst and then in the HRSG stack on July 10, 1990. Aldehydes and benzene emissions were measured using CARB Methods 430 and 410, respectively, on July 10 and 11, 1990. A sample of the PUC grade natural gas fired in the turbine was collected and analyzed using ASTM methods.

Section 2 of the report describes the test matrix used by Pape & Steiner on this program.

SECTION 2

TEST MATRIX

Table 2-1 summarizes the tests performed on this program. A single CO catalyst reduction efficiency test was performed. Triplicate aldehyde, benzene, flowrate and moisture tests were performed as part of the AB2588 requirements.

Section 3 summarizes the results of the tests.

TABLE 2-1. GILROY ENERGY TEST MATRIX

Date	Test Location	Test No.	Test Parameters	Test Time
07/10/90	CO Catalyst Inlet	1	$NO_x/CO/CO_2/O_2$	8:54 am - 9:52 am
07/10/90	HRSG Stack	1	$NO_x/CO/CO_2/O_2$ Aldehydes Flowrate, H_2O	1:28 pm - 4:02 pm
			Benzene	1:36 pm - 2:37 pm
07/11/90	HRSG Stack	2	$NO_x/CO/CO_2/O_2$ Aldehydes Flowrate, H_2O	8:00 am - 1:30 pm
			Benzene	7:44 am - 8:44 am
	HRSG Stack	3	$NO_x/CO/CO_2/O_2$ Aldehydes Flowrate, H_2O	2:33 pm - 4:56 pm
			Benzene	2:48 pm - 3:49 pm

SECTION 3

TEST RESULTS

3.1 CO CATALYST REDUCTION EFFICIENCY

The CO concentration measured at nine points just before the CO catalyst averaged 40.43 ppm or 37.35 ppm corrected to 15% O_2. The CO concentration measured at 25 points in the HRSG stack averaged 10.40 ppm (Run 1, Table 3-1) or 9.19 ppm corrected to 15% O_2. The CO catalyst reduction efficiency was 75.39%.

3.2 ALDEHYDE EMISSIONS

Emissions of aldehydes formaldehyde (CH_2O), acetaldehyde (CH_3CHO) and acrolein (C_3H_4O) were measured at the HRSG stack using CARB Method 430. The method requires that the sample results be reported without any blank correction. Data on the blank sample train are also provided. When reviewing the results, only those values which are at least five times the blank are considered to be significant. The "less than" symbol (<) indicates that acrolein was not detected in any of the samples so the detection limit was used for calculation purposes. The actual values for acrolein are less than the values reported. Using these criteria, a small amount of formaldehyde and acetaldehyde were found in Tests #3 and #2, respectively; but, these amounts are not significant when compared to the blank.

3.3 BENZENE EMISSIONS

No benzene (C_6H_6) was detected in the exhaust gases at the 2 ppb detection level of the method.

TABLE 3-1. SUMMARY OF SOURCE EMISSION TEST DATA AT 60°F

Unit Tested: Gilroy Energy HRSG Out Date: July 10-11, 1990

Test Number	1	2	3	AVG.
Test Condition	GAS 100%			
Barometric Pressure (in. Hg)	29.35	29.75	29.36	29.49
Stack Pressure (in. Hg)	29.31	29.71	29.32	29.45
Stack Area (ft^2)	215.33	215.33	215.33	215.33
Elapsed Sampling Time (min.)	225.0	225.0	225.0	225.0
Volume Gas Sampled (dscf)	4.558	3.620	3.474	3.884
F-Factor	8489.38	8489.38	8489.38	8489.38
GAS DATA				
Average Gas Velocity (fps)	53.02	53.16	53.91	53.36
Average Gas Temperature (°F)	235.76	227.76	234.60	232.71
Gas Flowrate (dscfm)	440196	463997	451859	452017
Gas Analysis (Volume %)				
Carbon Dioxide, dry	3.18	3.55	3.34	3.36
Oxygen, dry	14.01	14.64	14.51	14.39
Water	12.23	10.02	11.57	11.27
EMISSION CONCENTRATION				
Formaldehyde (ppm)	0.23	0.19	0.56	0.31*
Acetaldehyde (ppm)	0.05	0.15	0.13	0.12*
Acrolein (ppm)	<0.0015	<0.0019	<0.0020	<0.0018*
Benzene (ppm)	<0.0020	<0.0020	<0.0020	<0.0020*
CO (ppm)	10.40	13.17	8.24	10.60
NO_x (ppm)	25.83	27.25	26.18	26.42
EMISSION RATE - LB/HR				
Formaldehyde $\bar{X}=0.70$	0.47	0.42	1.20	0.66*
Acetaldehyde	0.15	0.49	0.41	0.37*
Acrolein	<0.0059	<0.0078	<0.0079	<0.0071*
Benzene	<0.0109	<0.0115	<0.0112	<0.0112*
CO	20.27	27.06	16.49	21.27
NO_x	82.71	91.97	86.05	86.91
EMISSION FACTOR - LB/MMBTU				
Formaldehyde	4.69E-04	4.26E-04	1.23E-03	6.69E-04*
Acetaldehyde	1.50E-04	4.94E-04	4.19E-04	3.80E-04*
Acrolein	<5.73E-06	<7.94E-06	<8.11E-06	<7.12E-06*
Benzene	<1.06E-05	<1.17E-05	<1.15E-05	<1.12E-05*
CO	0.0198	0.0276	0.0169	0.0214
NO_x	0.0807	0.0937	0.0882	0.0875

*These numbers are the blank values - not the averages.

SECTION 4

SAMPLING EQUIPMENT AND PROCEDURES

This section of the report describes the equipment and procedures used to conduct the particulate gaseous tests on this program.

4.1 PRELIMINARY MEASUREMENTS

Before conducting the stack tests a series of preliminary measurements were made to determine:

- The location of the sampling site and the number and location of the sampling points to be used (CARB Method 1-1)
- The velocity, temperature, and pressure of the gases in the stack (CARB Method 1-2)
- The composition of the stack gases (EPA Method 20)
- The moisture content of the stack gases (CARB Method 1-4)

Using the results of these preliminary measurements and the calibration constants for the sampling train, a series of calculations were made to determine the value of K, a constant, and N_d, ideal nozzle diameter, required to run an isokinetic test according to the equation:

$$\Delta H = \left\{ \frac{60^2 \pi^2 K_p^2 C_p^2 (1 - B_{wo})^2 P_s MW_d}{576^2 K_o^2 MW_s P_m} \right\} (N_d^4) \left(\frac{T_m}{T_s} \right) (\Delta P)$$

where

$$K = \left\{ \frac{60^2 \pi^2 K_p^2 C_p^2 (1 - B_{wo})^2 P_s MW_d}{576^2 K_o^2 MW_s P_m} \right\}$$

An actual nozzle, whose diameter was as close as possible to the ideal nozzle diameter, was selected for the test. Isokinetic sampling rates for each sampling point in the stack were computed using the equation:

$$\Delta H = (K)(N_d^4)\left(\frac{T_m}{T_s}\right)(\Delta P)$$

Since K and N_d are known, and remain constant during a test, the only variables are the meter temperatures, the stack gas temperature and the velocity pressure for each sampling point.

4.2 PREPARATION OF THE FORMALDEHYDE SAMPLING TRAIN

All sampling train components were cleaned in the laboratory (soap and water, tap water rinse, distilled water rinse and acetonitrile rinse) to eliminate previous contamination. The sampling train components were sealed and transported to the sampling site. The CARB Method 430 equipment and procedures used to measure formaldehyde consisted of:

- A 316 stainless steel sampling nozzle with a quartz wool plug
- A heated Pyrex glass filter bypass
- A heated stainless steel probe (10 feet long) equipped with a S-type pitot tube and a thermocouple to measure stack velocity, pressure and temperature

- A Pyrex glass midget impinger train in an icebath (impinger 1 was dry; impingers 2, 3 and 4 contained 15 ml DNPH; bubbler 5 was dry; bubbler 6 contained a weighed amount of silica gel)
- An umbilical to connect the probe and sample box to the control module
- A control module containing a vacuum pump, a rotameter and a calibrated dry gas meter to measure the pressure, temperature and flowrate throughout the train.

The sampling train was charged using freshly prepared reagents (within 48-hours). Each impinger and its contents was weighed to the nearest 0.1 gm on a calibrated electronic balance. Blanks of all reagents were retained for subsequent analysis. A blank sample train was treated in the same manner.

4.3 SAMPLING PROCEDURES FOR THE FORMALDEHYDE SAMPLING TRAIN

Prior to a test, the sampling train was heated and leak-checked at 5-inches Mercury to insure leakage was less than 0.002 cfm. The S-type pitot tube was also leak-checked. The sampling train was installed on the unirail and the probe was inserted into the stack at the farthest point. A constant sampling rate (0.5 to 1.0 liter per minute) was calculated using an HP-41CV calculator for each sampling point on the traverse. Each point (25 points) was sampled for an equal period of time (5 minutes) and all pertinent data was recorded on the data sheet for each point at 5-minute intervals over the 125-minute test period. The probe and sample box were maintained at 250°F throughout the traverse. The gases leaving the impinger train were maintained at <68°F. At the end of a traverse, the probe was withdrawn from the stack and the entire

sampling train was transferred intact to the next sampling point. The remaining traverse of the stack was completed and the sampling train was withdrawn for the final leak check. This leak check was performed at 5-inches Mercury or at the highest vacuum achieved during the test. The S-type pitot tube was also checked at this time. The probe, nozzle, filter bypass, and impinger train were sealed with aluminum foil and lowered to the ground for sample recovery.

4.4 SAMPLE RECOVERY PROCEDURES FOR THE FORMALDEHYDE SAMPLING TRAIN

Sample recovery occurred in the mobile lab. Each impinger was removed from the icebath, wiped dry and weighed to the nearest 0.1 gm. The probe, glass connectors and impingers 1, 2 and 3 are rinsed with distilled water and the rinsings were transferred to a glass sample bottle. All sample bottles were marked, labeled and stored in a container containing granular charcoal on ice. A chain-of-custody log was completed and the field data sheet was also labeled with the sample ID numbers. The sampling train was then recharged in preparation for the next test.

4.5 SAMPLING TRAIN PREPARATION FOR VOLATILE ORGANIC COMPOUNDS (VOC)

VOC included benzene. The Summa electropolished stainless steel canister (6 liter) used to collect the VOC (benzene) was thoroughly cleaned prior to use in the field. The container was put in an oven and heated to drive off any organic contamination. Ultra-pure nitrogen was used to purge the canister during the heating step to remove any contamination. After completing the canister cleaning, a sample of the purge gas was collected and analyzed for hydrocarbon to determine the blank for the canister. The canister was then evacuated and sealed for shipment to the field.

4.6 SAMPLING PROCEDURES FOR VOLATILE ORGANIC COMPOUNDS (VOC)

A 1/8-inch stainless steel probe was connected to the flow regulator on the Summa electropolished stainless steel canister. An integrated grab sample of the exhaust gases was collected at a constant sampling rate over the 4-hour test period. The canister was then sealed for shipment back to the laboratory.

4.7 SAMPLING PROCEDURES FOR CONTINUOUS MONITORING

The continuous monitors used in the Pape & Steiner Mobile Monitoring Lab are shown in Table 4-1. Figure 4-1 is a schematic of the continuous monitoring system. The procedures used to continuously monitor stack gases for NO_x, CO, CO_2, and O_2 strictly follow EPA Method 20.

Sample was taken from the stack (nine points at inlet, 25 points at HRSG outlet) using a 316 stainless steel probe. A heated Balston filter holder and fiberglass filter (99.9999 percent efficiency retention of 0.6 micron particles) was connected to the outlet of the probe. Sample gas was transported through heated Teflon sample line (maintained at >250°F) by a Teflon-lined diaphragm pump to a 316 stainless steel refrigeration type conditioner (Hankison Model E-4G-SS). The sample gas was passed through the conditioner two separate times under vacuum before entering the pump, then two additional times under pressure. The clean, dry sample gas (approximately 35°F) was then transported to the continuous analyzer system through an unheated Teflon line. A series of flowmeters, valves, and regulators maintain constant flow through the system at a constant pressure. A TECO Model 300 NO_2 to NO converter was placed in front of the NO_x analyzer to prevent NH_3 interference with the NO_x measurement.

TABLE 4-1. CONTINUOUS MONITORING LAB - TRAILERS 1, 2, AND 4

NO_x CHEMILUMINESCENT ANALYZER -- THERMO ELECTRON MODEL 10

Response Time (0-90%)	1.5 sec -- NO mode; 1.7 sec -- NO_x mode
Zero Drift	Negligible after 1/2 hour warmup
Linearity	±1% of full scale
Accuracy	Derived from the NO or NO_2 calibration gas, ±1% of full scale
Output	0-10 V
Operating Ranges	0-2, 5, 10, 25, 100, 250 ,1000, 2500, and 10,000 ppm

O_2 ANALYZER, FUEL TYPE -- TELEDYNE MODEL 326

Response Time (0-90%)	60 seconds
Accuracy	±1% of scale at constant temperatures; ±1% of scale of ±5% of reading, whichever is greater, over the operating temperature range
Output	0-1 V
Operating Ranges	0-5%, 10%, 25% O_2

CO_2/CO INFRARED ANALYZER -- ANARAD MODEL AR-600

Response Time (0-90%)	5 seconds
Zero Drift	±1%
Span Drift	±1%
Linearity	1%
Resolution	Less than 1% of full scale
Output	0-1 V
Operating Ranges	0-20% CO_2/0-10,000 ppm CO

CO GAS FILTER CORRELATION - THERMO ELECTRON MODEL 48

Response Time (0-95%)	1 minute
Zero Drift	±0.2 ppm CO
Span Drift	Less than 1% full scale in 24 hours
Linearity	±1% full scale, all ranges
Accuracy	±0.1 ppm CO
Output	0-10V
Operating Ranges	1, 2, 5, 10, 20, 50 ,100, 200, 500, 1000 ppm

SO_2 UV ANALYZER -- DUPONT MODEL 400

Response Time (0-90%)	Less than 1 second
Zero Drift	Less than 1% full scale in 24 hours
Linearity	±1% full scale
Accuracy	±2% full scale
Output	0-5 V
Operating Ranges	0-100 ppm, 0-1000 ppm

STRIP CHART RECORDERS (3) -- MOLYTEK MODEL 2800

Pen Response	0.75 seconds Full Scale
Input Spans	10, 20, 50, 100 MV; 1, 5, 10 VDC
Zero Set	LH standard, adjustable to 100% of Full Scale
Accuracy	±0.25% of Span
Dead Band	±0.15% of Span
Linearity	±0.25% of Span
Chart Speed	0.5, 1, 2, 3, 6, 12 inches/hour; 0.5, 1, 2, 4, 10 inches/minute
Recording Pen	Fiber tip cartridge
Chart Width	10 inches

SCOTSMAN TRAILER

Fully Insulated	Air conditioned	8-ft x 14-ft x 11-ft

1. Filter 0.6 μ, 99.9999 percent efficient
2. Duct
3. 316 stainless steel probe
4. 3/8-inch, heated (250°F) Teflon
5. Four-pass conditioner-dryer, 316 stainless steel internals
6. 3/8-inch, unheated Teflon
7. Teflon-lined sample pump
8. 3/8-inch unheated Teflon
9. Rotameter
10. 1/4-inch Teflon tubing
11. Calibration gas manifold
12. Calibration gas selector valve
13. Calibration gas cylinders
14. Backpressure regulator
15. Auxiliary analysis port

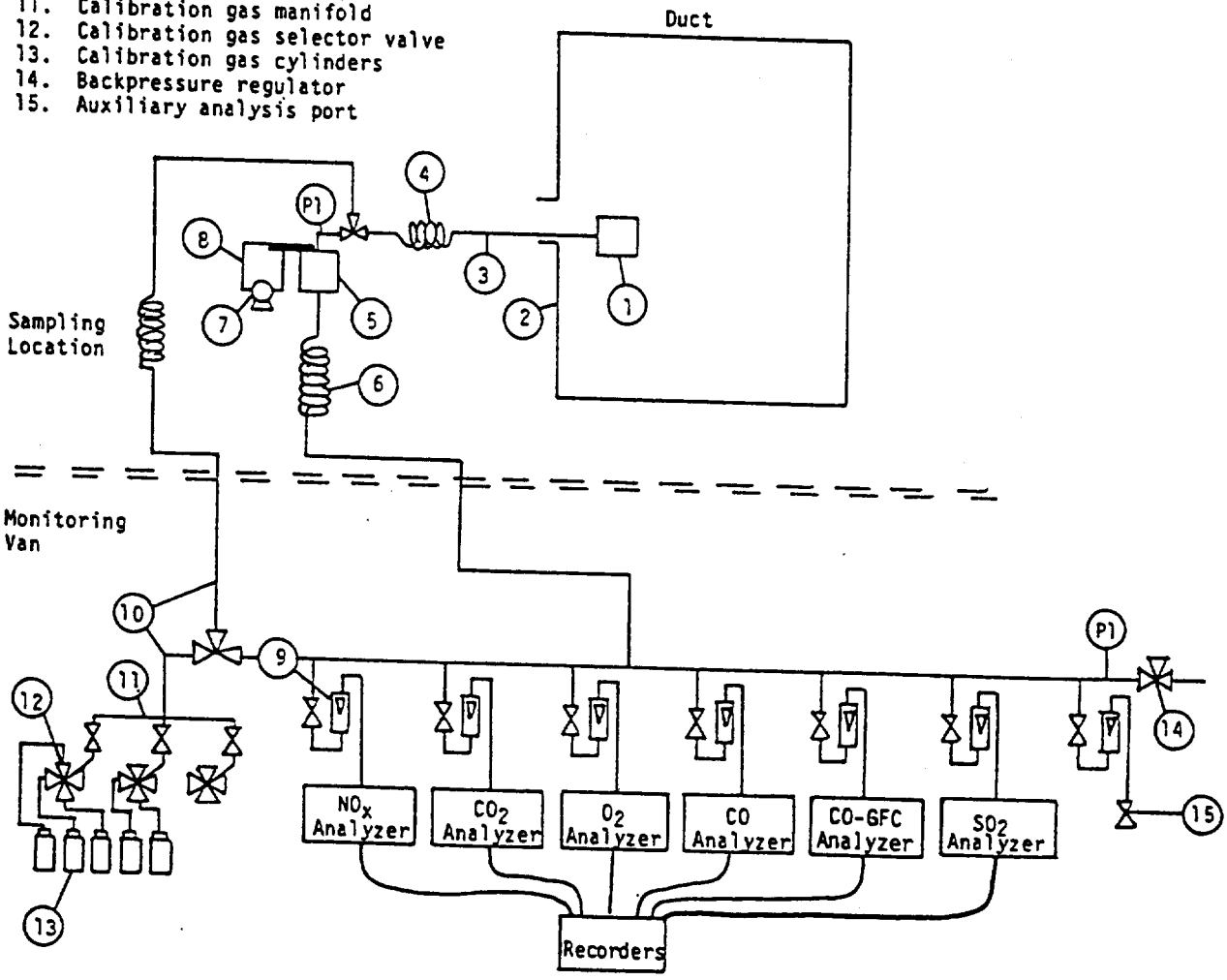

FIGURE 4-1. SCHEMATIC OF CONTINUOUS MONITORING SYSTEM

Calibrations of the continuous analyzers were performed using EPA Protocol 1 calibration gases (±1%) for NO_x and NBS certified calibration gases (±1%) for CO, CO_2 and O_2 and ±1% and ±5% NO/NO_2 for the converter efficiency check. Copies of the gas certifications are included in the Appendix of this report. All pertinent data (date, time, test locations, analyzer range, cal gas value) were recorded on both the field data sheets and continuous analyzer strip charts in the field.

At the start of a test day, a leak-check was performed. The sample probe was removed from the stack and the end was sealed. A leak-check was successful only if pressure at the analyzer system and flow through the rotameters to the individual analyzers all dropped to zero. A mandatory leak-check was performed at the completion of each test day.

An initial calibration was performed at the start of the test period by introducing zero and span gases for each analyzer and making the necessary adjustments. A multipoint linearity check was performed on each analyzer to insure all points were within ±2% of full scale. An NO_2 to NO converter check was performed to insure converter efficiency was greater than 90%. And, finally, the upscale and downscale response time of the sampling system was measured to insure the sampling time per point could be set at 1-minute plus the system response time. Calibration gas values were recorded on the continuous monitor strip charts and field data sheets. A calibration check was completed at the end of a test and adjustments (if necessary) to the analyzers were made in preparation for another test.

An external calibration of the sampling system was performed at the start of a test day. EPA Protocol 1 gas was flowed through the

entire sampling system from the probe tip. The response of the analyzers had to be within ±5% of the certified tank value before testing could proceed. An external calibration was also performed at the end of each test day.

Test data was collected by recording averages from the strip chart recordings onto the field data sheets. A fuel analysis was used to calculate the F-Factor, dscf/MMBtu corrected to zero percent O_2 (standard conditions 68°F, 29.92 inches Mercury), as described in 40 CFR 60.45. The pollutant concentration and the F-Factor were used to calculate an emission factor in lb/MMBtu.

SECTION 5

ANALYSIS PROCEDURES

This section of the report describes the procedures used to analyze the samples to be collected during the test program. ENSECO Labs in Sacramento, California performed the aldehyde and benzene analyses. Pacific Gas Technology performed the fuel gas analysis.

5.1 FORMALDEHYDE

Formaldehyde reacts with DNPH by nucleophilic addition to the carbonyl radical followed by 1,2-elimination of water and the formation of the 2,4-dinitrophenylhydrazone. Acid is required to promote protonation of the carbonyl radical because DNPH is a weak nucleophile.

After organic solvent extraction, the DNPH-aldehyde derivatives were separated using reverse phase HPLC and detected with an ultraviolet (UV) adsorption detector operated at 360 nm.

Formaldehyde in the sample was identified and quantified by comparison of retention time and area count, respectively, with those of standard samples.

A blank solution of the impinger absorption solution was treated in the same manner.

5.2 VOLATILE ORGANIC COMPOUNDS

A sample of the VOC gases contained in the 6-liter Summa canister was metered through a mass flow controller into a cryogenically-cooled

trap with a temperature control assembly (Nutech Model 320-01). After 500 ml of the sample had been trapped, a valve was switched and the trap was rapidly heated (-160°C to 120°C in 60 seconds) to purge the trap's contents onto the GC column (OV-1 capillary column, 0.53 mm X 50 m with 0.88 μm crosslinked methyl silicone coating). The individual VOCs were separated by the GC (HP Model 5890 with temperature programming and jet separator option) and measured by the mass selective detector (HP Model 5970B with HP-1000 RTE-A data system) within a preselected range of atomic mass units (amu). A library search was then performed to identify the compounds eluted from the GC.

An initial calibration curve consisting of three standards was run in the linear working range of the instrument. Each day, the mass spectrometer had to meet the tuning criteria described in Table 4 of EPA Compendium Method TO-14. After tuning, a single point check standard was analyzed. Ninety percent of the target compound concentrations had to be within +30% of the three-point calibration curve. If the check standard failed to meet this criterion, a new three-point calibration curve was run. This daily, one-point check standard was used to calculate the concentration of the samples.

5.3 FUEL

A sample of the fuel fired during this test program was collected and sent to Pacific Gas Technology for analysis. Analysis was performed by PGT in accordance with EPA Title 40 Section 60.45. The specific procedures are itemized in Table 5-1. The results appear at the end of this section.

TABLE 5-1. FUEL ANALYSIS METHODS

LABORATORY TEST PROCEDURES FOR FUEL OILS AND FUEL GASES

Reference: EPA Title 40, Section 60.45

FUEL OIL TESTS:	
Sediment and Water, Vol. %	ASTM D4007-81
Gravity by Hydrometer (API)	ASTM D1298-80
API Gravity Corrected to 60°F	ASTM Table 5A
Gross Calorific Value (Btu/lb)	ASTM D2015-77
Ultimate Analysis (C, H, O, N, S, wt. %)	
Carbon, Hydrogen	ASTM D3178-73
Nitrogen (chemiluminescence detector)	ASTM D3431-80
Sulfur	ASTM D2622-82
Ash	ASTM D482
Oxygen	ASTM D3176-74
GASEOUS FUELS BY GAS-LIQUID CHROMATOGRAPHY:	
Gas Analysis	ASTM D1945-81
Sulfur Analysis	CPA B16
Calculation of Gross Calorific Value	ASTM D3588-81
Component Weight %, F-factor calculations	EPA 40:60.45
PROCEDURES FOR SCRUBBER LIQUOR ANALYSIS:	
Specific Gravity	ASTM D1429
Chlorides	ASTM D512-67

PACIFIC GAS TECHNOLOGY

4700 Easton Drive - Suite 39
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805/324-1317
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RECEIVED JUL [illegible] 1990

GAS ANALYSIS BY CHROMATOGRAPH

PAPE & STEINER ENVIRONMENTAL SERVICES
5801 Norris Road
Bakersfield, CA 93308

Attention: Jim Steiner

SAMPLED: JULY 11, 1990
SUBMITTED: JULY 12, 1990
REPORTED: JULY 13, 1990

LAB # 2900

Sample ID : GILROY COGEN
FUEL GAS

P&S ID # : 23735

ANALYZED GAS

	MOLE %	WT %
OXYGEN	0.11	0.20
NITROGEN	1.92	3.06
CARBON DIOXIDE	1.03	2.58
HYDROGEN	ND	0.00
CARBON MONOXIDE	ND	0.00
HYDROGEN SULFIDE	ND	0.00
METHANE	91.19	83.26
ETHANE	4.90	8.39
PROPANE	0.61	1.53
iso-BUTANE	0.05	0.17
n-BUTANE	0.08	0.26
iso-PENTANE	0.03	0.12
n-PENTANE	0.02	0.08
HEXANE +	0.06	0.10

CHONS WT %	
CARBON	71.81
HYDROGEN	23.05
OXYGEN	2.08
NITROGEN	3.06
SULFUR	0.00

SPECIFIC GRAVITY * : 0.606

SPECIFIC VOLUME : 21.66 cu ft/lb

HYDROGEN SULFIDE (Draeger) : ppm

TOTAL * BTU/cu ft	DRY	: 1035	NET * BTU/cu ft	DRY	: 933
	WET	: 1017		WET	: 917
BTU/lb		: 22418	BTU/lb		: 20213

* CALCULATED ACCORDING TO : ASTM D-3588

SECTION 6

QUALITY ASSURANCE

6.1 MANUAL SAMPLING EQUIPMENT

A detailed record of repair and maintenance to each sampling train is kept. Preventative maintenance to each system is performed periodically to avoid complete component breakdown during a field test.

A detailed record of sampling system calibrations is also kept. Calibration data for the sampling nozzles, pitot tubes, dry gas meters and orifice meters are available for review. Results of the EPA Quality Assurance Branch biannual audits of the dry gas meter and orifice meter combinations are also logged and verify our in-house calibration data. The calibration data for the equipment used on this program can be found in the Appendix.

6.2 ALDEHYDE ANALYSIS

Prior to shipping the DNPH to the test site, Enseco purified the DNPH and checked it for contamination. Enseco evaluated a method blank, spiked a laboratory control sample (LCS) twice to determine percent recovery and repeatability for the analyses, and evaluated a sampling train blank. The results of the QA/QC checks appear in Appendix B.

6.3 VOC ANALYSIS

A laboratory control sample (LCS) was analyzed after the check standard. This sample consisted of five target VOCs prepared in a

separate canister at a concentration that differed from that of the check standard. Five compounds were used to assess control for the LCS: methylene chloride, 1,1-dichloroethene, trichloroethene, toluene and 1,1,2,2-tetrachloroethane. The percent recovery for the five control compounds must be within a window of 80-115%.

For each lot of 20 samples analyzed, a duplicate control sample (DCS) was analyzed after the LCS. The DCS was identical to the LCS in composition and source. The 80-115% recovery criterion had to be met. In addition, the relative percent difference (RPD) for the LCS and DCS had to be <20%.

A system blank of the HC-free air was analyzed after the LCS and DCS. The blank results had to indicate that there were no target compounds present above the minimum detection level.

The results of these checks appear in Appendix B.

6.4 CONTINUOUS MONITORS

The NO_x analyzer is calibrated before and after each test using an EPA Protocol 1 gas (±1%) traceable to NBS. The CO, CO_2, and O_2 analyzers are calibrated before and after each test using a NBS certified gas mixture (±1%). Copies of the calibration gas certificates appear in the Appendix of this report.

A sampling system check was performed at the beginning and end of each test day. This was done by introducing an EPA Protocol 1 gas at the sampling probe and measuring the system response. The purpose of this was to check the system for leaks and sample loss.

Multipoint calibration linearity checks of the continuous analyzers were performed on June 19, 21, 25 and 26, 1990. These results were

well within CARB limitations of ±2% of full scale. Tables 6-1 through 6-6 list the results of these checks.

All of the EPA Method 20 QA/QC checks (e.g., linearity, interference, response time, converter efficiency, etc.) were performed on the continuous monitoring system and the system passed these requirements.

TABLE 6-1. CO CALIBRATION SUMMARY

1. Monitoring Trailer 4
2. Calibration by GAP 6/25/90
3. Analyzer TECO
   Model 48
   S/N 22876-207
4. Calibrator Manufacturer ENVIRONICS
   Model 201-1520
   S/N 1122
5. CO Standard AAL-114 / AAL-5660
   Concentration 1003ppm / 9942ppm
   Cylinder Pressure 1300 / 1500

CO CALIBRATION AND LINEARITY CHECKS

Range 0-20 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(CO) out ppm	Chart ppm	% Difference ÷2% Full Scale
Zero	5010.6	—	0	0	0
80% URL	4935.5	80.2	16.05	16.05	0
1	4950.4	59.3	11.86	11.94	+.4
2	4972.9	39.8	7.95	7.88	-.35
3	4990.4	20.2	4.04	3.88	-.8

Range 0-100 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(CO) out ppm	Chart ppm	% Difference ÷2% Full Scale
Zero	9030	—	0	0	0
80% URL	8300.8	722.8	80.34	80.34	0
1	8480.5	533.4	59.4	59.7	+.3
2	8660.3	357.0	39.7	39.5	-.2
3	8840.0	180.3	20.0	19.8	-.2

Form MULTI-1.(6/90)

TABLE 6-1. CO CALIBRATION AND LINEARITY CHECKS (Concluded)

Range 0-1000 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(CO) out ppm	Chart ppm	% Difference ±2% Full Scale
Zero	909.7	—	0	0	0
80% URL	8293.3	716.9	791	791	0
1	8478.0	538.3	593.5	592	-.15
2	8657.8	360.2	397.0	398	-.1
3	8840.0	182	200.4	202	-.16

Range ____________ ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(CO) out ppm	Chart ppm	% Difference ±2% Full Scale
Zero					
80% URL					
1					
2					
3					

Range ____________ ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(CO) out ppm	Chart ppm	% Difference ±2% Full Scale
Zero					
80% URL					
1					
2					
3					

Range ____________ ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(CO) out ppm	Chart ppm	% Difference ±2% Full Scale
Zero					
80% URL					
1					
2					
3					

Pape & Steiner Environmental Services

TABLE 6-2. O_2 CALIBRATION SUMMARY

1. Monitoring Trailer 4
2. Calibration by JSP 6-21-90
3. Analyzer TELEDYNE
   Model 326A
   S/N 57069
4. Calibrator Manufacturer ENVIRONICS
   Model 201-1520
   S/N 1122
5. O_2 Standard A14722
   Concentration 45%
   Cylinder Pressure 1800 PSI

O_2 CALIBRATION AND LINEARITY CHECKS

Range 0-25 %

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(O_2) out %	Chart %	% Difference +2% Full Scale
Zero	2000	—	0	0	0
80% URL	1105.8	894.2	20.1	20.1	0
1	1862.2	939.3	15.09	15.08	-.09
2	2171.8	616.5	10.0	10.18	+.72
3	2483.9	310	5.0	5.18	+.72

Range 0-10 %

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(O_2) out %	Chart %	% Difference +2% Full Scale
Zero	5010	—	0	0	0
80% URL	4121.6	893.0	8.01	8.01	0
1	4343.8	659.9	5.94	6.03	+.9
2	4565.9	441.2	3.96	4.06	+1.0
3	4788.2	222.2	2.0	2.1	+1.0

Form MULTI-5.(6/90)

TABLE 6-2. O_2 CALIBRATION AND LINEARITY CHECKS (Concluded)

Range 0-5 %

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(O_2) out %	Chart %	% Difference +2% Full Scale
Zero	9019.8	—	0	.05	1.0
80% URL	8218.3	803.8	4	4	0
1	8418.1	594.3	2.97	3	+.6
2	8617.8	397.1	1.98	2.01	+.6
3	8820.1	200.5	1.0	1.05	+1.0

Tape & Steiner Environmental Services

TABLE 6-3. NO_x CALIBRATION SUMMARY

1. Monitoring Trailer 4
2. Calibration by GP 6-21-90
3. Analyzer TECO
   Model 10AR
   S/N 13133-134
4. Calibrator Manufacturer ENVIRONICS
   Model 201-1520
   S/N 1122
5. NO_x Standard ALM 2882 / ALM 2355
   Concentration 2972 / 8805
   Cylinder Pressure 1700 PSI / 1600 PSI

NO_x CALIBRATION AND LINEARITY CHECKS

Range 0-25 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(NO_x) out ppm	Chart ppm	% Difference +2% Full Scale
Zero	9019.8	—	0	0	0
80% URL	8957.9	60.1	19.8	19.8	0
1	8974.8	45.2	14.9	14.88	-.08
2	8989.8	30.4	10.0	10.0	0
3	9004.8	15.53	5.12	5.18	+.24

Range 0-100 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(NO_x) out ppm	Chart ppm	% Difference +2% Full Scale
Zero	2510	—	0	0	0
80% URL	2446.4	66.7	79.0	79.0	0
1	2461.4	50.3	59.6	59.8	+.2
2	2476.9	33.7	39.9	39.5	-.4
3	2493.9	17.2	20.3	20.0	-.3

Form MULTI-2.(6/90)

TABLE 6-3. NO_x CALIBRATION AND LINEARITY CHECKS (Concluded)

Range 0–1000 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(NO_x) out ppm	Chart ppm	% Difference +2% Full Scale
Zero	9019.8	—	0	0	0
80% URL	8203.4	822.2	802.1	802.1	0
1	8405.6	608.1	599	605	+1.1
2	8610.3	406.6	397	401	+.4
3	8815	205.3	200.3	202	+.17

Range ____________ ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(NO_x) out ppm	Chart ppm	% Difference +2% Full Scale
Zero					
80% URL					
1					
2					
3					

Range ____________ ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(NO_x) out ppm	Chart ppm	% Difference +2% Full Scale
Zero					
80% URL					
1					
2					
3					

Range ____________ ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(NO_x) out ppm	Chart ppm	% Difference +2% Full Scale
Zero					
80% URL					
1					
2					
3					

Pape & Steiner Environmental Services

TABLE 6-4. SO_2 CALIBRATION SUMMARY

1. Monitoring Trailer 4
2. Calibration by GP 6/19/90
3. Analyzer DUPONT
   Model 400
   S/N 6131
4. Calibrator Manufacturer ENVIRONICS
   Model 201-1520
   S/N 1122
5. SO_2 Standard AAL-5414
   Concentration 972ppm
   Cylinder Pressure 1500

SO_2 CALIBRATION AND LINEARITY CHECKS

Range 0-100 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(SO_2) out ppm	Chart ppm	% Difference ±2% Full Scale
Zero	9000	—	0	0	0
80% URL	8273.3	745.5	80.3	80.3	0
1	8460.6	550.6	59.4	59.6	.2
2	8645.3	368.1	39.7	38.9	.8
3	8830.0	185.8	20.0	19.2	-.8

Range 0-1000 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(SO_2) out ppm	Chart ppm	% Difference ±2% Full Scale
Zero	8961	—	0	0	0
80% URL	164.6	732.7	793.6	793.6	0
1	344.4	550.1	597.8	610	+1.22
2	524.1	367.8	400.8	412	+1.12
3	708.9	185.8	201.8	208	+.62

Form MULTI-3.(6/90)

TABLE 6-5. CO_2 CALIBRATION SUMMARY

1. Monitoring Trailer 4
2. Calibration by JA 6/19/90
3. Analyzer ANARAD
   Model AR 602
   S/N 1846
4. Calibrator Manufacturer ENVIRONICS
   Model 201-1520
   S/N 1122
5. CO_2 Standard AAL-795
   Concentration 20%
   Cylinder Pressure 950 PSE

CO_2 CALIBRATION AND LINEARITY CHECKS

Range 0-20 %

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(CO_2) out %	Chart %	% Difference ÷2% Full Scale
Zero	995.9	—	0	0	0
80% URL	202.1	803.9	16.02	16.02	0
1	399.3	594.1	11.96	12.16	+1.0
2	594	396.8	8.0	8.0	0
3	796.2	200.0	4.02	4.0	-.1

Form MULTI-6.(6/90)

TABLE 6-6. CO CALIBRATION SUMMARY

1. Monitoring Trailer 4
2. Calibration by JP 6-26-90
3. Analyzer ANARAD
   Model AK602
   S/N 1846
4. Calibrator Manufacturer ENVIRONICS
   Model 201-1520
   S/N 1122
5. CO Standard AAL-5660
   Concentration 9942ppm
   Cylinder Pressure 1500 PSI

CO CALIBRATION AND LINEARITY CHECKS

Range 0 - 10,000 ppm

Calibration Points	Flow, Dil. cc/min	Flow, Std. cc/min	(CO) out ppm	Chart ppm	% Difference ±2% Full Scale
Zero	995.7	—	0	0	0
80% URL	189.6	814.8	8065	8065	0
1	391.8	602.7	6041	6030	-.11
2	591.5	402.4	4025	4000	-.25
3	793.7	202.5	2025	2100	+.75

Form MULTI-4.(6/90)

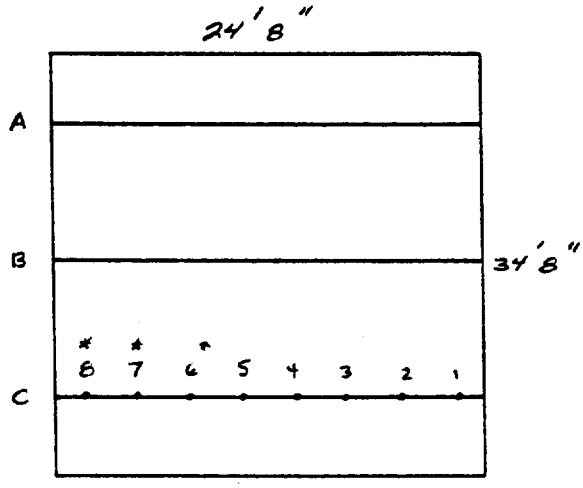
APPENDIX A

PAPE & STEINER RAW DATA

Pape & Steiner Environmental Services

SAMPLING POINT LOCATION DATA SHEET

Plant Gilroy Energy
Date 7/9/90
Test Location CO Catalyst Inlet
Upstream Dist./Dia. _____
Downstream Dist./Dia. _____
No. of Sampling Points 24
Stack Dimension 24'8" x 34'8"
Coupling Length 7
3, 2 -inch MPT/FPT/Flange



need zoom boom to hold 18' probe
no hooks, no rails

XEQ PNT

Sample Point	Dist	Sample Point	Dist	Sample Point	Dist	Sample Point	Dist
1	25.5						
2	62.5						
3	99.5						
4	136.5						
5	173.5						
6	210.5						
7	247.5						
8	284.5						

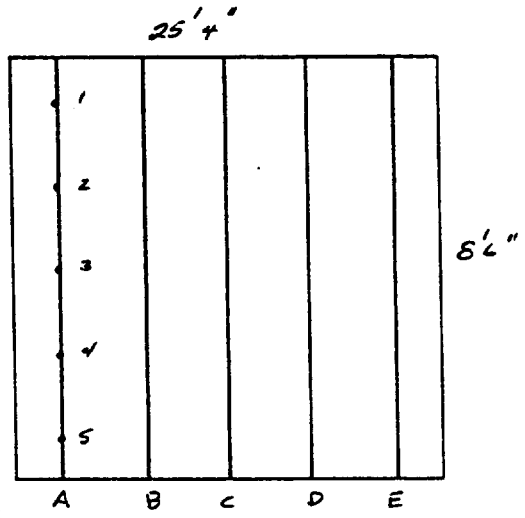
SAMPLING POINT RELOCATION: none

* can only reach points 6, 7, 8; points 5 and 4 blocked by I-Beam inside duct; can't reach points 1, 2, 3

Pape & Steiner Environmental Services

SAMPLING POINT LOCATION DATA SHEET

Plant Gilroy Energy
Date 7/9/90
Test Location HRSG Out
Upstream Dist./Dia. 72" / 0.5 ∅
Downstream Dist./Dia. 360" / 2.4 ∅ Deq = 151.32
No. of Sampling Points 25
Stack Dimension 8'6" x 25'4"
Coupling Length 12
5, 3 -inch MPT/FPT/Flange



need 5 small clips
no hooks
5 chains, 5-10' rails
pulley stand 200' rope

Bring transformer
Hankison: level down from platform

XEQ PNT 100' power

Sample Point	Dist	Sample Point	Dist	Sample Point	Dist	Sample Point	Dist
1	22.2						
2	42.6						
3	63.0						
4	83.4						
5	103.8						

SAMPLING POINT RELOCATION: none

Pape & Ster Environmental Services

PLANT Gilroy Energy TES. TYPE 430 FIELD TEST DATA SHEET (Page 1 of 3)

Date 7/10/90
Test Location HRSG Out
Run Number 1
Stack Diameter 8'6" x 25'4"
Operator JS
Filter No. none

Barometric Pressure 29.35
Static in. wg. -0.56
Probe Type/Length SS/10'
Pitot Coefficient 0.84
Meter Box No./γ 779/1.0094
Nozzle No./Size straight

Impinger Volumes/Weights			
Contents	Final	Initial	Net
dry	93.6	83.8	9.8
15 DNPH	103.1	102.3	0.8
15 DNPH	101.6	98.6	3.0
15 DNPH dry	102.8	105.1	-2.3
S.G.	113.4	111.0	2.4
		Total	13.7

Gas Composition			
Time	CO_2	O_2	CO

Leak Rate	cfm	"Hg
Initial	0.0010	5 nozzle
Final		

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	Temperature °F: Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out	Pump Vacuum in. Hg	$\sqrt{\Delta P}$	Comments
A 1	1:28 0	0.335	0.010	93.941	222	197	204	62	115	115	2.5	0.579	pitot ok
2	5	0.505	0.010	94.324	223	211	196	58	116	117	2.5	0.711	
3	10	0.995	0.010	94.680	223	212	197	58	116	117	2.5	0.997	A040 Ben 30psi start
4	15	0.755	0.010	94.982	235	216	202	57	118	119	2.5	0.869	1:36 D4
5	20	0.655	0.010	95.240	236	215	192	57	119	120	2.5	0.809	
	25			95.507									23761 DNPH
B 1	1:59 0	0.540	0.010	95.507	226	216	196	63	120	123	2.5	0.735	23760 DNPH2
2	5	0.615	0.010	95.770	237	218	202	59	121	123	2.5	0.784	
3	10	0.695	0.010	96.007	222	220	213	58	122	125	2.5	0.834	23759 DNPH
4	15	0.725	0.010	96.157	223	215	205	58	123	125	2.5	0.851	23758 DNPH BL
5	20	0.695	0.010	96.326	225	211	204	56	123	125	2.5	0.834	
	25			96.471									

Pape & Stoner Environmental Services

PLANT Gilroy Energy TEST TYPE 430 FIELD TEST DATA SHEET (Page 2 of 3)

Date 7/10/90
Test Location HRSG Out
Run Number 1
Stack Diameter 8'6" x 25'4"
Operator JS
Filter No. none

Barometric Pressure 29.35
Static in. wg. − 0.56
Probe Type/Length SS/10'
Pitot Coefficient 0.84
Meter Box No./γ 229/1.0094
Nozzle No./Size straight

Impinger Volumes/Weights			
Contents	Final	Initial	Net
S.G.			
		Total	

Gas Composition			
Time	CO_2	O_2	CO

Leak Rate	cfm	"Hg
Initial		
Final		

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	Temperature °F						Pump Vacuum in. Hg	$\sqrt{\Delta P}$	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
C 1	2:30 0	0.355	0.010	96.471	232	213	208	59	122	125	2.5	0.596	
2	5	0.495	0.010	96.584	233	216	212	58	122	124	2.5	0.704	
3	10	0.620	0.010	96.716	228	219	210	58	122	123	2.5	0.787	ben 2:37 end
4	15	0.715	0.010	96.860	236	217	203	58	121	122	2.5	0.846	16 psi
5	20	0.660	0.010	97.011	245	204	190	57	121	122	2.5	0.812	
	25			97.159									
O 1	3:04 0	0.490	0.010	97.159	242	194	173	59	116	116	2.5	0.700	
2	5	0.545	0.010	97.350	244	195	184	58	113	114	2.5	0.738	
3	10	0.715	0.010	97.562	241	192	179	58	112	112	2.5	0.846	
4	15	0.770	0.010	97.742	240	191	194	58	111	111	2.5	0.877	
5	20	0.615	0.010	97.928	238	191	181	58	110	111	2.5	0.784	
	25			98.130									

Pape & Sc r Environmental Services

PLANT Gilroy Energy TEST TYPE 430 FIELD TEST DATA SHEET (Page 2 of 3)

Date 7/10/90
Test Location HRSG Out
Run Number 1
Stack Diameter 8'6" x 25'4"
Operator JS
Filter No. none
Barometric Pressure 29.35
Static in. wg. -0.56
Probe Type/Length SS/10'
Pitot Coefficient 0.84
Meter Box No./γ 779/1.00 94
Nozzle No./Size straight

Impinger Volumes/Weights			
Contents	Final	Initial	Net
S.G.			
		Total	

Gas Composition			
Time	CO_2	O_2	CO

Leak Rate	cfm	"Hg
Initial		
Final	0.0015	2.5 nozzle

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	Temperature °F						Pump Vacuum in. Hg	$\sqrt{\Delta P}$	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
E 1	3:37 0	0.385	0.010	98.130	246	191	195	57	108	108	2.5	0.620	
2	5	0.715	0.010	98.318	246	190	188	57	106	107	2.5	0.846	
3	10	1.10	0.010	98.493	248	186	172	57	105	105	2.5	1.049	
4	15	0.770	0.010	98.681	252	180	184	57	104	105	2.5	0.877	
5	20	0.740	0.010	98.862	252	188	183	57	104	105	2.5	0.860	pitot ok
	25			99.041									
	225		0.010	5.100	235.76				116	.18		0.7978	

Pape & S[illegible]er Environmental Services

PLANT Gilroy Energy TES[illegible].YPE 430 FIELD TEST DATA SHEET (Page ___ of 3)

Date 7/11/90
Test Location HRSG Out
Run Number 2
Stack Diameter 8'6" x 25'4"
Operator JB
Filter No. none

Barometric Pressure 29.75
Static in. wg. -0.52
Probe Type/Length SS/10'
Pitot Coefficient 0.84
Meter Box No./γ 779/1.0094
Nozzle No./Size straight

Impinger Volumes/Weights			
Contents	Final	Initial	Net
dry	91.2	83.7	7.5
15 DW'H	102.7	102.4	0.3
15 DW'H	98.3	98.3	0.0
15 DW'H	106.0	106.0	0.0
S.G.	114.4	113.5	0.9
		Total	8.7

Gas Composition			
Time	CO_2	O_2	CO

Leak Rate	cfm	"Hg
Initial	0.0010	5 nozzle JB
Final		

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft³	Temperature °F						Pump Vacuum in. Hg	√ΔP	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
A 1	8:00 0	0.365	0.010	99.071	214	182	198	58	72	72	2.0	0.604	pitot ok
2	5	0.555	0.010	99.194	210	192	201	58	73	73	2.0	0.745	
3	10	1.060	0.010	99.363	210	196	196	59	75	75	2.0	1.030	Ben A025 OK
4	15	0.805	0.010	99.516	208	199	198	59	77	77	2.0	0.897	30 psi 7:44 am start
5	20	0.690	0.010	99.680	221	202	210	59	78	78	2.0	0.831	13 psi 8:44 am end
	25			99.833									
B 1	8:30 0	0.565	0.010	99.833	214	202	214	59	83	84	2.0	0.752	23738 Bottle
2	5	0.635	0.010	100.030	215	210	212	59	85	86	2.0	0.797	
3	10	0.720	0.010	100.167	210	220	199	59	85	86	2.0	0.849	23737 Bottle
4	15	0.745	0.010	100.280	210	229	203	59	85	86	2.0	0.863	
5	20	0.755	0.010	100.385	210	234	207	59	86	86	2.0	0.869	
	25			100.494									23736 Bottle

Pape & Stoner Environmental Services

PLANT Gilroy Energy TEST TYPE 430 FIELD TEST DATA SHEET (Page 2 of 3)

Date 7/11/90
Test Location HRSG Out
Run Number 2
Stack Diameter 8'6" x 25'4"
Operator JB
Filter No. none

Barometric Pressure 29.75
Static in. wg. -0.52
Probe Type/Length SS/10'
Pitot Coefficient 0.84
Meter Box No./γ 779/1.0094
Nozzle No./Size straight

Impinger Volumes/Weights			
Contents	Final	Initial	Net
S.G.			
		Total	

Gas Composition			
Time	CO_2	O_2	CO
Leak Rate		cfm	"Hg
Initial			
Final			

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	Temperature °F						Pump Vacuum in. Hg	$\sqrt{\Delta P}$	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
C 1	9:00 0	0.355	0.010	100.494	224	222	213	59	89	90	2.0	0.596	
2	5	0.505	0.010	100.710	218	225	250	59	89	91	2.0	0.711	
3	10	0.610	0.010	100.909	216	220	202	59	91	93	2.0	0.781	
4	15	0.735	0.010	101.076	222	213	210	59	91	92	2.0	0.857	
5	20	0.685	0.010	101.243	233	213	205	59	92	93	2.0	0.828	
	25			101.395									broke hot to cold
D 1	12:36 0	0.525	0.010	101.425	233	213	224	62	108	109	2.0	0.725	re-leakcheck 0.0010
2	5	0.560	0.010	101.642	243	211	211	62	110	112	2.0	0.748	@ 3" Hg
3	10	0.745	0.010	101.658	242	216	214	62	113	115	2.0	0.863	* subtract out leak
4	15	0.840	0.010	101.815	240	218	213	62	114	116	2.0	0.917	check volume
5	20	0.645	0.010	101.959	240	217	204	62	116	118	2.0	0.803	
	25			102.107									

Pape & Si[illegible]r Environmental Services

PLANT Gilroy Energy TES. .YPE 430 FIELD TEST DATA SHEET (Page _ of 3)

Date 7/11/90
Test Location HRSG Out
Run Number 2
Stack Diameter 8'6" x 25'4"
Operator JS
Filter No. none

Barometric Pressure 29.75
Static in. wg. -0.52
Probe Type/Length SS/10'
Pitot Coefficient 0.84
Meter Box No./γ 729/1.0094
Nozzle No./Size straight

Impinger Volumes/Weights			
Contents	Final	Initial	Net
S.G.			
		Total	

Gas Composition			
Time	CO_2	O_2	CO

Leak Rate	cfm	"Hg
Initial		
Final	0.0010	2.5 nozzle

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	Temperature °F						Pump Vacuum in. Hg	$\sqrt{\Delta P}$	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
E 1	1:08 0	0.350	0.010	102.107	248	210	215	63	118	120	2.0	0.592	
2	5	0.695	0.010	102.252	251	213	198	63	120	121	2.0	0.834	
3	10	1.150	0.010	102.422	252	210	207	63	119	121	2.0	1.072	
4	15	0.825	0.010	102.613	254	209	209	63	120	122	2.0	0.908	
5	20	0.805	0.010	102.778	256	210	202	64	120	121	2.0	0.897	pitot ok
	25			102.964									
	125		0.010	3.863	227.76				96.	92		0.8147	

A-9

Pape & Si ...r Environmental Services

PLANT Gilroy Energy TES. .YPE 430 FIELD TEST DATA SHEET (Page . . of 3)

Date 7/11/90
Test Location HRSG Out
Run Number 3
Stack Diameter 8'6" x 25'4"
Operator JB
Filter No. none

Barometric Pressure 29.36
Static in. wg. -0.53
Probe Type/Length SS/10'
Pitot Coefficient 0.84
Meter Box No./γ 779/1.0094
Nozzle No./Size straight

Impinger Volumes/Weights			
Contents	Final	Initial	Net
S.G.			
		Total	

Gas Composition			
Time	CO_2	O_2	CO

Leak Rate	cfm	"Hg
Initial		
Final		

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	Temperature °F						Pump Vacuum in. Hg	$\sqrt{\Delta P}$	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
C 1	3:33 0	0.365	0.010	104.561	230	201	232	63	118	119	2.0	0.604	
2	5	0.535	0.010	104.732	232	210	204	63	118	118	2.0	0.731	
3	10	0.615	0.010	104.850	224	209	206	63	116	118	2.0	0.784	
4	15	0.715	0.010	105.041	240	208	206	63	117	118	2.0	0.846	
5	20	0.695	0.010	105.209	239	209	201	63	117	108	2.0	0.834	
	25			105.349									
D 1	4:06 0	0.565	0.010	105.349	241	198	194	63	116	116	2.0	0.752	
2	5	0.615	0.010	105.515	241	204	213	63	115	116	2.0	0.784	
3	10	0.820	0.010	105.667	240	205	208	63	114	115	2.0	0.906	
4	15	0.900	0.010	105.813	238	208	201	63	115	115	2.0	0.949	
5	20	0.710	0.010	105.974	238	208	198	63	115	116	2.0	0.849	
	25			106.125									

Pape & Stemer Environmental Services

PLANT Gilroy Energy TEST TYPE 430 FIELD TEST DATA SHEET (Page 3 of 3)

Date 7/11/90
Test Location HRSGOut
Run Number 3
Stack Diameter 8'6" x 25'4"
Operator JS
Filter No. none

Barometric Pressure 29.36
Static in. wg. -0.53
Probe Type/Length SS/10'
Pitot Coefficient 0.84
Meter Box No./γ 779/1.0094
Nozzle No./Size straight

Impinger Volumes/Weights			
Contents	Final	Initial	Net
S.G.			
		Total	

Gas Composition			
Time	CO_2	O_2	CO
Leak Rate		cfm	"Hg
Initial			
Final		0.0010	2.5 nozzle dia

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	Temperature °F						Pump Vacuum in. Hg	$\sqrt{\Delta P}$	Comments
					Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out			
E 1	4:36 0	0.340	0.010	106.125	244	194	206	63	115	116	2.0	0.583	
2	5	0.665	0.010	106.275	247	198	208	63	112	114	2.0	0.815	
3	10	1.090	0.010	106.425	252	189	191	63	115	116	2.0	1.044	
4	15	0.755	0.010	106.574	252	189	196	63	115	116	2.0	0.869	
5	20	0.775	0.010	106.725	252	190	192	63	115	117	2.0	0.880	pitot ok
	25			106.879									
	126		0.010	3.891	234.60				116.94			0.8136	

Pape & Steiner Environmental Services

CONTINUOUS MONITOR DATA SHEET

Plant GILROY ENERGY COGEN
Date 7-10-90 Run No. CAL CHECKS / RUN 1
Test Location HRSG/CO INLET
Operator TD
Fuel Type NAT'L GAS Trailer No. 4

APCD Witness/Number
Generator Type
Burner Type
O_2 Controller Type
Gas Cylinder Nos. N_2 - 5667 / CO, CO_2, O_2 - 5256, 6305, 6871, IL23410,
NOx - 6721, 5588, 2062 / CO - AAL 9891

Time	Sample Point	Fuel Flow	Dry Uncorrected O_2 %	CO_2 %	CO ppm	SO_2 ppm	NO ppm	NO_x ppm	Response Time Up (sec)	Down (sec)	NO-NOx Converter Gas NO	NO2	NOx				Comments
			15.0	5.0	409.0			20.63									SPAN GAS VALUES
			—	—	8.01			80.12									LINEARITY CHK
			—	—	3.18			54.91						LEAK CHK = 0.000	3.0 FH	1+1 MED	
											38.02	16.98	54.91				CONVERTER CHECK
			0.0					0.0									INTS REFERENCE CHK.
									38.0	38.0							Response times
			0.0	—	8.05			79.2									EXT RESPONSE
					80.7			80.12									CAL Adjust
0854	B-6		14.44	3.35	42.0			19.0									
59	B-7		14.44	3.35	42.0			18.5									RUN 1
0904	B-8		14.44	3.35	39.5			18.6									
0909																	HRSG INLET
																	CO STUDY
0916	A-6		14.44	2.00	42.0			17.5									
21	7		14.44	2.20	42.0			17.2									
26	8		14.44	2.60	39.0			17.2									
31																	
0937	C-6		13.44	2.86	40.0			17.0									
42	7		13.94	2.86	39.0			17.0									
47	8		13.94	2.86	39.0			17.0									
52																	
			0.0	-0.79	0.0			-0.80									ZERO
			14.5	4.10	81.0			78.0									SPAN
			0.1	—	80.5			76.5									EXT. RESPONSE

Pape & Steiner Environmental Services

CONTINUOUS MONITOR DATA SHEET

Plant GILROY ENERGY
Date 7/10/90 Run No. 2
Test Location HRSG - OUTLET
Operator TD
Fuel Type NATURAL GAS Trailer No. 4

APCD Witness/Number
Generator Type
Burner Type
O_2 Controller Type
Gas Cylinder Nos. See pg. 1

Time	Sample Point	Fuel Flow	Dry Uncorrected						Response Time		NO-NOx Converter Gas						Comments
			O_2 %	CO_2 %	CO ppm	SO_2 ppm	NO ppm	NO_x ppm	Up (sec)	Down (sec)	NO	NO2	NOx				
			15.0	5.0	16.0			20.63									
			0.05	–	15.8			19.75									SPAN GAS VALUES EXTERNAL RESPONSE
1328	B-1		14.75	2.24	10.10			20.60									RUN 2
33	2		14.75	2.20	10.10			20.40									
38	3		14.75	2.10	10.30			20.00									
43	4		14.75	2.10	10.40			21.40									
48	5		14.75	2.05	10.80			21.75									
53																	
1359	A-1		14.75	2.00	8.20			22.25									
1404	2		14.75	2.00	8.70			22.25									
09	3		14.75	2.60	9.00			21.63									
14	4		14.75	2.00	9.00			21.50									
19	5		14.75	2.00	9.00			21.75									
1424																	
1430	E-1		14.75	2.00	9.40			22.63									
35	2		14.70	2.00	9.95			23.50									
40	3		14.75	2.00	9.70			24.00									
45	4		14.75	2.40	9.65			23.00									DRIFT PROBLEMS WITH CO_2 ANALYZER!
50	5		14.75	1.90	9.65			23.25									
55	CAL		0.0	-1.40	0.00			0.50									ZERO
			15.0	3.20	16.00			19.38									SPAN

Pape & Steiner Environmental Services

CONTINUOUS MONITOR DATA SHEET

Plant GILROY ENERGY
Date 7/10/90 Run No. 1
Test Location HRSG - OUT
Operator TD
Fuel Type NATURAL GAS Trailer No. 4

APCD Witness/Number
Generator Type
Burner Type
O_2 Controller Type
Gas Cylinder Nos. See pg. 1

Time	Sample Point	Fuel Flow	Dry Uncorrected O_2 %	CO_2 %	CO ppm	SO_2 ppm	NO ppm	NO_x ppm	Response Time Up (sec)	Response Time Down (sec)	NO-NOx Converter Gas NO	NO2	NOx				Comments
			15.0	5.0	16.0			80.12									
																	SPAN GAS VALUES
1515	C-1		13.25	3.20	10.60			27.0									CHANGE NOx Scale
20	2		13.25	3.20	10.00			27.5									
25	3		13.25	3.20	10.40			27.0									
30	4		13.25	3.20	10.50			28.0									
35	5		13.25	3.20	11.10			28.0									
1542	D-1		13.25	4.00	11.20			29.0									
47	2		13.25	3.20	12.00			29.0									
52	3		13.25	3.20	12.40			29.5									
57	4		13.25	3.20	11.90			31.0									
1602	5		13.25	3.20	11.95			31.0									
1607			0.0	-0.25	-0.05			0.0									ZERO
			14.95	4.70	16.0			79.0									SPAN
			0.10	—	15.85			76.5									EXT. RESPONSE

Pape & Stenner Environmental Services

CONTINUOUS MONITOR DATA SHEET

Plant GILROY ENERGY COGEN
Date 7/11/90 Run No. 2
Test Location HRSG - OUT
Operator TD
Fuel Type NAT'L GAS Trailer No. 4

APCD Witness/Number
Generator Type
Burner Type
O_2 Controller Type
Gas Cylinder Nos.

Time	Sample Point	Fuel Flow	Dry Uncorrected O_2 %	Dry Uncorrected CO_2 %	Dry Uncorrected CO ppm	Dry Uncorrected SO_2 ppm	Dry Uncorrected NO ppm	Dry Uncorrected NO_x ppm	Response Time Up (sec)	Response Time Down (sec)	NO-NOx Converter Gas NO	NO2	NOx				Comments
			15.0	5.0	16.0			80.0									SPAN GAS VALUES
			0.10	–	16.0			78.0									External response
0800	B - 1		14.75	3.30	12.4			33.0									RUN 2
05	2		14.50	3.40	13.6			31.0									
10	3		14.50	3.80	14.8			31.0									CO_2 offset on
15	4		14.50	3.80	15.4			31.0									chart = -1.0%.
20	5		14.50	3.80	15.4			31.0									
25																	
0830	A - 1		14.5	3.70	12.4			30.0									
0835	2		14.5	3.70	12.4			30.0									
40	3		14.5	3.70	12.8			30.0									
45	4		14.5	3.70	13.3			30.0									
50	5		14.5	3.70	12.8			30.0									
55																	
0900	B - 1		14.50	3.36	15.35			29.50									
05	2		14.50	3.36	13.50			29.0									
10	3		14.50	3.36	13.40			29.0									
15	4		14.50	3.36	13.30			28.5									
20	5		14.50	3.36	13.30			28.5									
25																	
			0.0	0.00	0.00			5.0									ZERO
			15.0	4.00	15.85			78.0									SPAN

Pape & Steiner Environmental Services

CONTINUOUS MONITOR DATA SHEET

Plant GILROY ENERGY COGEN
Date 7/11/90 Run No. 2 - 3
Test Location HRSG - OUT
Operator TD
Fuel Type NAT'L GAS Trailer No. 4

APCD Witness/Number
Generator Type
Burner Type
O_2 Controller Type
Gas Cylinder Nos. N_2 - ALM 5667 / CO-CO_2-O_2 - 6781, 11-23410, ALM-5256, ALM 63035
NOx - ALM 6721, 5588.2662 CO/ALM 9871

Time	Sample Point	Fuel Flow	Dry Uncorrected O_2 %	CO_2 %	CO ppm	SO_2 ppm	NO ppm	NO_x ppm	Response Time Up (sec)	Response Time Down (sec)	NO-NOx Converter Gas NO	NO2	NOx				Comments
			15.0	5.0	16.0			60.12									SPAN GAS VALUES
1236	E - 1		14.75	3.26	14.35			24.5									
41	2		14.75	3.26	14.60			25.0									
46	3		14.75	3.26	15.20			25.5									
51	4		14.75	3.26	11.80			25.5									
56	5		14.75	3.26	11.80			25.6									23735 FG-A11
1301																	
1307	C - 1		14.70	3.20	11.10			26.0									
12	2		14.70	3.24	12.40			26.5									
17	3		14.70	3.24	12.40			26.5									
22	4		14.70	3.24	11.80			27.0									
25	5		14.70	3.24	11.80			27.0									
30																	
			0.0	0.30	0.03			2.7									ZERO
			14.95	5.30	16.13			76.0									SPAN
1433	B - 1		14.63	3.20	7.25			25.0									RUN 3
38	2		14.60	3.20	7.80			26.0									
43	3		14.60	3.20	8.20			26.0									
48	4		14.60	3.20	8.20			26.5									
53	5		14.60	3.20	8.20			26.8									

Pape & Steiner Environmental Services

CONTINUOUS MONITOR DATA SHEET

Plant GILROY ENERGY COGEN
Date 7/11/90 Run No. 3
Test Location HRSG - OUT
Operator TD
Fuel Type NAT'L GAS Trailer No. 4

APCD Witness/Number
Generator Type
Burner Type
O_2 Controller Type
Gas Cylinder Nos.

Time	Sample Point	Fuel Flow	Dry Uncorrected						Response Time		NO-NOx Converter Gas						Comments
			O_2 %	CO_2 %	CO ppm	SO_2 ppm	NO ppm	NO_x ppm	Up (sec)	Down (sec)	NO	NO2	NOx				
			15.0	5.0	16.0			80.12									SPAN GAS VALUES
1503	port A-1		14.50	3.10	6.95			27.0									
08	2		14.50	3.00	6.95			27.5									
13	3		14.50	3.34	7.20			28.0									
18	4		14.50	3.34	7.40			28.0									
23	5		14.50	3.34	7.35			28.3									
28																	
1533	E - 1		14.50	3.40	8.75			25.0									
38	2		14.50	3.40	8.60			25.5									
43	3		14.50	3.40	8.90			26.0									
48	4		14.50	3.40	9.30			26.0									
53	5		14.50	3.40	9.80			26.0									
58																	
1607	C - 1		14.50	3.40	8.40			26.0									
12	2		14.50	3.40	8.60			25.0									
17	3		14.50	3.40	8.60			24.8									
22	4		14.50	3.40	8.30			24.8									
27	5		14.50	3.40	8.65			24.7									
32																	

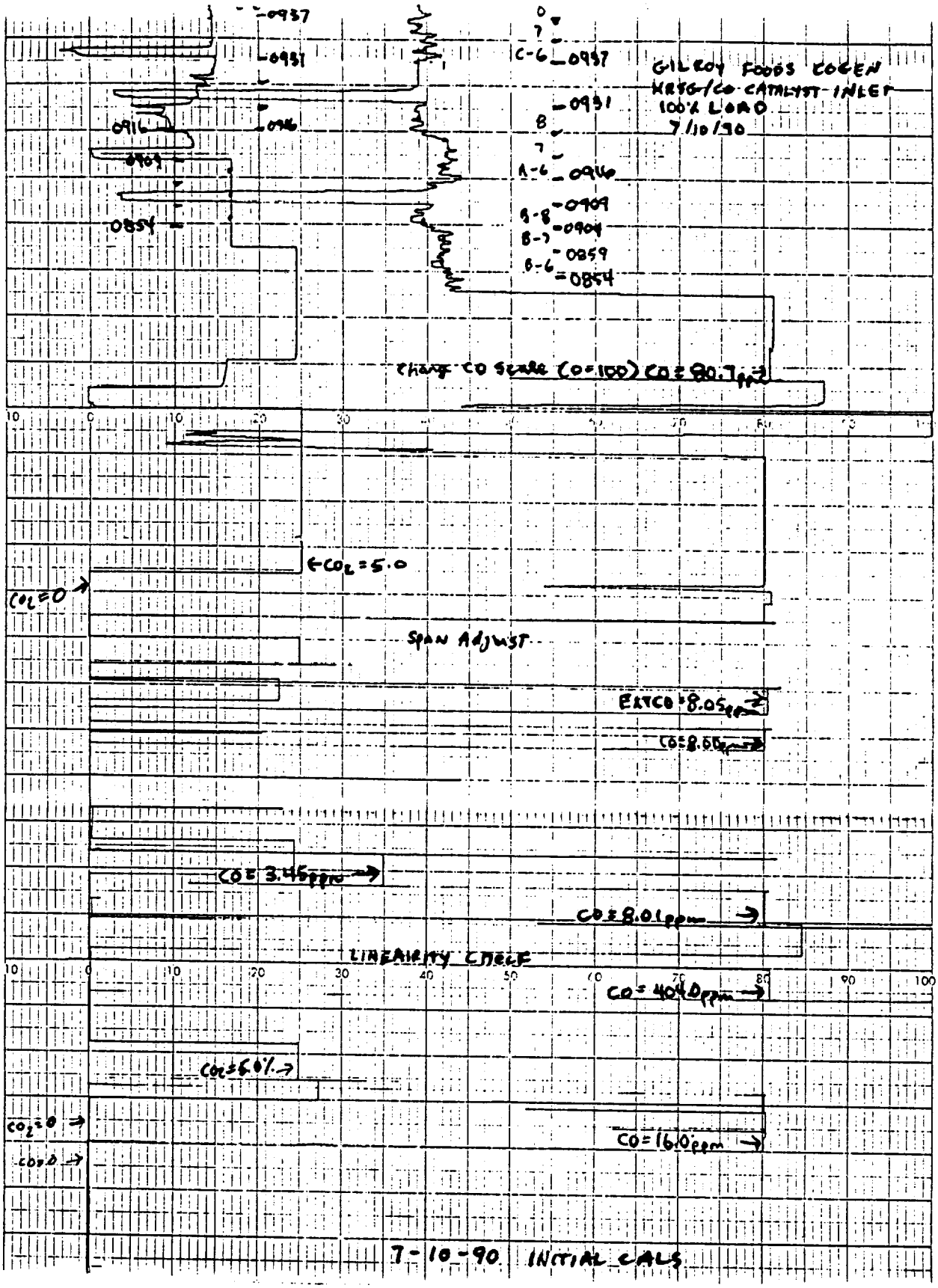
Pape & Stoner Environmental Services

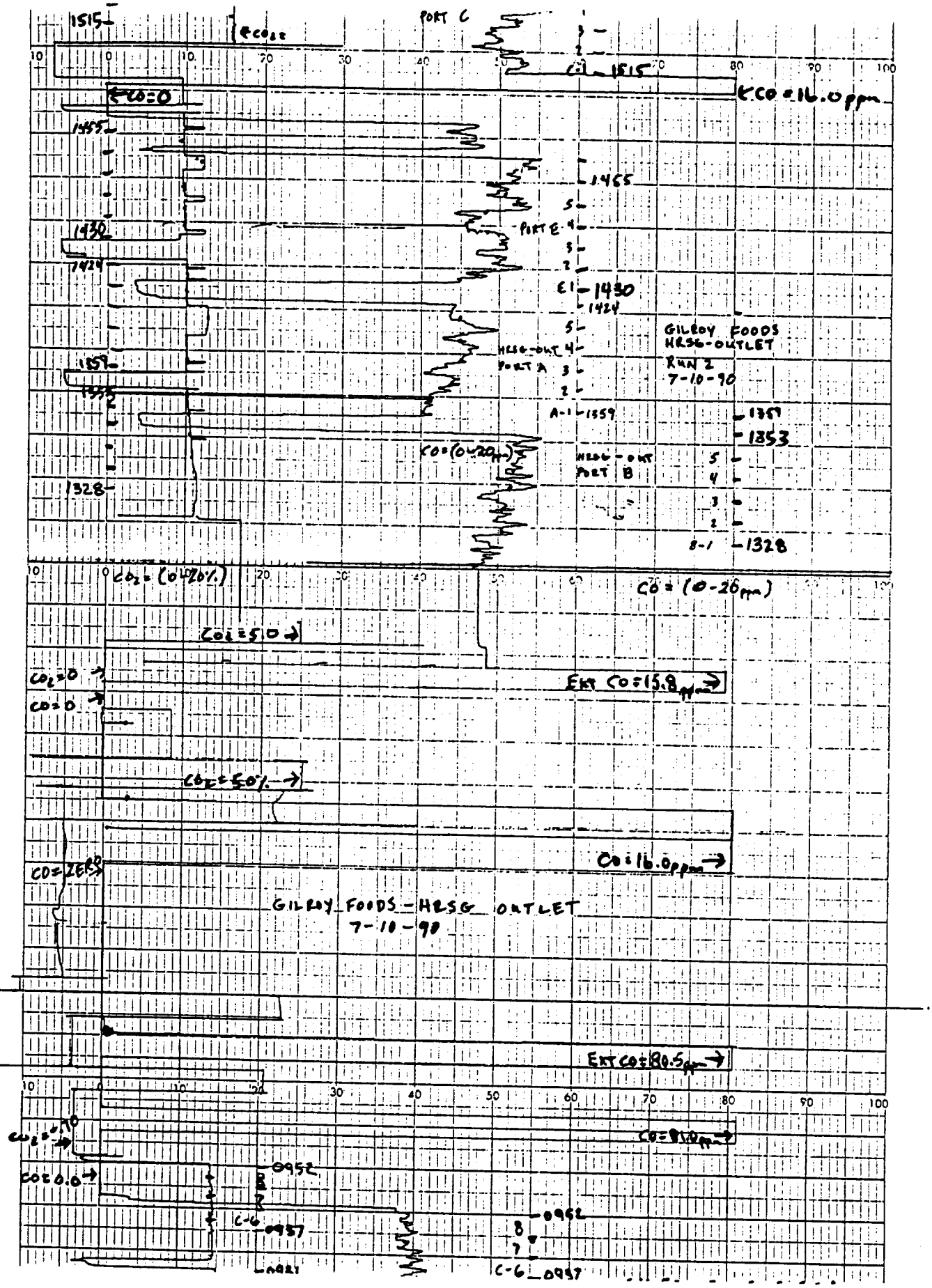
CONTINUOUS MONITOR DATA SHEET

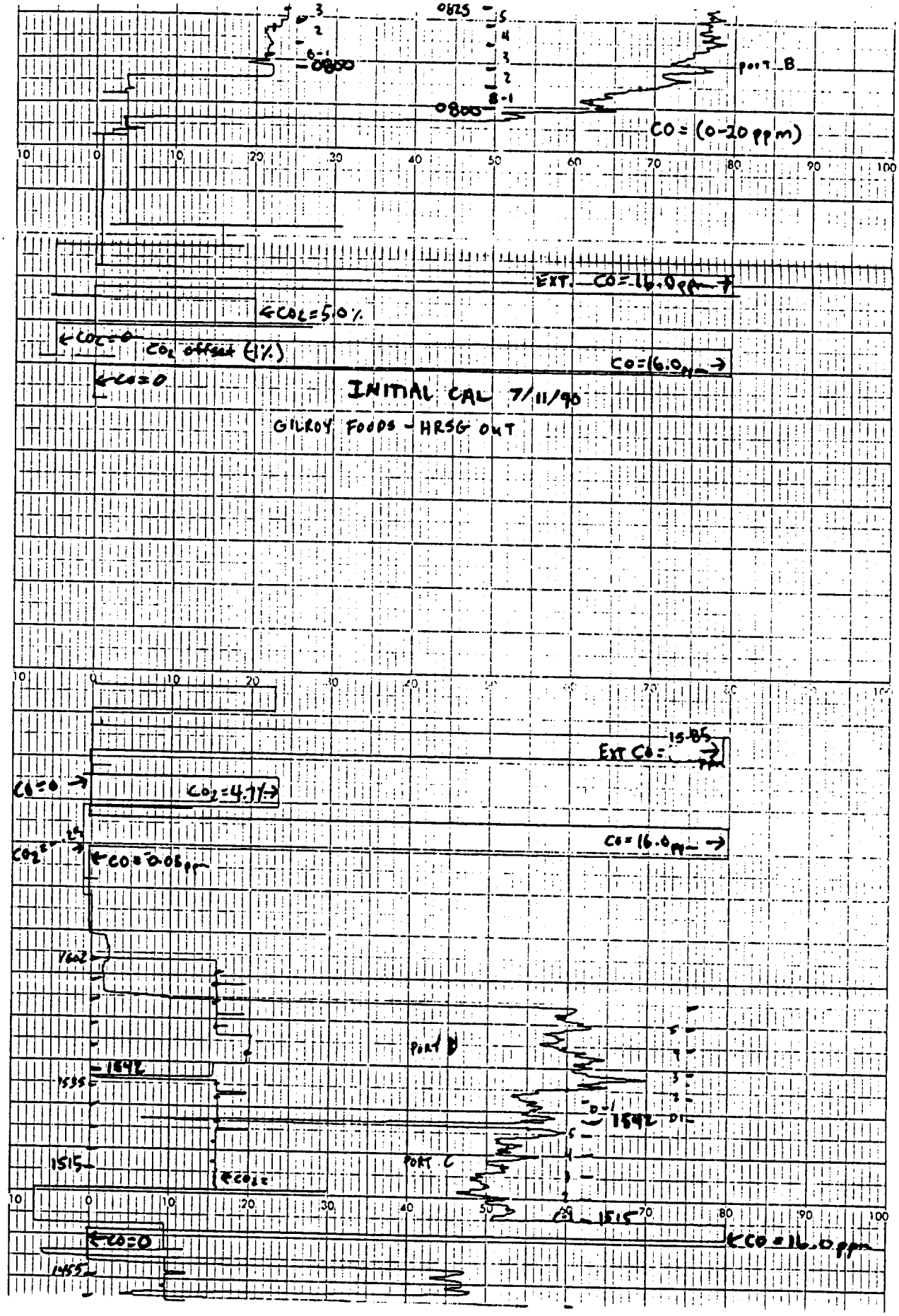
Plant GILROY ENERGY COGEN
Date 7-11-90 Run No. 3
Test Location HRSG - OUT
Operator TD
Fuel Type NAT'L GAS Trailer No. 4

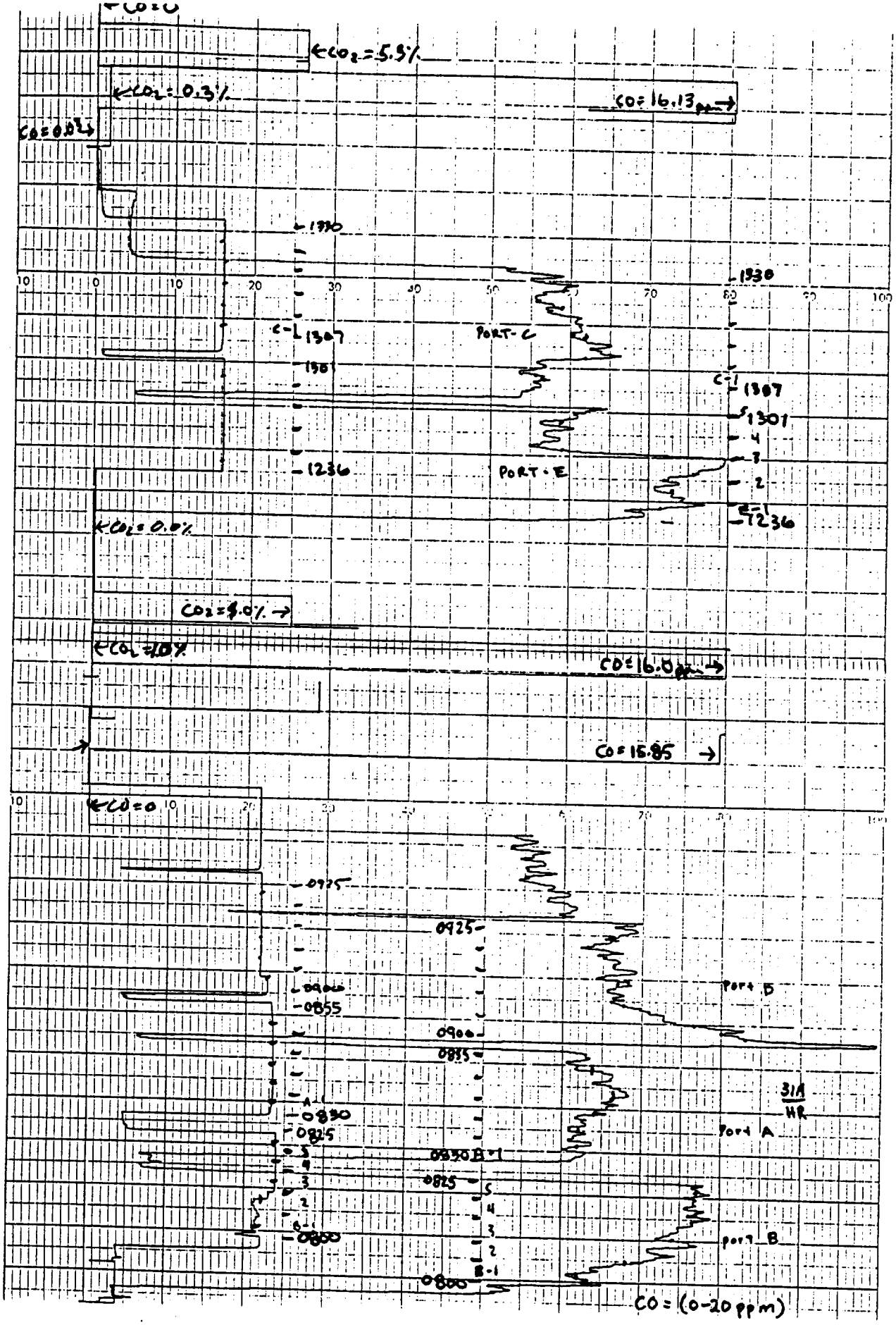
APCD Witness/Number
Generator Type
Burner Type
O_2 Controller Type
Gas Cylinder Nos.

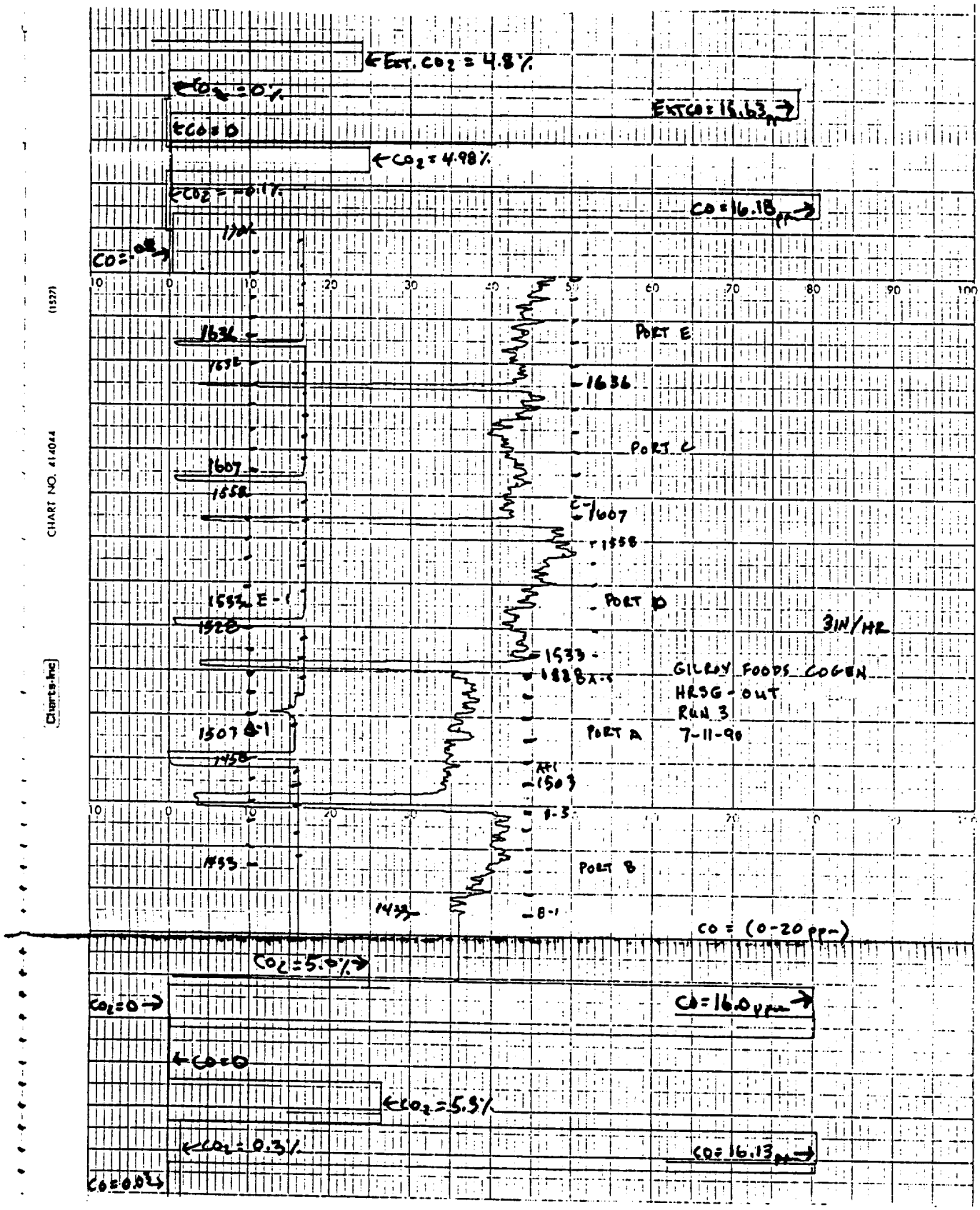
Time	Sample Point	Fuel Flow	Dry Uncorrected O_2 %	CO_2 %	CO ppm	SO_2 ppm	NO ppm	NO_x ppm	Response Time Up (sec)	Response Time Down (sec)	NO-NOx Converter Gas NO	NO2	NOx				Comments
			15.00	5.0	16.0			80.12									
																	SPAN VALUES
1636	D - 1		14.43	3.34	8.80			24.5									
41	2		14.43	3.34	8.60			25.0									
46	3		14.43	3.34	8.80			25.0									
51	4		14.43	3.34	8.85			25.5									
56	5		14.43	3.34	9.20			25.0									
1701																	
			0.06	-0.1	0.08			0.0									ZERO
			15.00	4.98	16.18			78.5									SPAN
			14.80	4.80	15.63			75.1									EXTERNAL RESP.

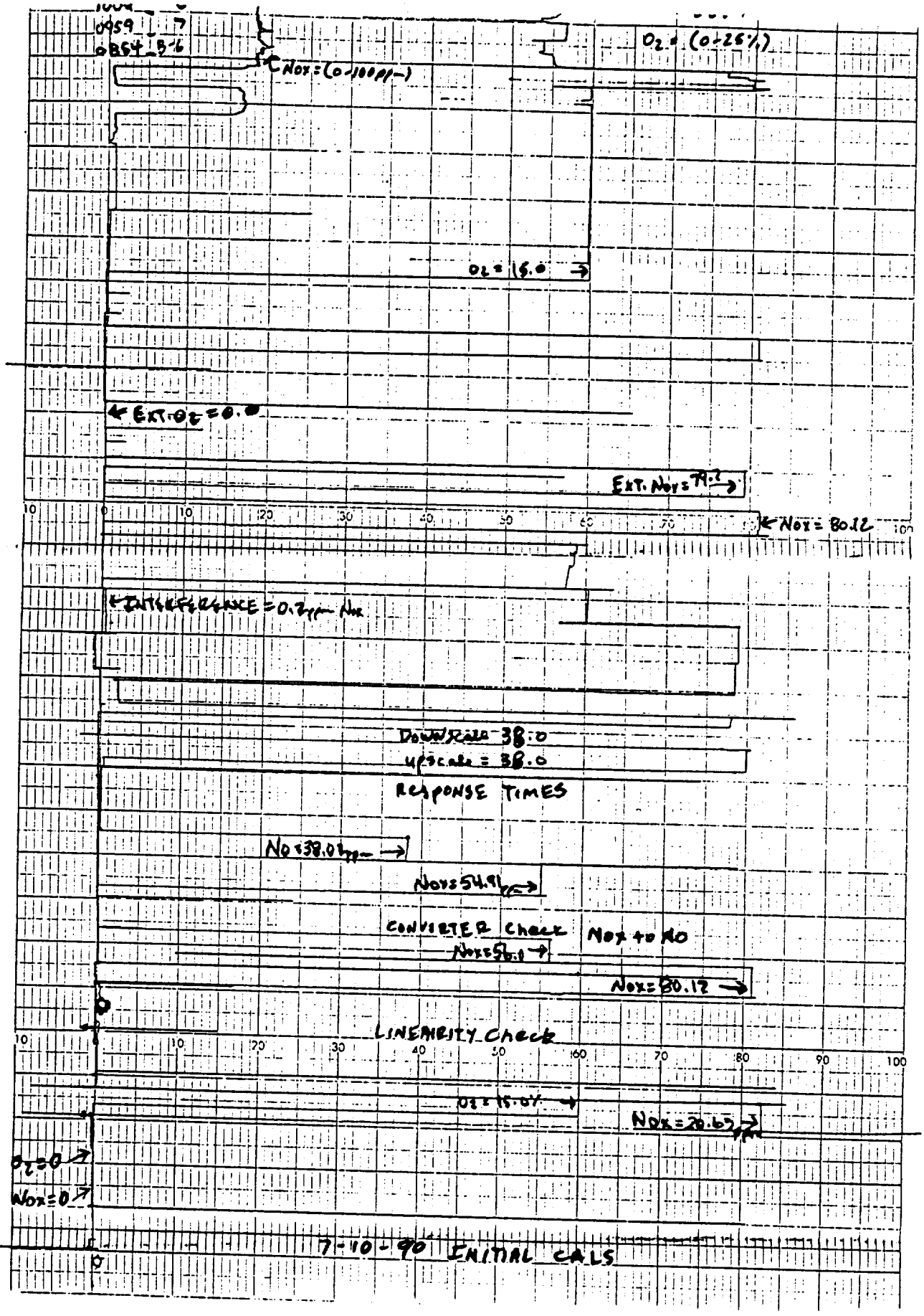

GILROY FOODS COGEN
HRSG/CO CATALYST INLET
100% LOAD
7/10/90
C-6 0937
B 0931
A-6 0916
B-8 0909
B-7 0904
B-6 0859
0854
CHART CO SCALE (0=100) CO=80.7ppm
CO2=5.0
CO2=0
SPAN ADJUST
EXTCO=8.05ppm
CO=8.01ppm
CO=3.45ppm
CO=8.01ppm
LINEARITY CHECK
CO=40.0ppm
CO2=6%
CO2=0
CO=0
CO=16.0ppm
7-10-90 INITIAL CALS
CHART NO. 41404
(1527)
Charts Inc
CHART NO. 41404


1515
1455
1430
1424
1359
1328
CO=0
PORT C
C-1 1515
EXT CO=16.0 ppm
1465
PORT E
E-1 1430
1424
GILROY FOODS
HRSG-OUTLET
RUN 2
7-10-90
HRSG-OUT
PORT A
A-1 1359
1359
1353
HRSG-OUT
PORT B
B-1 1328
CO2=(0-20%)
CO=(0-20ppm)
CO2=5.0
CO2=0
CO=0
EXT CO=15.8ppm
CO2=50%
CO=16.0ppm
CO=ZERO
GILROY FOODS - HRSG OUTLET
7-10-90
EXT CO=80.5ppm
CO=81.0ppm
CO2=7.0
CO=0.0
0952
C-6
0957
0952
C-6 0957


0825
0800
port B
CO = (0-20 ppm)
EXT. CO = 16.0 ppm
CO2 = 5.0%
CO2 = 0 CO2 offset (-1%)
CO = 16.0 ppm
CO = 0
INITIAL CAL 7/11/90
GILROY FOODS - HRSG OUT
EXT CO =
CO = 0
CO2 = 4.7%
CO = 16.0 ppm
CO2 =
CO = 0.05 ppm
1602
1535
1542
port C
1515
CO = 0
CO = 16.0 ppm
1455




EST. CO2 = 4.8%
CO2 = 0%
EST CO = 15.63 PPM
CO = 0
CO2 = 4.98%
CO2 = 0.1%
CO = 16.18 PPM
1636
1607
1558
1533
1503
1453
PORT E
PORT C
PORT D
PORT A
PORT B
3IN/HR
GILROY FOODS COGEN
HRSG - OUT
RUN 3
7-11-90
CO = (0-20 PPM)
CO2 = 5.0%
CO = 16.0 PPM
CO2 = 0
CO = 0
CO2 = 5.5%
CO2 = 0.3%
CO = 16.13 PPM
CHART NO. 41404
Charts Inc


0959
0854 - 9-6
NOx = (0-1000 PPM)
O2 = (0-25%)
O2 = 15.0
EXT. O2 = 0.0
EXT. NOx = 79.2
NOx = 80.12
INTERFERENCE = 0.3% NOx
DOWNSCALE 38.0
UPSCALE = 38.0
RESPONSE TIMES
NO = 38.0 PPM
NOx = 54.9 PPM
CONVERTER CHECK NOx to NO
NOx = 80.1
NOx = 80.12
LINEARITY CHECK
O2 = 15.0%
NOx = 20.67 PPM
O2 = 0
NOx = 0
7-10-90 INITIAL CALS
CHART NO. 41044
Charts, Inc.
(1527)
CHART NO. 41.1044

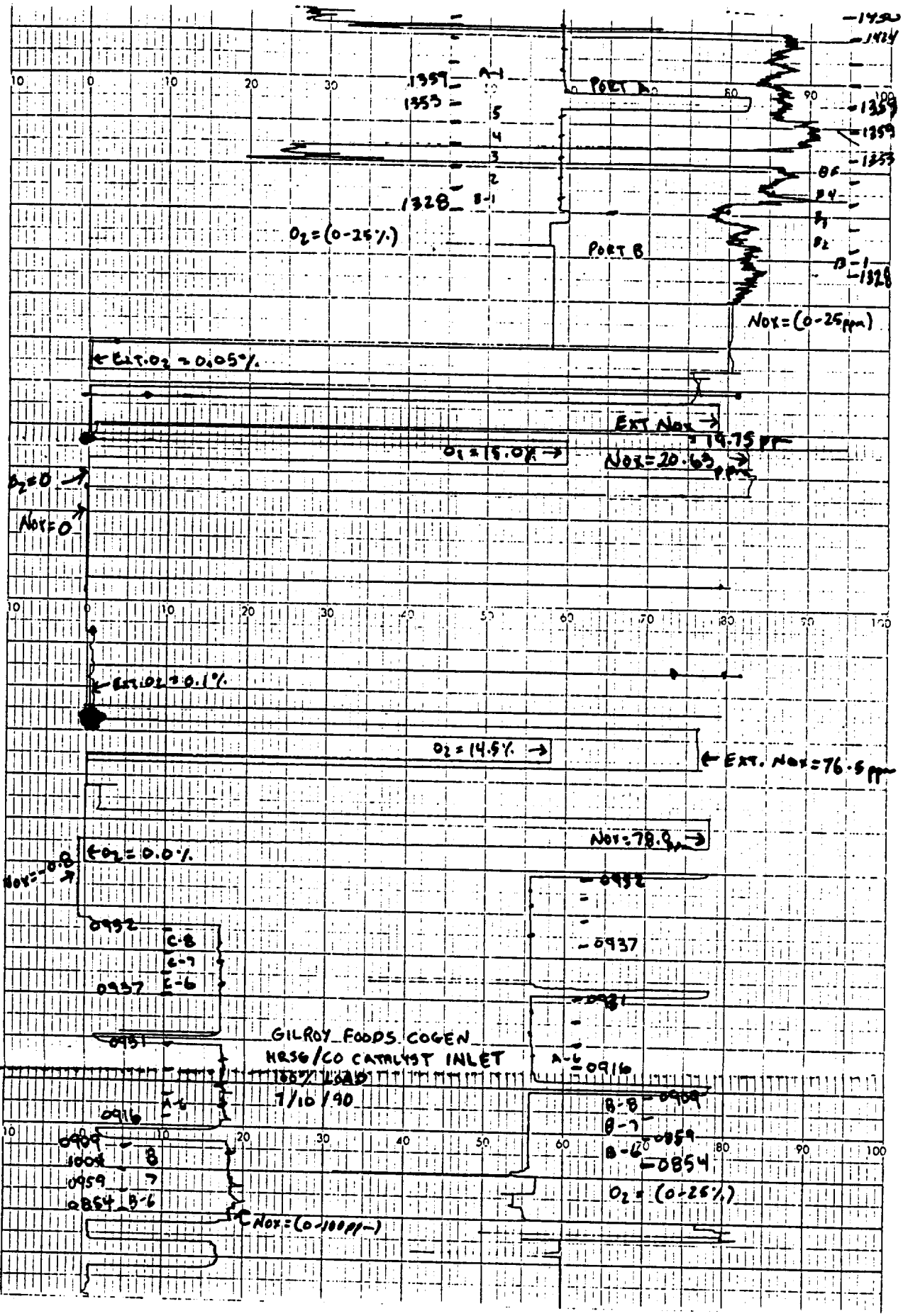
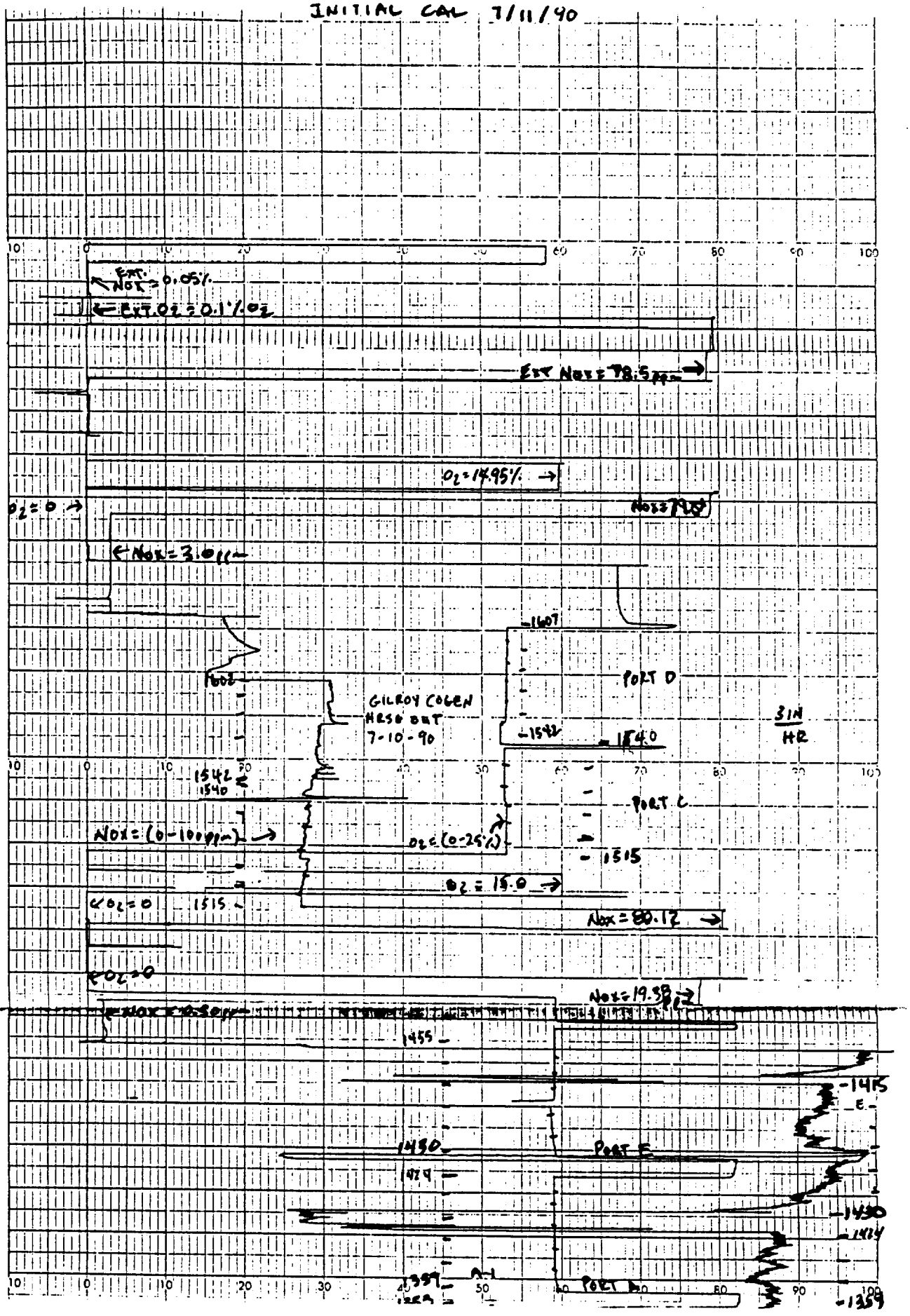
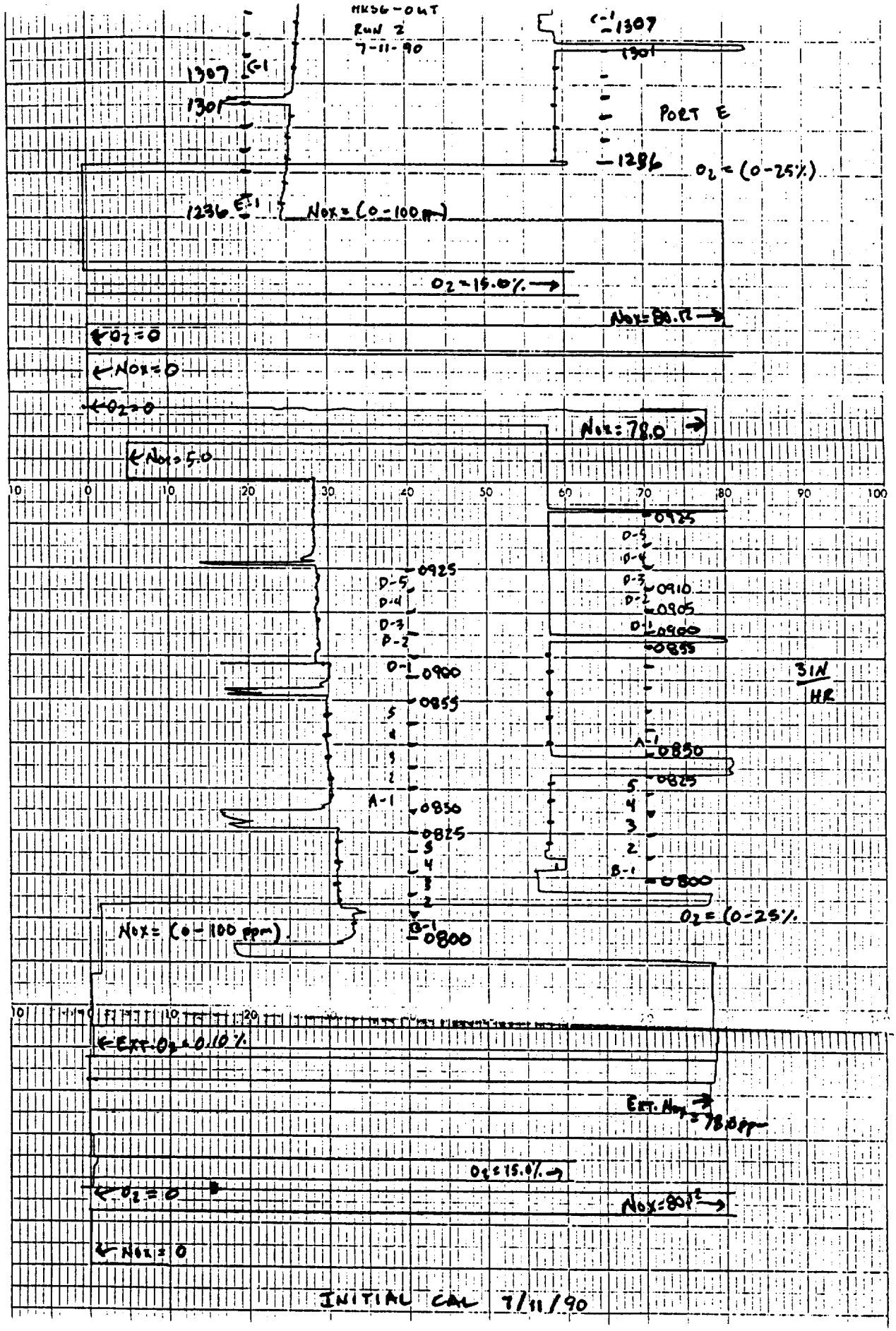
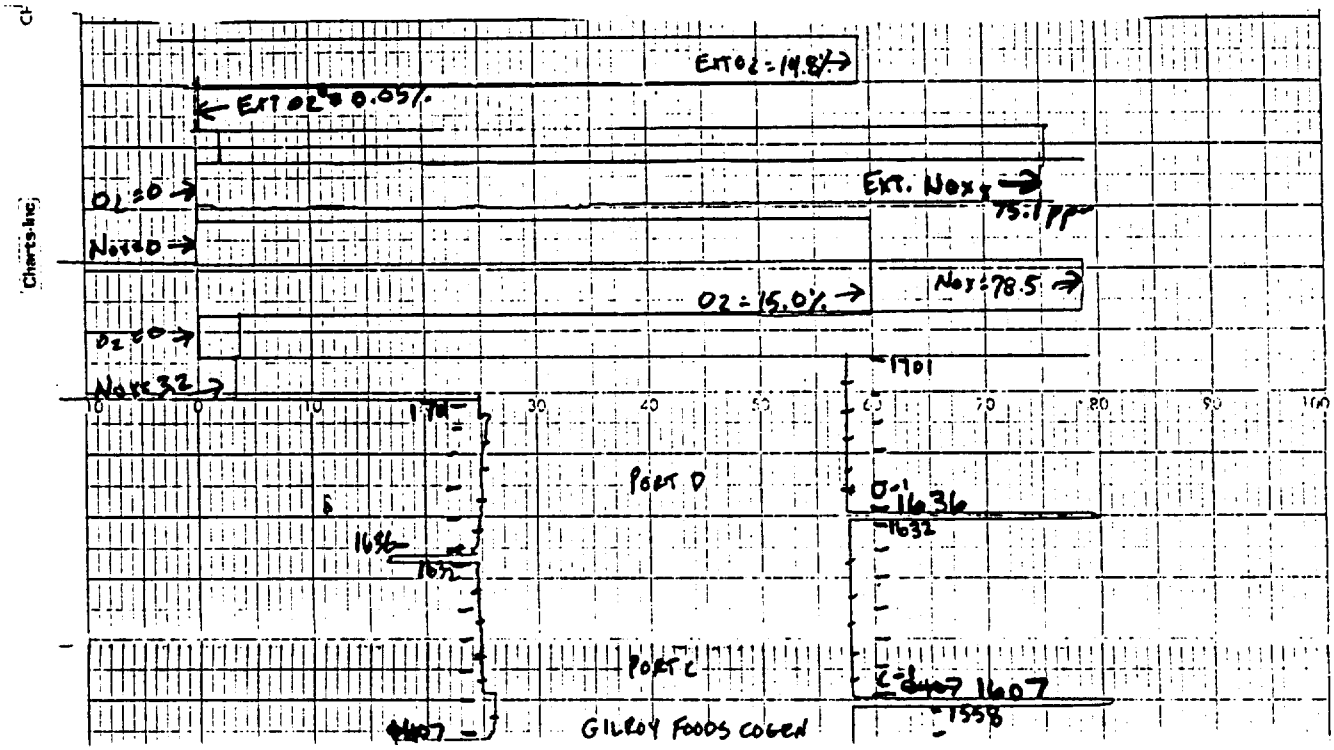


CHART NO. 414044
Charts Inc
1359
1353
1328
PORT A
PORT B
O_2 = (0-25%)
NOx = (0-25 ppm)
Ext. O_2 = 0.05%
Ext NOx → 19.75 ppm
O_2 = 15.0% →
NOx = 20.63 ppm →
O_2 = 0
NOx = 0
Ext. O_2 = 0.1%
O_2 = 14.5% →
← Ext. NOx = 76.5 ppm
NOx = 78.9 ppm →
Ext O_2 = 0.0%
NOx = 0.0
0932
0937
0951
0916
0909
1008
0959
0854
C-8
C-7
C-6
A-6
B-8
B-7
B-6
GILROY FOODS COGEN
HRSG/CO CATALYST INLET
100% LOAD
7/10/90
NOx = (0-100 ppm)
O_2 = (0-25%)


INITIAL CAL 7/11/90
EXT. NOx = 0.05%
← EXT. O2 = 0.1% O2
EXT NOx = 78.5 ppm →
O2 = 14.95% →
O2 = 0 →
NOx = 7.58
← NOx = 3.0 ppm
1607
PORT D
GILROY COGEN
HRSG OUT
7-10-90
1542
1540
1540
3 IN
HR
NOx = (0-100 ppm) →
O2 = (0-25%)
PORT C
1515
O2 = 15.0 →
O2 = 0
1515
NOx = 80.12 →
O2 = 0
NOx = 19.58 ppm →
1455
1415
E
1430
PORT E
1414
1430
1414
1359
PORT B
1359
(1527)
CHART NO. 41404
Charts-Inc


MK56-OUT
RUN 2
7-11-90
1307
1301
1236
PORT E
O_2 = (0-25%)
NOx = (0-100 ppm)
O_2 = 15.0%
NOx = 80.12
O_2 = 0
NOx = 0
O_2 = 0
NOx = 78.0
NOx = 5.0
0925
0910
0905
0900
0855
0850
0825
0800
D-5
D-4
D-3
D-2
D-1
A-1
B-1
5
4
3
2
1
3 IN / HR
O_2 = (0-25%)
NOx = (0-100 ppm)
EXT. O_2 = 0.10%
EXT. NOx = 78.0 ppm
O_2 = 15.0%
O_2 = 0
NOx = 80.12
NOx = 0
INITIAL CAL 7/11/90
CHART NO. 414044
(1527)
Charts-Inc


Ext O2 = 14.8%
Ext O2 = 0.05%
O2 = 0
Nox = 0
Ext. Nox =
75.1 ppm
O2 = 15.0%
Nox = 78.5
O2 = 0
Nox = 32
1701
1636
1632
1696
1692
PORT D
PORT C
1607
1558
GILROY FOODS COGEN

A. CALIBRATION AND CORRECTION DATA

Company : GILROY ENERGY
Source : CO CATALYST INLET
Date : 7/10/90
Test Run : 1
Test Condition: GAS 100%

	Concentration : Drift Uncorrected (A) / Corrected (B)									
	%O2		%CO2		ppm CO		ppm SO2		ppm NOx	
Point #	A	B	A	B	A	B	A	B	A	B
1	14.44	14.47	3.35	3.40	42.00	41.99			19.00	19.06
2	14.44	14.52	3.35	3.49	42.00	41.97			18.50	18.68
3	14.44	14.57	3.35	3.58	39.50	39.46			18.00	18.31
4	14.44	14.63	2.00	2.31	42.00	41.94			17.50	17.93
5	14.44	14.68	2.20	2.60	42.00	41.92			17.20	17.75
6	14.44	14.74	2.60	3.10	39.00	38.91			17.20	17.87
7	13.94	14.28	2.86	3.47	40.00	39.89			17.00	17.79
8	13.94	14.34	2.86	3.56	39.00	38.88			17.00	17.91
9	13.94	14.39	2.86	3.66	39.00	38.86			17.00	18.04
MEAN		14.51		3.24		40.43				18.15

	%O2	%CO2	ppm CO	ppm SO2	ppm NOx
Zero Check	0.00	-0.70	0.00		-0.80
Span Check	14.50	4.10	81.00		78.00
Cal. Gas	15.00	5.00	80.70		80.12
Scf	-0.00370	-0.00444	0.00041		-0.00183
Zcf	0.00000	-0.07778	0.00000		-0.08889

Scf, Span Drift Correction Factor = (% Drift / 100) / # of Readings

Zcf, Zero Drift Correction Factor = Zero Drift / # of Readings

Cz, Zero Corr. Concentration = measured value - [Zcf x (Point # - 0.5)]

B, Corrected Concentration = Cz / [1 + (Scf x (Point # - 0.5))]

A. CALIBRATION AND CORRECTION DATA

Company : GILROY ENERGY
Source : HRSG OUTLET
Date : 7/10/90
Test Run : 1A
Test Condition: GAS 100%

Concentration : Drift Uncorrected (A) / Corrected (B)

Point #	%O2 A	%O2 B	%CO2 A	%CO2 B	ppm CO A	ppm CO B	ppm SO2 A	ppm SO2 B	ppm NOx A	ppm NOx B
1	14.75		2.24	2.29	10.10				20.60	20.64
2	14.75		2.20	2.36	10.10				20.40	20.52
3	14.75		2.10	2.36	10.30				20.00	20.20
4	14.75		2.10	2.47	10.40				21.40	21.71
5	14.75		2.05	2.53	10.60				21.75	22.16
6	14.75		2.00	2.59	8.20				22.25	22.78
7	14.75		2.00	2.70	8.70				22.25	22.87
8	14.75		2.60	3.44	9.00				21.63	22.33
9	14.75		2.00	2.93	9.00				21.50	22.29
10	14.75		2.00	3.04	9.00				21.75	22.65
11	14.75		2.00	3.16	9.40				22.63	23.69
12	14.75		2.00	3.27	9.95				23.50	24.72
13	14.75		2.00	3.39	9.70				24.00	25.38
14	14.75		2.40	3.94	9.65				23.00	24.41
15	14.75		1.90	3.53	9.65				23.25	24.80
MEAN	14.75			2.93	9.58					22.74

	%O2	%CO2	ppm CO	ppm SO2	ppm NOx
Zero Check	0.00	-1.40	0.00		0.50
Span Check	15.00	3.20	16.00		19.38
Cal. Gas	15.00	5.00	16.00		20.63
Scf		-0.00533			-0.00566
Zcf		-0.09333			0.03333

Scf, Span Drift Correction Factor = (% Drift / 100) / # of Readings

Zcf, Zero Drift Correction Factor = Zero Drift / # of Readings

Cz, Zero Corr. Concentration = measured value - [Zcf x (Point # - 0.5)]

B, Corrected Concentration = Cz / [1 + (Scf x (Point # - 0.5))]

A. CALIBRATION AND CORRECTION DATA

Company : GILROY ENERGY
Source : HRSG OUTLET
Date : 7/10/90
Test Run : 1B
Test Condition: GAS 100%

	Concentration : Drift Uncorrected (A) / Corrected (B)									
	%O2		%CO2		ppm CO		ppm SO2		ppm NOx	
Point #	A	B	A	B	A	B	A	B	A	B
1	13.25	13.25	3.20	3.21	10.60	10.60			27.00	27.02
2	13.25	13.26	3.20	3.24	10.00	10.00			27.50	27.56
3	13.25	13.26	3.20	3.27	10.40	10.40			27.00	27.09
4	13.25	13.27	3.20	3.30	10.50	10.51			28.00	28.14
5	13.25	13.27	3.20	3.33	11.10	11.11			28.00	28.18
6	13.25	13.27	4.00	4.16	11.20	11.21			29.00	29.22
7	13.25	13.28	3.20	3.38	12.00	12.01			29.00	29.27
8	13.25	13.28	3.20	3.41	12.40	12.41			29.50	29.81
9	13.25	13.29	3.20	3.44	11.90	11.91			31.00	31.37
10	13.25	13.29	3.20	3.47	11.95	11.96			31.00	31.42
MEAN		13.27		3.42		11.21				28.91

	%O2	%CO2	ppm CO	ppm SO2	ppm NOx
Zero Check	0.00	-0.25	-0.05		0.00
Span Check	14.95	4.70	16.00		79.00
Cal. Gas	15.00	5.00	16.00		80.12
Scf	-0.00033	-0.00100	0.00031		-0.00140
Zcf	0.00000	-0.02500	-0.00500		0.00000

Scf, Span Drift Correction Factor = (% Drift / 100) / # of Readings

Zcf, Zero Drift Correction Factor = Zero Drift / # of Readings

Cz, Zero Corr. Concentration = measured value - [Zcf x (Point # - 0.5)]

B, Corrected Concentration = Cz / [1 + (Scf x (Point # - 0.5))]

A. CALIBRATION AND CORRECTION DATA

Company : GILROY ENERGY
Source : HRSG OUTLET
Date : 7/11/90
Test Run : 2A
Test Condition: GAS 100%

Concentration : Drift Uncorrected (A) / Corrected (B)

Point #	%O2 A	%O2 B	%CO2 A	%CO2 B	ppm CO A	ppm CO B	ppm SO2 A	ppm SO2 B	ppm NOx A	ppm NOx B
1	14.75		3.30	3.31	12.40	12.40			33.00	32.93
2	14.50		3.40	3.44	13.60	13.61			31.00	30.77
3	14.50		3.80	3.89	14.80	14.82			31.00	30.62
4	14.50		3.80	3.93	15.40	15.43			31.00	30.47
5	14.50		3.80	3.98	15.40	15.44			31.00	30.31
6	14.50		3.70	3.91	12.40	12.44			30.00	29.12
7	14.50		3.70	3.95	12.40	12.45			30.00	28.95
8	14.50		3.70	4.00	12.80	12.86			30.00	28.78
9	14.50		3.70	4.05	13.30	13.37			30.00	28.61
10	14.50		3.70	4.11	12.80	12.88			30.00	28.43
11	14.50		3.36	3.69	15.35	15.45			29.50	27.72
12	14.50		3.36	3.74	13.50	13.60			29.00	27.01
13	14.50		3.36	3.79	13.40	13.51			29.00	26.82
14	14.50		3.36	3.84	13.30	13.41			28.50	26.09
15	14.50		3.36	3.90	13.30	13.42			28.50	25.89
MEAN	14.52			3.84		13.67				28.83

	%O2	%CO2	ppm CO	ppm SO2	ppm NOx
Zero Check	0.00	1.00	0.00		5.00
Span Check	15.00	4.00	15.85		78.00
Cal. Gas	15.00	5.00	16.00		80.12
Scf		-0.02667	-0.00062		-0.00592
Zcf		0.06667	0.00000		0.33333

Scf, Span Drift Correction Factor = (% Drift / 100) / # of Readings

Zcf, Zero Drift Correction Factor = Zero Drift / # of Readings

Cz, Zero Corr. Concentration = measured value - [Zcf x (Point # - 0.5)]

B, Corrected Concentration = Cz / [1 + (Scf x (Point # - 0.5))]

A. CALIBRATION AND CORRECTION DATA

Company : GILROY ENERGY
Source : HRSG OUTLET
Date : 7/11/90
Test Run : 2B
Test Condition: GAS 100%

	Concentration : Drift Uncorrected (A) / Corrected (B)									
	%O2		%CO2		ppm CO		ppm SO2		ppm NOx	
Point #	A	B	A	B	A	B	A	B	A	B
1	14.75	14.75	3.26		14.35	14.34			24.50	24.47
2	14.75	14.76	3.26		14.60	14.58			25.00	24.91
3	14.75	14.76	3.26		15.20	15.17			25.50	25.36
4	14.75	14.77	3.26		11.80	11.76			25.50	25.31
5	14.75	14.77	3.26		11.80	11.75			25.60	25.36
6	14.70	14.73	3.20		11.10	11.05			26.00	25.72
7	14.70	14.73	3.24		12.40	12.33			26.50	26.19
8	14.70	14.74	3.24		12.40	12.32			26.50	26.14
9	14.70	14.74	3.24		11.80	11.71			27.00	26.63
10	14.70	14.75	3.24		11.80	11.70			27.00	26.58
MEAN		14.75	3.25			12.67				25.67

	%O2	%CO2	ppm CO	ppm SO2	ppm NOx
Zero Check	0.00	0.30	0.03		2.70
Span Check	14.95	5.30	16.13		76.00
Cal. Gas	15.00	5.00	16.00		80.12
Scf	-0.00033		0.00062		-0.00851
Zcf	0.00000		0.00300		0.27000

Scf, Span Drift Correction Factor = (% Drift / 100) / # of Readings

Zcf, Zero Drift Correction Factor = Zero Drift / # of Readings

Cz, Zero Corr. Concentration = measured value - [Zcf x (Point # - 0.5)]

B, Corrected Concentration = Cz / [1 + (Scf x (Point # - 0.5))]

A. CALIBRATION AND CORRECTION DATA

Company : GILROY ENERGY
Source : HRSG OUTLET
Date : 7/11/90
Test Run : 3
Test Condition: GAS 100%

Concentration : Drift Uncorrected (A) / Corrected (B)

Point #	%O2 A	%O2 B	%CO2 A	%CO2 B	ppm CO A	ppm CO B	ppm SO2 A	ppm SO2 B	ppm NOx A	ppm NOx B
1	14.63		3.20	3.20	7.25	7.25			25.00	25.01
2	14.60		3.20	3.20	7.80	7.79			26.00	26.03
3	14.60		3.20	3.20	8.20	8.19			26.00	26.05
4	14.60		3.20	3.21	8.20	8.18			26.50	26.58
5	14.60		3.20	3.21	8.20	8.18			26.80	26.90
6	14.50		3.10	3.11	6.95	6.92			27.00	27.12
7	14.50		3.00	3.01	6.95	6.92			27.50	27.65
8	14.50		3.34	3.35	7.20	7.16			28.00	28.17
9	14.50		3.34	3.36	7.40	7.36			28.00	28.19
10	14.50		3.34	3.36	7.35	7.30			28.30	28.52
11	14.50		3.40	3.42	8.75	8.69			25.00	25.21
12	14.50		3.40	3.42	8.60	8.54			25.50	25.74
13	14.50		3.40	3.42	8.90	8.83			26.00	26.27
14	14.50		3.40	3.42	9.30	9.23			26.00	26.29
15	14.50		3.40	3.43	9.80	9.72			26.00	26.31
16	14.50		3.40	3.43	8.40	8.32			26.00	26.33
17	14.50		3.40	3.43	8.60	8.51			25.00	25.34
18	14.50		3.40	3.43	8.60	8.51			24.80	25.16
19	14.50		3.40	3.43	8.30	8.20			24.80	25.18
20	14.50		3.40	3.44	8.65	8.55			24.70	25.10
21	14.43		3.34	3.38	8.80	8.69			24.50	24.91
22	14.43		3.34	3.38	8.60	8.49			25.00	25.44
23	14.43		3.34	3.38	8.80	8.68			25.00	25.46
24	14.43		3.34	3.38	8.85	8.72			25.50	25.99
25	14.43		3.34	3.38	9.20	9.07			25.00	25.48
MEAN	14.51			3.34		8.24				26.18

	%O2	%CO2	ppm CO	ppm SO2	ppm NOx
Zero Check	0.00	-0.10	0.08		0.00
Span Check	15.00	4.98	16.18		78.50
Cal. Gas	15.00	5.00	16.00		80.12
Scf		0.00064	0.00025		-0.00081
Zcf		-0.00400	0.00320		0.00000

Scf, Span Drift Correction Factor = (% Drift / 100) / # of Readings

Zcf, Zero Drift Correction Factor = Zero Drift / # of Readings

Cz, Zero Corr. Concentration = measured value - [Zcf x (Point # - 0.5)]

B, Corrected Concentration = Cz / [1 + (Scf x (Point # - 0.5))]

B. ZERO AND SPAN DRIFT PERCENT CALCULATIONS

Company : GILROY ENERGY Date : 7/10/90

Source : CO CATALYST INLET

Run 1	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span	15.00	5.00	80.70		80.12
Measured Span	14.50	4.10	81.00		78.00
Zero Drift	0.00	-0.70	0.00		-0.80
Final, Actual Span	14.50	4.80	81.00		78.80
Percent Drift	-3.3	-4.0	0.4		-1.6

Run	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span					
Measured Span					
Zero Drift					
Final, Actual Span					
Percent Drift					

Run	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span					
Measured Span					
Zero Drift					
Final, Actual Span					
Percent Drift					

Final, Actual Span = Measured Span - Zero Drift

Percent Drift = (Final, Actual Span - Initial Span) / Initial Span x 100

B. ZERO AND SPAN DRIFT PERCENT CALCULATIONS

Company : GILROY ENERGY Date : 7/10/90

Source : HRSG OUTLET

Run 1A	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span	15.00	5.00	16.00		20.63
Measured Span	15.00	3.20	16.00		19.38
Zero Drift	0.00	-1.40	0.00		0.50
Final, Actual Span	15.00	4.60	16.00		18.88
Percent Drift	0.0	-8.0	0.0		-8.5

Run 1B	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span	15.00	5.00	16.00		80.12
Measured Span	14.95	4.70	16.00		79.00
Zero Drift	0.00	-0.25	-0.05		0.00
Final, Actual Span	14.95	4.95	16.05		79.00
Percent Drift	-0.3	-1.0	0.3		-1.4

Run	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span					
Measured Span					
Zero Drift					
Final, Actual Span					
Percent Drift					

Final, Actual Span = Measured Span - Zero Drift

Percent Drift = (Final, Actual Span - Initial Span) / Initial Span x 100

B. ZERO AND SPAN DRIFT PERCENT CALCULATIONS

Company : GILROY ENERGY Date : 7/11/90

Source : HRSG OUTLET

Run 2A	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span	15.00	5.00	16.00		80.12
Measured Span	15.00	4.00	15.85		78.00
Zero Drift	0.00	1.00	0.00		5.00
Final, Actual Span	15.00	3.00	15.85		73.00
Percent Drift	0.0	-40.0	-0.9		-8.9

Run 2B	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span	15.00	5.00	16.00		80.12
Measured Span	14.95	5.30	16.13		76.00
Zero Drift	0.00	0.30	0.03		2.70
Final, Actual Span	14.95	5.00	16.10		73.30
Percent Drift	-0.3	0.0	0.6		-8.5

Run	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span					
Measured Span					
Zero Drift					
Final, Actual Span					
Percent Drift					

Final, Actual Span = Measured Span - Zero Drift

Percent Drift = (Final, Actual Span - Initial Span) / Initial Span x 100

B. ZERO AND SPAN DRIFT PERCENT CALCULATIONS

Company : GILROY ENERGY Date : 7/11/90

Source : HRSG OUTLET

Run 3	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span	15.00	5.00	16.00		80.12
Measured Span	15.00	4.98	16.18		78.50
Zero Drift	0.00	-0.10	0.08		0.00
Final, Actual Span	15.00	5.08	16.10		78.50
Percent Drift	0.0	1.6	0.6		-2.0

Run	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span					
Measured Span					
Zero Drift					
Final, Actual Span					
Percent Drift					

Run	O2 (%)	CO2 (%)	CO (ppm)	SO2 (ppm)	NOx (ppm)
Initial Span					
Measured Span					
Zero Drift					
Final, Actual Span					
Percent Drift					

Final, Actual Span = Measured Span - Zero Drift

Percent Drift = (Final, Actual Span - Initial Span) / Initial Span x 100

Pape & Steiner Environmental Services

SAMPLE HANDLING/LOG-IN

Date 7/11/90 Test Location GILROY ENERGY

	Sample Type	Volume	Comments
1.	23735 Meth FG Sample All Test		GT Fuel, taken @ 1520
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

CHAIN OF CUSTODY

Trent A. Griffin

Pape & Steiner Environmental Services

SAMPLE HANDLING/LOG-IN

Date 7/12/90 Test Location Gilroy Energy HRSG Out

	Sample Type	Volume	Comments
1.	23761 430 Meth DNPH Sample 3 Test		
2.	23760 430 Meth DNPH Sample 2 Test		
3.	23759 430 Meth DNPH Sample 1 Test		
4.	23758 430 Meth DNPH Sample BL Test		
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

CHAIN OF CUSTODY

[signature] 7/12/90

[signature] 7/13/90 11:00

Pape & Steiner Environmental Services

SAMPLE HANDLING/LOG-IN

Date 7/12/90 Test Location Gilroy Energy HRSG Out

	Sample Type	Volume	Comments
1.	23738 410 Meth Benz 3 Sample 3 Test		
2.	23737 410 Meth Benz 3 Sample 2 Test		
3.	23736 410 Meth Benz 3 Sample 1 Test		
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

CHAIN OF CUSTODY

[signature] 7/12/90

SOURCE TEST CALCULATIONS

PLANT : GILROY ENERGY
HRSG OUT

RUN NO.: 1
DATE : JULY 10,1990

STANDARD TEMP.: 60 DEG. F

METER TEMP.	=	116.18 DEG. F	STATIC PRESS.	=	-0.56 in. H2O
STACK TEMP.	=	235.76 DEG. F	Cp	=	0.840
SQ.RT. dP	=	0.7978 in. H2O	STACK I.D.	=	inch
METER ORIFICE	=	0.01 in. H2O	DUCT LENGTH	=	102 inch
METER VOLUME	=	5.100 Cu.Ft.	DUCT WIDTH	=	304 inch
METER Y	=	1.0094	STACK AREA	=	215.333 Sq.Ft.
BAR. PRESSURE	=	29.35 in.Hg	TEST TIME	=	225.00 min.
COND.(Vlc)	=	13.7 ml	NOZZLE DIA.	=	inch

GAS ANALYSIS = 14.01 % O2 0.00 % CO
3.18 % CO2 82.81 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 4.558 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic = 0.635 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.122 | Lower Bws value used.

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 1.000

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = 178.43

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 29.07

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 27.72

P(stack) = Pbar + [Pstatic / 13.6] ..... = 29.31 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 53.02 ft/sec

Qs = vs x As x 60 ..... = 685,048 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 440,196 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = %

SOURCE TEST CALCULATIONS

PLANT : GILROY ENERGY
HRSG OUT

RUN NO.: 2
DATE : JULY 10,1990

STANDARD TEMP.: 60 DEG. F

METER TEMP.	=	96.92 DEG. F	STATIC PRESS.	=	-0.52 in. H2O
STACK TEMP.	=	227.76 DEG. F	Cp	=	0.840
SQ.RT. dP	=	0.8147 in. H2O	STACK I.D.	=	inch
METER ORIFICE	=	0.01 in. H2O	DUCT LENGTH	=	102 inch
METER VOLUME	=	3.863 Cu.Ft.	DUCT WIDTH	=	304 inch
METER Y	=	1.0094	STACK AREA	=	215.333 Sq.Ft.
BAR. PRESSURE	=	29.75 in.Hg	TEST TIME	=	225.00 min.
COND.(Vlc)	=	8.7 ml	NOZZLE DIA.	=	inch

GAS ANALYSIS : 14.64 % O2 0.00 % CO
3.55 % CO2 81.81 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)..... = 3.620 dscf

Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic = 0.403 scf

Bws = Vw(std) / (Vm(std) + Vw(std))..... = 0.100 | Lower Bws value used.

Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.) ..... = 1.000

%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100 = 210.41

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 29.15

Ms = (Md x (1-Bws)) + (18.0 x Bws)..... = 28.04

P(stack) = Pbar + [Pstatic / 13.6] ..... = 29.71 in. Hg

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)] ..... = 53.16 ft/sec

Qs = vs x As x 60 ..... = 686,838 acf/min

Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92) ..... = 463,997 dscf/min

I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60) = %

SOURCE TEST CALCULATIONS

PLANT : GILROY ENERGY
HRSG OUT

RUN NO.: 3
DATE : JULY 10,1990

STANDARD TEMP.: 60 DEG. F

METER TEMP.	=	116.94 DEG. F	STATIC PRESS.	=	-0.53 in. H2O
STACK TEMP.	=	234.60 DEG. F	Cp	=	0.840
SQ.RT. dP	=	0.8136 in. H2O	STACK I.D.	=	inch
METER ORIFICE	=	0.01 in. H2O	DUCT LENGTH	=	102 inch
METER VOLUME	=	3.891 Cu.Ft.	DUCT WIDTH	=	304 inch
METER Y	=	1.0094	STACK AREA	=	215.333 Sq.Ft.
BAR. PRESSURE	=	29.36 in.Hg	TEST TIME	=	225.00 min.
COND.(Vlc)	=	9.8 ml	NOZZLE DIA.	=	inch

GAS ANALYSIS : 14.51 % O2 0.00 % CO
3.34 % CO2 82.15 % N2

****

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460).....	=	3.474	dscf
Vw(std) =(8.9148 x 10e-5) x (Tstd + 460) x Vic	=	0.454	scf
Bws = Vw(std) / (Vm(std) + Vw(std)).....	=	0.116	Lower Bws value used.
Bws @ Saturated Conditions = Vapor Press. of H2O @ Dew Point Temp. / (Ps, in.Hg.)	=	1.000	
%EA =(%O2 - 0.5%CO)/(0.264%N2 - (%O2-0.5%CO)) x 100	=	202.16	
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)]	=	29.11	
Ms = (Md x (1-Bws)) + (18.0 x Bws).....	=	27.83	
P(stack) = Pbar + [Pstatic / 13.6]	=	29.32	in. Hg
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts + 460) / (Ms x Ps)]	=	53.91	ft/sec
Qs = vs x As x 60	=	696,457	acf/min
Qs(std) = Qs x (1-Bws)x((Tstd + 460)/(Ts + 460)) x (Ps/29.92)	=	451,859	dscf/mir
I = (Ts+460) x [(0.002669 x Vlc) + (Vm(std)/(Tstd + 460)/ 29.92] x 100 / (Time x Ps x An x vs x 60)	=		%

EMISSION RATE CALCULATIONS

PLANT : GILROY ENERGY
SOURCE : CO CATALYST INLET

Temp. Std. : 60 dF
Press. Std.: 29.92 in. Hg. 15 % O2 Correction

Run No.	INLET	AVERAGE
Date	7/10/90	
Oxygen (%)	14.51	14.51
Qs(std), dscfm		
NOx, ppm	18.15	18.15
SO2, ppm		
CO, ppm	40.43	40.43
HC, ppm		
F-Factor	8489.38	8489.38
NOx, MW = 46.005		
NOx, lb/hr		
NOx, ppm @ O2	16.77	16.77
NOx, lb/MMBtu	0.0612	0.0612
SO2, MW = 64.058		
SO2, lb/hr		
SO2, ppm @ O2		
SO2, lb/MMBtu		
CO, MW = 28.010		
CO, lb/hr		
CO, ppm @ O2	37.35	37.35
CO, lb/MMBtu	0.0830	0.0830
HC, MW = 16.043		
HC, lb/hr		
HC, ppm @ O2		
HC, lb/MMBtu		

* lb/hr = 8.223E-5 x Qs(std) x MW x ppm / (Tstd + 460)

* ppm @ O2 = ppm measured x [(20.9 - O2% correction) / (20.9 - %O2 measured)]

* lb/MMBtu = F-Factor x MW x [1.3711E-6 / (Tstd + 460)] x [20.9 / (20.9 - O2%)] x ppm

EMISSION RATE CALCULATIONS

PLANT : GILROY ENERGY
SOURCE : HRSG OUTLET

Temp. Std. : 60 dF
Press. Std.: 29.92 in. Hg. 15 % O2 Correction

Run No.	1A	1B	AVERAGE
Date	7/10/90	7/10/90	
Oxygen (%)	14.75	13.27	14.01
Qs(std), dscfm	440,196	440,196	440,196
NOx, ppm	22.74	28.91	25.83
SO2, ppm			
CO, ppm	9.58	11.21	10.40
HC, ppm			
F-Factor	8489.38	8489.38	8489.38
NOx, MW = 46.005			
NOx, lb/hr	72.84	92.58	82.71
NOx, ppm @ O2	21.82	22.36	22.09
NOx, lb/MMBtu	0.0796	0.0816	0.0806
SO2, MW = 64.058			
SO2, lb/hr			
SO2, ppm @ O2			
SO2, lb/MMBtu			
CO, MW = 28.010			
CO, lb/hr	18.69	21.86	20.27
CO, ppm @ O2	9.19	8.67	8.93
CO, lb/MMBtu	0.0204	0.0193	0.0198
HC, MW = 16.043			
HC, lb/hr			
HC, ppm @ O2			
HC, lb/MMBtu			

* lb/hr = 8.223E-5 x Qs(std) x MW x ppm / (Tstd + 460)

* ppm @ O2 = ppm measured x [(20.9 - O2% correction) / (20.9 - %O2 measured)]

* lb/MMBtu = F-Factor x MW x [1.3711E-6 / (Tstd + 460)] x [20.9 / (20.9 - O2%)] x ppm

EMISSION RATE CALCULATIONS

PLANT : GILROY ENERGY
SOURCE : HRSG OUTLET

Temp. Std. : 60 dF
Press. Std.: 29.92 in. Hg. 15 % O2 Correction

Run No.	2A	2B	AVERAGE
Date	7/11/90	7/11/90	
Oxygen (%)	14.52	14.75	14.63
Qs(std), dscfm	463,997	463,997	463,997
NOx, ppm	28.83	25.67	27.25
SO2, ppm			
CO, ppm	13.67	12.67	13.17
HC, ppm			
F-Factor	8489.38	8489.38	8489.38
NOx, MW = 46.005			
NOx, lb/hr	97.33	86.65	91.99
NOx, ppm @ O2	26.65	24.62	25.64
NOx, lb/MMBtu	0.0972	0.0898	0.0935
SO2, MW = 64.058			
SO2, lb/hr			
SO2, ppm @ O2			
SO2, lb/MMBtu			
CO, MW = 28.010			
CO, lb/hr	28.10	26.04	27.07
CO, ppm @ O2	12.64	12.16	12.40
CO, lb/MMBtu	0.0281	0.0270	0.0275
HC, MW = 16.043			
HC, lb/hr			
HC, ppm @ O2			
HC, lb/MMBtu			

* lb/hr = 8.223E-5 x Qs(std) x MW x ppm / (Tstd + 460)

* ppm @ O2 = ppm measured x [(20.9 - O2% correction) / (20.9 - %O2 measured)]

* lb/MMBtu = F-Factor x MW x [1.3711E-6 / (Tstd + 460)] x [20.9 / (20.9 - O2%)] x ppm

EMISSION RATE CALCULATIONS

PLANT : GILROY ENERGY
SOURCE : HRSG OUTLET

Temp. Std. : 60 dF
Press. Std.: 29.92 in. Hg. 15 % O2 Correction

Run No.	3	AVERAGE
Date	7/11/90	
Oxygen (%)	14.51	14.51
Qs(std), dscfm	451,859	451,859
NOx, ppm	26.18	26.18
SO2, ppm		
CO, ppm	8.24	8.24
HC, ppm		
F-Factor	8489.38	8489.38
NOx, MW = 46.005		
NOx, lb/hr	86.05	86.05
NOx, ppm @ O2	24.16	24.16
NOx, lb/MMBtu	0.0881	0.0881
SO2, MW = 64.058		
SO2, lb/hr		
SO2, ppm @ O2		
SO2, lb/MMBtu		
CO, MW = 28.010		
CO, lb/hr	16.49	16.49
CO, ppm @ O2	7.60	7.60
CO, lb/MMBtu	0.0169	0.0169
HC, MW = 16.043		
HC, lb/hr		
HC, ppm @ O2		
HC, lb/MMBtu		

* lb/hr = 8.223E-5 x Qs(std) x MW x ppm / (Tstd + 460)

* ppm @ O2 = ppm measured x [(20.9 - O2% correction) / (20.9 - %O2 measured)]

* lb/MMBtu = F-Factor x MW x [1.3711E-6 / (Tstd + 460)] x [20.9 / (20.9 - O2%)] x ppm

CH2O CALCULATIONS

COMPANY NAME : GILROY ENERGY
SOURCE : HRSG OUT
DATE : 7/10,11/90
O2 CORRECTION: 15 % TEMP.STD. : 60 dF

	Run 1	Run 2	Run 3	Blank
Tm, dF	116.18	96.92	116.94	
Y, meter fac.	1.0094	1.0094	1.0094	
Vm, cu.ft. ..	5.100	3.863	3.891	
Pb, in.Hg. ..	29.35	29.75	29.36	
dH, in.H2O ..	0.01	0.01	0.01	
O2, percent .	14.01	14.64	14.51	14.39
Qs(std),dscfm	440,196	463,997	451,859	452,017

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x
(Pb + (dH / 13.6)) / (Tm +460) :

	Run 1	Run 2	Run 3	Blank	
Vm(std)	4.5576	3.6202	3.4738	3.8839	dscf

LABORATORY ANALYSIS :

	Run 1	Run 2	Run 3	Blank
mg CH2O	0.037	0.025	0.070	0.043

* MW of CH2O 30.03

EMISSION CALCULATIONS :

ppm CH2O = 1.60864 x (Temp.Std. + 460) x (mg CH2O) / (MW x Vm,std)

ppm CH2O @ corrected O2% = ppm CH2O x [20.9 - O2 correction /
(20.9 - %O2 measured)

lb/hr = 8.223e-5 x Qs(std) x MW x ppm / (Tstd + 460)

	Run 1	Run 2	Run 3	Run 4
ppm CH2O	0.23	0.19	0.56	0.31
ppm CH2O @ 15.0 %O2	0.19	0.18	0.52	0.28
lb/hr CH2O	0.47	0.42	1.20	0.66

CH3CHO CALCULATIONS

COMPANY NAME : GILROY ENERGY
SOURCE : HRSG OUT
DATE : 7/10,11/90
O2 CORRECTION: 15 % TEMP.STD. : 60 dF

	Run 1	Run 2	Run 3	Blank
Tm, dF	116.18	96.92	116.94	
Y, meter fac.	1.0094	1.0094	1.0094	
Vm, cu.ft. ..	5.100	3.863	3.891	
Pb, in.Hg. ..	29.35	29.75	29.36	
dH, in.H2O ..	0.01	0.01	0.01	
O2, percent .	14.01	14.64	14.51	14.39
Qs(std),dscfm	440,196	463,997	451,859	452,017

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x
(Pb + (dH / 13.6)) / (Tm +460) :

	Run 1	Run 2	Run 3	Blank	
Vm(std)	4.5576	3.6202	3.4738	3.8839	dscf

LABORATORY ANALYSIS :

	Run 1	Run 2	Run 3	Blank
mg CH3CHO	0.012	0.029	0.024	0.024

* MW of CH3CHO 44.05

EMISSION CALCULATIONS :

ppm CH3CHO = 1.60864 x (Temp.Std. + 460) x (mg CH3CHO) / (MW x Vm,std)

ppm CH3CHO @ corrected O2% = ppm CH3CHO x [20.9 - O2 correction /
(20.9 - %O2 measured)

lb/hr = 8.223e-5 x Qs(std) x MW x ppm / (Tstd + 460)

	Run 1	Run 2	Run 3	Run 4
ppm CH3CHO	0.05	0.15	0.13	0.12
ppm CH3CHO @ 15.0 %O2 ..	0.04	0.14	0.12	0.11
lb/hr CH3CHO	0.15	0.49	0.41	0.37

C3H4O CALCULATIONS

COMPANY NAME : GILROY ENERGY
SOURCE : HRSG OUT
DATE : 7/10,11/90
O2 CORRECTION: 15 % TEMP.STD. : 60 dF

	Run 1	Run 2	Run 3	Blank
Tm, dF	116.18	96.92	116.94	
Y, meter fac.	1.0094	1.0094	1.0094	
Vm, cu.ft. ..	5.100	3.863	3.891	
Pb, in.Hg. ..	29.35	29.75	29.36	
dH, in.H2O ..	0.01	0.01	0.01	
O2, percent .	14.01	14.64	14.51	14.39
Qs(std),dscfm	440,196	463,997	451,859	452,017

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x
(Pb + (dH / 13.6)) / (Tm +460) :

	Run 1	Run 2	Run 3	Blank	
Vm(std)	4.5576	3.6202	3.4738	3.8839	dscf

LABORATORY ANALYSIS :

	Run 1	Run 2	Run 3	Blank
mg C3H4O	4.6E-04	4.6E-04	4.6E-04	4.6E-04

* MW of C3H4O 56.06

EMISSION CALCULATIONS :

ppm C3H4O = 1.60864 x (Temp.Std. + 460) x (mg C3H4O) / (MW x Vm,std)

ppm C3H4O @ corrected O2% = ppm C3H4O x [20.9 - O2 correction /
(20.9 - %O2 measured)

lb/hr = 8.223e-5 x Qs(std) x MW x ppm / (Tstd + 460)

	Run 1	Run 2	Run 3	Blank
ppm C3H4O	1.5E-03	1.9E-03	2.0E-03	1.8E-03
ppm C3H4O @ 15.0 %O2 ...	1.3E-03	1.8E-03	1.9E-03	1.6E-03
lb/hr C3H4O	5.9E-03	7.8E-03	7.9E-03	7.1E-03

BENZENE CALCULATIONS

COMPANY NAME : GILROY ENERGY
SOURCE : HRSG OUT
DATE : 7/10,11/90
O2 CORRECTION: 15 % TEMP.STD. : 60 dF

	Run 1	Run 2	Run 3	Blank
Tm, dF				
Y, meter fac.				
Vm, cu.ft. ..				
Pb, in.Hg. ..				
dH, in.H2O ..				
O2, percent .	14.01	14.64	14.51	14.39
Qs(std),dscfm	440,196	463,997	451,859	452,017

Vm(std) = [T(std) + 460 / 29.92] x Vm x Y x
(Pb + (dH / 13.6)) / (Tm +460) :

	Run 1	Run 2	Run 3	Blank	
Vm(std)					dscf

LABORATORY ANALYSIS :

	Run 1	Run 2	Run 3	Blank
mg BENZENE				

* MW of BENZENE 78.11

EMISSION CALCULATIONS :

ppm BENZENE = 1.60864 x (Temp.Std. + 460) x (mg BENZENE) / (MW x Vm,std

ppm BENZENE @ corrected O2% = ppm BENZENE x [20.9 - O2 correction /
(20.9 - %O2 measured)

lb/hr = 8.223e-5 x Qs(std) x MW x ppm / (Tstd + 460)

	Run 1	Run 2	Run 3	Run 4
ppm BENZENE 2.0E-03		2.0E-03	2.0E-03	2.0E-03
ppm BENZENE @ 15.0 %O2 .1.7E-03		1.9E-03	1.9E-03	1.8E-03
lb/hr BENZENE 1.1E-02		1.2E-02	1.1E-02	1.1E-02

DRY GAS METER / ORIFICE METER CALIBRATION DATA

Date .....JUNE 6, 1990
Bar. Press, in.Hg 29.72
Meter Box No. ... 779

Dry Gas Meter No. ... 68190
Standard Test Meter # 69279
Operator ..... TD

STANDARD TEST METER			DRY TEST METER				
Press. dHs (in. H2O)	Temp. Ts (dF)	Volume Vs (ft3)	Press. dH (in. H2O)	Temp. Tdi (dF)	Temp. Tdo (dF)	Volume Vd (ft3)	Time t (min)
	63.5	102.381		99	88	745.646	
-2.2	63.5	79.180	0.5	91	84	721.394	60.0
Avg/Net :	63.5	23.201			91	24.252	
	63.5	134.929		102	89	779.384	
-3.5	63.5	102.559	1.0	91	87	745.822	60.0
Avg/Net :	63.5	32.370			92	33.562	
	65.0	1030.053		101	89	671.848	
-4.8	65.0	998.639	1.5	76	75	639.904	49.0
Avg/Net :	65.0	31.414			85	31.944	
	64.0	57.834		105	90	700.095	
-5.6	65.0	30.358	2.0	89	89	672.163	36.0
Avg/Net :	64.5	27.476			93	27.932	
	64.0	79.071		104	83	721.285	
-7.2	64.0	58.265	3.0	78	78	700.527	23.0
Avg/Net :	64.0	20.806			86	20.758	

$$y = Vs \times (Pbar + (dHs / 13.6)) \times (Avg.\ Td + 460) / [\ Vd \times (Pbar + (dH / 13.6)) \times (\ Ts + 460)]$$

$$Ko = [(Vs/t) \times [(Tdo + 460) / (Ts + 460)] \times [(Pbar + (dHs/13.6) / (Pbar + (dH/13.6)] / [((Tdo + 460) \times dH) / (Pbar + (dH/13.6)) \times (Mm)]^{0.5}$$

dH :	0.5	1.0	1.5	2.0	3.0	Avg.	Std.Dev.
y :	0.9993	1.0062	1.0055	1.0182	1.0178	1.0094	0.0074
Ko :	0.7118	0.7008	0.6717	0.6961	0.6652	0.6891	0.0177

y : 0.73 % Relative Std. Dev.

Ko : 2.57 % Relative Std. Dev.

TELEX: 510-100-8831 (ScotGas)
FAX: 714-887-0549
PHONE: 714-887-2571

Scott Specialty Gases a division of

Scott Environmental Technology Inc. 2600 CAJON BLVD., SAN BERNARDINO, CA 92405

PAPE & STEINER
ATTN: SUE POWERS

Shipped From: Scott SAN BERNARDINO
Date Shipped 5-31-89
Our Project No: 00237
Your P.O. No: SP2302-89 R14
Page 1 of 1
Expiration Date: 11-31-90

CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES*

Certified Per Traceability Protocol No. 1 Procedure No. G1 Cylinder No. ALM-6721 Cylinder Pressure 1900 psig Certified Accuracy ±1 % NBS Traceable

COMPONENTS	CERTIFIED CONC	REFERENCE STD SRM/CRM NO.	REFERENCE STD CYL. NO.	REFERENCE STD CONC.	GAS ANALYZER MAKE/MODEL/SERIAL NO.	GAS ANALYZER LAST CAL. DATE	GAS ANALYZER ANALYTICAL PRINCIPLE
Nitric Oxide	20.55 PPM	SRM 2629 A	CAL-10065	18.69 PPM	Thermo-Electron	5-2-89	Chemi-Luminenscent
					10 AR S/N 14853-150		
NOX	20.63 PPM						

BALANCE GAS Nitrogen

ANALYZER READINGS: Z = Zero Gas T = Test Gas R = Reference Gas

Component Nitric Oxide
First Analysis Date 5-22-89 Units PPM

Z 0.00	R 74.81	T 82.39			
R 74.79	Z 0.07	T 82.67			
Z 0.08	T 82.83	R 74.99			

Mean Test Assay 20.63

Second Analysis Date 5-30-89 Units PPM

Z 0.00	R 74.88	T 82.27			
R 74.99	Z 0.12	T 82.55			
Z 0.22	T 82.69	R 75.27			

Mean Test Assay 20.55

Component ____ Date ____ Units ____

Z	R	T			
R	Z	T			
Z	T	R			

Mean Test Assay ____

Date ____ Units ____

Z	R	T			
R	Z	T			
Z	T	R			

Mean Test Assay ____

Component ____ Date ____ Units ____

Z	R	T			
R	Z	T			
Z	T	R			

Mean Test Assay ____

Date ____ Units ____

Z	R	T			
R	Z	T			
Z	T	R			

Mean Test Assay ____

Chronology: Date ____
Assay ____

Analyst Doug Hagberg

Approved By: [signature]

Scott Specialty Gases a division of
Scott Environmental Technology Inc. 2600 CAJON BLVD., SAN BERNARDINO, CA 92405
TELEX: 510-100-8831 (ScotGas)
FAX: 714-887-0549
PHONE: 714-887-2571

PAPE & STEINER
5801 NORRIS ROAD
BAKERSFIELD, CA 93308

Date: 4/23/90
Our Project No.: 6264
Your P.O. No.: SP2546-90 REL 12

Gentlemen:

Thank you for choosing Scott for your Specialty Gas needs. The analyses for the gases ordered, as reported by our laboratory, are listed below. Results are in volume percent, unless otherwise indicated.

ANALYTICAL REPORT

CGA 660
Cyl. No. AAL-2062 Analytical Accuracy ±1%/±5%

Component	Concentration
NITRIC OXIDE	37.91 ppm
NOX	54.91 ppm
NITROGEN DIOXIDE	17 ppm
NITROGEN	BALANCE
NO2=±5%	

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Analyst _____

Approved By _____

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

Scott Specialty Gases a division of
Scott Environmental Technology Inc. 2600 CAJON BLVD., SAN BERNARDINO, CA 92405
TELEX: 510-100-8831 (ScotGas)
FAX: 714-887-0549
PHONE: 714-887-2571

PAPE & STEINER
5801 NORRIS ROAD
BAKERSFIELD, CA 93308
ATTEN: SUE POWERS

Date: 6/7/90
Our Project No.: 7053
Your P.O. No.: SP2546-90 REL# 16

Gentlemen:

Thank you for choosing Scott for your Specialty Gas needs. The analyses for the gases ordered, as reported by our laboratory, are listed below. Results are in volume percent, unless otherwise indicated.

ANALYTICAL REPORT

CGA 350
Cyl. No. AAL-5256 Analytical Accuracy ±1%

Component	Concentration
CARBON DIOXIDE	16.10%
TRACEABLE TO CRM2636 CARBON MONOXIDE	404.0 ppm
OXYGEN	4.020%
NITROGEN	BALANCE
* GRAVIMETRIC MASTER	

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Analyst _____

Approved By _____

* CERTIFIED TO HAVE BEEN BLENDED AGAINST NIST CERTIFIED WEIGHTS AND VERIFIED TO BE CORRECT BY INDEPENDENT ANALYSIS.

Scott Specialty Gases a division of
Scott Environmental Technology Inc. 2600 CAJON BLVD., SAN BERNARDINO, CA 92405
TELEX: 510-100-8831 (ScotGas)
FAX: 714-887-0549
PHONE: 714-887-2571

PAPE & STEINER
5801 NORRIS ROAD
BAKERSFIELD, CA 93308
ATTEN: SUE POWER

Date: 6/1/90
Our Project No.: 7155
Your P.O. No.: SP2546-90 REL# 13
CGA 590

Gentlemen:

Thank you for choosing Scott for your Specialty Gas needs. The analyses for the gases ordered, as reported by our laboratory, are listed below. Results are in volume percent, unless otherwise indicated.

ANALYTICAL REPORT

Cyl. No. AAL-6305 Analytical Accuracy ±1%

Component	Concentration
CARBON DIOXIDE	5.004%
CARBON MONOXIDE	8.01 ppm
OXYGEN	15.02%
NITROGEN	BALANCE

CO IS TRACEABLE TO CRM1677C

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Analyst _____

Approved By R S Lacy

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

Scott Specialty Gases a division of
Scott Environmental Technology Inc. 2600 CAJON BLVD., SAN BERNARDINO, CA 92405
TELEX: 510-100-8831 (ScotGas)
FAX: 714-887-0549
PHONE: 714-887-2571

PAPE & STEINER
5801 NORRIS ROAD
BAKERSFIELD, CA 93308

Date: 5/3/90
Our Project No.: 6685
Your P.O. No.: SP2546-90 REL# 15
CGA 590

Gentlemen:

Thank you for choosing Scott for your Specialty Gas needs. The analyses for the gases ordered, as reported by our laboratory, are listed below. Results are in volume percent, unless otherwise indicated.

ANALYTICAL REPORT

Cyl. No. AAL-6781 Analytical Accuracy ±1%

Component	Concentration
CARBON DIOXIDE	5.00%
CARBON MONOXIDE	16.00 ppm
OXYGEN	15.0%
NITROGEN	BALANCE
CO TRACEABLE TO CRM2635	

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Analyst _____

Approved By R. S[illegible]

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

Scott Specialty Gases a division of
Scott Environmental Technology Inc. 2600 CAJON BLVD., SAN BERNARDINO, CA 92405
TELEX: 510-100-8831 (ScotGas)
FAX: 714-887-0549
PHONE: 714-887-2571

PAPE & STEINER
5801 NORRIS ROAD
BAKERSFIELD, CA 93308

Date: 2/14/90
Our Project No.: 5087
Your P.O. No.: SP 2546-90 REL# 5

Gentlemen:

Thank you for choosing Scott for your Specialty Gas needs. The analyses for the gases ordered, as reported by our laboratory, are listed below. Results are in volume percent, unless otherwise indicated.

ANALYTICAL REPORT

Cyl. No. 1L-23410 Analytical Accuracy ±1%

Component	Concentration
CARBON DIOXIDE	5.02%
CARBON MONOXIDE	80.7 ppm
OXYGEN	15.0%
CO NIST TRACEABLE TO SRM 1679	
NITROGEN	BALANCE

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Analyst _____

Approved By _____

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

Scott Specialty Gases

TROY, MI. 48083 PHONE: 313-589-2950 FAX NO: 313-589-2134

PAPE & STEINER
5801 NORRIS RD
BAKERSFIELD, CA 93308

Date: 1/6/89
Our Project No.: 931908
Your P.O. No.: SP6073 88 REL#24

Gentlemen:

Thank you for choosing Scott for your Specialty Gas needs. The analyses for the gases ordered, as reported by our laboratory, are listed below. Results are in volume percent, unless otherwise indicated.

ANALYTICAL REPORT

Cyl. No. AAL-9891 Analytical Accuracy ±1%

Component	Concentration
CARBON MONOXIDE	3.484ppm
NITROGEN	BALANCE
GRAVIMETRIC MASTER GAS	

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

Cyl. No. _____ Analytical Accuracy _____

Component	Concentration

CERTIFIED

Analyst _____ Approved By J. Shapiro

**CERTIFIED TO HAVE BEEN BLENDED AGAINST NBS CERTIFIED WEIGHTS AND VERIFIED CORRECT BY INDEPENDENT ANALYSIS **

APPENDIX B

ENSECO DATA

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

RECEIVED
AUG 15 1990
Ans'd.....

August 13, 1990

PAPE & STEINER
5801 Norris Rd.
Bakersfield, CA 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019807-001
ANALYSES: Volatile Organics by GCMS - EPA TO14
DATE SAMPLED: 7/10/90
DATE SAMPLE REC'D: 7/16/90

PROJECT: GILROY ENERGY

Enclosed with this letter is the report on the chemical and physical analyses on the sample from ANALYSIS NO: A9019807-001 shown above.

The sample was received by ENSECO Air Toxics Laboratory, intact and with the chain-of-custody record attached.

Please note that ND means not detected at the detection limit expressed.

Martin M. Lanza
REVIEWED

APPROVED

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Enseco
A CORNING Company

LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, Ca 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019807
ANALYSES: Prescreen for Benzene (CARB 410A)
DATE SAMPLED: NA
DATE SAMPLE REC'D: NA
DATE ANALYZED: 7/03/90
SAMPLE TYPE: Air

BENZENE (CARB 410A)

Sample Identification	RESULTS ppm (vol/vol)
A - 040	ND(0.02)

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Enseco
A CORNING Company

LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, CA 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019807-001
ANALYSES: Volatile Organics by GCMS - EPA TO14
DATE SAMPLED: 7/10/90
DATE SAMPLE REC'D: 7/16/90
DATE ANALYZED: 7/25/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9007251

Volatile Organics by GCMS
EPA T014

Sample Identification	Benzene ppb (vol/vol)	Detection Limits
A-040 Test 1 23736	ND	2

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Enseco
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LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, CA 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019807-001
ANALYSES: Volatile Organics by GCMS - EPA TO14
DATE SAMPLED: 7/10/90
DATE SAMPLE REC'D: 7/16/90
DATE ANALYZED: 7/25/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9007251

QC SUMMARY
Volatile Organics by GCMS
EPA T014

Compounds	Laboratory Control Sample % Recovery	Duplicate Control Sample % Recovery	RPD
Methylene Chloride	98	101	3
1,1 Dichloroethene	105	108	3
Trichloroethene	97	105	8
Toluene	105	112	6
1,1,2,2-Tetrachlorethane	102	108	6
Limits	80 - 115	80 - 115	20

Enseco
A CORNING Company

☐ 7440 Lincoln Way, Garden Grove, CA 92641, (714) 898-6370
☐ 2810 Bunsen Ave., Unit A Ventura, CA 93003, (805) 650-0546
☐ 2325 Skyway Dr., Unit K, Santa Maria, CA 93455, (805) 922-2776
☒ 9537 Telstar Ave., Unit 118, El Monte, CA 91731, (818) 442-8400
☐ Mobile Labs, (800) ENSECO-8

CHAIN OF CUSTODY RECORD

Date 7/12/90 Page 1 of 1

Lab Number A9019807-01

CLIENT Pape & Steiner Env. Services
ADDRESS 5801 Norris Rd
Bakersfield CA 93308
PROJECT NAME Gilroy Energy
CONTRACT / PURCHASE ORDER / QUOTE #

PROJECT MANAGER Jim Steiner
PHONE NUMBER 805 - 3938442
SITE CONTACT

ANALYSES

Sample No. / Identification	Date	Time	Lab Sample Number	SAMPLE TYPE: LIQ.	AIR	SOLID	No. of Containers	Benzene	Sample Condition/ REMARKS
A040 Test 1	7/10	1:36-2:37	23736		✓		1	✓	

SAMPLERS: (Signature) Jim Steiner

Received by: (Signature) | Date | Time

Relinquished by: (Signature)

Received by: (Signature) | Date | Time

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Enseco Terms and Conditions, unless a contract or purchase order has been executed and is cited above.

Relinquished by: (Signature) | Date | Time

Received for Laboratory by: Jon E Dal | Date RECEIVED 7-16-90 | Time 3pm. | Date ACCEPTED | Time

Method of Shipment:

Special Instructions:

SAMPLE DISPOSITION:
1. Storage time requested: _____ days
(Samples will be stored for 30 days without additional charges; thereafter storage charges will be billed at the published rates.)
2. Sample to be returned to client: Y N
(Enseco will dispose of unreturned samples at no extra charge. Disposal will be by incineration wherever possible; otherwise, as appropriate, according to legal requirements.)

DISTRIBUTION: White with report, Yellow to Enseco, Pink to Courier, Gold to Sample Control

Enseco

Canister Chain of Custody and Field Data Record (Composite Samples)

Client Pope & Steiner

Canister Serial # A-040 Date Cleaned 6-28-90 VFR Serial# AT-21

1) Initial Calibration of VFR (vacuum flow regulator)	___ ml/sec x 60 sec/1 min = 21.2 ml/min (7-3-90: 67.4)	Date 7-3-90 Initials [illegible]
2) Initial vacuum check of canister	30 inches of Hg vacuum	Date 7-5-90 Initials [illegible]
3) Field vacuum check before sampling	30 inches of Hg vacuum	Date 7/10/90 Initials [illegible]
4) Final vacuum/pressure after sampling	16 inches of Hg vacuum	Date 7/10/90 Initials [illegible]
5) Final vacuum/pressure after receipt by lab	67 psig = 16 inches of Hg vacuum	Date 7-23-90 Initials [illegible]
6) Calibration check of VFR after receipt by lab	___ ml/sec x 60 sec/1 min = 67.0 ml/min	Date 7-23-90 Initials [illegible]

Relinquished By:	Received by:	Date / Time
Dan E Dale	FED-Ex	7-5-90 5pm
Fed-Ex	[illegible]	7/6/90
[illegible]	[illegible]	7/9/90
[illegible]	[illegible]	7/12/90
Fed Ex	Dan E Dale	7-16-90 3pm

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

CFDR

Enseco, Inc. - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

August 13, 1990

PAPE & STEINER
5801 Norris Rd.
Bakersfield, CA 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019808-001
ANALYSES: Volatile Organics by GCMS - EPA TO14
DATE SAMPLED: 7/11/90
DATE SAMPLE REC'D: 7/16/90

PROJECT: GILROY ENERGY

Enclosed with this letter is the report on the chemical and physical analyses on the sample from ANALYSIS NO: A9019808-001 shown above.

The sample was received by ENSECO Air Toxics Laboratory, intact and with the chain-of-custody record attached.

Please note that ND means not detected at the detection limit expressed.

Marita M. Lorenzo
REVIEWED

APPROVED

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, Ca 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019808
ANALYSES: Prescreen by Volatile Organics by GCMS - EPA T014
DATE SAMPLED: NA
DATE SAMPLE REC'D: NA
DATE ANALYZED: 7/02/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9007021

Volatile Organics by GCMS - EPA T014

Sample Identification	RESULTS Benzene ppb (vol/vol)
A - 025	ND(2)

Enseco

Canister Chain of Custody and Field Data Record (Composite Samples)

Client Dape & Steiner Page 1 of 3

Canister Serial # A-025 Date Cleaned 6-28-90 VFR Serial# HT-20

1) Initial Calibration of VFR (vacuum flow regulator)	/ ml/sec x 60 sec/1 min = 67.1 ml/min	Date 7-3-90 Initials DK
2) Initial vacuum check of canister	30 inches of Hg vacuum	Date 7-5-90 Initials JD
3) Field vacuum check before sampling	30 inches of Hg vacuum	Date 7/11/90 Initials JS
4) Final vacuum/pressure after sampling	13 inches of Hg vacuum	Date 7/11/90 Initials JS
5) Final vacuum/pressure after receipt by lab	8.5 psia = 13 inches of Hg vacuum	Date 7-23-90 Initials DK
6) Calibration check of VFR after receipt by lab	/ ml/sec x 60 sec/1 min = 74.5 ml/min	Date 7-23-90 Initials DK

Relinquished By:	Received by:	Date / Time
Dan E Dole	Fed-Ex	7-5-90 5pm.
Fed-Ex	KW	7/6/90
KW.	JS	7/9/90
JS	KW	7/12/90
Fed Ex.	Dan E Dole	7/16-90 3pm

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

CFDR

Enseco, Inc. - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Enseco
A CORNING Company

LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, Ca 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019808
ANALYSES: Prescreen by Volatile Organics by GCMS - EPA T014
DATE SAMPLED: NA
DATE SAMPLE REC'D: NA
DATE ANALYZED: 7/02/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9007021

QC SUMMARY
Volatile Organics by GCMS
EPA T014

Compounds	Laboratory Control Sample % Recovery	Duplicate Control Sample % Recovery	RPD
Methylene Chloride	105	104	1
1,1 Dichloroethene	103	104	1
Trichloroethene	109	104	5
Toluene	102	107	5
1,1,2,2-Tetrachlorethane	107	113	6
Limits	80 - 115	80 - 115	20

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, CA 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019808-001
ANALYSES: Volatile Organics by GCMS - EPA TO14
DATE SAMPLED: 7/11/90
DATE SAMPLE REC'D: 7/16/90
DATE ANALYZED: 7/25/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9007251

Volatile Organics by GCMS
EPA T014

Sample Identification	Benzene ppb (vol/vol)	Detection Limits
A-025 TEST 2 23737	ND	2

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

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LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, CA 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019808-001
ANALYSES: Volatile Organics by GCMS - EPA TO14
DATE SAMPLED: 7/11/90
DATE SAMPLE REC'D: 7/16/90
DATE ANALYZED: 7/25/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9007251

QC SUMMARY
Volatile Organics by GCMS
EPA TO14

Compounds	Laboratory Control Sample % Recovery	Duplicate Control Sample % Recovery	RPD
Methylene Chloride	98	101	3
1,1 Dichloroethene	105	108	3
Trichloroethene	97	105	8
Toluene	105	112	6
1,1,2,2-Tetrachlorethane	102	108	6
Limits	80 - 115	80 - 115	20

Enseco
A CORNING Company

☐ 7440 Lincoln Way, Garden Grove, CA 92641, (714) 898-6370
☐ 2810 Bunsen Ave., Unit A Ventura, CA 93003, (805) 650-0546
☐ 2325 Skyway Dr., Unit K, Santa Maria, CA 93455, (805) 922-2776
☐ 9537 Telstar Ave., Unit 118, El Monte, CA 91731, (818) 442-8400
☐ Mobile Labs, (800) ENSECO-8

CHAIN OF CUSTODY RECORD

Date 7/12/90 Page 1 of 1
Lab Number A9019808-02

CLIENT: Pape + Steiner Env. Services
ADDRESS: 5801 Norris Rd
Bakersfield CA 93308
PROJECT NAME: Gilroy Energy
CONTRACT / PURCHASE ORDER / QUOTE #:

PROJECT MANAGER: Jim Steiner
PHONE NUMBER: 805-393-8442
SITE CONTACT:

ANALYSES: Benzene

Sample No. / Identification	Date	Time	Lab Sample Number	SAMPLE TYPE: LIQ.	AIR	SOLID	No. of Containers	Benzene	Sample Condition/ REMARKS
A025 Test 2	7/11	7:44-8:44	23737		✓		1	✓	

SAMPLERS: (Signature) Jim Steiner

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

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Enseco Terms and Conditions, unless a contract or purchase order has been executed and is cited above.

Relinquished by: (Signature)	Date	Time	Received for Laboratory by:	Date RECEIVED	Time	Date ACCEPTED	Time
			Jan E Dale	7-16-90	3pm		

Method of Shipment:

Special Instructions:

SAMPLE DISPOSITION:
1. Storage time requested: _____ days
(Samples will be stored for 30 days without additional charges; thereafter storage charges will be billed at the published rates.)
2. Sample to be returned to client: Y N
(Enseco will dispose of unreturned samples at no extra charge. Disposal will be by incineration wherever possible; otherwise, as appropriate, according to legal requirements.)

DISTRIBUTION: White with report, Yellow to Enseco, Pink to Courier, Gold to Sample Control

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

August 13, 1990

PAPE & STEINER
5801 Norris Rd.
Bakersfield, CA 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019809-001
ANALYSES: Volatile Organics by GCMS - EPA TO14
DATE SAMPLED: 7/11/90
DATE SAMPLE REC'D: 7/16/90

PROJECT: GILROY ENERGY

Enclosed with this letter is the report on the chemical and physical analyses on the sample from ANALYSIS NO: A9019809-001 shown above.

The sample was received by ENSECO Air Toxics Laboratory, intact and with the chain-of-custody record attached.

Please note that ND means not detected at the detection limit expressed.

Maritta M. Lonzo
REVIEWED

APPROVED

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, Ca 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019809
ANALYSES: Prescreen by Volatile Organics by GCMS - EPA T014
DATE SAMPLED: NA
DATE SAMPLE REC'D: NA
DATE ANALYZED: 6/28/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9006281

Volatile Organics by GCMS - EPA T014

Sample Identification	Results Benzene ppb (vol/vol)
A - 060	ND(2)

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Enseco
A CORNING Company

LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, Ca 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019809
ANALYSES: Prescreen by Volatile Organics by GCMS - EPA T014
DATE SAMPLED: NA
DATE SAMPLE REC'D: NA
DATE ANALYZED: 6/28/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9006281

QC SUMMARY
Volatile Organics by GCMS
EPA T014

Compounds	Laboratory Control Sample % Recovery	Duplicate Control Sample % Recovery	RPD
Methylene Chloride	99	91	8
1,1 Dichloroethene	108	96	12
Trichloroethene	96	94	3
Toluene	100	96	4
1,1,2,2-Tetrachlorethane	100	95	5
Limits	80 - 115	80 - 115	20

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Enseco
A CORNING Company

LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, CA 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019809-001
ANALYSES: Volatile Organics by GCMS - EPA TO14
DATE SAMPLED: 7/11/90
DATE SAMPLE REC'D: 7/16/90
DATE ANALYZED: 7/25/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9007251

Volatile Organics by GCMS
EPA TO14

Sample Identification	Benzene ppb (vol/vol)	Detection Limits
A-060 TEST 3 23738	ND	2

Enseco - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Enseco
A CORNING Company

LABORATORY REPORT

PAPE & STEINER
5801 Norris Rd.
Bakersfield, CA 93308
ATTN: MR. JIM STEINER

ANALYSIS NO.: A9019809-001
ANALYSES: Volatile Organics by GCMS - EPA TO14
DATE SAMPLED: 7/11/90
DATE SAMPLE REC'D: 7/16/90
DATE ANALYZED: 7/25/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9007251

QC SUMMARY
Volatile Organics by GCMS
EPA TO14

Compounds	Laboratory Control Sample % Recovery	Duplicate Control Sample % Recovery	RPD
Methylene Chloride	98	101	3
1,1 Dichloroethene	105	108	3
Trichloroethene	97	105	8
Toluene	105	112	6
1,1,2,2-Tetrachlorethane	102	108	6
Limits	80 - 115	80 - 115	20

Enseco
A CORNING Company

☐ 7440 Lincoln Way, Garden Grove, CA 92641, (714) 898-6370
☐ 2810 Bunsen Ave., Unit A Ventura, CA 93003, (805) 650-0546
☐ 2325 Skyway Dr., Unit K, Santa Maria, CA 93455, (805) 922-2776
☐ 9537 Telstar Ave., Unit 118, El Monte, CA 91731, (818) 442-8400
☐ Mobile Labs, (800) ENSECO-8

CHAIN OF CUSTODY RECORD

Date 7/12/90 Page 1 of 1
Lab Number A9019809-0

CLIENT: Pape + Steiner Env. Services
ADDRESS: 5801 Norris Rd
Bakersfield CA 93308
PROJECT NAME: Gilroy Energy
CONTRACT / PURCHASE ORDER / QUOTE #:

PROJECT MANAGER: Jim Steiner
PHONE NUMBER: 805-3938442
SITE CONTACT:

Sample No. / Identification	Date	Time	Lab Sample Number	SAMPLE TYPE: LIQ.	AIR	SOLID	No. of Containers	ANALYSES: Benzene							Sample Condition/ REMARKS
Adco Test 3	7/11	3:48-3:49	23738		V		1	V							

SAMPLERS: (Signature) Jim Steiner

Relinquished by: (Signature)

Received by: (Signature) — Date — Time

Received by: (Signature) — Date — Time

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Enseco Terms and Conditions, unless a contract or purchase order has been executed and is cited above.

Relinquished by: (Signature) — Date — Time

Received for Laboratory by: Dan C Dale — Date RECEIVED: 7-16-90 — Time: 3pm

Date ACCEPTED — Time

Method of Shipment:

Special Instructions:

SAMPLE DISPOSITION:
1. Storage time requested: _____ days
(Samples will be stored for 30 days without additional charges; thereafter storage charges will be billed at the published rates.)
2. Sample to be returned to client: Y N
(Enseco will dispose of unreturned samples at no extra charge. Disposal will be by incineration wherever possible; otherwise, as appropriate, according to legal requirements.)

DISTRIBUTION: White with report, Yellow to Enseco, Pink to Courier, Gold to Sample Control

Enseco

Canister Chain of Custody and Field Data Record (Composite Samples)

Client Pape & Steiner Page 3 of 3

Canister Serial # A-060 Date Cleaned 6-27-90 VFR Serial# HT-22

1) Initial Calibration of VFR (vacuum flow regulator)	~~/~~ ml / sec x 60 sec / 1 min = 70.7 ml/min (7-3-90 = 66.9)	Date 7-3-90 Initials DK
2) Initial vacuum check of canister	_____ inches of Hg vacuum	Date _____ Initials _____
3) Field vacuum check before sampling	30 inches of Hg vacuum	Date 7/11/90 Initials JS
4) Final vacuum/pressure after sampling	16 inches of Hg vacuum	Date 7/11/90 Initials JS
5) Final vacuum/pressure after receipt by lab	6.5 psia = 17 inches of Hg vacuum	Date 7-23-90 Initials DK
6) Calibration check of VFR after receipt by lab	~~72.1~~ 72.3-4.0 ml / 1 sec x 60 sec / 1 min = 72.1 ml/min	Date 7-23-90 Initials DK

Relinquished By:	Received by:	Date / Time
Dan E Dale	Fed Ex	7-5-90 / 5pm
Fed-Ex.	KW	7/6/90
KW	DS	7/9/90
DS	KW	7/12/90
Fed-Ex	Dan E Dale	7/16/90 3pm

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

CFDR

Enseco, Inc. - Air Toxics Laboratory
9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Enseco
A CORNING Company

August 6, 1990
Lab ID: 053751

Jim Steiner
Pape & Steiner Environmental Services
5801 Norris Road
Bakersville, CA 93308

Dear Mr. Steiner:

Enclosed is the report for the four aqueous samples for your P.O. #SP-02768 which were received at Enseco-Cal Lab on 13 July 1990.

The report consists of the following sections:

I Sample Description
II Analysis Request
III Quality Control Report
IV Analysis Results

If you have any questions, please feel free to call.

Sincerely,

Timothy M. Cleary
Program Administrator

td

Enseco Incorporated
2544 Industrial Boulevard
West Sacramento, California 95691
916/372-1393 Fax: 916/371-8420

I Sample Description

See the attached Sample Description Information.

The samples were received under chain-of-custody.

II Analysis Request

The following analytical test was requested.

Lab ID	Analysis Description
053751-1 thru 4	Formaldehyde, Acetaldehyde, Acrolein

III Quality Control

A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.

B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.

C. Laboratory Control Samples - The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Accuracy is measured by Percent Recovery as in:

$$\% \text{ recovery} = \frac{\text{(measured concentration)}}{\text{(actual concentration)}} \times 100$$

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

$$\text{RPD} = \frac{\text{(\% recovery test 1 - \% recovery test 2)}}{\text{(\% recovery test 1 + \% recovery test 2)/2}} \times 100$$

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/-3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. In cases where there is not enough historical data, EPA limits or advisory limits are set, with the approval of the Quality Assurance department.

IV Analysis Results

Test methods may include minor modifications of published EPA Methods such as reporting limits or parameter lists. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis; i.e., no correction is made for moisture content, unless the method requires or the client requests that such correction be made.

Results are on the attached data sheets.

SAMPLE DESCRIPTION INFORMATION
for
Pape & Steiner Environmental Services

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
053751-0001-SA	23759	AQUEOUS	10 JUL 90		13 JUL 90
053751-0002-SA	23760	AQUEOUS	10 JUL 90		13 JUL 90
053751-0003-SA	23761	AQUEOUS	10 JUL 90		13 JUL 90
053751-0004-SA	23758	AQUEOUS	10 JUL 90		13 JUL 90

QC LOT ASSIGNMENT REPORT
GPLC Analysis Area

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
053751-0001-SA	GAS	FORM-G	17 JUL 90-A	17 JUL 90-AD
053751-0002-SA	GAS	FORM-G	17 JUL 90-A	17 JUL 90-AD
053751-0003-SA	GAS	FORM-G	17 JUL 90-A	17 JUL 90-AD
053751-0004-SA	GAS	FORM-G	17 JUL 90-A	17 JUL 90-AD

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METHOD BLANK REPORT
HPLC Analysis

Analyte	Result	Units	Reporting Limit
Test: FORM-CARB-G			
Matrix: AQUEOUS			
QC Lot: 17 JUL 90-A QC Run: 17 JUL			
Formaldehyde	ND	mg/sample	0.0005
Acetaldehyde	ND	mg/sample	0.0005
Acrolein	ND	mg/sample	0.0005

DUPLICATE CONTROL SAMPLE REPORT
''PLC Analysis Area

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: FORM-G Matrix: GAS QC Lot: 17 JUL 90-A Concentration Units: ug								
Formaldehyde	2.0	1.88	1.82	1.85	93	60-140	3.2	40

Calculations are performed before rounding to avoid round-off errors in calculated results.

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Aldehydes

Method CARB 430

Client Name: Pape & Steiner Environmental Services
Client ID: 23759
Lab ID: 053751-0001-SA
Matrix: AQUEOUS
Authorized: 16 JUL 90
Enseco ID: 156156
Sampled: 10 JUL 90
Prepared: 17 JUL 90
Received: 13 JUL 90
Analyzed: 18 JUL 90

Parameter	Result	Units	Reporting Limit	
Formaldehyde	0.037	mg/sample	0.0014	R
Acetaldehyde	0.012	mg/sample	0.00040	
Acrolein	ND	mg/sample	0.00046	

Note R : Raised reporting limit(s) due to high analyte level(s).

ND = Not detected
NA = Not applicable

Reported By: Lisa Weiskopf
Approved By: Randy Hill

The cover letter is an integral part of this report.
Rev 230787

Enseco
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Aldehydes

Method CARB 430

Client Name: Pape & Steiner Environmental Services
Client ID: 23760
Lab ID: 053751-0002-SA
Matrix: AQUEOUS
Authorized: 16 JUL 90

Enseco ID: 156157
Sampled: 10 JUL 90
Prepared: 17 JUL 90

Received: 13 JUL 90
Analyzed: 18 JUL 90

Parameter	Result	Units	Reporting Limit	
Formaldehyde	0.025	mg/sample	0.0014	R
Acetaldehyde	0.029	mg/sample	0.00040	
Acrolein	ND	mg/sample	0.00046	

Note R : Raised reporting limit(s) due to high analyte level(s).

ND = Not detected
NA = Not applicable

Reported By: Lisa Weiskopf

Approved By: Randy Hill

The cover letter is an integral part of this report.
Rev 230787

Enseco
A CORNING Company

Aldehydes

Method CARB 430

Client Name: Pape & Steiner Environmental Services
Client ID: 23761
Lab ID: 053751-0003-SA
Matrix: AQUEOUS
Authorized: 16 JUL 90

Enseco ID: 156158
Sampled: 10 JUL 90
Prepared: 17 JUL 90

Received: 13 JUL 90
Analyzed: 18 JUL 90

Parameter	Result	Units	Reporting Limit	
Formaldehyde	0.070	mg/sample	0.0014	R
Acetaldehyde	0.024	mg/sample	0.0040	
Acrolein	ND	mg/sample	0.00046	

Note R : Raised reporting limit(s) due to high analyte level(s).

ND = Not detected
NA = Not applicable

Reported By: Lisa Weiskopf

Approved By: Randy Hill

The cover letter is an integral part of this report.
Rev 230787

Aldehydes

Method CARB 430

Client Name: Pape & Steiner Environmental Services
Client ID: 23758
Lab ID: 053751-0004-SA
Matrix: AQUEOUS
Authorized: 16 JUL 90

Enseco ID: 156159
Sampled: 10 JUL 90
Prepared: 17 JUL 90

Received: 13 JUL 90
Analyzed: 18 JUL 90

Parameter	Result	Units	Reporting Limit	
Formaldehyde	0.043	mg/sample	0.0014	R
Acetaldehyde	0.0019	mg/sample	0.00040	
Acrolein	ND	mg/sample	0.00046	

Note R : Raised reporting limit(s) due to high analyte level(s).

ND = Not detected
NA = Not applicable

Reported By: Lisa Weiskopf

Approved By: Randy Hill

The cover letter is an integral part of this report.
Rev 230787

Pape & S... r Environmental Services

PLANT Gilroy Energy TES YPE 430 FIELD TEST DATA SHEET (Page ___ of 3)

Date 7/11/90
Test Location HRSG Out
Run Number 3
Stack Diameter 86"x25'4"
Operator JS
Filter No. none

Barometric Pressure 29.36
Static in. wg. -0.53
Probe Type/Length SS/10'
Pitot Coefficient 0.84
Meter Box No./γ 779/1.0094
Nozzle No./Size straight

Impinger Volumes/Weights			
Contents	Final	Initial	Net
dry	41.8	83.7	8.1
1S DNPH	103.1	102.3	0.8
1S DNPH	98.0	98.0	0.0
1S DNPH	105.9	105.9	0.0
S.G.	112.2	111.3	0.9
		Total	9.8

Gas Composition			
Time	CO_2	O_2	CO

Leak Rate	cfm	"Hg
Initial	0.0015	5 nozzle
Final		

Sample Point	Time	ΔP in wg	ΔH in wg	Gas Meter Volume Ft^3	Temperature °F: Stack	Probe	Oven	Imp.	Gas Meter In	Gas Meter Out	Pump Vacuum in. Hg	$\sqrt{\Delta P}$	Comments
A 1	2:33 0	0.350	0.010	102.988	225	195	208	65	114	114	2.0	0.592	pitot ok
2	5	0.555	0.010	103.162	228	195	194	64	116	116	2.0	0.745	
3	10	1.04	0.010	103.310	223	204	191	64	118	118	2.0	1.020	
4	15	0.775	0.010	103.480	235	208	190	64	120	120	2.0	0.880	ben A060 30psi
5	20	0.670	0.010	103.635	235	210	194	64	120	121	2.0	0.819	start 2:48 D4
	25			103.776									end 3:49 16psi
B 1	3:03 0	0.535	0.010	103.776	225	194	188	64	120	121	2.0	0.731	
2	5	0.605	0.010	103.944	224	205	250	63	119	119	2.0	0.778	
3	10	0.695	0.010	104.093	222	205	202	63	119	120	2.0	0.834	
4	15	0.745	0.010	104.253	219	203	202	63	120	120	2.0	0.863	
5	20	0.720	0.010	104.418	219	203	191	62	120	121	2.0	0.849	
	25			104.561									