

COMPANY: PACIFIC ENERGY
 DATE: APRIL 2, 1991
 UNIT: OTAY FACILITY ICE #1
 REPORT #:T-1259

NO2 - NOx CORRECTIONS

RUN #	UNCORRECTED			NOx CORRECTED VALUES			
	NO ppm	NO2 ppm	% LOSS*	NO2 ppm	ppm @ 3% O2	LB/HR	
#1	117.24	37.55	7.98%	40.55	157.79	218.10	5.55
#2	117.24	40.50	11.79%	45.28	162.52	221.90	5.66
#3	111.58	41.48	15.60%	47.95	159.53	218.48	5.56
AVERAGE				44.59	159.95	219.50	5.59

RUN #	%O2	DSCFM	GR/BHP-HR	NO2 LB/HR
#1	7.95	4825	0.96	1.42
#2	7.79	4766	0.98	1.57
#3	7.83	4781	0.96	1.67
AVERAGE =			0.97	1.56

* Initial NO2 system loss was 6.08%, final NO2 system loss was 17.50%

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 RUN #: #1-NOx MODE

NOx/CO/O2 DATA

TIME INTERVAL		CONCENTRATIONS			% Full Scale		
BEGIN	END	O2;%	NOx;ppm	CO;ppm	O2%fs	NOx%fs	CO%fs
10:30 AM	10:35 AM	7.88	153.79	259.14	42	20.4	30.8
10:35 AM	10:40 AM	7.88	159.78	259.14	42	21	30.8
10:40 AM	10:45 AM	8.03	155.79	257.17	42.6	20.6	30.6
10:45 AM	10:50 AM	8.03	152.79	257.17	42.6	20.3	30.6
10:50 AM	10:55 AM	7.88	159.78	251.23	42	21	30
10:55 AM	11:00 AM	7.98	146.80	257.17	42.4	19.7	30.6
Averages;		7.95	154.79	256.84	42.3	20.5	30.6

	O2	NOx	CO
INITAL zero; %fs	10	5	4.6
INITAL span; %fs	42.5	56.2	53.2
FINAL zero; %fs	10	5	4.8
FINAL span; %fs	44	56	52.4
ZERO DRIFT %/ppm:	0	0	2
CALIB. DRIFT %/ppm:	0.4	-2	-8
ZERO DRIFT %fs:	0	0	-0.2
CALIB.DRIFT %fs:	-1.5	0.2	0.8
CAL GAS value	8.05	511	483
FULL SCALE RANGE	25	1000	1000

SDCFM = 4825.3 COMBUSTION CALCULATION
 B-Hp = 2627 %O2 = 7.95

NOx values;	ppm	@ 3%O2	@15%O2	lbs/hr 1b/day
	154.79	213.96	70.52	5.44 130.56
				grms/BHp
				0.94
CO values;	ppm	@ 3%O2	@15%O2	lbs/hr 1b/day
	256.84	355.01	117.02	5.49 131.76
				grms/BHp
				0.95

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 RUN #: #2-NOx MODE

NOx/CO/O2 DATA

TIME INTERVAL		CONCENTRATIONS			% Full Scale		
BEGIN	END	O2;%	NOx;ppm	CO;ppm	O2%fs	NOx%fs	CO%fs
11:57 AM	12:02 PM	7.81	154.40	261.96	42.8	20.4	30.6
12:02 PM	12:07 PM	7.76	160.42	260.95	42.6	21	30.5
12:07 PM	12:12 PM	7.76	164.43	260.95	42.6	21.4	30.5
12:12 PM	12:17 PM	7.73	160.42	260.95	42.5	21	30.5
12:17 PM	12:22 PM	7.85	154.40	259.93	43	20.4	30.4
12:22 PM	12:27 PM	7.85	152.40	257.90	43	20.2	30.2
Averages;		7.79	157.74	260.44	42.8	20.7	30.5

	O2	NOx	CO
INITAL zero; %fs	10	5	4.8
INITAL span; %fs	44	56	52.4
FINAL zero; %fs	9.9	4.9	4.8
FINAL span; %fs	43.1	56.9	52.2
ZERO DRIFT %/ppm:	0	-1	0
CALIB. DRIFT %/ppm:	-0.2	9	-2
ZERO DRIFT %fs:	0.1	0.1	0
CALIB.DRIFT %fs:	0.9	-0.9	0.2
CAL GAS value	8.05	511	483
FULL SCALE RANGE	25	1000	1000

SDCFM = 4766.4 COMBUSTION CALCULATION
 B-Hp = 2627 %O2 = 7.79

NOx values;	ppm	@ 3%O2	@15%O2	1bs/hr 1b/day
	157.74	215.37	70.99	5.47 131.28
				grms/BHp
				0.95
CO values;	ppm	@ 3%O2	@15%O2	1bs/hr 1b/day
	260.44	355.6	117.21	5.5 132
				grms/BHp
				0.95

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 RUN #: #3-NOx MODE

NOx/CO/O2 DATA

TIME INTERVAL		CONCENTRATIONS			% Full Scale		
BEGIN	END	O2;%	NOx;ppm	CO;ppm	O2%fs	NOx%fs	CO%fs
01:05 PM	01:10 PM	7.81	151.75	258.99	42.1	20.4	30.2
01:10 PM	01:15 PM	7.84	151.75	258.99	42.2	20.4	30.2
01:15 PM	01:20 PM	7.84	157.63	258.99	42.2	21	30.2
01:20 PM	01:25 PM	7.84	155.67	258.99	42.2	20.8	30.2
01:25 PM	01:30 PM	7.86	150.78	257.97	42.3	20.3	30.1
01:30 PM	01:35 PM	7.79	150.78	257.97	42	20.3	30.1
Averages;		7.83	153.06	258.65	42.2	20.5	30.2

	O2	NOx	CO
INITAL zero; %fs	9.9	4.9	4.8
INITAL span; %fs	43.1	56.9	52.2
FINAL zero; %fs	9.8	5	4.8
FINAL span; %fs	43.4	57	52
ZERO DRIFT %/ppm:	0	1	0
CALIB. DRIFT %/ppm:	0.1	1	-2
ZERO DRIFT %fs:	0.1	-0.1	0
CALIB.DRIFT %fs:	-0.3	-0.1	0.2
CAL GAS value	8.05	511	483
FULL SCALE RANGE	25	1000	1000

SDCFM = 4781.0 COMBUSTION CALCULATION
 B-Hp = 2627 %O2 = 7.83

NOx values;	ppm	@ 3%O2	@15%O2	lbs/hr	lb/day
	153.06	209.62	69.09	5.33	127.92
				grms/BHp	
				0.92	
CO values;	ppm	@ 3%O2	@15%O2	lbs/hr	lb/day
	258.65	354.23	116.76	5.48	131.52
				grms/BHp	
				0.95	

COMPANY: PACIFIC ENERGY
UNIT: ICE #1-EXHAUST (FIRED ON LANDFILL GAS ONLY)
REPORT #: T1259
DATE: APRIL 2, 1991

EPA METHOD 18 HYDROCARBON EMISSION

RUN #: 1
DSCFM: 4791 (AVERAGE OF 3 ANALYZER RUNS)
BHP : 2627

COMPOUND	ppm	lb/hr
Methane	914.1	11.0713
Ethane	3.5	0.0795
Propane	0	0.0000
Butane	0	0.0000
Pentane	0	0.0000
Hexane	2.4	0.1562
Total	920	11.3070
Total (non methane)	5.9	0.2357

Total Non-methane Hydrocarbons (gr/bhp-hr)= 0.04

*EQUATIONS: $TNMHC \text{ lb/hr} = TNMHC \text{ ppm} * MW * 1.58 * 10^{-7} * DSCFM$

TNMHC = Total non-methane hydrocarbons (ROG)

ppm = parts per million, concentration

MW = molecular weight

$1.58 * 10^{-7}$ = conversion factor

DSCFM = dry standard cubic feet per minute

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EPA METHOD 18 HYDROCARBON EMISSION

RUN #: 2
DSCFM: 4791 (AVERAGE OF 3 ANALYZER RUNS)
BHP : 2627

COMPOUND	ppm	lb/hr
Methane	892.2	10.8060
Ethane	4.2	0.0954
Propane	0	0.0000
Butane	0	0.0000
Pentane	0	0.0000
Hexane	1	0.0651
Total	897.4	10.9665
Total (non methane)	5.2	0.1605

Total Non-methane Hydrocarbons (gr/bhp-hr)= 0.03

*EQUATIONS: $TNMHC \text{ lb/hr} = TNMHC \text{ ppm} * MW * 1.58 * 10^{-7} * DSCFM$

TNMHC = Total non-methane hydrocarbons (ROG)

ppm = parts per million, concentration

MW = molecular weight

$1.58 * 10^{-7}$ = conversion factor

DSCFM = dry standard cubic feet per minute

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EPA METHOD 18 HYDROCARBON EMISSION

RUN #: 3
DSCFM: 4791 (AVERAGE OF 3 ANALYZER RUNS)
BHP : 2627

COMPOUND	ppm	lb/hr
Methane	780.8	9.4568
Ethane	3.9	0.0886
Propane	0	0.0000
Butane	0	0.0000
Pentane	0	0.0000
Hexane	0	0.0000
Total	784.7	9.5453
Total (non methane)	3.9	0.0886

Total Non-methane Hydrocarbons (gr/bhp-hr)= 0.02

*EQUATIONS: $\text{TNMHC lb/hr} = \text{TNMHC ppm} * \text{MW} * 1.58 * 10^{-7} * \text{DSCFM}$

TNMHC = Total non-methane hydrocarbons (ROG)

ppm = parts per million, concentration

MW = molecular weight

$1.58 * 10^{-7}$ = conversion factor

DSCFM = dry standard cubic feet per minute