Laidlaw Gas Recovery Systems
Newby Island Plant #1
Emissions Testing

Test Date: September 22, 1992

BEST ENVIRONMENTAL, INC.
15890 Foothill Boulevard
San Leandro, California 94578
(510) 278-4011 FAX (510) 278-4018

October 6, 1992

Laidlaw Gas Recovery Systems
39899 Balentine Dr. Suite 275
Newark, CA. 94560

To: Mr. Matt L. Nourot, Mechanical Engineer

Subject: Newby Island Plant Site #1 I.C. Engine's Emissions Test

Test Date: September 22, 1992

Sampling Location: Muffler outlets of the #1 and 3 I.C. engines operated at Gas Recovery Systems Newby Island Plant #1 site in Milpitas, California.

Sampling Personnel: Jeff Mesloh and Dan Cartner of BEST ENVIRONMENTAL.

Process Description: Gas Recovery Systems operates seven engines at the Newby Island Plant. The two engines tested were Waukesha Model VHP7200 GL I.C. engines operating at 450 kilowatts and burn landfill gas fuel.

Test Program: Three thirty minute test runs for NOx, CO, CO2, O2, THC, and TNMHC were performed at the engine muffler 1 & 3 outlets. Stack gas temperatures, moisture content and volumetric flowrates were determined at both locations.

Sampling Methods: The following Source Test Methods of the Bay Area Air Quality Management District (BAAQMD) and the California Air Resources Board (CARB) were used:

Method ST-17	Stack Velocity and Volumetric Flow Rate
Method ST-23	Water Vapor Sampling
CARB 1-100	Continuous NOx, O2, CO2, CO, THC

Instrumentation:

TECO Model 10 NOx analyzer
Horiba Model PIR 2000 CO2 analyzer
Infrared Model IR-2200 O2 analyzer
TECO Model 48 CO analyzer
Bendix Model 8401 Hydrocarbon analyzer
Standard pitot tube, inclined manometer, thermocouple
Calibrated Dry Gas Meter
All Glass Impingers
Hewlett Packard Chart Recorders
Calibrated Omega Temperature Meter

Test Results: Table 1 presents the results of the #1 engine emissions tests. Average NOx concentration and emission rate were 184.3 ppm and 1.60 lbs/hr. CO concentration and emission rate were 1.0 ppm and 0.01 lbs/hr. No detectable level of TNMHC was measured.

Table 2 presents the results of the #3 engine emissions tests. Average NOx concentration and emission rate were 387 ppm and 3.35 lbs/hr. CO concentration and emission rate were 123 ppm and 0.65 lbs/hr. No detectable level of TNMHC was measured.

Field data sheets, strip chart recordings, calibration gas certifications and volumetric flowrate calculations are appended to this report. If there are any questions, please call Dan Cartner at (415) 784-0706.

Submitted by,

Dan Cartner

Dan Cartner
Source Test Engineer

LAIDLAW
Newby Island
Engine #1

TABLE 1
CEMS TEST RESULTS

TEST TEST LOCATION	1 OUTLET	2 OUTLET	3 OUTLET	AVERAGE
TEST TIME	0926-0956	1002-1032	1038-1108	
TEST DATE	09-22-92	09-22-92	09-22-92	
FLOWRATE, SDCFM	1,212	1,212	1,212	1,212
OUTPUT, KW	450	450	450	
O2, %	0.6	0.6	0.6	0.6
CO2, %	17.0	17.0	17.2	17.07
H2O, %	17.4	17.4	17.4	17.40
NOx, ppm	178.0	187.0	188.0	184.3
NOx, ppm corr. 3%, O2	157.0	164.9	165.8	162.54
NOx, lbs/hr	1.55	1.63	1.64	1.60
NOx, gr/Bhp-hr	1.106	1.162	1.168	1.145
CO, ppm	1.0	1.0	1.0	1.0
CO, lbs/hr	0.01	0.01	0.01	0.01
CO, gr/Bhp-hr	0.004	0.004	0.004	0.004
THC, ppm	1947.0	1688.0	1657.0	1764.00
TNMHC, ppm	< 25.0	< 25.0	< 25.0	< 25.0
TNMHC, lbs/hr	< 0.08	< 0.08	< 0.08	< 0.08
TNMHC, gr/Bhp-hr	< 0.054	< 0.054	< 0.054	< 0.054

WHERE,
- NOx = Oxides of Nitrogen
- THC = Tot. Hydrocarbons @CH4
- TNMHC = Tot. Non-methane Hydrocarbons @CH4
- ppm = Parts Per Million Concentration
- lbs/hr = Pounds Per Hour Emission Rate
- CO = Carbon Monoxide
- CO2 = Carbon Monoxide

Calculations,
- lbs/hr = ppm x SDCFM x (1.56e-7) x Mol. Wt.
- gr/Bhp-hr = (lbs/hr)(453.6g/lb) / (kw/(.746 x 95%))

LAIDLAW
Newby Island
Engine #3

TABLE 2
CEMS TEST RESULTS

TEST TEST LOCATION	1 OUTLET	2 OUTLET	3 OUTLET	AVERAGE
TEST TIME	1115-1145	1150-1220	1222-1252	
TEST DATE	09-22-92	09-22-92	09-22-92	
FLOWRATE, SDCFM	1,207	1,207	1,207	1,207
OUTPUT, KW	450	450	450	
O2, %	1.8	1.8	1.7	1.8
CO2, %	17.3	17.3	17.3	17.30
H2O, %	17.5	17.5	17.5	17.50
NOx, ppm	400.0	383.0	378.0	387.0
NOx, ppm corr. 3%, O2	374.9	358.9	352.4	362.07
NOx, lbs/hr	3.46	3.32	3.27	3.35
NOx, gr/Bhp-hr	2.475	2.370	2.339	2.395
CO, ppm	130.0	125.0	114.0	123.0
CO, lbs/hr	0.69	0.66	0.60	0.65
CO, gr/Bhp-hr	0.490	0.471	0.429	0.463
THC, ppm	4.0	5.0	4.0	4.33
TNMHC, ppm	< 1.0	< 1.0	< 1.0	< 1.0
TNMHC, lbs/hr	< 0.00	< 0.00	< 0.00	< 0.00
TNMHC, gr/Bhp-hr	< 0.002	< 0.002	< 0.002	< 0.002

WHERE,
- NOx = Oxides of Nitrogen
- THC = Tot. Hydrocarbons @CH4
- TNMHC = Tot. Non-methane Hydrocarbons @CH4
- ppm = Parts Per Million Concentration
- lbs/hr = Pounds Per Hour Emission Rate
- CO = Carbon Monoxide
- CO2 = Carbon Monoxide

Calculations,
- lbs/hr = ppm x SDCFM x (1.56e-7) x Mol. Wt.
- gr/Bhp-hr = (lbs/hr)(453.6g/lb) / (kw/(.746 x 95%))

APPENDIX

BEST ENVIRONMENTAL
CONTINUOUS MONITOR DATA SHEET

Plant: Laidlaw / Newby Is. #1
Date: 9-22-92
Test Location: Eng #1
Run Number: R-1, 2
Operator: DC

Ambient Temperature: 75
Barometric Pressure: 29.98
Static Pressure Duct: +4.0
Fuel: Landfill gas
Number:

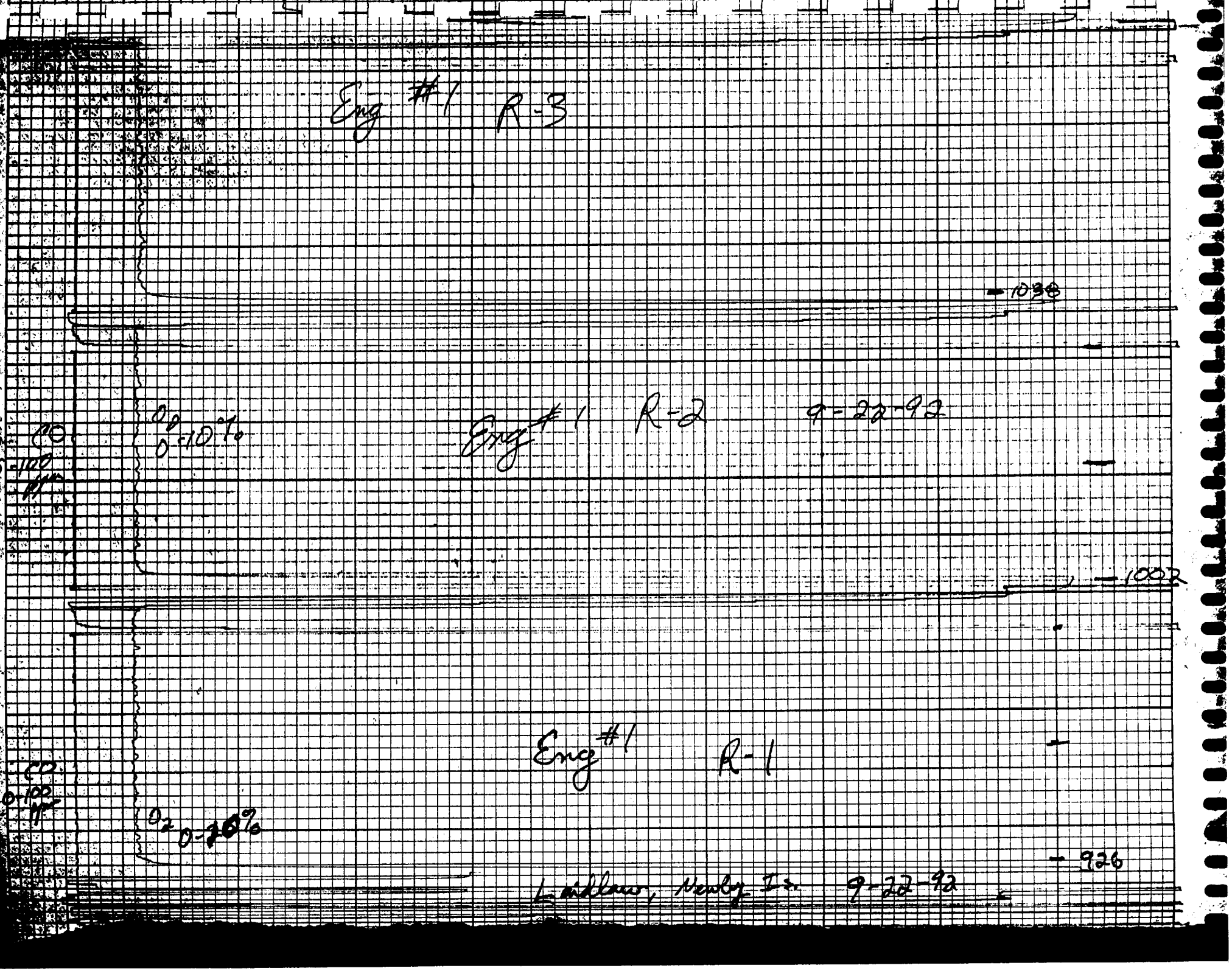
Time	Sample Point	Fuel Flow	Dry Uncorrected O_2 %	Dry Uncorrected CO_2 %	Dry Uncorrected CO ppm	Dry Uncorrected SO_2 ppm	Dry Uncorrected NO ppm	Dry Uncorrected NO_x ppm	3% O_2 Dry ppm	3% O_2 Dry NO_x ppm	Hydrocarbons THC	Hydrocarbons Non CH_4	Hydrocarbons ~~Non~~ CH_4	TOC ppm	CO2 ppm	VOC ppm	Comments
			8.68	12.38	251.7 (80)			199.9			1776 84.6						900 RPM
																	450 KW
926			0.6	17.0	1.0			275			1840	<25					
936			0.6	17.0	1.0			280			2000	<25					
946			0.6	17.1	1.0			280			2000	<25					
956	zero		0	0.1	0.4			0.3			0						
	cal		8.65	12.5	81			200			1750						
	Ave →		(0.6)	(17.0)	(1.0)			(178)									
1002			0.6	17.0	1.0			180			1700	<25					
1012			.6	17.0	1.0			190			1680	<25					
1022			.6	17.0	1.0			190			1680	<25					
1032	zero		0	0.1	0.5			0			0						
	cal		8.6	12.2	81			200			1780						
	Ave →		(0.6)	(17.0)	(1.0)			(187)			(1688)						
1038			0.6	17.2	1.0			190			1650	<25					
1048			0.7	17.3	1.0			190			1660	<25					
1058			0.6	17.2	1.0			185			1660	<25					
1108	zero		0	0.1	0.4			2			0						
	cal		8.7	12.5				200			1770						
	Ave →		(0.6)	(17.2)	(1.0)			(188)			(1657)						

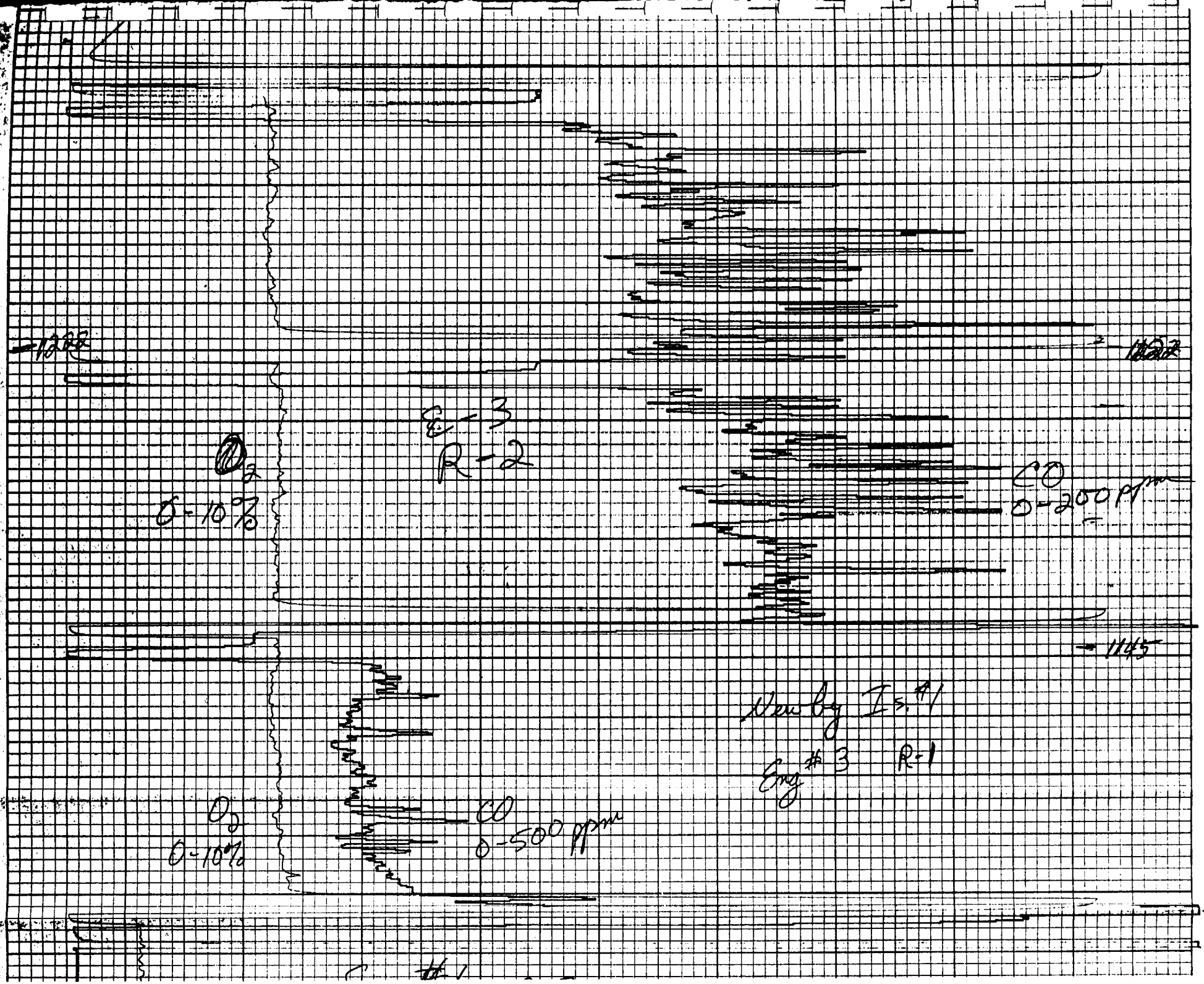
BEST ENVIRONMENTAL
CONTINUOUS MONITOR DATA SHEET

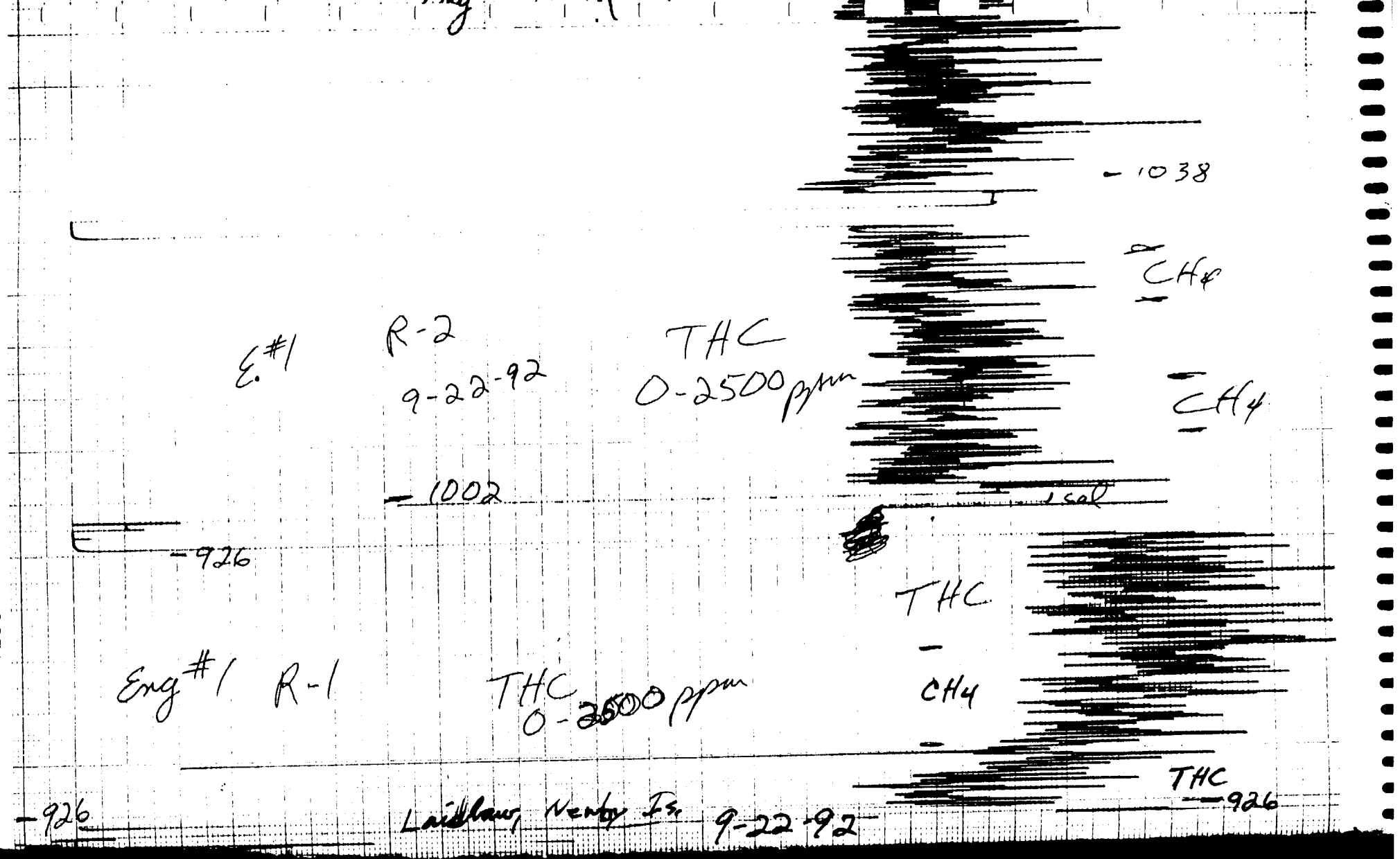
Plant: Laidlaw / Newby Is. #1
Date: 9-22-92
Test Location: Eng #3 ~~R-1~~
Run Number: 1,2,3
Operator: DC

Ambient Temperature: 77
Barometric Pressure: 29.98
Static Pressure Duct: +4
Fuel:
Number:

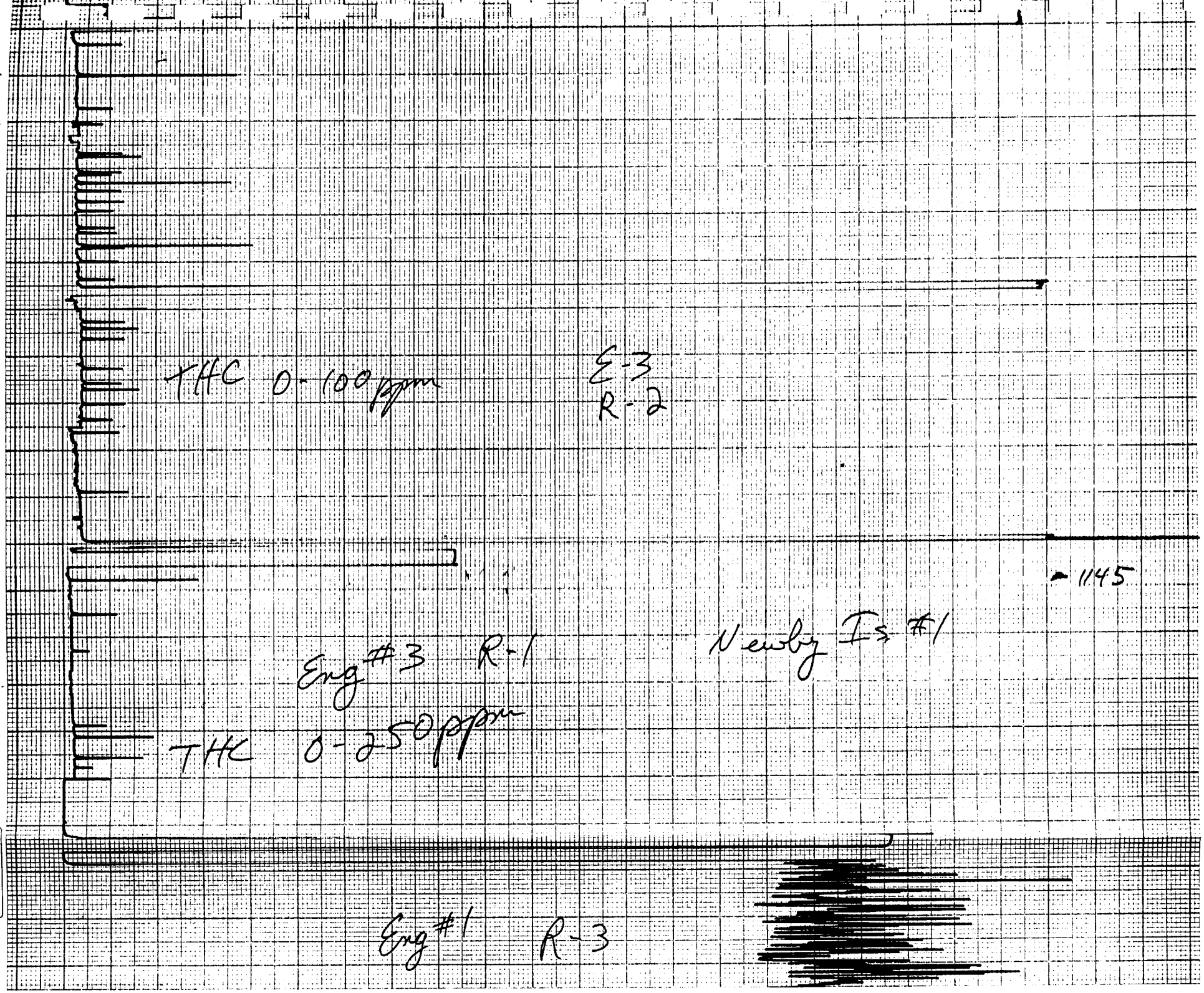
Time	Sample Point	Fuel Flow	Dry Uncorrected O_2 %	Dry Uncorrected CO_2 %	Dry Uncorrected CO ppm	Dry Uncorrected SO_2 ppm	Dry Uncorrected NO ppm	Dry Uncorrected NO_x ppm	3% O_2 Dry ppm	3% O_2 Dry NO_x ppm	Hydrocarbons THC	Hydrocarbons CH_4	Hydrocarbons Non CH_4	TOC ppm	CO2 ppm	VOC ppm	Comments
			8.68	12.38	80			199.9			84.6						450 KW
																	900 RPM
1115			1.8	17.2	135			410			4.0		<1				
25			1.8	17.3	125			400			4.0		<1				
35			1.7	17.3	130			390			4.0		<1				
1145	zero		0	0.1	0			2.0			0						
	cal		8.7	12.5	79			200			8.4						
	Ave.		(1.8)	(17.3)	(130)			(400)			(4.0)		(<1)				
1150			1.8	17.3	120			380			4.0						
1200			1.8	17.3	130			380			5.0						
1210			1.8	17.3	125			390			5.0						
1220	zero		0	0	0			0			0						
	cal		8.8	12.5	79			200			84						
	Ave		(1.8)	(17.3)	(125)			(383)			(5.0)		(<1)				
1222			1.7	17.2	115			370			4.0		<1				
32			1.7	17.4	120			370			4.0		<1				
42			1.7	17.4	108			390			4.0		<1				
1252	zero		0								1.0						
	cal										82.5						
	Ave		(1.7)	(17.3)	(114)			(378)			(4.0)		(<1)				


Eng #1 R-3
1038
O2 0-10%
CO 0-100 ppm
Eng #1 R-2 9-22-92
1002
Eng #1 R-1
CO 0-100 ppm
O2 0-10%
926
Lindlaw, Newby Inc. 9-22-92


1222
1222
E-3
R-2
O_2
0-10%
CO
0-200 ppm
1145
New by I.S. #1
Eng #3 R-1
O_2
0-10%
CO
0-500 ppm


1038
CH4
E.#1
R-2
9-22-92
THC
0-2500 ppm
CH4
1002
926
THC
Eng#1
R-1
THC
0-2500 ppm
CH4
THC
926
926
Laidlaw, Newby Fs. 9-22-92

1236



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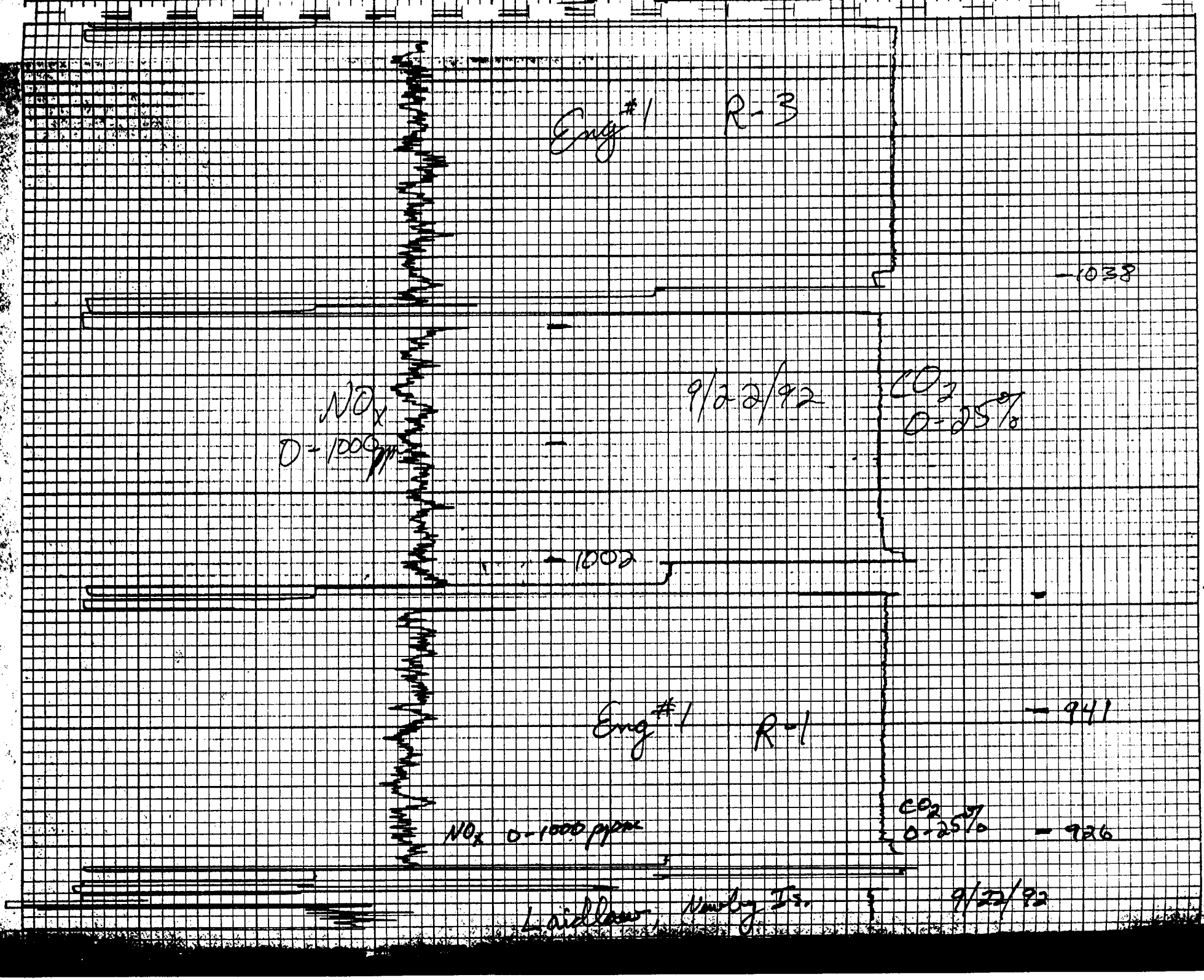
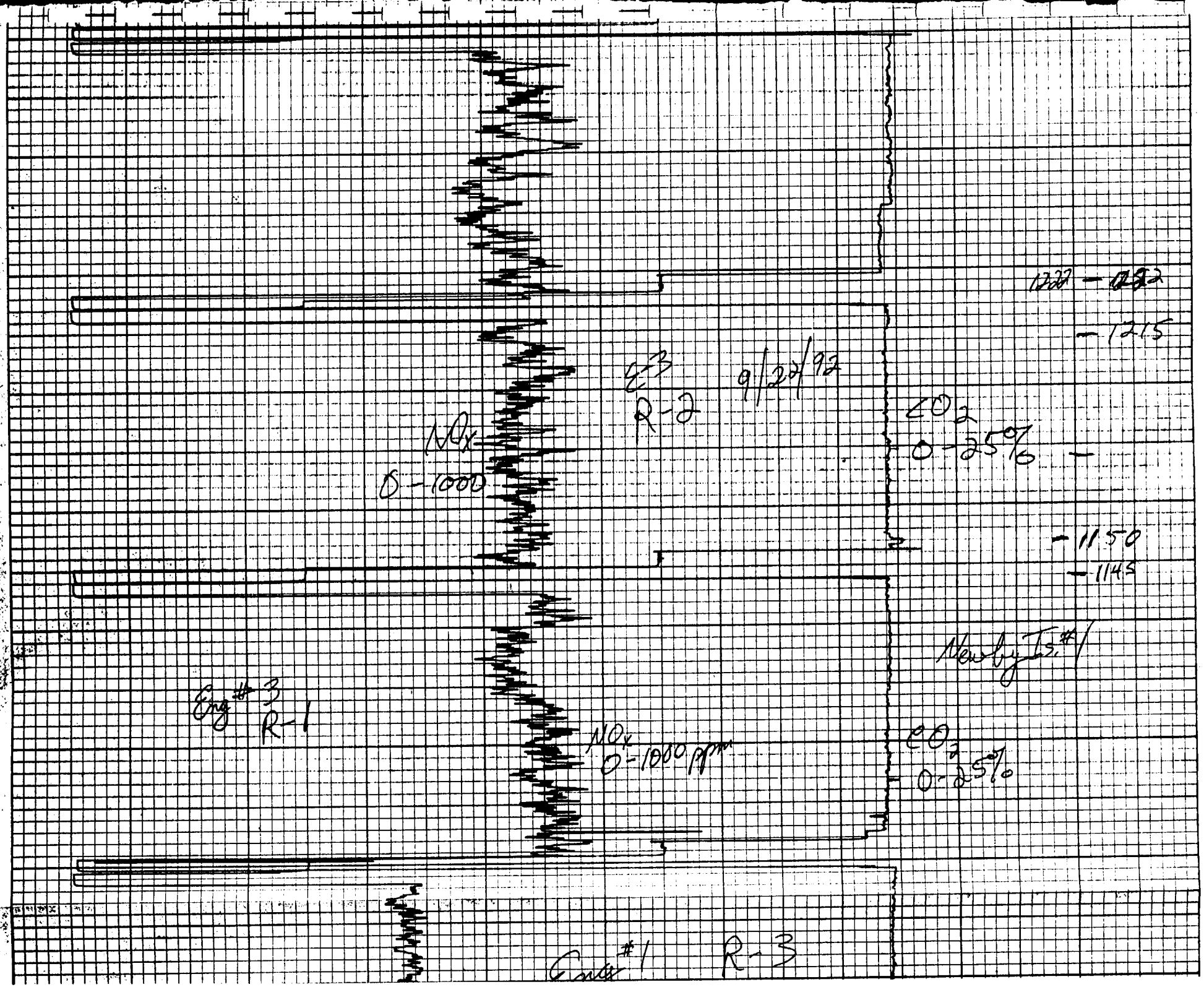
Charts-Inc


Eng #1 R-3
-1038
NOx
0-1000 ppm
9/22/92
CO2
0-25%
-1002
Eng #1 R-1
-941
NOx 0-1000 ppm
CO2
0-25%
-926
Laidlaw Analyzers
9/22/92


1222 — 1222
— 1215
E-3
R-2
9/22/92
CO2
0-25%
NOx
0-1000
— 1150
— 1145
Newby Is. #1
Eng #3
R-1
NOx
0-1000 ppm
CO2
0-25%
Eng #1
R-3

SCOTT-MARRIN, INC.
2001 THIRD ST. • UNIT H • RIVERSIDE, CA 92507
TELEPHONE (714) 784-1240

REPORT OF ANALYSIS
NIST TRACEABLE GAS MIXTURES

BEST01
TO: REGAN BEST
BEST ENVIRONMENTAL
27343 INDUSTRIAL BLVD.
SUITE E
HAYWARD, CA 94545

DATE: 05/31/91

CUSTOMER ORDER NUMBER: 8289

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CYLINDER NUMBER	COMPONENT	CONCENTRATION(v/v)	NIST TRACEABLE REFERENCE STANDARD
CC12793	Nitric Oxide	199.9 ± 4.0 ppm	SRM 1685b
	Nitrogen,O2-Free	Balance	

ppm = umole/mole % = mole-%

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

Analyst: B.E. Gross

Approved: J.T. Marrin

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

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (714) 653-6780 • FAX (714) 653-2430

REPORT OF ANALYSIS
NIST TRACEABLE GAS MIXTURES

BEST01
TO:
Craig Thiry
Best Environmental
15890 Foothill Blvd.
San Leandro, CA 94578-2101

DATE: 04/02/92

CUSTOMER ORDER NUMBER: 8416

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CYLINDER NUMBER	COMPONENT	CONCENTRATION(v/v)	NIST TRACEABLE REFERENCE STANDARD
CC12567	Propane Zero Air	592 ± 6 ppm Balance	SRM 2646

ppm = umole/mole   % = mole-%

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

Analyst: M.S. Calhoun

Approved: J.T. Marrin

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

STANDARD CALIBRATION GASES IN ALUMINUM CYLINDERS

SCOTT-MARRIN, INC.
6531 BOX SPRINGS BLVD. • RIVERSIDE, CA 92507
TELEPHONE (714) 653-6780 • FAX (714) 653-2430

REPORT OF ANALYSIS
NIST TRACEABLE GAS MIXTURES

BEST01

TO:

CRAIG THIRY
BEST ENVIRONMENTAL
15890 FOOTHILL BLVD.
SAN LEANDRO, CA 94578-2101

DATE: 08/06/92

CUSTOMER ORDER NUMBER: 8446

CYLINDER NUMBER	COMPONENT	CONCENTRATION(v/v)	NIST TRACEABLE REFERENCE STANDARD
CC114767	Carbon Monoxide	80.0 ± 0.8 ppm	SRM 1679c
	Carbon Dioxide	12.38 ± 0.12 %	SRM 1675b
	Oxygen	8.68 ± 0.09 %	SRM 2658a
	Nitrogen	Balance	

ppm = umole/mole % = mole-%

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

Analyst: M.S. Calhoun

Approved: J.T. Marrin

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

BEST ENVIRONMENTAL
STACK VOLUMETRIC FLOW RATE DETERMINATION

LAIDLAW
Engine #1

Date: 9-22-92
Location: Outlet
Time: 1010

1. Temperature of Stack (Ts)	1294	F
2. Square Root of Delta P (√P)	1.109	"H20
3. Barometric Pressure (Pb)	29.98	"Hg
4. Stack Static Pressure	4	"H20
5. Percent of H20 in Stack	17.5	%
6. Mol. Weight of Stack Gas (MWs)	28.51	
A. Percent O2	0.6	%
B. Percent CO2	17	%
C. Percent CO	0	%
7. Area of Stack (As)	0.601	ft2
8. Pitot Tube Factor (Cp)	0.99	

STACK GAS VELOCITY (Vs)	133.79	ft/sec
STACK GAS VOLUMETRIC FLOWRATE (Qs)	1,212	SDCFM
STACK GAS VOLUMETRIC FLOWRATE (Qa)	4,825	ACFM

Vs = velocity of the stack gas (ft/sec)
Qs = Volumetric flowrate at standard conditions
MWs = Mol.Wt.Stack Gas wet
MWd = Mol. Wt. Stack Gas dry
Ps = stack pressure
Delta P = differential pressure measured by the pitot

Calculations,

MWs = MWd x (1-Bwo) + 18 (Bwo)
MWd = .44 (%CO2) + .32 (%O2) + .28 (%CO + %N2)
Ps = static /13.6 + Pb
Vs = 85.49 x (Cp) x sqrt √P x (Ts+460) / (PsxMWs)
Qs = 1058.8 (1-Bwo) x Vs x As x Ps / (Ts+460)
Qa = 60 x Vs x As

BEST ENVIRONMENTAL
STACK VOLUMETRIC FLOW RATE DETERMINATION

LAIDLAW
Engine #3

Date: 9-22-92
Location: Outlet
Time: 1210

1. Temperature of Stack (Ts)	1417	F
2. Square Root of Delta P ($\sqrt{P}$)	1.141	"H20
3. Barometric Pressure (Pb)	29.98	"Hg
4. Stack Static Pressure	6	"H20
5. Percent of H20 in Stack	17.5	%
6. Mol. Weight of Stack Gas (MWs)	28.59	
A. Percent 02	1.8	%
B. Percent C02	17.3	%
C. Percent CO	0	%
7. Area of Stack (As)	0.601	ft2
8. Pitot Tube Factor (Cp)	0.99	

STACK GAS VELOCITY (Vs)	141.86	ft/sec
STACK GAS VOLUMETRIC FLOWRATE (Qs)	1,207	SDCFM
STACK GAS VOLUMETRIC FLOWRATE (Qa)	5,115	ACFM

Vs = velocity of the stack gas (ft/sec)
Qs = Volumetric flowrate at standard conditions
MWs = Mol.Wt.Stack Gas wet
MWd = Mol. Wt. Stack Gas dry
Ps = stack pressure
Delta P = differential pressure measured by the pitot

Calculations,

MWs = MWd x (1-Bwo) + 18 (Bwo)
MWd = .44 (%C02) + .32 (%02) + .28 (%CO + %N2)
Ps = static /13.6 + Pb
Vs = 85.49 x (Cp) x sqrt $\sqrt{P}$ x (Ts+460) / (PsxMWs)
Qs = 1058.8 (1-Bwo) x Vs x As x Ps / (Ts+460)
Qa = 60 x Vs x As

BEST ENVIRONMENTAL
MOISTURE DETERMINATION

LAIDLAW
Engine #1

Date: 9-22-92
Method: CARB M4
Time: 0925-0955
Fuel: Landfill Gas
RUN#: 1

1. Uncorrected Meter Volume (Vm)	17.691 ft3
2. Meter Factor (Yd)	0.9912
3. Barometric Pressure (Pb)	29.98 " Hg
4. Meter Pressure (^H)	0.2 " H20
5. Meter Temperature (Tm)	75.4 F
6. Std. Temperature (Tstd)	70.0 F
7. Impinger H20 Gain (Vw)	72.0 ml
8. Silica Gel Wt. Gain (Vw)	6.5 gm
9. Moisture Vapor (Vw std)	3.71 ft3
Std. Meter Volume (Vm std)	17.402 ft3
Percent of H20 in Stack (% H20)	17.58 %

ft3 = Cubic Feet
Hg = Mercury
F = Fahrenheit
ml = milliliters
gm = grams
% = Percent

Calculations,

Moisture Vapor = 0.00267 x ml cond. x 460 + Std Temp. / 29.92
Std Meter Vol = Vm x Yd x Tstd + 460 x Pb + ^H / Tm + 460 x 29.92
Stack Moisture = Moisture Vapor / Moisture Vapor + Std. Vol.

BEST ENVIRONMENTAL
MOISTURE DETERMINATION

LAIDLAW
Engine #3

Date: 9-22-92
Method: CARB M4
Time: 1126-1156
Fuel: Landfill Gas
RUN#: 1

1. Uncorrected Meter Volume (Vm)	18.589	ft3
2. Meter Factor (Yd)	0.9912	
3. Barometric Pressure (Pb)	29.98	" Hg
4. Meter Pressure (^H)	0.2	" H20
5. Meter Temperature (Tm)	85.9	F
6. Std. Temperature (Tstd)	70.0	F
7. Impinger H20 Gain (Vw)	74.0	ml
8. Silica Gel Wt. Gain (Vw)	6.5	gm
9. Moisture Vapor (Vw std)	3.81	ft3
Std. Meter Volume (Vm std)	17.933	ft3
Percent of H20 in Stack (% H20)	17.51	%

ft3 = Cubic Feet
Hg = Mercury
F = Fahrenheit
ml = milliliters
gm = grams
% = Percent

Calculations,

Moisture Vapor = 0.00267 x ml cond. x 460 + Std Temp. / 29.92
Std Meter Vol = Vm x Yd x Tstd + 460 x Pb + ^H / Tm + 460 x 29.92
Stack Moisture = Moisture Vapor / Moisture Vapor + Std. Vol.

STACK VOLUMETRIC FLOWRATE DETERMINATION

Date 9-22-92 Client Laidlaw / N.I. #1 Operators DC
Time 1210 Barometric (Pb) Static
Location Eng #3 Pressure 29.98 Pressure +6.0
Pitot Factor .99 Duct dimen. 10.5 ID.
CO2% 12.3 Stack Area(As) .601
O2% 1.8 Round duct=π r_2 ÷ 144 (radius in inches)
H2O%

Velocity Traverse Data Remarks

Inches from wall	Port &pt.	Time	Delta P	Stack Temp	sqrt. ^P
		1210	1.37	1417	
			1.1		
			1.3		
			1.35		
			1.40		
			1.30		
					(1.141)
Averages					

Stack Gas Velocity
@ Stack conditions
(feet per second)

Vs = 85.49 x (Cp) x
sqrt^p avg. x
sqrt[Tsavgx460/PsxMWs]

Where,
Vs=velocity stack
Cp=pitot factor
Ts=Stack Temperature
Ps=Stack pressure
MWs=Molecular Wt.gas
where,
MWs=MWd x(1-Bwo)+18(Bwo)

MWd=.44(%CO2)+.32(%O2)
+.28(%CO+%N2)

Bwo=%moisture/100
Ps=static/13.6 + Pb

Stack Gas Volume at
Standard Conditions
Qs = SCFM

Qs=60(1-Bwo) x Vsavg
x As x (528/Tsavg+460)
x (Ps/29.92)

Vs=

Qs=

Notes/Comments

STACK VOLUMETRIC FLOWRATE DETERMINATION

Date 9-22-92 Client Lindlaw/Newby Is. #1 Operators DC/JM
Time 10:10 A.M. Barometric (Pb) Static
Location Eng #1 Pressure 29.98 Pressure +4.0
Pitot Factor .99 Duct dimen. 10.5" ID.
CO2% 17.0 Stack Area(As) .601
O2% 0.6 Round duct=π r2 ÷ 144 (radius in inches)
H2O%

Velocity Traverse Data Remarks

Inches from wall	Port &pt.	Time	Delta P	Stack Temp	sqrt. ^P
			7		
		1010	1.25	1294	
			1.30		
			1.15		
			1.10		
			1.10		
			1.5		
					(1.109)
Averages					

Stack Gas Velocity
@ Stack conditions
(feet per second)

Vs = 85.49 x (Cp) x
sqrt^p avg. x
sqrt[Tsavgx460/PsxMWs]

Where,
Vs=velocity stack
Cp=pitot factor
Ts=Stack Temperature
Ps=Stack pressure
MWs=Molecular Wt.gas
where,
MWs=MWd x(1-Bwo)+18(Bwo)

MWd=.44(%CO2)+.32(%O2)
+.28(%CO+%N2)

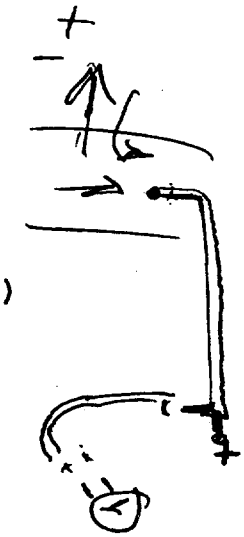
Bwo=%moisture/100
Ps=static/13.6 + Pb

Stack Gas Volume at
Standard Conditions
Qs = SCFM

Qs=60(1-Bwo) x Vsavg
x As x (528/Tsavg+460)
x (Ps/29.92)

Vs=

Qs=



Notes/Comments

BEST ENVIRONMENTAL Particulate Field Data Sheet

Run # 1 Method # 4

Plant LAIDLAW NEWBY ISLAND
Date 9-22
Location ENGINE # 3
Port Dia. 10.5 "
Stack I.D. "
Stack Area ft2
Personnel DC/JM

ΔH@ 2.383
Meter Yd 0.9912
Bar. 29.93
Stat Press
%O2 Assum
%CO2 Assum

%H2O Assum.
Pitot Cp
Noz. Diam.
Noz I.D.
Meter # 8812
Probe #

Filter #
Pitot #
Net Imp Vol 74
Tot Imp Vol 274
Sample Time 30
Sqrt ΔP Ave

F.H. Wt. (mg)
S.H. Wt. (mg)
Gel Wt. (mg) 6.5
%CO2 Actual
%O2 Actual
Tot. Moisture
Std Vm

Pre leak ck .002 cfm 14 "Hg Post leak ck .002 cfm 4 "Hg

	Sample Point	Clock Time	Vel. ΔP	M.R. cfm	Orif. ΔH	Gas Meter Volume ft2	Gas Meter In	Gas Meter Out	Temperatures F Stack	Imp.	Filter	Probe	Pump Vac.	Comments
1		11:26				498.161	79	77	1417°				4.	
2		31				501.350	82	79						
3		36				504.455	87	80						
4		41				507.535	93	82						
5		46				510.615	93	89						
6		51				513.710	95	85						
7		11:56				516.750	95	86					4	
8														
9						18.589		(85.9)						
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28	Average													

Notes:

Ms =
Ave. Vs =
Sample I.D. # =

	#1	#2
Final Imp Vol =	169	105
Initial Imp Vol =		

BEST ENVIRONMENTAL Particulate Field Data Sheet

Run # 1 Method # 4

LAIDLAW

Plant NEWBY ISLAND
Date 9-22
Location ENGINE # 1
Port Dim. "
Stack I.D. 10.5" "
Stack Area ft2
Personnel DC/JM

ΔH@ 2.383
Meter Yd 0.9912
PBar. 29.98
Stat Press
%O2 Assum
%CO2 Assum

%H2O Assum.
Pitot Cp
Noz. Diam.
Noz I.D.
Meter # 8812
Probe #

Filter #
Pitot #
Net Imp Vol 72
Tot Imp Vol 272
Sample Time 30
Sqrt ΔP Ave

F.H. Wt. (mg)
S.H. Wt. (mg)
Gel Wt. (mg) 6.5
%CO2 Actual
%O2 Actual
Tot. Moisture
Std Vm

Pre leak ck .002 cfm 15 "Hg Post leak ck .001 cfm 5 "Hg

	Sample Point	Clock Time	Vel. ΔP	M.R. cfm	Orif. ΔH	Gas Meter Volume ft2	Gas Meter In	Gas Meter Out	Temperatures F Stack	Imp.	Filter	Probe	Pump Vac.	Comments
1						~~479.966~~	~~71~~	~~70~~					4	
2		9:25				480.029	71	70	1294°				4	
3		30				483.050	75	71						
4		35				485.990	77	72						
5		40				488.920	79	72						
6		45				491.855	80	73						
7		50				494.790	82	74						
8		9:55				497.720	84	75					4	
9														
10						17.691		75.4						
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28	Average													

Notes:

Ms =
Ave. Vs =
Sample I.D. # =

	#1	#2
Final Imp Vol =	177	
Initial Imp Vol =	102	