



KLEINFELDER

**SOURCE TEST REPORT
LANDFILL GAS-FIRED FLARE
WASTE MANAGEMENT OF CALIFORNIA, INC.
SIMI VALLEY LANDFILL
SIMI VALLEY, CALIFORNIA 93065**

Prepared for

**SIMI VALLEY LANDFILL
2801 Madera Road
SIMI VALLEY, CALIFORNIA 93065**

Prepared by

**KLEINFELDER, INC.
1370 VALLEY VISTA DRIVE, SUITE 150
DIAMOND BAR, CALIFORNIA 91765**

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**SOURCE TEST REPORT
LANDFILL GAS-FIRED FLARE
SIMI VALLEY LANDFILL**

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ACRONYMS AND ABBREVIATIONS

AB 2588	California Air Toxics Hot Spots Information and Assessment Act
acfm	actual cubic feet per minute
ACS	American Chemical Society
atc	Authority to Construct
BACT	Best Available Control Technology
°C	degrees Centigrade
CARB	California Air Resources Board
CEM	continuous emissions monitor
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO ₂	carbon dioxide
DNPH	2,4-dinitrophenylhydrazine
dscf	dry standard cubic feet
dscfm	dry standard cubic feet per minute
EPA	United States Environmental Protection Agency
°F	degrees Fahrenheit
FID	flame ionization detector
ft/sec	feet per second
GFC	gas filter correlation
gr/dscf	grains per dry standard cubic feet
Hg	mercury
HPLC	high-pressure liquid chromatography
HRGC	high-resolution gas chromatography
ID	identification
lb/hr	pounds per hour
LRMS	low-resolution mass spectrometry
MEL	Mobile Emissions Laboratory
mM	millimolar
N	normal
NaHCO ₃	sodium bicarbonate
Na ₂ CO ₃	sodium carbonate
NDIR	non-dispersive infrared detection method
NO _x	nitrogen oxides
NO ₂	nitrogen dioxide
O ₂	oxygen
PAH	polycyclic aromatic hydrocarbons
ppb,v	parts per billion by volume
ppm,v	parts per million by volume
ROG	reactive organic gas
scfm	standard cubic feet per minute
SO _x	sulfur oxides
SO ₂	sulfur dioxide
TGNMO	total gaseous non-methane organic
VCAPCD	Ventura County Air Pollution Control District
% vol	percent by volume
WMC	Waste Management of California, Inc.
XAD-2	nomenclature for PAH-capturing resin

1 EXECUTIVE SUMMARY

On behalf of Waste Management of California, Inc. (WMC), Kleinfelder, Inc. performed a series of source emissions tests on the landfill gas-fired flare located at the Simi Valley Landfill site in Simi Valley, California. The source emissions tests were conducted from February 20 through 26, 1991 on both the flare inlet and exhaust gases. Flare inlet tests were conducted to determine the quantities of reduced sulfur compounds, fixed gases, and methane and non-methane organics (total and speciated) entering the flare. Flare exhaust gas tests were conducted to determine the quantities of emitted methane and non-methane organics (total and speciated), nitrogen oxides, sulfur oxides, carbon monoxide, particulate matter, hydrochloric acid, hydrofluoric acid, formaldehyde, polycyclic aromatic hydrocarbons, and heavy metals.

The source tests were conducted to fulfill the requirements of the Ventura County Air Pollution Control District (VCAPCD) Authority to Construct (ATC) No. 1395-2 and the "Test and Operating Conditions" included in the ATC, and to quantify the emissions of substances regulated under the AB 2588 air toxics "hot spots" legislation. All test and analytical procedures conformed to the Source Test Protocol submitted to the VCAPCD on December 21, 1990 and amended by a response letter from the VCAPCD dated January 8, 1991.

39000 SCFH 1936000 SCFD

During the testing period, the flare was operated under normal conditions with a landfill gas flow rate of 650 standard cubic feet per minute (scfm) and the flare combustion temperature controller set to 1700°F. Results of the tests are summarized in Table 1-1. As illustrated on the table, the emission rates of reactive organic gases (ROG), oxides of nitrogen (NO_x) and carbon monoxide (CO) are much lower than those specified in the ATC "Test and Operating Conditions". Sulfur oxides (SO_x) and particulate matter are emitted at rates greater than the ATC Conditions. However, the observed organic gas destruction efficiency was greater than 99%, which is indicative of a very well designed and operated flare system.

The observed particulate emission rate, although greater than ATC Conditions, is consistent with particulate emission rates observed at other sanitary landfills. Landfill flares are significantly influenced by the presence of relatively high ambient concentrations of naturally occurring particulate matter. This particulate matter enters the flare system unencumbered through the combustion air louvers. Ambient air monitoring conducted by Kleinfelder at the Simi Valley Landfill site in the past has indicated that the ambient levels of particulates are indeed relatively high and would contribute to the greater than expected particulate emission rates observed in the flare exhaust.

TABLE 1-1 SUMMARY OF RESULTS
Simi Valley Landfill

Compound	ATC Conditions (pound/hr)	Test Result (pound/hr)
ROG	1.09	<0.02
NOx (as NO ₂)	3.11	1.10
SOx (as SO ₂)	0.04	0.22
CO	15.01	0.14
Particulate	0.15	2.07
Flare Efficiency		>99.2%
Formaldehyde		0.022
Arsenic		0.00037
Cadmium		0.00032
Chromium (total)		0.013
Chromium (hexavalent)		<0.000090
Copper		0.0030
Manganese		0.0109
Nickel		0.0119
Zinc		0.00167
Hydrochloric Acid		0.095
Hydrofluoric Acid		0.0135
PAH (total)		0.0212

The observed SO_x emission rate is also greater than the ATC Conditions, but the observed rate is consistent with emissions from other landfill gas flare systems. The sulfur oxide emissions result from oxidation of sulfur compounds in the landfill gas and are not an indication of poor flare design or operations. The VCAPCD recognized that the actual emission rates of some parameters may be greater than initially designated in the ATC, and stated that the "permitted emissions may be revised based on the source test data" (ATC Page 3, Condition B.6).

PM = 53.06 #/MWH

2 INTRODUCTION

Waste Management of California, Inc. (WMC) retained Kleinfelder, Inc. to perform a source emissions test on the landfill gas fired flare located at the Simi Valley Landfill in Simi Valley, California. The tests were performed from February 20 through 26, 1991.

This section summarizes the purpose of the source emissions tests, provides an overview of the procedures used during testing, and details the chronology of field testing activities. Section 3 provides summary tables of the results of testing, including emission rates and flare destruction efficiency, for the various landfill gas inlet and exhaust gas components. A brief process description of the flare system is contained in Section 4. Sections 5 and 6 summarize the field sampling procedures and laboratory analytical methods employed during the program. Because the quantity of written material on these topics is voluminous, Sections 4, 5 and 6 provide only summaries of the relevant information. However, the complete information is readily available elsewhere. For example, a complete description of the flare system is available from the ATC application documents. Detailed descriptions of the test methods and analytical procedures can be found in the published California Air Resources Board (CARB) reference methods noted. Complete copies of the raw, original field and laboratory data are contained in Appendices A and B. Detailed results and sample calculations are provided in Appendices C and D. Equipment calibration records are included in Appendix E.

2.1 Purpose and Objectives

The landfill gas extraction system and the landfill gas-fired flare are operated to reduce the potential for uncontrolled gaseous emissions. Gas which might otherwise diffuse through the landfill cover or travel laterally beneath the surface is collected for combustion in the flare. The flare is designed to destroy the landfill gases by combusting the gases with air. Complete combustion would result in the flare exhaust gases containing only carbon dioxide and water. Although flares such as the one installed at the Simi Valley Landfill are extremely effective at destroying the landfill gases through complete combustion, trace amounts of gases other than carbon dioxide and water are emitted. Because of these trace emissions, the flare is regulated as a stationary source by the VCAPCD. The purpose of the source test was to verify the destruction efficiency of the flare and to quantify the emissions of the trace gases that could be emitted from the flare exhaust.

Consistent with the need to verify performance, the test fulfilled the requirements of the VCAPCD Authority to Construct No. 1395-2 and quantified the emissions of substances regulated under the AB 2588 air toxics "hot spots" legislation.

2.2 Procedures

The testing program was coordinated by Mr. Dan Vidal of WMC and Mr. Roland Hebert of Kleinfelder. Table 2-1 provides a chronological log which depicts the sequence of field sampling events. The CARB procedures listed in the table were described in the Source Test Protocol submitted to the VCAPCD on December 21, 1990, and were approved by the VCAPCD as amended in the District's response letter dated January 8, 1991. Details regarding each sampling method are summarized in Section 5. Field sampling records are contained in Appendix A. For reference to Table 2-1, a summary is provided here for each of the field sampling activities and the associated CARB method.

- Sample traverse points were determined using **CARB Method 1**.
- Measurement of gas stream velocity, gas temperature, and gas pressure, as well as verification of the absence of cyclonic flow, were accomplished using **CARB Method 2**.
- Stack gas moisture content was measured using **CARB Method 4** in conjunction with the particulate sampling.
- Particulate matter was measured using **CARB Method 5**.
- Molecular weights of the stack gases (carbon dioxide, oxygen, and carbon monoxide) were determined using continuous monitors operated according to **CARB Method 100**.
- Emissions of gaseous products of combustion were continuously monitored with the Kleinfelder Mobile Emissions Laboratory according to **CARB Method 100**.
- Emissions of hydrogen chloride and hydrogen fluoride were sampled by **CARB Method 421**.
- Reduced sulfur, fixed gases, and total gaseous non-methane organic (TGNMO) compounds were sampled into evacuated Tedlar bags using **CARB Method 422**. The bags were submitted to an analytical laboratory for analysis within 48 hours of sampling.
- Total and hexavalent chromium emissions were measured using **CARB Method 425**.
- Polycyclic aromatic hydrocarbons (PAH) were sampled using **CARB Method 429**.

TABLE 2-1 CHRONOLOGICAL SAMPLING LOG**SIMI VALLEY LANDFILL
LANDFILL GAS-FIRED FLARE**

Type	Run No.	Date	Time On	Time Off
CARB 5	1	20 Feb 91	1514	1656
CARB 425	1	20 Feb 91	1514	1656
CARB 100	1	20 Feb 91	1530	1700
CARB 5	2	21 Feb 91	0729	0938
CARB 425	2	21 Feb 91	0729	0938
CARB 100	2	21 Feb 91	0800	0930
CARB 5	3	21 Feb 91	1032	1240
CARB 425	3	21 Feb 91	1032	1240
CARB 100	3	21 Feb 91	1010	1140
CARB 5-Amb	1	21 Feb 91	1035	1232
CARB 436	1	21 Feb 91	1318	1637
CARB 100	4	21 Feb 91	1310	1610
CARB 422 In	1	21 Feb 91	1430	1445
CARB 422 Out	1	21 Feb 91	1430	1445
CARB 422 In	2	21 Feb 91	1500	1515
CARB 422 Out	2	21 Feb 91	1500	1515
CARB 422 In	3	21 Feb 91	1530	1545
CARB 422 Out	3	21 Feb 91	1530	1545
CARB 436	2	22 Feb 91	0726	1045
CARB 100	5	22 Feb 91	0725	1045
CARB 429	1	22 Feb 91	1202	1612
CARB 100	6	22 Feb 91	1200	1610
CARB 421	1	25 Feb 91	1042	1249
CARB 100	7	25 Feb 91	1035	1240
CARB 430	1	25 Feb 91	1309	1339
CARB 430	2	25 Feb 91	1344	1414
CARB 421	2	26 Feb 91	0731	0939
CARB 100	8	26 Feb 91	0705	0940
CARB 429	2	26 Feb 91	1040	1400
CARB 100	9	26 Feb 91	1000	1250

Note: CARB Methods 1, 2, and 4 were performed in concert with every other isokinetic sampling method (i.e., Methods 5, 421, 429, 430, and 436).

- Formaldehyde was sampled using CARB Method 430.
- Samples for measuring emissions of arsenic, cadmium, total chromium, copper, manganese, nickel, and zinc were collected by CARB Method 436.

Samples collected by the various methods noted were analyzed by several individual laboratories. Analyses for particulate matter were conducted at the Kleinfelder Air Quality Laboratory in Diamond Bar, California. Analyses for fixed gases, methane and non-methane organics (total and speciated), hydrogen sulfide, and organic reduced sulfur compounds were performed by Atmosphere Assessment Associates at its Chatsworth, California facility. The PAH samples were analyzed by Eureka Laboratories in Sacramento, California. The remaining samples were analyzed by TMA/ARLI Laboratory in Monrovia, California. Section 6 describes the analytical procedures, while the laboratory data are provided in Appendix B.

3 SUMMARY OF SOURCE TEST RESULTS

This section provides tabulated results for each of the parameters measured during the source test. On Table 3-1, test results for criteria pollutants and reactive organic compounds are compared to emission limits specified in the ATC. Measured source operational and analytical parameters are described in Table 3-2. Test results for formaldehyde, heavy metals, organic compounds, and polycyclic aromatic hydrocarbons are quantified respectively in Tables 3-3 through 3-6. Detailed results and example calculations are provided in Appendices C and D.

**TABLE 3-1 TEST RESULTS - AUTHORITY TO CONSTRUCT CONDITIONS
Simi Valley Landfill**

Parameter	Units	ATC Conditions	Result ^a
ROG	lb/hr	1.09	<0.02
NO _x (as NO ₂)	lb/hr	3.11	1.10
SO _x (as SO ₂)	lb/hr	0.04	0.22
CO	lb/hr	15.01	0.14
Particulate	lb/hr	0.15	2.07

^a Average of three test runs

TABLE 3-2 TEST RESULTS - SOURCE EMISSION PARAMETERS
Simi Valley Landfill

Parameter	<i>Average</i>	Units	Run 1	Run 2	Run 3
Stack Temperature		°F	1571	1549	1548
Moisture		% vol	8.46	8.22	8.18
Gas Meter Volume		dscf	27.42	36.47	33.62
Gas Velocity		ft/sec	14.4	15.5	14.5
Gas Volume		acfm	43560	46627	43622
Gas Volume		dscfm	10438	11287	10570
Isokinetics		%	100.9	99.3	97.7
Oxygen		% vol	12.1	12.1	12.2
Carbon Dioxide		% vol	8.1	8.0	8.1
Carbon Monoxide					
Concentration		ppm,v	0.6	6.8	1.0
Emission Rate		lb/hr	0.027	0.333	0.046
Sulfur Dioxide					
Concentration		ppm,v	2.0	2.1	2.2
Emission Rate		lb/hr	0.207	0.235	0.231
Nitrogen Oxides					
Concentration		ppm,v	10.2	15.4	17.4
Emission Rate		lb/hr	0.760	1.240	1.313
Particulate Matter					
Concentration		gr/dscf	0.027	0.020	0.020
Emission Rate		lb/hr	2.44	1.96	1.80
Landfill Gas					
Carbon Dioxide		% vol	41.2	41.3	41.8
Oxygen		% vol	0.7	0.5	0.6
Nitrogen		% vol	8.9	8.7	8.4
Methane		% vol	48.8	48.5	49.4
Hydrogen Sulfide		ppm,v	9.2	9.2	9.0
C ₁ Reduced Sulfur		ppm,v	< 0.5	< 0.5	< 0.5
C ₂ Reduced Sulfur		ppm,v	2.1	1.7	2.2
C ₃ Reduced Sulfur		ppm,v	< 1.0	< 1.0	< 1.0
TGNMO, Inlet					
Concentration		ppm,v	1290	2810	2110
Feed Rate ^a		lb/hr	1.561	3.400	2.553
TGNMO, Outlet					
Concentration		ppm,v	< 1	< 1	< 1
Emission Rate	< 0.02	lb/hr	< 0.019	< 0.021	< 0.020
Flare Efficiency ^b		%	> 98.8	> 99.4	> 99.2

^a Based on landfill gas flow rate of 650 scfm

^b Based on feed and emission rates

TABLE 3-3 TEST RESULTS - FORMALDEHYDE
Simi Valley Landfill

Parameter	Units	Run 1	Run 2	Average
Stack Temperature	°F	1580	1580	1580
Moisture	% vol	8.34	8.00	8.17
Gas Meter Volume	dscf	1.039	1.088	1.063
Gas Velocity	ft/sec	15.5	15.5	15.5
Gas Volume	acfm	46684	46651	46682
Gas Volume	dscfm	11085	11119	11102
Oxygen	% vol	11.9	11.9	11.9
Carbon Dioxide	% vol	8.4	8.4	8.4
Formaldehyde	ppm,v	0.848	0.007	0.428
	lb/hr	4.38E-02	3.60E-04	2.21E-02

TABLE 3-4 TEST RESULTS - HEAVY METALS
Simi Valley Landfill

Parameter	Units	Run 1	Run 2	Average
Stack Temperature	° F	1522	1542	1532
Moisture	% vol	8.18	8.08	8.13
Gas Meter Volume	dscf	56.98	53.65	55.32
Isokinetic	%	97.7	102.9	100.3
Gas Velocity	ft/sec	15.1	13.7	14.4
Gas Volume	acfm	45600	41314	43457
Gas Volume	dscfm	11193	10111	10652
Oxygen	% vol	11.9	11.3	11.6
Carbon Dioxide	% vol	8.5	8.4	8.4
Arsenic	lb/hr	3.85E-04	3.53E-04	3.69E-04
Cadmium	lb/hr	4.18E-04	2.15E-04	3.16E-04
Chromium				
Hexavalent ^a	lb/hr	<9.07E-05	<9.01E-05	<9.04E-05
Total ^a	lb/hr	1.52E-02	1.08E-02	1.30E-02
Total ^b	lb/hr	2.78E-02	1.31E-02	2.04E-02
Copper	lb/hr	2.83E-03	3.16E-03	3.00E-03
Manganese	lb/hr	9.45E-03	1.24E-02	1.09E-02
Nickel	lb/hr	8.28E-02	1.55E-01	1.19E-01
Zinc	lb/hr	2.78E-03	5.60E-04	1.67E-03

^a CARB Method 425

^b CARB Method 436, used for internal verification

TABLE 3-5 TEST RESULTS - ORGANICS
Simi Valley Landfill

Parameter	Units	Run 1	Run 2	Run 3
Landfill Gas Inlet				
Acetonitrile	ppb,v	<20	<20	<20
78 Benzene	ppb,v	997 726	917	981
Benzyl Chloride	ppb,v	<100	<100	<100
Chlorobenzene	ppb,v	<100	<100	<100
Dichlorobenzene	ppb,v	<100	<100	<100
1,1-dichloroethane	ppb,v	2780	2830	2910
1,2-dichloroethane	ppb,v	60 113	86	112
1,1-dichloroethylene	ppb,v	116	116	119
Dichloromethane	ppb,v	13800	13100	13400
Perchloroethene	ppb,v	6820	6920	6830
Carbon Tetrachloride	ppb,v	<1	<1	<1
72 Toluene	ppb,v	34600	61200	65100
1,1,1-trichloroethane	ppb,v	610 172	608	617
Trichloroethene	ppb,v	3780 2142	3800	4160
Chloroform	ppb,v	6	6	6
Vinyl Chloride	ppb,v	3030 4153	3070	3100
106 m + p-xylenes	ppb,v	4140	21500	14300
106 o-xylenes	ppb,v	2360	9570	6440
Ethylene Dibromide	ppb,v	<1	<1	<1
Flare Exhaust Stack				
Acetonitrile	ppb,v	<0.8	<0.8	<0.8
Benzene	ppb,v	0.27	0.21	<0.1
Benzyl Chloride	ppb,v	<0.8	<0.8	<0.8
Chlorobenzene	ppb,v	<0.1	0.16	<0.1
Dichlorobenzene	ppb,v	<1.1	<1.1	<1.1
1,1-dichloroethane	ppb,v	<0.4	<0.4	<0.4
1,2-dichloroethane	ppb,v	<0.2	<0.2	<0.2
1,1-dichloroethylene	ppb,v	<0.1	<0.1	<0.1
Dichloromethane	ppb,v	3.98	3.54	3.36
Perchloroethene	ppb,v	<0.1	<0.1	<0.1
Carbon Tetrachloride	ppb,v	<0.05	<0.05	<0.05
Toluene	ppb,v	3.91	2.02	2.29
1,1,1-trichloroethane	ppb,v	0.31	0.26	0.24
Trichloroethene	ppb,v	<0.06	<0.06	<0.06
Chloroform	ppb,v	<0.08	<0.08	<0.08
Vinyl Chloride	ppb,v	<0.1	0.34	<0.1
m + p-xylenes	ppb,v	1.20	0.99	0.87
o-xylenes	ppb,v	1.20	<0.5	0.75
Ethylene Dibromide	ppb,v	<0.5	<0.5	<0.5
Hexachlorobenzene	ppm,v	<2.2	<2.2	
Acrylonitrile	ppm,v	<0.34	<0.34	
1,3-butadiene	ppm,v	<1.4	<1.4	
1,4-dioxane	ppm,v	<0.25	<0.25	

TABLE 3-6 TEST RESULTS - PAH
Simi Valley Landfill

Parameter	Units	Run 1	Run 2	Average
Naphthalene	lb/hr	1.933E-02	2.300E-02	2.11E-02
Acenaphthylene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Acenaphthene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Fluorene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Phenanthrene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Anthracene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Fluoranthene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Pyrene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Benzo(a)anthracene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Chrysene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Benzo(b)fluoranthene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Benzo(k)fluoranthene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Benzo(a)pyrene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Benzo(g,h,i)perylene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Dibenzo(a,h)anthracene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05
Indeno(1,2,3-cd)pyrene	lb/hr	<3.195E-05	<3.647E-05	<3.421E-05

4 PROCESS DESCRIPTION

The landfill gas collection and flare system is an environmentally beneficial system used to control emissions of gas generated through the natural decomposition of waste buried in the landfill. The system consists of a series of landfill gas collection wells, gas manifold and pumping system, and the landfill gas-fired flare. The collected gas is piped through a common manifold to the flare where the gas is combusted with air at a very high temperature. The high flare temperature, coupled with a designed residence time for gases in the combustion zone, is the key to achieving complete combustion of the landfill gases (i.e., converting the landfill gases to carbon dioxide and water through combustion with air). Flare design is consistent with Best Available Control Technology (BACT) requirements for treatment of landfill gas.

The flare located at the Simi Valley Landfill is designed to combust landfill gas at temperatures in excess of 1400°F. Prior to combustion, the landfill gas passes through a condensate collection system to remove most of the entrained moisture. The landfill gas is fed to the flare by a variable-speed blower capable of adjusting landfill gas flow rates to those required for proper flare operation. In addition, the flare is equipped with automatic air control louvers and a temperature controller to monitor and maintain the minimum acceptable flame temperature. The flare also is designed with a flame failure detector that automatically shuts off the flow of landfill gas to the flare should the flame become extinguished. Operation of the flare within design parameters will ensure that sufficient flare temperature and residence time are achieved for essentially complete destruction of landfill gases.

5 FIELD SAMPLING PROCEDURES

This section summarizes the field sampling procedures used for the source test. This information is condensed from the applicable CARB and U.S. Environmental Protection Agency (EPA) standard methods for stationary source emissions tests. More extensive details concerning those methods are available in the complete test method documents published by the relevant agencies. Section 5.1 describes the general concepts underlying the field test methods and procedures, while the subsequent sections summarize the specific methods used in the Simi Valley Landfill source emissions test.

5.1 General Factors Involved in Sampling

During the Simi Valley Landfill flare source emissions test, pre-approved standard test methods were applied utilizing instruments calibrated in accordance with calibration procedures specified in the individual methods. Appropriate sample custody records and other required field and laboratory documentation were maintained by the field sampling and laboratory staff. These records are included in Appendices A and B. Equipment calibration records are contained in Appendix E. Section 5.2 describes the chain-of-custody procedures used on this project.

The various test methods can be grouped into four categories. These categories include:

- Methods for proper withdrawal of the exhaust gases from the stack into the sampling equipment
- Methods for continuous monitoring of standard combustion parameters
- Methods for obtaining, transporting and directly analyzing exhaust gas in a laboratory
- Methods for collecting exhaust gas samples in specially prepared impingers that will later be analyzed in the laboratory.

Sections 5.3 and 5.4 describe the exhaust gas withdrawal procedures which are used to help ensure that the gases extracted for analysis are representative of actual flare exhaust gases. Section 5.5 describes the methods for continuous monitoring of standard combustion parameters. These parameters determine flare combustion performance and are used in deriving emission rates for the compounds sampled by the remaining methods. Section 5.6 describes the method for extraction and direct analysis of exhaust gases. This method is used

to obtain samples that will be analyzed for organic constituents, including the AB 2588 compounds. Sections 5.7 through 5.11 describe the various specially-designed impinger methods used to obtain samples for laboratory analyses of particulates, PAH, heavy metals, formaldehyde, and halogenated acid constituents.

5.2 Sample Custody Procedures

To help ensure sample integrity and traceability, Kleinfelder's standard chain-of-custody plan was used on this project. The elements of this plan include:

- Sampling train component identification
- Sample identification
- Sample labeling
- Documentation
- Chain-of-custody records.

The sequence of activities related to chain of custody and the sample identification and tracking procedures are described below.

- Sample train components, including filter holders, impingers, and other sampling equipment, were prepared in the laboratory and identified by tags and codes.
- The sample train was issued to the test team and the master log completed. Sample I.D. number stickers were issued according to the test identification code.
- The train was returned to the recovery area when a valid sample was obtained. The sample train was accompanied by all field data sheets.
- The recovery team recovered samples using appropriate containers, and affixed sample I.D. labels to the sample containers, master log, field data sheet, and train recovery sheet.
- Samples and their associated chain-of-custody forms were transferred to appropriate laboratory personnel.
- All samples were returned to Kleinfelder accompanied by the chain-of-custody forms.
- Samples were examined at each transfer point for integrity (broken containers, loss in liquid, or seal integrity).

Upon completing the required analysis, the chain-of-custody form was returned with the analytical results. The Project Manager for the test program ensured that all samples were analyzed and analytical results returned by the laboratory. Within each individual laboratory, that facility's standard procedures for chain of custody were utilized.

5.3 Location and Number of Traverse Points

To help ensure that the extracted exhaust gases analyzed by the appropriate test methods were representative of the actual exhaust gases leaving the flare, the location of sampling ports and the number of traverse points were determined using the procedure specified in CARB Method 1. The ideal sample port location is at least eight equivalent stack diameters (i.e., eight times the effective stack diameter) downstream of any physical obstruction that would disturb the air flow in the stack, and at least two equivalent diameters upstream of a second disturbance point (usually the exit point for the exhaust gases). Upstream disturbances can be caused by bends, baffles, tees, or other stack construction deviations from the standard "straight pipe" exhaust stack. The minimum requirement for a sampling port is a location two equivalent diameters downstream of a disturbance point and one-half equivalent diameter upstream from a second disturbance point. Additionally, at the sample location, exhaust gas stream flow characteristics should be free from eddy currents and from helical or cyclonic flow.

At an ideal test location as described in CARB Method 1, the exhaust gas velocity and temperature tend to remain constant across the diameter of the stack. The resultant velocity and temperature profiles are flat. Using the criteria described in CARB Method 1, 24 traverse points were identified for the Simi Valley Landfill flare, consisting of 12 along each of the two ports located in the same horizontal plane 90 degrees apart. The method for measuring temperature and velocity is described in Section 5.4.

5.4 Gas Flow and Temperature Measurements

Gas volumetric flow rate and temperature profiles were measured by conducting simultaneous velocity and temperature traverses following the procedures of CARB Method 2. A Chromel-Alumel (K type) thermocouple, attached to a digital indicator, was used to measure the gas temperature at each of the traverse points.

Gas velocity at each traverse point was measured with a calibrated "S" type pitot tube connected to an inclined manometer. The manometer indicates the pressure differential, in inches of water column, between the pressure at the tip of the pitot and the vented leg of the manometer (i.e., atmospheric pressure). This pressure differential is then converted to a velocity through application of the standard Bernoulli equations. The static pressure of the gas stream was measured using the pitot tube and manometer with the tips of the pitot turned perpendicular to the gas stream.

During the initial traverse at each sample location, the absence of cyclonic flow was verified. This was accomplished by turning the pitot tube perpendicular to the exhaust gas flow. If the indicated reading on the manometer did not change (i.e., remained at the "null" position), no cyclonic flow was present. If the manometer did not remain at the null position, the pitot tube was rotated until the manometer null indication was restored. The angle of rotation of the pitot tube is a measure of cyclonic flow in the exhaust gas. The angle of rotation was determined at each of the traverse points, and the average angle of rotation for the entire traverse calculated. If the average angle of rotation for the entire traverse was less than 10 degrees, the sample location is considered to be free of cyclonic flow and suitable for further testing.

5.5 Continuous Emission Monitors

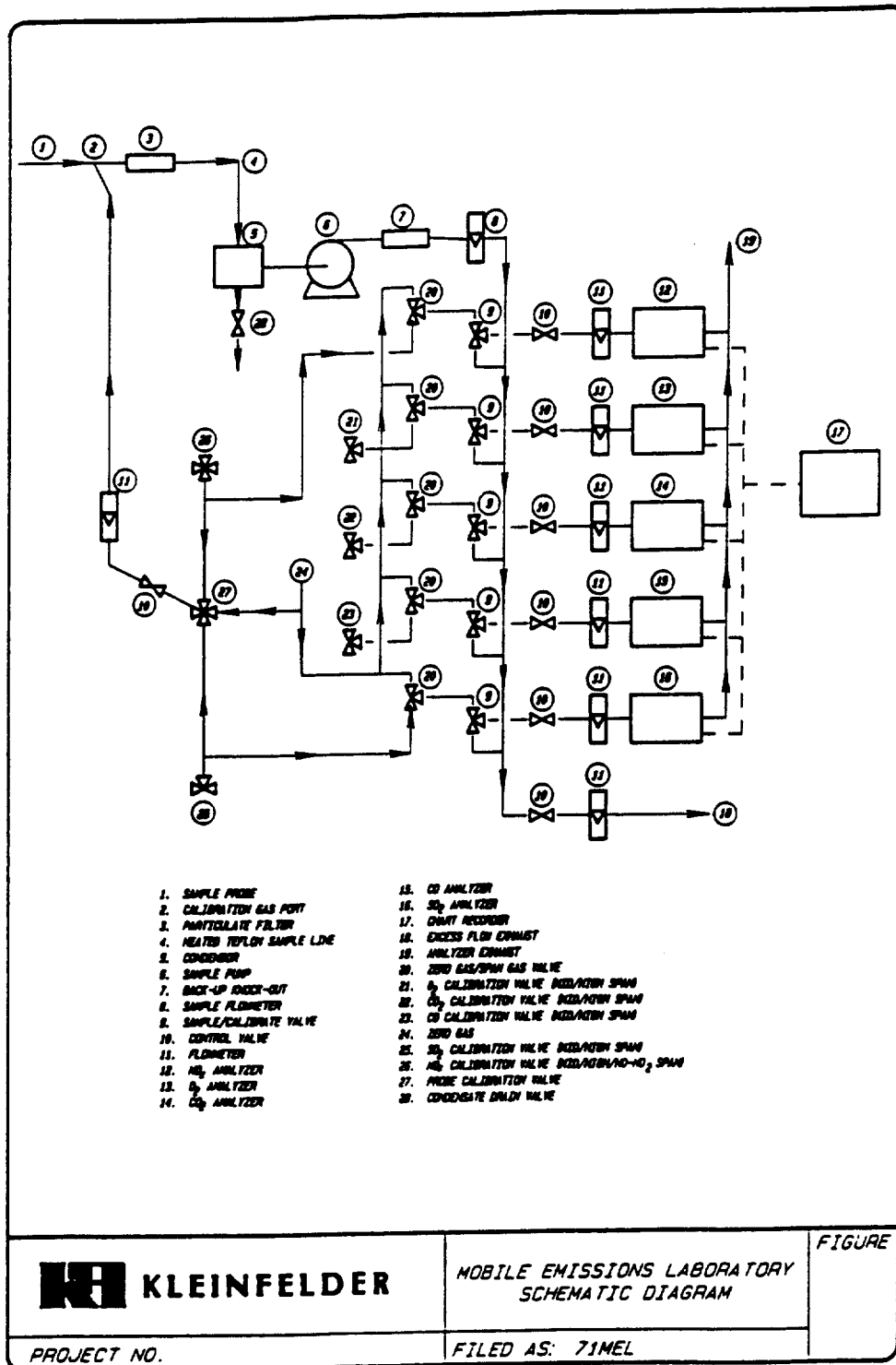
Once an acceptable sampling location was determined by CARB Methods 1 and 2, standard combustion parameters were sampled and analyzed with on-line continuous emission monitors (CEMs) housed in the Kleinfelder Mobile Emissions Laboratory (MEL). These monitors determine carbon dioxide (CO₂), oxygen (O₂), carbon monoxide (CO), nitrogen oxides (NO_x), and sulfur dioxide (SO₂) concentrations in the sampled exhaust gas. Procedures for CEM instrumental sampling are contained in CARB Method 100. Instrument quality control requirements are contained in 40 CFR 60, Appendix A, Method 6C. Requirements for analyzer instrument calibration procedures, error checks, and system bias checks are contained within the methods. The instruments used on this project are listed in Table 5-1, along with methods of detection and applicable operating ranges. The instrument results were electronically transmitted to a strip chart recorder. Copies of the strip charts for the tests conducted are included in Appendix A.

TABLE 5-1 CONTINUOUS EMISSION MONITORING EQUIPMENT

Parameter	Manufacturer	Model	Range	Principle of Detection
SO ₂	Western Research	721AT2	0 -200 ppm	Ultraviolet
NO _x	TECO	10A	0 - 100 ppm	Chemiluminescence
O ₂	Teledyne	320A	0 - 25%	Fuel Cell
CO ₂	ACS	3300	0 - 20%	NDIR
CO	TECO	48	0 - 100 ppm	GFC NDIR

Two of the more critical aspects of continuous emissions monitoring are transporting and conditioning the gas sample from the exhaust gas stream to the instruments, because particulate matter and water vapor can interfere with instrument performance. Particulate matter and water vapor were removed by using an in-line fiberglass filter and a water condenser, respectively. The sample probe was constructed of stainless steel, and the sample lines were heated Teflon. The heated components were maintained at a temperature of 248° ± 25°F to ensure that no moisture condensed in the sampling lines which could remove stack gas constituents prior to their being measured by the MEL instrumentation. After the heated stack gas passed through the in-line filter and condenser, the gas was pumped through a Teflon line to the instrument manifold. A three-way sample valve was located immediately downstream of the filter to allow calibration gases to flow through the entire system for quality control checks. A schematic of the complete CEM system is presented in Figure 5-1. As required by the CARB and EPA methods, each analyzer was multi-point calibrated with a suitable zero gas and at least two upscale span gases, one of which was certified as an EPA Protocol 1 gas. The span gases for each parameter were in the appropriate concentrations described in CARB Method 100.

Figure 5-1



5.6 Tedlar Bag Samples

The two methods of sampling and analyzing the flare exhaust gases other than the CEMs described in Section 5.5 are: (1) extraction of exhaust gases for transport and direct gaseous analysis at the laboratory (termed "bag sampling"); and (2) extraction of exhaust gases and bubbling the gases through specially prepared impingers for later analysis at the laboratory through wet chemistry and similar methods (termed "impinger sampling"). Bag sampling methods were used to evaluate fixed gases, hydrogen sulfide, organic reduced sulfur compounds, methane and non-methane organics. Among the organic constituents analyzed by this method were the specific AB 2588 organic species (hexachlorobenzene, 1,4-dioxane, 1,3-butadiene, and acrylonitrile) requested by the VCAPCD.

For the bag samples, the procedures of CARB Method 422 were used with an integrated Tedlar bag sampling system. The sampling system included a stainless steel probe which was inserted into the stack. A Teflon sample line was connected to the probe and run to the Tedlar bag contained in a rigid, light-sealed container. A sample pump, equipped with a needle valve for flow control and flow meter to measure the flow rate, was used to evacuate the bag. As the bag was evacuated, stack gas from the probe and Teflon sample line filled the bag. At the completion of the sample period, the Tedlar bag was removed, sealed and transported to the analytical laboratory for the appropriate analyses.

5.7 Particulate Sampling

The method utilized for particulate sampling and analysis relies on a specially-designed impinger system. The basis of the particulate sampling system is described in CARB Method 5. In addition to being the specific method for obtaining particulate samples, CARB Method 5 also forms the basis for all the other impinger sampling methods described in Sections 5.8 through 5.11.

It is critical for Method 5 sampling that the samples be obtained isokinetically. Acceptable isokinetic rates for sampling range from 90 percent to 110 percent. The isokinetic percentage is the best single criterion in assessing the validity of an individual test run. An isokinetic percentage of 100 percent means that the nozzle inlet velocity is identical to the undisturbed mainstream stack gas exhaust velocity, and that the withdrawn sample accurately represents stack gas conditions.

especially in the probe, was removed by a nylon brush followed by a final deionized water rinse. All washings were stored in sealed nonreactive sample bottles for subsequent laboratory analysis.

The contents of the first three impingers were measured gravimetrically. The impinger contents, connecting glassware, and impinger washings were stored in a separate, sealed, nonreactive sample bottle for subsequent laboratory analysis.

The silica gel in the fourth impinger was reweighed to determine the weight gain. If the silica gel was not totally spent, it was reused in subsequent tests. If spent, it was removed, and fresh material added before reuse.

Analysis of the samples for particulate matter was conducted using CARB Method 5 procedures. Each run set consisted of three samples: 1) the probe, nozzle, filter holder front half, and flexible line wash; 2) the filter; and 3) the impinger contents, connecting glassware and their associated wash.

5.8 Polycyclic Aromatic Hydrocarbon Sampling

Polycyclic aromatic hydrocarbon (PAH) sampling is conducted with an impinger system based upon CARB Method 5. According to AB 2588, there are 16 separate substances that comprise the PAH content of stack gases. All 16 substances were analyzed by the laboratory.

Exhaust gas samples were collected using CARB Method 429. CARB Method 429 is based upon the CARB Method 5 impinger train system (including the requirement for isokinetic sampling) with the addition of an adsorbent cartridge of XAD-2 resin that "traps" PAH vapors. The sample train consisted of a glass nozzle, heated probe, heated Teflon sample line, heated Teflon or Teflon-coated glass fiber filter, glass condenser, XAD-2 sorbent module, and the impinger train. The components of the sampling train were treated the same as in Method 5, except that no sealant grease was used in any portions of the sample train.

The most difficult aspect of Method 429 is ensuring that inadvertent PAH contamination of the sample does not occur through the use of materials other than Teflon and glass or through the use of solvents that may contain trace amounts of PAH. Therefore, for this

project, all recovery solvents (methanol, toluene, and methylene chloride) were nano-grade quality, distilled in glass, and stored in their original glass containers. In addition, the reagent water was deionized, distilled, and stored in glass containers with Teflon-lined screw caps.

5.9 Heavy Metals Sampling

Sampling for heavy metals was conducted in accordance with CARB Method 436. This method contains the same requirements for isokinetic sampling as CARB Method 5. The Method 436 sampling train design was based on the CARB multi-metal draft methodology (drafted November 8, 1990). The method was used to detect and quantify arsenic, cadmium, chromium, copper, manganese, nickel, and zinc.

The Method 436 sample train consisted of a quartz nozzle, heated probe, heated Teflon sample line, heated glass fiber filter, and the impinger train. Heated components were maintained at $248 \pm 25^{\circ}\text{F}$. The impinger train consisted of five impingers in series. The first two impingers each contained 100 milliliters of 5 percent nitric acid and 10 percent hydrogen peroxide. The third impinger was dry, and the fourth contained about 400 grams of indicating silica gel. The impinger train was maintained at ice-water conditions to attain gas exit temperatures of no more than 68°F .

Upon completion of each test, the soiled filter was removed from the holder and sealed in its container. The nozzle, probe, Teflon sample line, and front half of the filter holder were washed three times using a total volume of 100 milliliters of acetone, and then three times with 0.1N nitric acid (100 milliliters total volume) while brushing all exposed surfaces with a nonmetallic brush. All acetone and nitric acid washings were placed in separate sealed sample bottles for subsequent analysis.

The contents of the first three impingers were measured gravimetrically and, along with their associated washings of a total of 100 milliliters of 0.1N nitric acid, were stored in a sealed sample bottle. The fourth impinger was reweighed in the field to the nearest 0.1 milligram, and the impinger re-sealed for subsequent recovery or reuse. Samples of unexposed filters and unused reagents were carried through the entire process as analytical blanks.

Careful field preparation and sample recovery procedures were implemented in order to obtain representative results. All impinger and recovery solutions were prepared from ACS-certified reagent grade or equivalent quality reagents and stored in acid-cleaned glass containers, while reagent water was distilled and deionized and stored in glass containers with Teflon-lined screw caps.

5.10 Formaldehyde Sampling

Formaldehyde sampling was performed by CARB Method 430. This impinger method is based upon CARB Method 5, except that midget impingers are used and the impingers are filled with 2,4-dinitrophenylhydrazine (DNPH) to "trap" the formaldehyde. The Method 430 sample train consisted of a heated probe, flexible heated Teflon sample line, and three midget impingers in series. The first two impingers each contained 10 milliliters of DNPH in hydrochloric acid, and the third impinger was dry. A drying tube filled with silica gel was located after the third impinger and before the metering console in order to protect the equipment. After the sampling event, the midget impingers were sealed and transported to the laboratory for analysis.

5.11 Halogenated Acids Sampling

Halogenated acids (hydrochloric and hydrofluoric acid) were sampled using a CARB Method 421 sampling system. The operation of the sampling system was identical to the CARB Method 5 procedures. This method collects only those halogenated acids which pass through the filter at its elevated temperature (i.e., gaseous acids). The sample of exhaust gas was withdrawn isokinetically from the source through a heated ($248^{\circ} \pm 25^{\circ}\text{F}$) probe. The sample then passed through a glass fiber filter maintained in the same temperature range as the probe, and then through a Teflon sample line and into the impinger train. The train consisted of four impingers in series. The first two impingers were each charged with 100 milliliters of 3 mM sodium bicarbonate (NaHCO_3) and 2.4 mM sodium carbonate (Na_2CO_3). The third impinger was dry, and the fourth was filled with 400 grams of indicating silica gel.

6 ANALYTICAL PROCEDURES

This section briefly summarizes the analytical methods used to quantify the presence of the various exhaust components sampled as described in Section 5. Samples were analyzed within 48 hours after collection.

6.1 Moisture Content

In order to determine the emission rates of the various constituents analyzed, the moisture content of the sampled stack gas was determined in accordance with CARB Method 4. The total moisture gain for each test run is equivalent to the difference between the initial impinger volume and the final impinger solution volume before washing (measured gravimetrically to the nearest 0.1 milligram), plus the weight gain of the silica gel for that test run. This method was used to determine the moisture content of the sampled gases.

6.2 Tedlar Bags

The Tedlar bag samples were analyzed differently by the laboratories depending upon the chemical species of interest in each bag sample. Fixed gases, hydrogen sulfide, and organic reduced sulfur compounds were analyzed using gas chromatography with the appropriate columns and detectors according to standard analytical methods. Methane and total gaseous non-methane organics were analyzed using Method 25.2 as published by the South Coast Air Quality Management District. This method determines the total organic content of the sample by gas chromatography which separates the non-methane organics from carbon monoxide, carbon dioxide, and methane. The remaining non-methane organics are then oxidized to carbon dioxide, reduced to methane, and measured using a flame ionization detector (FID). In order to determine the quantities of specific organic compounds, the Tedlar bag samples were analyzed using gas chromatographic techniques. Depending upon the compound, the species were quantified either by using direct injection to specified columns and measurement by compound-specific detectors or by using mass spectrophotometric techniques.

6.3 Particulate Analysis

Particulate analysis consists of determining the weight of particulate matter trapped on the filters and sampling system as described previously. Prior to weighing for analysis, all filters, including blanks, were desiccated for a minimum of 24 hours and weighed to constant weight. "Constant weight" means that the difference between two consecutive weighings is less than 0.5 milligrams or 1 percent of the resultant net weight, whichever is greater, with no less than 6 hours of desiccation time between weighings. All liquid samples were evaporated to dryness at 105°C in tared beakers, desiccated and weighed to constant weight. The resulting weight data, coupled with the standard combustion parameter measurements, then were used to determine the particulate emission rates.

For quality assurance checks, samples of unexposed filters and unused reagents were stored as blanks. A system blank was also collected by washing down the nozzle, probe, filter holder, and Teflon line before a test.

6.4 Polycyclic Aromatic Hydrocarbons

As required by CARB Method 429, PAH samples collected on the XAD-2 resin were shipped to the laboratory for analysis. Method 429 analysis begins with a compound-specific extraction of the content of the XAD-2 resin. The extract as well as the wash solutions were analyzed for specific PAH compounds using high-resolution capillary-column gas chromatography coupled with low-resolution mass spectrometry (HRGC/LRMS). Because of the complexity of the analysis, the method includes addition of known quantities of internal standards to the sample for internal quality assurance checks.

6.5 Heavy Metals

The impingers used to collect samples for heavy metals were analyzed in accordance with CARB Method 436. The Method 436 samples first were acid-digested to dissolve inorganics and to remove organics that could interfere with the analysis. Samples were analyzed for cadmium, chromium, copper, manganese, nickel, and zinc using inductively-coupled argon plasma emission spectroscopy. The arsenic analysis was performed using atomic absorption spectrophotometry.

The total and hexavalent chromium samples collected by CARB Method 425 were analyzed using Method 425 methodology. The total chromium fraction was acid-digested and analyzed using graphite-tube furnace atomic absorption. The hexavalent chromium fraction was extracted in an alkaline solution and analyzed by the diphenylcarbazide colorimetric method.

6.6 Formaldehyde

The midjet impingers collected by Method 430 for formaldehyde analysis were transported to the laboratory where the DNPH sample solutions were extracted with chloroform, washed with hydrochloric acid, and evaporated to dryness. The dry residue was then dissolved in acetonitrile. The analysis was performed using reverse-phase high-pressure liquid chromatography with an ultraviolet adsorption detector.

6.7 Halogenated Acids

Samples for analysis of halogenated acids were obtained as described in Section 5.11 as required by CARB Method 421. The impinger solutions obtained were analyzed for chloride and fluoride by ion chromatography with a conductivity detector. The chloride and fluoride peaks were identified by characteristic retention times and quantified by reference to external standards. The amount of chloride and fluoride ion is directly related to the amount of acid present in the stack gas.

Appendix B provides copies of the laboratory results obtained by the various analytical methods described above. If additional information concerning the precise analytical procedures is needed, the published reference methods should be consulted.

7 LIMITATIONS

This report was prepared in general accordance with the accepted standard of care that existed in Southern California at the time the report was written. It should be recognized that determining all possible emission scenarios and chemicals is difficult. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the facility. Kleinfelder should be notified for additional consultation if the client wishes to reduce the uncertainties beyond the level associated with this report. No warranty, expressed or implied, is made.

This report may be used only by the Client and appropriate regulatory agency and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on site and off site) or other factors may change over time, and additional work may be required with the passage of time. Any party other than the Client or appropriate government agency who wishes to use this report shall notify Kleinfelder of such intended use by executing the "Application for Authorization to Use" which follows this document as an Appendix. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Noncompliance with any of these requirements by the Client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

City of Industry, California

Plant SIMI VALLEY LANDFILL

Date 20 FEB 91

Location LFG FLARE

Diam.
Stack ~~D.~~ 8'

Barometric Pressure 30.02" Hg

Static Pres - 0.08

Operators JK, TV, AE

Pitot No. _____

$$K = 15.79$$

TRAVERSE POINT NUMBER	VELOCITY HEAD	STACK TEMP.	CYCLONIC FLOW ANGLE
A 1	0.02	1435	
2	0.02	1470	
3	0.03	1479	
4	0.03	1475	
5	0.03	1482	
6	0.02	1495	
7	0.02	1491	
8	0.02	1500	
9	0.02	1500	
10	0.02	1490	
11	0.02	1486	
12	0.02	1480	
AVERAGE	0.023		

TRAVERSE POINT NUMBER	VELOCITY HEAD	STACK TEMP.	CYCLONIC FLOW ANGLE
B 1	0.03	1490	
2	0.03	1500	
3	0.03	1480	
4	0.03	1500	
5	0.03	1500	
6	0.03	1490	
7	0.03	1480	
8	0.03	1490	
9	0.03	1500	
10	0.04	1512	
11	0.03	1498	
12	0.02	1480	
AVERAGE	0.95		

Meter ΔH 1.80
Meter Gamma 1.004
Meter Box # DP01C
Nozzle Diameter .6"
Probe Length 9'

Meter H_2O 1.80
Meter Gamma 1.004
Meter Box # DP01C
Nozzle Diameter 1.5"
Probe Length 9'

[illegible]

FIELD DATA

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Plant Sing Valley
 Date 2/21/91
 Test Site Flare
 Run Number 4441
 Operator JK

Ambient Temp _____
 Barometer _____
 Stack Pressure _____
 Stack H₂O % _____
 Stack Dia _____

Meter Hg
 Meter Gamma _____
 Meter Box # _____
 Nozzle Diameter _____
 Probe Length _____

Probe Mat'l _____
 Filter Number _____
 Samp Box # _____
 PRE LEAK _____
 POST LEAK 0.005 cfm @ 17" Hg

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (Vn)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H2O)		T E M P E R A T U R E S						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	96	1501	26.800	.01	.16	.16	1495	94	93	60	233	250	4.0
2	104	09	28.600	.02	.30	.30	1556	96	91	59	236	250	5.0
3	112	17	31.100	.02	.30	.30	1585	97	91	60	236	250	5.0
4	120	25	33.610	.02	.30	.30	1605	98	91	62	234	250	5.0
5	128	33	36.110	.03	.45	.45	1567	99	92	61	233	250	6.0
6	136	41	39.150	.02	.30	.30	1556	100	92	62	237	250	5.0
7	144	49	41.660	.02	.30	.30	1559	99	92	63	238	250	5.0
8	152	57	44.280	.02	.30	.30	1554	98	93	64	233	250	5.0
9	160	1605	47.000	.02	.30	.30	1565	99	92	65	236	250	5.0
10	168	13	48.650	.02	.30	.30	1553	98	91	64	234	250	5.0
11	176	21	51.695	.02	.32	.32	1502	98	91	65	229	250	6.0
12	184	29	54.215	.01	.16	.16	900	97	91	64	229	250	3.0
	192	37	56.805										
AVERAGE /SUM			59.480	0.139		0.30	1522.4	95.9		59.3	226.1	250	
				</									

PAGE 1 OF 2

Meter #	180
Meter Gamma	1.004
Meter Box #	D801C
Nozzle Diameter	0.5"
Probe Length	9'

Probe Mat'l _____
Filter Number _____
Samp Box # _____
PRE LEAK 0.
POST LEAK _____

[illegible]

02 11.3
60.2.4

FIELD #

PAGE 2 OF 2

Plant 51071 VALLEY
Date 2-22-91
Test Site Flare
Run Number Stack 2
Operator JK

Ambient Temp _____
Barometer _____
Stack Pressure _____
Stack H₂O % _____
Stack Dia _____

Meter #H0 _____
Meter Gamma _____
Meter Box # _____
Nozzle Diameter _____
Probe Length _____

Probe Mat'l _____
Filter Number _____
Samp Box # _____
PRE LEAK _____
POST LEAK 0.0054 fm @ 10" Hg

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (Vn)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H2O)		T E M P E R A T U R E S						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	96	0909	082.554	0.02	0.30	0.30	1606	83	82	68	225	250	5.0
2	104	0917	85.300	.02	.30	.30	1620	89	82	60	246	250	5.0
3	112	0925	87.790	.02	.30	.30	1619	91	83	59	233	250	5.0
4	120	0933	90.980	.03	.45	.45	1575	92	83	59	236	250	6.0
5	128	0941	93.275	.03	.45	.45	1554	95	86	58	233	250	6.0
6	136	0949	96.295	.02	.30	.30	1542	94	84	56	231	250	6.0
7	144	0957	98.875	.02	.30	.30	1576	95	87	52	232	250	5.0
8	152	1005	101.360	.02	.30	.30	1565	93	87	56	229	250	5.0
9	160	1013	103.850	.01	.15	.15	1582	94	91	67	232	250	3.5
10	168	1021	105.625	.01	.15	.15	1596	94	91	58	232	250	3.5
11	176	1029	107.415	.01	.15	.15	1582	94	90	59	229	250	3.5
12	184	1037	109.206	.01	.15	.15	950	96	91	60	226	250	3.5
	192	1045	111.015										
AVERAGE /SUM	192		54.635	0.125		0.24	1542	80		57	230	250	

Plant San Valley
 Date 2/20/90
 Test Site FALLEN
 Run Number 24001
 Operator J.R.

Ambient Temp 70°
 Barometer 30.02
 STATIC Stack Pressure -0.08
 Stack H2O 10
 Stack Dia 8'

Meter Hg 1.004
 Meter Gamma 1.80
 Meter Box # 0701C
 Nozzle Diameter 0.5"
 Probe Length 9'

Probe Mat'l
 Filter Number SP
 Samp Box #
 PRE LEAK 0.008
 POST LEAK

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (V _m)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H ₂ O)		TEMPERATURES						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
K=15.77 215.10 1	0	1514	894.205	.03	.47	.47	1684	82	80	60	223	250	4.0
2	4	18	895.785	0.02	0.32	.32	1568	84	80	62	207	250	3.5
3	8	22	897.500	.01	0.14	.16	1574	87	82	65	215	250	3.0
4	12	26	897.980	.01	0.16	0.14	1575	83	77	66	219	250	3.0
5	16	30	898.900	1.02	.30	.30	1580	91	84	64	230	250	4.0
6	20	34	900.125	.02	.30	.30	1578	95	86	63	233	250	4.0
7	24	38	901.380	.02	.30	.30	1560	97	88	60	238	250	4.0
8	28	42	902.635	.02	.30	.30	1588	98	89	61	232	250	4.0
9	32	46	903.900	.02	.30	.30	1552	100	90	62	237	250	4.0
10	36	50	905.185	.02	.30	.30	1575	100	91	62	232	250	4.0
11	40	54	906.405	.02	0.30	.30	1532	101	92	62	230	250	3.5
12	44	58	907.865	.01	.15	.15	1635	100	92	60	238	250	3.5
	48	16:02	908.620										
AVERAGE /SUM													

* Change To Bar K

Plant Singapore
 Date 2/20/91
 Test Site Flare
 Run Number CARB 1
 Operator JF

Ambient Temp _____
 Barometer _____
 Stack Pressure _____
 Stack H₂O % _____
 Stack Dia _____

Meter ^{He} _____
 Meter Gamma _____
 Meter Box # _____
 Nozzle Diameter _____
 Probe Length _____

Probe Mat'l _____
 Filter Number _____
 Samp Box # _____
 PRE LEAK _____
 POST LEAK 0.005 @ 15"

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (V _m)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H ₂ O)		TEMPERATURES							PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE		
1	48	1608	908.620	1.02	.30	.30	1600	93	90	69	227	250	4.0	
2	52	12	909.925	1.02	.30	.30	1622	94	89	69	230	250	4.0	
3	56	16	911.275	1.03	.430	.430	1647	96	89	65	229	250	4.1	
4	60	20	912.465	1.03	.43	.43	1639	98	89	65	227	250	4.0	
5	64	24	914.150	1.03	.430	.430	1585	98	70	66	222	250	4.0	
6	68	28	915.675	1.02	.30	.30	1580	97	90	67	222	250	4.0	
7	72	32	916.945	1.01	0.15	.15	1565	96	90	67	226	260	3.0	
8	76	36	917.875	1.01	.15	.15	1568	96	90	66	226	260	3.0	
9	80	40	918.770	1.01	.15	.15	1560	96	90	67	225	250	3.0	
10	84	44	919.740	1.01	.15	.15	1556	95	90	65	226	250	3.0	
11	88	48	920.635	1.01	.14	.14	1466	96	90	69	226	250	3.0	
12	92	52	921.575	1.01	.16	.16	1600	97	91	69	226	250	3.0	
	96	56	922.575											
AVERAGE /SUM	96		28.290	0.02		0.27	1571 1569	91.2		64	227	250		

$$\sqrt{f} = 0.1312$$



VIN 3E13

% Efficiency = 98.72

NO₂ = 176.0

NO_x Int. Cal = 79.5

NO_x Zero

NO₂ Conversion Efficiency Check (TVI)

20 NO₂ Cyl. # C40648 / 50 NO₂ Conc. = 176.00

20 NO Cyl. # C449619 / 50 NO Conc. = 79.50

March 30, 1992

KBS NO scale = 0-250 ppm

Plant Summit Valley
 Date 2/21/91
 Test Site Flare
 Run Number CARB 2
 Operator JK

Ambient Temp 65°F
 Barometer 29.92
 Stack Pressure _____
 Stack H₂O % 10
 Stack Dia 8'

Meter HQ 1.80
 Meter Gamma 1.004
 Meter Box # 2801C
 Nozzle Diameter 0.5
 Probe Length 9'

Probe Mat'l
 Filter Number 59
 Samp Box # _____
 PRE LEAK 0.015 cfm @ 15" Hg
 POST LEAK _____

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (V _m)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H ₂ O)		T E M P E R A T U R E S						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	0	0729	923.000	0.01	0.15	.15	1575	56	54	50	200	250	2
2	5	39	924.230	.02	0.28	.28	1650	63	55	50	210	250	3
3	10	39	925.490	.02	0.28	.28	1655	67	57	52	215	250	3
4	15	49	926.980	.02	0.28	0.28	1630	72	60	53	223	250	3
5	20	49	928.590	.02	0.28	0.18	1600	75	62	53	226	250	3
6	25	54	930.000	.02	0.28	.28	1580	76	64	54	227	250	3
7	30	59	931.525	.01	0.15	0.15	1585	80	70	55	226	250	3
8	35	0804	932.785	0.02	0.30	0.30	1588	81	72	55	226	250	3.5
9	40	09	934.240	.02	0.30	.30	1530	80	73	56	226	250	3.0
10	45	14	935.810	.02	.30	.30	1555	87	76	57	227	250	3.0
11	50	19	937.430	.01	0.16	.16	1517	97	78	57	226	250	2.0
12	55	24	938.590	.02	.32	.32	1200	90	80	58	226	250	3.0
	60	29	940.250										
AVERAGE /SUM	0		37.070	0.14		0.30	1548.9	81.27		72	223.7	250	

FIELD LOG

PAGE 2 OF 2

Plant Sing. Valley
 Date 2/24/91
 Test Site Flare
 Run Number CAR 2
 Operator JK

Ambient Temp _____
 Barometer _____
 Stack Pressure _____
 Stack H₂O % _____
 Stack Dia _____

Meter Δ Hg _____
 Meter Gamma _____
 Meter Box # _____
 Nozzle Diameter _____
 Probe Length _____

Probe Mat'l _____
 Filter Number _____
 Samp Box # _____
 PRE LEAK _____
 POST LEAK 0.012 atm @ 12" Hg

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (V _m)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H ₂ O)		T E M P E R A T U R E S						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	60	0838	960.250	.01	.66	.016	1500	83	82	59	227	250	2.0
2	65	43	941.485	.02	.30	.30	1560	87	83	59	226	250	3.0
3	70	48	942.960	.02	.30	.30	1557	91	83	60	225	250	3.0
4	75	53	944.725	.02	.30	.30	1572	93	84	61	224	250	3.0
5	80	58	946.120	.02	.30	.30	1588	94	87	62	226	250	3.0
6	85	0903	946.790	.03	.45	.45	1610	96	87	63	226	250	4.0
7	90	09	949.580	.03	.45	.45	1579	98	89	64	225	250	4.0
8	95	13	951.480	.04	.60	.60	1600	98	89	65	226	250	5.0
9	100	18	953.530	.03	.45	.45	1603	100	91	66	226	250	4.0
10	105	23	955.385	.02	.30	.30	1580	99	91	67	227	250	3.0
11	110	28	957.915	.02	.30	.30	1614	99	92	65	226	250	3.0
12	115	33	958.445	.02	.32	.32	1140	99	92	66	226	250	3.0
	120	38	960.070										
AVERAGE /SUM			37.070	0.0141 0.141		0.30	1548.9	81.27		72	223.1	250	

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Meter Hg 1.80
Meter Gamma 1.004
Meter Box # _____
Nozzle Diameter 0.5"
Probe Length 9'

Probe Mat'l _____
Filter Number 61
Samp Box # _____
PRE LEAK 0.0086 C.I. 5th Hg
POST LEAK _____

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (Vm)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H2O)			T E M P E R A T U R E S						PUMP VAC. "Hg
							STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE		
					Desired	Actual								
1	0	1032	960.400	.01	0.16	.16	1481	79	79	50	200	250	3.5	
2	5	37	961.595	.02	.30	.30	1577	85	90	55	243	250	4.0	
3	10	42	963.120	.02	.30	.30	1574	89	82	56	222	250	4.0	
4	15	47	964.625	.02	.30	.30	1550	94	84	56	214	250	4.0	
5	20	52	966.230	.02	.30	.30	1584	98	98	57	215	250	4.0	
6	25	57	967.825	.03	.45	.45	1597	102	90	59	221	250	4.0	
7	30	1102	969.790	.03	.30	.30	1575	106	93	60	217	250	4.0	
8	35	07	971.295	.02	.30	.30	1558	106	95	62	219	250	4.0	
9	40	02	972.900	.02	.30	.30	1557	109	98	61	236	250	4.0	
10	45	17	974.520	.01	.15	.15	1570	110	101	62	223	250	3.5	
11	50	22	975.350	.01	.15	.15	1565	112	102	64	222	250	4.0	
12	55	27	976.975	.01	.16	.16	1484	112	104	66	228	250	4.0	
	60	32	978.170											
AVERAGE /SUM			35.565	0.0004		0.276	1547.8	103.2		60.9	221.1	250		
				</										

FIELD DATA

PAGE 2 OF 2

Plant SIGN VALLEY
 Date 2/21/91
 Test Site Flare
 Run Number 0ARB3
 Operator JK

Ambient Temp _____
 Barometer _____
 Stack Pressure _____
 Stack H₂O % _____
 Stack Dia _____

Meter "Hg _____
 Meter Gamma _____
 Meter Box # _____
 Nozzle Diameter _____
 Probe Length _____

Probe Mat'l _____
 Filter Number _____
 Samp Box # _____
 PRE LEAK _____
 POST LEAK 0.0086 @ 15" Hg

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (Vn)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H2O)		T E M P E R A T U R E S						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	60	1140	978.170	.01	.15	.15	1584	106	105	57	223	250	3.5
2	65	45	977.390	.01	.15	.15	1589	107	105	58	230	250	3.0
3	70	50	980.525	.04	.60	.60	1629	114	106	59	221	250	5.5
4	75	55	982.490	.03	.45	.45	1612	115	106	63	220	250	5.0
5	80	1200	984.390	.02	.30	.30	1615	116	107	64	223	250	4.5
6	85	1205	986.000	.02	.30	.30	1573	116	108	65	222	250	4.0
7	90	1210	987.525	.03	.45	.45	1576	118	109	64	218	250	5.0
8	95	15	989.410	.02	.30	.30	1540	117	111	63	224	250	4.0
9	100	20	990.990	.02	.30	.30	1530	117	111	64	220	250	4.0
10	105	25	992.585	.01	.15	.15	1540	116	111	65	217	250	3.0
11	110	30	993.710	.01	.16	.16	1466	113	110	66	221	250	3.0
12	115	35	994.865	.01	.16	.16	1204	112	109	66	214	250	3.0
	120	40	995.965										
AVERAGE /SUM	120		35.505	0.004 0.132		0.276	1547.8	103.2		60.9	221.1	250	

Plant Sunny Valley
 Date 2/22/91
 Test Site Blare
 Run Number PAH 1
 Operator JR

Ambient Temp 75
 Barometer 29.92
 Stack Pressure _____
 Stack H₂O % _____
 Stack Dia _____

Meter "H₀ 1.80
 Meter Gamma 1.004
 Meter Box # 2801C
 Nozzle Diameter 1.5"
 Probe Length 9'

Probe Mat'l _____
 Filter Number 65
 Samp Box # _____
 PRE LEAK 0.15 cfm @ 15" Hg
 POST LEAK _____

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (V _m)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H ₂ O)		TEMPERATURES						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	0	1202	113.315	.01	.15	.15	1586	85	84	48	200	250	7
2	10	32	115.555	.03	.45	.45	1595	90	84	44	224	250	14
3	20	22	119.040	.03	.45	.45	1596	91	86	46	212	250	15
4	30	32	123.100	.02	.28	.28	1650	91	88	47	212	250	12
5	40	42	125.830	.03	.45	.45	1600	93	89	50	225	250	16
6	50	52	129.400	.02	.32	.32	1460	92	89	52	216	250	12
7	60	1302	132.650	.02	.30	.30	1570	93	89	54	217	250	12
8	70	12	135.498	.01	.16	.16	1480	94	90	55	221	250	8
9	80	22	137.545	.02	.30	.30	1582	95	91	57	219	250	12
10	90	32	140.500	.01	.15	.15	1560	93	91	60	217	250	8
11	100	42	142.570	.01	.15	.15	1596	93	92	61	215	250	8
12	110	52	144.585	.01	.15	.15	1580	94	91	62	221	250	8
	120	1402	146.585										
AVERAGE / SUM													

Meter γ HQ _____
 Meter Gamma _____
 Meter Box # _____
 Nozzle Diameter _____
 Probe Length _____

Probe Mat'l _____
Filter Number _____
Samp Box # _____
PRE LEAK _____
POST LEAK _____

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (V _m)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H ₂ O)		TEMPERATURES						PUMP VAC. "Hg
					Desired	Actual	STACK (T _s)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	120	1412	166.585	.02	.30	.30	1585	86	84	56	236	250	15
2	130	22	169.855	.02	.30	.30	1571	88	86	57	238	250	14
3	140	32	153.165	.02	.30	.30	1579	90	86	58	237	250	14
4	150	42	156.500	.03	.45	.45	1560	91	87	59	226	250	15
5	160	52	160.425	.02	.30	.30	1550	92	88	59	239	250	13
6	170	1502	163.150	.02	.30	.30	1585	92	88	60	242	250	12
7	180	12	166.920	.02	.30	.30	1581	93	88	61	240	250	12
8	190	22	170.170	.02	.30	.30	1669	93	89	63	243	250	12
9	200	32	173.580	.02	.30	.30	1570	92	89	64	240	250	12
10	210	42	176.785	.01	.15	.15	1566	91	88	65	238	250	8
11	220	52	179.156	.01	.15	.15	1560	90	88	66	244	250	8
12	230	1502	181.590	.01	.15	.15	1211	91	89	65	240	250	8
	240	12	183.880										
AVERAGE / SUM	240		70.565	0.133		0.28	1556	90		57	228	250	

Plant SIMM VALLEYDate 2/26/91Test Site PlaveRun Number PAH 2Operator JKAmbient Temp 70Barometer 29.84

Stack Pressure

Stack H2O % 10Stack Dia 9'Meter # HQ 1.89Meter Gamma 0.9996Meter Box # D817CNozzle Diameter 0.5"Probe Length 9'

Probe Mat'l

Filter Number 66

Samp Box #

PRE LEAK 0.015 CFM 16"

POST LEAK

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (Vn)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H2O)		T E M P E R A T U R E S						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	0	1040	601.120	.02		.33	1430	68	67	53	218	250	13
2	8	48	601.060	.01		.16	1423	76	78	53	201	250	6
3	16	56	605.890	.02		.34	1360	83	71	53	208	250	9
4	24	1104	608.580	.02		.34	1334	85	73	51	206	250	9
5	32	12	611.235	.02		.35	1376	87	73	48	206	250	10
6	40	20	614.040	.02		.35	1324	87	75	46	199	250	9
7	48	28	616.790	.01		.18	1201	86	76	46	211	250	6.5
8	56	36	618.815	.01		.20	1103	86	78	49	213	250	7.0
9	64	44	621.085	.01		.20	1038	88	78	55	213	250	7.0
10	72	52	623.120	.01		.26	746	90	79	54	215	250	8.0
11	80	1200	625.495	.01		.26	744	89	79	53	207	250	8.0
12	88	68	627.925	.01		.26	617	91	81	54	214	250	8.0
	96	16	630.355										
AVERAGE /SUM													

Conclusion

FIELD DATA

PAGE 2 OF 2

Plant Singh Valley
 Date 2/26/91
 Test Site Flare
 Run Number PAH 2
 Operator JNC

Ambient Temp _____
 Barometer _____
 Stack Pressure _____
 Stack H2O % _____
 Stack Dia _____

Meter "H₂O" _____
 Meter Gamma _____
 Meter Box # _____
 Nozzle Diameter _____
 Probe Length _____

Probe Mat'l _____
 Filter Number _____
 Samp Box # _____
 PRE LEAK _____
 POST LEAK _____

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (V _m)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H ₂ O")		T E M P E R A T U R E S						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	96	1224	630.355	0.02		6.33	1460	81	78	60	221	250	9.5
2	104	32	632.955	.02		0.33	1419	87	78	51	229	250	9.0
3	112	40	635.650	.02		.34	1356	90	77	50	223	250	9.8
4	120	48	638.525	.02		.37	1266	91	80	51	226	250	10.0
5	128	56	641.265	.02		.34	1364	93	81	53	222	250	9.0
6	136	1304	643.910	.02		.34	1335	93	82	55	217	250	9.0
7	144	12	646.655	.01		.20	1137	92	83	56	221	250	7.0
8	152	20	648.880	.01		.21	1064	92	84	58	220	250	7.0
9	160	28	651.020	.01		.20	1096	92	84	60	219	250	7.0
10	168	36	653.160	.01		.20	1068	92	86	59	220	250	7.0
11	176	44	655.315	.01		.41	310	93	85	60	228	250	9.0
12	184	52	657.950	.01		.23	903	94	86	57	229	250	7.8
	192	1400	660.550										
AVERAGE /SUM	192		59.43	0.119		0.26	1150	93		54	216	250	

Condenser

PAGE / OF 2

Ambient Temp 61°F

Meter ΔH 287

Barometer 29.88

Stack Pressure —

Stack H₂O % 16.1Stack Dia 9'

Meter $\sim \text{He}$ 287

Meter Gamma 1.004

Meter Box # 2801C

Nozzle Diameter .5"

Probe Length 7'

Probe Mat'l

Filter Number 67

Samp Box #

PRE LEAK

POST LEAK

[illegible]

Probe Mat'l.

Filter Number

Samp Box #

PRE LEAK

POST :

Abstract

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (Vn)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H2O)		T E M P E R A T U R E S						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	60	1149	201.725	.02	.30	.30	1579	93	92	60	230	250	3.0
2	65	54	203.365	.02	.30	.30	1586	95	92	59	230	250	3.0
3	70	59	204.910	.02	.30	.30	1595	96	92	57	230	250	3.0
4	75	1204	206.525	.02	.30	.30	1620	98	92	56	228	250	3.0
5	80	09	208.120	.02	.30	.30	1598	99	92	57	227	260	3.0
6	85	14	209.745	.02	.30	.30	1606	100	93	57	231	250	3.0
7	90	19	211.375	.02	.30	.30	1570	99	93	54	230	250	3.0
8	95	24	213.000	.02	.30	.30	1574	100	94	57	229	250	3.0
9	100	29	214.620	.01	.15	.15	1565	98	93	56	230	250	2.0
10	105	34	215.825	.01	.15	.15	1559	96	93	57	226	250	2.0
11	110	39	216.995	.01	.15	.15	1555	96	93	58	228	250	2.0
12	115	44	219.215	.01	.15	.15	1167	96	92	57	228	250	2.0
	120	49	219.420										
AVERAGE /SUM	120		34.440	0.124		0.24	1550	88		58	233	250	

FIELD DATA

PAGE 2 OF 2

Plant Sims Valley
 Date 2/26/27
 Test Site Flare
 Run Number HCL 2
 Operator Tony V.

Ambient Temp _____
 Barometer _____
 Stack Pressure _____
 Stack H2O % _____
 Stack Dia _____

Meter Hg
 Meter Gamma _____
 Meter Box # _____
 Nozzle Diameter _____
 Probe Length _____

Probe Mat'l _____
 Filter Number _____
 Samp Box # _____
 PRE LEAK _____
 POST LEAK 0.03 cfm @ 10" Hg

TRAVERSE POINT NUMBER	ELAPSED TIME (mins)	CLOCK TIME	GAS METER READING (Vn)	VELOCITY HEAD (delta p)	ORIFICE PRESSURE (delta H, "H2O)		TEMPERATURES						PUMP VAC. "Hg
					Desired	Actual	STACK (Ts)	METER INLET	METER OUT	IMP	FILTER	PROBE	
1	60	839	582.850	.02		.33	1487	70	66	46	224	250	2.8
2	65	94	584.500	.02		.33	1430	75	66	42	225	250	2.8
3	70	49	586.160	.02		.33	1428	78	67	43	220	250	2.8
4	75	54	587.895	.02		.33	1363	80	68	41	220	250	3.0
5	80	59	589.440	.02		.33	1414	80	69	42	221	250	3.0
6	85	94	591.100	.02		.33	1486	82	69	42	213	250	3.0
7	90	9	592.755	.01		.16	1315	80	71	40	218	250	2.0
8	95	14	594.035	.01		.17	1350	80	70	41	220	250	2.0
9	100	19	595.25	.01		.20	1134	80	72	45	218	250	2.0
10	105	24	596.550	.01		.17	1350	80	72	44	207	250	2.0
11	110	29	597.800	.01		.19	1174	82	72	42	208	250	2.0
12	115	34	599.115	.01		.19	984	82	72	43	215	250	2.0
	120	39	600.530										
AVERAGE / SUM	120		33240	0.116		0.22	1432	71		42	213	250	

PAGE 1 OF 2

Meter # HQ 1.89
Meter Gamma 0.9496
Meter Box # D817c
Nozzle Diameter 0.5"
Probe Length 9'

Probe Mat'l _____
Filter Number _____
Samp Box # _____
PRE LEAK 0.00
POST LEAK _____

[illegible]

Plant Simi Valley
 Date 25 FEB 51
 Test Site FLARE EXHAUST
 Run Number 1 - CARB 430
 Operator RLH

Ambient Temp	70
Barometer	29.84
Stack Pressure	-0.08
Stack H2O %	10
Stack Dia	96

Meter	^H@
Meter	Gamma
Meter	Box # 63
Nozzle	Diameter 1/2 A
Probe	Length 2/3 A

Probe Mat'l SS
Filter Number N/A
Samp Box # N/A
PRE LEAK 0.000
POST LEAK 0.000

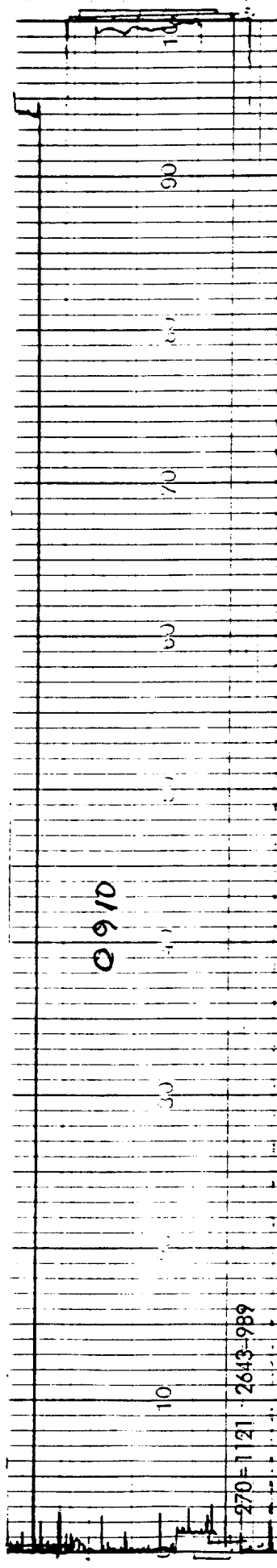
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Ambient Temp	70
Barometer	29.84
Stack Pressure	0.8
Stack H2O %	10
Stack Dia	96

Meter	^H0
Meter	Gamma
Meter Box #	63
Nozzle Diameter	NA
Probe Length	NA

Probe Mat'l	SS
Filter Number	NA
Samp Box #	NA
PRE LEAK	0.000
POST LEAK	0.000

[illegible]



CO (BLUE) 100 PPM SO₂ (GREEN) 200 PPM

CO₂ (BLUE) 20%v NO_x (BLACK) 250 PPM O₂ (RED) 25%v

CHART : 2mm/min

20 FEB 91

SIMI VALLEY LANDFILL

CAL CHECK @ 1235

1015

100

90

80

70

60

50

40

30

20

10

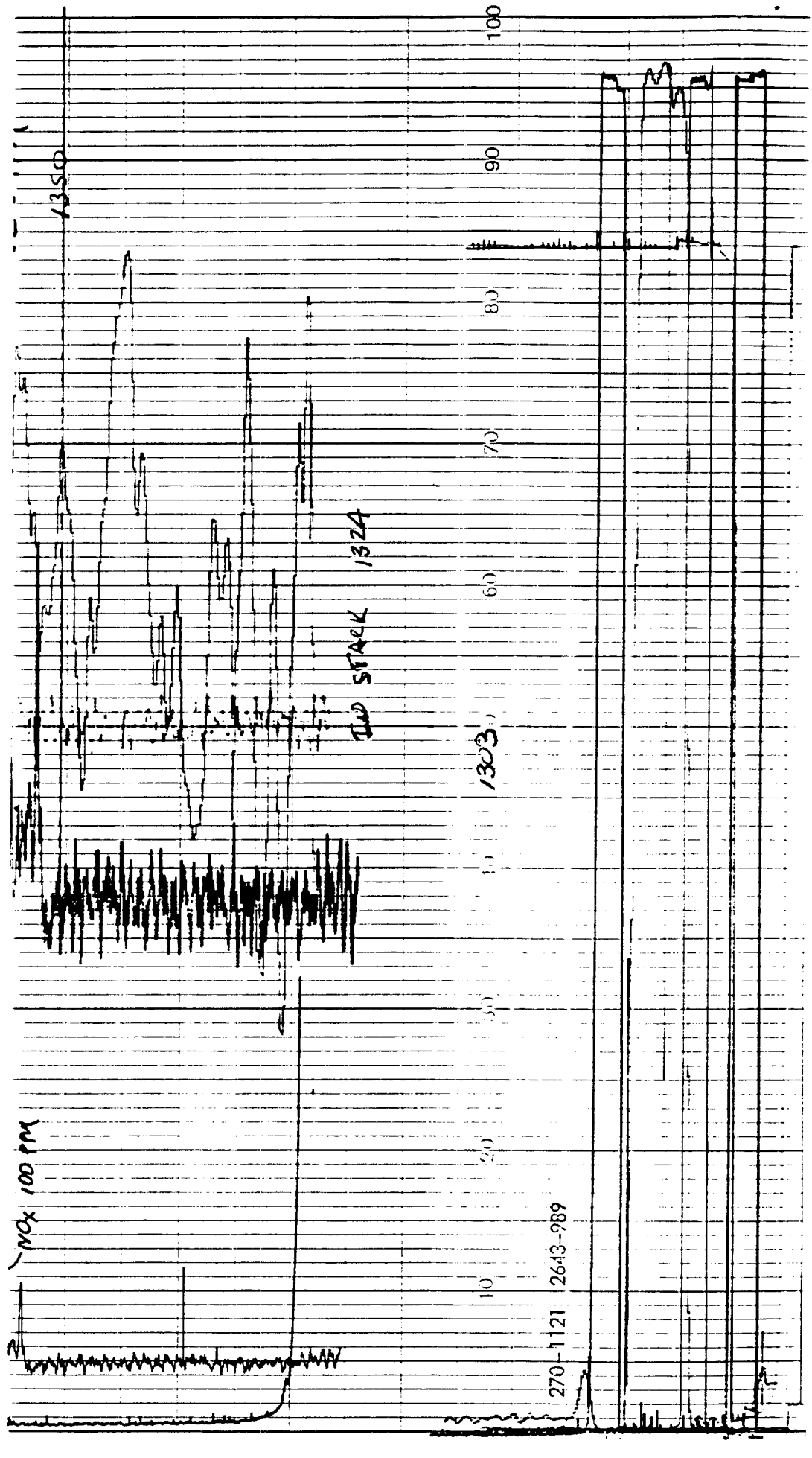
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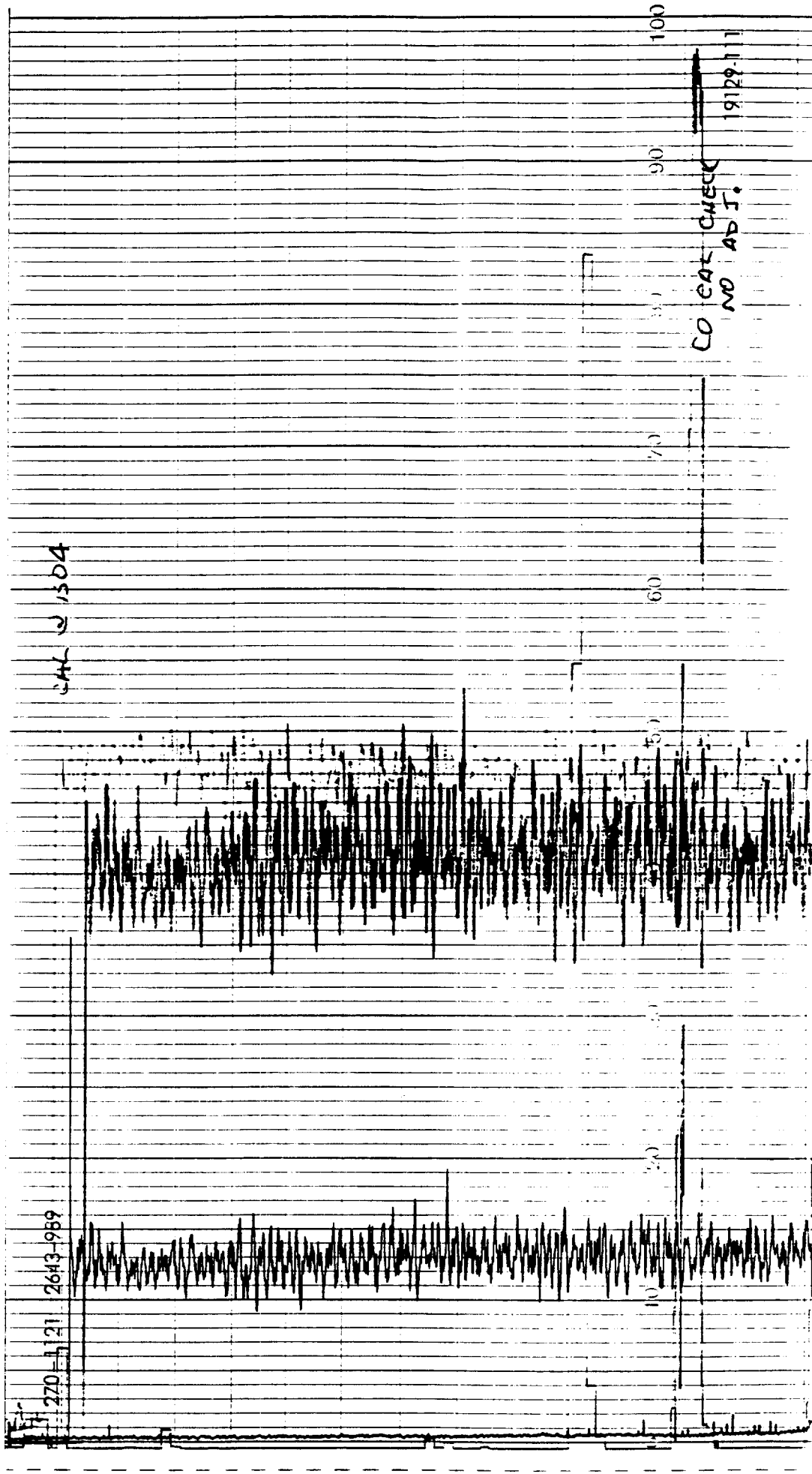
CO₂

SO₂

NO_x

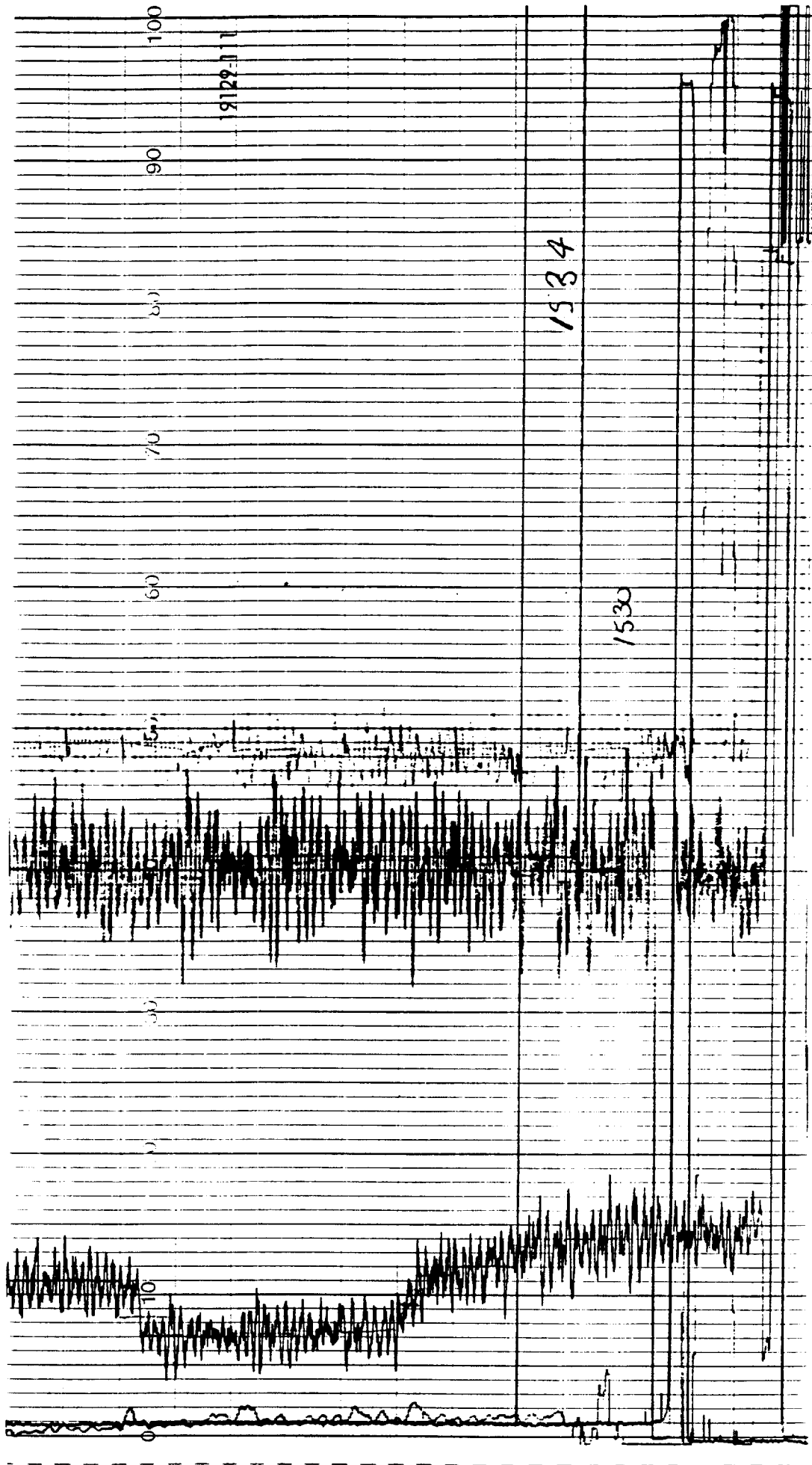
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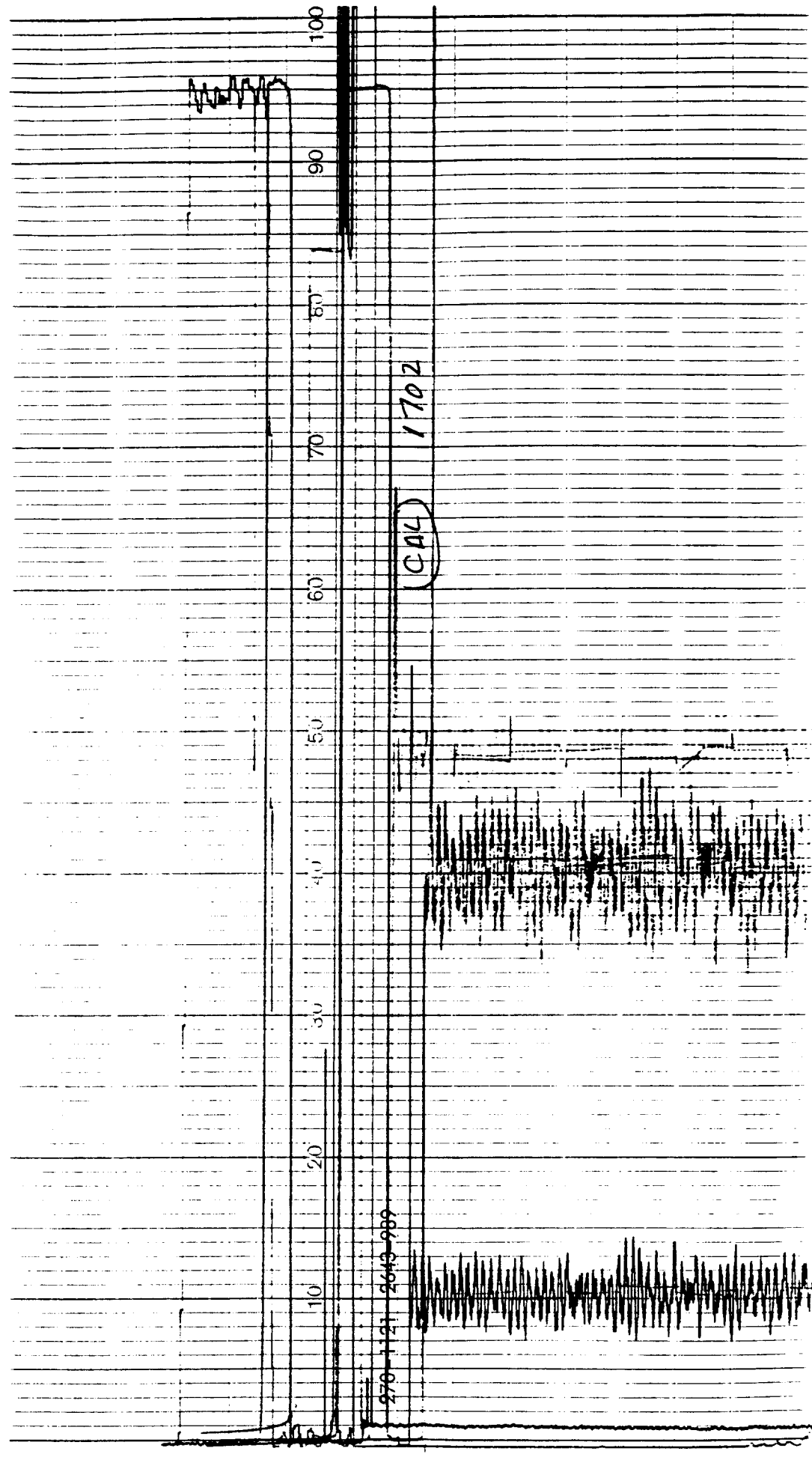


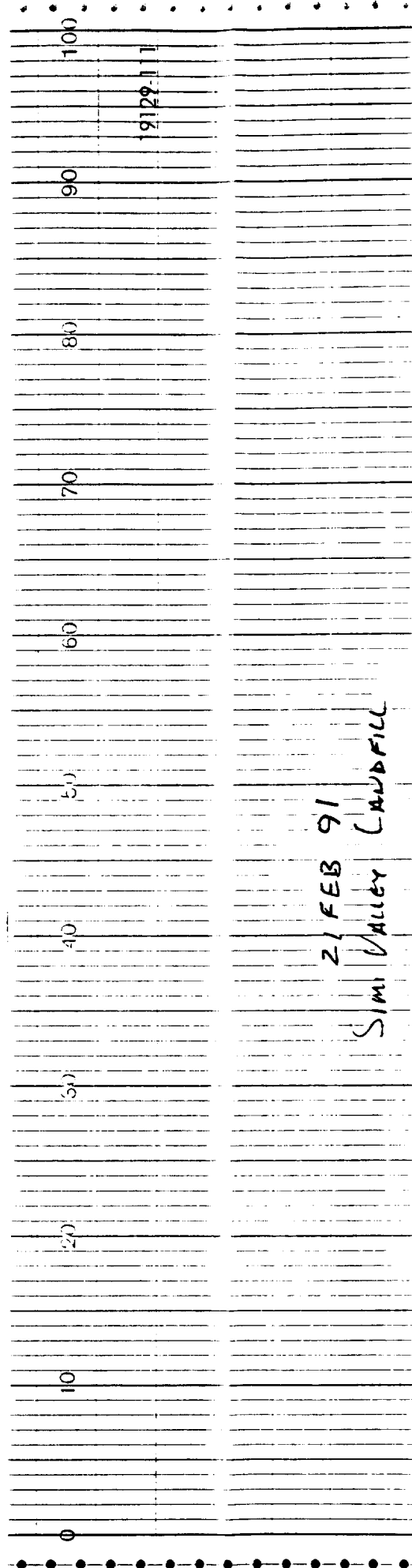


CAL W 1304

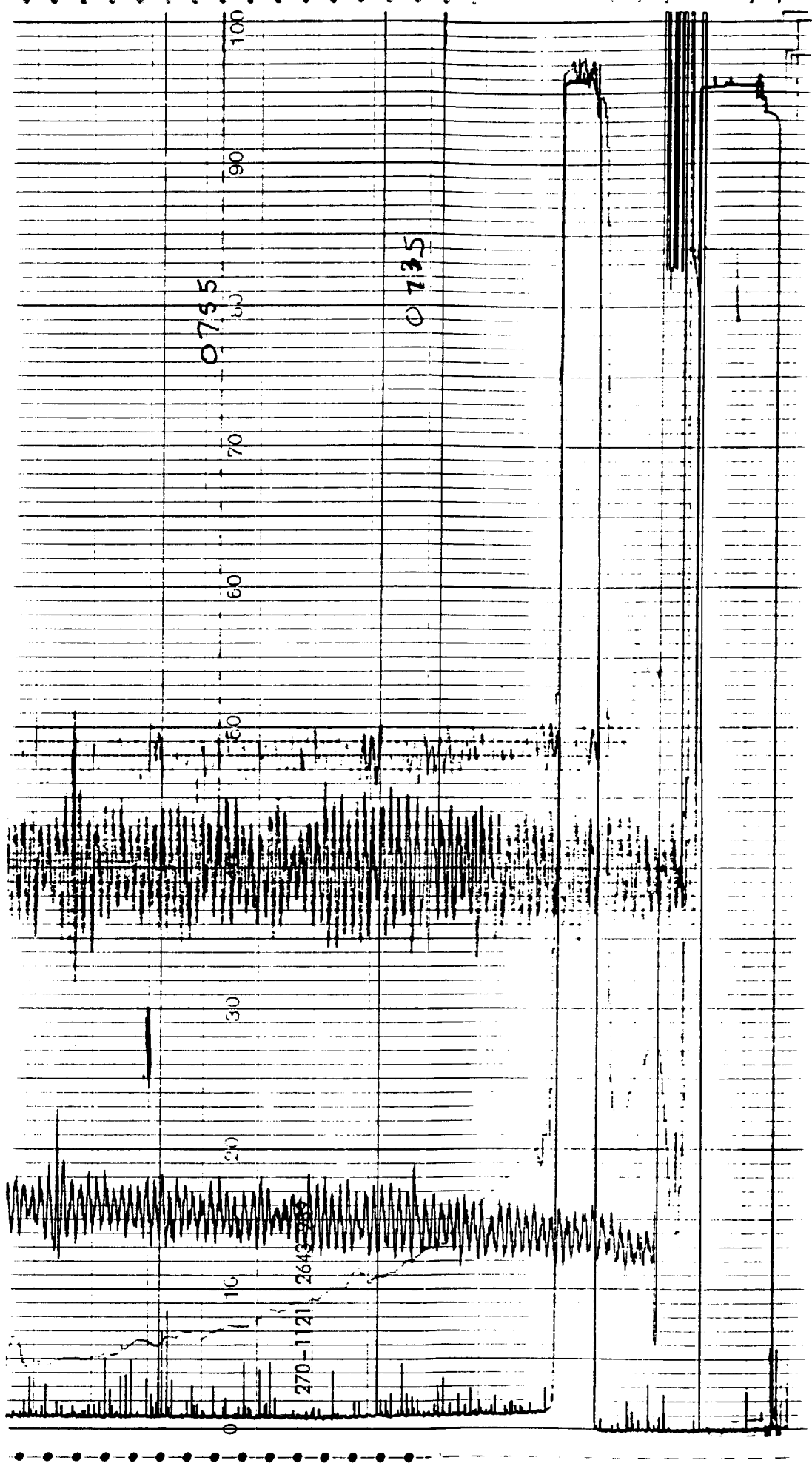
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NO ADJ. 19129.11







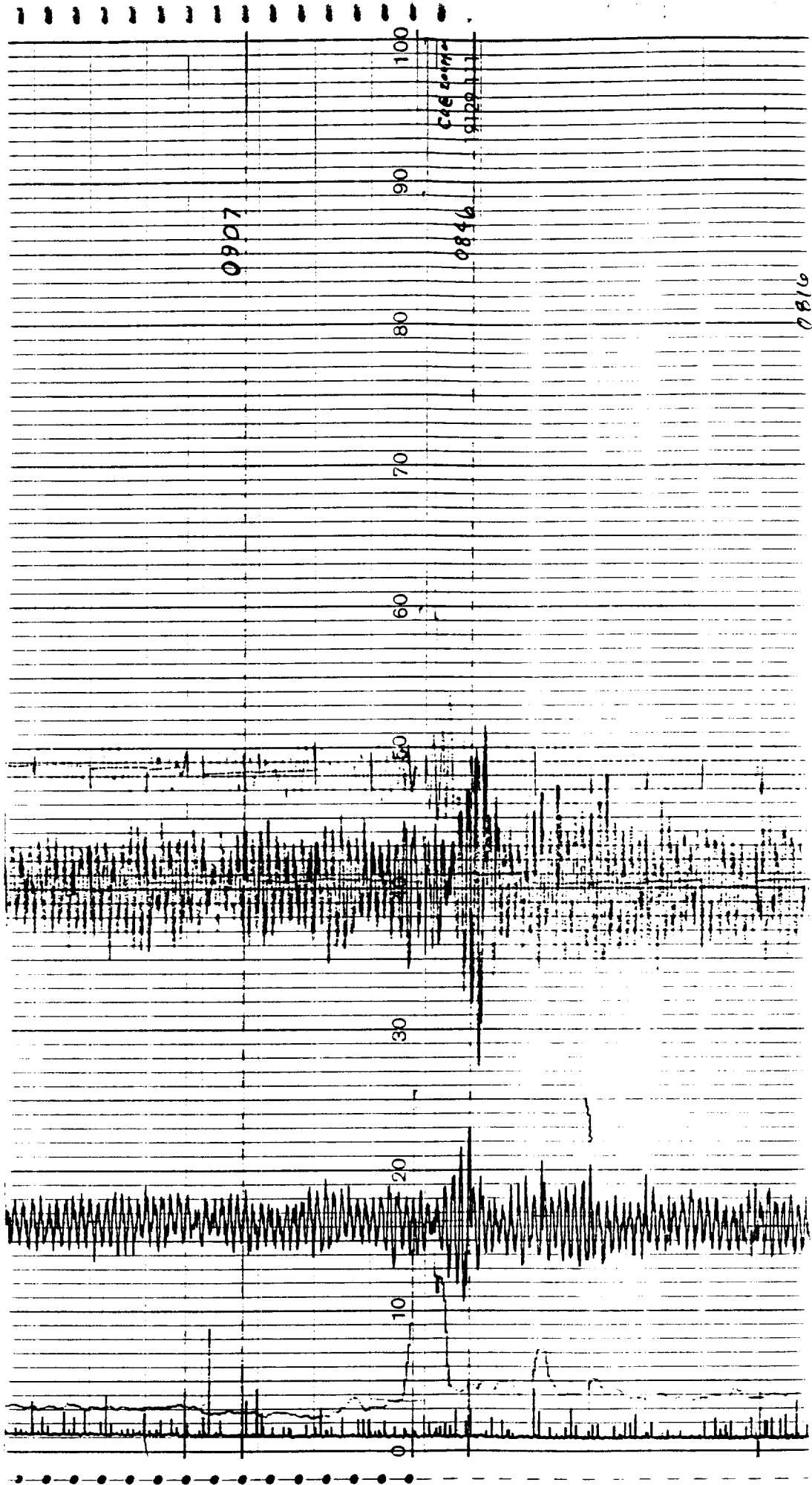
27 FEB 91
Simi Valley Caudrell

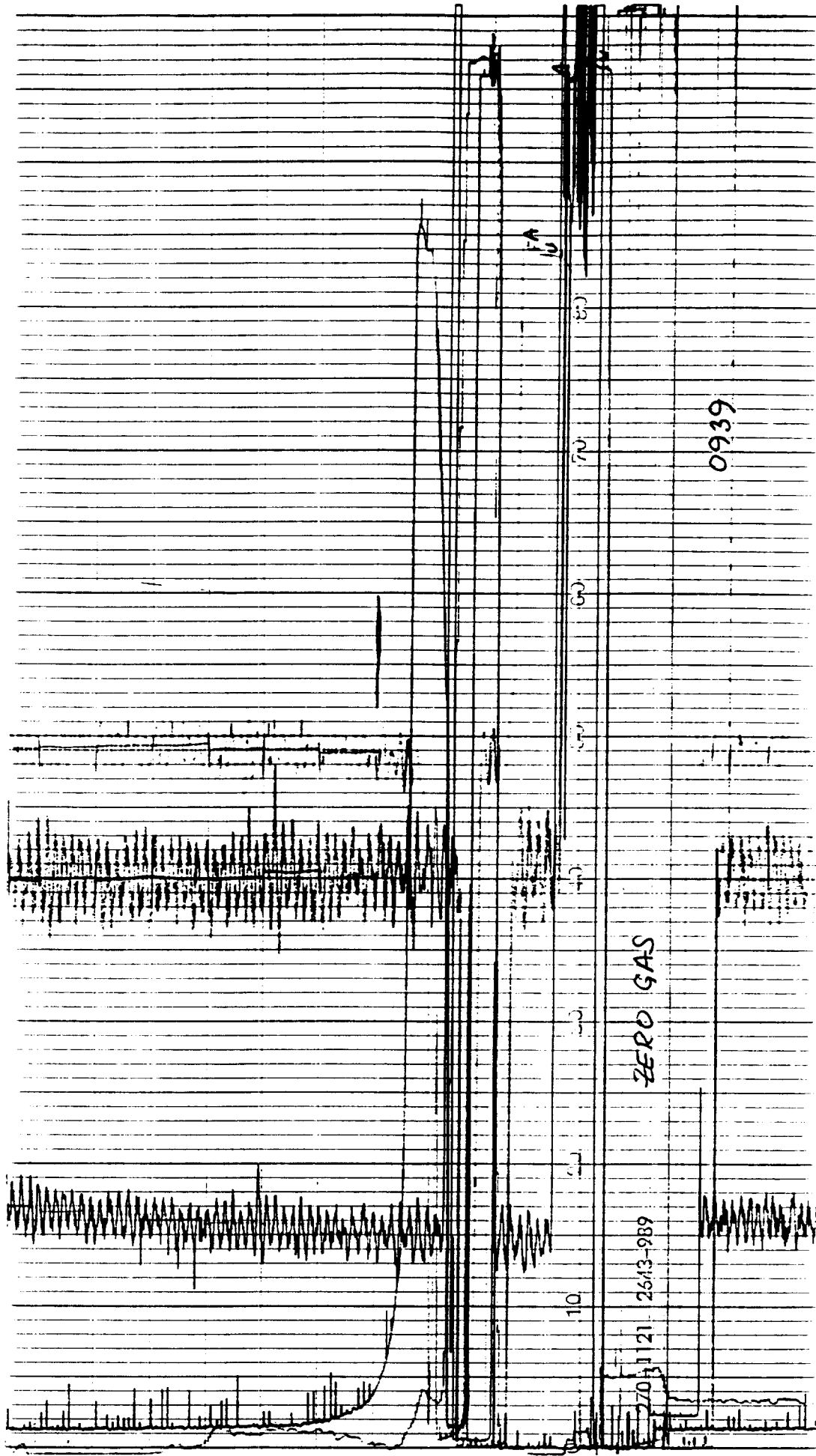


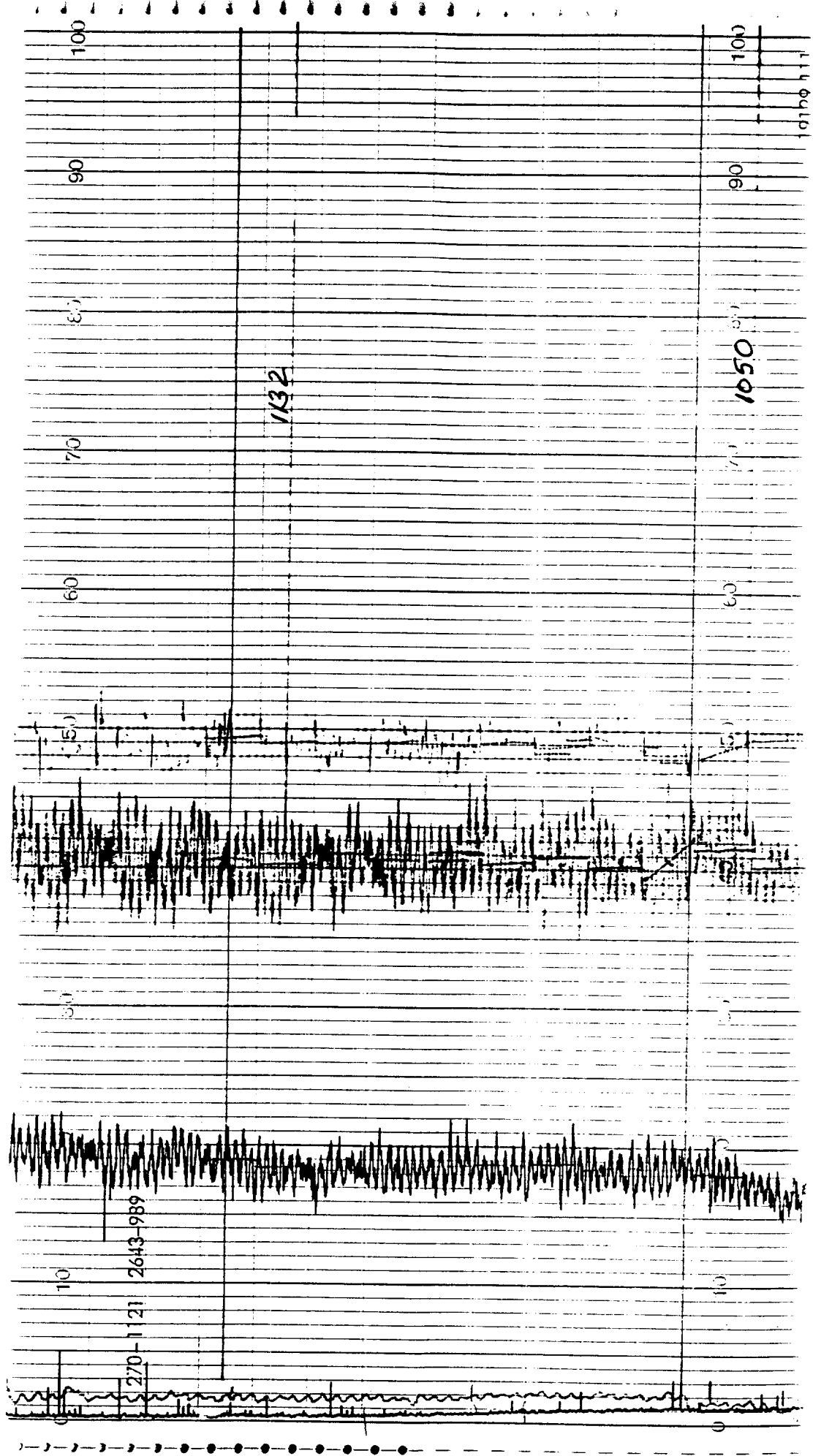
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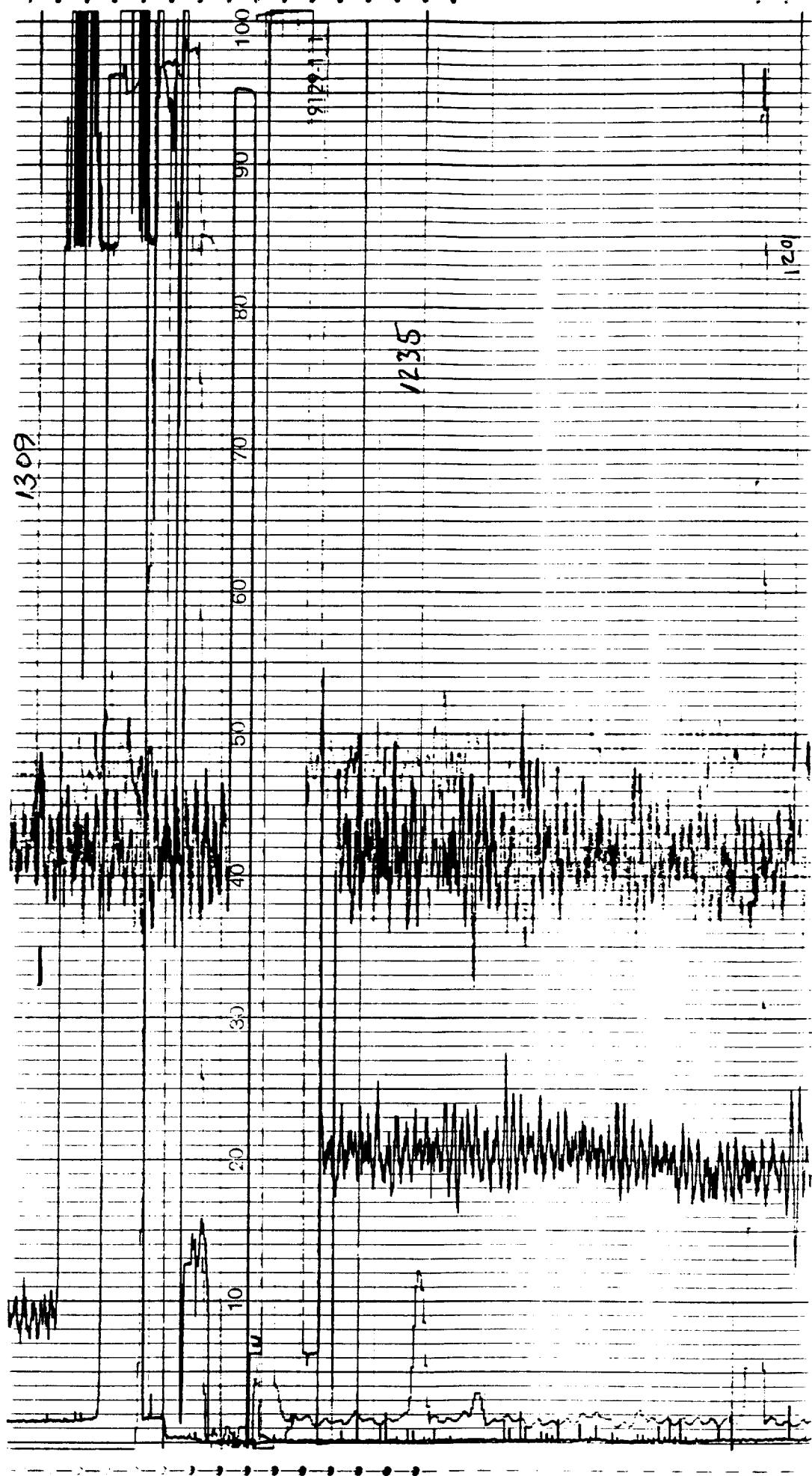
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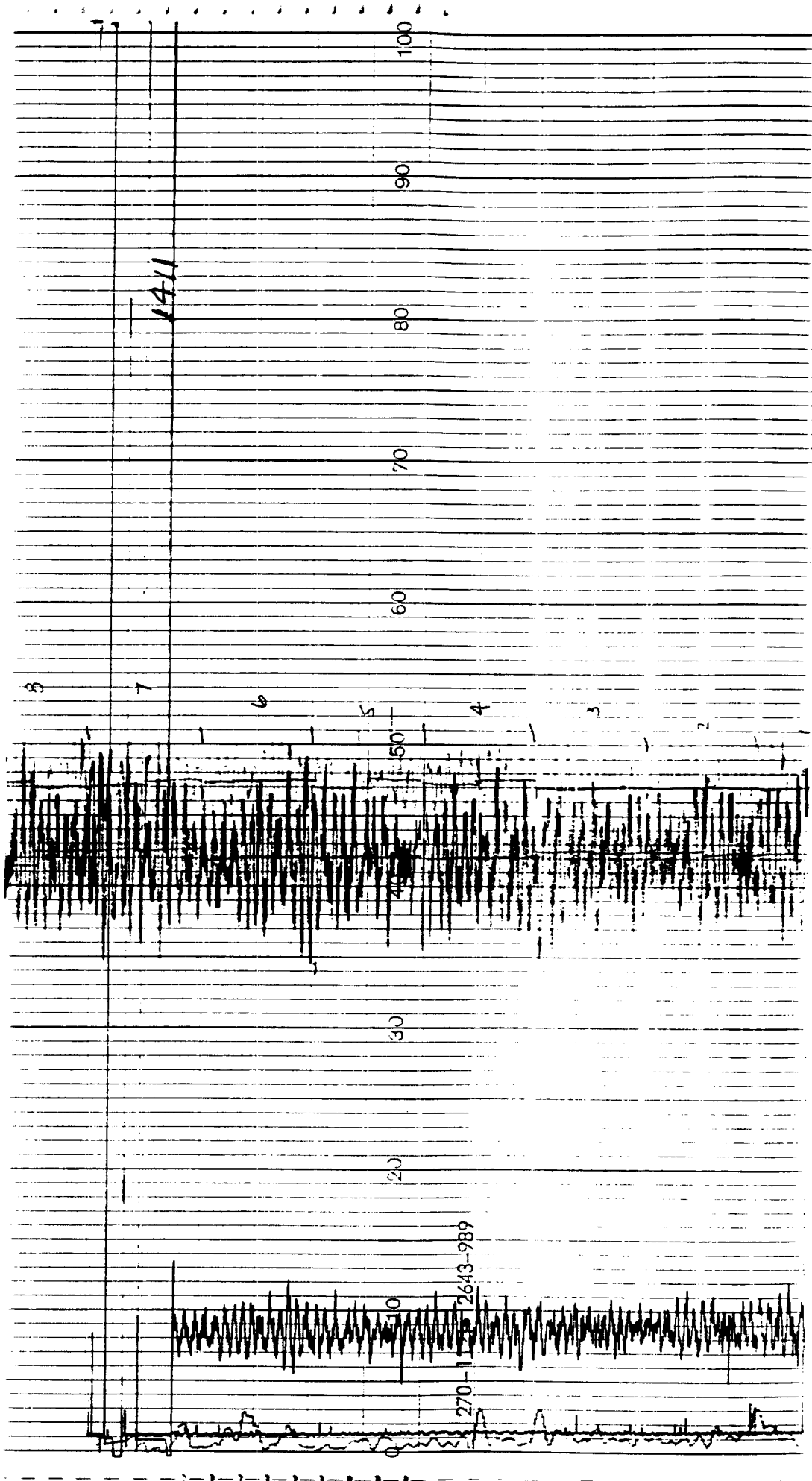
270-1121 2643-285

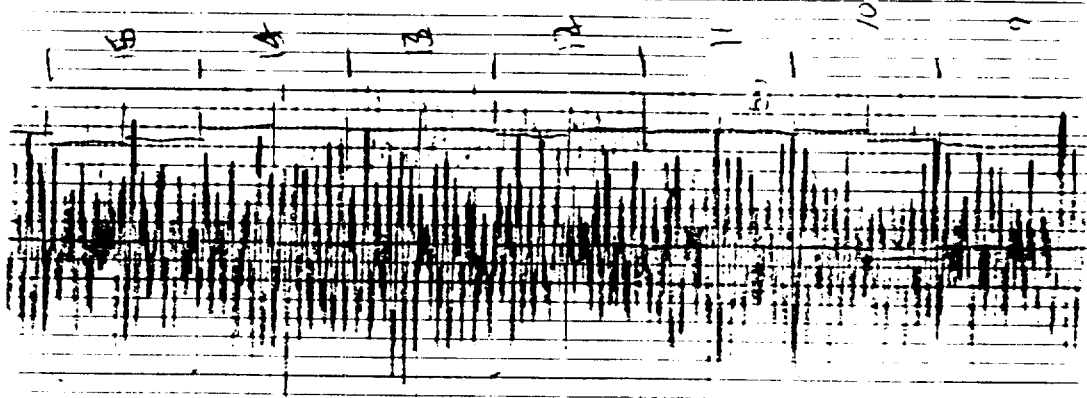










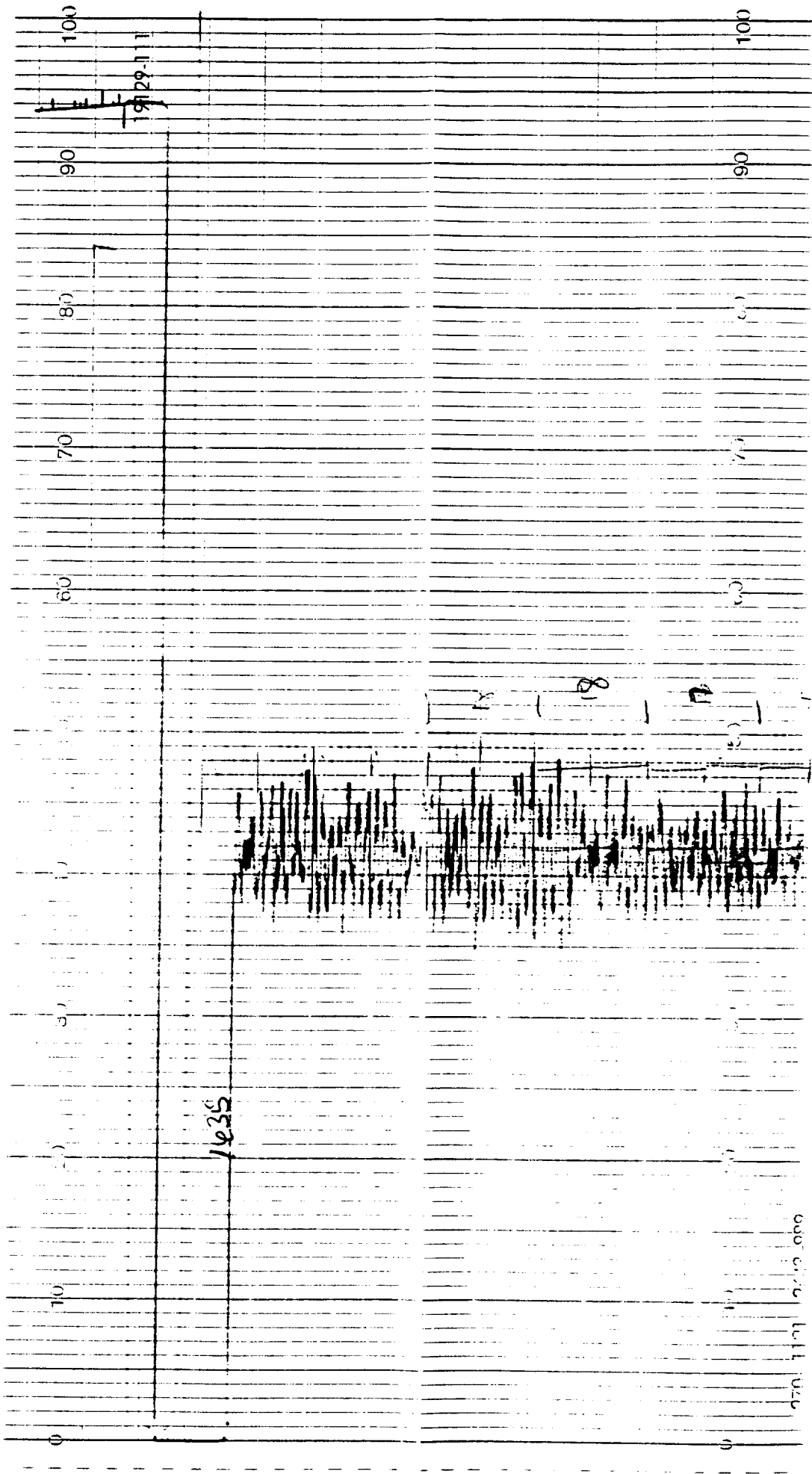


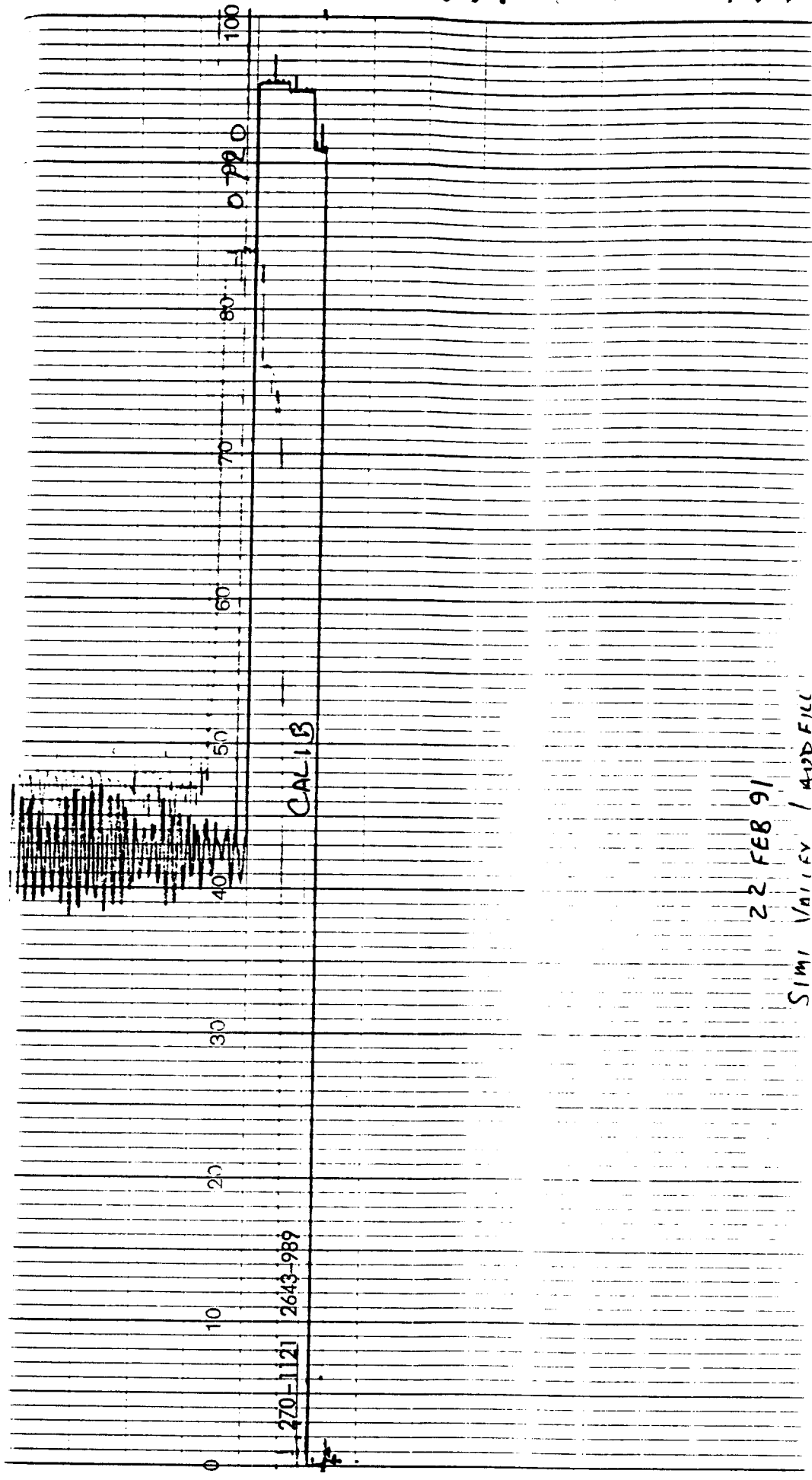
15 14 13 12 11 10 9

100

90

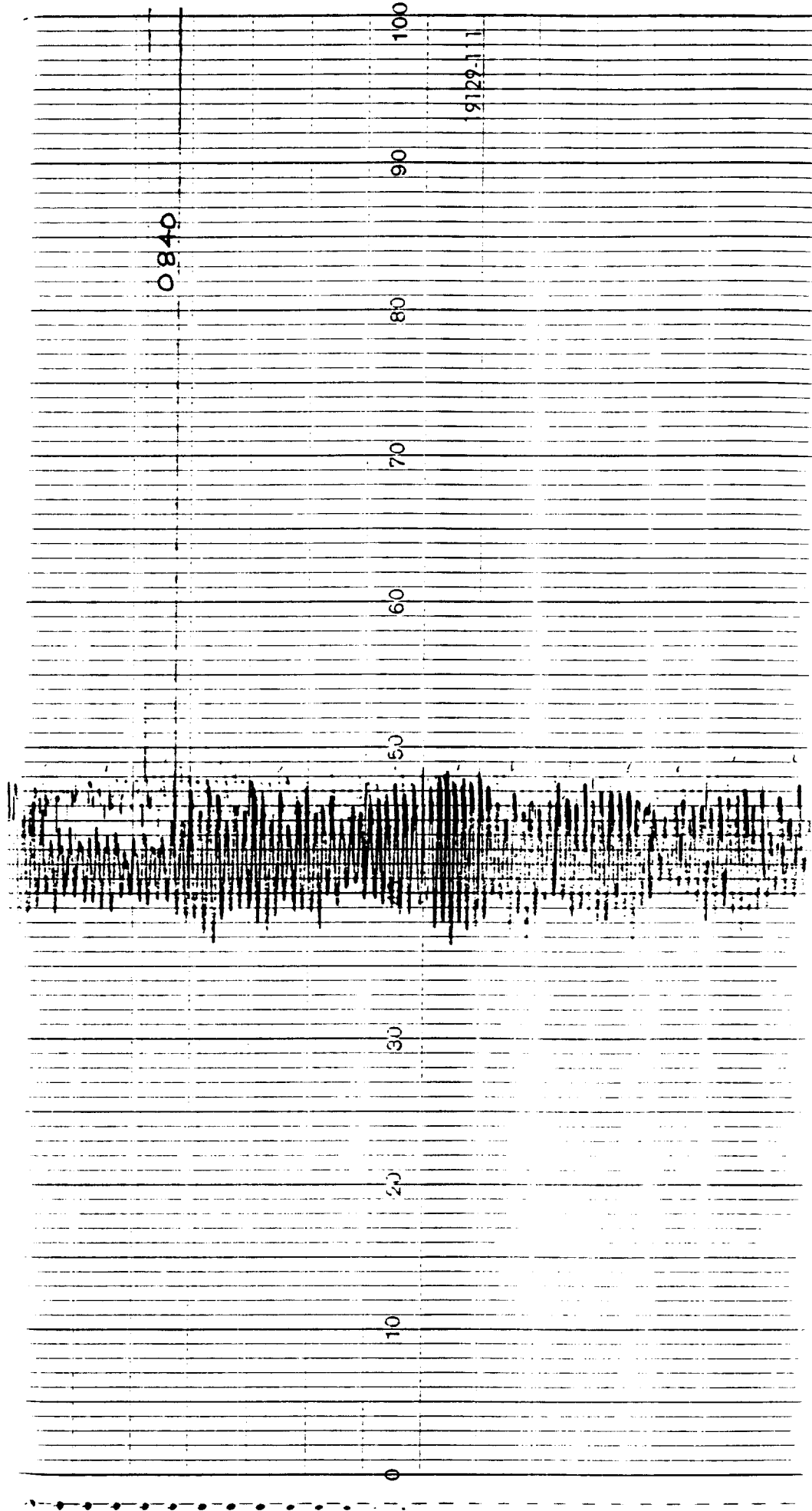
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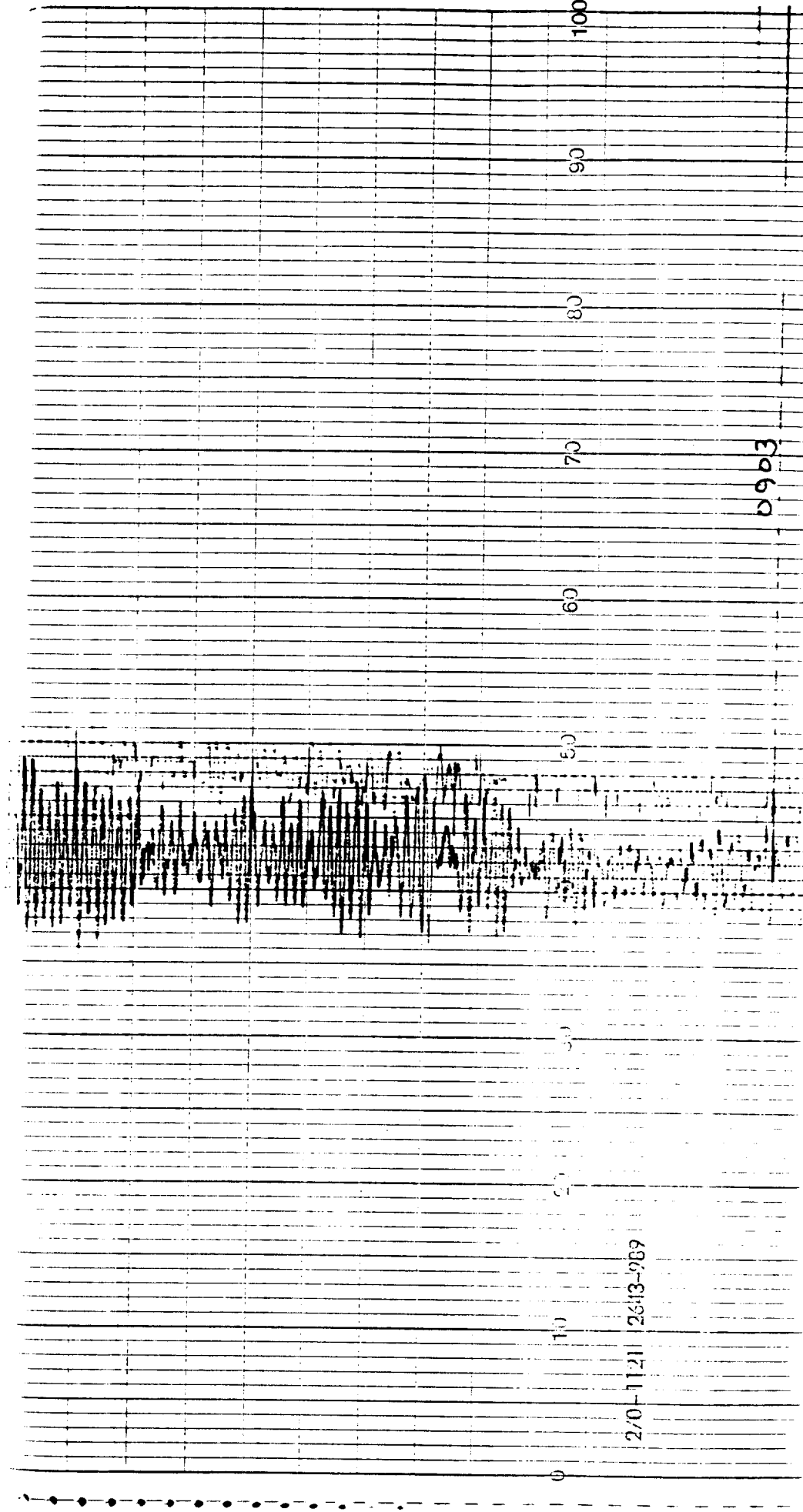




22 FEB 91

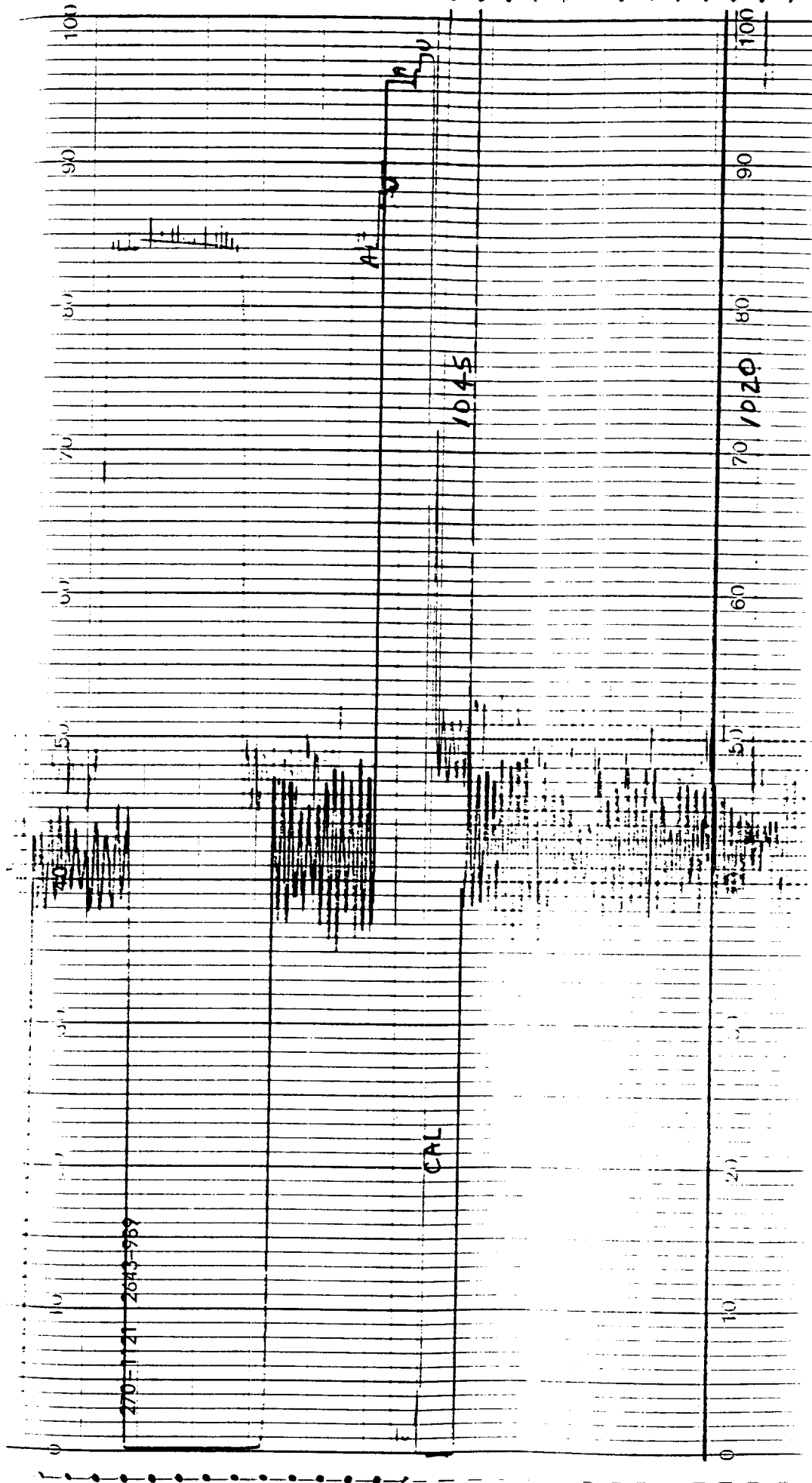
SIMI VALLEY / ADD FILE

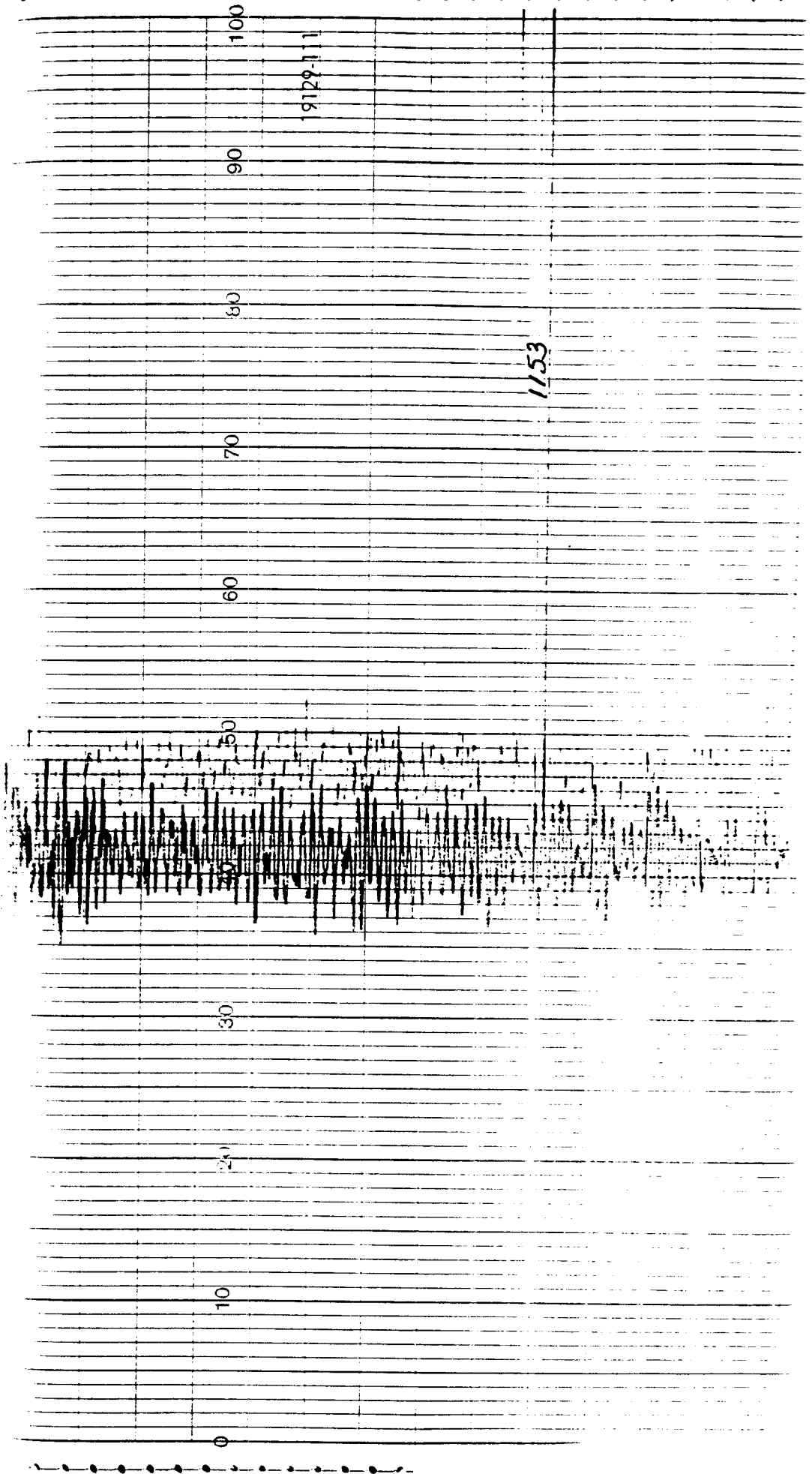




2/0-1121 2643-989

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19129-111

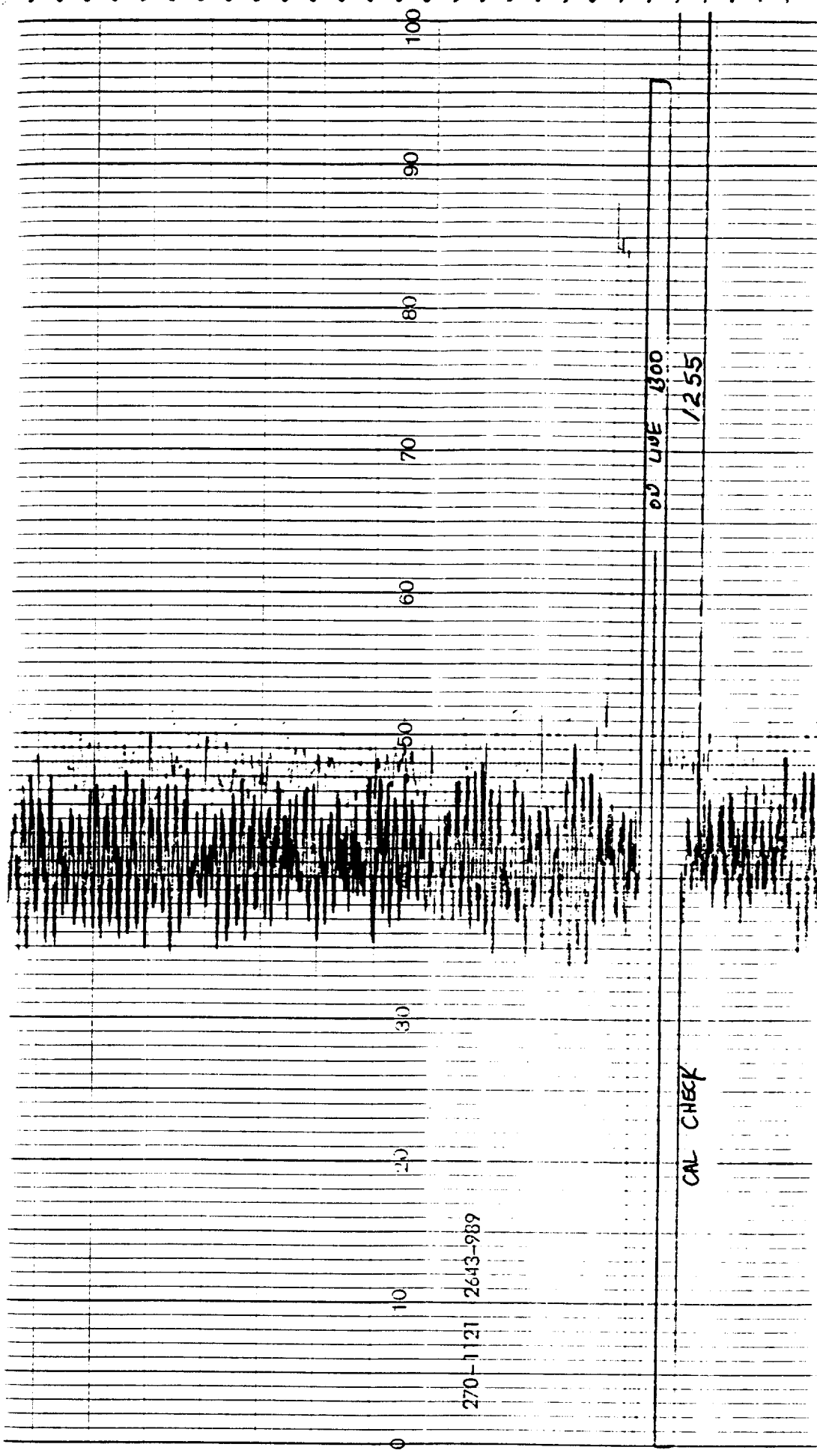
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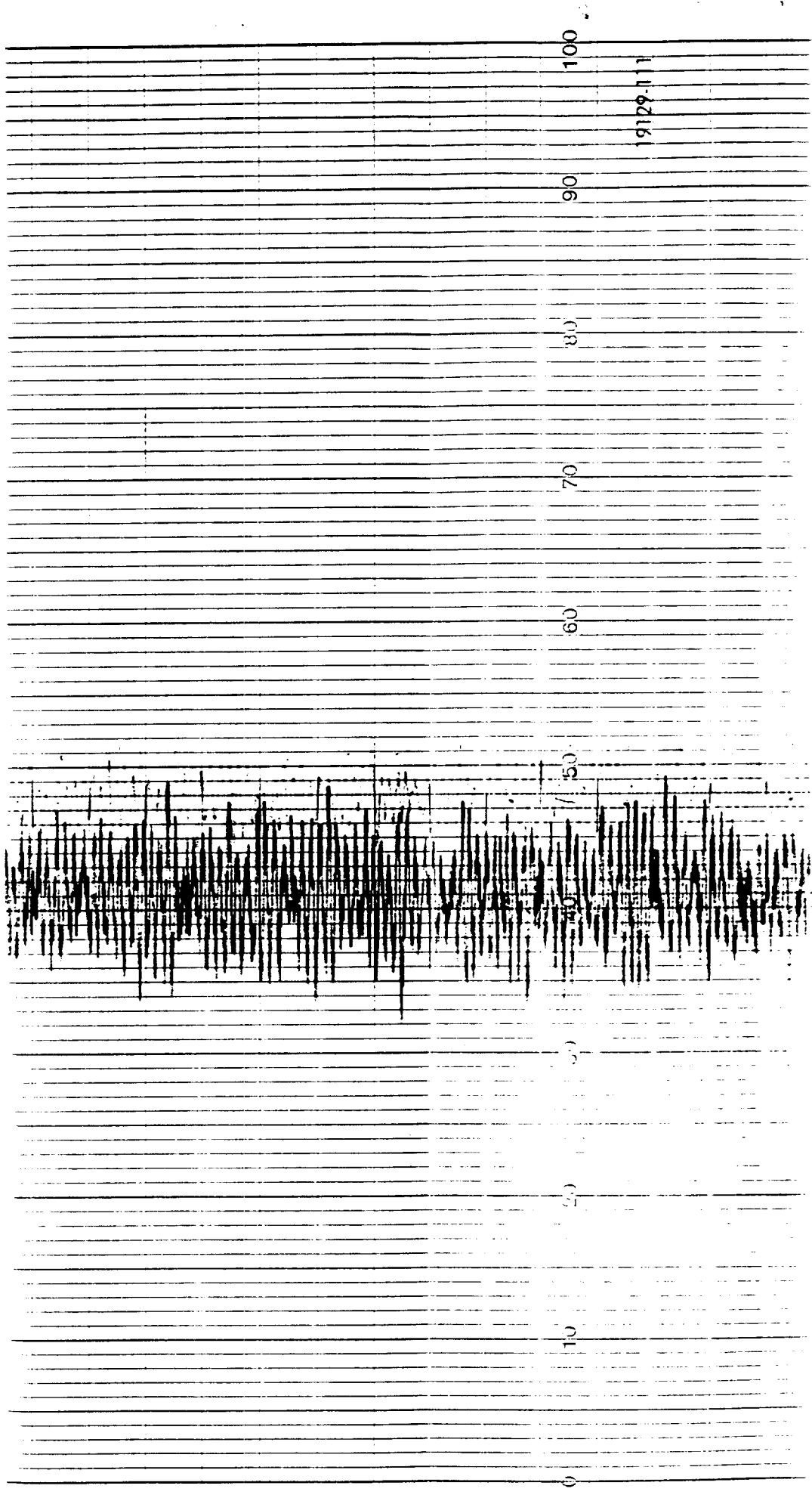
270-1121 2643-989

CAL CHECK

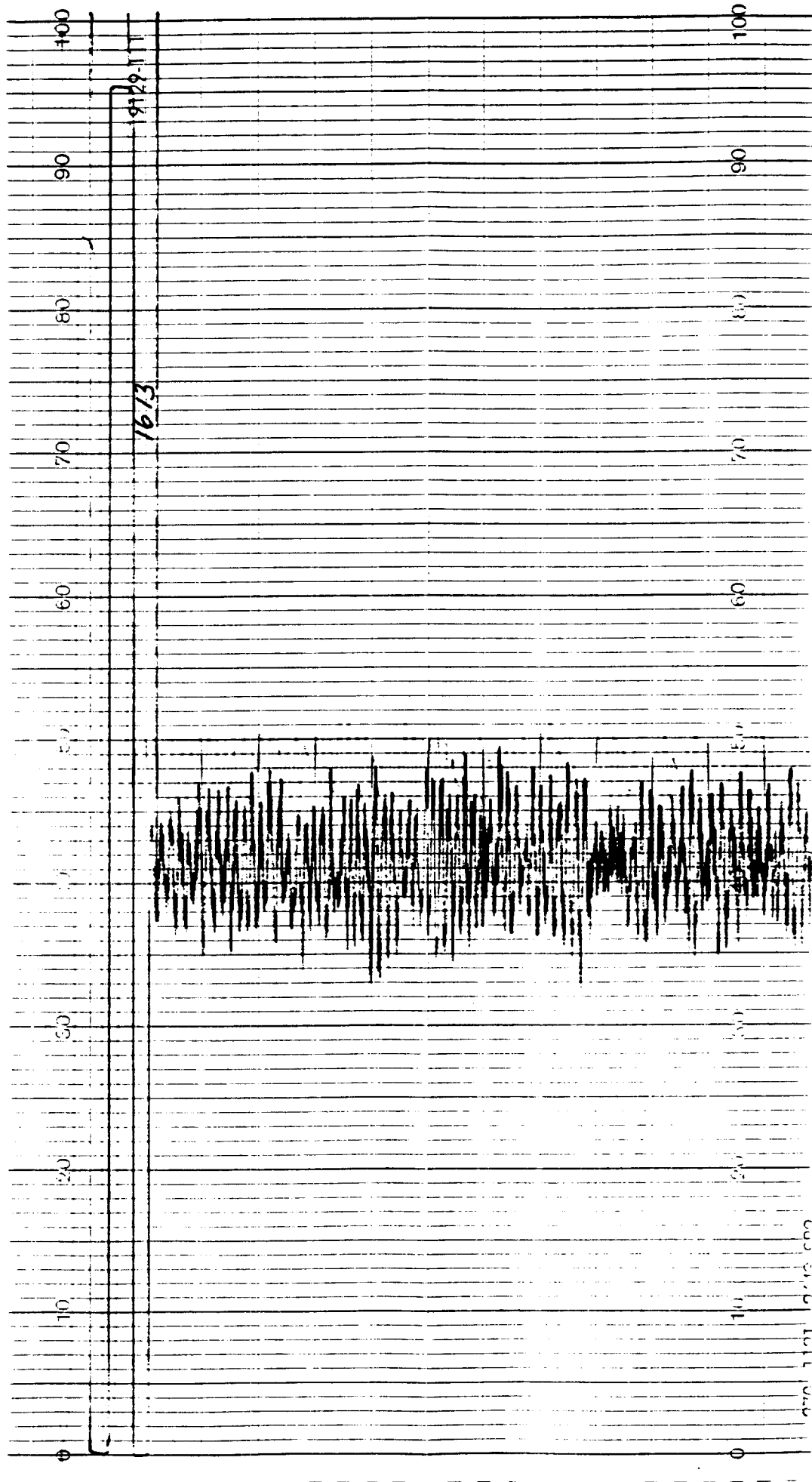
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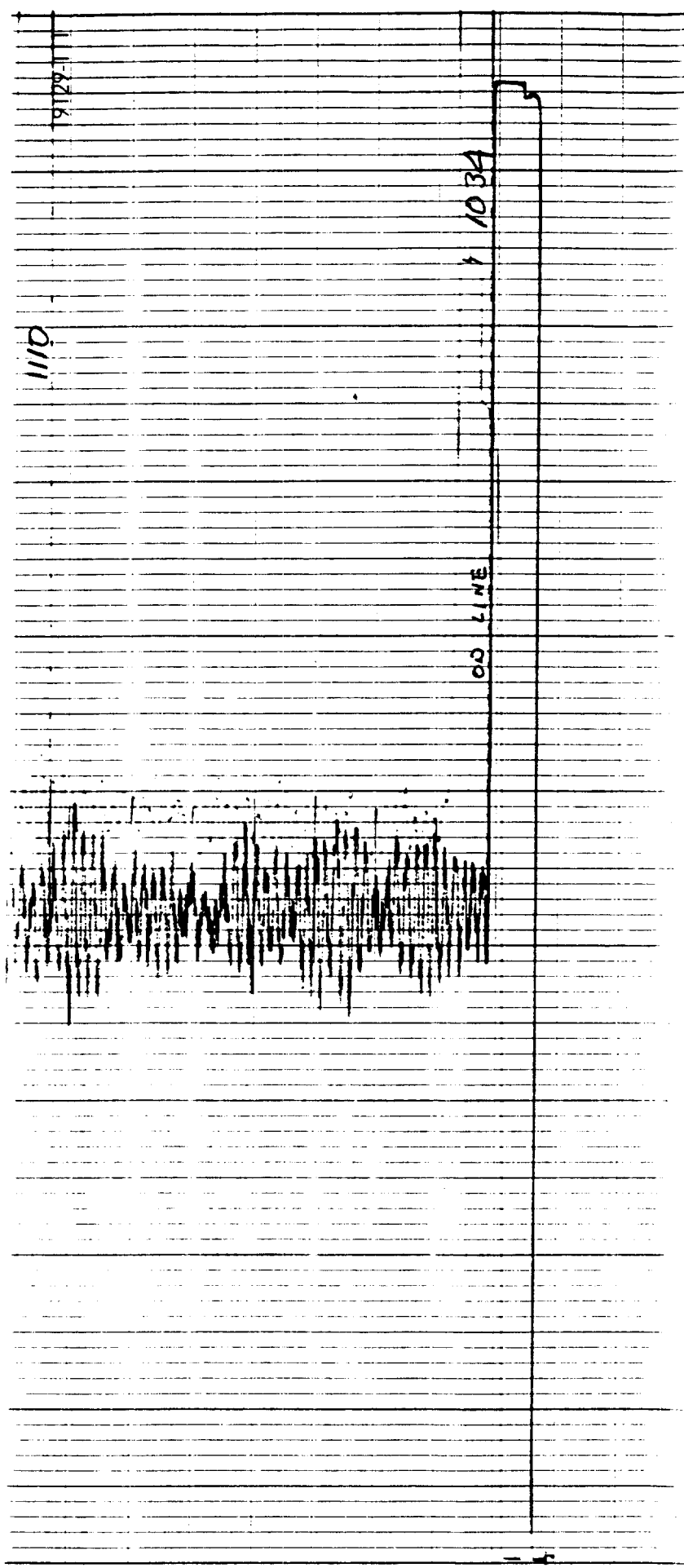
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19129.111

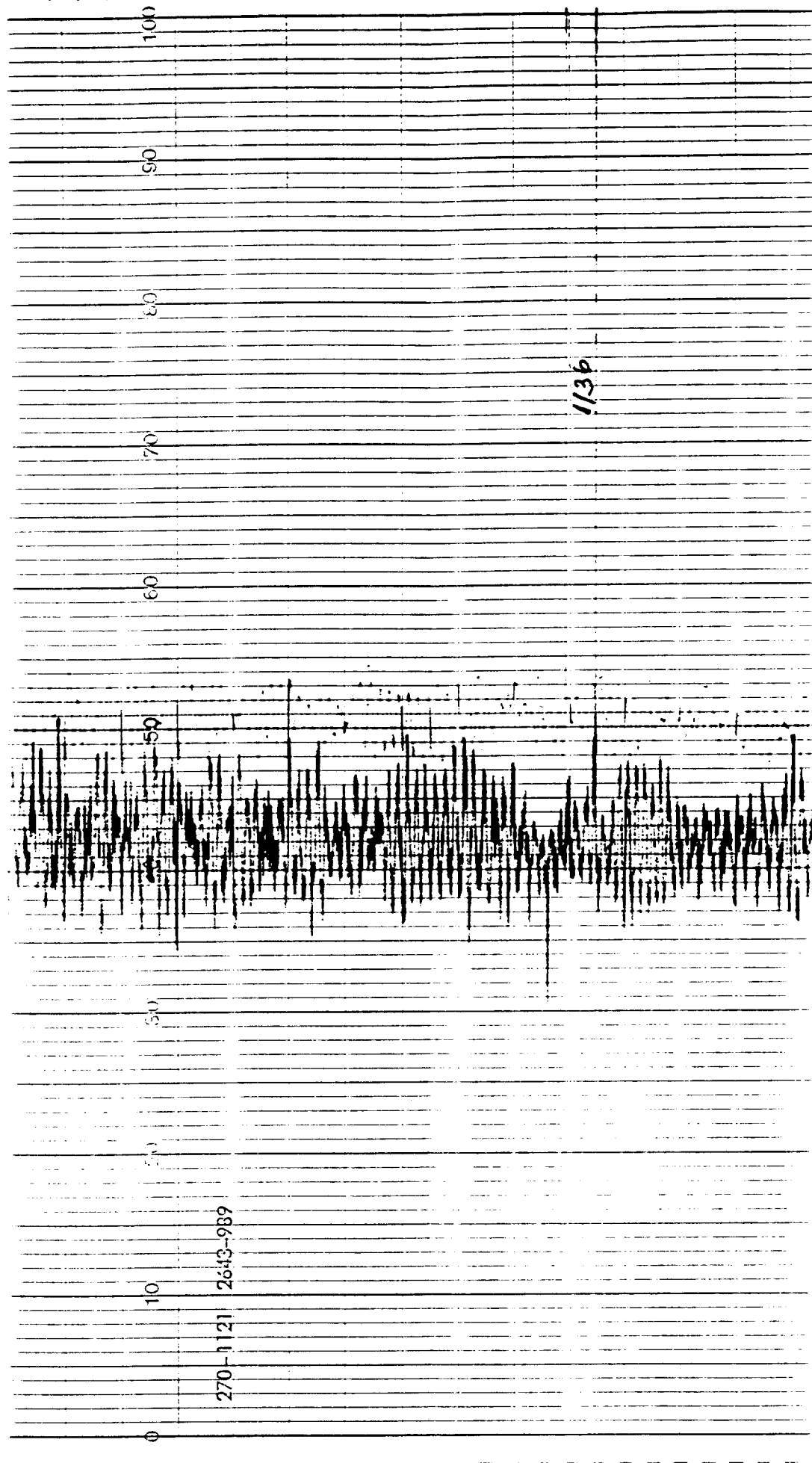




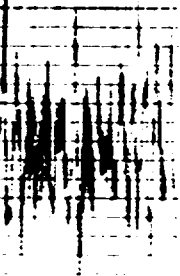
0 10 20 30 40 50 60 70 80 90 100

270-1121 2643-989

25 FEB 91



1242



26 FEB 91
SIM/ VALLEY LAUDFILL

100

90

80

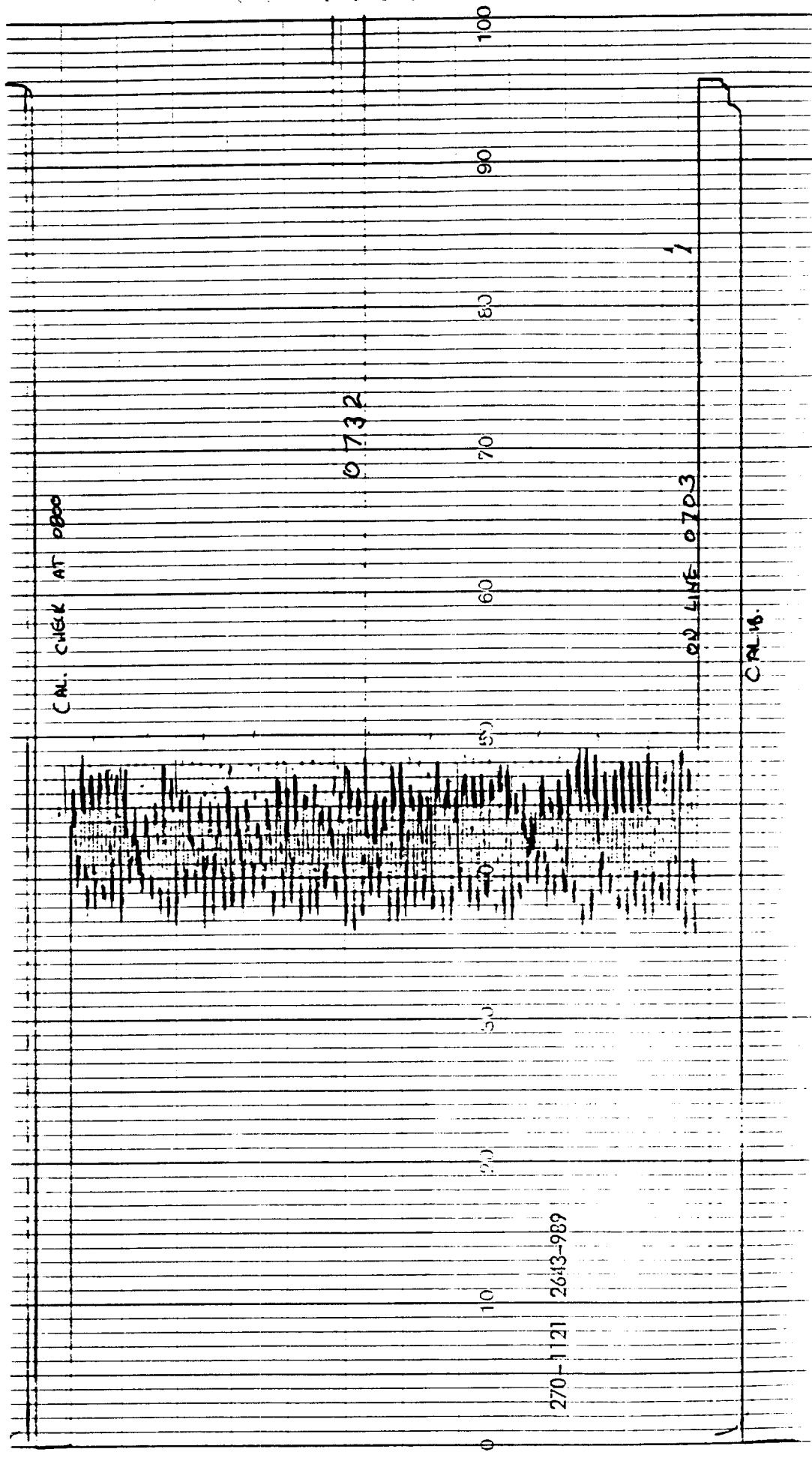
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60

40

10

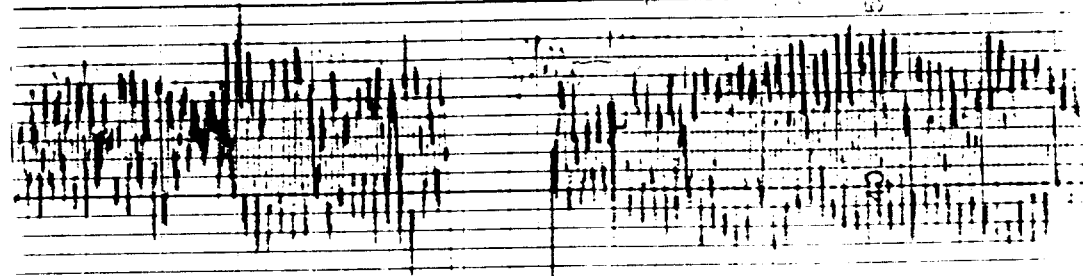
19129.111



270-1121 2613-989

2231

SYSTEM N₂ PURGE



100

90

80

70

60

50

40

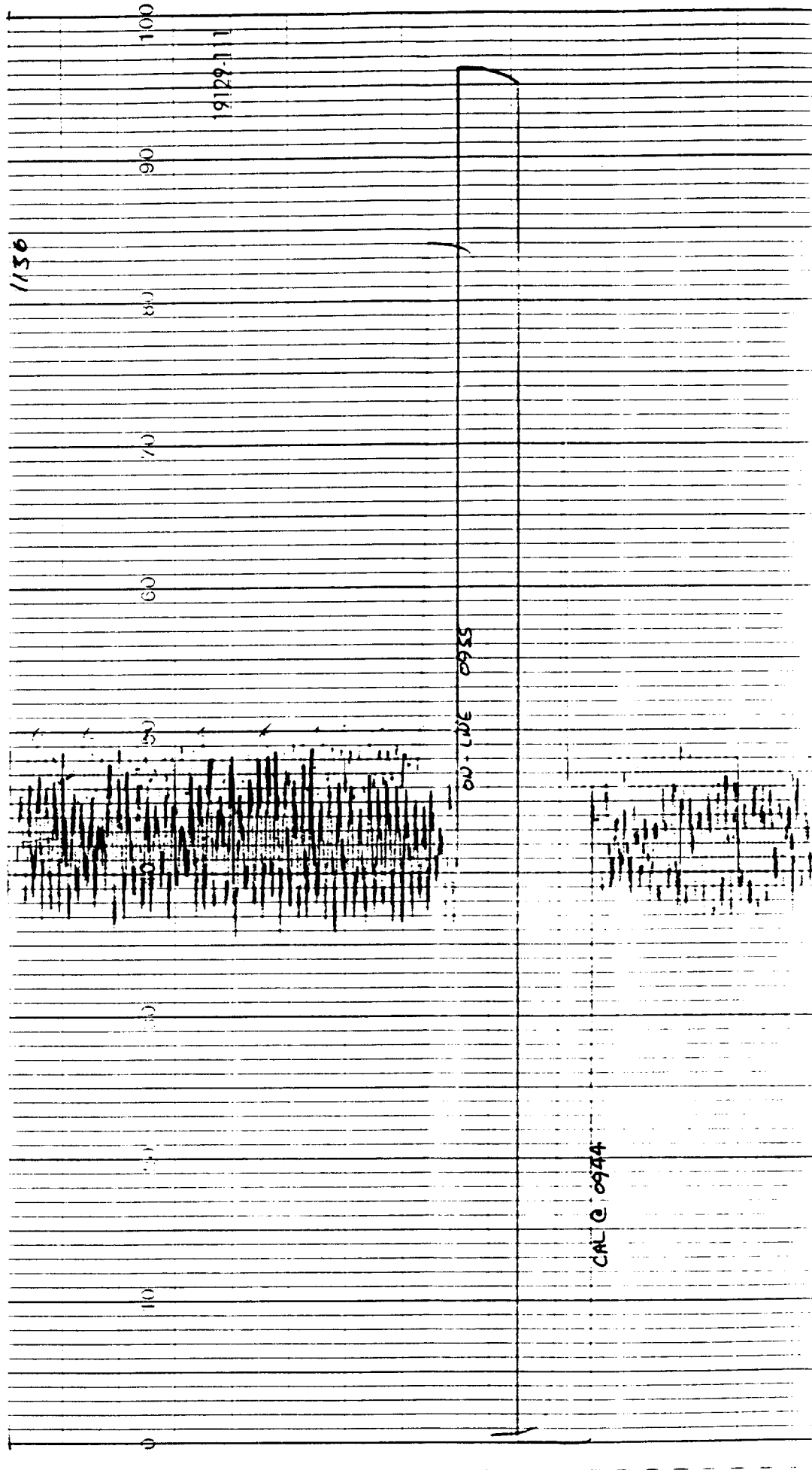
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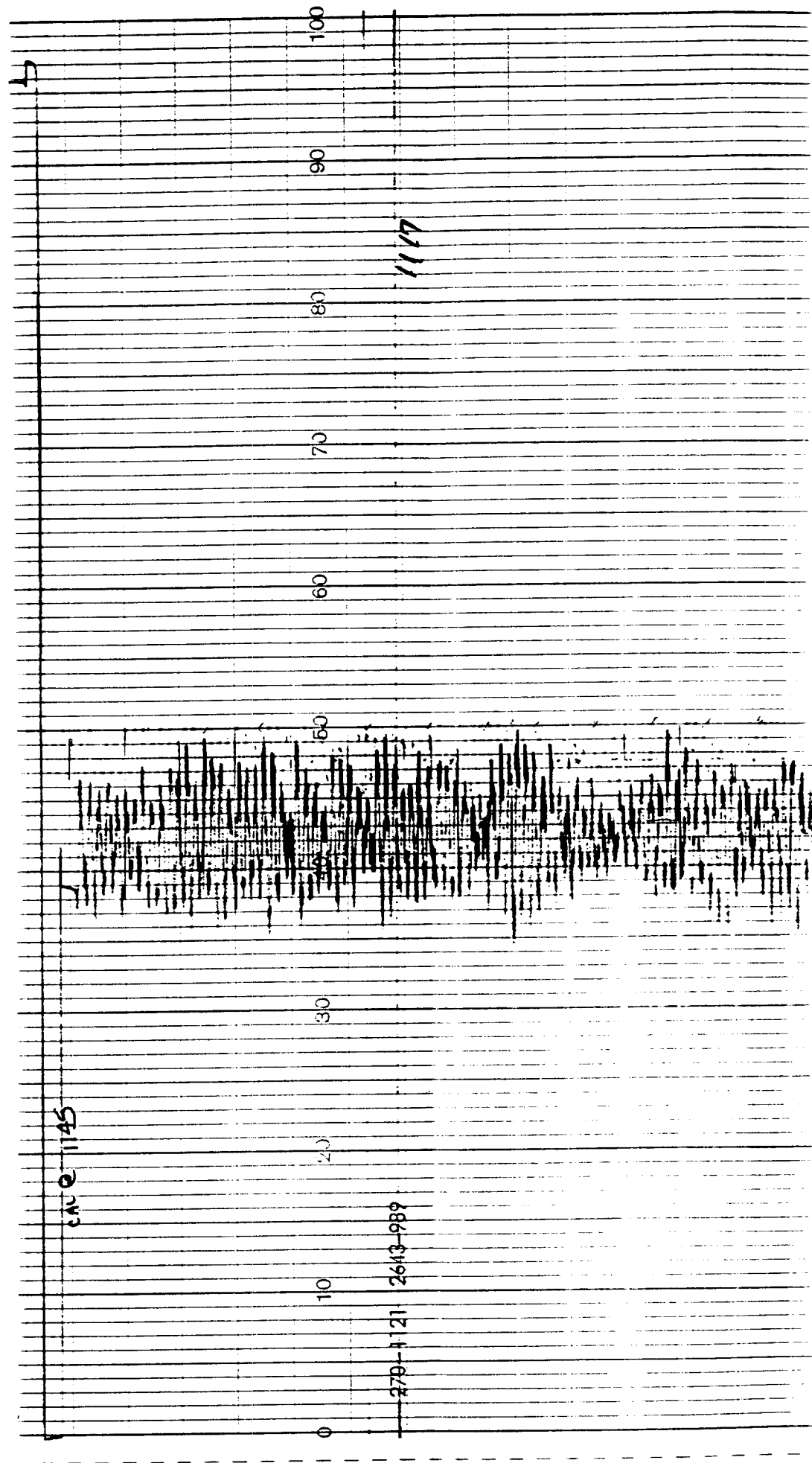
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1912-11

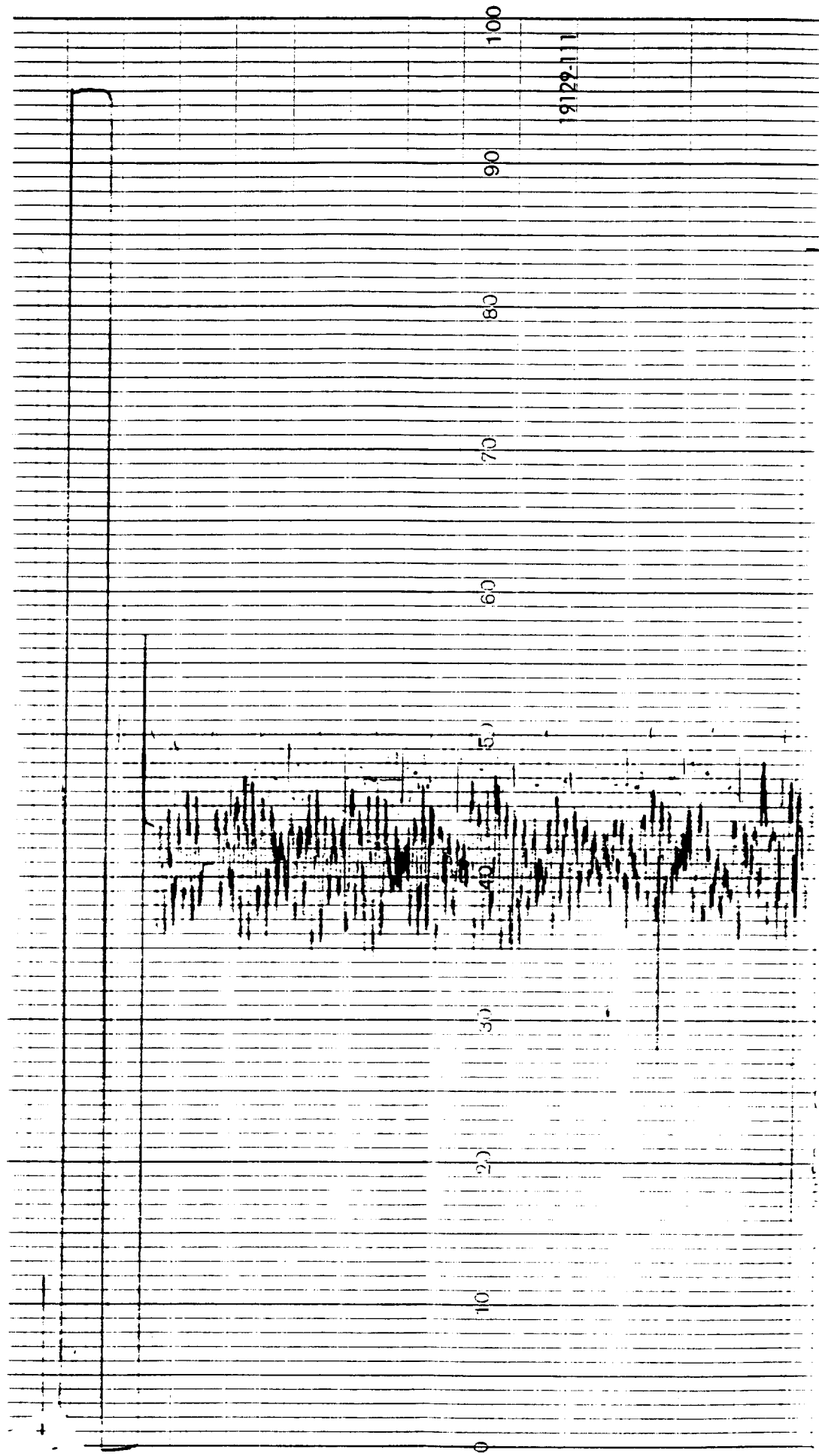




CAU 0 1145

279-1-21 2643-989

1117



KLEINFELDER, INC.

TRAIN RECOVERY SHEET

DATE 21 FEB 1991RUN# 1 METHOD Multi MetalsFACILITY SIM VALLEY LFG FLARETYPE Std. ImpingersTECHNICIAN A. ErbesIMP. SOLUTION 5% HNO₃/10% H₂O₂

NOZZLE-PROBE RINSE

UMBILICAL RINSE

SOLUTION	VOL. (ml)	DESCRIPTION

IMPINGER # 1IMPINGER # 2IMPINGER # 3IMPINGER # 4

DESCRIPTION

IMPINGER RINSE

SOLUTION	FINAL (g)	INITIAL (g)	NET (g)
Empty	510.3	433.7	76.6
100ml Soln	571.7	554.7	17.0
100ml Soln	551.1	549.2	1.9
Silica Gel	677.2	665.3	11.9
			107.4

SILICA GEL

CONDITION	FINAL (g)	INITIAL (g)	NET (g)
NUMBER	DESCRIPTION		
0063	0.4117g - TARE		

FILTER

TOTAL MOISTURE (g)

--

FIELD BLANKS

DISPOSITION/COMMENTS

KLEINFELDER, INC.

TRAIN RECOVERY SHEET

DATE 22 FEB 91RUN# 2 METHOD Multi MetalsFACILITY SIMI VALLEY LFG. FLARETYPE Std ImpingersTECHNICIAN A. ErbesIMP. SOLUTION 5% HNO₃ / 10% H₂O₂

NOZZLE-PROBE RINSE

UMBILICAL RINSE

SOLUTION	VOL. (ml)	DESCRIPTION

IMPINGER # 1IMPINGER # 2IMPINGER # 3IMPINGER # 4

DESCRIPTION

IMPINGER RINSE

SOLUTION	FINAL (g)	INITIAL (g)	NET (g)
Empty	507.4	436.7	70.7
100 ml Sol'n	583.6	564.9	18.7
100 ml Sol'n	542.1	540.6	1.5
Silica Gel	728.2	719.4	8.8
			99.7

SILICA GEL

CONDITION	FINAL (g)	INITIAL (g)	NET (g)

FILTER

NUMBER	DESCRIPTION
0064	0.4012 g - TARE

TOTAL MOISTURE (g)

FIELD BLANKS

DISPOSITION/COMMENTS

KLEINFELDER, INC.
1370 Valley Vista Dr. Suite 150
Diamond Bar, California
(714) 396-0335

CHAIN OF CUSTODY RECORD

Project No.		Project Name		Project Manager		ANALYSIS REQUIRED						SENT TO:		
71-401022		SIMI VALLEY L.F.		R. Hebert								SHIPPED VIA:		
Samples Collected By:		Phone:										SHIPPED BY:		
Jon Kawaguchi		(714) 396-0335										Remarks		
Lab No.	Test Date	Sample Description (Container, Media, Volume, etc.)				CARB	436	Aspen	Li	Mn	Manganese	CARB	421	HCl/HF
401022-1	2/21/91	Multi #1, FRONT, ACETONE				X								
401022-2	2/21/91	Multi #1, FRONT, HNO3				X								
401022-3	2/21/91	Multi #1, BACK,				X								
401022-4	2/22/91	Multi #2, FRONT, ACETONE				X								
401022-5	2/22/91	Multi #2, FRONT, HNO3				X								
401022-6	2/22/91	Multi #2, BACK				X								
401022-7	2/21/91	Multi FIELD BLANK, ACETONE				X								
401022-8	2/21/91	Multi FIELD BLANK, 0.1N HNO3				X								
401022-9	2/21/91	Multi FIELD BLANK, 5% HNO3/10% H2O2				X								
401022-10	2/25/91	HCl #1										X		
Relinquished by:		Date/Time		Received by:		Reason for Exchange:		Comments:						
Phone:		3/1/91		Of: <i>Jon Kawaguchi</i>		3/1/91								
Relinquished by:		Date/Time		Received by:		Reason for Exchange:		Comments:						
Phone:				Of:										
Relinquished by:		Date/Time		Received by:		Reason for Exchange:		Comments:						
Phone:				Of:										
Relinquished by:		Date/Time		Received by:		Reason for Exchange:		Comments:						
Phone:				Of:										

KLEINFELDER, INC.
1370 Valley Vista Dr. Suite 150
Diamond Bar, California
(714) 396-0335

CHAIN OF CUSTODY RECORD

[illegible]

Received: 03/01/91

TMA Inc.

REPORT

Work Order # A1-03-018

03/21/91 14:34:22

REPORT Kleinfelder, Inc.
 TO 1370 Valley Vista Dr.
 Suite 150
 Diamond Bar, CA 91765
 ATTN Roland Hebert

CLIENT KLEINFELDER SAMPLES 5
 COMPANY Kleinfelder, Inc.
 FACILITY

WORK ID 71-401022 Simi Valley L.F.
 TAKEN By Kleinfelder Staff
 TRANS By Kleinfelder Staff
 TYPE Liquid & Filter
 P.O. # 71-1621-050
 INVOICE under separate cover

PREPARED Thermo Analytical, Inc.
 BY 160 Taylor Street
 Monrovia, CA 91016

ATTEN Ms. Carole Harris
 PHONE 818-337-3247

CERTIFIED BY

CONTACT MCH

This report is for the sole and exclusive use of the client
 to whom it is addressed and represents only those samples
 herein described. Samples not destroyed in testing are re-
 tained a maximum of 30 days unless otherwise requested.

SAMPLE IDENTIFICATION

01 401022-26 Filter
 01 401022-1 Acetone
 01 401022-2 Front Half
 01 401022-3 Back Half
 01 Omitted KMnO4 Catch
 01 401022 MUL11 #1 (Totals)
 02 401022-27 Filter
 02 401022-4 Acetone
 02 401022-5 Front Half
 02 401022-6 Back Half
 02 Omitted KMnO4 Catch
 02 401022 Multi #2 (Totals)
 03 401022-28 Filter Blank
 03 401022-7 F.B. Acetone
 03 401022-8 F.B. Front Half
 03 401022-9 F.B. Back Half
 03 Omitted KMnO4 Catch
 03 401022 Multi F.B. (Totals)
 04 401022-10 HCl #1
 05 401022-11 HCl #2

TEST CODES and NAMES used on this workorder

AS SED As/Se Digestion
 COMPEX Sample Compositing
 HG P Hg Digestion
 MIFILT MMT Filter Digestion
 MMIAA1 CARB Method 436-MMT
 MMIAA2 CARB Method 436
 MMIIC1 CARB Method 436
 MMIIC2 CARB Method 436
 MMITOT CARB Method 436
 VOLUME Sample Volume

Received: 03/01/91

TMA Inc.

REPORT

Work Order # A1-03-018

Results by Sample

SAMPLE ID	401022-26 Filter	SAMPLE #	01	FRACTIONS:	A	
		Date & Time	Collected	02/21/91	Category	
MIFILT	03/15/91					
	Date Complete					

SAMPLE ID	401022-1 Acetone	SAMPLE #	01	FRACTIONS:	B	
		Date & Time	Collected	02/21/91	Category	
VOLUME	78					
	mls					

SAMPLE ID	401022-2 Front Half	SAMPLE #	01	FRACTIONS:	C	
		Date & Time	Collected	02/21/91	Category	
VOLUME	92					
	mls					

SAMPLE ID 401022-2 Front Half FRACTION 01C TEST CODE MMTAA1 NAME CARB Method 436-MMT
Date & Time Collected 02/21/91 Category _____

CARB METHOD 436 - MMT
Front Half composite results AA
Fraction 1A+1B

ELEMENT	RESULT		DET. LIMIT		RESULT		DET. LIMIT	
	ug	ug	ug	mg/L	mg/L	mg/L	mg/L	mg/L
Arsenic	17		0.30		0.0580		0.0010	
Lead	NA		0.30		NA		NA	
Mercury	NA		0.060		NA		NA	
Selenium	NA		96		NA		NA	

Notes and Definitions for this Report:

ANALYST RSF

Final volume of composite 300 ml

SAMPLE ID 401022-2 Front Half

FRACTION 01C TEST CODE MMTIC1 NAME CARB Method 436

Date & Time Collected 02/21/91

Category

CARB METHOD 436 - MMT
Front Half Composite Results - ICAP
Fraction 01A

ELEMENT	RESULT ug	DET LIM ug	RESULT mg/L	DET LIM mg/L
Aluminum	NA		NA	
Antimony	NA		NA	
Barium	NA		NA	
Beryllium	NA		NA	
Cadmium	14	1.2	0.045	0.0040
Chromium	960	1.5	3.2	0.0050
Copper	110	0.90	0.38	0.0030
Iron	NA		NA	
Lead	NA		NA	
Manganese	360	0.60	1.2	0.0020
Nickel	2800	6.0	9.3	0.020
Phosphorus	NA		NA	
Silver	NA		NA	
Thallium	NA		NA	
Zinc	140	3.0	0.47	0.010

Notes and Definitions for this Report:

ANALYST REM
Final volume of composite, mL 300

Received: 03/01/91

TMA Inc.

REPORT

Work Order # A1-03-6

Results by Sample

SAMPLE ID 401022-3 Back Half

SAMPLE # 01 FRACTIONS: D

Date & Time Collected 02/21/91

Category

VOLUME

398

mls

Page 6
Received: 03/01/91

TMA Inc.

REPORT

Work Order # A1-03-018

Results by Sample

SAMPLE ID 401022-3 Back Half

FRACTION 01D

TEST CODE MMTAA2

NAME CARB Method 436

Date & Time Collected 02/21/91

Category

CARB METHOD 436 - MMT
Back half results
Fraction 2A+2B

ELEMENT

Arsenic
Lead
Mercury
Selenium

RESULT ug	DET LIM ug	RESULT mg/L	DET LIM mg/L
0.51	0.17	0.0030	0.0010
NA	0.17	NA	
NA	0.080	NA	
NA	55	NA	

Notes and Definitions for this Report:

ANALYST RSF

Initial volume back half sample, ml. 398

Final digestate volume, ml& 150

SAMPLE ID 401022-3 Back Half

FRACTION 01D

TEST CODE MMTIC2

NAME CARB Method 436

Date & Time Collected 02/21/91

Category

CARB METHOD 436 - MMT
Back Half Results - ICAP
Fraction 2A

ELEMENT	RESULT ug	DET LIM ug	RESULT mg/L	DET LIM mg/L
Aluminum	NA	3.4	NA	
Antimony	NA	6.9	NA	
Barium	NA	0.17	NA	
Beryllium	NA	0.17	NA	
Cadmium	2.1	0.69	0.012	0.0040
Chromium	120	0.86	0.68	0.0050
Copper	1.0	0.51	0.0060	0.0030
Iron	NA	1.0	NA	
Lead	NA	8.6	NA	
Manganese	12	0.34	0.068	0.0020
Nickel	10	3.4	0.058	0.020
Phosphorus	NA	8.6	NA	
Silver	NA	0.86	NA	
Thallium	NA	41	NA	
Zinc	27	1.7	0.16	0.010

Notes and Definitions for this Report:

ANALYST REM 398
Initial volume back half sample, mL
Final digestate volume, mL 150

Results by Sample

SAMPLE ID 401022 MULTI #1 (Totals)

FRACTION 01F

TEST CODE MMT101

NAME CARB Method 436

Date & Time Collected 02/21/91

Category

CARB METHOD 436 - Multiple Metal Train Analysis

Total Train Results

ELEMENT	RESULT ug	Det. Limit ug
Aluminum	NA	
Antimony	NA	
Arsenic	18	0.47
Barium	NA	
Beryllium	NA	
Cadmium	16	1.89
Chromium	1100	2.36
Copper	110	1.41
Iron	NA	
Lead	NA	
Manganese	370	0.94
Mercury	NA	
Nickel	2800	9.4
Phosphorus	NA	
Selenium	NA	
Silver	NA	
Thallium	NA	
Zinc	170	4.7

Notes and Definitions for this Report:

ANALYST

* denotes some present but less than nominal detection limits

Received: 03/01/91

TMA Inc.

REPORT

Work Order # A1-03-018

Results by Sample

SAMPLE ID 401022-27 Filter SAMPLE # 02 FRACTIONS: A
Date & Time Collected 02/21/91 Category _____
MIFILT 03/15/91
Date Complete _____

SAMPLE ID 401022-4 Acetone SAMPLE # 02 FRACTIONS: B
Date & Time Collected 02/22/91 Category _____
VOLUME 68
mls

SAMPLE ID 401022-5 Front Half SAMPLE # 02 FRACTIONS: C
Date & Time Collected 02/22/91 Category _____
VOLUME 88
mls

SAMPLE ID 401022-6 Back Half FRACTION 02D TEST CODE MMTAA2 NAME CARB Method 436
Date & Time Collected 02/22/91 Category

CARB METHOD 436 - MM1
Back half results
Fraction 2A+2B

ELEMENT	RESULT ug	DET LIM ug	RESULT mg/L	DET LIM mg/L
Arsenic	ND	0.17	ND	0.0010
Lead	NA	0.17	NA	
Mercury	NA		NA	
Selenium	NA		NA	

Notes and Definitions for this Report:

ANALYST RSF 388
Initial volume back half sample, ml.
Final digestate volume, ml. 150

PaS 10

Received: 03/01/91

SAMPLE ID 401022-5 Front Half

TMA Inc.

FRACTION 02C

Date & Time Collected 02/22/91

REPORT

TEST CODE MMTAA1

Category

Results by Sample

NAME CARB Method 436-MMT

Work Order # A14

-018

CARB METHOD 436 - MMT

Front Half composite results AA

Fraction 1A+1B

ELEMENT	RESULT ug	DET. LIMIT ug	RESULT mg/L	DET. LIMIT mg/L
Arsenic	17	0.30	0.0550	0.0010
Lead	NA	0.30	NA	NA
Mercury	NA	0.060	NA	NA
Selenium	NA	96	NA	NA

Notes and Definitions for this Report:

ANALYST RSF

Final volume of composite 300 ml

Page 11
Received: 03/01/91

TMA Inc. REPORT
Results by Sample

Work Order # A1-0-018

SAMPLE ID 401022-5 Front Half

FRACTION 02C TEST CODE MMTIC1

NAME CARB Method 436

Date & Time Collected 02/22/91

Category

CARB METHOD 436 - MMT
Front Half Composite Results - ICAP
Fraction 01A

ELEMENT	RESULT ug	DET LIM ug	RESULT mg/L	DET LIM mg/L
Aluminum	NA		NA	
Antimony	NA		NA	
Barium	NA		NA	
Beryllium	NA		NA	
Cadmium	8.7	1.2	0.029	0.0040
Chromium	540	1.5	1.8	0.0050
Copper	130	0.90	0.43	0.0030
Iron	NA		NA	
Lead	NA		NA	
Manganese	510	0.60	1.7	0.0020
Nickel	6300	6.0	21	0.020
Phosphorus	NA		NA	
Silver	NA		NA	
Thallium	NA		NA	
Zinc	81	3.0	0.27	0.010

Notes and Definitions for this Report:

ANALYST REM
Final volume of composite, mL 300

SAMPLE ID 401022-6 Back Half		SAMPLE # 02	FRACTIONS: D
		Date & Time Collected	02/22/91
		Category	
VOLUME		388	
		mls	

SAMPLE ID 401022-6 Back Half

FRACTION 02D

TEST CODE MMTAA2 NAME CARB Method 436

Date & Time Collected 02/22/91

Category

CARB METHOD 436 - MM1
Back half results
Fraction 2A+2B

ELEMENT	RESULT ug	DET LIM ug	RESULT mg/L	DET LIM mg/L
Arsenic	ND	0.17	ND	0.0010
Lead	NA	0.17	NA	
Mercury	NA		NA	
Selenium	NA		NA	

Notes and Definitions for this Report:

ANALYST RSF

Initial volume back half sample, ml.

388

Final digestate volume, ml. 150

SAMPLE ID 401022-6 Back Half FRACTION 02D TEST CODE MMTIC2 NAME CARB Method 436
Date & Time Collected 02/22/91 Category _____

CARB METHOD 436 - MMT
Back Half Results - ICAP
Fraction 2A

ELEMENT	RESULT ug	DET LIM ug	RESULT mg/L	DET LIM mg/L
Aluminum	NA	3.4	NA	
Antimony	NA	6.9	NA	
Barium	NA	0.17	NA	
Beryllium	NA	0.17	NA	
Cadmium	ND	0.69	ND	0.0040
Chromium	1.7	0.86	0.010	0.0050
Copper	ND	0.52	ND	0.0030
Iron	NA	1.0	NA	
Lead	NA	8.6	NA	
Manganese	ND	0.34	ND	0.0020
Nickel	5.2	3.4	0.030	0.020
Phosphorus	NA	8.6	NA	
Silver	NA	0.86	NA	
Thallium	NA	41	NA	
Zinc	1.7	1.7	0.010	0.010

Notes and Definitions for this Report:

ANALYST REM
Initial volume back half sample, mL 388
Final digestate volume, mL 150

Received: 03/01/91

TMA Inc. REPORT

Work Order # A1-03-011

Results by Sample

SAMPLE ID 401022 Multi #2 (Totals)

FRACTION 02F

TEST CODE MMTTOT NAME CARB Method 436

Date & Time Collected 02/22/91

Category

CARB METHOD 436 - Multiple Metal Train Analysis

Total Train Results

ELEMENT	RESULT ug	Det. Limit ug
Aluminum	NA	
Antimony	NA	
Arsenic	17	0.47
Barium	NA	
Beryllium	NA	
Cadmium	8.7	1.89
Chromium	540	2.36
Copper	130	1.42
Iron	NA	
Lead	NA	
Manganese	510	0.94
Mercury	NA	
Nickel	6300	9.4
Phosphorus	NA	
Selenium	NA	
Silver	NA	
Thallium	NA	
Zinc	83	4.7

Notes and Definitions for this Report:

ANALYST

* denotes some present but less than nominal detection limits

Page 16
Received: 03/01/91

TMA Inc. REPORT
Results by Sample

Work Order # A1-03-01

SAMPLE ID 401022-28 Filter Blank	SAMPLE # 03 FRACTIONS: A	
	Date & Time Collected 02/21/91	Category
MIFILT 03/15/91		
Date Complete		

SAMPLE ID 401022-7 F.B. Acetone	SAMPLE # 03 FRACTIONS: B	
	Date & Time Collected 03/21/91	Category
VOLUME 99		
mls		

SAMPLE ID 401022-8 F.B. Front Half	SAMPLE # 03 FRACTIONS: C	
	Date & Time Collected 02/21/91 W	Category
VOLUME 202		
mls		

1

2

3

SAMPLE ID 401022-8 F. B. Front Half FRACTION 03C TEST CODE MMTAA1 NAME CARB Method 436-MMT
Date & Time Collected 02/21/91 Category _____

CARB METHOD 436 - MMT
Front Half composite results AA
Fraction 1A+1B

ELEMENT	RESULT	DET. LIMIT	RESULT	DET. LIMIT
	ug	ug	mg/L	mg/L
Arsenic	2.7	0.30	0.0090	0.0010
Lead	NA	0.30	NA	NA
Mercury	NA	0.060	NA	NA
Selenium	NA	96	NA	NA

Notes and Definitions for this Report:

ANALYST RSF

Final volume of composite 300 ml

SAMPLE ID 401022-8 F.B. Front Half

FRACTION 03C

TEST CODE MMTIC1

NAME CARB Method 436

Date & Time Collected 02/21/91

Category

CARB METHOD 436 - MMT
Front Half Composite Results - ICAP
Fraction 01A

ELEMENT	RESULT ug	DET LIM ug	RESULT mg/L	DET LIM mg/L
Aluminum	NA		NA	
Antimony	NA		NA	
Barium	NA		NA	
Beryllium	NA		NA	
Cadmium	ND	1.2	ND	0.0040
Chromium	9.6	1.5	0.032	0.0050
Copper	2.1	0.90	0.0070	0.0030
Iron	NA		NA	
Lead	NA		NA	
Manganese	8.4	0.60	0.028	0.0020
Nickel	6.0	6.0	0.020	0.020
Phosphorus	NA		NA	
Silver	NA		NA	
Thallium	NA		NA	
Zinc	60	3.0	0.20	0.010

Notes and Definitions for this Report:

ANALYST REM
Final volume of composite, mL 300

Page 1,
Received: 03/01/91

TMA Inc. REPORT
Results by Sample

Work Order # A1-03-018

SAMPLE ID 401022-9 F.B. Back Half		SAMPLE # 03 FRACTIONS: D	
		Date & Time Collected 02/21/91	
VOLUME 200		Category	
mls			

SAMPLE ID 401022-9 F.B. Back Half FRACTION 03D TEST CODE MMTAA2 NAME CARB Method 436
Date & Time Collected 02/21/91 Category _____

CARB METHOD 436 - MMT
Back half results
Fraction 2A+2B

ELEMENT	RESULT ug	DET LIM ug	RESULT mg/L	DET LIM mg/L
Arsenic	ND	0.20	ND	0.0010
Lead	NA	0.20	NA	
Mercury	NA		NA	
Selenium	NA		NA	

Notes and Definitions for this Report:

ANALYST RSF
Initial volume back half sample, ml. 200
Final digestate volume, ml. 150

Received: 03/01/91

TMA Inc.

REPORT

Work Order # A1-03-010

Results by Sample

SAMPLE ID 401022-9 F.B. Back Half

FRACTION 03D TEST CODE MMTIC2

NAME CARB Method 436

Date & Time Collected 02/21/91

Category

CARB METHOD 436 - MMT
Back Half Results - ICAP
Fraction 2A

ELEMENT

	RESULT ug	DET LIM ug	RESULT mg/L	DET LIM mg/L
Aluminum	NA	4.0	NA	
Antimony	NA	8.0	NA	
Barium	NA	0.20	NA	
Beryllium	NA	0.20	NA	
Cadmium	ND	0.80	ND	0.0040
Chromium	1.4	1.0	0.0070	0.0050
Copper	ND	0.60	ND	0.0030
Iron	NA	1.2	NA	
Lead	NA	10	NA	
Manganese	ND	0.40	ND	0.0020
Nickel	4.0	4.0	0.020	0.020
Phosphorus	NA	10	NA	
Silver	NA	1.0	NA	
Thallium	NA	48	NA	
Zinc	ND	2.0	ND	0.010

Notes and Definitions for this Report:

ANALYST REM

Initial volume back half sample, mL

200

Final digestate volume, mL

150

Received: 03/01/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-03-w1

SAMPLE ID 401022 Multi F.B. (Totals)

FRACTION 03F

TEST CODE MMTTOT

NAME CARB Method 436

Date & Time Collected 02/21/91

Category

CARB METHOD 436 - Multiple Metal Train Analysis

Total Train Results

ELEMENT

RESULT ug Det. Limit ug

Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Copper
Iron
Lead
Manganese
Mercury
Nickel
Phosphorus
Selenium
Silver
Thallium
Zinc

NA
NA
2.7
NA
NA
ND
11
2.1
NA
NA
8.4
NA
10
NA
NA
NA
NA
60
5

Notes and Definitions for this Report:

ANALYST

* denotes some present but less than nominal detection limits

01A	I	COMPLEX			
01B	I	COMPLEX			
01C	I	3010	AS_SED	COMPLEX	HG_P
01D	I	3010	AS_SED	COMPLEX	HG_P
01E	I	OMIT			
02A	I	COMPLEX			
02B	I	COMPLEX			
02C	I	3010	AS_SED	COMPLEX	HG_P
02D	I	3010	AS_SED	COMPLEX	HG_P
02E	I	OMIT			
03A	I	COMPLEX			
03B	I	COMPLEX			
03C	I	3010	AS_SED	COMPLEX	HG_P
03D	I	3010	AS_SED	COMPLEX	HG_P
03E	I	OMIT			
04A	I	WC_421			
05A	I	WC_421			

KLEINFELDER, INC.

TRAIN RECOVERY SHEET

DATE 20 FEB 91RUN# 1 METHOD CARB5FACILITY SIMI VALLEY L.F.TYPE Std. ImpingersTECHNICIAN A. ErbesIMP. SOLUTION H₂O (DI)

NOZZLE-PROBE RINSE

UMBILICAL RINSE

SOLUTION	VOL. (ml)	DESCRIPTION

IMPINGER # 1IMPINGER # 2IMPINGER # 3IMPINGER # 4

DESCRIPTION

IMPINGER RINSE

SOLUTION	FINAL (g)	INITIAL (g)	NET (g)
100 ml H ₂ O	569.6	538.1	31.5
100 ml H ₂ O	583.0	571.0	12.0
Empty	433.0	430.9	2.1
Silica Gel	697.5	689.5	8.0
			53.6

SILICA GEL

CONDITION	FINAL (g)	INITIAL (g)	NET (g)

FILTER

NUMBER	DESCRIPTION
0058	TARE 0.4088g

TOTAL MOISTURE (g)

FIELD BLANKS

DISPOSITION/COMMENTS

KLEINFELDER, INC.

TRAIN RECOVERY SHEET

DATE 20 FEB 91RUN# 2 METHOD CARB5FACILITY SIMI VALLEY L.F.TYPE Std. ImpingersTECHNICIAN A. ErbesIMP. SOLUTION H₂O (DI)

NOZZLE-PROBE RINSE

UMBILICAL RINSE

SOLUTION	VOL. (ml)	DESCRIPTION

IMPINGER # 1IMPINGER # 2IMPINGER # 3IMPINGER # 4

DESCRIPTION

IMPINGER RINSE

SOLUTION	FINAL (g)	INITIAL(g)	NET(g)
100 ml H ₂ O	586.7	532.6	54.1
100 ml H ₂ O	554.6	547.7	6.9
Empty	443.7	442.6	1.1
Silica Gel	665.3	658.3	7.0
			69.1

SILICA GEL

CONDITION	FINAL (g)	INITIAL(g)	NET (g)

FILTER

NUMBER	DESCRIPTION
0059	TARE 0.4129g

TOTAL MOISTURE (g)

FIELD BLANKS

DISPOSITION/COMMENTS

KLEINFELDER, INC.

TRAIN RECOVERY SHEET

DATE 20 FEB 91RUN# 3 METHOD CARB 5FACILITY SIMI VALLEY LF.TYPE Std. ImpingersTECHNICIAN A. ErbesIMP. SOLUTION H₂O (DI)

NOZZLE-PROBE RINSE

UMBILICAL RINSE

SOLUTION	VOL. (ml)	DESCRIPTION

IMPINGER # 1IMPINGER # 2IMPINGER # 3IMPINGER # 4

DESCRIPTION

IMPINGER RINSE

SOLUTION	FINAL (g)	INITIAL(g)	NET(g)
100ml H ₂ O	585.0	533.8	51.2
100ml H ₂ O	564.8	559.8	5.0
Empty	436.3	435.4	0.9
Silica Gel	719.5	713.3	6.2
			63.3

SILICA GEL

CONDITION	FINAL (g)	INITIAL(g)	NET (g)

FILTER

NUMBER	DESCRIPTION
0061	TARE 0.4137g

TOTAL MOISTURE (g)

FIELD BLANKS

DISPOSITION/COMMENTS

Project No.	Project Name	Project Manager	ANALYSIS REQUIRED					SENT TO:
71-401022	SUNNY VALLEY L.F.	R. HERBERT						SHIPPED VIA:
Samples Collected By: Jon Kawaguchi (714) 396-0335								SHIPPED BY:
Lab No.	Test Date	Sample Description (Container, Media, Volume, etc.)						Remarks
40102257	2/20/91	Cr#1, FRONT, DI H ₂ O						Please measure total
-17	2/20/91	Cr#1, BACK, DI H ₂ O						Volume
-20	2/21/91	Cr#2, FRONT, DI H ₂ O						
-21	2/21/91	Cr#2, BACK, DI H ₂ O						
-22	2/21/91	Cr#3, FRONT, DI H ₂ O						
-23	2/21/91	Cr#3, BACK, DI H ₂ O						
-33	2/20/91	CARB #1 Filter (Cr#1)						
-34	2/21/91	CARB #2 Filter (Cr#2)						
-35	2/21/91	CARB #3 Filter (Cr#3)						
-36	2/20/91	Blank Filter						
Relinquished by: [Signature]			Reason for Exchange:				Comments:	
Phone: (714) 396-0335			Received by: Sam Valdivia					
Relinquished by:			Date/Time: 3/4/91					
Phone:			Of: TNA					
Relinquished by:			Date/Time: 4:00					
Phone:			Received by:					
Relinquished by:			Date/Time:					
Phone:			Of:					
Relinquished by:			Date/Time:					
Phone:			Received by:					
Relinquished by:			Date/Time:					
Phone:			Of:					

KLEINFELDER, INC.
Diamond Bar, California

LABORATORY DATA
PARTICULATE DRYDOWNS

DATE ANALYZED _____

DATE FINISHED _____

ANALYST _____

TEST DATE _____

FACILITY SIMI VALLEY

BOOK PAGE	FRACTION	BEAKER/ FILTER NO.	ALiquot FACTOR	GROSS WT (gm)	TARE WT (gm)	(NET WT * AF) - BLANK = FINAL
	RUN NO. 1 LABORATORY CONTROL NO.					
	A	0058	1	0.4134	0.4088	0.0046
	B	A02	225 / 113	110.7193	110.6992	0.0400
	C	A03	388 / 212	110.9029	110.9008	0.0038
	RUN NO. 2 LABORATORY CONTROL NO.					
	A	0059	1	0.4164	0.4159	0.0005
	B	A06	196 / 94	111.1813	111.1627	0.0388
	C	A07	379 / 188	110.9485	110.9442	0.0087
	RUN NO. 3 LABORATORY CONTROL NO.					
	A	0061	1	0.4235	0.4137	0.0098
	B	A10	248 / 119	103.1084	103.0977	0.0223
	C	A12	363 / 180	105.7666	105.7610	0.0113

FRACTIONS:

- A = FILTER CATCH
- B = PROBE CATCH
- C = IMPINGER CATCH
- F = SOLVENT CATCH
- AF = TOTAL VOLUME / ALIQUOT VOLUME

Received: 03/04/91

TMA Inc.

REPORT

Work Order # A1-03-012

03/15/91 09:52:53

REPORT Kleinfelder, Inc.
TO 1370 Valley Vista Dr.
Suite 150
Diamond Bar, CA 91765
ATTEN Roland Hebert

CLIENT KLEINFELDER
COMPANY Kleinfelder, Inc.
FACILITY
SAMPLES 4

WORK ID 71-401022 Simi Valley L.F.
TAKEN By Kleinfelder Staff
TRANS By Kleinfelder Staff
TYPE Liquid & Filters
P.O. # 71-1621-050
INVOICE under separate cover

PREPARED Thermo Analytical, Inc.
BY 160 Taylor Street
Monrovia, CA 91016

ATTEN Ms. Carole Harris
PHONE 818-357-3247

CERTIFIED BY

CONTACT MCH

This report is for the sole and exclusive use of the client
to whom it is addressed and represents only those samples
herein described. Samples not destroyed in testing are re-
tained a maximum of 30 days unless otherwise requested.

SAMPLE IDENTIFICATION

01 401022-33 Carb #1 Filter
01 401022-18 Cr #1 Front
01 401022-19 Cr #1 Back
02 401022-34 Carb #2 Filter
02 401022-20 Cr #2 Front
02 401022-21 Cr #2 Back
03 401022-35 Carb #3 Filter
03 401022-22 Cr #3 Front
03 401022-23 Cr #3 Back
04 401022-36 Blank Filter

TEST CODES and NAMES used on this workorder

CRHEXA Hexavalent Chromium - Air
CR A Chromium - Air
CR HEX Hexavalent Chromium
CR L Chromium - Liquids
MPREPW Metals Prep. - Liquid
VOLUME Sample Volume

Received: 03/04/91

Results by Sample

SAMPLE ID 401022-33 Carb #1 Filter SAMPLE # 01 FRACTIONS: A
Date & Time Collected 02/20/91 Category
CRHEXA <0.5 CR A 1.79
ug/filter Total ug

SAMPLE ID 401022-18 Cr #1 Front SAMPLE # 01 FRACTIONS: B
Date & Time Collected 02/20/91 Category
CR HEX <0.003 CR L 1.39 VOLUME 102
mg/L ml

SAMPLE ID 401022-19 Cr #1 Back SAMPLE # 01 FRACTIONS: C
Date & Time Collected 02/20/91 Category
CR HEX <0.003 CR L <0.001 VOLUME 176
mg/L ml

SAMPLE ID 401022-34 Carb #2 Filter SAMPLE # 02 FRACTIONS: A
Date & Time Collected 02/21/91 Category
CRHEXA <0.5 CR A 0.55
ug/filter Total ug

Received: 03/04/91

TMA Inc.

REPORT

Work Order # A1-03-012

Results by Sample

SAMPLE ID 401022-20 Cr #2 Front SAMPLE # 02 FRACTIONS: B
Date & Time Collected 02/21/91 Category _____
CR HEX <0.003 CR L 1.33 VOLUME 102
mg/L mg/L mls

SAMPLE ID 401022-21 Cr #2 Back SAMPLE # 02 FRACTIONS: C
Date & Time Collected 02/21/91 Category _____
CR HEX <0.003 CR L 0.004 VOLUME 191
mg/L mg/L mls

SAMPLE ID 401022-35 Carb #3 Filter SAMPLE # 03 FRACTIONS: A
Date & Time Collected 02/21/91 Category _____
CRHEXA <0.5 CR A 1.40
ug/filter Total ug

SAMPLE ID 401022-22 Cr #3 Front SAMPLE # 03 FRACTIONS: B
Date & Time Collected 02/21/91 Category _____
CR HEX <0.003 CR L 1.21 VOLUME 128
mg/L mg/L mls

KLEINFELDER, INC.

TRAIN RECOVERY SHEET

DATE 22 FEB 91RUN# 1 METHOD 429 (PAH)FACILITY SIMI VALLEY LF.TYPE Std. ImpingersTECHNICIAN A. ErbesIMP. SOLUTION DI H₂O

NOZZLE-PROBE RINSE

UMBILICAL RINSE

SOLUTION	VOL. (ml)	DESCRIPTION

IMPINGER # 1IMPINGER # 2IMPINGER # 3IMPINGER # 4

DESCRIPTION

IMPINGER RINSE

SOLUTION	FINAL (g)	INITIAL(g)	NET(g)
100ml H ₂ O	587.5	543.6	43.9
100ml H ₂ O	548.4	549.2	-0.8
Empty	435.5	434.4	1.1
Silica Gel	677.9	659.6	18.3
			62.5

SILICA GEL

CONDITION	FINAL (g)	INITIAL(g)	NET (g)

FILTER

NUMBER	DESCRIPTION
0065	0.4023 g - Tare

TOTAL MOISTURE (g)

FIELD BLANKS

DISPOSITION/COMMENTS

KLEINFELDER, INC.

TRAIN RECOVERY SHEET

DATE 22 FEB 91RUN# 2 METHOD 429 (PAH)FACILITY SIMI VALLEY LFTYPE Std. ImpingersTECHNICIAN A. ErbesIMP. SOLUTION DI H₂O

NOZZLE-PROBE RINSE

UMBILICAL RINSE

SOLUTION	VOL. (ml)	DESCRIPTION

IMPINGER # 1IMPINGER # 2IMPINGER # 3IMPINGER # 4

DESCRIPTION

IMPINGER RINSE

SOLUTION	FINAL (g)	INITIAL (g)	NET (g)
100ml H ₂ O	632.3	545.0	87.3
100ml H ₂ O	549.6	550.8	-1.2
Empty	435.3	435.0	0.3
Silica Gel	666.1	652.9	13.2

SILICA GEL

FILTER

CONDITION	FINAL (g)	INITIAL (g)	NET (g)
NUMBER	DESCRIPTION		
0066	TARE - 0.3976g		

TOTAL MOISTURE (g)

99.6

FIELD BLANKS

DISPOSITION/COMMENTS

21/12

CHAIN OF CUSTODY RECORD

[illegible]

POLYCYLIC AROMATIC HYDROCARBONS
CARB METHOD 429

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

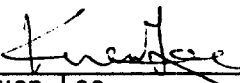
Order No: 91-03-018
Hazardous Waste Testing
Certification: E765

CLIENT: KLEINFELDER, INC.
CONTRACT #: N/A
PROJECT: SIMI VALLEY
TASK #: N/A
P.O. #: N/A
SAMPLE LOCATION: N/A
ELI SAMPLE ID: 9103018-03A
FILE ID: N/A
PROJECT #: 71-401022
SAMPLE ID: BLANK

DATE RECEIVED: 03/04/1991
DATE EXTRACTED: 03/06/1991
DATE ANALYZED: 03/07/1991
DATE SAMPLED: N/A
INSTRUMENT ID: BNA#2
MATRIX: AIR
% MOISTURE: N/A
REPORT WT: WET
SAMPLE VOL./WT.: N/A
DILUTION FACTOR: 1

<u>COMPOUND</u>	<u>CONCENTRATION</u> <u>ug/emission</u>	<u>PQL *</u> <u>ug/emission</u>
Naphthalene	<1.5	1.5
Acenaphthylene	<1.5	1.5
Acenaphthene	<1.5	1.5
Fluorene	<1.5	1.5
Phenanthrene	<1.5	1.5
Anthracene	<1.5	1.5
Fluoranthene	<1.5	1.5
Pyrene	<1.5	1.5
Benzo(a)anthracene	<1.5	1.5
Chrysene	<1.5	1.5
Benzo(b)fluoranthene	<1.5	1.5
Benzo(k)fluoranthene	<1.5	1.5
Benzo(a)pyrene	<1.5	1.5
Benzo(g,h,i)perylene	<1.5	1.5
Dibenzo(a,h)anthracene	<1.5	1.5
Indeno(1,2,3-cd)pyrene	<1.5	1.5
Benzo(a)anthracene-d12	% Surrogate Spike Recovery	
Methyl-Naphthalene-d10	66%	

* Instrument Detection Limit are 1.5 ug/ml, and samples extract final volume are 1 ml. The practical detection limit is 1.5 ug/emission.


Kuen Lee
Chemist

March 15, 1991
Date

POLYCYCLIC AROMATIC HYDROCARBONS
CARB METHOD 429

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

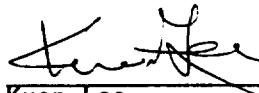
Order No: 91-03-018
Hazardous Waste Testing
Certification: E765

CLIENT: KLEINFELDER, INC.
CONTRACT #: N/A
PROJECT: SIMI VALLEY
TASK #: N/A
P.O. #: N/A
SAMPLE LOCATION: N/A
ELI SAMPLE ID: 9103018-01A
FILE ID: N/A
PROJECT #: 71-401022
SAMPLE ID: PAH-1(FRRN,BK,IMP,FILT#65)

DATE RECEIVED: 03/04/1991
DATE EXTRACTED: 03/06/1991
DATE ANALYZED: 03/07/1991
DATE SAMPLED: 02/22/1991
INSTRUMENT ID: BNA#2
MATRIX: AIR
% MOISTURE: N/A
REPORT WT: WET
SAMPLE VOL./WT.: N/A
DILUTION FACTOR: 1

<u>COMPOUND</u>	<u>CONCENTRATION</u> <u>ug/emission</u>	<u>PQL *</u> <u>ug/emission</u>
Naphthalene	907	1.5
Acenaphthylene	<1.5	1.5
Acenaphthene	<1.5	1.5
Fluorene	<1.5	1.5
Phenanthrene	<1.5	1.5
Anthracene	<1.5	1.5
Fluoranthene	<1.5	1.5
Pyrene	<1.5	1.5
Benzo(a)anthracene	<1.5	1.5
Chrysene	<1.5	1.5
Benzo(b)fluoranthene	<1.5	1.5
Benzo(k)fluoranthene	<1.5	1.5
Benzo(a)pyrene	<1.5	1.5
Benzo(g,h,i)perylene	<1.5	1.5
Dibenzo(a,h)anthracene	<1.5	1.5
Indeno(1,2,3-cd)pyrene	<1.5	1.5
	% Surrogate Spike Recovery	
Benzo(a)anthracene-d12	15%	
Methyl-Naphthalene-d10	27%	

* Instrument Detection Limit are 1.5 ug/ml, and samples extract final volume are 1 ml. The practical detection limit is 1.5 ug/emission.


Kuen Lee
Chemist

March 15, 1991
Date

POLYCYCLIC AROMATIC HYDROCARBONS
CARB METHOD 429

EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

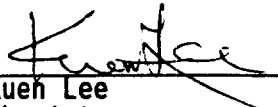
Order No: 91-03-018
Hazardous Waste Testing
Certification: E765

CLIENT: KLEINFELDER, INC.
CONTRACT #: N/A
PROJECT: SIMI VALLEY
TASK #: N/A
P.O. #: N/A
SAMPLE LOCATION: N/A
ELI SAMPLE ID: 9103018-02A
FILE ID: N/A
PROJECT #: 71-401022
SAMPLE ID: PAH-2(FRRN,BK,IMP,FILT#66)

DATE RECEIVED: 03/04/1991
DATE EXTRACTED: 03/06/1991
DATE ANALYZED: 03/07/1991
DATE SAMPLED: 02/26/1991
INSTRUMENT ID: BNA#2
MATRIX: AIR
% MOISTURE: N/A
REPORT WT: WET
SAMPLE VOL./WT.: N/A
DILUTION FACTOR: 1

<u>COMPOUND</u>	<u>CONCENTRATION</u> <u>ug/emission</u>	<u>PQL *</u> <u>ug/emission</u>
Naphthalene	946	1.5
Acenaphthylene	<1.5	1.5
Acenaphthene	<1.5	1.5
Fluorene	<1.5	1.5
Phenanthrene	<1.5	1.5
Anthracene	<1.5	1.5
Fluoranthene	<1.5	1.5
Pyrene	<1.5	1.5
Benzo(a)anthracene	<1.5	1.5
Chrysene	<1.5	1.5
Benzo(b)fluoranthene	<1.5	1.5
Benzo(k)fluoranthene	<1.5	1.5
Benzo(a)pyrene	<1.5	1.5
Benzo(g,h,i)perylene	<1.5	1.5
Dibenzo(a,h)anthracene	<1.5	1.5
Indeno(1,2,3-cd)pyrene	<1.5	1.5
	% Surrogate Spike Recovery	
Benzo(a)anthracene-d12	30%	
Methyl-Naphthalene-d10	35%	

* Instrument Detection Limit are 1.5 ug/ml, and samples extract final volume are 1 ml. The practical detection limit is 1.5 ug/emission.


Kuen Lee
Chemist

March 15, 1991
Date

POLYCYLIC AROMATIC HYDROCARBONS
CARB METHOD 429

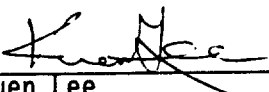
EUREKA LABORATORIES, INC.
6790 Florin-Perkins Road
Sacramento, CA 95828
(916) 381-7953

Order No: 91-03-018
Hazardous Waste Testing
Certification: E765

CLIENT: KLEINFELDER, INC.
CONTRACT #: N/A
PROJECT: SIMI VALLEY
TASK #: N/A
P.O. #: N/A
SAMPLE LOCATION: N/A
ELI SAMPLE ID: 9103018-04A
FILE ID: N/A
PROJECT #: 71-401022
SAMPLE ID: REAGENT SPIKE RECOVERY DUP.

DATE RECEIVED: 03/04/1991
DATE EXTRACTED: 03/06/1991
DATE ANALYZED: 03/07/1991
DATE SAMPLED: N/A
INSTRUMENT ID: BNA#2
MATRIX: AIR
% MOISTURE: N/A
REPORT WT: WET
SAMPLE VOL./WT.: N/A
DILUTION FACTOR: 1

<u>COMPOUND</u>	<u>SPIKE RECOVERY</u>
Naphthalene	31%
Acenaphthylene	68%
Acenaphthene	69%
Fluorene	80%
Phenanthrene	32%
Anthracene	85%
Fluoranthene	83%
Pyrene	82%
Benzo(a)anthracene	81%
Chrysene	72%
Benzo(b)fluoranthene	79%
Benzo(k)fluoranthene	78%
Benzo(a)pyrene	81%
Benzo(g,h,i)perylene	80%
Dibenzo(a,h)anthracene	64%
Indeno(1,2,3-cd)pyrene	82%
	% Surrogate Spike Recovery
Benzo(a)anthracene-d12	38%
Methyl-Naphthalene-d10	-


Kuen Lee
Chemist

March 15, 1991
Date

KLEINFELDER, INC.

DATE 22 FEB 91

TRAIN RECOVERY SHEET

RUN# 1 METHOD 421 (HCl)FACILITY SIMI VALLEY L.F.TYPE Std. ImpingersTECHNICIAN A. ErbesIMP. SOLUTION NaHCO₃ / Na₂CO₃

NOZZLE-PROBE RINSE

UMBILICAL RINSE

SOLUTION	VOL. (ml)	DESCRIPTION

IMPINGER # 1IMPINGER # 2IMPINGER # 3IMPINGER # 4

DESCRIPTION

IMPINGER RINSE

SOLUTION	FINAL (g)	INITIAL(g)	NET(g)
100ml Sol'n	580.7	534.4	46.3
100ml Sol'n	564.7	558.5	6.2
Empty	437.3	436.4	0.9
Silica Gel	735.0	727.9	7.1

SILICA GEL

CONDITION	FINAL (g)	INITIAL(g)	NET (g)

FILTER

NUMBER	DESCRIPTION
0067	TARE - 0.4001g

TOTAL MOISTURE (g)

60.5

FIELD BLANKS

DISPOSITION/COMMENTS

KLEINFELDER, INC.

TRAIN RECOVERY SHEET

DATE 2/25/91RUN# HCl #2 METHOD 421FACILITY SINGI VALLEYTYPE Std. Imp.TECHNICIAN Jon KIMP. SOLUTION NaHCO₃/Na₂CO₃

NOZZLE-PROBE RINSE

UMBILICAL RINSE

SOLUTION	VOL. (ml)	DESCRIPTION

IMPINGER # 1IMPINGER # 2IMPINGER # 3IMPINGER # 4

DESCRIPTION

IMPINGER RINSE

SOLUTION	FINAL (g)	INITIAL (g)	NET (g)
<u>100ml</u>	<u>586.6</u>	<u>535.3</u>	<u>51.3</u>
<u>100ml</u>	<u>565.1</u>	<u>561.7</u>	<u>3.4</u>
<u>Empty</u>	<u>437.6</u>	<u>437.4</u>	<u>0.2</u>
<u>Silica</u>	<u>676.4</u>	<u>670.5</u>	<u>5.9</u>
			<u>60.8</u>

SILICA GEL

CONDITION	FINAL (g)	INITIAL (g)	NET (g)

FILTER

NUMBER	DESCRIPTION

TOTAL MOISTURE (g)

FIELD BLANKS

DISPOSITION/COMMENTS

Received: 03/04/91

Kleinfelder, Inc.

TMA Inc.

REPORT

03/19/91 15:09:40

Work Order # A1-03-020

SUMMARY

Compound	#1	#2
Hexachlorobenzene	<2.2 ppm	<2.2 ppm
Acrylonitrile	<0.34 ppm	<0.34 ppm
1,3 Butadiene	<1.4 ppm	<1.4 ppm
1,4 Dioxane	<0.25 ppm	<0.25 ppm

●●

carlos

[illegible]

Received: 02/22/91

TMA Inc.

REPORT

Work Order # A1-02-070

03/21/91 11:33:40

REPORT Kleinfelder, Inc.

TO 1370 Valley Vista Dr.

Suite 150

Diamond Bar, CA 91765

ATTEN Roland Hebert

CLIENT KLEINFELDER

COMPANY Kleinfelder, Inc.

FACILITY

SAMPLES 3

WORK ID Simi Valley L.F.

TAKEN BY KLEINFELDER STAFF

TRANS BY TMA STAFF

TYPE NA

P.O. # 71-1621-050

INVOICE under separate cover

SAMPLE IDENTIFICATION

01 NA

01 Blank

02 NA

02 Blank

03 Shipping & Handling

PREPARED Thermo Analytical, Inc.

BY 160 Taylor Street

Monrovia, CA 91016

ATTEN Ms. Carole Harris

PHONE 818-357-3247

CONTACT MCH

CERTIFIED BY

This report is for the sole and exclusive use of the client to whom it is addressed and represents only those samples herein described. Samples not destroyed in testing are retained a maximum of 30 days unless otherwise requested.

Received: 02/22/91

TMA Inc.

REPORT

03/21/91 11:33:40

Work Order # A1-02-075

Kleinfelder, Inc.

Two samples received March 4, 1991 were analyzed for formaldehyde by CARB Method 430. The results are as follows:

Sample	Volume, ml	Analyte	Result, ug/ml
Lab Blank	_____	Formaldehyde	0.23
401022-30	27.7	Formaldehyde	1.35
401022-31	26.6	Formaldehyde	0.20
401022-31 (Duplicate)	26.6	Formaldehyde	0.24

KLEINFELDER, INC.
526 Hofgarden St.
City of Industry, California
(818) 369-2224

CHAIN OF CUSTODY RECORD

[illegible]

MAR 05 '81 10:03

152

Received: 03/04/91

TMA Inc.

REPORT

Work Order # A1-03-020

03/19/91 15:09:40

REPORT Kleinfelder, Inc.
TO 1370 Valley Vista Dr.
Suite 120
Diamond Bar, CA 91765
ATTEN Roland Hebert

CLIENT KLEINFELDER SAMPLES 2
COMPANY Kleinfelder, Inc.
FACILITY

WORK ID 71-401122.003 Simi Valley
TAKEN BY Kleinfelder Staff
TRANS BY Kleinfelder Staff
TYPE Gas
P.O. # 71-1621-050
INVOICE under separate cover

PREPARED Thermo Analytical, Inc.
BY 160 Taulor Street
Monrovia, CA 91016

ATTEN Ms. Carole Harris
PHONE 818-357-3247

CERTIFIED BY

CONTACT MCH

This report is for the sole and exclusive use of the client
to whom it is addressed and represents only those samples
herein described. Samples not destroyed in testing are re-
tained a maximum of 30 days unless otherwise requested.

SAMPLE IDENTIFICATION

01 Tedlar Bag #1-Outlet
02 Tedlar Bag #2-Outlet

TEST CODES and NAMES used on this workorder

FTIR G Gases by FTIR

Kleinfelder, Inc.

CARB 421 by IC

Sample ID	HF, mg	HCl, mg
04A 401022-10	0.33	2.2
05A 401022-11	0.37	2.7
Detection Limit	0.03	0.03
Date Analyzed	3/19/91	

CHAIN OF CUSTODY RECORD

CHAIN OF CUSTODY RECORD

Project No.	Project Name	Project Manager	ANALYSIS REQUIRED						SENT TO: AAM	
71-401022	SIMI VALLEY	ROLAND HERBERT	CH4	H2S	CI-C3	Refract	CO2	N2	SCALED	1150.1
Samples Collected By:			Sample Description (Container, Media, Volume, etc.)						SHIPPED VIA: HAWB CARRY	
KLEINFELDER			Lab No.	Test Date						
Phone: 714/396-0335 <td data-kind="ghost"></td> <td data-kind="ghost"></td> <td>2201</td> <td>2/21/91</td> <td data-cs="6" data-kind="parent">INLET - LANDFILL GAS</td> <td data-kind="ghost"></td> <td data-kind="ghost"></td> <td data-kind="ghost"></td> <td data-kind="ghost"></td> <td data-kind="ghost"></td>			2201	2/21/91	INLET - LANDFILL GAS					
			2202	"	"					
			2203	"	"					
			2204	"	OUTLET - FURNACE EXHAUST					
			2205	"	"					
			2206	"	"					



AtmAA Inc.

21354 Nordhoff St., Suite 113, Chatsworth, CA 91311 (818) 718-6070 • FAX (818) 718-9779

environmental consultants
laboratory services

February 27, 1991

LTR/094/90
201

Roland Hebert
Kleinfelder
1370 Valley Vista Drive, Suite 150
Diamond Bar, CA 91765

re: Project No.: 71-401022
P.O. No.: 71-1621-049

Dear Roland:

Please find enclosed the laboratory analysis reports and quality assurance summaries for six Tedlar bag samples, received on February 21, 1991.

The samples were analyzed for SCAQMD Rule 1150.1 contaminants, methane, total gaseous non-methane organics (TGNMO), permanent gases, hydrogen sulfide and C₁-C₃ reduced sulfur compounds, as requested.

Also enclosed is an invoice for laboratory analysis work performed.

Sincerely,

AtmAA, Inc.

Michael L. Porter
Laboratory Director

Encl.
MLP/kp



21354 Nordhoff St., Suite 113, Chatsworth, CA 91311 (818) 718-6070 • FAX (818) 718-9779

environmental consultants
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LABORATORY ANALYSIS REPORT

SCAQMD Rule 1150.1 Contaminants Analysis in Tedlar Bag Samples

Report Date : February 26, 1991
P.O. No.: 71-1621-49
Project No.: 71-401022
Site : Simi Valley Landfill
Date Received : February 21, 1991
Date Analyzed : February 22 & 23, 1991

AtmAA Lab No.:	90521-35	90521-36	90521-37
Sample I.D. No.:	2201	2202	2203
	Inlet	Inlet	Inlet

<u>Component</u>	(Concentration in ppm, v/v)		
TGNMO	1290	2810	2110
	(Concentration in %, v/v)		
Nitrogen	8.88	8.68	8.45
Oxygen	0.68	0.51	0.60
Methane	48.8	48.5	49.4
Carbon Dioxide	41.2	41.3	41.8
	(Concentration in ppb, v/v)		
Acetonitrile	<20	<20	<20
Benzene	997	917	981
Benzyl chloride	<100	<100	<100
Chlorobenzene	<100	<100	<100
Dichlorobenzene*	<100	<100	<100
1,1-dichloroethane	2780	2830	2910
1,2-dichloroethane	59.9	85.5	112
1,1-dichloroethylene	116	116	119
Dichloromethane	13800	13100	13400
Perchloroethene	6820	6920	6830
Carbon Tetrachloride	<1	<1	<1
Toluene	34600	61200	65100
1,1,1-trichloroethane	610	608	617
Trichloroethene	3780	3800	4160
Chloroform	6.20	5.99	6.21
Vinyl chloride	3030	3070	3100
m+p-xylenes	4140	21500	14300
o-xylenes	2360	9570	6440
Ethylenedibromide	<1	<1	<1

* total amount containing meta, para & ortho isomers.

TGNMO is total gaseous non-methane organics reported as ppm methane.

LABORATORY ANALYSIS REPORT

SCAQMD Rule 1150.1 Contaminants Analysis in Tedlar Bag Samples

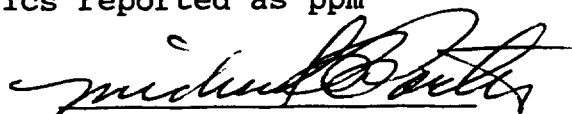
Report Date : February 26, 1991
P.O. No.: 71-1621-49
Project No.: 71-401022
Site : Simi Valley Landfill
Date Received : February 21, 1991
Date Analyzed : February 22 & 23, 1991

AtmAA Lab No.:	90521-38	90521-39	90521-40
Sample I.D. No.:	2204	2205	2206
	Outlet	Outlet	Outlet

<u>Component</u>	(Concentration in ppm, v/v)		
TGNMO	<1	<1	<1
Methane	4.49	<3	<3
	(Concentration in ppb, v/v)		
Acetonitrile	<0.8	<0.8	<0.8
Benzene	0.27	0.21	<0.1
Benzyl chloride	<0.8	<0.8	<0.8
Chlorobenzene	<0.1	0.16	<0.1
Dichlorobenzene*	<1.1	<1.1	<1.1
1,1-dichloroethane	<0.4	<0.4	<0.4
1,2-dichloroethane	<0.2	<0.2	<0.2
1,1-dichloroethylene	<0.1	<0.1	<0.1
Dichloromethane	3.98	3.54	3.36
Perchloroethene	<0.1	<0.1	<0.1
Carbon Tetrachloride	<0.05	<0.05	<0.05
Toluene	3.91	2.02	2.29
1,1,1-trichloroethane	0.31	0.26	0.24
Trichloroethene	<0.06	<0.06	<0.06
Chloroform	<0.08	<0.08	<0.08
Vinyl chloride	<0.1	0.34	<0.1
m+p-xylenes	1.20	0.99	0.87
o-xylenes	1.20	<0.5	0.75
Ethylenedibromide	<0.5	<0.5	<0.5

* total amount containing meta, para & ortho isomers

TGNMO is total gaseous non-methane organics reported as ppm methane.


Michael L. Porter
Laboratory Director



QUALITY ASSURANCE SUMMARY
(Duplicates Analyses)

P.O. No.: 71-1621-49
AtmAA Project No.: 201
Client Project No.: 71-401022
Site: Simi Valley Landfill

Tedlar Bag Samples

Date Received: February 21, 1991
Date Analyzed: February 22 & 23, 1991

<u>Component</u>	<u>Sample ID</u>	<u>Duplicates Run #1</u>	<u>Analyses Run #2</u>	<u>Mean Conc.</u>	<u>% Diff. from Mean</u>
(Concentration in ppm, v/v)					
TGNMO	2202	2780	2840	2810	1.1
	2204	<1	<1	---	---
	2206	<1	<1	---	---
Methane	2206	<3	<3	---	---
	(Concentration in %, v/v)				
Nitrogen	2201	8.91	8.84	8.88	0.39
Oxygen	2201	0.69	0.68	0.68	0.73
Methane	2201	49.0	48.5	48.8	0.51
Carbon Dioxide	2201	41.4	40.9	41.2	0.61
(Concentration in ppb, v/v)					
Acetonitrile	2201	<20	<20	---	---
	2205	<0.8	<0.8	---	---
Benzene	2202	933	901	917	1.8
	2205	0.21	0.21	0.21	0.0
Benzyl chloride	2205	<0.8	<0.8	---	---
Chlorobenzene	2205	0.15	0.17	0.16	6.2
Dichloro-benzenes*	2205	<1.1	<1.1	---	---



QUALITY ASSURANCE SUMMARY
(Duplicates Analyses)
(continued)

<u>Component</u>	<u>Sample ID</u>	<u>Duplicates Run #1</u>	<u>Analyses Run #2</u>	<u>Mean Conc.</u>	<u>% Diff. from Mean</u>
(Concentration in ppb, v/v)					
1,1-dichloroethane	2201	2780	2790	2780	0.18
	2204	<0.4	<0.4	---	---
1,2-dichloroethane	2204	<0.2	<0.2	---	---
1,1-dichloroethylene	2201	113	118	116	2.2
	2204	<0.1	<0.1	---	---
Dichloromethane	2201	13100	14600	13800	5.4
	2205	3.53	3.55	3.54	0.28
Perchloroethene	2201	6740	6900	6820	1.2
	2205	<0.1	<0.1	---	---
Carbon Tetrachloride	2205	<0.05	<0.05	---	---
Toluene	2203	65000	65200	65100	0.15
	2205	2.07	1.97	2.02	2.5
1,1,1-trichloroethane	2201	609	611	610	0.16
	2205	0.24	0.27	0.26	5.9
Trichloroethene	2201	3840	3710	3780	1.7
	2205	<0.06	<0.06	---	---
Chloroform	2205	<0.08	<0.08	---	---
Vinyl chloride	2201	3030	3030	3030	0.0
	2204	<0.1	<0.1	---	---
m&p-xylene	2203	14000	14600	14300	2.1
	2205	1.07	0.91	0.99	8.1
o-xylene	2203	6380	6500	6440	0.93
Ethylenedibromide	2201	<1	<1	---	---



QUALITY ASSURANCE SUMMARY
(Duplicates Analyses)
(continued)

A set of 6 Tedlar bag samples, laboratory numbers 90521-(35-40) was analyzed for 1150.1 contaminants, permanent gases, methane, and total gaseous non-methane organics (TGNMO). Agreement between duplicate analyses is a measure of precision and is shown above in the column "% Difference from Mean". Duplicate analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 22 duplicate measurements from the sample set of 6 Tedlar bag samples is 1.9%.





AtMAA Inc.

21354 Nordhoff St., Suite 113, Chatsworth, CA 91311 (818) 718-6070 • FAX (818) 718-9779

environmental consultants
laboratory services

LABORATORY ANALYSIS REPORT

Selected Volatile Sulfur Components
Analysis in Tedlar Bag Samples

Report Date: February 26, 1991
Client: Kleinfelder
P.O. No.: 71-1621-49
Project No.: 71-401022
Site: Simi Valley Landfill
Date Received: February 21, 1991
Date Analyzed: February 23, 1991

Hydrogen sulfide, plus C1, C2, and C3 reduced sulfur compounds, are analyzed by gas chromatography with a Hall electrolytic conductivity detector operated in the oxidative sulfur mode.

AtMAA Lab No.	Sample ID	Hydrogen Sulfide	C1	C2	C3
(Concentration in ppm, v/v)					
90521-35	2201	9.22	<0.5	2.08	<1
90521-36	2202	9.24	<0.5	1.69	<1
90521-37	2203	8.98	<0.5	2.22	<1
90521-38	2204	<0.5	<0.5	<1	<1
90521-39	2205	<0.5	<0.5	<1	<1
90521-40	2206	<0.5	<0.5	<1	<1


Micheal L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Duplicate Analysis)

P.O. No.: 71-162
AtmAA No.: 201
Client Project No.: 71-401
Site: Simi Valley Landfill

Tedlar Bag Samples

Date Received: February 21, 1991
Date Analyzed: February 23, 1991

Component	Sample ID	Duplicate Analysis		Mean	% Diff.
		Run #1	Run #2	Conc.	from Mean
		(Concentration in ppm, v/v)			
Hydrogen Sulfide	2201	9.24	9.19	9.22	0.27
C1	2201	<0.5	<0.5	---	---
C2	2201	2.03	2.14	2.08	2.6
C3	2201	<1	<1	---	---

A set of 6 samples, laboratory numbers 90521-(35-40), was analyzed for sulfur components. Agreement between duplicate analyses is a measure of precision and is shown above in the column "% Difference from Mean". Duplicate analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 2 duplicate measurements from the sample set of 6 Tedlar bag samples is 1.4%.



KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
SOURCE: LANDFILL GAS FIRED FLARE STATION
TEST DATE: 20 FEB 91
RUN NO.: 1 CARB 425 (HEXAVALENT CHROMIUM)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	30.02
OXYGEN CONTENT (%)	12.10
CARBON DIOXIDE CONTENT (%)	8.10
MOISTURE CONTENT (%)	8.463
STACK TEMPERATURE (deg F)	1571.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.79
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	14.44
EXHAUST GAS FLOW RATE (ACFM)	43,560.5
EXHAUST GAS FLOW RATE (DSCFM)	10,438.1

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	28.290
DRY GAS VOLUME SAMPLED (DSCF)	27.420
DRY GAS METER TEMPERATURE (deg F)	91.20
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.27
TOTAL RUN TIME (min)	96.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	100.87

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	53.60
NOZZLE, PROBE & WASHES (mg)	0.0001
FILTER (mg)	0.0005
IMPINGERS (mg)	0.0012

EMISSIONS DATA

FRONT HALF (gr/DSCF)	0.338E-06
(lb/hr)	0.302E-04
BACK HALF (gr/DSCF)	0.675E-06
(lb/hr)	0.604E-04
TOTAL (gr/DSCF)	0.101E-05
(lb/hr)	0.907E-04

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 20 FEB 91
 RUN NO.: 1 CARB 425 (TOTAL CHROMIUM)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	30.02
OXYGEN CONTENT (%)	12.10
CARBON DIOXIDE CONTENT (%)	8.10
MOISTURE CONTENT (%)	8.463
STACK TEMPERATURE (deg F)	1571.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.79
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	14.44
EXHAUST GAS FLOW RATE (ACFM)	43,560.5
EXHAUST GAS FLOW RATE (DSCFM)	10,438.1

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	28.290
DRY GAS VOLUME SAMPLED (DSCF)	27.420
DRY GAS METER TEMPERATURE (deg F)	91.20
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.27
TOTAL RUN TIME (min)	96.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	100.87

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	53.60
NOZZLE, PROBE & WASHES (mg)	0.2991
FILTER (mg)	0.0018
IMPINGERS (mg)	0.0000

EMISSIONS DATA

FRONT HALF (gr/DSCF)	0.169E-03
(lb/hr)	0.152E-01
BACK HALF (gr/DSCF)	0.000E+00
(lb/hr)	0.000E+00
TOTAL (gr/DSCF)	0.169E-03
(lb/hr)	0.152E-01

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
SOURCE: LANDFILL GAS FIRED FLARE STATION
TEST DATE: 20 FEB 91
RUN NO.: 1 CARB 5 (PARTICULATE MATTER)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	30.02
OXYGEN CONTENT (%)	12.10
CARBON DIOXIDE CONTENT (%)	8.10
MOISTURE CONTENT (%)	8.463
STACK TEMPERATURE (deg F)	1571.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.79
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	14.44
EXHAUST GAS FLOW RATE (ACFM)	43,560.5
EXHAUST GAS FLOW RATE (DSCFM)	10,438.1

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	28.290
DRY GAS VOLUME SAMPLED (DSCF)	27.420
DRY GAS METER TEMPERATURE (deg F)	91.20
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.27
TOTAL RUN TIME (min)	96.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	100.87

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	53.60
NOZZLE, PROBE & WASHES (mg)	40.00
FILTER (mg)	4.60
IMPINGERS (mg)	3.80

EMISSIONS DATA

FRONT HALF (gr/DSCF)	0.0251
(lb/hr)	2.246
BACK HALF (gr/DSCF)	0.0021
(lb/hr)	0.191
TOTAL (gr/DSCF)	0.0272
(lb/hr)	2.438

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
SOURCE: LANDFILL GAS FIRED FLARE STATION
TEST DATE: 21 FEB 91
RUN NO.: 2 CARB 5 (PARTICULATE MATTER)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	12.10
CARBON DIOXIDE CONTENT (%)	8.00
MOISTURE CONTENT (%)	8.224
STACK TEMPERATURE (deg F)	1549.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.77
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.46
EXHAUST GAS FLOW RATE (ACFM)	46,626.9
EXHAUST GAS FLOW RATE (DSCFM)	11,286.9

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	37.070
DRY GAS VOLUME SAMPLED (DSCF)	36.470
DRY GAS METER TEMPERATURE (deg F)	81.27
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.30
TOTAL RUN TIME (min)	120.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	99.26

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	69.10
NOZZLE, PROBE & WASHES (mg)	38.80
FILTER (mg)	0.50
IMPINGERS (mg)	8.70

EMISSIONS DATA

FRONT HALF (gr/DSCF)	0.0166
(lb/hr)	1.609
BACK HALF (gr/DSCF)	0.0037
(lb/hr)	0.356
TOTAL (gr/DSCF)	0.0203
(lb/hr)	1.965

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 1 CARB 436 (ZINC)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	11.90
CARBON DIOXIDE CONTENT (%)	8.50
MOISTURE CONTENT (%)	8.185
STACK TEMPERATURE (deg F)	1522.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.84
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.12
EXHAUST GAS FLOW RATE (ACFM)	45,599.7
EXHAUST GAS FLOW RATE (DSCFM)	11,193.4

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	59.480
DRY GAS VOLUME SAMPLED (DSCF)	56.978
DRY GAS METER TEMPERATURE (deg F)	95.90
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.30
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	97.73

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	107.40
NOZZLE, PROBE & WASHES (mg)	0.0800
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0270

EMISSIONS DATA

FRONT HALF (gr/DSCF)	2.166E-05
(lb/hr)	2.079E-03
BACK HALF (gr/DSCF)	7.312E-06
(lb/hr)	7.017E-04
TOTAL (gr/DSCF)	2.898E-05
(lb/hr)	2.781E-03

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 1 CARB 436 (NICKEL)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	11.90
CARBON DIOXIDE CONTENT (%)	8.50
MOISTURE CONTENT (%)	8.185
STACK TEMPERATURE (deg F)	1522.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.84
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.12
EXHAUST GAS FLOW RATE (ACFM)	45,599.7
EXHAUST GAS FLOW RATE (DSCFM)	11,193.4

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	59.480
DRY GAS VOLUME SAMPLED (DSCF)	56.978
DRY GAS METER TEMPERATURE (deg F)	95.90
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.30
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	97.73

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	107.40
NOZZLE, PROBE & WASHES (mg)	2.7940
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0060

EMISSIONS DATA

FRONT HALF (gr/DSCF)	7.566E-04
(lb/hr)	7.262E-02
BACK HALF (gr/DSCF)	1.625E-06
(lb/hr)	1.559E-04
TOTAL (gr/DSCF)	7.583E-04
(lb/hr)	7.277E-02

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 1 CARB 436 (MANGANESE)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	11.90
CARBON DIOXIDE CONTENT (%)	8.50
MOISTURE CONTENT (%)	8.185
STACK TEMPERATURE (deg F)	1522.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.84
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.12
EXHAUST GAS FLOW RATE (ACFM)	45,599.7
EXHAUST GAS FLOW RATE (DSCFM)	11,193.4

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	59.480
DRY GAS VOLUME SAMPLED (DSCF)	56.978
DRY GAS METER TEMPERATURE (deg F)	95.90
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.30
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	97.73

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	107.40
NOZZLE, PROBE & WASHES (mg)	0.3516
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0120

EMISSIONS DATA

FRONT HALF (gr/DSCF)	9.522E-05
(lb/hr)	9.138E-03
BACK HALF (gr/DSCF)	3.250E-06
(lb/hr)	3.119E-04
TOTAL (gr/DSCF)	9.847E-05
(lb/hr)	9.450E-03

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 1 CARB 436 (COPPER)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	11.90
CARBON DIOXIDE CONTENT (%)	8.50
MOISTURE CONTENT (%)	8.185
STACK TEMPERATURE (deg F)	1522.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.84
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.12
EXHAUST GAS FLOW RATE (ACFM)	45,599.7
EXHAUST GAS FLOW RATE (DSCFM)	11,193.4

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	59.480
DRY GAS VOLUME SAMPLED (DSCF)	56.978
DRY GAS METER TEMPERATURE (deg F)	95.90
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.30
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	97.73

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	107.40
NOZZLE, PROBE & WASHES (mg)	0.1079
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0010

EMISSIONS DATA

FRONT HALF (gr/DSCF)	2.922E-05
(lb/hr)	2.804E-03
BACK HALF (gr/DSCF)	2.708E-07
(lb/hr)	2.599E-05
TOTAL (gr/DSCF)	2.949E-05
(lb/hr)	2.830E-03

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 1 CARB 436 (TOTAL CHROMIUM)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	11.90
CARBON DIOXIDE CONTENT (%)	8.50
MOISTURE CONTENT (%)	8.185
STACK TEMPERATURE (deg F)	1522.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.84
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.12
EXHAUST GAS FLOW RATE (ACFM)	45,599.7
EXHAUST GAS FLOW RATE (DSCFM)	11,193.4

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	59.480
DRY GAS VOLUME SAMPLED (DSCF)	56.978
DRY GAS METER TEMPERATURE (deg F)	95.90
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.30
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	97.73

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	107.40
NOZZLE, PROBE & WASHES (mg)	0.9504
FILTER (mg)	0.0000
IMPINGERS (mg)	0.1186

EMISSIONS DATA

FRONT HALF (gr/DSCF)	2.574E-04
(lb/hr)	2.470E-02
BACK HALF (gr/DSCF)	3.212E-05
(lb/hr)	3.082E-03
TOTAL (gr/DSCF)	2.895E-04
(lb/hr)	2.778E-02

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 1 CARB 436 (CADMIUM)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	11.90
CARBON DIOXIDE CONTENT (%)	8.50
MOISTURE CONTENT (%)	8.185
STACK TEMPERATURE (deg F)	1522.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.84
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.12
EXHAUST GAS FLOW RATE (ACFM)	45,599.7
EXHAUST GAS FLOW RATE (DSCFM)	11,193.4

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	59.480
DRY GAS VOLUME SAMPLED (DSCF)	56.978
DRY GAS METER TEMPERATURE (deg F)	95.90
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.30
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	97.73

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	107.40
NOZZLE, PROBE & WASHES (mg)	0.0140
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0021

EMISSIONS DATA

FRONT HALF (gr/DSCF)	3.791E-06
(lb/hr)	3.639E-04
BACK HALF (gr/DSCF)	5.687E-07
(lb/hr)	5.458E-05
TOTAL (gr/DSCF)	4.360E-06
(lb/hr)	4.184E-04

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 3 CARB 5 (PARTICULATE MATTER)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	12.20
CARBON DIOXIDE CONTENT (%)	8.10
MOISTURE CONTENT (%)	8.176
STACK TEMPERATURE (deg F)	1548.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.79
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	14.46
EXHAUST GAS FLOW RATE (ACFM)	43,621.7
EXHAUST GAS FLOW RATE (DSCFM)	10,570.3

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	35.565
DRY GAS VOLUME SAMPLED (DSCF)	33.625
DRY GAS METER TEMPERATURE (deg F)	103.20
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.28
TOTAL RUN TIME (min)	120.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	97.72

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	63.30
NOZZLE, PROBE & WASHES (mg)	22.30
FILTER (mg)	9.80
IMPINGERS (mg)	11.30

EMISSIONS DATA

FRONT HALF (gr/DSCF)	0.0147
(lb/hr)	1.335
BACK HALF (gr/DSCF)	0.0052
(lb/hr)	0.470
TOTAL (gr/DSCF)	0.0199
(lb/hr)	1.805

$$\begin{array}{r} 1.335 \\ 1.47 \\ \hline 1.805 \end{array}$$

$$\frac{1.335}{1.805} = 74\%$$

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 2 CARB 425 (TOTAL CHROMIUM)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	12.10
CARBON DIOXIDE CONTENT (%)	8.00
MOISTURE CONTENT (%)	8.224
STACK TEMPERATURE (deg F)	1549.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.77
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.46
EXHAUST GAS FLOW RATE (ACFM)	46,626.9
EXHAUST GAS FLOW RATE (DSCFM)	11,286.9

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	37.070
DRY GAS VOLUME SAMPLED (DSCF)	36.470
DRY GAS METER TEMPERATURE (deg F)	81.27
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.30
TOTAL RUN TIME (min)	120.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	99.26

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	69.10
NOZZLE, PROBE & WASHES (mg)	0.2613
FILTER (mg)	0.0006
IMPINGERS (mg)	0.0015

EMISSIONS DATA

FRONT HALF (gr/DSCF)	0.111E-03
(lb/hr)	0.107E-01
BACK HALF (gr/DSCF)	0.635E-06
(lb/hr)	0.614E-04
TOTAL (gr/DSCF)	0.111E-03
(lb/hr)	0.108E-01

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 3 CARB 425 (TOTAL CHROMIUM)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	12.20
CARBON DIOXIDE CONTENT (%)	8.10
MOISTURE CONTENT (%)	8.176
STACK TEMPERATURE (deg F)	1548.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.79
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	14.46
EXHAUST GAS FLOW RATE (ACFM)	43,621.7
EXHAUST GAS FLOW RATE (DSCFM)	10,570.3

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	35.565
DRY GAS VOLUME SAMPLED (DSCF)	33.625
DRY GAS METER TEMPERATURE (deg F)	103.20
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.28
TOTAL RUN TIME (min)	120.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	97.72

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	63.30
NOZZLE, PROBE & WASHES (mg)	0.2996
FILTER (mg)	0.0014
IMPINGERS (mg)	0.0000

EMISSIONS DATA

FRONT HALF (gr/DSCF)	0.138E-03
(lb/hr)	0.125E-01
BACK HALF (gr/DSCF)	0.000E+00
(lb/hr)	0.000E+00
TOTAL (gr/DSCF)	0.138E-03
(lb/hr)	0.125E-01

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 3 CARB 425 (HEXAVALENT CHROMIUM)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	12.20
CARBON DIOXIDE CONTENT (%)	8.10
MOISTURE CONTENT (%)	8.176
STACK TEMPERATURE (deg F)	1548.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.79
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	14.46
EXHAUST GAS FLOW RATE (ACFM)	43,621.7
EXHAUST GAS FLOW RATE (DSCFM)	10,570.3

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	35.565
DRY GAS VOLUME SAMPLED (DSCF)	33.625
DRY GAS METER TEMPERATURE (deg F)	103.20
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.28
TOTAL RUN TIME (min)	120.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	97.72

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	63.30
NOZZLE, PROBE & WASHES (mg)	0.0007
FILTER (mg)	0.0005
IMPINGERS (mg)	0.0011

EMISSIONS DATA

FRONT HALF (gr/DSCF)	0.551E-06
(lb/hr)	0.499E-04
BACK HALF (gr/DSCF)	0.505E-06
(lb/hr)	0.457E-04
TOTAL (gr/DSCF)	0.106E-05
(lb/hr)	0.957E-04

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 21 FEB 91
 RUN NO.: 2 CARB 425 (HEXAVALENT CHROMIUM)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	12.10
CARBON DIOXIDE CONTENT (%)	8.00
MOISTURE CONTENT (%)	8.224
STACK TEMPERATURE (deg F)	1549.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.77
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.46
EXHAUST GAS FLOW RATE (ACFM)	46,626.9
EXHAUST GAS FLOW RATE (DSCFM)	11,286.9

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	37.070
DRY GAS VOLUME SAMPLED (DSCF)	36.470
DRY GAS METER TEMPERATURE (deg F)	81.27
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.30
TOTAL RUN TIME (min)	120.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	99.26

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	69.10
NOZZLE, PROBE & WASHES (mg)	0.0006
FILTER (mg)	0.0005
IMPINGERS (mg)	0.0011

EMISSIONS DATA

FRONT HALF (gr/DSCF)	0.465E-06
(lb/hr)	0.450E-04
BACK HALF (gr/DSCF)	0.465E-06
(lb/hr)	0.450E-04
TOTAL (gr/DSCF)	0.931E-06
(lb/hr)	0.901E-04

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 22 FEB 91
 RUN NO.: 2 CARB 436 (ZINC)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.80
OXYGEN CONTENT (%)	11.30
CARBON DIOXIDE CONTENT (%)	8.40
MOISTURE CONTENT (%)	8.079
STACK TEMPERATURE (deg F)	1542.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.80
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	13.70
EXHAUST GAS FLOW RATE (ACFM)	41,313.5
EXHAUST GAS FLOW RATE (DSCFM)	10,011.3

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	54.635
DRY GAS VOLUME SAMPLED (DSCF)	53.654
DRY GAS METER TEMPERATURE (deg F)	80.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.24
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	102.90

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	99.70
NOZZLE, PROBE & WASHES (mg)	0.0210
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0017

EMISSIONS DATA

FRONT HALF (gr/DSCF)	6.039E-06
(lb/hr)	5.184E-04
BACK HALF (gr/DSCF)	4.889E-07
(lb/hr)	4.197E-05
TOTAL (gr/DSCF)	6.528E-06
(lb/hr)	5.604E-04

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
SOURCE: LANDFILL GAS FIRED FLARE STATION
TEST DATE: 22 FEB 91
RUN NO.: 2 CARB 436 (NICKEL)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.80
OXYGEN CONTENT (%)	11.30
CARBON DIOXIDE CONTENT (%)	8.40
MOISTURE CONTENT (%)	8.079
STACK TEMPERATURE (deg F)	1542.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.80
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	13.70
EXHAUST GAS FLOW RATE (ACFM)	41,313.5
EXHAUST GAS FLOW RATE (DSCFM)	10,011.3

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	54.635
DRY GAS VOLUME SAMPLED (DSCF)	53.654
DRY GAS METER TEMPERATURE (deg F)	80.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.24
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	102.90

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	99.70
NOZZLE, PROBE & WASHES (mg)	6.2940
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0012

EMISSIONS DATA

FRONT HALF (gr/DSCF)	1.810E-03
(lb/hr)	1.554E-01
BACK HALF (gr/DSCF)	3.451E-07
(lb/hr)	2.962E-05
TOTAL (gr/DSCF)	1.810E-03
(lb/hr)	1.554E-01

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
SOURCE: LANDFILL GAS FIRED FLARE STATION
TEST DATE: 22 FEB 91
RUN NO.: 2 CARB 436 (MANGANESE)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.80
OXYGEN CONTENT (%)	11.30
CARBON DIOXIDE CONTENT (%)	8.40
MOISTURE CONTENT (%)	8.079
STACK TEMPERATURE (deg F)	1542.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.80
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	13.70
EXHAUST GAS FLOW RATE (ACFM)	41,313.5
EXHAUST GAS FLOW RATE (DSCFM)	10,011.3

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	54.635
DRY GAS VOLUME SAMPLED (DSCF)	53.654
DRY GAS METER TEMPERATURE (deg F)	80.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.24
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	102.90

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	99.70
NOZZLE, PROBE & WASHES (mg)	0.5016
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0000

EMISSIONS DATA

FRONT HALF (gr/DSCF)	1.443E-04
(lb/hr)	1.238E-02
BACK HALF (gr/DSCF)	0.000E+00
(lb/hr)	0.000E+00
TOTAL (gr/DSCF)	1.443E-04
(lb/hr)	1.238E-02

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 22 FEB 91
 RUN NO.: 2 CARB 436 (COPPER)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.80
OXYGEN CONTENT (%)	11.30
CARBON DIOXIDE CONTENT (%)	8.40
MOISTURE CONTENT (%)	8.079
STACK TEMPERATURE (deg F)	1542.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.80
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	13.70
EXHAUST GAS FLOW RATE (ACFM)	41,313.5
EXHAUST GAS FLOW RATE (DSCFM)	10,011.3

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	54.635
DRY GAS VOLUME SAMPLED (DSCF)	53.654
DRY GAS METER TEMPERATURE (deg F)	80.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.24
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	102.90

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	99.70
NOZZLE, PROBE & WASHES (mg)	0.1279
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0000

EMISSIONS DATA

FRONT HALF (gr/DSCF)	3.678E-05
(lb/hr)	3.157E-03
BACK HALF (gr/DSCF)	0.000E+00
(lb/hr)	0.000E+00
TOTAL (gr/DSCF)	3.678E-05
(lb/hr)	3.157E-03

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 22 FEB 91
 RUN NO.: 2 CARB 436 (TOTAL CHROMIUM)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.80
OXYGEN CONTENT (%)	11.30
CARBON DIOXIDE CONTENT (%)	8.40
MOISTURE CONTENT (%)	8.079
STACK TEMPERATURE (deg F)	1542.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.80
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	13.70
EXHAUST GAS FLOW RATE (ACFM)	41,313.5
EXHAUST GAS FLOW RATE (DSCFM)	10,011.3

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	54.635
DRY GAS VOLUME SAMPLED (DSCF)	53.654
DRY GAS METER TEMPERATURE (deg F)	80.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.24
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	102.90

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	99.70
NOZZLE, PROBE & WASHES (mg)	0.5304
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0003

EMISSIONS DATA

FRONT HALF (gr/DSCF)	1.525E-04
(lb/hr)	1.309E-02
BACK HALF (gr/DSCF)	8.628E-08
(lb/hr)	7.406E-06
TOTAL (gr/DSCF)	1.526E-04
(lb/hr)	1.310E-02

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 22 FEB 91
 RUN NO.: 2 CARB 436 (CADMIUM)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.80
OXYGEN CONTENT (%)	11.30
CARBON DIOXIDE CONTENT (%)	8.40
MOISTURE CONTENT (%)	8.079
STACK TEMPERATURE (deg F)	1542.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.80
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	13.70
EXHAUST GAS FLOW RATE (ACFM)	41,313.5
EXHAUST GAS FLOW RATE (DSCFM)	10,011.3

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	54.635
DRY GAS VOLUME SAMPLED (DSCF)	53.654
DRY GAS METER TEMPERATURE (deg F)	80.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.24
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	102.90

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	99.70
NOZZLE, PROBE & WASHES (mg)	0.0087
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0000

EMISSIONS DATA

FRONT HALF (gr/DSCF)	2.502E-06
(lb/hr)	2.148E-04
BACK HALF (gr/DSCF)	0.000E+00
(lb/hr)	0.000E+00
TOTAL (gr/DSCF)	2.502E-06
(lb/hr)	2.148E-04

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 22 FEB 91
 RUN NO.: 2 CARB 436 (ARSENIC)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.80
OXYGEN CONTENT (%)	11.30
CARBON DIOXIDE CONTENT (%)	8.40
MOISTURE CONTENT (%)	8.079
STACK TEMPERATURE (deg F)	1542.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.80
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	13.70
EXHAUST GAS FLOW RATE (ACFM)	41,313.5
EXHAUST GAS FLOW RATE (DSCFM)	10,011.3

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	54.635
DRY GAS VOLUME SAMPLED (DSCF)	53.654
DRY GAS METER TEMPERATURE (deg F)	80.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.24
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	102.90

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	99.70
NOZZLE, PROBE & WASHES (mg)	0.0143
FILTER (mg)	0.0000
IMPINGERS (mg)	0.0000

EMISSIONS DATA

FRONT HALF (gr/DSCF)	4.112E-06
(lb/hr)	3.530E-04
BACK HALF (gr/DSCF)	0.000E+00
(lb/hr)	0.000E+00
TOTAL (gr/DSCF)	4.112E-06
(lb/hr)	3.530E-04

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
SOURCE: LANDFILL GAS FIRED FLARE STATION
TEST DATE: 22 FEB 91
RUN NO.: 1 CARB 429 (PAH - NAPHTHALENE)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.92
OXYGEN CONTENT (%)	11.80
CARBON DIOXIDE CONTENT (%)	8.30
MOISTURE CONTENT (%)	4.147
STACK TEMPERATURE (deg F)	1556.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.81
VELOCITY PRESSURE (sq rt inches water)	0.13
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	14.48
EXHAUST GAS FLOW RATE (ACFM)	43,670.2
EXHAUST GAS FLOW RATE (DSCFM)	11,002.4

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	70.565
DRY GAS VOLUME SAMPLED (DSCF)	68.318
DRY GAS METER TEMPERATURE (deg F)	90.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.28
TOTAL RUN TIME (min)	240.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	95.38

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	62.50
NOZZLE, PROBE & WASHES (mg)	0.9070
FILTER (mg)	0.0000

EMISSIONS DATA

FRONT HALF (gr/DSCF)	2.049E-04
(lb/hr)	1.933E-02
TOTAL (gr/DSCF)	2.049E-04
(lb/hr)	1.933E-02

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
SOURCE: LANDFILL GAS FIRED FLARE STATION
TEST DATE: 25 FEB 91
RUN NO.: 2 CARB 430 (FORMALDEHYDE)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.84
OXYGEN CONTENT (%)	11.90
CARBON DIOXIDE CONTENT (%)	8.40
MOISTURE CONTENT (%)	7.997
STACK TEMPERATURE (deg F)	1580.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.83
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.47
EXHAUST GAS FLOW RATE (ACFM)	46,651.3
EXHAUST GAS FLOW RATE (DSCFM)	11,118.9

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	1.090
DRY GAS VOLUME SAMPLED (DSCF)	1.088
DRY GAS METER TEMPERATURE (deg F)	69.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.00
TOTAL RUN TIME (min)	30.00

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	2.00
FORMALDEHYDE MEASURED (ug/ml)	0.01
SOLUTION VOLUME (ml)	26.60

FORMALDEHYDE EMISSIONS DATA

CONCENTRATION (PPM,d, v/v)	0.007
EMISSIONS (lb/hr)	3.595E-04

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
SOURCE: LANDFILL GAS FIRED FLARE STATION
TEST DATE: 25 FEB 91
RUN NO.: 1 CARB 430 (FORMALDEHYDE)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.84
OXYGEN CONTENT (%)	11.90
CARBON DIOXIDE CONTENT (%)	8.40
MOISTURE CONTENT (%)	8.345
STACK TEMPERATURE (deg F)	1580.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.83
VELOCITY PRESSURE (sq rt inches water)	0.14
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	15.48
EXHAUST GAS FLOW RATE (ACFM)	46,684.5
EXHAUST GAS FLOW RATE (DSCFM)	11,084.8

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	1.040
DRY GAS VOLUME SAMPLED (DSCF)	1.039
DRY GAS METER TEMPERATURE (deg F)	68.70
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.00
TOTAL RUN TIME (min)	30.00

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	2.00
FORMALDEHYDE MEASURED (ug/ml)	1.12
SOLUTION VOLUME (ml)	27.70

FORMALDEHYDE EMISSIONS DATA

CONCENTRATION (PPM,d, v/v)	0.848
EMISSIONS (lb/hr)	4.378E-02

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
 SOURCE: LANDFILL GAS FIRED FLARE STATION
 TEST DATE: 25 FEB 91
 RUN NO.: 1 CARB 421 (HCl and HF)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.88
OXYGEN CONTENT (%)	11.90
CARBON DIOXIDE CONTENT (%)	8.40
MOISTURE CONTENT (%)	7.887
STACK TEMPERATURE (deg F)	1550.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.83
VELOCITY PRESSURE (sq rt inches water)	0.12
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	13.59
EXHAUST GAS FLOW RATE (ACFM)	40,978.1
EXHAUST GAS FLOW RATE (DSCFM)	9,937.7

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	34.440
DRY GAS VOLUME SAMPLED (DSCF)	33.417
DRY GAS METER TEMPERATURE (deg F)	88.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.24
TOTAL RUN TIME (min)	120.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	103.30

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	60.50
HYDROGEN CHLORIDE (mg)	2.20
HYDROGEN FLUORIDE (mg)	0.33

EMISSIONS DATA

HCl (ppm,D,v/v)	1.5395
HCl (lb/hr)	8.654E-02
HF (ppm,D,v/v)	0.4209
HF (lb/hr)	1.298E-02

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
SOURCE: LANDFILL GAS FIRED FLARE STATION
TEST DATE: 26 FEB 91
RUN NO.: 2 CARB 429 (PAH - NAPHTHALENE)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.84
OXYGEN CONTENT (%)	11.90
CARBON DIOXIDE CONTENT (%)	8.50
MOISTURE CONTENT (%)	7.497
STACK TEMPERATURE (deg F)	1150.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.84
VELOCITY PRESSURE (sq rt inches water)	0.12
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	11.67
EXHAUST GAS FLOW RATE (ACFM)	35,182.4
EXHAUST GAS FLOW RATE (DSCFM)	10,682.7

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	59.430
DRY GAS VOLUME SAMPLED (DSCF)	58.124
DRY GAS METER TEMPERATURE (deg F)	83.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.28
TOTAL RUN TIME (min)	192.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	104.47

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	99.60
NOZZLE, PROBE & WASHES (mg)	0.9460
FILTER (mg)	0.0000

EMISSIONS DATA

FRONT HALF (gr/DSCF)	2.511E-04
(lb/hr)	2.300E-02
TOTAL (gr/DSCF)	2.511E-04
(lb/hr)	2.300E-02

KLEINFELDER, INC., DIAMOND BAR, CAL.

CLIENT: SIMI VALLEY LANDFILL
SOURCE: LANDFILL GAS FIRED FLARE STATION
TEST DATE: 26 FEB 91
RUN NO.: 2 CARB 421 (HCl and HF)

STANDARD TEMP.: 70 DEG F STANDARD PRESS.: 29.92 in HG

PLANT GAS FLOW DATA

STACK DIAMETER (inches)	96.00
STACK CROSS-SECTIONAL AREA (sq feet)	50.264
BAROMETRIC PRESSURE (inches Hg)	29.84
OXYGEN CONTENT (%)	11.60
CARBON DIOXIDE CONTENT (%)	8.50
MOISTURE CONTENT (%)	7.962
STACK TEMPERATURE (deg F)	1432.00
STACK STATIC PRESSURE (inches water)	-0.08
STACK GAS DRY MOLECULAR WEIGHT	29.83
VELOCITY PRESSURE (sq rt inches water)	0.12
PITOT TUBE CORRECTION FACTOR	0.840
VELOCITY (ft per sec)	12.34
EXHAUST GAS FLOW RATE (ACFM)	37,220.3
EXHAUST GAS FLOW RATE (DSCFM)	9,568.7

FIELD SAMPLING DATA

DRY GAS VOLUME METERED (DCF)	33.240
DRY GAS VOLUME SAMPLED (DSCF)	33.239
DRY GAS METER TEMPERATURE (deg F)	71.00
DRY GAS METER GAMMA	1.00
AVERAGE ORIFICE PRESSURE (inches water)	0.22
TOTAL RUN TIME (min)	120.00
NOZZLE DIAMETER (inches)	0.500
ISOKINETIC (%)	106.71

ANALYTICAL DATA

MOISTURE RECOVERED (mls)	60.80
HYDROGEN CHLORIDE (mg)	2.70
HYDROGEN FLUORIDE (mg)	0.37

EMISSIONS DATA

HCl (ppm, D, v/v)	1.8994
HCl (lb/hr)	1.028E-01
HF (ppm, D, v/v)	0.4744
HF (lb/hr)	1.409E-02

KLEINFELDER, INC.
Diamond Bar, California

ANALYZER CALIBRATION ERROR

Facility: Simi Valley Landfill

Date: 20 Feb 91

Source: Landfill Flare System

Operator: RPH

Location: Exhaust Stack

Time: 0910 - 1000

Run No. <u>1</u>	Specie	Full Scale	Cylinder Value	Analyzer Reading	Absolute Diff.	Diff. % Span
Zero	CO	100	0.0	0.0	0.0	0.00
Upscale		ppm	96.6	96.6	0.0	0.00
Zero	SO ₂	200	0.0	0.0	0.0	0.00
Upscale		ppm	192.0	192.5	0.5	0.25
Zero	NO _x	250	0.0	0.0	0.0	0.00
Upscale		ppm	239.0	239.0	0.0	0.00
Zero	O ₂	25	0.0	0.08	0.08	0.30
Upscale		%v	21.0	21.0	0.0	0.00
Zero	CO ₂	20	0.0	0.0	0.0	0.00
Upscale		%v	19.1	19.1	0.0	0.00

SUMMARY OF CEM DATA

Project Simi Valley Landfill

Date 20 February 1991

Sheet 1 of 1

Plant

Location	Exhaust Stack
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Operator Roland Hebert

Time	NOx 100 ppm		SO ₂ 200 ppm		CO 100 ppm		O ₂ 25% vol		CO ₂ 20% vol									
	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (%)	% Chart	Conc. (%)	% Chart	Conc.	% Chart	Conc.	% Chart	
1530-1535	14.0	14.0	1.0	2.0	1.0	1.0	48.5	12.1	40.0	8.0								
1535-1540	13.5	13.5	1.0	2.0	1.5	1.5	48.3	12.1	40.2	8.0								
1540-1545	12.0	12.0	1.0	2.0	1.3	1.3	48.3	12.1	40.5	8.1								
1545-1550	10.3	10.3	1.0	2.0	1.5	1.5	48.0	12.0	40.8	8.2								
1550-1555	7.5	7.5	1.0	2.0	1.3	1.3	48.5	12.1	40.8	8.2								
1555-1600	7.5	7.5	1.0	2.0	1.0	1.0	48.2	12.0	40.7	8.1								
1600-1605	7.5	7.5	1.0	2.0	1.2	1.2	48.5	12.1	40.0	8.0								
1605-1610	7.5	7.5	1.0	2.0	1.1	1.1	48.7	12.2	40.0	8.0								
1610-1615	8.4	8.4	1.0	2.0	1.0	1.0	48.7	12.2	40.0	8.0								
1615-1620	11.0	11.0	1.0	2.0	0.8	0.8	49.2	12.3	40.5	8.1								
1620-1625	11.0	11.0	1.0	2.0	0.5	0.5	48.6	12.2	40.5	8.1								
1625-1630	10.7	10.7	1.0	2.0	0.2	0.2	48.6	12.2	40.3	8.1								
1630-1635	10.5	10.5	1.0	2.0	<0.1	0.0	48.6	12.2	40.3	8.1								
1635-1640	10.5	10.5	1.0	2.0	<0.1	0.0	48.5	12.1	40.5	8.1								
1640-1645	10.8	10.8	1.0	2.0	<0.1	0.0	48.0	12.0	40.6	8.1								
1645-1650	10.5	10.5	1.0	2.0	<0.1	0.0	48.5	12.1	40.5	8.1								
1650-1655	10.0	10.0	1.0	2.0	<0.1	0.0	48.5	12.1	41.0	8.2								
1655-1700	10.4	10.4	1.0	2.0	<0.1	0.0	48.2	12.0	41.0	8.2								

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: Simi Valley Landfill

Date: 20 Feb 91

Source: Landfill Flare System

Operator: RPH

Location: Exhaust Stack

Time: 1530 - 1700

Run No. <u>01</u>	Specie	Full Scale	Initial Response	Final Response	Drift (% Span)
Zero	CO	100	0.7	-0.8	1.50
Upscale		ppm	97.0	95.4	1.60
Zero	SO ₂	200	0.0	0.0	0.00
Upscale		ppm	191.0	192.0	0.50
Zero	NO _x	100	0.0	0.0	0.00
Upscale		ppm	99.5	99.5	0.00
Zero	O ₂	25%	0.2	0.2	0.00
Upscale		vol	21.0	20.8	0.80
Zero	CO ₂	20%	0.0	0.0	0.00
Upscale		vol	19.1	19.1	0.00

KLEINFELDER, INC.
Diamond Bar, California
MOBILE EMISSIONS LABORATORY
CONTINUOUS EMISSIONS MONITORS DATA
CALIBRATION DRIFT CORRECTION

Project No. Simi Valley Landfill Source Name Landfill Flare System
Test Location Exhaust Stack Date 20 February 1991

Test No.	Parameter	$\bar{C}$	C_o	C_m	C_{ma}	C_{gas}
1	NOx	10.20	0.0	99.5	99.65	10.2
1	SO2	2.00	0.0	191.5	192.0	2.0
1	CO	0.69	-0.05	96.2	96.6	0.64
1	O2	12.12	0.2	20.9	21.0	12.1
1	CO2	8.1	0.0	19.1	19.1	8.1

$$C_{gas} = (\bar{C} - C_o) (C_{ma} / (C_m - C_o))$$

C_{gas} - corrected gas concentration, ppm or %vol(dry)

$\bar{C}$ - analyzer gas concentration, ppm or % vol(dry)

C_o - average of initial and final zero drift, ppm or % vol(dry)

C_m - average of initial and final span drift, ppm or %vol(dry)

C_{ma} - span gas cylinder concentration, ppm or %vol(dry)

KLEINFELDER, INC.
Diamond Bar, California

ANALYZER CALIBRATION ERROR

Facility: Simi Valley Landfill

Date: 21 Feb 91

Source: Landfill Flare System

Operator: RPH

Location: Exhaust Stack

Time: 0700 - 0730

Run No. _____	Specie	Full Scale	Cylinder Value	Analyzer Reading	Absolute Diff.	Diff. % Span
Zero	CO	100	0.0	0.0	0.0	0.00
Upscale		ppm	96.6	96.8	0.2	0.20
Zero	SO ₂	200	0.0	0.0	0.0	0.00
Upscale		ppm	192.0	192.0	0.0	0.00
Zero	NO _x	100	0.0	0.0	0.0	0.00
Upscale		ppm	99.6	99.6	0.0	0.00
Zero	O ₂	25%	0.0	0.18	0.18	0.70
Upscale		vol	21.0	21.0	0.0	0.00
Zero	CO ₂	20%	0.0	0.0	0.0	0.00
Upscale		vol	19.1	19.1	0.0	0.00

KLEINFELDER, INC.

Diamond Bar, California

SUMMARY OF CEM DATA

Project Simi Valley Landfill Date 21 February 1991 Sheet 1 of 1
 Plant Landfill Gas Fired Flare System Location Flare Exhaust Stack
 Operator Roland Hebert

Time	NOx 100 ppm		O ₂ %vol		SO ₂ ppm		CO 100 ppm		CO ₂ %vol									
	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (%)	% Chart	Conc.	% Chart	Conc.	% Chart	Conc.	% Chart	
0800-0805	16.0	16.0	48.0	12.0	1.0	2.0	5.7	5.7	40.5	8.1								
0805-0810	16.0	16.0	48.0	12.0	1.0	2.0	4.9	4.9	40.5	8.1								
0810-0815	16.0	16.0	48.0	12.0	1.0	2.0	5.0	5.0	40.5	8.1								
0815-0820	16.2	16.2	48.0	12.0	1.0	2.0	4.0	4.0	40.5	8.1								
0820-0825	16.2	16.2	48.3	12.1	1.0	2.0	4.0	4.0	40.0	8.0								
0825-0830	16.4	16.4	48.0	12.0	1.0	2.0	3.8	3.8	40.5	8.1								
0830-0835	16.0	16.0	48.3	12.1	1.0	2.0	4.1	4.1	40.3	8.1								
0835-0840	16.7	16.7	48.0	12.0	1.0	2.0	5.0	5.0	40.3	8.1								
0840-0845	16.5	16.5	48.2	12.0	1.0	2.0	4.5	4.5	41.0	8.2								
0845-0850	16.3	16.3	48.0	12.0	1.0	2.0	65.0	65.0	41.0	8.2								
0850-0855	16.3	16.3	48.3	12.1	1.0	2.0	4.0	4.0	40.5	8.1								
0855-0900	16.7	16.7	48.2	12.1	1.0	2.0	3.0	3.0	40.5	8.1								
0900-0905	16.4	16.4	48.3	12.1	1.0	2.0	2.6	2.6	40.5	8.1								
0905-0910	16.5	16.5	48.2	12.0	1.0	2.0	2.8	2.8	40.5	8.1								
0910-0915	16.6	16.6	48.5	12.1	1.0	2.0	3.1	3.1	40.5	8.1								
0915-0920	16.5	16.5	48.7	12.2	1.2	2.4	3.0	3.0	40.0	8.0								
0920-0925	16.5	16.5	48.8	12.2	1.2	2.4	3.2	3.2	40.5	8.1								
0925-0930	16.5	16.5	48.6	12.2	1.3	2.6	3.2	3.2	40.5	8.1								

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: Simi Valley Landfill

Date: 21 Feb 91

Source: Landfill Gas Flare

Operator: RPH

Location: Exhaust Stack

Time: 0720 - 0940

Run No. <u>2</u>	Specie	Full Scale	Initial Response	Final Response	Drift (% Span)
Zero	CO	100	0.0	1.0	1.00
Upscale		ppm	96.7	97.0	0.30
Zero	SO ₂	200	0.0	0.0	0.00
Upscale		ppm	192.0	192.0	0.00
Zero	NO _x	100	0.0	2.3	2.30
Upscale		ppm	99.6	99.6	0.00
Zero	O ₂	25%	0.2	0.0	0.80
Upscale		vol	21.0	20.9	0.40
Zero	CO ₂	20%	0.0	0.0	0.00
Upscale		vol	19.1	19.4	1.50

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: Simi Valley Landfill

Date: 21 Feb 91

Source: Landfill Flare System

Operator: RPH

Location: Exhaust Stack

Time: 0940 - 1240

Run No. <u>3</u>	Specie	Full Scale	Initial Response	Final Response	Drift (% Span)
Zero	CO	100	0.0	0.5	0.50
Upscale		ppm	97.0	98.0	1.00
Zero	SO ₂	200	0.0	-0.3	0.15
Upscale		ppm	192.0	192.0	0.00
Zero	NO _x	100	0.0	0.0	0.00
Upscale		ppm	99.6	99.6	0.00
Zero	O ₂	25%	0.0	0.0	0.00
Upscale		vol	21.0	21.2	1.00
Zero	CO ₂	20%	0.0	0.0	0.00
Upscale		vol	19.1	19.0	0.50

KLEINFELDER, INC.
Diamond Bar, California
MOBILE EMISSIONS LABORATORY
CONTINUOUS EMISSIONS MONITORS DATA
CALIBRATION DRIFT CORRECTION

Project No. Simi Valley Landfill Source Name Landfill Flare System
Test Location Exhaust Stack Date 21 February 1991

Test No.	Parameter	$\bar{C}$	C_o	C_m	C_{ma}	C_{gas}
2	NOx	16.35	1.15	99.6	99.6	15.4
2	SO2	2.08	0.00	192.0	192.0	2.1
2	CO	7.27	0.50	96.85	96.6	6.8
2	O2	12.07	0.10	20.95	21.0	12.1
2	CO2	8.10	0.00	19.25	19.1	8.0
3	NOx	17.44	0.00	99.6	99.6	17.4
3	SO2	2.13	-0.15	192.0	192.0	2.2
3	CO	1.22	0.22	97.5	96.6	1.0
3	O2	12.25	0.00	21.0	21.0	12.2
3	CO2	8.08	0.00	19.05	19.1	8.1

$$C_{gas} = (\bar{C} - C_o) (C_{ma} / (C_m - C_o))$$

C_{gas} - corrected gas concentration, ppm or %vol(dry)

$\bar{C}$ - analyzer gas concentration, ppm or % vol(dry)

C_o - average of initial and final zero drift, ppm or % vol(dry)

C_m - average of initial and final span drift, ppm or %vol(dry)

C_{ma} - span gas cylinder concentration, ppm or %vol(dry)

SUMMARY OF CEM DATA

Project Simi Valley Landfill

Date 21 February 1991

Sheet 1 of 1

Plant Landfill Gas Fired Flare System

Location	Exhaust Stack
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Operator Roland Hebert

[illegible]

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: Simi Valley Landfill

Date: 21 Feb 91

Source: Landfill Flare System

Operator: RPH

Location: Exhaust Stack

Time: 1245 - 1635

Run No. <u>4</u>	Specie	Full Scale	Initial Response	Final Response	Drift (% Span)
Zero	CO				
Upscale					
Zero	SO ₂				
Upscale					
Zero	NO _x				
Upscale					
Zero	O ₂	25%	0.0	0.0	0.00
Upscale		vol	21.0	21.0	0.00
Zero	CO ₂	20%	0.0	0.0	0.00
Upscale		vol	19.0	18.8	1.10

KLEINFELDER, INC.
Diamond Bar, California
MOBILE EMISSIONS LABORATORY
CONTINUOUS EMISSIONS MONITORS DATA
CALIBRATION DRIFT CORRECTION

Project No. Simi Valley Landfill Source Name Landfill Flare System

Test Location Exhaust Stack Date 21 February 1991

Test No.	Parameter	$\bar{C}$	C_o	C_m	C_{ma}	C_{gas}
4	CO2	8.41	0.00	18.9	19.1	8.5
4	O2	11.88	0.00	21.0	21.0	11.9

$$C_{gas} = (\bar{C} - C_o) (C_{ma} / (C_m - C_o))$$

C_{gas} - corrected gas concentration, ppm or %vol(dry)

$\bar{C}$ - analyzer gas concentration, ppm or % vol(dry)

C_o - average of initial and final zero drift, ppm or % vol(dry)

C_m - average of initial and final span drift, ppm or %vol(dry)

C_{ma} - span gas cylinder concentration, ppm or %vol(dry)

KLEINFELDER, INC.
City of Industry, California

ANALYZER CALIBRATION ERROR

Facility: SIMI VALLEY LANDFILL Date: 2/22/91
 Source: LANDFILL FLARE SYSTEM Operator: R. HEBERT
 Location: FLARE EXHAUST Time: 0720

Run No. <u>1</u>	Specie	Full Scale	Cylinder Value	Analyzer Reading	Absolute Diff.	Diff. ± Span
Zero	CO					
Upscale						
Zero	SO2					
Upscale						
Zero	NOx					
Upscale						
Zero	O2	25 %v	0.0	0.2	0.2	0.80
Upscale			21.0	21.0	0.0	0.00
Zero	CO2	20 %v	0.0	0.0	0.0	0.00
Upscale			19.1	19.1	0.0	0.00

KLEINFELDER, INC.

City of Industry, California

SUMMARY OF CEM DATA

Project Santa Valley Landfill Date 2/22/91 Sheet 1 of 1
 Plant LANDFILL FLARE SYSTEM Location FLARE EXHAUST
 Operator RPH

Time	NO		NO _x		SO ₂		CO		CO ₂		O ₂					
	Chart	Conc. (ppm)	Chart	Conc. (ppm)	Chart	Conc. (ppm)	Chart	Conc. (ppm)	Chart	Conc. (%)	Chart	Conc. (%)	Chart	Conc. (%)	Chart	Conc. (%)
0725-0730									42.5	8.5	47.0	11.8				
0730-0735									42.5	8.5	46.8	11.7				
0735-0740									42.5	8.5	46.8	11.7				
0740-0745									42.5	8.5	46.5	11.6				
0745-0750									43.0	8.6	46.0	11.5				
0750-0755									42.5	8.5	47.0	11.8				
0755-0800									43.0	8.6	46.0	11.5				
0800-0805									42.5	8.5	46.0	11.5				
0805-0810									42.5	8.5	46.5	11.6				
0810-0815									42.5	8.5	47.0	11.8				
0815-0820									43.0	8.6	46.0	11.5				
0820-0825									43.0	8.6	46.0	11.5				
0825-0830									42.5	8.5	46.1	11.5				
0830-0835									42.2	8.4	46.5	11.6				
0835-0840									42.5	8.5	46.5	11.6				
0840-0845									41.5	8.3	47.0	11.8				
0845-0850									41.5	8.3	46.8	11.7				
0850-0855									42.0	8.4	46.9	11.7				

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: SIMI VALLEY LANDFILL

Date: 2/22/91

Source: LANDFILL FLARE SYSTEM

Operator: RPH

Location: FLARE EXHAUST

Time: 1045

Run No. _____	Specie	Full Scale	Initial Response	Final Response	Drift (% Span)
Zero Upscale	CO				
Zero Upscale	SO ₂				
Zero Upscale	NO _x				
Zero Upscale	O ₂	25	0.2	0.08	0.12
		20	21.0	22.0	1.00
Zero Upscale	CO ₂	20	0.0	0.0	0.00
		20	19.1	19.5	0.40

KLEINFELDER, INC.
City of Industry, California

**SOURCE TEST VAN
CONTINUOUS EMISSIONS MONITOR DATA
CALIBRATION DRIFT CORRECTION**

Project No. SIMI VALLEY LANDFILL Source Name LANDFILL FLARE SYSTEM

Test Location FLARE EXHAUST Date 2/22/91

Test No.	Parameter	$\bar{C}$	C_0	C_m	C_{ms}	C_{gas}
1	O ₂	11.6	0.14	21.5	21.0	11.3
1	CO ₂	8.5	0.0	19.3	19.1	8.4

$$C_{gas} = (\bar{C} - C_0) (C_{ms} / (C_m - C_0))$$

C_{gas} - corrected gas concentration, ppm or %vol(dry)

$\bar{C}$ - analyzer gas concentration, ppm or % vol(dry)

C_0 - average of initial and final zero drift, ppm or % vol(dry)

C_m - average of initial and final span drift, ppm or %vol(dry)

C_{ms} - span gas cylinder concentration, ppm or %vol(dry)

KLEINFELDER, INC.
City of Industry, California

ANALYZER CALIBRATION ERROR

Facility: SIMI VALLEY LANDFILL Date: 2/22/91
Source: LANDFILL FLARE SYSTEM Operator: RPH
Location: FLARE EXHAUST Time: 1255

Run No. —	Specie	Full Scale	Cylinder Value	Analyzer Reading	Absolute Diff.	Diff. ± Span
Zero	CO					
Upscale						
Zero	SO2					
Upscale						
Zero	NOx					
Upscale						
Zero	O2	25 %V	0.0	0.08	0.08	0.32
Upscale			21.0	21.6	0.0	0.00
Zero	CO2	20 %V	0.0	0.0	0.0	0.00
Upscale			19.1	19.2	0.1	0.50 0.50

KLEINFELDER, INC.

City of Industry, California

SUMMARY OF CEM DATA

Project Santa Valley Landfill Date 2-22/91 Sheet 1 of 2
 Plant Santa Valley Location FARE EXHAUST
 Operator RPH

Time	NO		NO _x		SO ₂		CO		CO ₂		O ₂					
	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (%)	% Chart	Conc. (%)	% Chart	Conc. (%)	% Chart	Conc. (%)
1300 - 1305								42.0	8.4	48.0	12.0					
1305 - 1310								41.0	8.2	48.0	12.0					
1310 - 1315								42.0	8.4	47.5	11.9					
1315 - 1320								42.5	8.5	47.5	11.9					
1320 - 1325								41.5	8.3	47.5	11.9					
1325 - 1330								42.0	8.4	47.5	11.9					
1330 - 1335								41.5	8.3	47.0	11.8					
1335 - 1340								41.5	8.3	47.5	11.9					
1340 - 1345								41.5	8.3	47.5	11.9					
1345 - 1350								41.0	8.2	48.0	12.0					
1350 - 1355								41.0	8.2	47.5	11.9					
1355 - 1400								41.0	8.2	47.5	11.9					
1400 - 1405								41.5	8.3	48.0	12.0					
1405 - 1410								42.5	8.5	47.5	11.9					
1410 - 1415								42.0	8.4	47.5	11.9					
1415 - 1420								41.0	8.2	47.5	11.9					
1420 - 1425								41.0	8.2	47.5	11.9					
1425 - 1430								42.0	8.4	47.5	11.9					

SUMMARY OF CEM DATA

Project SUN VALLEY LANDFILL Date 2/22/91 Sheet 2 of 2
Plant SUN VALLEY Location FLARE EXHAUST
Operator RPH

[illegible]

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: SIMI VALLEY LANDFILL

Date: 3/22/91

Source: LANDFILL FLARE SYSTEM

Operator: RPH

Location: FLARE EXHAUST

Time: 1613

Run No. _____	Specie	Full Scale	Initial Response	Final Response	Drift (% Span)
Zero Upscale	CO				
Zero Upscale	SO ₂				
Zero Upscale	NO _x				
Zero Upscale	O ₂	25 %V	0.08	0.0	0.08
			21.0	21.2	0.20
Zero Upscale	CO ₂	20 %V	0.0	0.0	0.00
			19.2	19.1	0.10

KLEINFELDER, INC.
City of Industry, California

**SOURCE TEST VAN
CONTINUOUS EMISSIONS MONITOR DATA
CALIBRATION DRIFT CORRECTION**

Project No. _____ Source Name _____

Test Location _____ Date _____

Test No.	Parameter	$\bar{C}$	C_0	C_m	C_{m0}	C_{gas}
1	O ₂	11.9	0.04	21.10	21.0	11.8
1	CO ₂	8.3	0.00	19.15	19.1	8.3

$$C_{gas} = (\bar{C} - C_0) (C_{m0} / (C_m - C_0))$$

- C_{gas} - corrected gas concentration, ppm or %vol(dry)
- $\bar{C}$ - analyzer gas concentration, ppm or % vol(dry)
- C_0 - average of initial and final zero drift, ppm or % vol(dry)
- C_m - average of initial and final span drift, ppm or %vol(dry)
- C_{m0} - span gas cylinder concentration, ppm or %vol(dry)

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: SIMI VALLEY LANDFILL

Date: 2/25/91

Source: LANDFILL FLARE SYSTEM

Operator: RPH

Location: FLARE EXHAUST

Time: 1242

Run No. _____	Specie	Full Scale	Initial Response	Final Response	Drift (% Span)
Zero Upscale	CO				
Zero Upscale	SO ₂				
Zero Upscale	NO _x				
Zero Upscale	O ₂	25 7.1V	0.0	0.0	0.00
			21.0	23.25	2.25
Zero Upscale	CO ₂	20 7.1V	0.0	0.0	0.0
			19.1	19.4	0.3

KLEINFELDER, INC.

City of Industry, California

SUMMARY OF CEM DATA

Project Santa Valley Landfill

Date 2/25/91

Sheet 1 of 1

Plant Santa Valley

Location PURE EXHAUST

Operator _____

Time	NO		NO _x		SO ₂		CO		CO ₂		O ₂					
	Chart	Conc. (ppm)	Chart	Conc. (ppm)	Chart	Conc. (ppm)	Chart	Conc. (ppm)	Chart	Conc. (%)	Chart	Conc. (%)	Chart	Conc. (%)	Chart	Conc. (%)
1140 - 1145									42.5	9.5	47.5	11.9				
1145 - 1150									43.0	9.6	47.5	11.9				
1150 - 1155									43.0	8.6	47.8	12.0				
1155 - 1200									42.3	8.5	48.0	12.0				
1200 - 1205									42.0	8.4	48.0	12.0				
1205 - 1210									42.5	8.5	49.5	12.1				
1210 - 1215									42.5	8.5	48.8	12.2				
1215 - 1220									42.5	8.5	49.5	12.4				
1220 - 1225									42.0	8.4	49.5	12.4				
1225 - 1230									42.0	8.4	50.3	12.6				
1230 - 1235									42.0	8.4	50.0	12.5				
1235 - 1240									42.0	8.4	50.5	12.6				
1240 - 1245									42.0	9.4	50.5	12.6				
1245 - 1250									43.0	8.6	51.3	12.8				
1250 - 1255									43.0	8.6	50.0	12.5				
1255 - 1300									43.0	8.6	51.0	12.8				
1300 - 1305									42.5	9.5	51.0	12.8				

KLEINFELDER, INC.
City of Industry, California

ANALYZER CALIBRATION ERROR

Facility: SIMI VALLEY LANDFILL

Date: 2/25/91

Source: LANDFILL FLARE SYSTEM

Operator: RPH

Location: FLARE EXHAUST

Time: 1034

Run No. —	Specie	Full Scale	Cylinder Value	Analyzer Reading	Absolute Diff.	Diff. % Span
Zero	CO					
Upscale						
Zero	SO ₂					
Upscale						
Zero	NO _x					
Upscale						
Zero	O ₂	25 %V	0.0	0.0	0.0	0.00
Upscale			21.0	21.0	0.0	0.00
Zero	CO ₂	20 %V	0.0	0.0	0.0	0.00
Upscale			19.1	19.1	0.0	0.00

KLEINFELDER, INC.
City of Industry, California

SOURCE TEST VAN
CONTINUOUS EMISSIONS MONITOR DATA
CALIBRATION DRIFT CORRECTION

Project No. SIMI VALLEY LANDFILL Source Name LANDFILL FLARE SYSTEM

Test Location FLARE EXHAUST Date 2/25/91

Test No.	Parameter	$\bar{C}$	C_0	C_m	C_{ms}	C_{gas}
1	O ₂	12.4	0.0	22.1	21.0	11.9
1	CO ₂	8.5	0.0	19.3	19.1	8.4

$$C_{gas} = (\bar{C} - C_0) (C_{ms} / (C_m - C_0))$$

C_{gas} - corrected gas concentration, ppm or %vol(dry)

$\bar{C}$ - analyzer gas concentration, ppm or % vol(dry)

C_0 - average of initial and final zero drift, ppm or % vol(dry)

C_m - average of initial and final span drift, ppm or %vol(dry)

C_{ms} - span gas cylinder concentration, ppm or %vol(dry)

KLEINFELDER, INC.
City of Industry, California

ANALYZER CALIBRATION ERROR

Facility: SANTA VALLEY LANDFILL

Date: 2/26/91

Source: LANDFILL FLARE SYSTEM

Operator: RPH

Location: FLARE EXHAUST

Time: 0732

Run No. ____	Specie	Full Scale	Cylinder Value	Analyzer Reading	Absolute Diff.	Diff. ± Span
Zero	CO					
Upscale						
Zero	SO ₂					
Upscale						
Zero	NO _x					
Upscale						
Zero	O ₂	25	0.0	0.1	0.1	0.40
Upscale			21.0	21.0	0.0	0.00
Zero	CO ₂	20	0.0	0.0	0.0	0.00
Upscale			19.1	19.1	0.0	0.00

KLEINFELDER, INC.
City of Industry, California
SUMMARY OF CEM DATA

Project Simi Valley Landfill Date 2/26/71 Sheet 1 of 1
 Plant Simi Valley Location FLARE EXHAUST
 Operator RPH

Time	NO		NO _x		SO ₂		CO		CO ₂		O ₂							
	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (%)	% Chart	Conc. (%)	% Chart	Conc. (%)	% Chart	Conc. (%)	% Chart	Conc. (%)
0710 - 0715									43.0	8.6	46.5	11.6						
0715 - 0720									43.0	8.6	46.5	11.6						
0720 - 0725									43.0	8.6	46.5	11.6						
0725 - 0730									42.5	8.5	46.5	11.6						
0730 - 0735									42.5	8.5	46.5	11.6						
0735 - 0740									42.5	8.5	47.0	11.8						
0740 - 0745									42.0	8.4	46.5	11.6						
0745 - 0750									41.5	8.3	47.0	11.8						
0750 - 0755									42.3	8.5	46.5	11.6						
0755 - 0800									43.0	8.6	46.5	11.6						
0800 - 0810	CALIBRATION																	
0810 - 0815									42.5	8.5	46.5	11.6						
0815 - 0820									42.5	8.5	47.0	11.8						
0820 - 0825									42.5	8.5	46.0	11.5						
0825 - 0830									43.0	8.6	46.0	11.5						
0830 - 0835									42.0	8.4	47.5	11.9						
0835 - 0840									42.5	8.5	46.5	11.6						
0840 - 0845									42.5	8.5	46.5	11.6						

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: SIMI VALLEY LANDFILL

Date: 2/26/91

Source: LANDFILL FLARE SYSTEM

Operator: RPH

Location: FLARE EXHAUST

Time: 0703-0807

Run No. _____	Specie	Full Scale	Initial Response	Final Response	Drift (% Span)
Zero Upscale	CO				
Zero Upscale	SO ₂				
Zero Upscale	NO _x				
Zero Upscale	O ₂	25 %V	0.0	0.1	0.00
			21.0	20.9	- 0.10
Zero Upscale	CO ₂	20 %V	0.0	0.0	0.00
			19.1	19.1	0.00

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: SIMI VALLEY LANDFILL

Date: 2/26/91

Source: LANDFILL FLARE SYSTEM

Operator: RPH

Location: FLARE EXHAUST

Time: 0807-0955

Run No. _____	Specie	Full Scale	Initial Response	Final Response	Drift (% Span)
Zero Upscale	CO				
Zero Upscale	SO ₂				
Zero Upscale	NO _x				
Zero Upscale	O ₂	25% 9.0V	0.1	0.1	0.00
			20.9	21.0	0.10
Zero Upscale	CO ₂	20% 9.0V	0.0	0.0	0.00
			19.1	19.1	0.00

KLEINFELDER, INC.
City of Industry, California
SOURCE TEST VAN
CONTINUOUS EMISSIONS MONITOR DATA
CALIBRATION DRIFT CORRECTION

Project No. SIMI VALLEY LANDFILL Source Name LANDFILL FLARE SYSTEM

Test Location FLARE EXHAUST Date 2/26/91

Test No.	Parameter	$\bar{C}$	C_0	C_s	C_m	C_{gas}
1	O ₂	11.6	0.1	20.95	21.0	11.6
1	CO ₂	8.5	0.0	19.1	19.1	8.5

$$C_{gas} = (\bar{C} - C_0) (C_m / (C_s - C_0))$$

C_{gas} - corrected gas concentration, ppm or %vol(dry)

$\bar{C}$ - analyzer gas concentration, ppm or % vol(dry)

C_0 - average of initial and final zero drift, ppm or % vol(dry)

C_s - average of initial and final span drift, ppm or %vol(dry)

C_m - span gas cylinder concentration, ppm or %vol(dry)

KLEINFELDER, INC.
City of Industry, California

ANALYZER CALIBRATION ERROR

Facility: SIMI VALLEY LANDFILL Date: 2/26/91
Source: LANDFILL FLARE SYSTEM Operator: RPH
Location: FLARE EXHAUST Time: 0955

Run No. —	Specie	Full Scale	Cylinder Value	Analyzer Reading	Absolute Diff.	Diff. ± Span
Zero	CO					
Upscale						
Zero	SO2					
Upscale						
Zero	NOx					
Upscale						
Zero	O2	25 %V	0.0	0.1	0.1	0.40
Upscale			21.0	21.0	0.0	0.00
Zero	CO2	20 %V	0.0	0.0	0.0	0.00
Upscale			19.1	19.1	0.0	0.00

KLEINFELDER, INC.

City of Industry, California

SUMMARY OF CEM DATA

Project Santa Valley Landfill Date 2/26/91 Sheet 1 of 2
 Plant Santa Valley Location FLARE EXHAUST
 Operator RPH

Time	NO		NO _x		SO ₂		CO		CO ₂		O ₂					
	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (ppm)	% Chart	Conc. (%)	% Chart	Conc. (%)	% Chart	Conc.	% Chart	Conc.
1005 - 1010									42.5	9.5	47.5	11.9				
1010 - 1015									42.5	9.5	46.9	11.7				
1015 - 1020									42.0	8.4	46.8	11.8				
1020 - 1025									42.0	8.4	47.0	11.8				
1025 - 1030									42.0	8.4	47.0	11.8				
1030 - 1035									42.5	8.5	47.0	11.8				
1035 - 1040									43.0	8.6	47.0	11.8				
1040 - 1045									42.5	8.5	47.3	11.8				
1045 - 1050									42.0	8.4	47.8	12.0				
1050 - 1055									43.0	8.6	47.5	11.9				
1055 - 1100									42.5	8.5	47.3	11.8				
1100 - 1105									42.5	8.5	47.5	11.9				
1105 - 1110									42.5	8.5	47.5	11.9				
1110 - 1115									42.5	8.5	47.5	11.9				
1115 - 1120									43.0	8.6	47.5	11.9				
1120 - 1125									42.3	8.5	47.5	11.9				
1125 - 1130									42.5	8.5	48.1	12.0				
1130 - 1135									43.0	8.6	48.0	12.0				

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: SIMI VALLEY LANDFILL

Date: 2/26/91

Source: LANDFILL FLARE SYSTEM

Operator: RPH

Location: FLARE EXHAUST

Time: 0955-1145

Run No. _____	Specie	Full Scale	Initial Response	Final Response	Drift (% Span)
Zero Upscale	CO				
Zero Upscale	SO ₂				
Zero Upscale	NO _x				
Zero Upscale	O ₂	25 %V	0.1	0.25	0.15
			21.0	21.25	0.25
Zero Upscale	CO ₂	20 %V	0.0	0.0	0.00
			19.1	19.4	0.3

KLEINFELDER, INC.
Diamond Bar, California

CALIBRATION DRIFT TEST

Facility: SIMI VALLEY LANDFILL

Date: 2/26/91

Source: LANDFILL FLARE SYSTEM

Operator: RPH

Location: FLARE EXHAUST

Time: 1145-1205

Run No. _____	Specie	Full Scale	Initial Response	Final Response	Drift (± Span)
Zero Upscale	CO				
Zero Upscale	SO ₂				
Zero Upscale	NO _x				
Zero Upscale	O ₂	25 %V	0.25	0.25	0.00
			21.0	21.0	0.00
Zero Upscale	CO ₂	20 %V	0.0	0.0	0.00
			19.0	19.0	0.10

City of Industry, California

SUMMARY OF CEM DATA

Project

Plant

Operator

Date _____

LocationSheet
of

of

[illegible]

KLEINFELDER, INC.

EXAMPLE CALCULATIONS

METHODS 1 THROUGH 4

Plant: SIMI VALLEY Date: 2/20/91
Location: FLARE OUTLET Run No: 1- CANS 5

STANDARD CONDITIONS

Temperature T_{std} 70 °F Pressure P_{std} 29.92 "Hg

METER VOLUME CORRECTED FOR LEAK

$$V_m = (V_m) - (L_i - L_a) (T_i)$$
$$V_m = () - () () \quad \text{N/A}$$
$$V_m = \text{ft}^3$$

STANDARD METER VOLUME, DRY

$$V_{m_{std}} = (V_m) (Y) \frac{T_{std}}{T_m} \frac{(P_b + H/13.6)}{P_{std}}$$

$$V_{m_{std}} = (28.29) (1.004) \frac{(530)}{(51.2)} \frac{(30.02 + 0.27 / 13.6)}{(29.92)}$$

$$V_{m_{std}} = \underline{27.42} \text{ ft}^3$$

WATER CONTENT OF GAS

Water in Sample

$$V_{w_{std}} = (0.0000894) (T_{std}) (V_{lc})$$

$$V_{w_{std}} = (0.0000894) (530) (53.6)$$

$$V_{w_{std}} = \underline{2.54} \text{ ft}^3$$

Water in Stack Gas

$$B_{wo} = 100 (V_{w_{std}}) / (V_{w_{std}} + V_{m_{std}})$$

$$B_{wo} = (100) (2.54) / (2.54 + 27.42)$$

$$B_{wo} = \underline{8.47} \% \text{vol}$$

Saturation Water Volume

$$V_{\text{sat}} = \exp(3.725253 + 0.006364(T_s) - (2078115/T_s^2))$$

$$V_{\text{sat}} = \exp(3.725253 + 0.006364(\quad) - 2078115/(\quad)^2)$$

$$V_{\text{sat}} = \quad \text{"Hg}$$

$$B_{\text{sat}} = V_{\text{sat}}(100)/P_b$$

$$B_{\text{sat}} = (\quad)(100)/(\quad)$$

$$B_{\text{sat}} = \quad \% \text{vol}$$

W/A

Use smaller value of Bwo or Bsat in all calculations asking for Bwo.

DRY GAS MOLECULAR WEIGHT

$$MW_d = 0.32(\%O_2) + 0.44(\%CO_2) + 0.28(\%CO + \%N_2)$$

$$MW_d = 0.32(12.1) + 0.44(8.1) + 0.28(0 + 79.8)$$

$$MW_d = \underline{29.78} \text{ lb/mole}$$

WET GAS MOLECULAR WEIGHT

$$MW_w = MW_d(1 - Bwo/100) + 18(Bwo/100)$$

$$MW_w = (29.78)(1 - 8.47/100) + 18(8.47/100)$$

$$MW_w = \underline{28.78} \text{ lb/mole}$$

STACK GAS VELOCITY

$$V_s = 85.48(C_p)(P)(T_s/(MW_w)(P_b + P_s/13.6))^{0.5}$$

$$V_s = 85.48(0.84)(0.131) \left(\frac{2031}{(28.78)(20.02 + (-0.08)/13.6)} \right)^{0.5}$$

$$V_s = \underline{14.42} \text{ ft/sec}$$

STACK CROSS-SECTIONAL AREA

Circular Stacks

$$A_s = (3.1416)(D_s^2)/576$$

$$A_s = 3.1416 (96)^2/576$$

$$A_s = \underline{50.264} \text{ ft}^2$$

Rectangular Stacks

$$A_s = (L)(W)/144$$

$$A_s = (\quad)(\quad)/144 \quad \text{in}^2$$

$$A_s = \underline{\hspace{2cm}} \text{ ft}^2$$

VOLUMETRIC FLOW AT STACK CONDITIONS

$$Q_a = (V_s)(A_s)(60)$$

$$Q_a = (14.42)(50.264)(60)$$

$$Q_a = \underline{43498} \text{ ACFM}$$

VOLUMETRIC FLOW AT WET STANDARD CONDITIONS

$$Q_{sw} = \frac{(Q_a)(T_{std})}{T_s} \frac{(P_b + P_s/13.6)}{P_{std}}$$

$$Q_{sw} = \frac{(43498)(530)}{(2031)} \frac{(30.12 + 0.08/13.6)}{(29.92)}$$

$$Q_{sw} = \underline{11125} \text{ SCFM,W}$$

VOLUMETRIC FLOW AT DRY STANDARD CONDITIONS

$$Q_{sd} = Q_{sw} (1 - B_{wo}/100)$$

$$Q_{sd} = (11125)(1 - 8.47/100)$$

$$Q_{sd} = \underline{10183} \text{ SCFM,D}$$

NOMENCLATURE

		<u>Units</u>
An	cross-sectional area of nozzle	ft ²
As	cross-sectional area of stack	ft ²
Bsat	saturation volume of water at stack temperature	%vol
Bwo	moisture content of stack gas	%vol
Cp	pitot tube calibration coefficient	
Ds	stack diameter	inch
L	length of rectangular duct	inch
La	maximum allowable leak rate	CFM
Li	observed leak rate	CFM
MWd	dry molecular weight of stack gas	lb/mole
MWw	wet molecular weight of stack gas	lb/mole
Pb	barometric pressure	"Hg
Ps	static pressure of stack gas	"H ₂ O
Pstd	standard pressure	"Hg
Qa	stack gas volumetric flow, stack conditions	CFM
Qsd	stack gas volumetric flow, dry standard condition	CFM
Qsw	stack gas volumetric flow, wet standard condition	CFM
Ti	total test time	min
Tm	dry gas meter temperature	°R
Ts	stack temperature	°R
Tstd	standard temperature	°R
Vlc	volume of liquid collected	mls
Vm	gas volume at meter condition	ft ³
Vm _{std}	gas volume at dry standard condition	ft ³
Vs	stack gas velocity	fps
Vsat	saturated vapor pressure of water	"Hg
Vw _{std}	water volume at standard conditions	ft ³
W	width of rectangular duct	inch
Y	accuracy of dry gas meter	
H	orifice differential pressure	"H ₂ O
P	velocity pressure head(average of square roots)	"H ₂ O ^{0.5}
%CO	carbon monoxide content of stack gas	%vol
%CO ₂	carbon dioxide content of stack gas	%vol
%N ₂	nitrogen content of stack gas	%vol
%O ₂	oxygen content of stack gas	%vol

KLEINFELDER, INC.
EXAMPLE CALCULATIONS
METHOD 5

Plant: _____ Date: _____

Location: _____ Run No.: _____

STANDARD CONDITIONS

Temperature T_{std} _____ °F Pressure P_{std} _____ "Hg

ISOKINETIC VARIATION

$$I = \frac{49.8667 (V_{mstd}) (T_s)}{(T_i)(P_b + P_s/13.6)(V_s)(A_n)(1 - B_{wo}/100)(T_{std})}$$

$$I = \frac{49.8667 (27.42) (203)}{(96) (30.02 + 0.02/13.6) (0.0014) (1442) (1 - 8.47/100) (530)}$$

$$I = \underline{101.0} \%$$

LABORATORY RESULTS(mg)

	<u>Actual</u>	<u>Water</u>	<u>Acetone</u>	<u>MeCl</u>
Front Half				
Filter				
Back Half				

PARTICULATE CONCENTRATION

Dry Standard Conditions

$$C_{sd} = 0.01543 (W_p) / (V_{mstd})$$

$$C_{sd} = 0.01543 (48.4) / (27.42)$$

$$C_{sd} = \underline{0.0272} \text{ gr/DSCF}$$

Wet Standard Conditions

$$C_{sw} = C_{sd} (1 - B_{wo}/100)$$

$$C_{sw} = (.0212)(1 - 8.47/100)$$

$$C_{sw} = \underline{0.0249} \text{ gr/WSCF}$$

Actual Stack Conditions

$$C_a = \frac{(C_{sd}) (T_{std}) (P_b + P_s/13.6) (1 - B_{wo}/100)}{(T_s) (P_{std})}$$

$$C_a = \frac{(.0212) \left(\frac{530}{2031} \right) (30.02 + 0.08/13.6) (1 - 8.47/100)}{(2992)}$$

$$C_a = \underline{0.0065} \text{ gr/ACF}$$

PARTICULATE EMISSION RATE

$$E_p = (C_{sd}) (60) (Q_{sd}) / 7000$$

$$E_p = (.0212)(60)(10183)/7000$$

$$E_p = \underline{2.37} \text{ lb/hr}$$

NOMENCLATURE

		<u>Units</u>
An	cross-sectional area of nozzle	ft ²
Bwo	moisture content of stack gas	%vol
Ca	particulate concentration at stack condition	gr/ft ³
Csd	concentration at dry standard condition	gr/ft ³
Csw	concentration at wet standard condition	gr/ft ³
Ep	particulate emission rate	lb/hr
I	isokinetic variation	%
Pb	barometric pressure	"Hg
Ps	static pressure of stack gas	"H ₂ O
Pstd	standard pressure	"Hg
Qsd	stack gas volumetric flow, dry std condition	CFM
Ti	total test time	min
Ts	stack temperature	°R
Tstd	standard temperature	°R
V _{mstd}	gas volume at dry standard condition	ft ³
Vs	stack gas velocity	fps
Wp	weight of particulate matter collected	mg

KLEINFELDER, INC.
Diamond Bar, California

TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 24 Jul 90 Thermocouple No. 1
 Barometric Pressure 29.22 in. Hg Ambient Temperature 74 °F
 Calibrated by RPH Reference: Mercury in glass ☒
 Other _____

Reference Point Number	Source (Specify)	Reference Thermometer Temperature (° F)	Thermocouple Potentiometer Temperature (° F)	Difference ±
1	AMBIENT	68	67	0.19
2	ICE WATER	33	33	0.00
3	HOT WATER	208	207	0.15
4	HOT OIL	410	408	0.23

$$\text{Diff.} = \frac{(\text{Ref. Temp} + 460) - (\text{Test Temp} + 460)}{(\text{Ref. Temp.} + 460)} \times 100$$

KLEINFELDER, INC.
City of Industry, California

METER BOX CALIBRATION DATA

Meter Box No. 1

Date 24 JUL 90

Barometric Pressure(Pb) 29.22

Calibrated by Raff

Orifice Manometer (in. H ₂ O) H	Gas Volume		Temperatures		Time (min) T _i	Y _i	H _g _i
	Wet Test Meter (ft ³) V _w	Dry Gas Meter (ft ³) V _d	Wet Test Meter (deg F) T _w	Dry Gas Meter (deg F) T _d			
0.5	5.000	5.087	68	80	12.39	1.004	1.72
1.0	5.000	5.085	68	81	8.87	1.005	1.76
1.5	5.000	5.107	68	83	7.38	1.003	1.82
2.0	5.000	5.115	68	85	6.49	1.004	1.87
3.0	10.000	10.241	68	87	10.53	1.004	1.84
4.0	10.000	10.262	68	90	9.02	1.005	1.79
Avg						1.004	1.80

H	$Y_i = \frac{(V_w) (P_b) (T_d + 460)}{(V_d) (P_b + H/13.6) (T_w + 460)}$	$H_{g_i} = \frac{(0.0317) (H)}{(P_b) (T_d + 460)} \left[\frac{(T_w + 460) (T_i)}{V_w} \right]^2$
0.5		
1.0		
1.5		
2.0		
3.0		
4.0		

Each individual Y_i must be within 0.02 of the average Y
 Each individual H_g_i must be within 0.15 of the average H_g

KLEINFELDER, INC.
City of Industry, California

POST TEST METER BOX CALIBRATION FORM

Meter Box No. D817C Date 12/31/90 Calibrated by Jon K

Barometric Pressure 30.10 Ambient Temp 75 Pre Test Y_1 _____

Project Name BFI Azusa Project No. _____ Hrun _____ Vac 2.0

Orifice Manometer (in. H ₂ O) H	Gas Volume		Temperatures		Time (min) T_1	Y_1	H_{E1}
	Wet Test Meter (ft ³) V_w	Dry Gas Meter (ft ³) V_d	Wet Test Meter (° F) T_w	Dry Gas Meter (° F) T_d			
1.00	5.634	5.505	72	76	10	1.0286	1.75
1.00	5.591	5.510	71.5	85	10	1.0379	1.75
1.00	5.588	5.620	71.5	89	10	1.0245	1.74
						Y_1 AVG 1.0303	

METER BOX CALIBRATION HISTORY

Last Calibration Date _____ Calibrated by _____

$H_{\odot}$ of Calibration _____ Y_1 of Calibration _____

Scott Specialty Gases

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

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

Shipped From: Scott SAN BERNARDINO, CA
Date Shipped 2/14/90
Our Project No: 4842
Your PQ. No: 71Y10001-001
Page 1 of 1
Expiration Date: 8/91

CERTIFICATE OF ANALYSIS—EPA PROTOCOL GASES*

Certified Per Traceability Protocol No. 1 Procedure No. G1
Cylinder No. ALM-11742 Cylinder Pressure 1900 psig Certified Accuracy ±1% % NBS Traceable

REFERENCE STD

COMPONENTS	CERTIFIED CONC	SRM/CRM NO.	CYL NO.	CONC.	MAKE/MODEL/SERIAL NO.	LAST CAL. DATE	ANALYTICAL PRINCIPLE
NITRIC OXIDE	238.4 ppm	CRM 1685 B	CAL-5841	236 ppm	THERMO-ELECTRON 10 AR 14853-150	11/10/89	CHEMI-LUMINESCENT
NOx	238.9 ppm						

GAS ANALYZER

MAKE/MODEL/SERIAL NO.	LAST CAL. DATE	ANALYTICAL PRINCIPLE
THERMO-ELECTRON 10 AR 14853-150	11/10/89	CHEMI-LUMINESCENT

BALANCE GAS

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

Component NITRIC OXIDE

First Analysis Date	L/25/90	Units	ppm
Z 0.00	R 94.40		T 95.48
R 94.34	Z 0.03		T 95.38
Z 0.03	T 95.50		R 94.35
Mean Test Assay			238.7 ppm

Mean Test Assay

Second Analysis	Date	2/1/90	Units	ppm
Z	0.00	R	94.42	T 95.30
R	94.25	Z	0.01	T 95.20
Z	0.00	T	95.19	R 94.10
Mean Test Assay				238.4 ppm

Mean Test Assay 238.4 ppm

Chronology: Date _____
Assay _____

Component _____

Date _____ Units _____

Z _____ R _____ T _____

R _____ Z _____ T _____

Z _____ T _____ R _____

Mean Test Assay _____

Mean Test Assay

Date _____ Units _____

Z _____ R _____ T _____

R _____ Z _____ T _____

Z _____ T _____ R _____

Menn Test Assy

Men's Test Essay

Component

Date	Units
Z	R
R	Z
Z	T
	R

Mean Test Assay

Mean Test Assay

Date _____ Units _____

Z _____ R _____ T _____

R _____ Z _____ T _____

Z _____ T _____ R _____

Mean Test Assay

Mean Test Assay

Analyst LEE OLDHAM

Approved By: G. S. Leach



Scott Specialty Gases

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

KLEINFELDER

TELEX: 510-100-8831 (SciGas)
FAX: 714-887-0549
a division of PHONE: 714-887-2571

Shipped From: Scott SAN BERNARDINO, CA
Date Shipped 2/14/90
Our Project No: 4842
Your PO No: 71Y10001-001
Page 1 of 1
Expiration Date: 8/91

CERTIFICATE OF ANALYSIS - EPA PROTOCOL GASES*

Certified Per Traceability Protocol No. 1 Procedure No. GL

Cylinder No. ALM-11729

Cylinder Pressure 1900 PSIG

Certified Accuracy $\pm 1\%$ % NBS Traceable

REFERENCE STD

COMPONENTS	CERTIFIED CONC	SRM/CRM NO.	CYL. NO.	CONC.
NITRIC OXIDE	99.52 ppm	CRM 1684B	ALM-3640	97.28 ppm
NOX	99.65 ppm			

GAS ANALYZER

MAKE/MODEL/SERIAL NO.	LAST CAL. DATE	ANALYTICAL PRINCIPLE
THERMO-ELECTRON 10 AR 14853-150	11/10/89	CHEMI-LUMINESCENT

BALANCE GAS NITROGEN

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

Component	NITRIC OXIDE
First Analysis Date	1/25/90
Z	0.00 R 97.29 T 99.50
R	97.20 Z 0.04 T 99.40
Z	0.00 T 99.50 R 97.28
Mean Test Assay	99.49 ppm
Second Analysis Date	2/1/90
Z	0.00 R 97.30 T 99.50
R	97.26 Z 0.06 T 99.49
Z	0.06 T 99.50 R 97.20
Mean Test Assay	99.52 ppm

Component	Date	Units
Z		R
R		Z
Z		T
Mean Test Assay		
Date		Units
Z		R
R		Z
Z		T
Mean Test Assay		

Component	Date	Units
Z		R
R		Z
Z		T
Mean Test Assay		
Date		Units
Z		R
R		Z
Z		T
Mean Test Assay		

Chronology: Date _____
Assay _____

Analyst LEE OLDFHAM

Approved By: R. Steady



Scott Specialty Gases

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

TELEX: 510-100-8831 (ScolGas)

FAX: 714-887-0549

PHONE: 714-887-2571

a division of

Shipped From: SAN BERNARDINO, CA

Date Shipped: 2/14/90

Our Project No: 4842

Your PO No: 71Y10001--001

Page 1 of 1

Expiration Date: 8/91

CERTIFICATE OF ANALYSIS - EPA PROTOCOL GASES*

Certified Per Traceability Protocol No. 1 Procedure No. G1

Cylinder No. ALM-11739

Cylinder Pressure 1900 psig

Certified Accuracy ±1% % NBS Traceable

REFERENCE STD

COMPONENTS	CERTIFIED CONC	SNW/CRM NO.	CYL. NO.	CONC.	MAKE/MODEL/SERIAL NO.	LAST CAL. DATE	ANALYTICAL PRINCIPLE
NITRIC OXIDE	977.2 ppm	CRM 1687B	AAL-19314	966 ppm	THERMO-ELECTRON	11/10/89	CHEMI-LUMINESCENT
NOX	979.5 ppm				TO AR 14853-150		

GAS ANALYZER

BALANCE GAS

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

NITRIC OXIDE

Component	Date	Units	ppm
First Analysis	2/1/90		
Z 0.00	R 96.60	T 97.50	
R 96.56	Z 0.00	T 97.62	
Z 0.03	T 97.77	R 96.69	
Mean Test Assay	976.1	ppm	
Second Analysis	2/1/90	Units	ppm
Z 0.00	R 96.60	T 97.60	
R 96.47	Z 0.02	T 97.68	
Z 0.01	T 97.79	R 96.63	
Mean Test Assay	977.2	ppm	

Component	Date	Units
Z	R	T
R	Z	T
Z	T	R
Mean Test Assay		
Date		Units
Z	R	T
R	Z	T
Z	T	R
Mean Test Assay		

Chronology: Date

Assay

Analyst LEE OLDHAN

Approved By:

2. Shady



Scott Specialty Gases

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

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

Shipped From: Scott SAN BERNARDINO, CA
Date Shipped: 2/14/90
Our Project No.: 4842
Your PO No.: 71Y10001-001

KLEINFELDER

Page 1 of 1
Expiration Date 2/91

CERTIFICATE OF ANALYSIS - EPA PROTOCOL GASES*

Certified Per Traceability Protocol No. 1 Procedure No. G1 Cylinder No. 11-3261 Cylinder Pressure 1900 PSIG Certified Accuracy ±1% to NBS Traceable

REFERENCE STD

COMPONENTS	CERTIFIED CONC	SRM/CRM NO.	CYL. NO.	CONC.
SULFUR DIOXIDE	192.1 ppm	GMIS	ALM-2395	495 ppm
		TRACEABLE TO CRM 1661A		

GAS ANALYZER

MAKE/MODEL/SERIAL NO.	LAST CAL. DATE	ANALYTICAL PRINCIPLE
HORIBA AIA23 56174104	1/29/90	INFRA-RED

BALANCE GAS

NITROGEN

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

Component SULFUR DIOXIDE

First Analysis Date	1/29/90	Units	ppm
Z	00.0	R	99.0
R	99.0	Z	00.0
Z	00.0	T	42.9
		R	99.0
		T	192.1
			Mean Test Assay

Second Analysis Date	2/5/90	Units	ppm
Z	00.0	R	99.0
R	99.0	Z	00.0
Z	00.0	T	42.9
		R	99.0
		T	192.1
			Mean Test Assay

Component	Date	Units
Z		R
R		Z
Z		T
		R
		Mean Test Assay

Date	Units
Z	R
R	Z
Z	T
	R
	Mean Test Assay

Component	Date	Units
Z		R
R		Z
Z		T
		R
		Mean Test Assay

Date	Units
Z	R
R	Z
Z	T
	R
	Mean Test Assay

Chronology: Date

Assay

Analyst D. BUTTERFIELD

Approved By: R. Steady



Scott Specialty Gases

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

KLEINFELDER

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

a division of

Shipped From: Scott

SAN BERNARDINO, CA

Date Shipped: 2/14/90

Our Project No: 4842

Your PO. No: 71Y10001-001

Page 1 of 1

Expiration Date: 8/90

CERTIFICATE OF ANALYSIS - EPA PROTOCOL GASES*

Certified Per Testability Protocol No. 1 Procedure No. G1

Cylinder No. AAL-1181

Cylinder Pressure

1900 psig

Certified Accuracy $\pm 1\%$

% NBS Traceable

REFERENCE STD

COMPONENTS	CERTIFIED CONC	SRM/CRM NO.	CYL. NO.	CONC
OXYGEN	9.525%	CRM 2659	AAL-18588	20.67%
CARBON DIOXIDE	10.02 %	CRM1675 B	ALM-1308	14.08%

GAS ANALYZER

MAKE/MODEL/SERIAL NO.	LAST CAL. DATE	ANALYTICAL PRINCIPLE
BECKMAN 755 100410	1/29/90	PARAMAGNETIC
HORIBA PIR 2000 406004	1/29/90	INFRA-RED

BALANCE GAS

NITROGEN

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

Component	OXYGEN	Units	%
First Analysis Date	1/29/90		
Z	00.0	R	82.7
R	82.7	Z	00.0
Z	00.0	T	38.1
T	38.1	Z	00.0
Mean Test Assay	9.525%		

Second Analysis Date	Units
Z	R
R	Z
Z	T
T	Z
Mean Test Assay	

Component CARBON DIOXIDE

Date	1/29/90	Units	%
Z	00.0	R	71.7
R	71.7	Z	00.0
Z	00.0	T	58.5
T	58.5	Z	00.0
Mean Test Assay	10.02%		

Date	Units
Z	R
R	Z
Z	T
T	Z
Mean Test Assay	

Chronology: Date _____
Assay _____

Analyst D. BUTTERFIELD

Approved By:

2. S. S. S. S.



Scott Specialty Gases

a division of

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

KLEINFELDER
526 HOFGAARDEN
CITY OF INDUSTRY, CA 91744

Date: 2/14/90Our Project No.: 4842Your P.O. No.: 71Y10001-001

PAGE 1 of 2

Gentlemen:

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

ANALYTICAL REPORT

Cyl. No. AAL-3328 Analytical Accuracy ±1%
Component Concentration

CARBON DIOXIDE 19.08%

NIST TRACEABLE TO CRM1675

NITROGEN BALANCE

Cyl. No. ALM-3487 Analytical Accuracy ±1%
Component Concentration

SULFUR DIOXIDE 100.0 ppm

NITROGEN BALANCE

*GRAVIMETRIC MASTER GAS

Cyl. No. ALM-11662 Analytical Accuracy ±1%
Component Concentration

NITRIC OXIDE 507.3 ppm

NOX 507.9 ppm

* GRAVIMETRIC MASTER GAS

NITROGEN BALANCE

Cyl. No. ALM-5695 Analytical Accuracy ±1%
Component Concentration

NITROGEN DIOXIDE 235 ppm

NITRIC OXIDE 189.6 ppm

NOX 424.6 ppm

NITROGEN BALANCE

NO2 ±5% ANALYSIS

Analyst _____

Approved By *[Signature]*

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

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



Scott Specialty Gases

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

KLEINFELDER

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

a division of

Shipped From: Scott SAN BERNARDINO, CA

Date Shipped: 2/14/90

Our Project No: 4842

Your P.O. No: 71Y10001-001

Page 1 of 1

Expiration Date: 8/91

CERTIFICATE OF ANALYSIS - EPA PROTOCOL GASES*

Certified For Traceability Protocol No. 1 Procedure No. G1 Cylinder No. ALM-6149 Cylinder Pressure 1200 PSIG Certified Accuracy $\pm 1\%$ w/ NBS Traceable

REFERENCE STD

COMPONENTS	CERTIFIED CONC	SRM/CRM NO.	CYL. NO.	CONC.	MAKE/MODEL/SERIAL NO.	LAST CAL. DATE	ANALYTICAL PRINCIPLE
CARBON MONOXIDE	96.64 ppm	GMIS	AAL-1081	253.3 ppm	HORIBA AIA 24	1/29/90	INFRA-RED
		TRACEABLE TO CRM2636			4564403		

GAS ANALYZER

BALANCE GAS

NITROGEN

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

Component	First Analysis Date	1/29/90	Units	ppm	Component	Date	Units
Z	00.0	R	95.0	T	39.7	Z	R
R	95.0	Z	00.0	T	39.6	R	Z
Z	00.0	T	39.6	R	95.0	Z	T
Mean Test Assay				96.72 ppm	Mean Test Assay		
Second Analysis Date				2/5/90	Mean Test Assay		
Z	00.0	R	95.0	T	39.6	Z	R
R	95.0	Z	00.0	T	39.6	R	Z
Z	00.0	T	39.6	R	95.0	Z	T
Mean Test Assay				96.64 ppm	Mean Test Assay		

Chronology: Date

Assay

Analyst D. BUTTERFIELD

Approved By: R. Steady

KLEINFELDER

Date: 2/14/90Our Project No.: 4842Your P.O. No.: 71Y10001-001

Cyl. No. <u>ALM-3484</u>	Analytical Accuracy <u>±1%</u>
Component	Concentration

<u>SULFUR DIOXIDE</u>	<u>1010 ppm</u>
-----------------------	-----------------

*GRAVIMETRIC MASTER GAS

<u>NITROGEN</u>	<u>BALANCE</u>
-----------------	----------------

Cyl. No. <u>ALM-8304</u>	Analytical Accuracy <u>±1%</u>
Component	Concentration

<u>CARBON MONOXIDE</u>	<u>45.74 ppm</u>
------------------------	------------------

* GRAVIMETRIC MASTER GAS

<u>NITROGEN</u>	<u>BALANCE</u>
-----------------	----------------

Cyl. No. _____	Analytical Accuracy _____
Component	Concentration

Cyl. No. _____	Analytical Accuracy _____
Component	Concentration

Cyl. No. _____	Analytical Accuracy _____
Component	Concentration

Cyl. No. _____	Analytical Accuracy _____
Component	Concentration

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

Analyst _____ Approved By Ray Mark

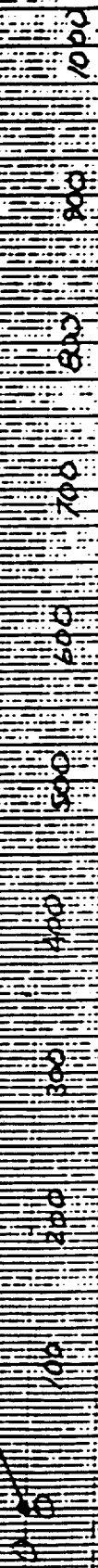
CERTIFIED REFERENCE MATERIALS EPA PROTOCOL GASES
 ACUBLEND[®] CALIBRATION & SPECIALTY GAS MIXTURES PURE GASES
 ACCESSORY PRODUCTS CUSTOM ANALYTICAL SERVICES

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

$$Y = 0.0001 - 0.0001X$$

$$Y = 0.0001(X) + 2.8$$

$$0.0001 \times 1000 = 0.1$$



100

80

60

40

20

0

0

10

20

30

40

50

60

70

80

90

100



100

100

$$y = 0.9933(x) + 1.45$$

$$r^2 = 0.9999$$

200

160

120

80

40

0

2

4

6

8

10

12

14

16

18

20

$CO_2 = 20\% \text{ F/S}$

$V = 10000(x) \text{ m}^3/\text{hr}$

$CO = 100000$