MOSTARDI-PLATT ASSOCIATES, INC.
Environmental Contract Engineering Services
1077 Entry Drive
Bensenville, IL 60106
(312) 860-5900

CID, 8/89
LFG EFD AP42

Rating = BC
Lack of ~~process data~~. emission calcs.

GASEOUS EMISSION STUDY
PERFORMED FOR
WASTE MANAGEMENT OF NORTH AMERICA, INC.
CID ENVIRONMENTAL COMPLEX GAS RECOVERY FACILITY
CHICAGO, ILLINOIS
CENTAUR UNITS 1, 2, 3
AUGUST 8, 1989

PROJECT NO. 92008
DATE SUBMITTED: AUGUST 25, 1989

MOSTARDI-PLATT ASSOCIATES, INC.
Environmental Contract Engineering Services
1077 Entry Drive
Bensenville, IL 60106
(312) 860-5900

EXECUTIVE SUMMARY

INTRODUCTION

MOSTARDI-PLATT ASSOCIATES, INC. (MPA) was retained by Waste Management of North America to perform carbon monoxide (CO) study at the CID Environmental Complex in Chicago, Illinois. This test program was authorized by and performed for Waste Management, Inc.

The purpose of this test program was to determine carbon monoxide emissions on each of three Solar Turbines during normal operations with test performance at the stack locations.

These tests were conducted by Messrs. G.M.Gozzi, K. Dyra and P. Schwalbach of MPA. Messrs. Gary Stuenkel and Joseph Gentile of Waste Management CID provided assistance and coordinated plant operating conditions during this test program.

SUMMARY OF RESULTS

On August 8, 1989, three one-hour carbon monoxide emission tests were performed on each of three stacks. The following aearges were measured:

Unit No.	1	2	3	Avg
CO ppm	33.13	33.83	29.83	32.26 ppm
CO lbs/hr	3.897	3.937	3.437	3.757 lbs/hr

A complete summary is tabulated and can be found on page 3.

MOSTARDI-PLATT ASSOCIATES, INC.

TEST PROCEDURES

All testing, sampling, analytical and calibration procedures used for this test program were performed as described in the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 10 and the latest revisions thereof.

Appendices

Test Location Diagram
Field Test Data
CO Analysis
Calibration Data
Operational Data
Horiba Monitor Description

Respectfully submitted,

MOSTARDI-PLATT ASSOCIATES, INC.

Graziano Gozzi

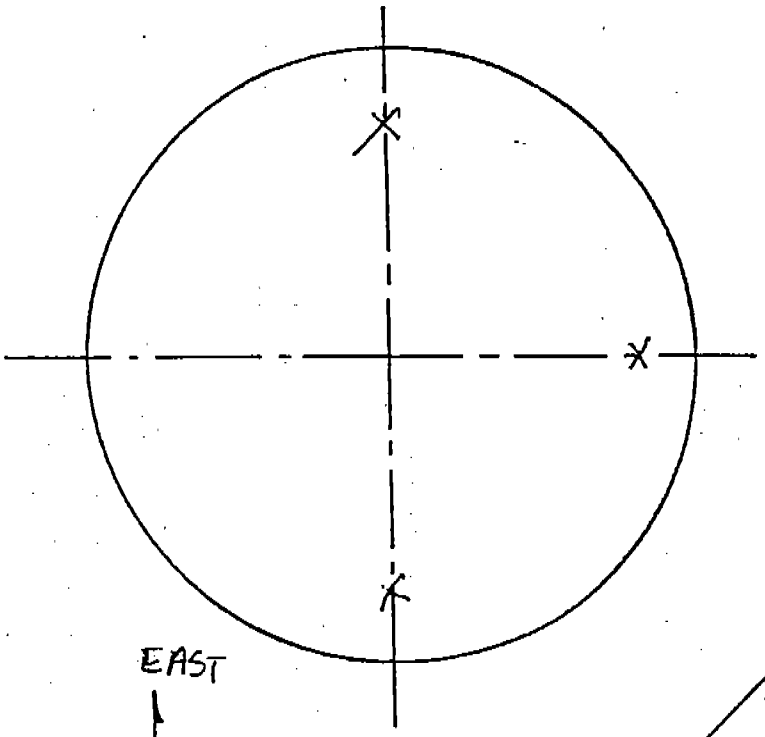
Graziano Gozzi - Project Supervisor

MOSTARDI-PLATT ASSOCIATES, INC.

WASTE MANAGEMENT
CID Landfill Facility
August 8, 1989

	Test No.	1	2	3	Average
Unit 1	CO emissions				
	ppm	32.9	31.8	34.7	33.13
	ppm @ 15% O_2	43.14	41.69	41.78	42.20
	lbs/dscf x 10^{-6}	2.39	2.31	2.52	2.407
	lbs/hr	3.87	3.74	4.08	3.897
	tons/yr (365 days)				17.07
	O_2 %	16.4	16.4	16.0	16.27
	DSCFM	26974			26974
Unit 2	CO emissions				
	ppm	34.8	34.9	31.8	33.83
	ppm @ 15% O_2	42.8	43.8	44.7	43.77
	lbs/dscf x 10^{-6}	2.53	2.54	2.31	2.46
	lbs/hr	4.05	4.06	3.70	3.937
	tons/yr (365 days)				17.24
	O_2 %	16.1	16.2	16.2	16.33
	DSCFM	26662			26662
Unit 3	CO emissions				
	ppm	28.9	30.4	30.2	29.83
	ppm @ 15% O_2	33.43	34.49	36.36	34.76
	lbs/dscf x 10^{-6}	2.10	2.21	2.19	2.167
	lbs/hr	3.33	3.50	3.48	3.437
	tons/yr (365 days)				15.05
	O_2 %	15.8	15.7	16.0	15.83
	DSCFM	26429			26429

32.26 ff



Compass Direction

Traverse point number on a diameter	Number of traverse points on a diameter											
	2	4	6	8	10	12	14	16	18	20	22	24
1	85.4	93.3	95.6	96.7	97.5	97.9	98.2	98.4	98.6	98.7	98.9	98.9
2	14.6	75.0	85.3	89.5	91.8	93.3	94.3	95.1	95.6	96.1	96.5	96.8
3		25.0	70.5	80.6	85.4	88.2	90.1	91.5	92.5	93.3	94.0	94.5
4			29.5	67.7	77.4	82.3	85.4	87.5	89.1	90.3	91.3	92.1
5			14.7	32.3	65.8	75.0	79.9	83.1	85.4	87.1	88.4	89.5
6				19.4	34.2	64.5	73.1	78.0	81.2	83.5	85.4	86.8
7				10.5	22.6	35.5	63.4	71.7	76.4	79.6	82.0	83.9
8				3.3	14.6	25.0	36.6	62.5	70.4	75.0	78.2	80.6
9					5.7	17.7	26.9	37.5	61.8	69.4	73.9	77.0
10					2.5	11.8	20.1	28.3	38.2	61.2	68.5	72.8
11						6.7	14.6	22.0	29.6	38.8	60.7	67.7
12						2.1	9.9	16.9	23.6	30.6	39.3	60.2
13							5.7	12.5	18.8	25.0	31.5	39.8
14							1.8	8.5	14.6	20.4	26.1	32.3
15								4.9	10.9	16.5	21.8	27.2
16								1.6	7.5	12.9	18.0	23.0
17									4.4	9.7	14.6	19.4
18									1.4	6.7	11.6	16.1
19										3.9	8.7	13.2
20										1.3	6.0	10.5
21											3.5	7.9
22											1.1	5.5
23												3.2
24												1.1

(Percent of stack diameter from inside wall to traverse point)

JOB: Waste Management CID LANDFILL

DATE: 8-8-89

TEST NO. All

DUCT NO. Typical of Stacks 1, 2, 3

DUCT DIA. _____ ft. _____ ins.

DUCT AREA _____ ft^2

NO. POINTS ACROSS DIA. _____

mostardi-platt associates, inc.

EQUAL AREA TRAVERSE

FOR ROUND DUCTS

SCALE:	DRAWN	APPROVED

mostardi-platt associates, inc.

METHOD 3 - FIELD DATA SHEET
INTEGRATED SAMPLES - GAS ANALYSIS

Project: WASTE MANAGEMENT CID Date: 8-8-89

Sampling Location: UNIT 1 STACK

Source Condition: _____ Monitor: Model _____

Fuel Type: _____ Serial No. _____

Module No. 1 Rate Meter Units: L/MIN Orsat No. 1 Bag Type: TEDLAR

Test(Run) No. 1/UNIT 1

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate
1-1	1545	1
1-1	1615	1
1-1	1645	1

ANALYSIS

% By Volume (dry-basis)

Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

Post-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Test(Run) No. 2/UNIT 1

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate
1-1	1645	1
1-1	1715	1
1-1	1745	1

ANALYSIS

% By Volume (dry-basis)

Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

Post-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Comments:

Operator: _____

$$F_o(\text{Orsat}) = \frac{20.9 - (\%O_2 - 0.5\,\%CO)}{\%CO_2 + \%CO}$$

$$F_o(\text{Fuel}) = \frac{0.209\,F_d}{F_c} + \frac{0.651\,(1.53\,\%C + 3.64\,\%H + 0.57\,\%S + 0.14\,\%N - 0.46\,\%O_2)}{\%C}$$

$$\%\,\text{Difference} = \frac{F_o(\text{Orsat}) - F_o(\text{Fuel})}{F_o(\text{Fuel})} \times 100$$

mostardi-platt associates, in

METHOD 3 - FIELD DATA SHEET
INTEGRATED SAMPLES - GAS ANALYSIS

Project: WASTE MANAGEMENT Date: 8-8-89

Sampling Location: UNIT 1 STACK

Source Condition: ______ Monitor: Model ______

Fuel Type: ______ Serial No. ______

Module No. 1 Rate Meter Units: ______ Orsat No. 1 Bag Type: TELDAR

Test(Run) No. 3/UNIT 1

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate
1-1	1745	1
1-1	1815	1
1-1	1845	1

ANALYSIS

% By Volume (dry-basis)			
Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

Post-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Test(Run) No. ______

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate

ANALYSIS

% By Volume (dry-basis)			
Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

Post-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Comments:

Operator: ______

$$F_o(\text{Orsat}) = \frac{20.9 - (\%O_2 - 0.5\ \%CO)}{\%CO_2 + \%CO}$$

$$F_o(\text{Fuel}) = \frac{0.209\ F_d}{F_c} = \frac{0.651\ (1.53\ \%C + 3.64\ \%H + 0.57\ \%S + 0.14\ \%N - 0.46}{\%C}$$

$$\%\ \text{Difference} = \frac{F_o(\text{Orsat}) - F_o(\text{Fuel})}{F_o(\text{Fuel})} \times 100$$

mostardi-platt associates, inc

METHOD 3 - FIELD DATA SHEET
INTEGRATED SAMPLES - GAS ANALYSIS

Project: WASTE MANAGEMENT CID Date: 8-8-89

Sampling Location: UNIT 2 STACK

Source Condition: _____ Monitor: Model _____

Fuel Type: _____ Serial No. _____

Module No. 1 Rate Meter Units: L/MIN Orsat No. 1 Bag Type: TEDLAR

Test(Run) No. 1/UNIT 2

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate
1-1	1211	1
1-1	1315	1
1-1	1411	1

ANALYSIS

% By Volume (dry-basis)			
Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

Post-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Test(Run) No. 2 UNIT 2

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate
1-1	1341	1-1
1-1	1415	1-1
	1441	

ANALYSIS

% By Volume (dry-basis)			
Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

Post-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Comments:

Operator: _____

$$F_o(\text{Orsat}) = \frac{20.9 - (\%O_2 - 0.5\,\%CO)}{\%CO_2 + \%CO}$$

$$F_o(\text{Fuel}) = \frac{0.209\,F_d}{F_c} + \frac{0.651\,(1.53\,\%C + 3.64\,\%H + 0.57\,\%S + 0.14\,\%N - 0.46\,\%O)}{\%C}$$

$$\%\,\text{Difference} = \frac{F_o(\text{Orsat}) - F_o(\text{Fuel})}{F_o(\text{Fuel})} \times 100$$

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METHOD 3 - FIELD DATA SHEET
INTEGRATED SAMPLES - GAS ANALYSIS

Project: WASTE MANAGEMENT CID Date: 8-8-89

Sampling Location: UNIT 2 STACK

Source Condition: _____ Monitor: Model _____

Fuel Type: _____ Serial No. _____

Module No. 1 Rate Meter Units: L/MIN Orsat No. 1 Bag Type: TEDLAR

Test(Run) No. 3/UNIT 2

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate
1-1	1441	1
1-1	1515	1
1-1	1541	1

ANALYSIS

% By Volume (dry-basis)			
Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:

Bag:

Pipettes:

Burette:

Post-Run Leak Check:
Train:

Bag:

Pipettes:

Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Test(Run) No. _____

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate

ANALYSIS

% By Volume (dry-basis)			
Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:

Bag:

Pipettes:

Burette:

Post-Run Leak Check:
Train:

Bag:

Pipettes:

Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Comments:

Operator: _____

$$F_o(\text{Orsat}) = \frac{20.9 - (\%O_2 - 0.5\,\%CO)}{\%CO_2 + \%CO}$$

$$F_o(\text{Fuel}) = \frac{0.209\,F_d}{F_c} + \frac{0.651\,(1.53\,\%C + 3.64\,\%H + 0.57\,\%S + 0.14\,\%N - 0.46\,\%O)}{\%C}$$

$$\%\,\text{Difference} = \frac{F_o(\text{Orsat}) - F_o(\text{Fuel})}{F_o(\text{Fuel})} \times 100$$

mostardi-platt associates, inc.

METHOD 3 - FIELD DATA SHEET
INTEGRATED SAMPLES - GAS ANALYSIS

Project: Waste Management CID Date: 8-8-89

Sampling Location: Unit 3 stack

Source Condition: _____ Monitor: Model _____

Fuel Type: _____ Serial No. _____

Module No. 1 Rate Meter Units: L/MIN Orsat No. 1 Bag Type: TEDLAR

Test(Run) No. 1 UNIT 3

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate
1-1	933	1
1-1	1003	1
1-1	1033	1

ANALYSIS

% By Volume (dry-basis)			
Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

Post-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Test(Run) No. 2 UNIT 3

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate
1-1	1034	1
1-1	1104	1
1-1	1134	

ANALYSIS

% By Volume (dry-basis)			
Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

Post-Run Leak Check:
Train:
Bag:
Pipettes:
Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Comments:

Operator: _____

$$F_o(\text{Orsat}) = \frac{20.9 \cdot (\%O_2 - 0.5\,\%CO)}{\%CO_2 + \%CO}$$

$$F_o(\text{Fuel}) = \frac{0.209\,F_d}{F_c} - \frac{0.651\,(1.53\,\%C + 3.64\,\%H + 0.57\,\%S + 0.14\,\%N - 0.46\,\%O)}{\%C}$$

$$\%\,\text{Difference} = \frac{F_o(\text{Orsat}) - F_o(\text{Fuel})}{F_o(\text{Fuel})} \times 100$$

mostardi-platt associates, Inc.

METHOD 3 - FIELD DATA SHEET
INTEGRATED SAMPLES - GAS ANALYSIS

Project: WASTE MANAGEMENT CID Date: 8-8-89

Sampling Location: UNIT 3 STACK

Source Condition: _____ Monitor: Model _____

Fuel Type: _____ Serial No. _____

Module No. 1 Rate Meter Units: L/MIN Orsat No. 1 Bag Type: TEDLAR

Test(Run) No. 3 UNIT 3

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate
1-1	1134	1
1-1	1204	1
1-1	1234	1

ANALYSIS

% By Volume (dry-basis)			
Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:

Bag:

Pipettes:

Burette:

Post-Run Leak Check:
Train:

Bag:

Pipettes:

Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Test(Run) No. _____

SAMPLING

Port-Point No.	Clock Time 24hr	Flow Rate

ANALYSIS

% By Volume (dry-basis)			
Total	CO_2	O_2	CO
Avg			

Pre-Run Leak Check:
Train:

Bag:

Pipettes:

Burette:

Post-Run Leak Check:
Train:

Bag:

Pipettes:

Burette:

VALIDATION

Fuel Factor (F_o)		Percent Difference
Orsat	Fuel	

Comments:

Operator: _____

$$F_o(\text{Orsat}) = \frac{20.9 - (\%O_2 - 0.5\,\%CO)}{\%CO_2 + \%CO}$$

$$F_o(\text{Fuel}) = \frac{0.209\,F_d}{F_c} + \frac{0.651\,(1.53\,\%C + 3.64\,\%H + 0.57\,\%S + 0.14\,\%N - 0.46\,\%O}{\%C}$$

$$\%\,\text{Difference} = \frac{F_o(\text{Orsat}) - F_o(\text{Fuel})}{F_o(\text{Fuel})} \times 100$$

mostardi-platt associates, Inc.

METHOD 10-CARBON MONOXIDE MONITOR

COMPANY Waste Management PLANT CID

TEST LOCATION Units 1, 2, 3 Stack DATE 8-8-89

TIME	CO MONITOR READING		STRIP CHART READING	CO_2 / O_2	
		Corrected			
Unit 3	Test No. 1			19.6	
	30	28.9	29	3.8	15.8
Test 2	30 (31.5)	30.4	31.5	3.6	15.7
Test 3	31.5	30.2	31.5	4.2	16.0
Unit 2					
Test 1	36	34.8	36	3.3	16.1
2	36	34.9		3.0	16.2
3	33	31.78		3.7	16.7
Unit 1	~~33.9~~	~~32.88~~		~~3.0~~	~~16.4~~
1	33.9	32.88		3.0	16.4
2	33.0	31.81		3.6	16.4
3	36	34.7		3.6	16.0

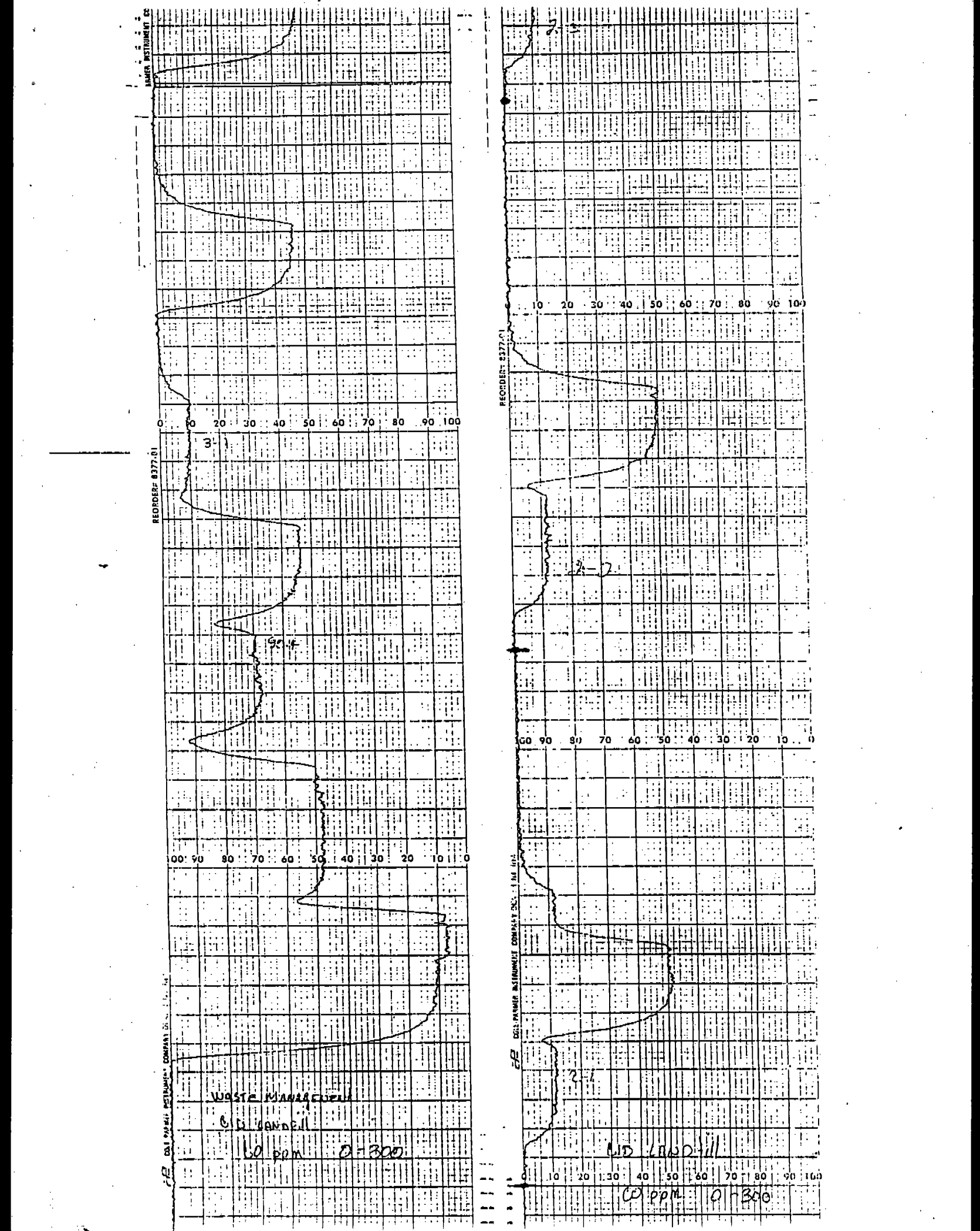
CALIBRATION- Strip Chart Settings; Rate= _____ Input= 10 mv

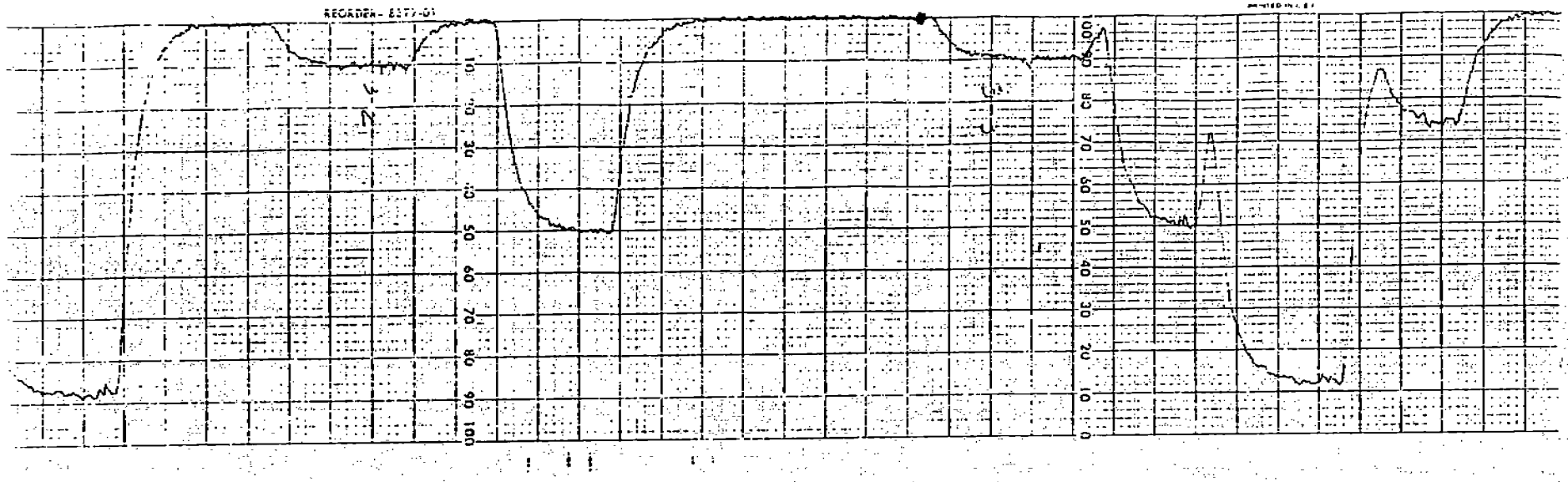
Pre-Test

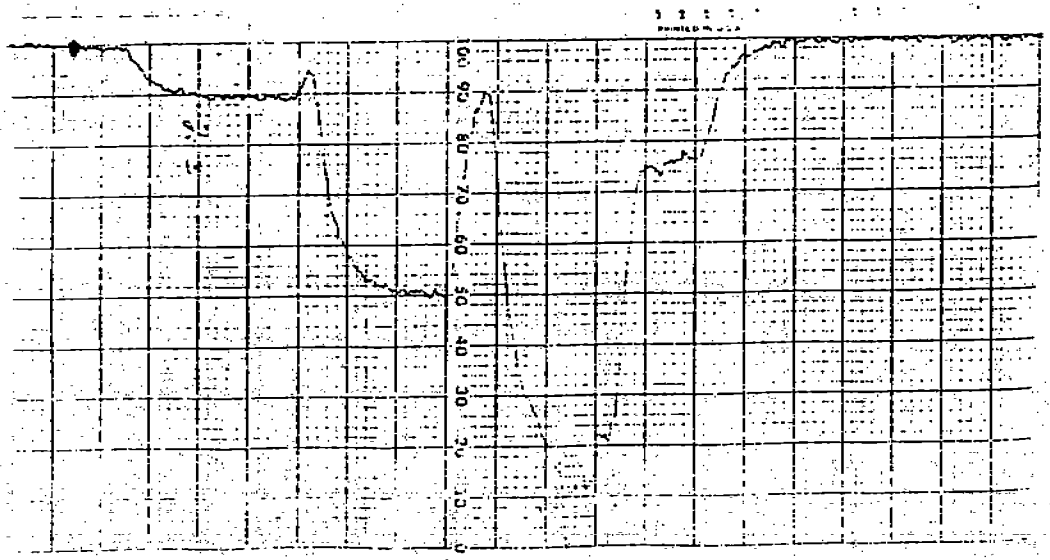
Reference Gas P.P.M.	Monitor Reading P.P.M.	Strip Chart Reading
279	279	93%
148	152	50%
90.4		
0	0	0

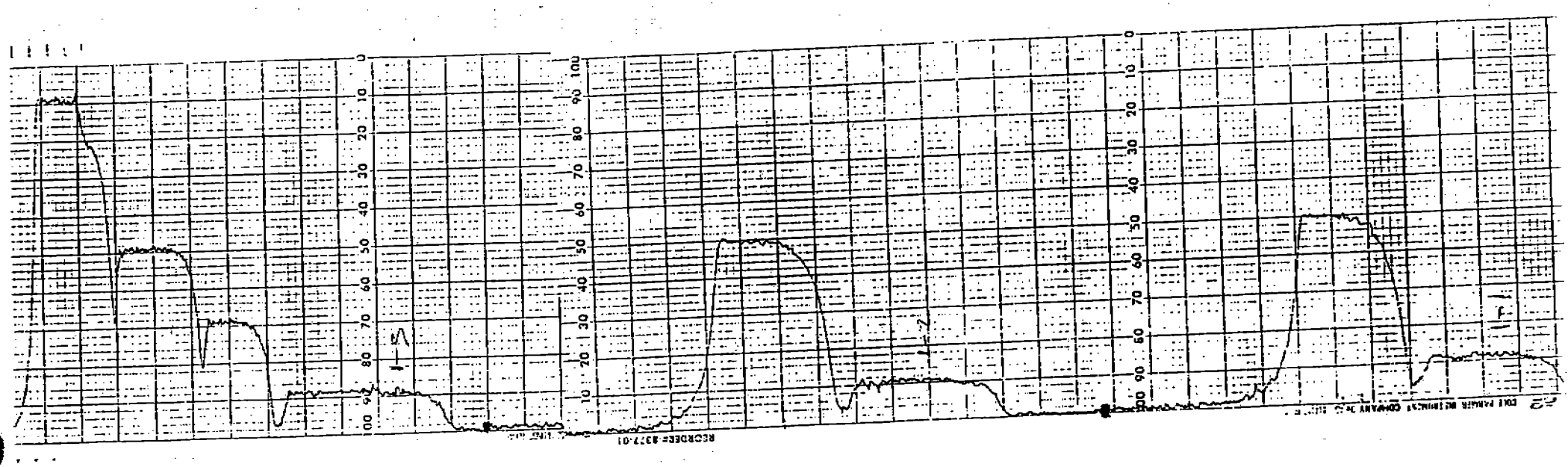
Post-Test

Reference Gas P.P.M.	Monitor Reading P.P.M.	Strip Chart Reading


BAKER INSTRUMENT CO
RECORDER 8377-01
3
95 F
WASTE MANAGEMENT
Oli landfill
60 ppm 0-300
RECORDER 8377-01
2
2-2
MID LAND-fill
0 ppm 0-300


RECORDER - 8377-01
N
100 90 80 70 60 50 40 30 20 10 0


S
100 90 80 70 60 50 40 30 20 10 0



RECEIVED DEC 17 1989

Air Products

INDUSTRIAL GAS DIVISION

Air Products and Chemicals, Inc.
Specialty Gas Department
12722 South Wentworth Avenue
Chicago, IL 60628
(312) 785-3000

ANALYTICAL REPORT

SAMPLE OF: 100 PPM CARBON MONOXIDE/ NITROGEN DATE: 11/16/1987 PAGE: 1 of 1

SHIPPER NO.: CUSTOMER ORDER NO.:

SAMPLE DATE: REQUESTED BY:

REMARKS:

ANALYTICAL METHOD		ANALYST
Electrolytic Cell (O_2 Trace)		
Infrared Horiba		
Ion Mobility for N_2 in Ar		
Dew Point		
Hydrogen Flame Analyzer (THC)		
Wet Analysis		
Flame Photometer		

ANALYTICAL METHOD		ANALYST
Gas Chromatography		
Infrared Spectroscopy		
C.G. Flame Ionization Unit	X	RM
Chemiluminescence		
Paramagnetic		
Gravimetric		

ANALYSIS

LAB NO.	CYL. NO.	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
C7369	SG1085NB	CARBON MONOXIDE	100	90.4	MOLAR PPM

CERTIFICATION

This analysis has been performed utilizing the analytical method(s) stated and is correct to within the analytical accuracies of this (these) method(s).

Authorized Signature

CC: Cylinder
File

FORM 8030-2 (REV. 2/83)

Air Products
INDUSTRIAL GAS DIVISION

Air Products and Chemicals, Inc.
Specialty Gas Department
Box 351, RD 1
Tamaqua, PA 18252
(717) 467-2981

ANALYTICAL REPORT

SAMPLE OF: 150 PPM CARBON MONOXIDE/BAL. NITROGEN 'BAL' DATE: JULY 25, 1988 PAGE: 1 of 1

SHIPPER NO. CUSTOMER ORDER NO.:

SAMPLE DATE: REQUESTED BY: MOSTARDI PLATT ASSOC.

REMARKS:

ANALYTICAL METHOD		ANALYST
Electrolytic Cell (O_2 Trace)		
Infrared Horiba		
Ion Mobility for N_2 in Ar		
Dew Point		
Hydrogen Flame Analyzer (THC)		
Wet Analysis		
Flame Photometer		

ANALYTICAL METHOD		ANALYST
Gas Chromatography		
Infrared Spectroscopy		
C.G. Flame Ionization Unit	X	RM
Chemiluminescence		
Paramagnetic		
Gravimetric		

ANALYSIS

LAB NO.	CYL. NO.	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
C9179	SG0734	CARBON MONOXIDE	150	148	MOLAR PPM

CERTIFICATION

This analysis has been performed utilizing the analytical method(s) stated and is correct to within the analytical accuracies of this (these) method(s).

Authorized Signature

CC: Cylinder
File

FORM 8030 (REV 3/78)

Air Products
INDUSTRIAL GAS DIVISION

Air Products and Chemicals, Inc.

Specialty Gas Department
Box 351, RD 1
Tamaqua, PA 18252
(717) 467-2981

ANALYTICAL REPORT

SAMPLE OF: 300 PPM CARBON MONOXIDE/BAL NITROGEN DATE: 7/25/88 PAGE: 1 of 1

SHIPPER NO. CUSTOMER ORDER NO.:

SAMPLE DATE: REQUESTED BY: MOSTARDI PLATT

REMARKS:

ANALYTICAL METHOD		ANALYST
Electrolytic Cell (O_2 Trace)		
Infrared Horiba		
Ion Mobility for N_2 in Ar		
Dew Point		
Hydrogen Flame Analyzer (THC)		
Wet Analysis		
Flame Photometer		

ANALYTICAL METHOD		ANALYST
Gas Chromatography		
Infrared Spectroscopy		
C.G. Flame Ionization Unit	X	RM
Chemiluminescence		
Paramagnetic		
Gravimetric		

ANALYSIS

LAB NO.	CYL. NO.	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
C9178	SG861390	CARBON MONOXIDE	300	279	MOLAR PPM

CERTIFICATION

This analysis has been performed utilizing the analytical method(s) stated and is correct to within the analytical accuracies of this (these) method(s).

K. McNair

Authorized Signature

CC: Cylinder
File

FORM 8030 (REV 3/78)

Turbine Performance Record

Plant: CID Engine Model: Centaur T4500 Equipment #: 1

Location: Calumet City, IL Serial #: 4283C Date: 8-8-89

Oil Used - Brand: Mobil Type: SHC 824

READING	REQUIRED VALUE	ACTUAL VALUE TIME: 4:34pm	ACTUAL VALUE TIME:	ACTUAL VALUE TIME:
Turbine Starts		74		
Turbine Hours		3211		
Turbine Vibrations (IPS)	< 0.4	0.07		
Gearbox Vibrations (G's)	< 20	6		
Generator Winding Temperature A (°C)	< 150	91		
Generator Winding Temperature B (°C)	< 150	91		
Generator Winding Temperature C (°C)	< 150	94		
Generator Vibrations Forward (IPS)	< 0.4	0.04		
Generator Vibrations Aft (IPS)	< 0.4	0.04		
Forward Generator Bearing Temp (°C)	< 82	72		
Aft Generator Bearing Temp (°C)	< 82	72		
Turbine Speed (%)	100%	100		
Turbine Temperature (°F)	1170 Max	1160		
Megawatts	2.8-3.3	2.85		
Power Factor	0.98	0.96		
KVAR		550		
Frequency (HZ)	60	60		
Volts A-B	4160	4300		
Volts B-C	4160	4325		
Volts A-C	4160	4300		
Amperes A	< 480	380		
Amperes B	< 480	395		
Amperes C	< 480	385		
Generator Oil Pressure (PSI)	15-22	15.5		
Fuel Pressure (PSI)	150-185	172		
PCD	113-125	115		
Turbine Filter Inlet Oil (PSI)	55-65	67		
Turbine Filter Outlet Oil (PSI)	35-65	57		
Oil Filter ΔP (PSI)	< 20	10		
Oil Level	1/2 - Full	Full		
Oil Temperature (°F)	135-155	151		
Fuel Gas Flow (SCFM)	1200-1750	1222		
Gas Temperature (°F)	120-140	108		
Turbine Room Temperature (°F)		78		
Battery Charger (Volts)	24-28	31		
Battery Charger (AMPS)	5-10	16		
Ambient Temperature (°F)		70		
Inlet Filter ΔP ("H20)	< 3.0	1.7		
Operator's Initials		[illegible]		

Avg = 1136.6 cfm of 5 sets

(Make all comments on back)

Turbine Performance Record

Plant: CID Engine Model: Centaur T4500 Equipment #: 2

Location: Calumet City, IL Serial #: 4239C Date: 8-8-89

Oil Used - Brand: Mobil Type: SHC 824

READING	REQUIRED VALUE	ACTUAL VALUE TIME: 7:12 AM	ACTUAL VALUE TIME: 4:38 PM	ACTUAL VALUE TIME:
Turbine Starts		77	77	
Turbine Hours		823.9	833.6	
Turbine Vibrations (IPS)	< 0.4	0.09	0.09	
Gearbox Vibrations (G's)	< 20	7.5	7.2	
Generator Winding Temperature A (°C)	< 150	75	90	
Generator Winding Temperature B (°C)	< 150	78	93	
Generator Winding Temperature C (°C)	< 150	78	94	
Generator Vibrations Forward (IPS)	< 0.4	0.04	0.04	
Generator Vibrations Aft (IPS)	< 0.4	0.02	0.03	
Forward Generator Bearing Temp (°C)	< 82	77	80	
Aft Generator Bearing Temp (°C)	< 82	77	80	
Turbine Speed (%)	100%	100	100	
Turbine Temperature (°F)	1170 Max	960	940	
Megawatts	2.8-3.3	2.0	2.2	
Power Factor	0.98	0.95	0.94	
KVAR		450	600	
Frequency (HZ)	60	60	60	
Volts A-B	4160	4300	4350	
Volts B-C	4160	4300	4350	
Volts A-C	4160	4300	4300	
Amperes A	< 480	285	300	
Amperes B	< 480	280	300	
Amperes C	< 480	280	300	
Generator Oil Pressure (PSI)	15-22	18	17.5	
Fuel Pressure (PSI)	150-185	161	158	
PCD	113-125	110	110	
Turbine Filter Inlet Oil (PSI)	55-65	64	64	
Turbine Filter Outlet Oil (PSI)	35-65	58	58	
Oil Filter ΔP (PSI)	< 20	6	6	
Oil Level	1/2 - Full	3/4	3/4	
Oil Temperature (°F)	135-155	149	150	
Fuel Gas Flow (SCFM)	1200-1750	964	1009	
Gas Temperature (°F)	120-140	106	121	
Turbine Room Temperature (°F)		84	76	
Battery Charger (Volts)	24-28	28	28	
Battery Charger (AMPS)	5-10	14	15	
Ambient Temperature (°F)		52	70	
Inlet Filter ΔP ("H2O)	< 3.0	1.4	1.5	
Operator's Initials		K.B	8-D	

(Make all comments on back)

AUG-24-1989 10:32 FROM

Turbine Performance Record

Plant: CID Engine Model: Centaur T4500 Equipment #: 2 3

Location: Calumet City, IL Serial #: 4239C Date: 8-8-89

Oil Used - Brand: Mobil Type: SHC 824

READING	REQUIRED VALUE	ACTUAL VALUE TIME: 7:16AM	ACTUAL VALUE TIME: 3:16PM	ACTUAL VALUE TIME:
Turbine Starts		77	77	
Turbine Hours		848.0	856.0	
Turbine Vibrations (IPS)	< 0.4	0.1	0.09	
Gearbox Vibrations (G's)	< 20	7.5	7	
Generator Winding Temperature A (°C)	< 150	103	104	
Generator Winding Temperature B (°C)	< 150	108	106	
Generator Winding Temperature C (°C)	< 150	108	107	
Generator Vibrations Forward (IPS)	< 0.4	0.02	0.02	
Generator Vibrations Aft (IPS)	< 0.4	0.02	0.02	
Forward Generator Bearing Temp (°C)	< 82	79	80	
Aft Generator Bearing Temp (°C)	< 82	79	80	
Turbine Speed (%)	100%	100	100	
Turbine Temperature (°F)	1170 Max	1160	1170	
Megawatts	2.8-3.3	2.9	2.8	
Power Factor	0.98	0.95	0.95	
KVAR		625	550	
Frequency (HZ)	60	60	60	
Volts A-B	4160	4300	4350	
Volts B-C	4160	4300	4325	
Volts A-C	4160	4300	4350	
Amperes A	< 480	385	380	
Amperes B	< 480	390	385	
Amperes C	< 480	390	390	
Generator Oil Pressure (PSI)	15-22	18	18	
Fuel Pressure (PSI)	150-185	154	154	
PCD	113-125	118	116	
Turbine Filter Inlet Oil (PSI)	55-65	64	64	
Turbine Filter Outlet Oil (PSI)	35-65	57	57	
Oil Filter ΔP (PSI)	< 20	7	7	
Oil Level	1/2 - Full	3/4	3/4	
Oil Temperature (°F)	135-155	150	150	
Fuel Gas Flow (SCFM)	1200-1750	1238	1250	
Gas Temperature (°F)	120-140	111	118	
Turbine Room Temperature (°F)		84	88	
Battery Charger (Volts)	24-28	28	28	
Battery Charger (AMPS)	5-10	15	15	
Ambient Temperature (°F)		61	60	
Inlet Filter ΔP ("H2O)	< 3.0	1.5		
Operator's Initials		X.B	X.B	

(Make all comments on back)

HORIBA

SPECIFICATIONS

Type	MEXA-201E	MEXA-221E	MEXA-321E
Measuring Method	Non-dispersive Infrared Ray Absorption Method (NDIR)		
Object of Measurement	Carbon Monoxide (CO)	Hydrocarbons (HC)	Carbon Monoxide (CO) and Hydrocarbons (HC)
Range of Measurement	0-2vol% CO 0-8vol% CO } Dual Range	0-500ppm HC 0-2000ppm HC } Dual Range	0-2vol% CO 0-8vol% CO } Dual Range 0-500ppm HC 0-2000ppm HC } Dual Range
Accuracy	CO: Within ±0.5vol% CO	HC: Within 5% of full scale of each range.	CO: Within ±0.5vol% CO HC: Within 5% of full scale of each range.
Indicator	Scale Length: Approx. 96mm concentration scale.		
Minimum Graduation	0.05vol% CO (0-2vol% CO Range) 0.2vol% CO (0-8vol% CO Range)	10ppm HC (0-500ppm HC Range) 50ppm HC (0-2000ppm HC Range)	0.05vol% CO (0-2vol% CO Range) 0.2vol% CO (0-8vol% CO Range) 10ppm HC (0-500ppm HC Range) 50ppm HC (0-2000ppm HC Range)
Warm Up Time	Approx. 30 min.		
Speed of Response	Within 10 sec. for 90% response (including sample handling system)		
Output for Recorder	DC100mV full scale (output impedance: 100Ω)		
Ambient Condition	Ambient Temperature: 0-40°C Ambient Humidity: Less than relative humidity of 90%		
Sampling	Directly sampled		
Power Source	AC100V/110V/115V±10% 60Hz AC220V/230V/240V±10% 50Hz		
Power Consumption	Approx. 50W		Approx. 80W
External Dimensions	220(W)×225(H)×520(D) mm		330(W)×225(H)×520(D) mm
Weight	Approx. 9.5kg		Approx. 13kg

SPECIFICATIONS

Type	MEXA-201E	MEXA-221E	MEXA-321E
Measuring Method	Non-dispersive Infrared Ray Absorption Method (NDIR)		
Object of Measurement	Carbon Monoxide (CO)	Hydrocarbons (HC)	Carbon Monoxide (CO) and Hydrocarbons (HC)
Range of Measurement	0-2vol% CO 0-8vol% CO } Dual Range	0-500ppm HC 0-2000ppm HC } Dual Range	0-2vol% CO 0-8vol% CO } Dual Range 0-500ppm HC 0-2000ppm HC } Dual Range
Accuracy	CO: Within ±0.5vol% CO	HC: Within 5% of full scale of each range.	CO: Within ±0.5vol% CO HC: Within 5% of full scale of each range.
Indicator	Scale Length: Approx. 98mm concentration scale.		
Minimum Graduation	0.05vol% CO (0-2vol% CO Range) 0.2vol% CO (0-8vol% CO Range)	10ppm HC (0-500ppm HC Range) 50ppm HC (0-2000ppm HC Range)	0.05vol% CO (0-2vol% CO Range) 0.2vol% CO (0-8vol% CO Range) 10ppm HC (0-500ppm HC Range) 50ppm HC (0-2000ppm HC Range)
Warm Up Time	Approx. 30 min.		
Speed of Response	Within 10 sec. for 90% response (including sample handling system)		
Output for Recorder	DC100mV full scale (output impedance: 100Ω)		
Ambient Condition	Ambient Temperature: 0-40° C Ambient Humidity: Less than relative humidity of 90%		
Sampling	Directly sampled from tail pipe of vehicle.		
Power Source	AC100V/110V/115V±10% 60Hz AC220V/230V/240V±10% 50Hz		
Power Consumption	Approx. 50W		Approx. 80W
External Dimensions	220(W) × 225(H) × 520(D) mm		330(W) × 225(H) × 520(D) mm
Weight	Approx. 9.5kg		Approx. 13kg

RUST ENVIRONMENT & INFRASTRUCTURE

1240 East Diehl Road ▮ Naperville, IL 60563
Tel.(708) 955-6600 ▮ Fax:(708) 955-6601

Fax Transmittal

Date: JULY 11, 1994

Time: 10:10

To: MR STEPHEN M. ROIE

Company: E.H. PECHAN + ASSOC

City/State: RANCHO CORDOVA CA

Fax Number: 916 852-9451

From: CHUCK ANDERSON

Project No:

Total Pages including This Page: 3

Comments: ATTACHED PLEASE FIND A RESPONSE TO YOUR REQUEST FOR INFORMATION DATED JUNE 16, 1994

IF WE CAN BE OF FURTHER ASSISTANCE, PLEASE CALL ME AT (708) 955-6665.

THANKS!

CHUCK

For Originator:
Return Original ☐ Yes ☐ No ☐ Pickup

For Operator:
Date Sent 7/11/94 Time _____ By _____

In case of transmission problems, please call: (708) 955-6600

Ref. #2

RUST ENVIRONMENT & INFRASTRUCTURE

RUST Environment & Infrastructure Inc.
1240 East Diehl Road
Naperville, IL 60563
Tel. (708) 955-6600 • FAX (708) 955-6601

July 8, 1994

Mr. Steven M. Roe
E.H. Pechan & Associates, Inc.
2880 Sunrise Boulevard, Suite 220
Rancho Cordova, CA 95742

Dear Mr. Roe:

In response to your request for information dated June 16, 1994 the following information is provided:

- Altamont Landfill has no history of co-disposal. Hazardous wastes were never accepted at the site. The fuel flow rate during the June 1988 test was approximately 1500 scfm of landfill gas. To the best of our knowledge NMOC sampling of the fuel gas has never been performed at Altamont.

- The methane content of the LFG fuel at Monroe-Livingston during the July 1989 test was approximately 54.2%. Need fuel FR.

- The following information was available for CID. To the best of our knowledge NMOC sampling of the fuel gas has never been performed at CID.

8/25/89	The average methane content was 58.4%. → (58.4 + 58.2)/2 = 58.3%
2/16/90	The average landfill gas flow rate at the gas recovery plant was 3282 scfm. → AVG = 3320
2/22/90	The average methane content was 58.2% and the average landfill gas flow rate at the gas recovery plant was 3359 scfm.

NMOC sampling of the fuel gas has not been performed for the Altamont or CID facilities. If you feel it may be beneficial to have the landfill gas tested at both facilities at this time, please contact me to discuss this option.

If we can be of any further assistance, please call me at (708) 955-6665.

Sincerely,

RUST Environment & Infrastructure, Inc.

Charles E. Anderson
Manager of Gas Recovery

cc: Mike Niemann