ONMENTAL
CES, INC.

3207 A
Bakersfield
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ANCE SOURCE TEST REPORT

PETROLEUM OPERATIONS, INC.
28590 HIGHWAY 119
PMAN, CALIFORNIA 93276

ENTION: DENNIS CHAMPION

UNIT TESTED:

K-71 30R
APCD #4091081B

DATE TESTED:

MAY 11, 1992

DATE REPORTED:

MAY 29, 1992

DETERMINATIONS:

ISSIONS OF NOx, CO, O_2
AND NMHC

REPORT: #10-854-24

TESTED BY: [signature]
SCOTT DAVIS

REVIEWED BY: SMB

RECEIVED
JUN 02 1992
ENVIRONMENTAL

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COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
REPORT : 10-854-24

% REDUCTION OF CO

RUN #	INLET lbs/hr	OUTLET lbs/hr	% REDUCTION
#1	5.10	0.821	83.9
#2	5.02	0.785	84.4

% REDUCTION OF NON-METHANE HYDROCARBONS

RUN #	INLET lbs/hr	OUTLET lbs/hr	% REDUCTION
#1	3.10	2.59	16.45
#2	3.24	2.61	19.44
#3	3.22	2.64	18.01

SUMMARY OF SOURCE TEST RESULTS

COMPANY: BECHTEL PETROLEUM OPERATIONS, INC. APCD # 4091081 B

TEST DATE: MAY 11, 1992 UNIT #: K-71

INLET EMISSIONS

	gr/scf	@12%CO2	ppm	@ 15% O2	lb/hr	gr/BHP-hr	Permit Limits
SO2 (wet)			Total Sulfur as H2S = < 1.0 ppm		< .00112		
					< .00111		
Mean:					< .00112		
NOx (dry)			104.0	56.8	1.51	0.769	
			71.2	39.8	1.05	0.542	
Mean:			87.6	48.3	1.28	0.656	
NMHC			609	337	3.10	1.59	
			636	352	3.24	1.66	
			633	350	3.22	1.65	
Mean:			626	346	3.19	1.63	
CO			576	315	5.10	2.60	
			561	314	5.02	2.60	
Mean:			569	315	5.06	2.60	

Comments:

Petro Chem Environmental Services, Inc.

SUMMARY OF SOURCE TEST RESULTS

COMPANY: BECHTEL PETROLEUM OPERATIONS, INC. APCD # 4091081 B

TEST DATE: MAY 11, 1992 UNIT #: K-71

OUTLET EMISSIONS

	gr/scf	@12%CO2	ppm	@ 15% O2	lb/hr	gr/BHP-hr	Permit Limits
SO2 (wet)			Total Sulfur as H2S = < 1.0 ppm		< .00111		
Mean:							
NOx (dry)			97.0	54.5	1.43	0.723	
			85.4	48.2	1.27	0.643	
Mean:			91.2	51.4	1.35	0.683	
NMHC			504	284	2.59	1.31	
			507	285	2.61	1.32	
			513	289	2.64	1.34	
Mean:			508	286	2.61	1.32	
CO			91.5	51.4	0.821	0.415	
			87.0	49.1	0.785	0.399	
Mean:			89.3	50.3	0.803	0.407	

Comments: _____

Petro Chem Environmental Services, Inc.

INTRODUCTION

INTRODUCTION

On May 11, 1992, Petro Chem Environmental Services, Inc. (PCES) performed a series of emission source tests for Bechtel Petroleum Operations, Inc. located at the Elk Hills Naval Petroleum Reserve No. 1 in Tupman, California. The test unit was K-71, a gas fired Waukesha L7042GS1 engine. The engine is rated at 1500 HP and is equipped with PCC and an oxidizing catalyst. Concentrations and emissions of NOx, CO, O_2, NMHC, and fuel sulfur as SO_2 were determined using the following procedures:

Parameters	Method	# Test Runs Catalyst Inlet and Outlet
NOx	CARB Method 100; Chemiluminescent Analyzer	2 - 1 hr.
CO	CARB Method 100; GFC Analyzer	2 - 1 hr.
O_2	CARB Method 100; Fuel Cell Analyzer	2 - 1 hr.
NMHC	EPA Method 18; Bag Sample, C_1-C_6 FID Analysis	3
Fuel Sulfur as SO_2	GC/FPD Analysis	1/day
Volume Flow	EPA Method 19; Fuel Usage (Supplied by Bechtel) and Fuel F-Factor Analysis	2
Fuel Analysis	C_1-C_6+, O_2, CO_2, and N_2	1/day
BHP Analysis	(Supplied by Bechtel)	2

All sampling was performed by Scott Davis of Petro Chem Environmental Services, Inc. (PCES). The fuel analysis was performed by Zalco Laboratories, Inc. of Bakersfield, California. The hydrocarbons were analyzed by Terry Rowles of PCES. Mike Carr of Bechtel Petroleum Operations, Inc. supervised the operation of the test unit.

UOUS MONITORING DATA

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
REPORT : 10-854-24

CONTINUOUS MONITORING RESULTS

	NOx			CO		
RUN #	ppm @ 15% O2	lbs/hr	gr/BHP-hr	ppm @ 15% O2	lbs/hr	gr/BHP-hr
INLET						
#1	56.8	1.51	0.769	315	5.10	2.60
#2	39.8	1.05	0.542	314	5.02	2.60
OUTLET						
#1	54.5	1.43	0.723	51.4	0.821	0.415
#2	48.2	1.27	0.643	49.1	0.785	0.399

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
REPORT : 10-854-24

INLET
NOx/CO/O2 DATA

RUN #1

TIME INTERVAL			CONCENTRATIONS			% Full Scale		
BEGIN	-	END	O2;%	NOx;ppm	CO;ppm	O2%fs	NOx%fs	CO%fs
09:35 AM	-	09:45 AM	10.08	111	582	50.9	54.6	68.1
09:45 AM	-	09:55 AM	10.05	109	577	51.0	54.0	67.6
09:55 AM	-	10:05 AM	10.01	104	578	51.1	52.0	67.6
10:05 AM	-	10:15 AM	10.05	102	577	51.5	51.0	67.5
10:15 AM	-	10:25 AM	10.06	100	573	51.8	50.3	67.0
10:25 AM	-	10:35 AM	10.46	97	571	51.9	49.0	67.1
	Averages:		10.12	104	576	51.4	51.8	67.5

	O2	NOx	CO
INITIAL zero	10	10	10
INITIAL span	94	93	53
FINAL zero	9.5	10.2	10
FINAL span	96	93	52.7
ZERO DRIFT %/ppm	-0.12	0.50	0.00
CALIB. DRIFT %/ppm	0.50	0.00	-3.00
ZERO DRIFT %fs	-0.50	0.20	0.00
CALIB.DRIFT %fs	2.00	0.00	-0.30
CAL GAS value	20.9	206.3	430
FULL SCALE RANGE	25	250	1000

Meter Differential	2.25		
Meter Static	7.1	MCF/DAY	160
Meter Coefficient	0.01	DSCFM	2001
MMBTU/SCF	0.00109		
F @ 60°F	8523		
Operating BHP	891		
RPM	859		

NOx	%O2	ppm	@ 3%O2	@15%O2	lb/hr	gr/BHP-hr
	10.12	104	172	56.8	1.51	0.769

CO	%O2	ppm	@ 3%O2	@15%O2	lb/hr	gr/BHP-hr
	10.12	576	957	315	5.10	2.60

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
REPORT : 10-854-24

INLET
NOx/CO/O2 DATA

RUN #2

TIME INTERVAL			CONCENTRATIONS			% Full Scale		
BEGIN	-	END	O2;%	NOx;ppm	CO;ppm	O2%fs	NOx%fs	CO%fs
12:52 PM	-	01:02 PM	10.39	71.8	563	52.0	38.7	65.0
01:02 PM	-	01:12 PM	10.35	74.8	567	52.0	40.0	65.4
01:12 PM	-	01:22 PM	10.30	70.8	563	52.0	38.5	65.0
01:22 PM	-	01:32 PM	10.31	71.8	558	52.2	39.0	64.5
01:32 PM	-	01:42 PM	10.27	68.3	558	52.2	37.7	64.5
01:42 PM	-	01:52 PM	10.52	69.3	558	52.2	37.5	64.5
	Averages:		10.36	71.2	561	52.1	38.6	64.8

	O2	NOx	CO
INITIAL zero	10	10	10
INITIAL span	94	92	52
FINAL zero	10	10.6	10
FINAL span	95	92	52
ZERO DRIFT %/ppm	0.00	1.51	0.00
CALIB. DRIFT %/ppm	0.25	0.00	0.00
ZERO DRIFT %fs	0.00	0.60	0.00
CALIB.DRIFT %fs	1.00	0.00	0.00
CAL GAS value	20.9	206.3	430
FULL SCALE RANGE	25	250	1000

Meter Differential	2.25		
Meter Static	7	MCF/DAY	158
Meter Coefficient	0.01	DSCFM	2021
MMBTU/SCF	0.00109		
F @ 60°F	8523		
Operating BHP	876		
RPM	849		

NOx	%O2	ppm	@ 3%O2	@15%O2	lb/hr	gr/BHP-hr
	10.36	71.2	121	39.8	1.05	0.542

CO	%O2	ppm	@ 3%O2	@15%O2	lb/hr	gr/BHP-hr
	10.36	561	953	314	5.02	2.60

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
REPORT : 10-854-24

OUTLET
NOx/CO/O2 DATA

RUN #1

TIME INTERVAL			CONCENTRATIONS			% Full Scale		
BEGIN	-	END	O2;%	NOx;ppm	CO;ppm	O2%fs	NOx%fs	CO%fs
10:42 AM	-	10:52 AM	10.33	103.3	91.0	51.5	51.5	18.9
10:52 AM	-	11:02 AM	10.33	102.5	91.1	51.5	51.0	18.8
11:02 AM	-	11:12 AM	10.39	97.9	92.3	51.7	49.0	18.8
11:12 AM	-	11:22 AM	10.40	95.7	92.5	51.7	48.0	18.7
11:22 AM	-	11:32 AM	10.46	93.6	94.6	51.9	47.0	18.8
11:32 AM	-	11:42 AM	10.41	88.9	87.6	51.9	46.0	18.8
	Averages:		10.39	97.0	91.5	51.7	48.8	18.8

	O2	NOx	CO
INITIAL zero	10.1	10.2	10
INITIAL span	94	93.1	52.9
FINAL zero	10.1	10.4	10
FINAL span	93.8	92	52.2
ZERO DRIFT %/ppm	0.00	0.50	0.00
CALIB. DRIFT %/ppm	-0.05	-2.74	-7.02
ZERO DRIFT %fs	0.00	0.20	0.00
CALIB.DRIFT %fs	-0.20	-1.10	-0.70
CAL GAS value	20.9	206.3	430
FULL SCALE RANGE	25	250	1000

Meter Differential	2.25		
Meter Static	7	MCF/DAY	158
Meter Coefficient	0.01	DSCFM	2027
MMBTU/SCF	0.00109		
F @ 60°F	8523		
Operating BHP	898		
RPM	854		

NOx	%O2	ppm	@ 3%O2	@15%O2	lb/hr	gr/BHP-hr
	10.39	97.0	165	54.5	1.43	0.723

CO	%O2	ppm	@ 3%O2	@15%O2	lb/hr	gr/BHP-hr
	10.39	91.5	156	51.4	0.821	0.415

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
REPORT : 10-854-24

OUTLET
NOx/CO/O2 DATA

RUN #2

TIME INTERVAL			CONCENTRATIONS			% Full Scale		
BEGIN	-	END	O2;%	NOx;ppm	CO;ppm	O2%fs	NOx%fs	CO%fs
11:45 AM	-	11:55 AM	10.40	87.8	87.0	51.5	45.0	18.5
11:55 AM	-	12:05 PM	10.41	87.9	87.0	51.4	45.1	18.5
12:05 PM	-	12:15 PM	10.44	85.7	87.0	51.4	44.3	18.5
12:15 PM	-	12:25 PM	10.50	85.5	87.0	51.5	44.3	18.5
12:25 PM	-	12:35 PM	10.53	83.4	87.0	51.5	43.5	18.5
12:35 PM	-	12:45 PM	10.33	82.1	87.0	51.5	42.6	18.5
	Averages:		10.44	85.4	87.0	51.5	44.1	18.5

	O2	NOx	CO
INITIAL zero	10.1	10	10
INITIAL span	93.7	92	52
FINAL zero	10	10.4	10
FINAL span	93	92	52
ZERO DRIFT %/ppm	-0.02	1.01	0.00
CALIB. DRIFT %/ppm	-0.18	0.00	0.00
ZERO DRIFT %fs	-0.10	0.40	0.00
CALIB.DRIFT %fs	-0.70	0.00	0.00
CAL GAS value	20.9	206.3	430
FULL SCALE RANGE	25	250	1000

Meter Differential	2.25		
Meter Static	7	MCF/DAY	158
Meter Coefficient	0.01	DSCFM	2037
MMBTU/SCF	0.00109		
F @ 60°F	8523		
Operating BHP	893		
RPM	851		

NOx	%O2	ppm	@ 3%O2	@15%O2	lb/hr	gr/BHP-hr
	10.44	85.4	146	48.2	1.27	0.643

CO	%O2	ppm	@ 3%O2	@15%O2	lb/hr	gr/BHP-hr
	10.44	87.0	149	49.1	0.785	0.399

CALCULATIONS

$$\frac{MCF}{DAY} = Meter\ Positive \times meter\ static \times meter\ coefficient$$

$$DSCFM = \frac{MCF}{DAY} \times .6944 \times \frac{MMBtu}{SCF} \times F\text{-}Factor \times O_2\ correction$$

$$PPM @\ 3\%\ O_2$$

$$ppm \times \frac{(20.9 - 3)}{(20.9 - actual O_2)}$$

$$@\ 15\% O_2$$

$$ppm \times \frac{(20.9 - 15)}{(20.9 - actual O_2)}$$

$$\frac{LBS}{HR} = ppm \times MW \times 1.581 \times 10^{-7} \times DSCFM$$

$$\frac{GR}{BHP\text{-}HR} = \left(\frac{\left(\frac{lbs}{hr} \times 454\right)}{Operating\ BHP} \right)$$

HYDROCARBON DATA

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
REPORT : 10-854-24

INLET
HYDROCARBON RESULTS

RUN No.: 1							
AVG DSCFM: 2011						OPERATING BHP	884
AVG % O2: 10.24							
				ppm	ppm @15% O2	lb/hr	gr/BHP-hr
		ppm	lb/hr		(as methane)		
Methane	(C1)	1596	8.12	1596	883	12.19	6.26
Ethane	(C2)	197	1.88	394	218	2.00	1.03
Propane	(C3)	45	0.63	135	75	0.69	0.35
Butane	(C4)	17	0.31	68	38	0.35	0.18
Pentane	(C5)	0	0	0	0	0	0
Hexane	(C6)	2	0.05	12	7	0.06	0.03
	Total	1857	11.0	2205	1220	15.3	7.85
	Total (non methane)	261	2.88	609	337	3.10	1.59

RUN No.: 2							
DSCFM: 2011						OPERATING BHP	884
AVG % O2: 10.24							
				ppm	ppm @15% O2	lb/hr	gr/BHP-hr
		ppm	lb/hr		(as methane)		
Methane	(C1)	1630	8.29	1630	902	8.29	4.26
Ethane	(C2)	201	1.92	402	222	2.04	1.05
Propane	(C3)	48	0.67	144	80	0.73	0.38
Butane	(C4)	18	0.33	72	40	0.37	0.19
Pentane	(C5)	0	0	0	0	0	0
Hexane	(C6)	3	0.08	18	10	0.09	0.05
	Total	1900	11.3	2266	1254	11.5	5.92
	Total (non methane)	270	3.00	636	352	3.24	1.66

RUN No.: 3							
DSCFM: 2011						OPERATING BHP	884
AVG % O2: 10.24							
				ppm	ppm @15% O2	lb/hr	gr/BHP-hr
		ppm	lb/hr		(as methane)		
Methane	(C1)	1600	8.14	1600	886	8.14	4.18
Ethane	(C2)	201	1.92	402	222	2.04	1.05
Propane	(C3)	47	0.66	141	78	0.72	0.37
Butane	(C4)	18	0.33	72	40	0.37	0.19
Pentane	(C5)	0	0	0	0	0	0
Hexane	(C6)	3	0.08	18	10	0.09	0.05
	Total	1869	11.1	2233	1236	11.4	5.83
	Total (non methane)	269	2.99	633	350	3.22	1.65

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
REPORT : 10-854-24

OUTLET
HYDROCARBON RESULTS

RUN No.: 1
AVG DSCFM: 2032
AVG % O2: 10.42

OPERATING BHP 896

		ppm	lb/hr	ppm	ppm @15% O2 (as methane)	lb/hr	gr/BHP-hr
Methane	(C1)	1614	8.30	1614	909	12.19	6.18
Ethane	(C2)	166	1.60	332	187	1.71	0.86
Propane	(C3)	40	0.57	120	68	0.62	0.31
Butane	(C4)	13	0.24	52	29	0.27	0.14
Pentane	(C5)	0	0	0	0	0	0
Hexane	(C6)	0	0	0	0	0	0
	Total	1833	10.7	2118	1192	14.8	7.49
	Total (non methane)	219	2.41	504	284	2.59	1.31

RUN No.: 2
DSCFM: 2032
AVG % O2: 10.42

OPERATING BHP 896

		ppm	lb/hr	ppm	ppm @15% O2 (as methane)	lb/hr	gr/BHP-hr
Methane	(C1)	1601	8.23	1601	901	8.23	4.17
Ethane	(C2)	166	1.60	332	187	1.71	0.86
Propane	(C3)	41	0.58	123	69	0.63	0.32
Butane	(C4)	13	0.24	52	29	0.27	0.14
Pentane	(C5)	0	0	0	0	0	0
Hexane	(C6)	0	0	0	0	0	0
	Total	1821	10.7	2108	1187	10.8	5.49
	Total (non methane)	220	2.42	507	285	2.61	1.32

RUN No.: 3
DSCFM: 2032
AVG % O2: 10.42

OPERATING BHP 896

		ppm	lb/hr	ppm	ppm @15% O2 (as methane)	lb/hr	gr/BHP-hr
Methane	(C1)	1605	8.25	1605	904	8.25	4.18
Ethane	(C2)	169	1.63	338	190	1.74	0.88
Propane	(C3)	41	0.58	123	69	0.63	0.32
Butane	(C4)	13	0.24	52	29	0.27	0.14
Pentane	(C5)	0	0	0	0	0	0
Hexane	(C6)	0	0	0	0	0	0
	Total	1828	10.7	2118	1192	10.9	5.52
	Total (non methane)	223	2.45	513	289	2.64	1.34

EMISSION FACTORS

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
REPORT : 10-854-24

SULFUR DIOXIDE EMISSION RESULTS

RUN #	H2S, ppm	MCF/DAY	FUEL SCFM	SO2 LBS/HR
INLET				
1	< 1.0	160	111	< 0.00112
2	< 1.0	158	110	< 0.00111
OUTLET				
1	< 1.0	158	110	< 0.00111
2	< 1.0	158	110	< 0.00111

EQUATION:

SCFM = MCF/DAY * 1000/24 * 1/60

SO2 LBS/HR = H2S ppm * 64 * SCFM * 1.581 * 10^-7

MW SO2 = 64

LAB ANALYSIS

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
REPORT : 10-854-24

EPA F Factor - ref Method 19, 40 CFR

Fuel analysis	Lab #: 031562-001
% Carbon	69.97
% Hydrogen	21.29
% Oxygen	4.70
% Nitrogen	4.03
% Sulfur	0.00
BTU/lb	21143

Fd @ 68 °F	8653	Oxygen Based DSCF/MMBtu @ 68° F
Fd @ 60 °F	8523	Oxygen Based DSCF/MMBtu @ 60° F
Fc @ 68 °F	1062	Carbon Dioxide Based DSCF/MMBtu @ 68° F
Fc @ 60 °F	1046	Carbon Dioxide Based DSCF/MMBtu @ 60° F

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-71
DATE : 5-11-92
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CONSTITUENT	WT. %
CO2	4.280
O2	1.593
N2	4.032
CO	0.000
METHANE	67.097
ETHANE	13.646
PROPANE	6.476
I-BUTANE	0.911
N-BUTANE	1.621
I-PENTANE	0.175
N-PENTANE	0.135
HEXANES +	0.034
TOTAL	100.00

CHONS	WT. %
CARBON	69.97
HYDROGEN	21.29
OXYGEN	4.70
NITROGEN	4.03
SULFUR	0.00
TOTAL	100.00
TOTAL H/C	0.30

ZALCO LABORATORIES, INC.

Analytical & Consulting Services

PETRO-CHEM ENVIRONMENTAL
3207 Antonino Avenue
Bakersfield, CA 93308

Lab. No.: 031562_001
Received: May 13, 1992
Reported: May 13, 1992

Attention: Terry Rowles

Sample Description: Bechtel Unit K-71 Job #10-854-24
Fuel Gas 5/11/92
* CHROMATOGRAPHIC ANALYSIS (Z 1610) *

Components	Mole %	Wt %	G.P.M.
Carbon Dioxide	1.899	4.280	
Oxygen	.972	1.593	
Nitrogen	2.810	4.032	
Carbon Monoxide	0.000	0.000	
Methane	81.651	67.097	
Ethane	8.860	13.646	
Propane	2.867	6.476	.788
IsoButane	.306	.911	.100
N-Butane	.545	1.621	.171
IsoPentane	.047	.175	.017
N-Pentane	.036	.135	.013
Hexanes+	.008	.034	.003
Totals =	100.000	100.000	1.093

	SPECIFIC GRAVITY (Air = 1)	.6755
*	SPECIFIC VOLUME, cu.ft./lb	19.40
*	GROSS CALORIFIC VALUE, BTU/cu.ft.	1071.55
**	GROSS CALORIFIC VALUE, BTU/cu.ft.	1090.08
**	GROSS CALORIFIC VALUE, BTU/lb	21143.28
*	NET CALORIFIC VALUE, BTU/cu.ft.	969.14
**	NET CALORIFIC VALUE, BTU/cu.ft.	985.90
	COMPRESSIBILITY FACTOR 'Z' (60 F,1 ATM)	.9974

* Water Saturated ** Dry Gas @ 60 F, 14.73 psia

Kathe Zimmerman
Analyst

Jim Etherton
Laboratory Director

4309 Armour Avenue Bakersfield, California 93308
(805) 395-0539 FAX (805) 395-3069

Petro Chem Environmental Services, Inc.

ZALCO LABORATORIES, INC.

Analytical & Consulting Services

Petro Chem Environmental Service
3207 Antonino Avenue
Bakersfield, CA 93308

Laboratory No: 31562
Date Received: 5-13-92
Date Reported: 5-19-92
P O #: 1907

Attention: Terry Rowles

Sample: Gas

Sample Description: Bechtel Unit #K-71 Fuel Gas, Job #10-854-24
Sampled by SAD on 5-11-92

Total Sulfur
(ASTM D 3246)

As H_2S, ppm (vol.)	< 1.0
As S, Grains/100 SCF*	< 0.06

* Standard cubic feet (60 °F, 14.7 psia)

Jim Etherton
Lab Operations Manager

JE/tds

4309 Armour Avenue Bakersfield, California 93308
(805) 395-0539 FAX (805) 395-3069

EMISSION FACTOR CALCULATIONS

EPA F-FACTOR

$$F = \frac{dscf}{MMBtu} = \left(\frac{10^6 \left[3.64\ \%H) + 1.53\ (\%C) + 0.57\ (\%S) + 0.14\ (\%N) - 0.46\ (\%O) \right]}{GCV} \right)$$

Where: GVC = *Gross calorific value of fuel combusted,* $\frac{BTU}{LB}$

$$F_{60^\circ F} = F_{68^\circ F} \times 0.985$$

GENERAL POLLUTANT LB/MMBtu EQUATION

$$E = F_{60^\circ F}\ C \left(\frac{20.9}{20.9 - \%\ O_2\ of\ C} \right)$$

Where: $E = \frac{LB}{MMBtu}$

$F_{60^\circ F}$ = *F-FACTOR @ 60° F*

C = *Concentration of pollutant,* $\frac{LB}{DSCF}$

SULFUR EMISSION FACTOR

$$E = \frac{LB_S}{MMBtu} = F_{60^\circ F}\ C_{SO_2} \left(\frac{20.9}{20.9 - \%\ O_2\ of\ C} \right)$$

METHODOLOGY

CONTINUOUS EMISSION MONITORING SYSTEM (CEMS)

Reference: Manual of Procedures; ST-13A, ST-19A, Jan 1982, State of California, Air Resources Board, Test Methods 1-100, June 1979.
EPA CFR Title 40, Pt. 60, Appendix A, Method 3A, 6C, 7E, & 10.

Instrument Summary

A constant sample of flue gas was extracted, dried, filtered and delivered to an instrument manifold system for distribution to one or more analyzers. Instrument results are recorded on an analog strip chart recorder. System calibration checks are performed as well as calibration checks at the beginning and end of each test run. Final data reduction includes zero and calibration drift corrections.

Sample Conditioning System

Consists of a borosilicate glass tube or 316 grade stainless steel probe fitted with a cindered stainless steel or pyrex glass wool particulate filter. The probe is fitted with a teflon (TFE) sample line which connects to a water condensation system located at the source. The condensation system consists of three 500-ml short stem glass impingers connected in a series, immersed in an ice bath. The gas is delivered to the instrument trailer with a teflon line (3/8" O.D.) through an in-line Balston particulate filter drawn by a teflon-coated diaphragm pump. The sample system is leak checked prior to sampling by plugging the end of the sample probe and adjusting the sample pump to its maximum rate (approximately 22" Hg). The manifold is by-passed and the leak rate monitored through a gas meter or low range flow meter.

Manifold System

Sample gas is delivered to each analyzer through a five way valve and regulated with a needle valve flow meter. Manifold pressure is controlled by a back pressure regulator which is typically set at three psi. Zero gas (N_2) and calibrated gases are delivered to the analyzers using the same five way valve and flow meter. All manifold parts are glass, stainless steel, or teflon materials.

Analog Strip Chart Data Reduction

Analog recordings consists of averaged time increments as shown on the data pages (typically 5,10, or 20 minute increments). Data for each increment was recorded at an average percent of full scale. The readings were then compared with the zero and calibration readings for calculation of the average concentration for each time increment. Any deviation of the zero and calibration readings from the start to the end of a test period was corrected by calculating apparent zero and calibration readings for the mid-point of each time increment. The average concentrations were then calculated from the sample readings and the apparent zero and span readings.

HYDROCARBON EMISSIONS TESTING
METHODS AND EQUATIONS

REF: EPA METHOD 18; FID ANALYSIS

Sampling Procedures

The sample will be pressurized down stream of a sample pump or drawn via an evacuated cannister through a stainless steel/teflon probe into a tedlar bag. Each sample bag will be evacuated, and then filled.

Analytical Procedures

The contents of the tedlar bag will be analyzed by gas chromatography. The gas chromatograph will be calibrated with an appropriate standard for each carbon #, before and after each set of samples are analyzed. The sample is speciated by carbon #-C1, C2, C3, C4, C5, and C6+ backflush.

Symbol Identification

i = carbon #; i = 1 to 6+
s = refers to standard for that carbon #
Rx_i = response factor for C_i
MW = molecular weight - g/mole
DSCFM = Average volume flow rate of unit tested

$$Rx_i = \frac{ppm\ std}{Area_s} \qquad Rx_i = \frac{Area\ std}{ppm\ std}$$

$$Sample\ ppm_i = \frac{1}{Rx_i} \times Area_i$$

$$Sample\ ppm\ (as\ C_1) = Sample\ ppm \times \#\ of\ Carbons$$

$$\frac{lbs}{hr_i} = ppm_i \times MW_i \times DSCFM \times 1.581 \times 10^{-7}$$

$$Total\ non\text{-}methane\ \frac{lbs}{hr} = \sum_{2}^{6+} \frac{lbs}{hr_i}$$

Note 1: *If* $\frac{lbs}{hr}$ *as methane is required, MW will equal* 16.0
(*MW of methane*)
Note 2: # *of carbons: ethane* = 2; *propane* = 3; *etc...*

COMPANY : PETRO CHEM ENVIRONMENTAL SERVICES
UNIT : BV-1
DATE : 3-17-92

CONTINUOUS MONITORING INSTRUMENT DATA

ANALYZER	MANUFACTURER & MODEL	SERIAL #
NOx ANALYZER	THERMO ELECTRON MODEL 10	10A/R-26616-226
CO ANALYZER	THERMO ELECTRON MODEL 48	48-23438-210
O2 ANALYZER	TELEDYNE MODEL 320AX	SN 93834

RAW DATA

I. C. ENGINE OBSERVATION REPORT
NAVAL PETROLEUM RESERVE NO. 1

LOCATION: SEC 30/T30S/R23E				DATE: 05-11-92		
APCD # 4091081 B K-71				RELEASE # AES 593		
REASON FOR TEST: ENGINEERING EVALUATION				TEST COMPANY: PCES		
EQUIPMENT DESCRIPTION: 1500HP WAUKESHA				VEE PERFORMED: YES		
NOx CONTROL:	CAT.	PSC	PCC X	O2	OXIDIZING CAT. X	
POLLUTANTS:	PM	NOx X	CO X	HC X	H2S X	SO2 X

EMISSIONS DATA

TIME	09:35-10:35	10:42-11:42	11:45-12:45	12:50-1:50		
NOX PPM	100	85	80	70		
CO PPM	570	86	86	550		
% O2	10.20	10.40	10.40	10.50		

CALIBRATION GASES

POLLUTANT	SPAN GAS	RANGE	EXP DATE		INST. MFG	MODEL
NOX	206.3	0-250	11-08-91		TECO	10
CO (OUTLET)	430	0-1000	06-30-92		TECO	48
O2 %	AMBIENT	0-25	N/A		TELEDYNE	

ENGINE PARAMETERS

RPM'S	859	854	851	849		
TOTAL BHP LOAD	891	898	893	876		
PERCENT LOAD	60.0	60.0	60.0	58.0		
CATALYST TEMP.	695	696	694	694		
FUEL STATIC	7.10	7.00	7.00	7.00		
FUEL DIFF.	2.25	2.25	2.25	2.25		
COEF.	0.010	0.010	0.010	0.010		
RATE (MCF/DAY)	160	158	158	158		
SUCTION PSI	45	45	45	45		
DISCHARGE PSI	450	460	460	460		

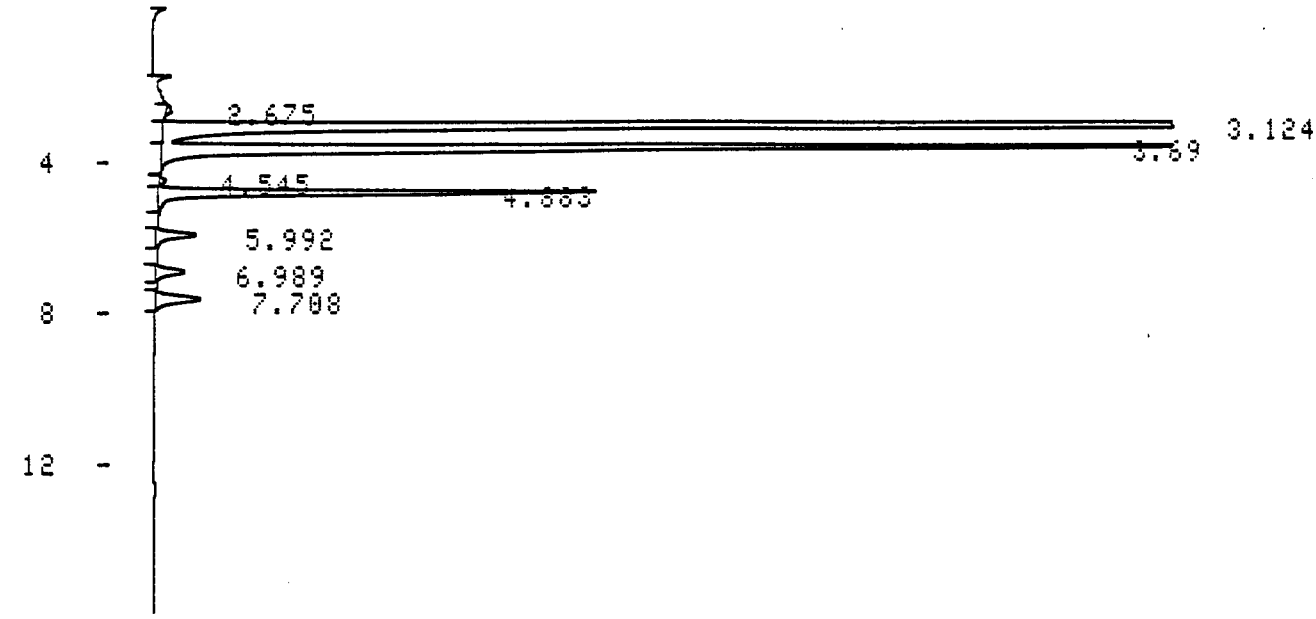
COMMENTS: (INLET) (OUTLET) (OUTLET) (INLET)

NO VISIBLE EMISSIONS

OBSERVER: M. Carr

Petro Chem Environmental Services, Inc.

BECHTEL UNIT # K-71
5-11-92 REPORT # 10-854-24
INLET HC SAMPLE # 1



CHROMATOGRAM 2 MEMORIZED

CR501 CHROMATOPAC
CHANNEL NO 1
SAMPLE NO 0
REPORT NO 53

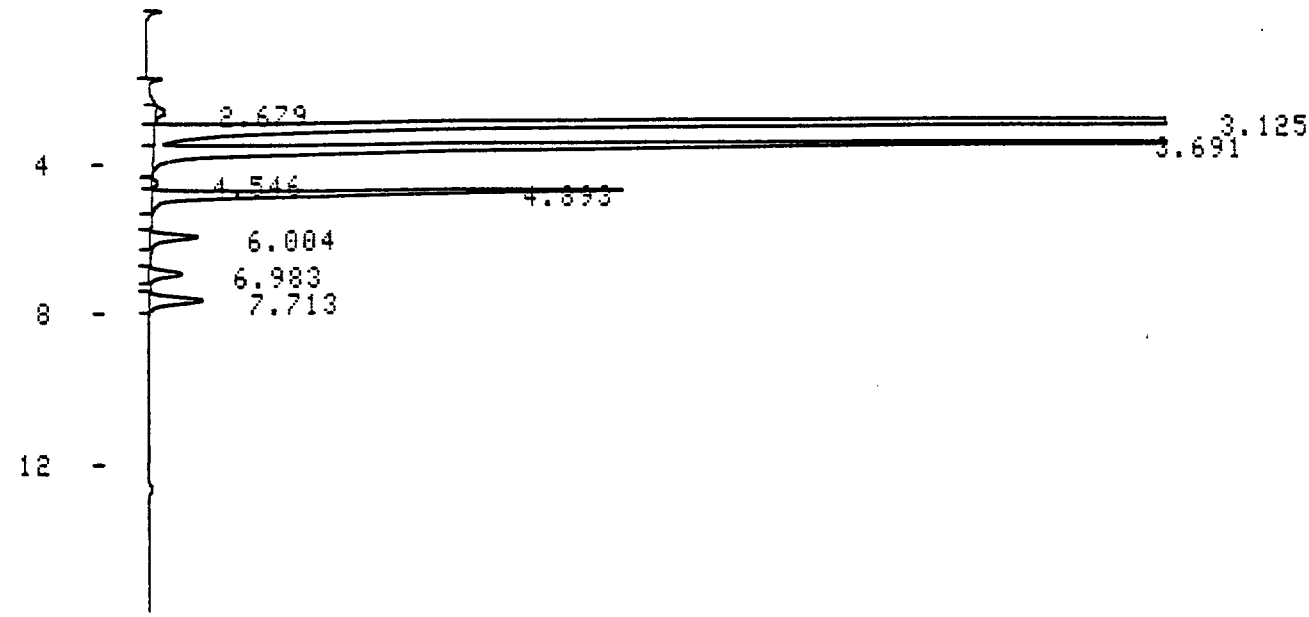
FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	2.675	682		6	2.2046	C-6+
2	3.124	373476		1	1596.3857	C-1
3	3.69	88239	V	2	197.4064	C-2
4	4.545	583		8	3.1388	C-3
5	4.883	27252	V	3	42.0622	C-3
6	5.992	3268		9	5.4561	C-4
7	6.989	2415		10	4.5072	C-4
8	7.708	4317		4	6.6242	C-4
	TOTAL	500231			1857.7846	

GROUP(NAME)	CONC
C-1	1596.3857
C-2	197.4064
C-3	45.201
C-4	16.5875
C-5	0
C-6+	2.2046

Petro Chem Environmental Services, Inc.

BECHTEL UNIT # K-71
5-11-92 REPORT # 10-854-24
INLET HC SAMPLE # 2



CHROMATOGRAM 3 MEMORIZED

CR501 CHROMATOPAC
CHANNEL NO 1
SAMPLE NO 0
REPORT NO 54

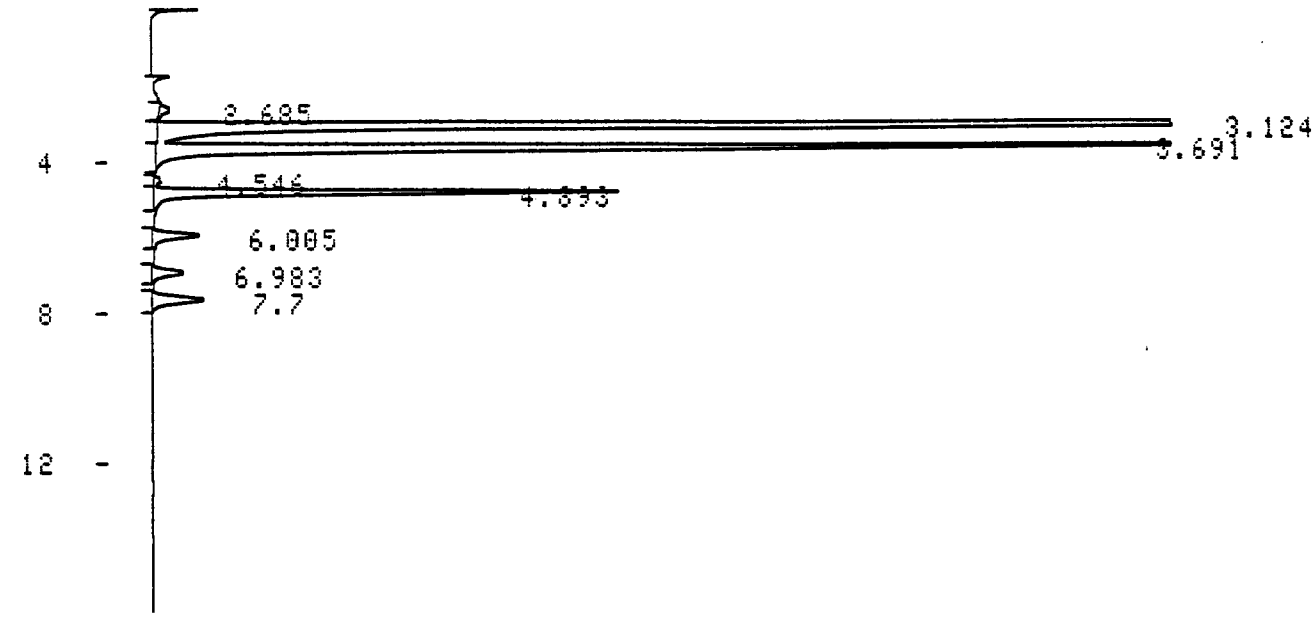
FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	2.679	1123		6	2.5215	C-6+
2	3.125	381374		1	1630.0645	C-1
3	3.691	89780	V	2	200.841	C-2
4	4.546	485		8	2.9958	C-3
5	4.893	29116		3	44.783	C-3
6	6.004	3850		9	6.1045	C-4
7	6.983	2728		10	4.8553	C-4
8	7.713	5078		4	7.4708	C-4
	TOTAL	513532			1899.6359	

GROUP(NAME)	CONC
C-1	1630.0645
C-2	200.841
C-3	47.7788
C-4	18.4305
C-5	0
C-6+	2.5215

Petro Chem Environmental Services, Inc.

BECHTEL UNIT # K-71
5-11-92 REPORT # 10-854-24
INLET HC SAMPLE # 3



CHROMATOGRAM 4 MEMORIZED

CR501 CHROMATOPAC
CHANNEL NO 1
SAMPLE NO 0
REPORT NO 55

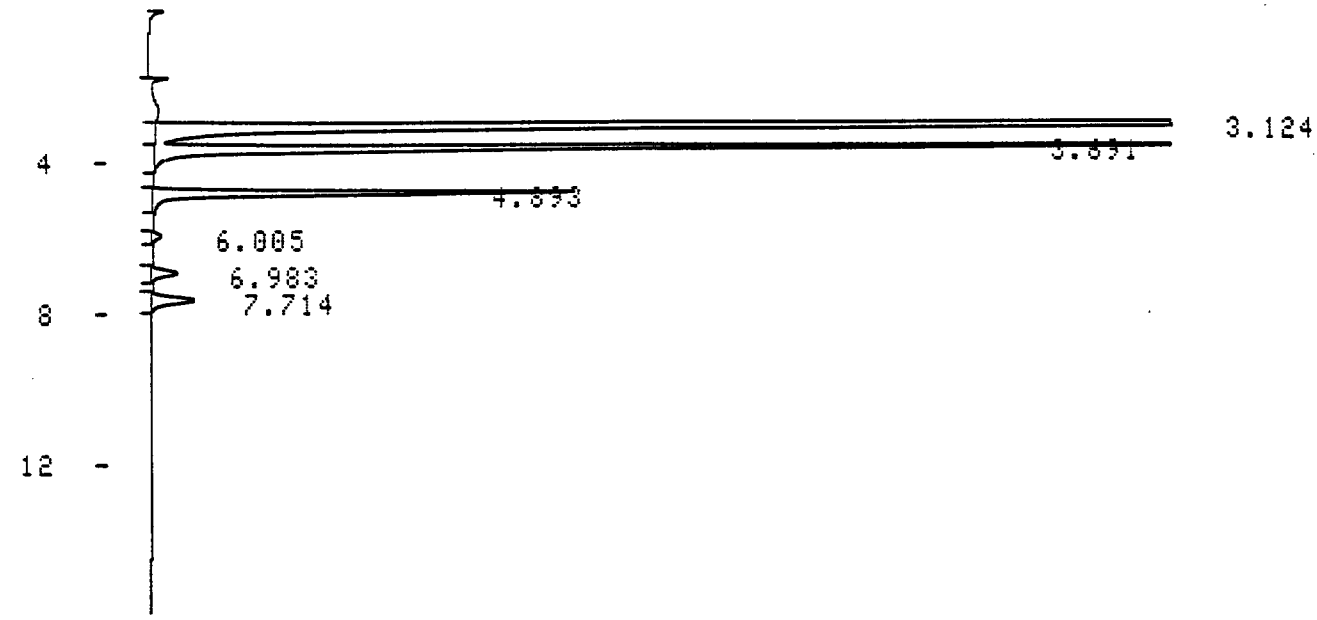
FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	2.685	1147		6	2.5388	C-6+
2	3.124	374248		1	1599.6759	C-1
3	3.691	89893	V	2	201.0937	C-2
4	4.546	542		8	3.0789	C-3
5	4.893	28697	V	3	44.1715	C-3
6	6.005	3745		9	5.9874	C-4
7	6.983	2705		10	4.8297	C-4
8	7.7	4858		4	7.2259	C-4
	TOTAL	505834			1868.6014	

GROUP(NAME)	CONC
C-1	1599.6759
C-2	201.0937
C-3	47.2504
C-4	18.043
C-5	0
C-6+	2.5388

Petro Chem Environmental Services, Inc.

BECHTEL UNIT # K-71
5-11-92 REPORT # 10-854-24
OUTLET HC SAMPLE # 1



CHROMATOGRAM 5 MEMORIZED

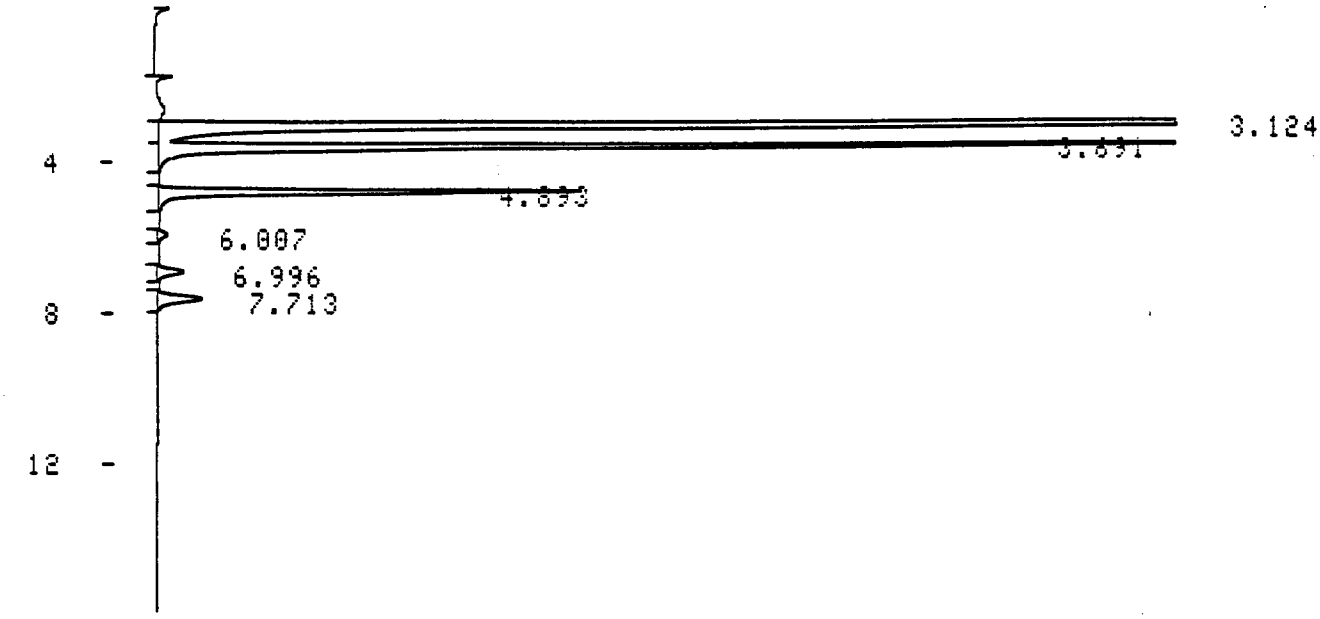
CR501 CHROMATOPAC
CHANNEL NO 1
SAMPLE NO 0
REPORT NO 56

FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.124	377575		1	1613.8665	C-1
2	3.691	74151	V	2	166.0114	C-2
3	4.893	26141		3	40.4413	C-3
4	6.005	609		9	2.4976	C-4
5	6.983	2135		10	4.196	C-4
6	7.714	4102		4	6.3848	C-4
	TOTAL	484714			1833.3974	

GROUP(NAME)	CONC
C-1	1613.8665
C-2	166.0114
C-3	40.4413
C-4	13.0784
C-5	0
C-6+	0

BECHTEL UNIT # K-71
5-11-92 REPORT # 10-854-24
OUTLET HC SAMPLE # 2



CHROMATOGRAM 6 MEMORIZED

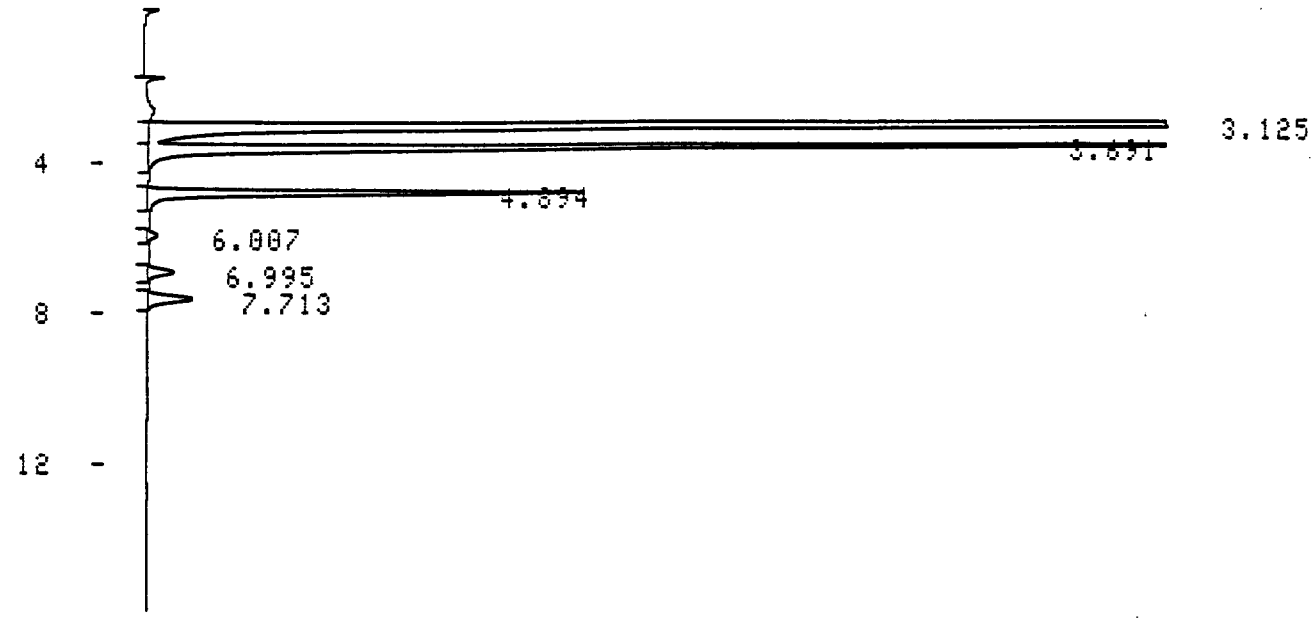
CR501 CHROMATOPAC
CHANNEL NO 1
SAMPLE NO 0
REPORT NO 57

FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.124	374570		1	1601.0511	C-1
2	3.691	74270	V	2	166.2782	C-2
3	4.893	26318		3	40.6998	C-3
4	6.007	650		9	2.5432	C-4
5	6.996	2157		10	4.2206	C-4
6	7.713	4161		4	6.45	C-4
	TOTAL	482127			1821.2427	

GROUP(NAME)	CONC
C-1	1601.0511
C-2	166.2782
C-3	40.6998
C-4	13.2138
C-5	0
C-6+	0

BECHTEL UNIT # K-71
5-11-92 REPORT # 10-854-24
OUTLET HC SAMPLE # 3



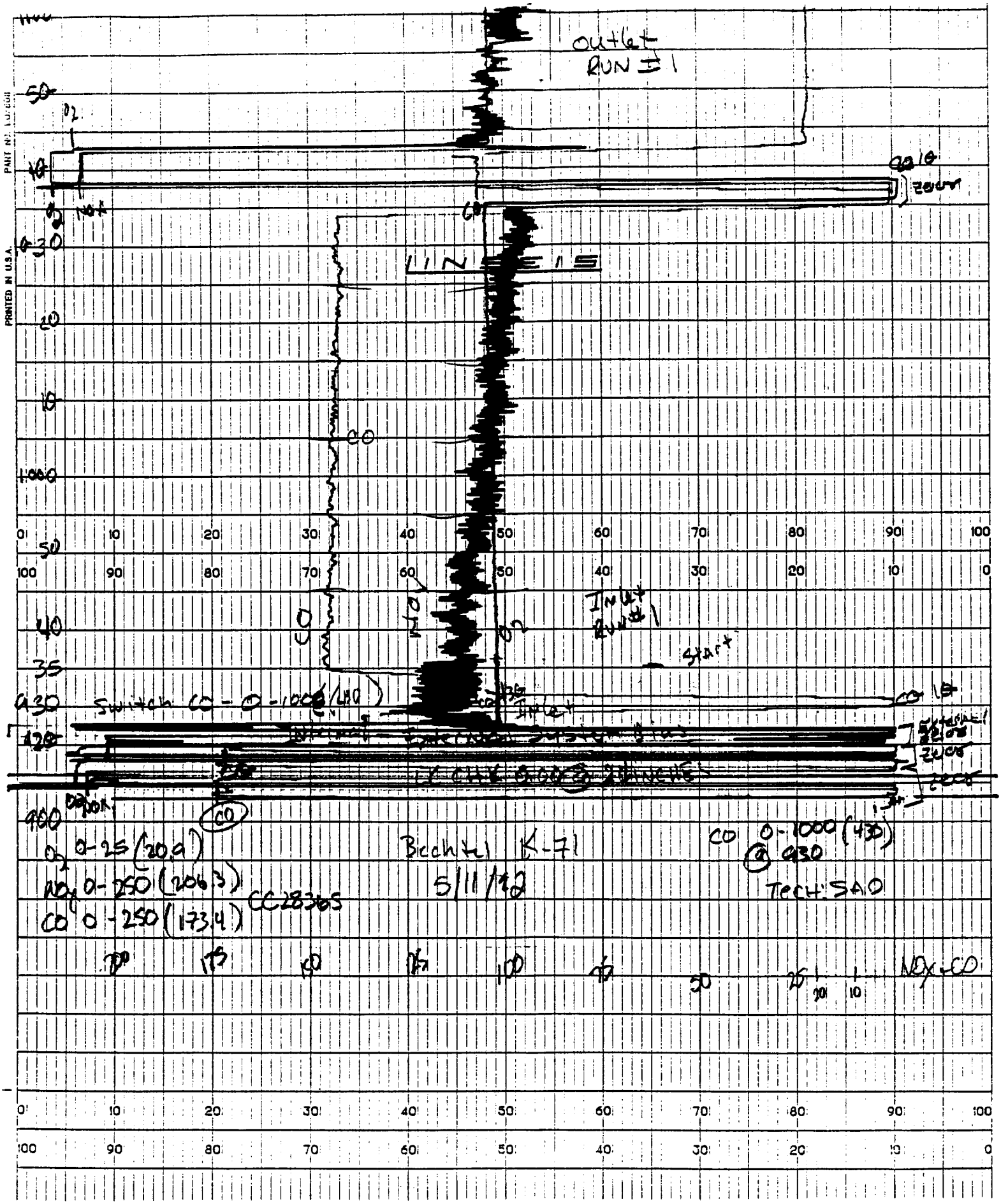
CHROMATOGRAM 7 MEMORIZED

CR501 CHROMATOPAC
CHANNEL NO 1
SAMPLE NO 0
REPORT NO 58

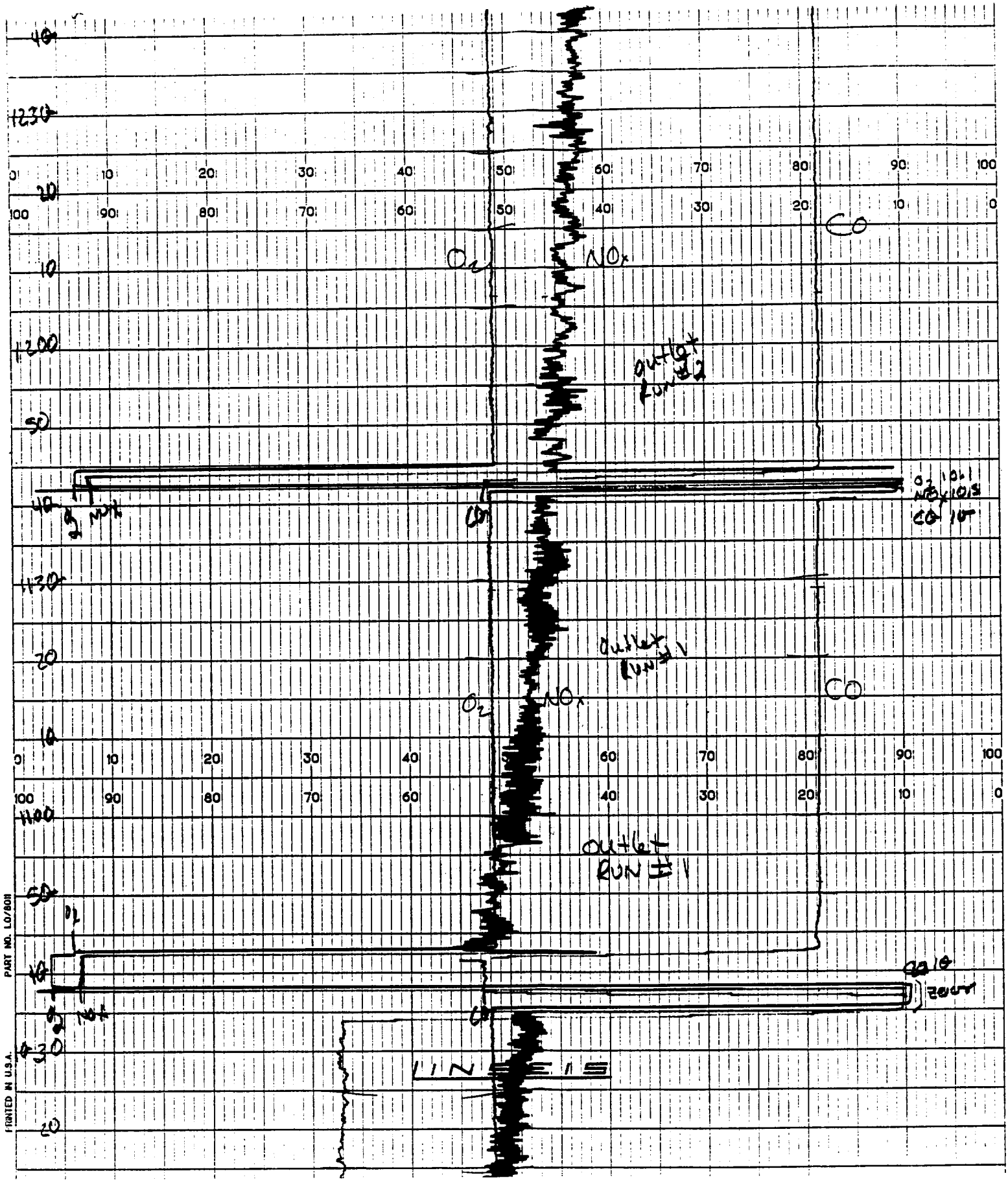
FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

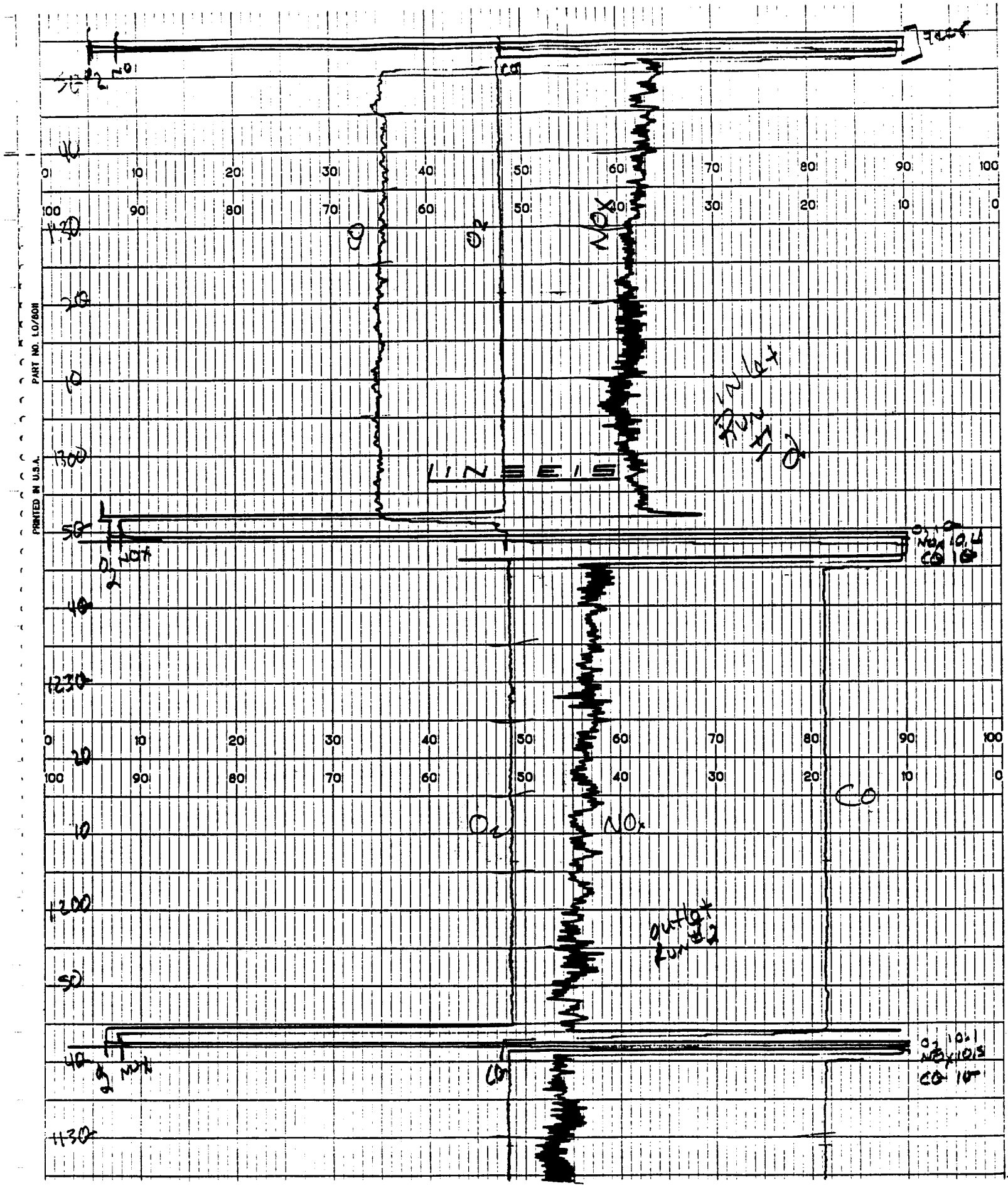
PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.125	375570		1	1605.3151	C-1
2	3.691	75341	V	2	168.6636	C-2
3	4.894	26843		3	41.4654	C-3
4	6.007	666		9	2.5609	C-4
5	6.995	2219		10	4.2888	C-4
6	7.713	4255		4	6.5549	C-4
	TOTAL	484894			1828.8487	

GROUP(NAME)	CONC
C-1	1605.3151
C-2	168.6636
C-3	41.4654
C-4	13.4047
C-5	0
C-6+	0



Outlet
RUN #1
Inlet
Run #1
Start
Switch CO - 0-1000 (430)
Inlet
O2 0-25 (20.9)
NOx 0-250 (206.3)
CO 0-250 (173.4)
CC28365
Bechtel K-71
5/11/92
CO 0-1000 (430)
@ 930
TECH: SAD
NOx+CO


O2
NOx
CO
outlet RUN #2
outlet RUN #1
PART NO. LO/8011
PRINTED IN U.S.A.



PART NO. LO/8011
PRINTED IN U.S.A.
LINSEIS
CO
O2
NOx
Inlet Run #2
outlet Run #2

QUALITY CONTROL

CHAIN OF CUSTODY RECORD

Submitted to: Zalco Labs

ANALYSIS REQUEST

COMPANY	LOCATION/UNIT
Bechtel	Unit# K-71

REPORT NO.	SAMPLER
10-854-24	SAD

METHOD	REPORT ATTN.	PO#
	Terry Rowles	1907

Sample No./ID	Sample Description	Sample Date	Liq.	Filter	Gas	O_2/N_2 Split	Low Range Total Sulfur Gas H_2S				
*3 Bags	Fuel Gas	5-11-92			✓	✓	✓				
	*note: all bags contain the same sample - one analysis only.										

COMMENTS:

RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
Terry Rowles	5-13-92	[signature]	
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE

PETRO CHEM ENVIRONMENTAL SERVICES, INC.
3207 Antonino Avenue, Bakersfield, CA 93308
(805) 327-7300 FAX (805) 327-3459

213 585-2154

LIQUID CARBONIC

SPECIALTY GAS CORPORATION

5700 SOUTH ALAMEDA STREET • LOS ANGELES, CALIFORNIA 90058

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER Petro Chem

P.O NUMBER

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
SULFUR DIOXIDE	1661a	FF-28539	486 ppm
CARBON MONOXIDE	1680	CAL-805	470 ppm
NITRIC OXIDE	1686	FF-13667	472 ppm

ANALYZER READINGS

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

1. COMPONENT SULFUR DIOXIDE ANALYZER MAKE-MODEL-S/N Varian 3300 FPD S/N 13273

ANALYTICAL PRINCIPLE Flame Photometric LAST CALIBRATION DATE 10/23/91

FIRST ANALYSIS DATE 12/20/91 SECOND ANALYSIS DATE 12/27/91

Z 0	R 534.2	C 626.8	CONC. 294 ppm	Z 0	R 533.0	C 326.1	CONC. 294 ppm
R 532.9	Z 0	C 327.5	CONC. 295 ppm	R 534.2	Z 0	C 326.5	CONC. 293 ppm
Z 0	C 326.0	R 532.0	CONC. 294 ppm	Z 0	C 327.0	R 534.6	CONC. 294 ppm
U/M SqRT(uV-sec)		MEAN TEST ASSAY	294 ppm	U/M SqRT(uV-sec)		MEAN TEST ASSAY	294 ppm

2. COMPONENT CARBON MONOXIDE ANALYZER MAKE-MODEL-S/N Siemens Ultramat 5E S/N A12-729

ANALYTICAL PRINCIPLE NDIR LAST CALIBRATION DATE 12/03/91

FIRST ANALYSIS DATE 12/20/91 SECOND ANALYSIS DATE 12/30/91

Z 0	R 470	C 430	CONC. 430 ppm	Z 0	R 470	C 430	CONC. 430 ppm
R 470	Z 0	C 429	CONC. 429 ppm	R 470	Z 0	C 430	CONC. 430 ppm
Z 0	C 429	R 469	CONC. 430 ppm	Z 0	C 430	R 470	CONC. 430 ppm
U/M ppm		MEAN TEST ASSAY	430 ppm	U/M ppm		MEAN TEST ASSAY	430 ppm

3. COMPONENT NITRIC OXIDE ANALYZER MAKE-MODEL-S/N Beckman 951A S/N 0101354

ANALYTICAL PRINCIPLE Chemiluminescence LAST CALIBRATION DATE 12/03/91

FIRST ANALYSIS DATE 12/20/91 SECOND ANALYSIS DATE 12/30/91

Z 0.0	R 47.6	C 43.6	CONC. 432 ppm	Z 0.0	R 47.1	C 43.3	CONC. 434 ppm
R 47.4	Z 0.0	C 43.6	CONC. 434 ppm	R 47.1	Z 0.0	C 43.3	CONC. 434 ppm
Z 0.0	C 43.7	R 47.5	CONC. 434 ppm	Z 0.0	C 43.3	R 47.1	CONC. 434 ppm
U/M mV		MEAN TEST ASSAY	433 ppm	U/M mV		MEAN TEST ASSAY	434 ppm

THIS CYLINDER NO. SA 3294
HAS BEEN CERTIFIED ACCORDING TO SECTION 3.0.4
OF TRACEABILITY PROTOCOL NO. 1
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 1650 PSIG
CERTIFICATION DATE 12/30/91
EXPIRATION DATE 06/30/92

CERTIFIED CONCENTRATION

SULFUR DIOXIDE	294 ppm
CARBON MONOXIDE	430 ppm
NITRIC OXIDE	434 ppm
NITROGEN	BALANCE
NOx	440 ppm

ANALYZED BY Doug Grant

CERTIFIED BY Rob Riedel

RECEIVED JUN - 6 1991

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

REPORT OF ANALYSIS
EPA PROTOCOL GAS MIXTURES

PETRØ1

TO:

DATE : Ø5/24/91

SCOTT DAVIS
PETROCHEM ENVIRONMENTAL SER.
32Ø7 ANTONINO AVE.
BAKERSFIELD, CA 93388

CUSTOMER ORDER NUMBER: Ø1335

PAGE 1

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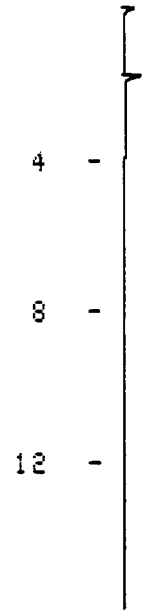
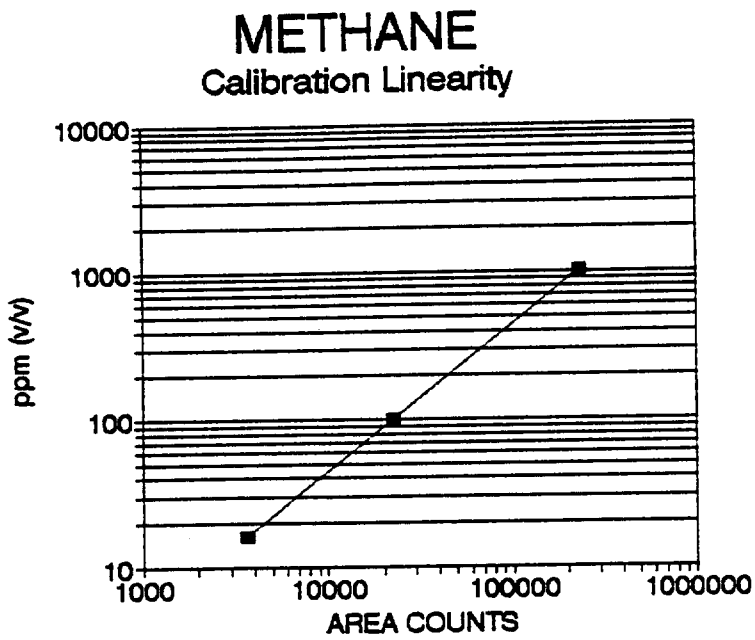
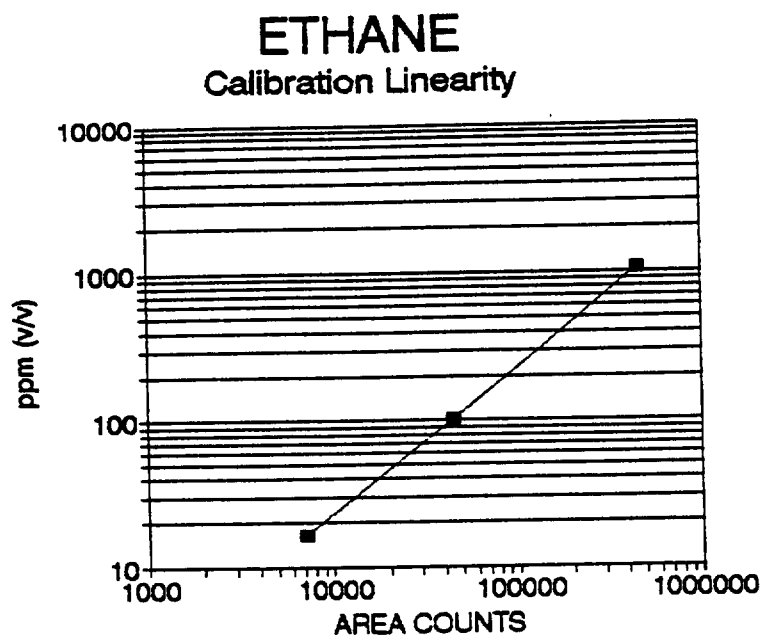
SYSTEM BLANK
UHP NITROGEN



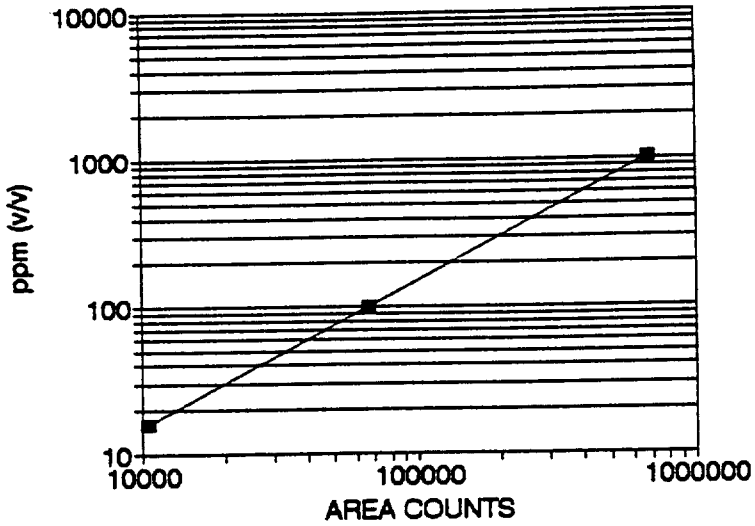
WARNING NO PEAK


METHANE
Calibration Linearity
10000
1000
100
10
ppm (v/v)
1000
10000
100000
1000000
AREA COUNTS


ETHANE
Calibration Linearity
10000
1000
100
10
ppm (v/v)
1000
10000
100000
1000000
AREA COUNTS

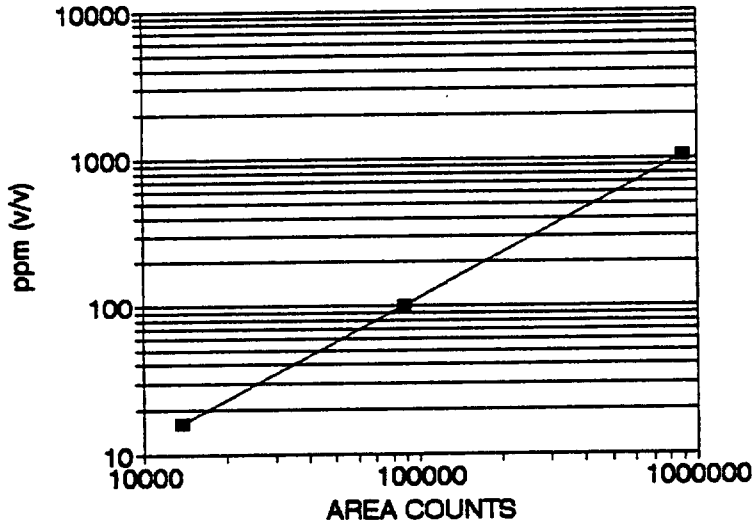
PROPANE

Calibration Linearity

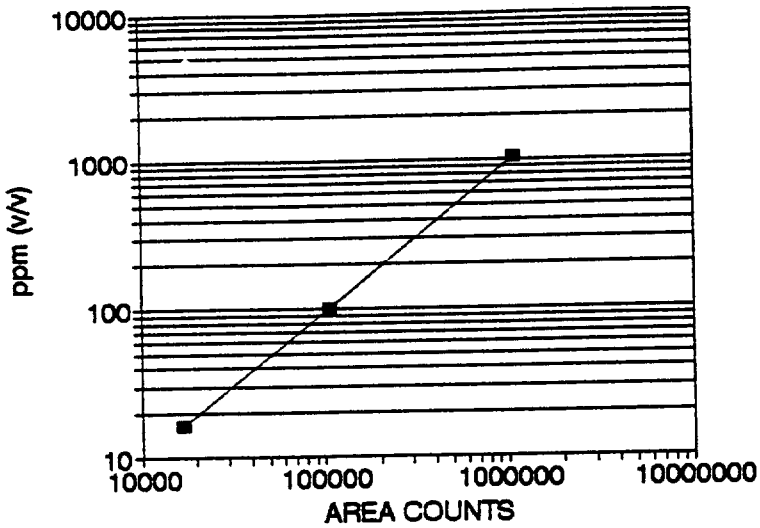


BUTANE

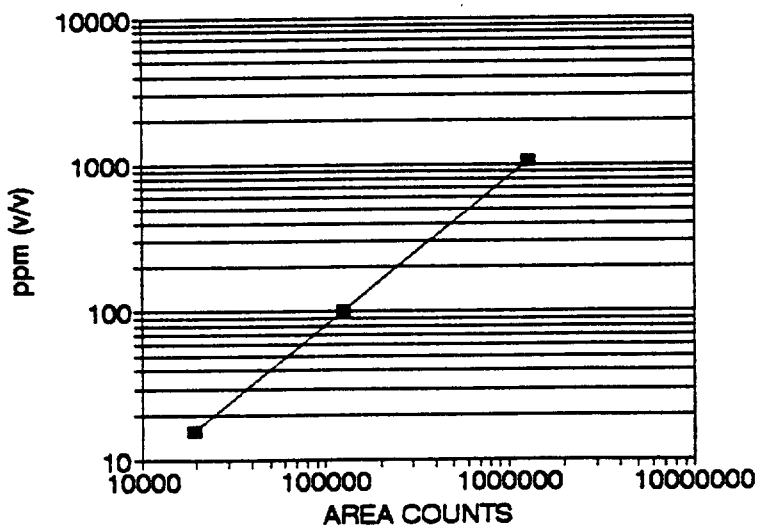
Calibration Linearity



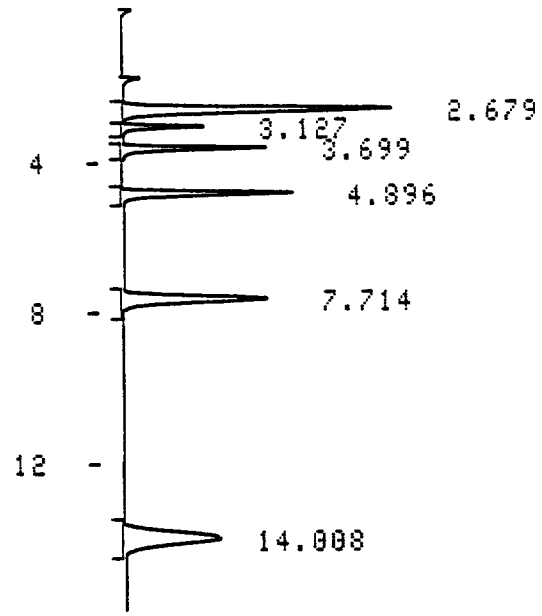
PENTANE
Calibration Linearity



HEXANES+
Calibration Linearity



15PPm HYDROCARBON STANDARD
SCOTTY CAN MIX 1



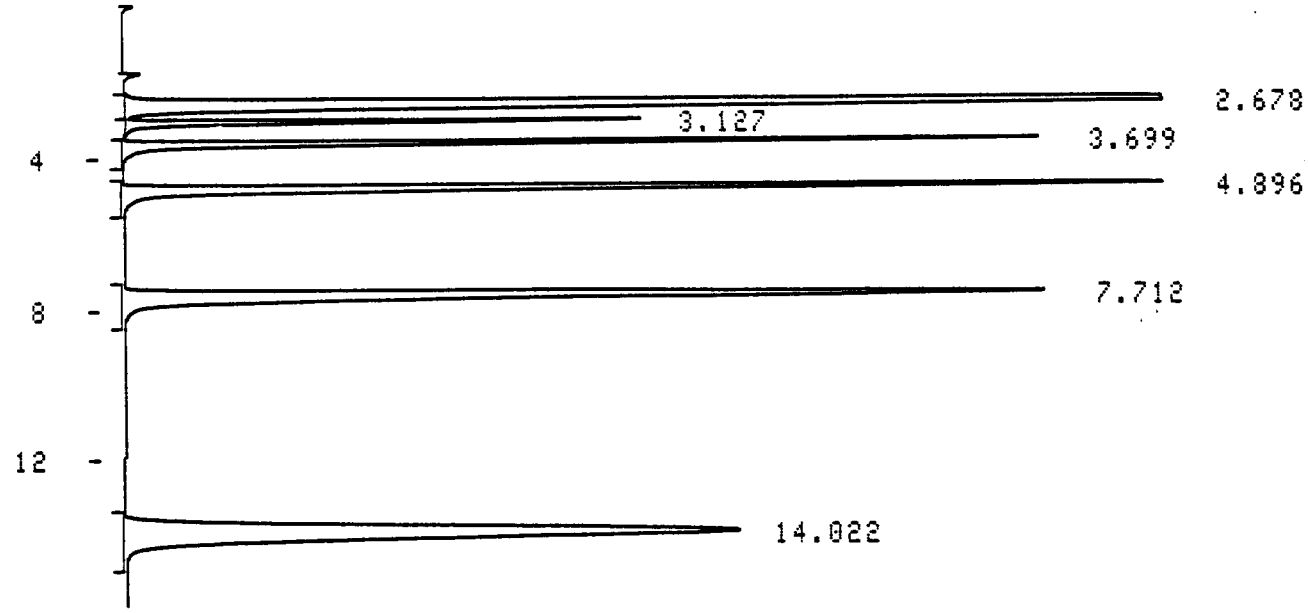
CR501 CHROMATOPAC

CHANNEL NO 1
SAMPLE NO 0
REPORT NO 49
STANDARD 1

FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	2.679	20738		6		C-6+
2	3.127	3569		1		C-1
3	3.699	7119		2		C-2
4	4.896	10498		3		C-3
5	7.714	14053		4		C-4
6	14.008	16671		5		C-5
	TOTAL	72647				

100PPm HYDROCARBON STANDARD
SCOTTY CAN MIX 220



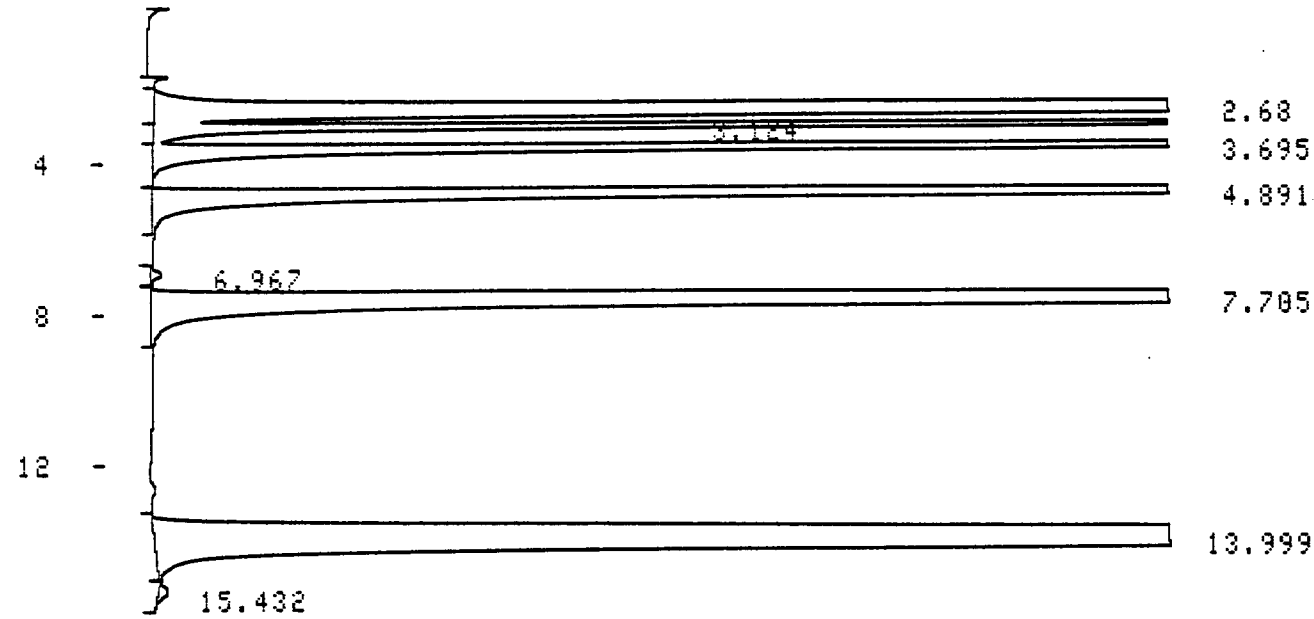
CR501 CHROMATOPAC

CHANNEL NO 1	FILE 0
SAMPLE NO 0	METHOD 0424(OPTION 0003)
REPORT NO 50	SAMPLE WT 100
STANDARD 2	

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	2.678	134330		6		C-6+
2	3.127	22207		1		C-1
3	3.699	44914		2		C-2
4	4.896	66805		3		C-3
5	7.712	88178		4		C-4
6	14.022	105633		5		C-5

	TOTAL	462068				

1000PPm HYDROCARBON STANDARD
SCOTTY CAN MIX 224



CHROMATOGRAM 20 MEMORIZED

CR501 CHROMATOPAC
CHANNEL NO 1
SAMPLE NO 0
REPORT NO 51
STANDARD 3

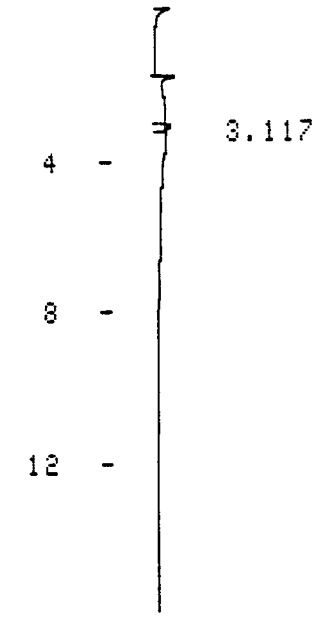
FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	2.68	1393702		6		C-6+
2	3.124	233678	V	1		C-1
3	3.695	461854	V	2		C-2
4	4.891	683673		3		C-3
5	6.967	988		10		C-4
6	7.705	905968		4		C-4
7	13.999	1108100		5		C-5
8	15.432	1474				
	TOTAL	4789436				

IDENTIFICATION FILE 0
MODE$ 105 WINDOW 3

IDNO	NAME	TIME	FACTOR1/2	CONC1/2
1	C-1	3.12	0.00426454	101
			3.68322	1.35632E-19
2	C-2	3.68	0.00222851	101
			0.76607	1.35632E-19
3	C-3	4.89	0.00145949	101
			2.28837	1.35632E-19
4	C-4	7.7	0.00111292	101
			1.8196	1.35632E-19
5	C-5	14	0.000920014	101
			0.637088	1.35632E-19
6	C-6+	2.67	0.000719965	101
			1.71327	1.35632E-19
7	C-2	3.81	0.00222851	101
			0.76607	1.35632E-19
8	C-3	4.59	0.00145949	101
			2.28837	1.35632E-19
9	C-4	6.04	0.00111292	101
			1.8196	1.35632E-19
10	C-4	6.96	0.00111292	101
			1.8196	1.35632E-19
11	C-5	10.21	0.000920014	101
			0.637088	1.35632E-19
12	C-5	10.59	0.000920014	101
			0.637088	1.35632E-19
13	C-5	12.7	0.000920014	101
			0.637088	1.35632E-19
14	C-5	13.27	0.000920014	101
			0.637088	1.35632E-19

BECHTEL UNIT # K-71
5-11-92 REPORT # 10-854-24
HC SAMPLE BLANK



CHROMATOGRAM 1 MEMORIZED

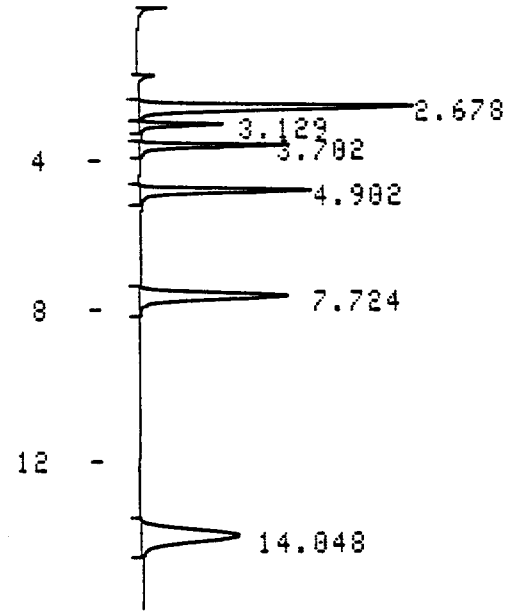
CR501 CHROMATOPAC
CHANNEL NO 1
SAMPLE NO 0
REPORT NO 52

FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	3.117	342		1	5.1432	C-1
	TOTAL	342			5.1432	

GROUP(NAME)	CONC
C-1	5.1432
C-2	0
C-3	0
C-4	0
C-5	0
C-6+	0

15 PPM HYDROCARBON STANDARD
SCOTTY CAN MIX #1
POST ANALYSIS CALIBRATION CHECK



CHROMATOGRAM 13 MEMORIZED

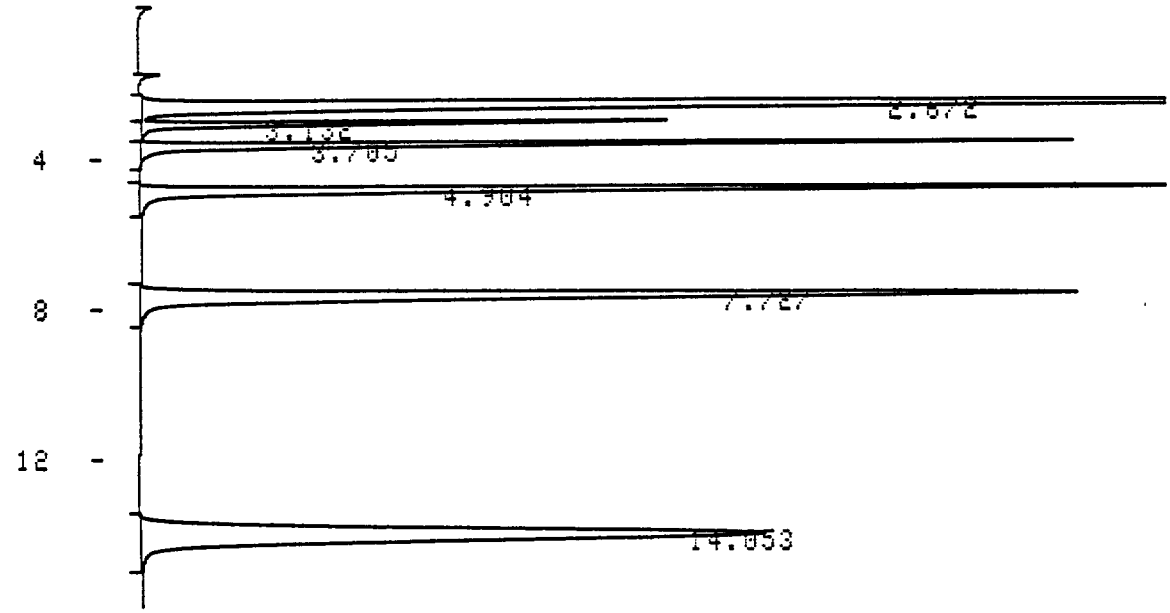
CR501 CHROMATOPAC
CHANNEL NO 1
SAMPLE NO 0
REPORT NO 59

FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	2.678	21055		6	16.8723	C-6+
2	3.129	3598		1	19.0275	C-1
3	3.702	7205		2	16.8218	C-2
4	4.902	10713		3	17.9233	C-3
5	7.724	14229		4	17.6555	C-4
6	14.048	16977		5	16.2559	C-5
	TOTAL	73777			104.5562	

GROUP(NAME)	CONC
C-1	19.0275
C-2	16.8218
C-3	17.9233
C-4	17.6555
C-5	16.2559
C-6+	16.8723

100 PPM HYDROCARBON STANDARD
SCOTTY CAN MIX 220
POST ANALYSIS CALIBRATION CHECK



CHROMATOGRAM 14 MEMORIZED

CR501 CHROMATOPAC
CHANNEL NO 1
SAMPLE NO 0
REPORT NO 60

FILE 0
METHOD 0424(OPTION 0003)
SAMPLE WT 100

PKNO	TIME	AREA	MK	IDNO	CONC	NAME
1	2.672	136979		6	100.3333	C-6+
2	3.132	22932	V	1	101.4793	C-1
3	3.705	45616		2	102.4211	C-2
4	4.904	67880		3	101.358	C-3
5	7.727	89796		4	101.7553	C-4
6	14.053	107306		5	99.3597	C-5
	TOTAL	470509			606.7067	

GROUP(NAME)	CONC
C-1	101.4793
C-2	102.4211
C-3	101.358
C-4	101.7553
C-5	99.3597
C-6+	100.3333

COMPANY : PETRO CHEM ENVIRONMENTAL SERVICES, INC.
UNIT : BV-1
DATE : 3-17-92

ANALYZER : NOx THERMO ELECTRON MODEL 10
SERIAL # : SN 10A/R-26616-226

QUARTERLY LINEARITIES

CYL #	RANGE = 2500	ANALYZER VALUE %	ACTUAL VALUE%	%OF RANGE DEVIATION
ALM023356	HIGH	1987	1987	0
CC83789	MID	727	727	0
	ZERO	0	0	0

CYL #	RANGE = 1000	ANALYZER VALUE %	ACTUAL VALUE%	%OF RANGE DEVIATION
CC83789	HIGH	727	727	0
SA2954	MID	441	441	0
	ZERO	0	0	0

CYL #	RANGE = 250	ANALYZER VALUE %	ACTUAL VALUE%	%OF RANGE DEVIATION
CC28365	HIGH	202	206.3	-1.72
CC43767	MID	81.7	81.7	0
	ZERO	0	0	0

CYL #	RANGE = 100	ANALYZER VALUE %	ACTUAL VALUE%	%OF RANGE DEVIATION
CC43767	HIGH	81.5	81.7	-0.2
ALM002359	MID	41.8	41.82	-0.02
	ZERO	0	0	0

CHECK LIST:		DUST	✓
OIL CHANGE	✓	OZONE SCRUBBER	✓
DRIERITE	✓	REACTION CHAMBER CLEANOUT	✓
FILTER	✓	CAPILLARIES	

COMPANY : PETRO CHEM ENVIRONMENTAL SERVICES, INC.
UNIT : BV-1
DATE : 3-17-92

ANALYZER : CO THERMO ELECTROL MODEL 48
SERIAL # : SN 48-23438-210

QUARTERLY LINEARITIES

CYL #	RANGE = 5000	ANALYZER VALUE %	ACTUAL VALUE%	%OF RANGE DEVIATION
ALM023356	HIGH	1992	1986	0.12
CC83789	MID	806	807	-0.02
	ZERO	0	0	0

CYL #	RANGE = 1000	ANALYZER VALUE %	ACTUAL VALUE%	%OF RANGE DEVIATION
CC83789	HIGH	806	807	-0.1
SA2954	MID	382	382	0
	ZERO	0	0	0

CYL #	RANGE = 100	ANALYZER VALUE %	ACTUAL VALUE%	%OF RANGE DEVIATION
CC43767	HIGH	81.5	82.8	-1.3
ALM002359	MID	40.5	40.53	-0.03
	ZERO	0	0	0

CHECK LIST:

OPTICS CHECK AND CLEAN	✓
DUST	✓
	✓

COMPANY : PETRO CHEM ENVIRONMENTAL SERVICES, INC.
UNIT : BV-1
DATE : 3-17-92

ANALYZER : O2 TELEDYNE MODEL 320AX
SERIAL # : SN 93834

QUARTERLY LINEARITIES

CYL #	RANGE = 25	ANALYZER VALUE %	ACTUAL VALUE%	%OF RANGE DEVIATION
AMBIENT	HIGH	20.7	20.9	-0.8
LK273312	MID	15	15	0
	ZERO	0.00	0	0

CYL #	RANGE = 25	ANALYZER VALUE %	ACTUAL VALUE%	%OF RANGE DEVIATION
T623349	HIGH	7	7	0
HKL34717	MID	4	4	0
	ZERO	0.00	0	0

CHECK LIST:

DUST	✓
FUEL CELL	✓
ELECTRICAL CONNECTION	✓