MONTROSE
AIR QUALITY SERVICES

January 13, 2022

Mr. Kevin Lawrence
Plant Manager
Desert View Power
62-300 Gene Welmas Drive
Mecca, California 92254

Subject: 2021 Mercury Emissions Performance Testing at the Desert View Power, Mecca Plant
Report Number: W002AS-011502-RT-3061

Dear Kevin:

Enclosed please find four hard copies of the report titled "2021 Mercury Emissions Performance Testing at the Desert View Power, Mecca Plant."

MAQS has enjoyed working with you on this project and we look forward to the opportunity to work with you again.

Please don't hesitate to call me if you have any questions or concerns about this report at (714) 279-6777.

Sincerely,

Dave Wonderly
Project Manger
Montrose Air Quality Services, LLC

DW/cs
Enclosures

TEST REPORT FOR 2021 MERCURY EMISSIONS PERFORMANCE TEST AT THE DESERT VIEW POWER MECCA PLANT

Prepared For:

Desert View Power
62-300 Gene Welmas Drive
Mecca, California 92254-0758

For Submittal To:

South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765-4178

Prepared By:

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, California 92705
(714) 282-8240

Dave Wonderly

Test Date: **November 30 and December 1-2, 2021**
Production Date: **January 13, 2022**
Report Number: **W002AS-011502-RT-3061**

STAC STACK TESTING ACCREDITATION COUNCIL

ACCREDITED TO ASTM D7036 ONLY CERT #3925.01

MONTROSE AIR QUALITY SERVICES

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REVIEW AND CERTIFICATION

All work, calculations, and other activities and tasks performed and presented in this document were carried out by me or under my direction and supervision. I hereby certify that, to the best of my knowledge, Montrose operated in conformance with the requirements of the Montrose Quality Management System and ASTM D7036-04 during this test project.

Signature: Dave Wonderly Date: 1/13/2022

Name: Dave Wonderly Title: Client Project Manager

I have reviewed, technically and editorially, details, calculations, results, conclusions, and other appropriate written materials contained herein. I hereby certify that, to the best of my knowledge, the presented material is authentic, accurate, and conforms to the requirements of the Montrose Quality Management System and ASTM D7036-04.

Signature: Dave Wonderly Date: 1/13/2022

Name: Michael Chowsanitphon Title: Reporting Hub Manager

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1.0 INTRODUCTION

Montrose Air Quality Services, LLC (MAQS) was contracted by Desert View Power, to conduct mercury (Hg) emissions performance emissions testing at the Desert View Power Project located in Mecca, California. Testing was conducted on November 30 and December 1-2, 2021 as a re-test of the March 11, 2021 Hg annual testing. Testing was performed in accordance with the test plan (MAQS Document Number: W002AS-011502-PP-437) submitted to Desert View Power on September 28, 2021. The MAQS test team consisted of Dave Wonderly, Gerrard Van der Jagt, and Patrick Whitman. Dave Wonderly and Gerrard Van der Jagt were the on-site Qualified Individual for MAQS. Kevin Lawrence of Desert View Power, coordinated plant operations and data retrieval during the test program. The South Coast Air Quality Management District (SCAQMD) and the Environmental Protection Agency (EPA) was notified of the test date but did not send a representative.

The emissions tests included measurements on Unit 1 and Unit 2 for mercury (Hg). Exhaust flow rate, oxygen (O_2), Carbon Dioxide (CO_2), and moisture measurements were performed in conjunction with the testing.

The Desert View Power Facility met the mercury emissions limits required by the U.S. Environmental Protection Agency Part 71 Operating Permit No. CB-ROP 05-01 NSR 4-4-11; SE 87-01 including amendments through September, 2020: and 40 CFR 60, Appendix F.

Tables 1-1 and 1-2 summarize the results of the emissions tests for Unit 1 and Unit 2.

TABLE 1-1
SUMMARY OF EMISSIONS RESULTS UNIT 1
DESERT VIEW POWER
NOVEMBER 30 AND DECEMBER 1, 2021

Parameter/Units	Average Emission Results	Permit Limit	Comment
Mercury lb/MMBtu	4.22×10^{-6}	5.7×10^{-6}	Pass

Note: The biomass default factor of 9,240 was used.

TABLE 1-2
SUMMARY OF EMISSIONS RESULTS UNIT 2
DESERT VIEW POWER
DECEMBER 2, 2021

Parameter/Units	Average Emission Results	Permit Limit	Comment
Mercury lb/MMBtu	4.02×10^{-6}	5.7×10^{-6}	Pass

Note: The biomass default factor of 9,240 was used.

2.0 UNIT DESCRIPTION

The Desert View Power plant consists of two 297 MMBtu/hr, circulating bed, biomass-fired boilers. The combined units are designed to produce 47 MW of net electrical output. Each unit is equipped with the following pollution control systems:

- An ammonia injection system for control of NO_x emissions
- Cyclonic mixing of injected ammonia with flue gas to provide for a minimum amount of ammonia slip (emission)
- A limestone injection system to limit emissions of SO_2
- A reverse air baghouse to control opacity and emissions of sulfates and particulate to very low levels

The plant CEMS system for each unit includes measurements of NO_x, CO, O_2, O_2 wet, SO_2, CO_2, flow and opacity. It is an extractive system with a heated line extending from the probe to the CEMS unit. Table 2-1 presents the current CEMS configuration.

TABLE 2-1
CONTINUOUS EMISSION MONITOR SYSTEM
UNITS 1 AND 2
DESERT VIEW POWER

Species	Manufacturer	Unit 1, Model/Serial Number	Unit 2, Model/Serial Number	Range
NO_x	CAI	ZRE/A3F4992T	ZRE/A3F4993T	100 and 500 ppm
CO	CAI	ZRE/A3F4992T	ZRE/A3F4993T	100 and 500 ppm
O_2 Dry	CAI	ZRE/A3F4992T	ZRE/A3F4993T	25%
SO_2	CAI	ZRE/A3F4992T	ZRE/A3F4993T	50 and 500 ppm
CO_2	CAI	ZRE/A3F4992T	ZRE/A3F4993T	20%
O_2 Wet	Thermox	WDG	WDG	25%
Flow	Dietrick Standard/Rosemont	0260938	--	Msdcfh
Opacity	Monitor Labs	Lighthawk 560	Lighthawk 560	100%
NO_2 Convertor	CAI	ZDL04001	ZDL04001	

2.1 TEST CONDITIONS

The tests were conducted in a steady state unit load condition. The target load for the unit being tested was 180 Klb/hr of steam production. Limestone injection rate, fuel combustion rate, ammonia injection rate, ash handling operations, excess air level, combustion air distribution, and combustor temperature were set to maintain stable unit operation. Pertinent operating conditions were recorded by Desert View Power personnel during the tests as presented in Table 2-2.

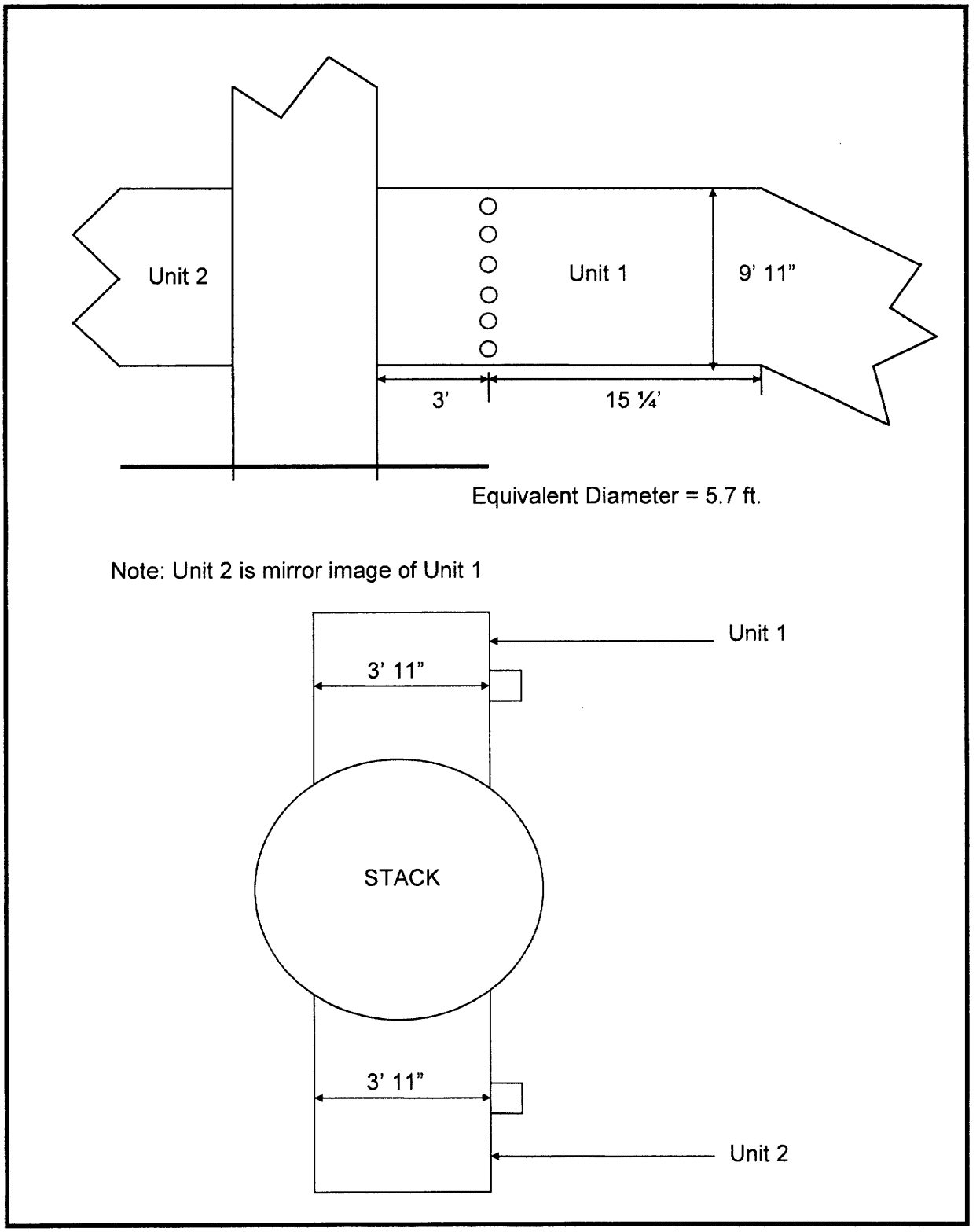
TABLE 2-2
AVERAGE DAILY UNIT DATA
DESERT VIEW POWER
NOVEMBER 30 AND DECEMBER 1-2, 2021

Date	Steam Prod. Klb/hr Unit 1	Steam Prod. Klb/hr Unit 2	Steam Prod. Klb/hr Total
2021-11-30 8:37	178.1	120.1	298.2
2021-12-01 7:45	188.4	126.3	314.8
2021-12-01 13:00	176.8	123.4	300.1
2021-12-01 14:48	178.4	124.3	302.7
2021-12-02 7:43	133.1	183.0	316.1
2021-12-02 9:38	130.6	178.5	309.0
2021-12-02 11:10	132.1	176.9	309.0

2.2 SAMPLE LOCATIONS

Samples were collected at the stack breaching ducts to the stack. Desert View Power previously conducted three dimensional flow testing and stratification testing on the baghouse exhaust ducts on each unit. This testing was performed in accordance to SCAQMD Chapter X, Section 1 and 13 and was presented in the report titled "Stack Gas Stratification and Absence of Flow Disturbance Testing at Desert View Power" (R106E622.T) submitted to SCAQMD in October of 1994. A copy of the sample location certification report can be found in the Appendix E of this report. The sample locations meet the requirements. All testing for both Unit 1 and 2 was conducted at the sample location presented in Figure 2-1.

FIGURE 2-1
SCHEMATIC OF THE DESERT VIEW POWER, SAMPLE LOCATION



3.0 TEST DESCRIPTIONS

The test procedures that were used are listed in Table 3-1. Tables 3-2 and 3-3 present the test schedule.

TABLE 3-1
TEST MATRIX PER UNIT
DESERT VIEW POWER

Parameter	No. of Tests	Limits	Measurement Principle	Reference Method	Duration per Test
O_2/CO_2	3		Non-Dispersive Infrared	EPA 3A	In conjunction with all Hg tests
Mercury	3	5.7E-06 lb per MMBtu		EPA 30B	60 Minutes
Fuel Mercury	Daily			ASTM D7622	Composite hourly samples
Stack Gas Flow Rate	--		S-Type Pitot Traverse	EPA 2	In conjunction with all Hg tests
Moisture	--		Condensation/Gravimetric	EPA 4	In conjunction with all Hg tests

TABLE 3-2
TEST SCHEDULE UNIT 1
DESERT VIEW POWER

Test Number	Date	Time	Test Parameter
1-HG-U1	11/30/2021	8:57	Hg
2-HG-U1	12/1/2021	8:05	Hg
3-HG-U1	12/1/2021	13:20	Hg
4-HG-U1	12/1/2021	15:08	Hg

TABLE 3-3
TEST SCHEDULE UNIT 2
DESERT VIEW POWER

Test Number	Date	Time	Test Parameter
1-HG-U2	12/2/2021	8:03	Hg
2-HG-U2	12/2/2021	9:58	Hg
3-HG-U2	12/2/2021	11:30	Hg

3.1 O_2 AND CO_2

O_2 and CO_2 were measured according to EPA reference methods using MAQS' continuous emissions monitoring system (CEM). O_2 and CO_2 concentrations were determined using MAQS' mobile emission measurement laboratory. The laboratory is housed in a truck outfitted to provide a clean, quiet, environmentally controlled base for the testing operations. The laboratory has lighting, electrical distribution, air conditioning and heating to support the test instruments and provide for optimal test performance.

Concentrations of these gaseous species were measured using an extractive sampling system consisting of a stainless steel probe to minimize reactions, a heat traced Teflon sample line connected to a thermo-electrically cooled sample dryer. Following the dryer, the sample is drawn into a Teflon lined pump where it is pressurized and then filtered for delivery to the gas analysis portion of the system. Gaseous samples were collected at a single point. Three 60-minute compliance tests were performed.

Oxygen concentration was determined using an CAI Paramagnetic analyzer (model 700). The analyzer full scale range was 20%. CO_2 was measured using a non-dispersive infrared analyzer manufactured by CAI (model #601). The analyzer full scale range was 20%.

The analyzers and sampling system were subjected to a variety of calibration and quality assurance procedures including leak checks, linearity and calibration error determinations before sampling, and system bias and drift determinations as part of each test run. Data are corrected for any observed bias or drift in accordance with the reference methods.

3.2 MERCURY

Triplicate one-hour mercury test runs were conducted at the stack location using EPA Method 30B. Each test run included a pair of sorbent tubes co-located at the tip of the sampling probe. Each test consisted of a "spiked" sorbent trap paired with an "un-spiked" sorbent trap.

Method 30B collects vapor phase mercury on carbon sorbent traps. Testing for total mercury uses a two-stage sorbent trap, each stage analyzed separately to confirm that there was no significant "breakthrough" or sample loss. Each of the two sets of traps were placed at the tip of a probe, both tube sets and probes in a single air-cooled probe assembly to maintain a temperature of approximately 250-300°F. The temperature was maintained to ensure mercury adsorption and prevent mercury breakthrough. Samples were drawn through the paired probes using an Apex mercury control/meter box. The trap sets were arranged in parallel and connected to two parallel moisture removal systems and two separate dry gas meters contained in the control box.

Each sorbent trap set was leak-checked before and after each test run, and the sampling volume and associated parameters were recorded for each trap set.

The following quality assurance requirements were used for a test run to be considered valid:

- Results agreement for each pair of traps: ≤ 10% Relative Deviation
- Sorbent trap section 2 breakthrough; mercury mass found in Section 2 ≤ 10% of mercury mass in Section 1

- Field recovery test: Recovery between 85% and 115% for elemental mercury spike (based on paired samples, one of which is spiked with a known level of mercury).

3.3 VELOCITY AND MOISTURE

Stack gas velocity and moisture content were determined by EPA Methods 2 and 4. Velocity traverses were performed during each set of Hg compliance tests.

3.4 FUEL ANALYSIS

Daily fuel samples were collected by Desert View Power personnel. Hourly samples were taken during each Hg test run and composited by the lab prior to analysis. Table 3-4 presents the sampling schedule and results. Sampling was consistent with ASTM D6323 sample collection methodology. Desert View power sent the samples out to be analyzed for mercury content using ASTM D6722.

TABLE 3-4
DAILY FUEL SAMPLES
DESERT VIEW POWER

Unit	Date	Fuel	Hg ppm
U-1	11/30/2021	Biomass-Solid	0.028
U-1	12/1/2021	Biomass-Solid	0.020
U-2	12/2/2021	Biomass-Solid	0.011
U-2	12/2/2021	Biomass-Solid	0.007

4.0 UNIT 1 AND 2 MERCURY PERFORMANCE TEST RESULTS

This section presents the results of the performance tests conducted at Desert View Power during November and December of 2021.

All supporting data sheets, CEM data, instrument strip charts, laboratory data, chain of custody records, and quality assurance data are included in Appendix A. Plant data are contained in Appendix B. Emissions and Load calculations are presented in Appendix C. Quality assurance information is contained in Appendix D.

The results of the Mercury testing are presented in Tables 4-1 and 4-2. Run 3 results for Unit 1 did not meet the 10% relative deviation requirement and therefore were not included in the average results. Mercury emissions for Unit 1 were 4.22×10^{-6} lb/MMBtu. Mercury emissions for Unit 2 were 4.02×10^{-6} lb/MMBtu. The results for both units are below the permit limit of 5.70×10^{-6} lb/MMBtu.

TABLE 4-1
MERCURY EMISSIONS PERFORMANCE TEST UNIT 1
DESERT VIEW POWER
NOVEMBER 30 AND DECEMBER 1, 2021

Test Number	**1-Hg-U1-A**	**1-Hg-U1-B**	**2-Hg-U1-A**	**2-Hg-U1-B**	**3-Hg-U1-A[1]**	**3-Hg-U1-B[1]**	**4-Hg-U1-A**	**4-Hg-U1-B**	**Averages[1]**	**Limits**
Date	**11/30/2021**	**11/30/2021**	**12/1/2021**	**12/1/2021**	**12/1/2021**	**12/1/2021**	**12/1/2021**	**12/1/2021**		
Start Time	**8:57**	**8:57**	**8:05**	**8:05**	**13:20**	**13:20**	**15:08**	**15:08**		
End Time	**9:57**	**9:57**	**9:05**	**9:05**	**14:20**	**14:20**	**16:08**	**16:08**		
Pre-Test Information										
Fuel F_d Factor, dscf/MMBtu	9,240	9,240	9,240	9,240	9,240	9,240	9,240	9,240		
Reference Temperature, °F	68	68	68	68	68	68	68	68		
Pollutant Emissions										
Mercury										
Total µg/dscm	4.540	4.347	3.650	3.717	2.637	2.071	3.856	3.911	4.004	
µg/dscf	0.129	0.123	0.103	0.105	0.075	0.059	0.109	0.111	0.113	
lb/hr	0.0017	0.0016	0.0014	0.0014	0.0010	0.0008	0.0014	0.0014	0.0015	
lb/MMBtu	4.81×10^{-6}	4.60×10^{-6}	3.83×10^{-6}	3.90×10^{-6}	2.86×10^{-6}	2.25×10^{-6}	4.07×10^{-6}	4.13×10^{-6}	4.22×10^{-6}	**5.70×10^{-6}**

(1) Run 3 results did not meet the 10% relative deviation requirement and therefore were not included in the average results.

TABLE 4-2
MERCURY EMISSIONS PERFORMANCE TEST UNIT 2
DESERT VIEW POWER
DECEMBER 2, 2021

Test Number	**1-Hg-U2-A**	**1-Hg-U2-B**	**2-Hg-U2-A**	**2-Hg-U2-B**	**3-Hg-U2-A**	**3-Hg-U2-B**	**Averages**	**Limits**
Date	**12/2/2021**	**12/2/2021**	**12/2/2021**	**12/2/2021**	**12/2/2021**	**12/2/2021**		
Start Time	**8:03**	**8:03**	**9:58**	**9:58**	**11:30**	**11:30**		
End Time	**9:03**	**9:03**	**10:58**	**10:58**	**12:30**	**12:30**		
Pre-Test Information								
Fuel F_d Factor, dscf/MMBtu	9,240	9,240	9,240	9,240	9,240	9,240		
Reference Temperature, °F	68	68	68	68	68	68		
Pollutant Emissions								
Mercury								
Total µg/dscm	4.513	4.930	3.633	3.315	3.298	2.889	3.763	
µg/dscf	0.128	0.140	0.103	0.094	0.093	0.082	0.107	
lb/hr	0.0017	0.0019	0.0014	0.0012	0.0012	0.0011	0.0014	
lb/MMBtu	4.80×10^{-6}	5.25×10^{-6}	3.89×10^{-6}	3.55×10^{-6}	3.53×10^{-6}	3.09×10^{-6}	4.02×10^{-6}	**5.70×10^{-6}**

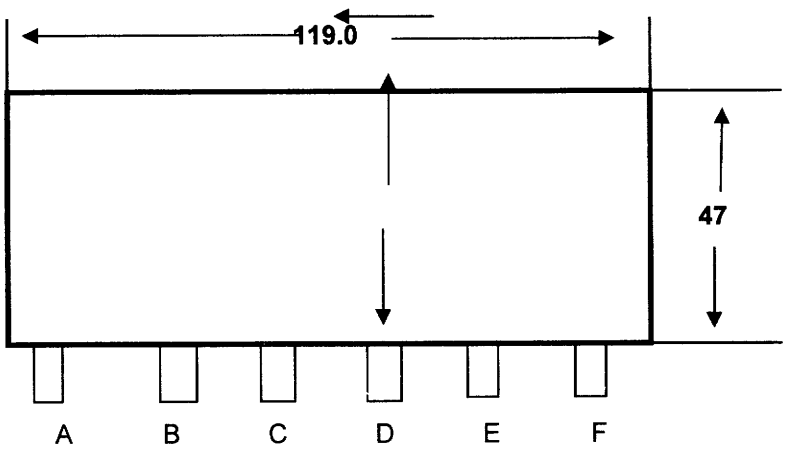
APPENDIX A
TEST DATA

Appendix A.1
Unit 1 Data

Appendix A.1.1
Unit 1 Sample Location

Client: Desert View Power Date: 11/30/2021

Sample Location: Unit 1-2 Prepared By: Dave Wonderly



		Point No.	Sample Point	
H (in.)	**119.0**			
		1	4.7	17.7
W (in.)	**47.0**	2	14.1	27.1
		3	23.5	36.5
Nipple length	**13.0**	4	32.9	45.9
		5	42.3	55.3
Distance between points	**9.40**			
Stack Area (ft^2)	**38.84**			

Appendix A.1.2
Unit 1 CEM Data

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
11/30/2021	7:31	18.999	18.965	
11/30/2021	7:32	18.997	18.965	High
11/30/2021	7:33	18.997	18.971	
11/30/2021	7:34	12.142	11.875	
11/30/2021	7:35	10.671	10.531	Mid
11/30/2021	7:36	2.419	2.19	
11/30/2021	7:37	0.017	0.027	Mid
11/30/2021	7:38	9.563	0.061	
11/30/2021	7:39	20.881	0.112	
11/30/2021	7:40	20.881	0.104	
11/30/2021	7:41	15.958	4.978	
11/30/2021	7:42	9.586	11.019	
11/30/2021	7:43	9.714	10.892	
11/30/2021	7:44	9.516	11.115	
11/30/2021	7:45	9.199	11.457	
11/30/2021	7:46	9.38	11.221	
11/30/2021	7:47	9.764	10.887	
11/30/2021	7:48	9.438	11.201	
11/30/2021	7:49	9.585	11.078	
11/30/2021	7:50	9.638	11.007	
11/30/2021	7:51	9.833	10.817	
11/30/2021	7:52	9.447	11.182	
11/30/2021	7:53	10.544	10.356	
11/30/2021	7:54	10.581	10.563	
11/30/2021	7:55	10.574	10.586	
11/30/2021	7:56	10.616	10.575	O2 CO2 Bias
11/30/2021	7:57	1.268	1.287	
11/30/2021	7:58	0.008	0.092	Zero Bias
11/30/2021	7:59	6.551	8.827	
11/30/2021	8:00	9.47	11.212	
11/30/2021	8:01	8.602	12.036	
11/30/2021	8:02	9.403	11.235	
11/30/2021	8:03	10.072	10.589	
11/30/2021	8:04	10.581	10.105	
11/30/2021	8:05	10.344	10.369	
11/30/2021	8:06	8.994	11.677	
11/30/2021	8:07	9.55	11.106	
11/30/2021	8:08	9.772	10.909	
11/30/2021	8:09	8.644	12.01	
11/30/2021	8:10	8.608	12.063	
11/30/2021	8:11	9.463	11.204	
11/30/2021	8:12	10.039	10.628	
11/30/2021	8:13	10.311	10.371	

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
11/30/2021	8:14	10.399	10.285	
11/30/2021	8:15	9.28	11.413	
11/30/2021	8:16	10.253	10.43	
11/30/2021	8:17	10.388	10.336	
11/30/2021	8:18	9.938	10.796	
11/30/2021	8:19	8.819	11.86	
11/30/2021	8:20	9.254	11.465	
11/30/2021	8:21	9.344	11.335	
11/30/2021	8:22	11.189	9.509	
11/30/2021	8:23	9.695	10.851	
11/30/2021	8:24	0.125	0.156	
11/30/2021	8:25	0.014	0.091	Zero Bias
11/30/2021	8:26	9.299	9.296	
11/30/2021	8:27	10.619	10.574	O2 CO2 Bias
11/30/2021	8:28	10.623	10.548	
11/30/2021	8:29	10.428	10.321	

Reset DAS time

11/30/2021	8:52	8.767	11.9	
11/30/2021	8:53	9.23	11.477	
11/30/2021	8:54	9.847	10.856	
11/30/2021	8:55	9.374	11.33	
11/30/2021	8:56	9.467	11.242	
11/30/2021	8:57	8.699	12.035	Start Run 1
11/30/2021	8:58	8.943	11.717	
11/30/2021	8:59	9.224	11.515	
11/30/2021	9:00	7.976	12.728	
11/30/2021	9:01	8.842	11.856	
11/30/2021	9:02	9.144	11.552	
11/30/2021	9:03	9.894	10.806	
11/30/2021	9:04	10.881	9.848	
11/30/2021	9:05	10.242	10.518	
11/30/2021	9:06	9.693	11.024	
11/30/2021	9:07	10.559	10.141	
11/30/2021	9:08	10.804	9.945	
11/30/2021	9:09	11.73	9.023	
11/30/2021	9:10	9.733	10.998	
11/30/2021	9:11	9.399	11.311	
11/30/2021	9:12	9.582	11.103	
11/30/2021	9:13	9.998	10.724	
11/30/2021	9:14	7.939	12.779	

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
11/30/2021	9:15	8.581	12.118
11/30/2021	9:16	8.449	12.235
11/30/2021	9:17	9.423	11.241
11/30/2021	9:18	9.68	11.023
11/30/2021	9:19	9.855	10.835
11/30/2021	9:20	11.01	9.675
11/30/2021	9:21	8.656	12.057
11/30/2021	9:22	8.606	12.098
11/30/2021	9:23	9.338	11.324
11/30/2021	9:24	9.576	11.108
11/30/2021	9:25	10.448	10.25
11/30/2021	9:26	9.318	11.434
11/30/2021	9:27	8.878	11.832
11/30/2021	9:28	8.308	12.328
11/30/2021	9:29	10.363	10.369
11/30/2021	9:30	9.794	10.868
11/30/2021	9:31	10.752	9.965
11/30/2021	9:32	10.036	10.741
11/30/2021	9:33	8.454	12.231
11/30/2021	9:34	9.091	11.633
11/30/2021	9:35	10.469	10.209
11/30/2021	9:36	11.243	9.473
11/30/2021	9:37	8.452	12.309
11/30/2021	9:38	9.239	11.441
11/30/2021	9:39	9.645	11.05
11/30/2021	9:40	8.634	12.087
11/30/2021	9:41	10.344	10.302
11/30/2021	9:42	7.953	12.727
11/30/2021	9:43	8.808	11.839
11/30/2021	9:44	8.212	12.387
11/30/2021	9:45	9.505	11.054
11/30/2021	9:46	10.628	9.989
11/30/2021	9:47	11.35	9.361
11/30/2021	9:48	8.135	12.475
11/30/2021	9:49	10.031	10.66
11/30/2021	9:50	9.675	11.015
11/30/2021	9:51	10.669	9.98
11/30/2021	9:52	9.529	11.199
11/30/2021	9:53	9.722	10.943
11/30/2021	9:54	9.263	11.442
11/30/2021	9:55	8.781	11.907
11/30/2021	9:56	10.095	10.578
11/30/2021	9:57	9.39	11.311

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
Run 1 Average		9.55	11.14	
11/30/2021	9:58	10.437	10.614	
11/30/2021	9:59	10.627	10.591	O2 CO2 Bias
11/30/2021	10:00	4.971	4.924	
11/30/2021	10:01	0.014	0.089	Zero Bias
11/30/2021	10:02	-0.032	0.051	
11/30/2021	10:03	-0.001	0.034	Zero
11/30/2021	10:04	9.202	9.002	
11/30/2021	10:05	10.656	10.569	Span
11/30/2021	10:06	9.924	10.975	
11/30/2021	10:07	10.128	10.51	
11/30/2021	10:08	8.253	12.474	
11/30/2021	10:09	8.728	11.963	
11/30/2021	10:10	8.626	12.026	
11/30/2021	10:11	8.649	11.964	
11/30/2021	10:12	10.265	10.423	
11/30/2021	10:13	10.308	10.348	
11/30/2021	10:14	9.66	11.097	
11/30/2021	10:15	9.843	10.734	
11/30/2021	10:16	10.15	10.551	
11/30/2021	10:17	10.119	10.521	
11/30/2021	10:18	8.765	11.831	
11/30/2021	10:19	8.951	11.721	
11/30/2021	10:20	7.568	13.033	
11/30/2021	10:21	9.542	11.077	
11/30/2021	10:22	8.038	12.591	
11/30/2021	10:23	10.546	10.063	
11/30/2021	10:24	8.697	11.983	
11/30/2021	10:25	9.405	11.208	
11/30/2021	10:26	9.447	11.192	
11/30/2021	10:27	9.46	11.182	
11/30/2021	10:28	7.895	12.65	
11/30/2021	10:29	9.134	11.443	
11/30/2021	10:30	9.192	11.367	
11/30/2021	10:31	9.888	10.73	
11/30/2021	10:32	9.072	11.325	
11/30/2021	10:33	9.548	10.837	
11/30/2021	10:34	9.55	10.815	
11/30/2021	10:35	9.793	10.635	
11/30/2021	10:36	9.174	11.173	
11/30/2021	10:37	10.008	10.363	
11/30/2021	10:38	8.692	11.623	

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
11/30/2021	10:39	8.533	11.731
11/30/2021	10:40	9.483	10.784
11/30/2021	10:41	10.287	10.021
11/30/2021	10:42	9.321	10.968
11/30/2021	10:43	10.064	10.228
11/30/2021	10:44	10.232	10.07
11/30/2021	10:45	9.757	10.547
11/30/2021	10:46	10.042	10.241
11/30/2021	10:47	10.835	9.488
11/30/2021	10:48	9.902	10.348
11/30/2021	10:49	9.385	10.64
11/30/2021	10:50	9.415	10.443
11/30/2021	10:51	9.794	9.918
11/30/2021	10:52	9.691	10.12
11/30/2021	10:53	8.306	11.433
11/30/2021	10:54	9.099	10.629
11/30/2021	10:55	8.463	11.026
11/30/2021	10:56	9.117	10.296
11/30/2021	10:57	9.509	9.859
11/30/2021	10:58	9.854	9.608
11/30/2021	10:59	10.597	8.808
11/30/2021	11:00	10.971	8.42
11/30/2021	11:01	9.186	9.985
11/30/2021	11:02	9.685	9.499
11/30/2021	11:03	8.477	10.664
11/30/2021	11:04	9.127	9.945
11/30/2021	11:05	6.74	12.133
11/30/2021	11:06	9.928	8.907
11/30/2021	11:07	8.75	10.131
11/30/2021	11:08	8.366	10.437
11/30/2021	11:09	9.39	9.456
11/30/2021	11:10	9.898	8.886
11/30/2021	11:11	10.943	7.94
11/30/2021	11:12	11.462	7.454
11/30/2021	11:13	11.348	7.519
11/30/2021	11:14	11.366	7.484
11/30/2021	11:15	11.949	6.902
11/30/2021	11:16	12.949	5.921
11/30/2021	11:17	11.499	7.373
11/30/2021	11:18	12.001	6.827
11/30/2021	11:19	11.793	7.03
11/30/2021	11:20	11.331	7.447
11/30/2021	11:21	11.443	7.353

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
11/30/2021	11:22	11.36	7.452
11/30/2021	11:23	12.192	6.55
11/30/2021	11:24	11.757	6.915
11/30/2021	11:25	12.568	6.182
11/30/2021	11:26	12.01	6.69
11/30/2021	11:27	11.774	6.961
11/30/2021	11:28	11.758	6.801
11/30/2021	11:29	12.089	6.46
11/30/2021	11:30	10.189	8.251
11/30/2021	11:31	9.335	8.957
11/30/2021	11:32	9.7	8.447
11/30/2021	11:33	9.601	8.535
11/30/2021	11:34	8.311	9.755
11/30/2021	11:35	11.089	7.018
11/30/2021	11:36	9.012	9.053
11/30/2021	11:37	9.566	8.464
11/30/2021	11:38	10.273	7.763
11/30/2021	11:39	9.898	8.145
11/30/2021	11:40	9.415	8.622
11/30/2021	11:41	10.682	7.299
11/30/2021	11:42	9.026	8.881
11/30/2021	11:43	10.386	7.535
11/30/2021	11:44	9.372	8.477
11/30/2021	11:45	9.949	7.947
11/30/2021	11:46	10.721	7.197
11/30/2021	11:47	8.837	9.041
11/30/2021	11:48	9.473	8.425
11/30/2021	11:49	10.558	7.328
11/30/2021	11:50	9.781	8.119
11/30/2021	11:51	9.196	8.64
11/30/2021	11:52	9.212	8.656
11/30/2021	11:53	9.607	8.236
11/30/2021	11:54	10.099	7.855
11/30/2021	11:55	8.904	8.932
11/30/2021	11:56	9.681	8.196
11/30/2021	11:57	8.979	8.886
11/30/2021	11:58	8.888	8.991
11/30/2021	11:59	8.872	8.988
11/30/2021	12:00	9.181	8.703
11/30/2021	12:01	9.595	8.279
11/30/2021	12:02	8.911	8.941
11/30/2021	12:03	8.484	9.398
11/30/2021	12:04	10.079	7.787

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
11/30/2021	12:05	8.645	9.246
11/30/2021	12:06	9.917	7.969
11/30/2021	12:07	8.91	8.884
11/30/2021	12:08	8.076	9.743
11/30/2021	12:09	8.351	9.419
11/30/2021	12:10	8.009	9.783
11/30/2021	12:11	8.397	9.364
11/30/2021	12:12	8.817	8.973
11/30/2021	12:13	9.921	7.898
11/30/2021	12:14	9.071	8.68
11/30/2021	12:15	9.555	8.268
11/30/2021	12:16	9.503	8.272
11/30/2021	12:17	11.349	6.519
11/30/2021	12:18	10.388	7.446
11/30/2021	12:19	10.129	7.698
11/30/2021	12:20	10.091	7.748
11/30/2021	12:21	9.93	7.857
11/30/2021	12:22	10.49	7.312
11/30/2021	12:23	9.738	8.009
11/30/2021	12:24	9.732	8.041
11/30/2021	12:25	9.034	8.721
11/30/2021	12:26	9.272	8.483
11/30/2021	12:27	9.433	8.29
11/30/2021	12:28	9.847	7.882
11/30/2021	12:29	10.082	7.616
11/30/2021	12:30	10.4	7.37
11/30/2021	12:31	10.219	7.549
11/30/2021	12:32	11.22	6.511
11/30/2021	12:33	10.832	6.953
11/30/2021	12:34	10.689	7.064
11/30/2021	12:35	9.52	8.206
11/30/2021	12:36	11.501	6.27
11/30/2021	12:37	11.412	6.372
11/30/2021	12:38	11.58	6.19
11/30/2021	12:39	11.327	6.442
11/30/2021	12:40	9.728	8.023
11/30/2021	12:41	10.75	7.016
11/30/2021	12:42	10.325	7.406
11/30/2021	12:43	10.045	7.721
11/30/2021	12:44	10.413	7.366
11/30/2021	12:45	10.929	6.803
11/30/2021	12:46	11.647	6.129
11/30/2021	12:47	11.545	6.24

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
11/30/2021	12:48	12.315	5.448
11/30/2021	12:49	13.071	4.767
11/30/2021	12:50	12.086	5.701
11/30/2021	12:51	13.241	4.586
11/30/2021	12:52	13.483	4.35
11/30/2021	12:53	13.403	4.439
11/30/2021	12:54	11.153	6.583
11/30/2021	12:55	12.066	5.641
11/30/2021	12:56	13.165	4.597
11/30/2021	12:57	13.386	4.387
11/30/2021	12:58	13.429	4.374
11/30/2021	12:59	12.578	5.177
11/30/2021	13:00	13.323	4.45
11/30/2021	13:01	13.512	4.291
11/30/2021	13:02	13.547	4.247
11/30/2021	13:03	13.595	4.206
11/30/2021	13:04	13.64	4.171
11/30/2021	13:05	13.56	4.214
11/30/2021	13:06	13.515	4.234
11/30/2021	13:07	13.471	4.251
11/30/2021	13:08	13.392	4.29
11/30/2021	13:09	13.421	4.275
11/30/2021	13:10	13.42	4.278
11/30/2021	13:11	13.425	4.276
11/30/2021	13:12	13.418	4.282
11/30/2021	13:13	13.416	4.278
11/30/2021	13:14	13.446	4.262
11/30/2021	13:15	13.416	4.277
11/30/2021	13:16	13.4	4.279
11/30/2021	13:17	13.432	4.267
11/30/2021	13:18	13.427	4.267
11/30/2021	13:19	13.437	4.258
11/30/2021	13:20	13.439	4.256
11/30/2021	13:21	13.427	4.264
11/30/2021	13:22	13.449	4.262
11/30/2021	13:23	13.426	4.273
11/30/2021	13:24	13.379	4.297
11/30/2021	13:25	13.452	4.252
11/30/2021	13:26	13.49	4.233
11/30/2021	13:27	13.493	4.229
11/30/2021	13:28	13.469	4.244
11/30/2021	13:29	13.492	4.235
11/30/2021	13:30	13.437	4.268

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
11/30/2021	13:31	13.472	4.25
11/30/2021	13:32	13.443	4.265
11/30/2021	13:33	13.433	4.269
11/30/2021	13:34	13.453	4.263
11/30/2021	13:35	13.419	4.28
11/30/2021	13:36	13.426	4.275
11/30/2021	13:37	13.355	4.316
11/30/2021	13:38	13.352	4.317
11/30/2021	13:39	13.336	4.323
11/30/2021	13:40	13.357	4.312
11/30/2021	13:41	13.353	4.313
11/30/2021	13:42	13.338	4.321
11/30/2021	13:43	13.425	4.275
11/30/2021	13:44	13.418	4.279
11/30/2021	13:45	13.389	4.298
11/30/2021	13:46	13.384	4.303
11/30/2021	13:47	13.038	4.5
11/30/2021	13:48	12.986	4.525
11/30/2021	13:49	12.962	4.543
11/30/2021	13:50	12.967	4.542
11/30/2021	13:51	12.952	4.548
11/30/2021	13:52	12.96	4.544
11/30/2021	13:53	12.977	4.528
11/30/2021	13:54	12.951	4.545
11/30/2021	13:55	12.981	4.526
11/30/2021	13:56	12.952	4.542
11/30/2021	13:57	12.955	4.54
11/30/2021	13:58	12.974	4.528
11/30/2021	13:59	12.954	4.536
11/30/2021	14:00	12.949	4.542
11/30/2021	14:01	12.977	4.524
11/30/2021	14:02	12.952	4.535
11/30/2021	14:03	12.956	4.535
11/30/2021	14:04	12.965	4.53
11/30/2021	14:05	12.962	4.533
11/30/2021	14:06	12.973	4.527
11/30/2021	14:07	12.935	4.551
11/30/2021	14:08	12.965	4.535
11/30/2021	14:09	12.98	4.523
11/30/2021	14:10	12.957	4.539
11/30/2021	14:11	12.984	4.522
11/30/2021	14:12	12.963	4.532
11/30/2021	14:13	12.981	4.52

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
11/30/2021	14:14	12.97	4.528
11/30/2021	14:15	12.973	4.528
11/30/2021	14:16	12.997	4.512
11/30/2021	14:17	12.984	4.521
11/30/2021	14:18	12.996	4.515
11/30/2021	14:19	12.98	4.519
11/30/2021	14:20	13	4.509
11/30/2021	14:21	13.005	4.504
11/30/2021	14:22	12.978	4.522
11/30/2021	14:23	13.026	4.493
11/30/2021	14:24	12.987	4.515
11/30/2021	14:25	13.013	4.501
11/30/2021	14:26	12.99	4.518
11/30/2021	14:27	13.004	4.512
11/30/2021	14:28	13.005	4.511
11/30/2021	14:29	12.998	4.514
11/30/2021	14:30	12.992	4.512
11/30/2021	14:31	12.943	4.542
11/30/2021	14:32	12.963	4.529
11/30/2021	14:33	12.949	4.538
11/30/2021	14:34	12.968	4.525
11/30/2021	14:35	12.943	4.539
11/30/2021	14:36	12.957	4.532
11/30/2021	14:37	12.959	4.531
11/30/2021	14:38	12.962	4.529
11/30/2021	14:39	12.987	4.513
11/30/2021	14:40	12.929	4.546
11/30/2021	14:41	12.956	4.521
11/30/2021	14:42	12.958	4.521
11/30/2021	14:43	12.957	4.522
11/30/2021	14:44	12.982	4.507
11/30/2021	14:45	12.971	4.515
11/30/2021	14:46	12.99	4.502
11/30/2021	14:47	12.98	4.507
11/30/2021	14:48	12.961	4.525
11/30/2021	14:49	12.967	4.526
11/30/2021	14:50	12.955	4.533
11/30/2021	14:51	12.977	4.52
11/30/2021	14:52	12.95	4.534
11/30/2021	14:53	12.995	4.51
11/30/2021	14:54	12.966	4.526
11/30/2021	14:55	12.951	4.537
11/30/2021	14:56	12.963	4.527

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
11/30/2021	14:57	12.956	4.532
11/30/2021	14:58	12.945	4.54
11/30/2021	14:59	12.962	4.531
11/30/2021	15:00	12.962	4.528
11/30/2021	15:01	12.946	4.538
11/30/2021	15:02	12.966	4.527
11/30/2021	15:03	12.965	4.524
11/30/2021	15:04	12.979	4.525
11/30/2021	15:05	12.965	4.528
11/30/2021	15:06	12.963	4.531
11/30/2021	15:07	12.952	4.536
11/30/2021	15:08	12.978	4.517
11/30/2021	15:09	12.957	4.53
11/30/2021	15:10	12.969	4.523
11/30/2021	15:11	12.964	4.528
11/30/2021	15:12	12.981	4.511
11/30/2021	15:13	12.96	4.504
11/30/2021	15:14	12.989	4.487
11/30/2021	15:15	12.956	4.51
11/30/2021	15:16	12.976	4.496
11/30/2021	15:17	12.955	4.518
11/30/2021	15:18	12.979	4.528
11/30/2021	15:19	12.967	4.538
11/30/2021	15:20	12.996	4.518
11/30/2021	15:21	12.967	4.538
11/30/2021	15:22	13.015	4.51
11/30/2021	15:23	12.993	4.523
11/30/2021	15:24	12.998	4.52
11/30/2021	15:25	12.998	4.516
11/30/2021	15:26	12.994	4.525
11/30/2021	15:27	12.993	4.519
11/30/2021	15:28	13.011	4.513
11/30/2021	15:29	13.013	4.51
11/30/2021	15:30	13.004	4.513
11/30/2021	15:31	12.989	4.525
11/30/2021	15:32	13.018	4.512
11/30/2021	15:33	12.988	4.53
11/30/2021	15:34	13.006	4.523
11/30/2021	15:35	12.973	4.543
11/30/2021	15:36	13.015	4.519
11/30/2021	15:37	12.974	4.539
11/30/2021	15:38	13.017	4.517
11/30/2021	15:39	12.966	4.543

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
11/30/2021	15:40	12.976	4.538	
11/30/2021	15:41	12.99	4.526	
11/30/2021	15:42	12.992	4.523	
11/30/2021	15:43	13.002	4.51	
11/30/2021	15:44	12.969	4.525	
11/30/2021	15:45	12.986	4.519	
11/30/2021	15:46	12.997	4.512	
11/30/2021	15:47	12.967	4.53	
11/30/2021	15:48	12.99	4.519	
11/30/2021	15:49	12.989	4.518	
11/30/2021	15:50	12.972	4.529	
11/30/2021	15:51	12.989	4.515	
11/30/2021	15:52	12.977	4.523	
11/30/2021	15:53	13.009	4.505	
11/30/2021	15:54	12.977	4.517	
11/30/2021	15:55	12.976	4.519	
11/30/2021	15:56	12.978	4.518	
11/30/2021	15:57	12.952	4.539	
11/30/2021	15:58	12.981	4.526	
11/30/2021	15:59	12.985	4.525	
11/30/2021	16:00	11.737	5.741	
11/30/2021	16:01	11.392	6.038	
11/30/2021	16:02	10.263	7.147	
11/30/2021	16:03	10.26	7.136	
11/30/2021	16:04	9.837	7.554	
11/30/2021	16:05	11.419	5.997	
11/30/2021	16:06	11.31	6.14	
11/30/2021	16:07	11.9	5.529	
11/30/2021	16:08	12.594	4.884	
11/30/2021	16:09	1.359	0.636	
11/30/2021	16:10	0.012	-0.021	Zero
11/30/2021	16:11	9.365	8.949	
11/30/2021	16:12	10.68	10.533	Mid
11/30/2021	16:13	16.114	15.468	
11/30/2021	16:14	19.017	19.021	High

Date	Time	O2 %	CO2 %	
12/1/2021	7:11	19.027	19.353	
12/1/2021	7:12	19.035	19.37	
12/1/2021	7:13	19.033	19.224	
12/1/2021	7:14	19.004	18.948	High

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
12/1/2021	7:15	19.001	18.941	
12/1/2021	7:16	18.997	18.935	
12/1/2021	7:17	11.844	11.369	
12/1/2021	7:18	10.671	10.5	
12/1/2021	7:19	10.669	10.502	Mid
12/1/2021	7:20	1.69	1.752	
12/1/2021	7:21	0.011	0.005	Zero
12/1/2021	7:22	8.8	0.047	
12/1/2021	7:23	18.783	2.258	
12/1/2021	7:24	9.555	11.177	
12/1/2021	7:25	8.21	12.375	
12/1/2021	7:26	9.055	11.499	
12/1/2021	7:27	9.262	11.322	
12/1/2021	7:28	9.643	10.965	
12/1/2021	7:29	9.135	11.478	
12/1/2021	7:30	8.609	11.954	
12/1/2021	7:31	6.552	8.418	
12/1/2021	7:32	0.041	0.074	
12/1/2021	7:33	0.035	0.061	Zero Bias
12/1/2021	7:34	8.436	8.467	
12/1/2021	7:35	10.635	10.536	O2 CO2 Bias
12/1/2021	7:36	10.189	10.684	
12/1/2021	7:37	9.231	11.441	
12/1/2021	7:38	8.887	11.687	
12/1/2021	7:39	10.566	10.066	
12/1/2021	7:40	8.917	11.754	
12/1/2021	7:41	8.848	11.775	
12/1/2021	7:42	9.304	11.315	
12/1/2021	7:43	9.908	10.731	
12/1/2021	7:44	9.997	10.688	
12/1/2021	7:45	9.775	10.887	
12/1/2021	7:46	10.136	10.49	
12/1/2021	7:47	10.355	10.404	
12/1/2021	7:48	9.09	11.629	
12/1/2021	7:49	9.356	11.289	
12/1/2021	7:50	9.204	11.542	
12/1/2021	7:51	9.476	11.189	
12/1/2021	7:52	9.222	11.467	
12/1/2021	7:53	10.04	10.646	
12/1/2021	7:54	9.282	11.424	
12/1/2021	7:55	9.467	11.214	
12/1/2021	7:56	9.424	11.295	

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
12/1/2021	7:57	9.836	10.854	
12/1/2021	7:58	10.767	9.906	
12/1/2021	7:59	10.859	9.872	
12/1/2021	8:00	2.981	2.506	
12/1/2021	8:01	0.036	0.077	Zero Bias
12/1/2021	8:02	9.267	9.288	
12/1/2021	8:03	10.615	10.542	O2 CO2 Bias
12/1/2021	8:04	9.956	11.004	
12/1/2021	8:05	7.858	12.809	
12/1/2021	8:06	8.999	11.696	
12/1/2021	8:07	8.343	12.356	
12/1/2021	8:08	8.482	12.185	
12/1/2021	8:09	9.162	11.513	
12/1/2021	8:10	7.864	12.837	
12/1/2021	8:11	8.752	11.897	
12/1/2021	8:12	11.041	9.64	
12/1/2021	8:13	9.326	11.424	
12/1/2021	8:14	7.872	12.797	
12/1/2021	8:15	10.573	10.089	
12/1/2021	8:16	9.713	10.989	
12/1/2021	8:17	11.187	9.537	
12/1/2021	8:18	10.603	10.08	
12/1/2021	8:19	9.517	11.249	
12/1/2021	8:20	10.291	10.389	
12/1/2021	8:21	9.993	10.737	
12/1/2021	8:22	9.04	11.589	
12/1/2021	8:23	8.779	11.913	
12/1/2021	8:24	7.995	12.663	
12/1/2021	8:25	8.938	11.768	
12/1/2021	8:26	8.124	12.528	
12/1/2021	8:27	7.325	13.263	
12/1/2021	8:28	8	12.612	
12/1/2021	8:29	7.572	12.976	
12/1/2021	8:30	8.639	11.947	
12/1/2021	8:31	10.47	10.179	
12/1/2021	8:32	12.663	7.951	
12/1/2021	8:33	10.862	9.89	
12/1/2021	8:34	10.128	10.529	
12/1/2021	8:35	9.387	11.306	
12/1/2021	8:36	9.543	11.1	
12/1/2021	8:37	9.537	11.115	
12/1/2021	8:38	10.314	10.364	

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
12/1/2021	8:39	10.106	10.6	
12/1/2021	8:40	9.978	10.688	
12/1/2021	8:41	10.138	10.524	
12/1/2021	8:42	10.199	10.487	
12/1/2021	8:43	8.979	11.733	
12/1/2021	8:44	9.318	11.291	
12/1/2021	8:45	10.927	9.812	
12/1/2021	8:46	10.639	10.065	
12/1/2021	8:47	8.254	12.508	
12/1/2021	8:48	8.373	12.268	
12/1/2021	8:49	9.492	11.244	
12/1/2021	8:50	8.383	12.301	
12/1/2021	8:51	7.472	13.201	
12/1/2021	8:52	8.734	11.96	
12/1/2021	8:53	9.318	11.377	
12/1/2021	8:54	9.772	10.912	
12/1/2021	8:55	9.494	11.257	
12/1/2021	8:56	9.58	11.123	
12/1/2021	8:57	9.114	11.592	
12/1/2021	8:58	9.972	10.718	
12/1/2021	8:59	9.545	11.211	
12/1/2021	9:00	9.953	10.752	
12/1/2021	9:01	10.426	10.286	
12/1/2021	9:02	9.396	11.322	
12/1/2021	9:03	9.782	10.94	
12/1/2021	9:04	10.698	10.029	
12/1/2021	9:05	9.366	11.355	
Run 2 Average		9.44	11.24	
12/1/2021	9:06	10.481	10.619	
12/1/2021	9:07	10.615	10.573	O2 CO2 Bias
12/1/2021	9:08	2.439	2.39	
12/1/2021	9:09	0.019	0.096	Zero Bias
12/1/2021	9:10	7.635	7.986	
12/1/2021	9:11	10.651	10.546	Span
12/1/2021	9:12	2.019	2.019	
12/1/2021	9:13	0.006	0.044	Zero
12/1/2021	9:14	5.833	5.306	
12/1/2021	9:15	10.684	10.055	
12/1/2021	9:16	8.73	12.035	
12/1/2021	9:17	8.608	12.075	
12/1/2021	9:18	9.486	11.207	
12/1/2021	9:19	9.525	11.245	

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
12/1/2021	9:20	9.913	10.792
12/1/2021	9:21	9.725	11.052
12/1/2021	9:22	8.76	11.982
12/1/2021	9:23	10.7	10.042
12/1/2021	9:24	8.981	11.759
12/1/2021	9:25	9.327	11.457
12/1/2021	9:26	8.879	11.856
12/1/2021	9:27	9.055	11.678
12/1/2021	9:28	10.711	10.068
12/1/2021	9:29	9.883	10.881
12/1/2021	9:30	9.148	11.597
12/1/2021	9:31	9.916	10.836
12/1/2021	9:32	9.065	11.681
12/1/2021	9:33	10.184	10.562
12/1/2021	9:34	10.393	10.308
12/1/2021	9:35	11.444	9.311
12/1/2021	9:36	10.727	10.002
12/1/2021	9:37	10.042	10.747
12/1/2021	9:38	9.572	11.199
12/1/2021	9:39	9.303	11.458
12/1/2021	9:40	8.611	12.124
12/1/2021	9:41	10.787	9.944
12/1/2021	9:42	11.335	9.367
12/1/2021	9:43	10.805	9.987
12/1/2021	9:44	11.543	9.193
12/1/2021	9:45	10.209	10.573
12/1/2021	9:46	11.17	9.593
12/1/2021	9:47	10.721	10.037
12/1/2021	9:48	11.214	9.531
12/1/2021	9:49	11.521	9.219
12/1/2021	9:50	12.6	8.149
12/1/2021	9:51	12.824	7.936
12/1/2021	9:52	11.746	9.014
12/1/2021	9:53	12.018	8.733
12/1/2021	9:54	12.062	8.681
12/1/2021	9:55	11.431	9.348
12/1/2021	9:56	11.518	9.179
12/1/2021	9:57	12.309	8.429
12/1/2021	9:58	12.669	8.08
12/1/2021	9:59	12.103	8.646
12/1/2021	10:00	11.822	8.936
12/1/2021	10:01	12.134	8.584
12/1/2021	10:02	12.23	8.485

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
12/1/2021	10:03	11.806	8.932
12/1/2021	10:04	11.104	9.665
12/1/2021	10:05	9.73	10.97
12/1/2021	10:06	11.174	9.528
12/1/2021	10:07	11.344	9.439
12/1/2021	10:08	10.561	10.143
12/1/2021	10:09	11.372	9.385
12/1/2021	10:10	10.865	9.875
12/1/2021	10:11	10.863	9.869
12/1/2021	10:12	9.807	10.923
12/1/2021	10:13	10.049	10.658
12/1/2021	10:14	9.567	11.153
12/1/2021	10:15	9.875	10.835
12/1/2021	10:16	9.599	11.116
12/1/2021	10:17	10.797	9.948
12/1/2021	10:18	11.276	9.428
12/1/2021	10:19	10.413	10.32
12/1/2021	10:20	9.577	11.177
12/1/2021	10:21	9.909	10.743
12/1/2021	10:22	9.933	10.823
12/1/2021	10:23	11.802	8.843
12/1/2021	10:24	14.079	6.451
12/1/2021	10:25	13.42	6.596
12/1/2021	10:26	11.772	7.807
12/1/2021	10:27	12.075	7.377
12/1/2021	10:28	11.904	7.483
12/1/2021	10:29	12.127	7.234
12/1/2021	10:30	11.882	7.463
12/1/2021	10:31	11.796	7.541
12/1/2021	10:32	11.766	7.558
12/1/2021	10:33	11.446	7.88
12/1/2021	10:34	12.493	6.828
12/1/2021	10:35	11.865	7.446
12/1/2021	10:36	10.681	8.607
12/1/2021	10:37	11.144	8.154
12/1/2021	10:38	10.704	8.578
12/1/2021	10:39	11.072	8.206
12/1/2021	10:40	11.393	7.906
12/1/2021	10:41	11.061	8.228
12/1/2021	10:42	11.038	8.229
12/1/2021	10:43	11.348	7.957
12/1/2021	10:44	10.529	8.759
12/1/2021	10:45	11.214	8.072

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
12/1/2021	10:46	10.269	9.02
12/1/2021	10:47	9.883	9.394
12/1/2021	10:48	10.04	9.221
12/1/2021	10:49	11.284	7.995
12/1/2021	10:50	10.36	8.926
12/1/2021	10:51	9.802	9.46
12/1/2021	10:52	9.352	9.906
12/1/2021	10:53	9.934	9.301
12/1/2021	10:54	9.119	10.112
12/1/2021	10:55	10.017	9.246
12/1/2021	10:56	10.388	8.874
12/1/2021	10:57	9.382	9.888
12/1/2021	10:58	9.365	9.886
12/1/2021	10:59	10.317	8.954
12/1/2021	11:00	10.226	9.037
12/1/2021	11:01	10.832	8.45
12/1/2021	11:02	10.573	8.709
12/1/2021	11:03	10.212	9.052
12/1/2021	11:04	9.759	9.528
12/1/2021	11:05	9.449	9.811
12/1/2021	11:06	9.751	9.521
12/1/2021	11:07	9.174	10.114
12/1/2021	11:08	9.171	10.129
12/1/2021	11:09	8.746	10.649
12/1/2021	11:10	9.341	10.086
12/1/2021	11:11	11.207	8.156
12/1/2021	11:12	10.708	8.71
12/1/2021	11:13	11.262	8.134
12/1/2021	11:14	10.622	8.786
12/1/2021	11:15	10.775	8.621
12/1/2021	11:16	10.738	8.669
12/1/2021	11:17	10.295	9.108
12/1/2021	11:18	10.887	8.504
12/1/2021	11:19	10.31	9.106
12/1/2021	11:20	10.651	8.708
12/1/2021	11:21	10.929	8.452
12/1/2021	11:22	10.957	8.466
12/1/2021	11:23	10.162	9.224
12/1/2021	11:24	10.314	9.061
12/1/2021	11:25	10.301	9.085
12/1/2021	11:26	10.906	8.474
12/1/2021	11:27	10.871	8.531
12/1/2021	11:28	10.129	9.256

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
12/1/2021	11:29	10.565	8.837
12/1/2021	11:30	10.421	8.977
12/1/2021	11:31	9.648	9.729
12/1/2021	11:32	8.968	10.448
12/1/2021	11:33	7.993	11.388
12/1/2021	11:34	9.009	10.342
12/1/2021	11:35	8.456	10.928
12/1/2021	11:36	9.629	9.726
12/1/2021	11:37	11.089	8.281
12/1/2021	11:38	11.713	7.661
12/1/2021	11:39	11.605	7.793
12/1/2021	11:40	10.914	8.476
12/1/2021	11:41	11.015	8.359
12/1/2021	11:42	10.874	8.497
12/1/2021	11:43	10.416	8.983
12/1/2021	11:44	10.235	9.13
12/1/2021	11:45	11.028	8.346
12/1/2021	11:46	11.257	8.131
12/1/2021	11:47	10.982	8.389
12/1/2021	11:48	11.359	8.044
12/1/2021	11:49	11.043	8.31
12/1/2021	11:50	11.616	7.789
12/1/2021	11:51	11.252	8.143
12/1/2021	11:52	10.894	8.491
12/1/2021	11:53	10.443	8.955
12/1/2021	11:54	10.456	8.919
12/1/2021	11:55	10.723	8.654
12/1/2021	11:56	11.162	8.202
12/1/2021	11:57	11.048	8.375
12/1/2021	11:58	10.166	9.199
12/1/2021	11:59	11.263	8.152
12/1/2021	12:00	11.112	8.271
12/1/2021	12:01	11.749	7.667
12/1/2021	12:02	10.825	8.59
12/1/2021	12:03	10.478	8.925
12/1/2021	12:04	10.612	8.774
12/1/2021	12:05	10.908	8.459
12/1/2021	12:06	11.534	7.854
12/1/2021	12:07	11.467	7.953
12/1/2021	12:08	11.024	8.381
12/1/2021	12:09	11.603	7.767
12/1/2021	12:10	13.206	6.216
12/1/2021	12:11	11.728	7.704

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
12/1/2021	12:12	11.31	8.117
12/1/2021	12:13	11.241	8.169
12/1/2021	12:14	11.283	8.135
12/1/2021	12:15	11.612	7.814
12/1/2021	12:16	10.712	8.717
12/1/2021	12:17	11.504	7.911
12/1/2021	12:18	10.964	8.442
12/1/2021	12:19	10.822	8.587
12/1/2021	12:20	11.292	8.108
12/1/2021	12:21	11.449	7.982
12/1/2021	12:22	10.964	8.413
12/1/2021	12:23	11.464	7.923
12/1/2021	12:24	16.453	3.008
12/1/2021	12:25	16.519	2.954
12/1/2021	12:26	16.88	2.58
12/1/2021	12:27	13.652	5.766
12/1/2021	12:28	10.718	8.59
12/1/2021	12:29	9.767	9.558
12/1/2021	12:30	9.229	10.116
12/1/2021	12:31	9.769	9.578
12/1/2021	12:32	9.702	9.727
12/1/2021	12:33	10.152	9.367
12/1/2021	12:34	9.856	9.65
12/1/2021	12:35	10.133	9.391
12/1/2021	12:36	9.375	10.123
12/1/2021	12:37	9.569	9.938
12/1/2021	12:38	9.483	10.335
12/1/2021	12:39	9.669	10.185
12/1/2021	12:40	10.798	9.062
12/1/2021	12:41	10.134	9.75
12/1/2021	12:42	9.409	10.457
12/1/2021	12:43	9.838	10.017
12/1/2021	12:44	9.892	9.957
12/1/2021	12:45	10.404	9.449
12/1/2021	12:46	10.273	9.599
12/1/2021	12:47	10.038	9.824
12/1/2021	12:48	9.569	10.289
12/1/2021	12:49	9.407	10.476
12/1/2021	12:50	10.085	9.77
12/1/2021	12:51	10.27	9.586
12/1/2021	12:52	10.45	9.423
12/1/2021	12:53	11.046	8.836
12/1/2021	12:54	11.023	8.847

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
12/1/2021	12:55	11.164	8.713	
12/1/2021	12:56	10.429	9.44	
12/1/2021	12:57	10.161	9.775	
12/1/2021	12:58	9.473	10.834	
12/1/2021	12:59	9.697	10.657	
12/1/2021	13:00	10.217	10.224	
12/1/2021	13:01	10.8	9.81	
12/1/2021	13:02	10.93	9.802	
12/1/2021	13:03	9.731	10.998	
12/1/2021	13:04	9.196	11.493	
12/1/2021	13:05	9.702	11.027	
12/1/2021	13:06	10.359	10.355	
12/1/2021	13:07	9.243	11.456	
12/1/2021	13:08	7.96	12.745	
12/1/2021	13:09	9.132	10.604	
12/1/2021	13:10	2.786	3.373	
12/1/2021	13:11	0.021	0.081	Zero Bias
12/1/2021	13:12	8.898	8.876	
12/1/2021	13:13	10.617	10.548	O2 CO2 Bias
12/1/2021	13:14	1.177	1.493	
12/1/2021	13:15	0.004	0.023	Zero
12/1/2021	13:16	8.936	9.441	
12/1/2021	13:17	10.648	10.521	Span
12/1/2021	13:18	10.448	10.368	
12/1/2021	13:19	10.023	10.739	
12/1/2021	13:20	9.808	10.887	
12/1/2021	13:21	9.415	11.285	
12/1/2021	13:22	9.041	11.649	
12/1/2021	13:23	9.759	10.949	
12/1/2021	13:24	10.059	10.647	
12/1/2021	13:25	10.611	10.092	
12/1/2021	13:26	10.834	9.891	
12/1/2021	13:27	9.972	10.754	
12/1/2021	13:28	10.661	10.079	
12/1/2021	13:29	9.895	10.808	
12/1/2021	13:30	10.132	10.588	
12/1/2021	13:31	10.02	10.669	
12/1/2021	13:32	9.459	11.234	
12/1/2021	13:33	10.1	10.601	
12/1/2021	13:34	9.916	10.766	
12/1/2021	13:35	9.972	10.722	
12/1/2021	13:36	10.182	10.543	

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %
12/1/2021	13:37	11.241	9.466
12/1/2021	13:38	10.821	9.867
12/1/2021	13:39	11.345	9.391
12/1/2021	13:40	9.941	10.793
12/1/2021	13:41	9.928	10.818
12/1/2021	13:42	9.493	11.204
12/1/2021	13:43	10.011	10.656
12/1/2021	13:44	10.545	10.178
12/1/2021	13:45	10.827	9.872
12/1/2021	13:46	10.144	10.639
12/1/2021	13:47	10.629	10.071
12/1/2021	13:48	9.737	10.96
12/1/2021	13:49	10.464	10.292
12/1/2021	13:50	9.25	11.509
12/1/2021	13:51	8.752	11.928
12/1/2021	13:52	9.369	11.355
12/1/2021	13:53	9.015	11.676
12/1/2021	13:54	10.323	10.387
12/1/2021	13:55	9.834	10.854
12/1/2021	13:56	10.134	10.575
12/1/2021	13:57	10.443	10.237
12/1/2021	13:58	10.188	10.541
12/1/2021	13:59	9.955	10.756
12/1/2021	14:00	10.464	10.239
12/1/2021	14:01	9.608	11.053
12/1/2021	14:02	9.063	11.638
12/1/2021	14:03	9.408	11.266
12/1/2021	14:04	9.603	11.05
12/1/2021	14:05	9.436	11.27
12/1/2021	14:06	9.565	11.061
12/1/2021	14:07	9.693	10.972
12/1/2021	14:08	9.795	10.92
12/1/2021	14:09	9.317	11.329
12/1/2021	14:10	8.978	11.667
12/1/2021	14:11	9.807	10.865
12/1/2021	14:12	8.515	12.134
12/1/2021	14:13	8.33	12.316
12/1/2021	14:14	8.54	12.072
12/1/2021	14:15	9.188	11.449
12/1/2021	14:16	9.388	11.253
12/1/2021	14:17	8.874	11.767
12/1/2021	14:18	9.237	11.374
12/1/2021	14:19	10.254	10.417

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
12/1/2021	14:20	8.762	11.871	
Run 3 Average		9.80	10.89	
12/1/2021	14:21	10.563	10.447	
12/1/2021	14:22	10.611	10.548	O2 CO2 Bias
12/1/2021	14:23	9.22	10.722	
12/1/2021	14:24	0.613	0.522	
12/1/2021	14:25	0.023	0.076	Zero Bias
12/1/2021	14:26	7.592	7.151	
12/1/2021	14:27	10.649	10.524	Span
12/1/2021	14:28	16.961	16.769	
12/1/2021	14:29	18.967	18.965	High
12/1/2021	14:30	2.706	2.652	
12/1/2021	14:31	-0.001	0.017	Zero
12/1/2021	14:32	-0.002	0.016	
12/1/2021	14:33	16.381	16.076	
12/1/2021	14:34	18.96	18.948	High
12/1/2021	14:35	12.612	12.541	
12/1/2021	14:36	10.644	10.523	Mid
12/1/2021	14:37	1.882	1.572	
12/1/2021	14:38	0.023	0.022	Zero
12/1/2021	14:39	0.02	0.023	
12/1/2021	14:40	0.015	0.022	
12/1/2021	14:41	0.017	0.022	
12/1/2021	14:42	0.016	0.022	
12/1/2021	14:43	0.017	0.021	
12/1/2021	14:44	8.41	7.295	
12/1/2021	14:45	11.16	9.409	
12/1/2021	14:46	11.105	9.474	
12/1/2021	14:47	10.288	10.278	
12/1/2021	14:48	10.781	9.786	
12/1/2021	14:49	10.21	10.366	
12/1/2021	14:50	10.213	10.351	
12/1/2021	14:51	10.314	10.26	
12/1/2021	14:52	11.261	9.331	
12/1/2021	14:53	11.027	9.565	
12/1/2021	14:54	9.699	10.892	
12/1/2021	14:55	10.655	9.933	
12/1/2021	14:56	10.312	10.284	
12/1/2021	14:57	10.667	9.93	
12/1/2021	14:58	9.999	10.588	
12/1/2021	14:59	10.523	10.249	
12/1/2021	15:00	10.603	10.528	

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
12/1/2021	15:01	10.602	10.531	O2 CO2 Bias
12/1/2021	15:02	8.383	8.152	
12/1/2021	15:03	0.023	0.079	Zero Bias
12/1/2021	15:04	3.947	4.97	
12/1/2021	15:05	10.228	10.343	
12/1/2021	15:06	11.113	9.517	
12/1/2021	15:07	10.55	10.116	
12/1/2021	15:08	9.682	10.915	
12/1/2021	15:09	8.652	12.028	
12/1/2021	15:10	8.886	11.736	
12/1/2021	15:11	9.464	11.082	
12/1/2021	15:12	9.76	10.899	
12/1/2021	15:13	9.607	10.98	
12/1/2021	15:14	9.099	11.561	
12/1/2021	15:15	9.381	11.242	
12/1/2021	15:16	9.364	11.248	
12/1/2021	15:17	9.166	11.484	
12/1/2021	15:18	9.846	10.745	
12/1/2021	15:19	9.607	11.006	
12/1/2021	15:20	10.026	10.596	
12/1/2021	15:21	10.02	10.608	
12/1/2021	15:22	9.335	11.334	
12/1/2021	15:23	9.586	11.014	
12/1/2021	15:24	9.513	11.067	
12/1/2021	15:25	10.131	10.52	
12/1/2021	15:26	9.648	10.937	
12/1/2021	15:27	10.28	10.359	
12/1/2021	15:28	10.07	10.535	
12/1/2021	15:29	10.039	10.626	
12/1/2021	15:30	9.206	11.143	
12/1/2021	15:31	9.488	11.162	
12/1/2021	15:32	8.913	11.736	
12/1/2021	15:33	8.739	11.836	
12/1/2021	15:34	9.479	11.087	
12/1/2021	15:35	9.736	10.922	
12/1/2021	15:36	9.986	10.659	
12/1/2021	15:37	9.279	11.379	
12/1/2021	15:38	9.872	10.728	
12/1/2021	15:39	10.004	10.653	
12/1/2021	15:40	9.752	10.886	
12/1/2021	15:41	9.731	10.882	
12/1/2021	15:42	9.507	11.165	

Desert View Power UNIT 1

Date	Time	O2 %	CO2 %	
12/1/2021	15:43	9.302	11.35	
12/1/2021	15:44	9.071	11.54	
12/1/2021	15:45	9.705	10.894	
12/1/2021	15:46	9.225	11.452	
12/1/2021	15:47	8.619	12.017	
12/1/2021	15:48	9.751	10.868	
12/1/2021	15:49	10.147	10.496	
12/1/2021	15:50	9.381	11.204	
12/1/2021	15:51	9.132	11.528	
12/1/2021	15:52	9.546	11.093	
12/1/2021	15:53	9.039	11.587	
12/1/2021	15:54	10.048	10.609	
12/1/2021	15:55	9.247	11.439	
12/1/2021	15:56	9.477	11.16	
12/1/2021	15:57	8.618	12.036	
12/1/2021	15:58	8.842	11.841	
12/1/2021	15:59	8.511	12.094	
12/1/2021	16:00	9.156	11.468	
12/1/2021	16:01	9.954	10.653	
12/1/2021	16:02	10.02	10.659	
12/1/2021	16:03	9.739	10.943	
12/1/2021	16:04	9.772	10.852	
12/1/2021	16:05	10.011	10.604	
12/1/2021	16:06	9.751	10.968	
12/1/2021	16:07	9.12	11.52	
12/1/2021	16:08	9.359	11.221	
Run 4 Average		9.50	11.13	
12/1/2021	16:09	2.01	1.642	
12/1/2021	16:10	0.014	0.067	Zero Bias
12/1/2021	16:11	8.083	8.213	
12/1/2021	16:12	10.61	10.533	O2 CO2 Bias
12/1/2021	16:13	0.414	0.795	
12/1/2021	16:14	0	0.016	Zero
12/1/2021	16:15	9.058	8.792	
12/1/2021	16:16	10.644	10.522	Span
12/1/2021	16:17	15.535	15.448	
12/1/2021	16:18	18.972	18.963	
12/1/2021	16:19	18.973	18.966	High
12/1/2021	16:20	18.973	18.969	

Appendix A.1.3
Unit 1 Instrument Strip Charts

SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 1

DATE: 12/1/2021
BY: RD

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO	CC707347	0.00		
O_2	CC181817	10.60	CC303876	18.99
CO_2	CC181817	10.65	CC303876	18.96

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Signature3 : No Sig.

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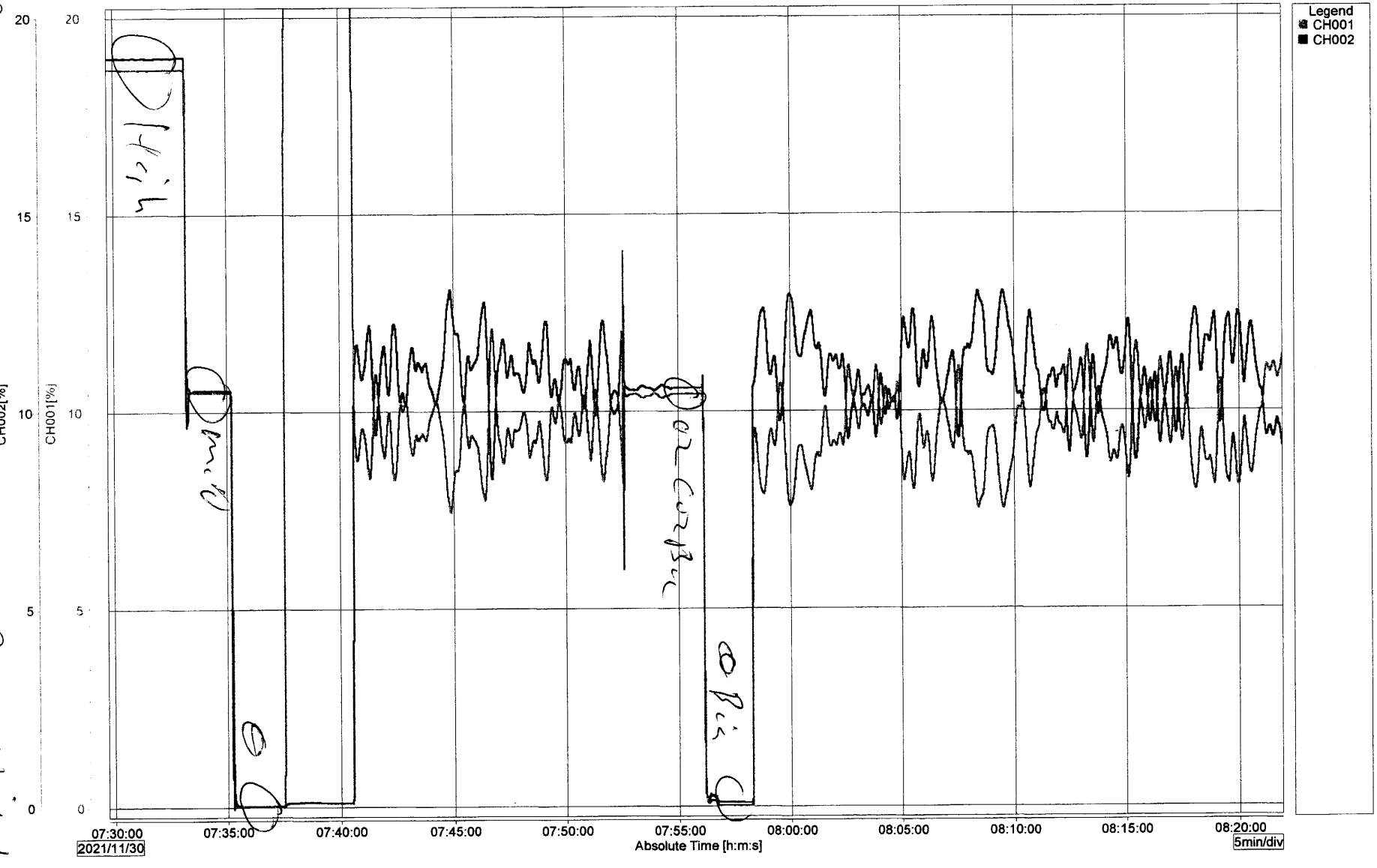

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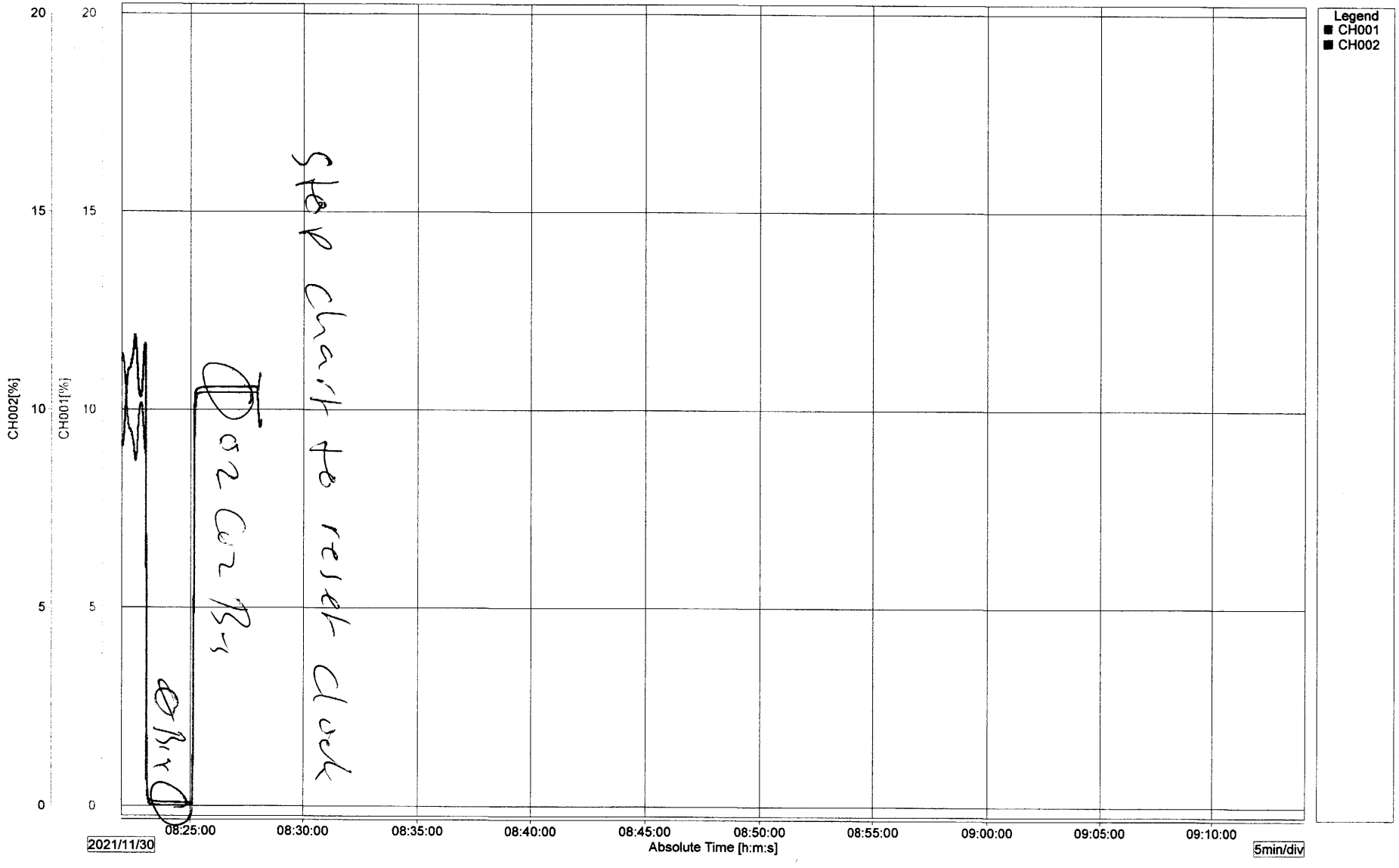

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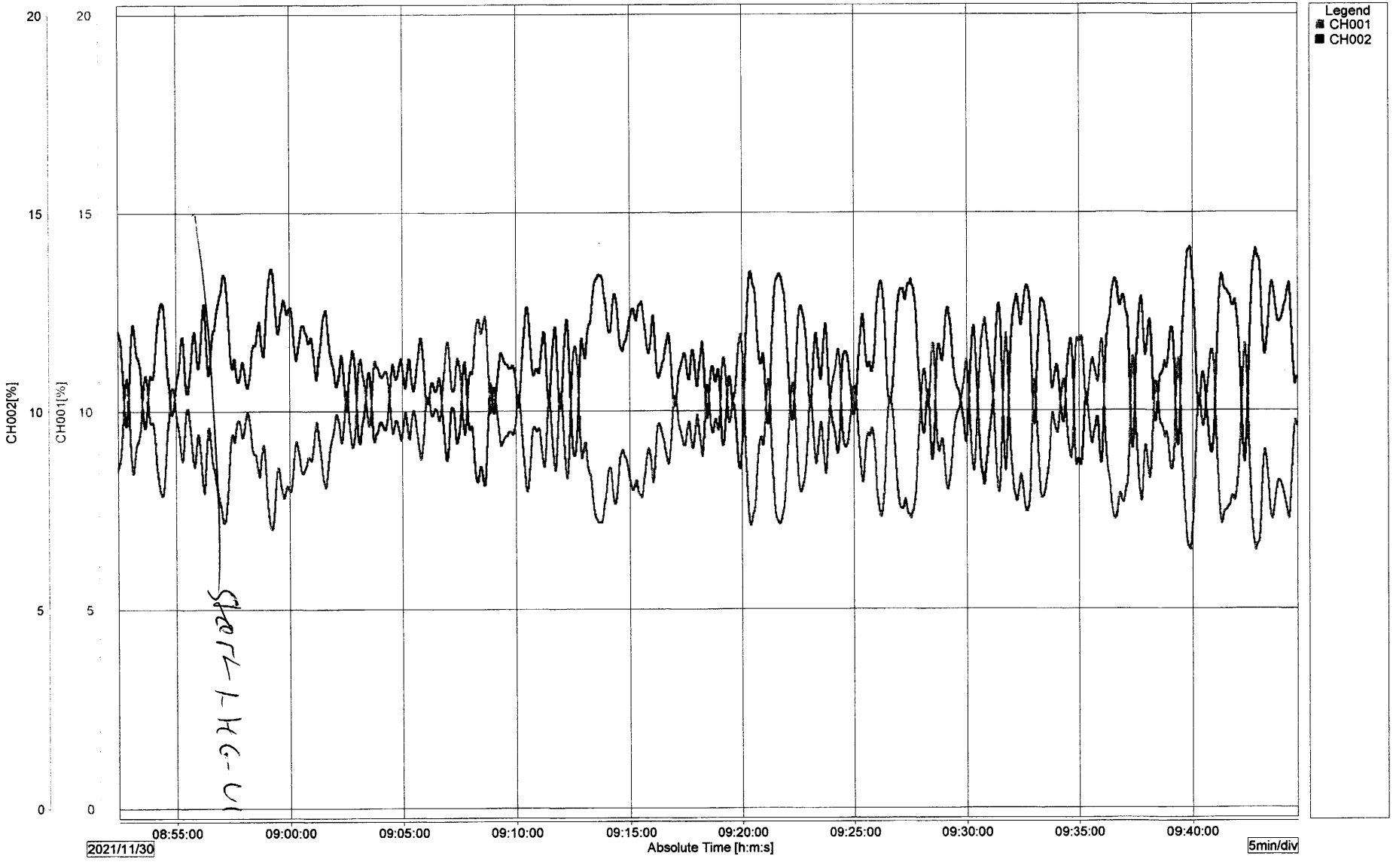

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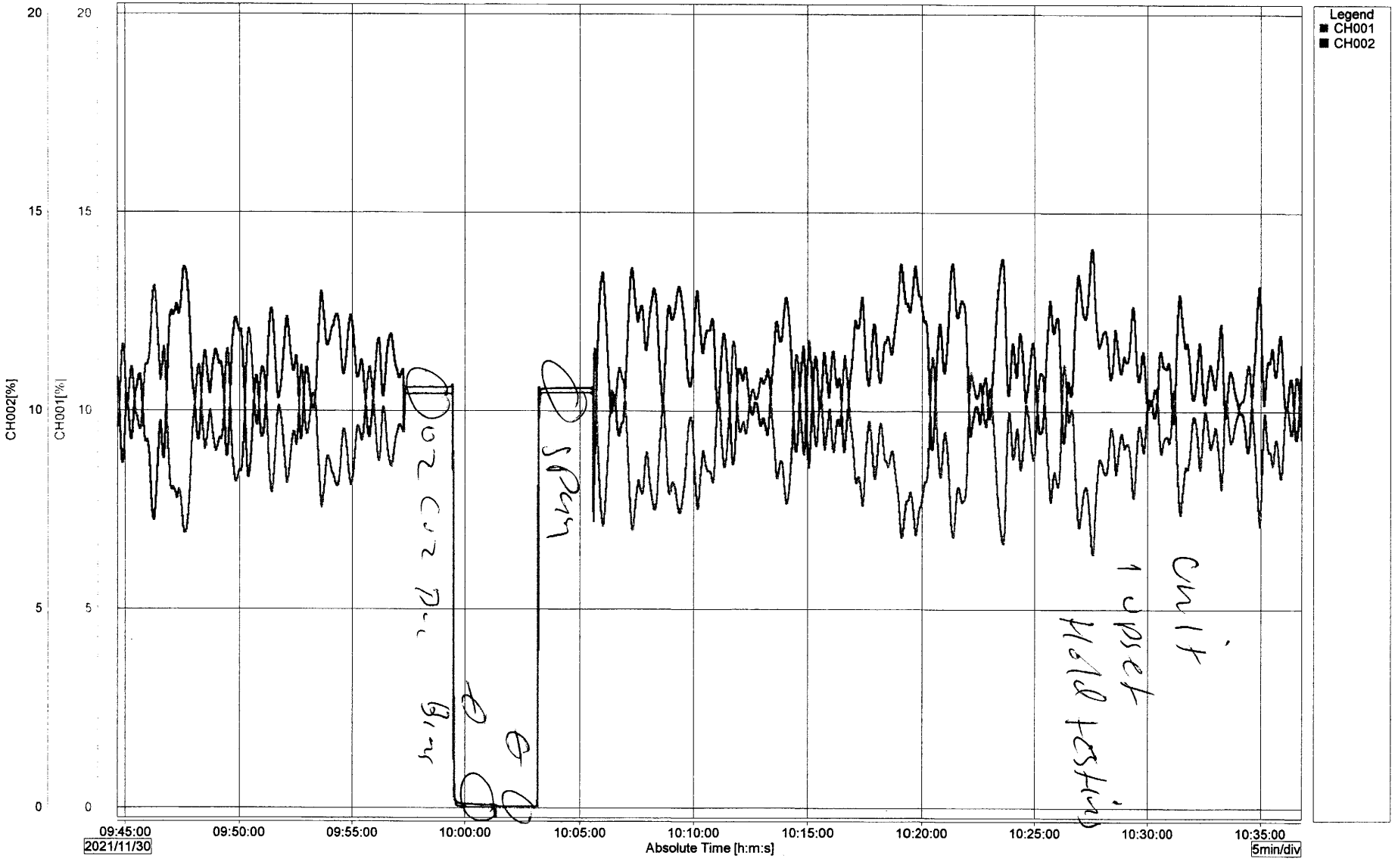

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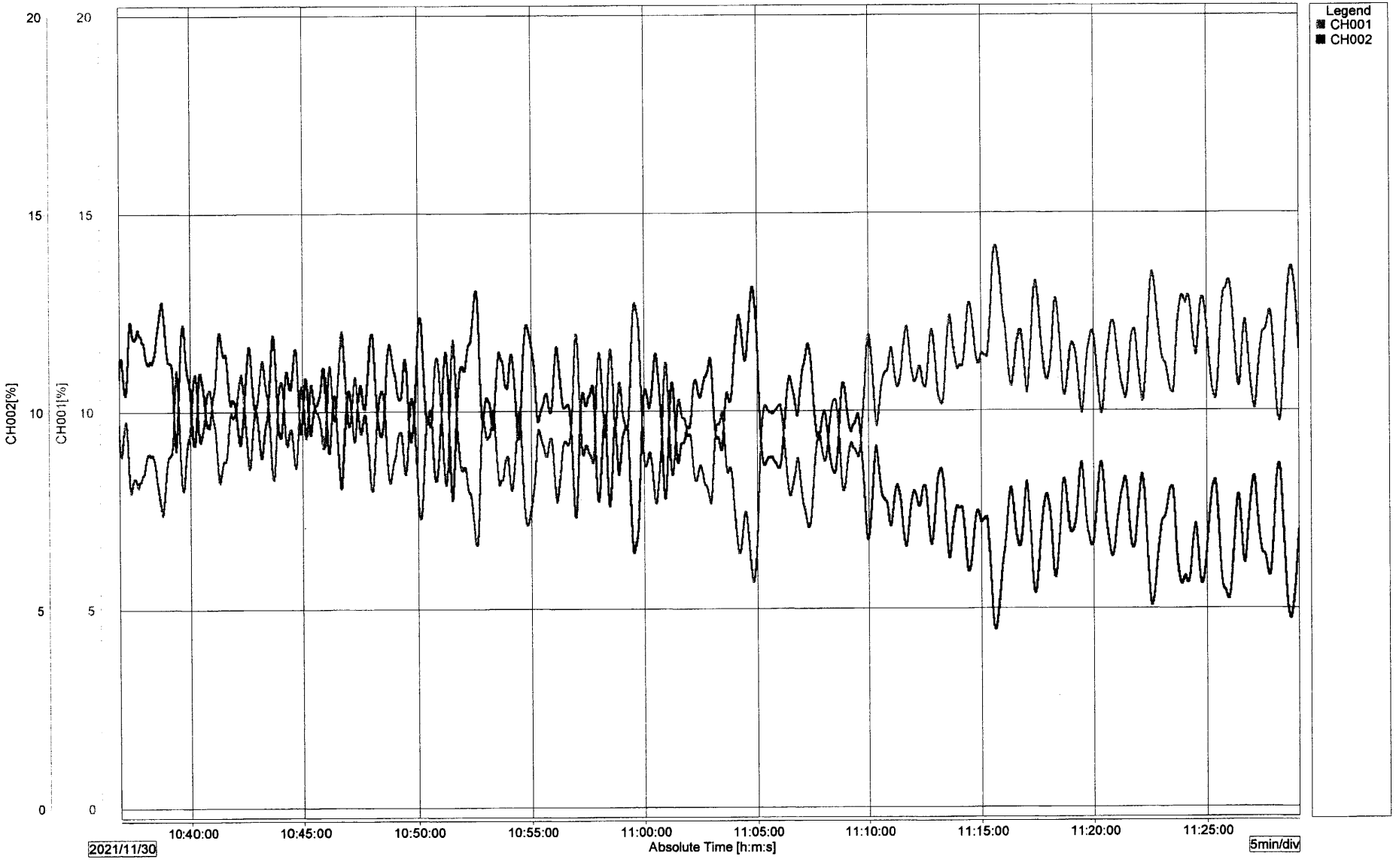

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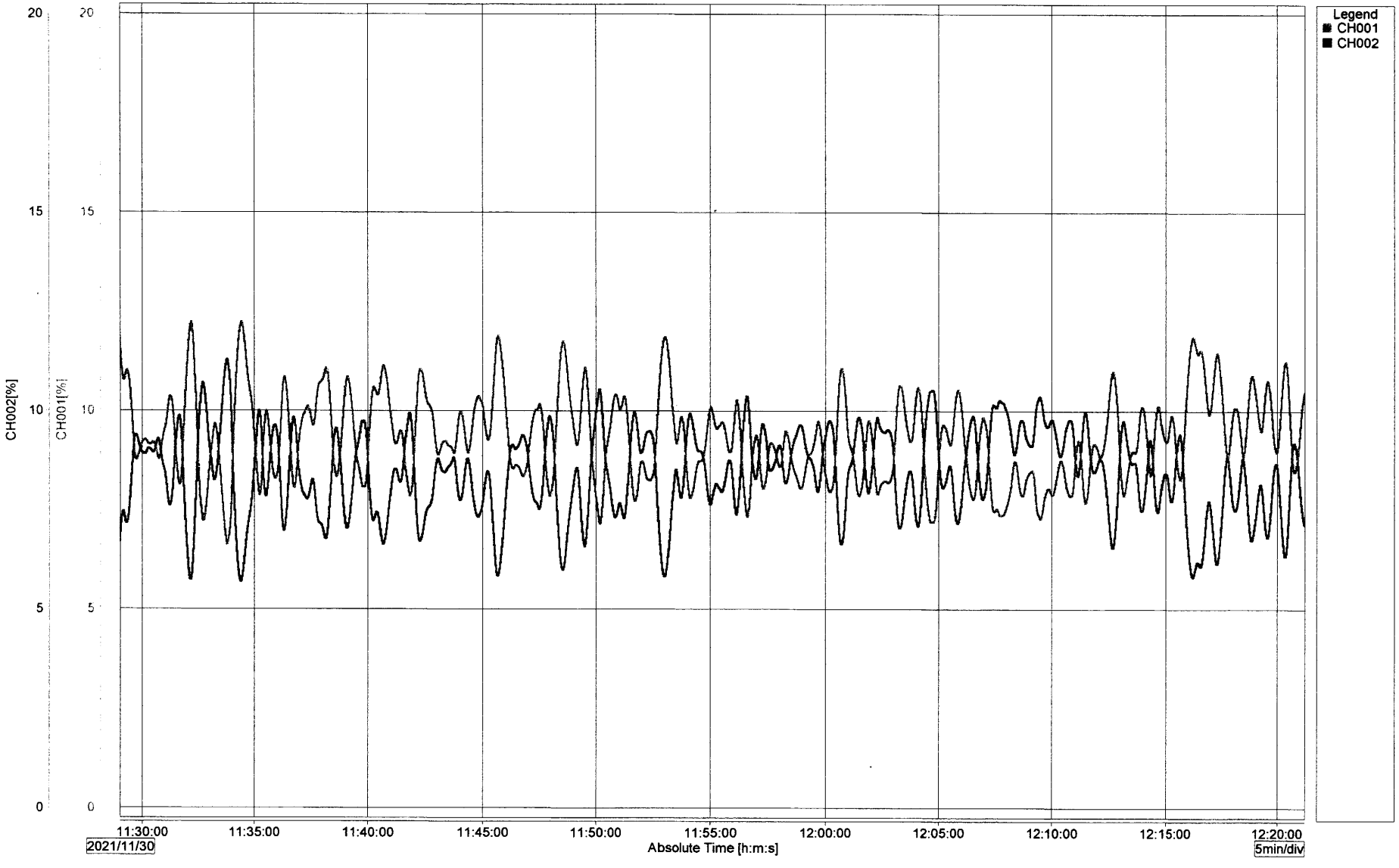

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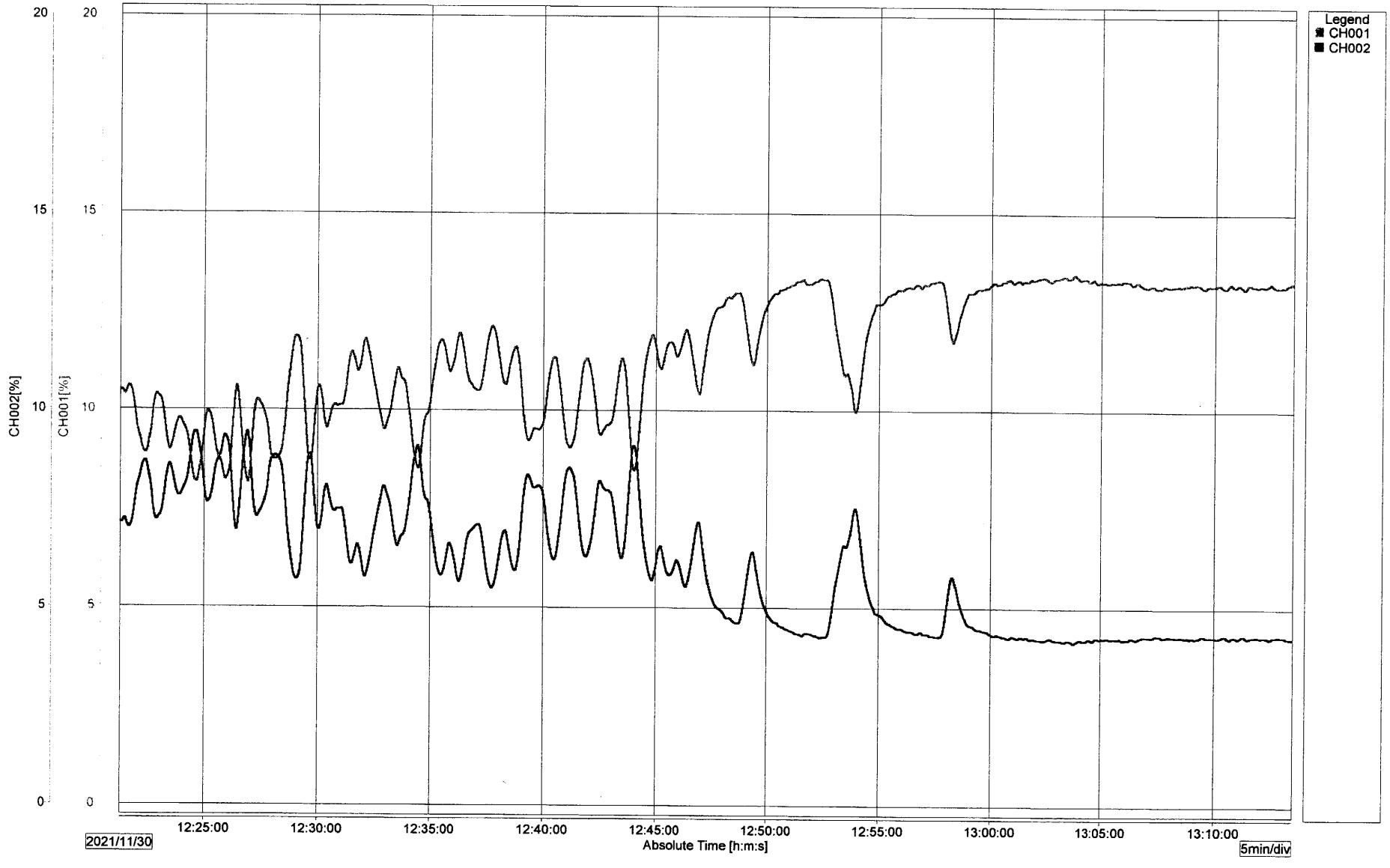

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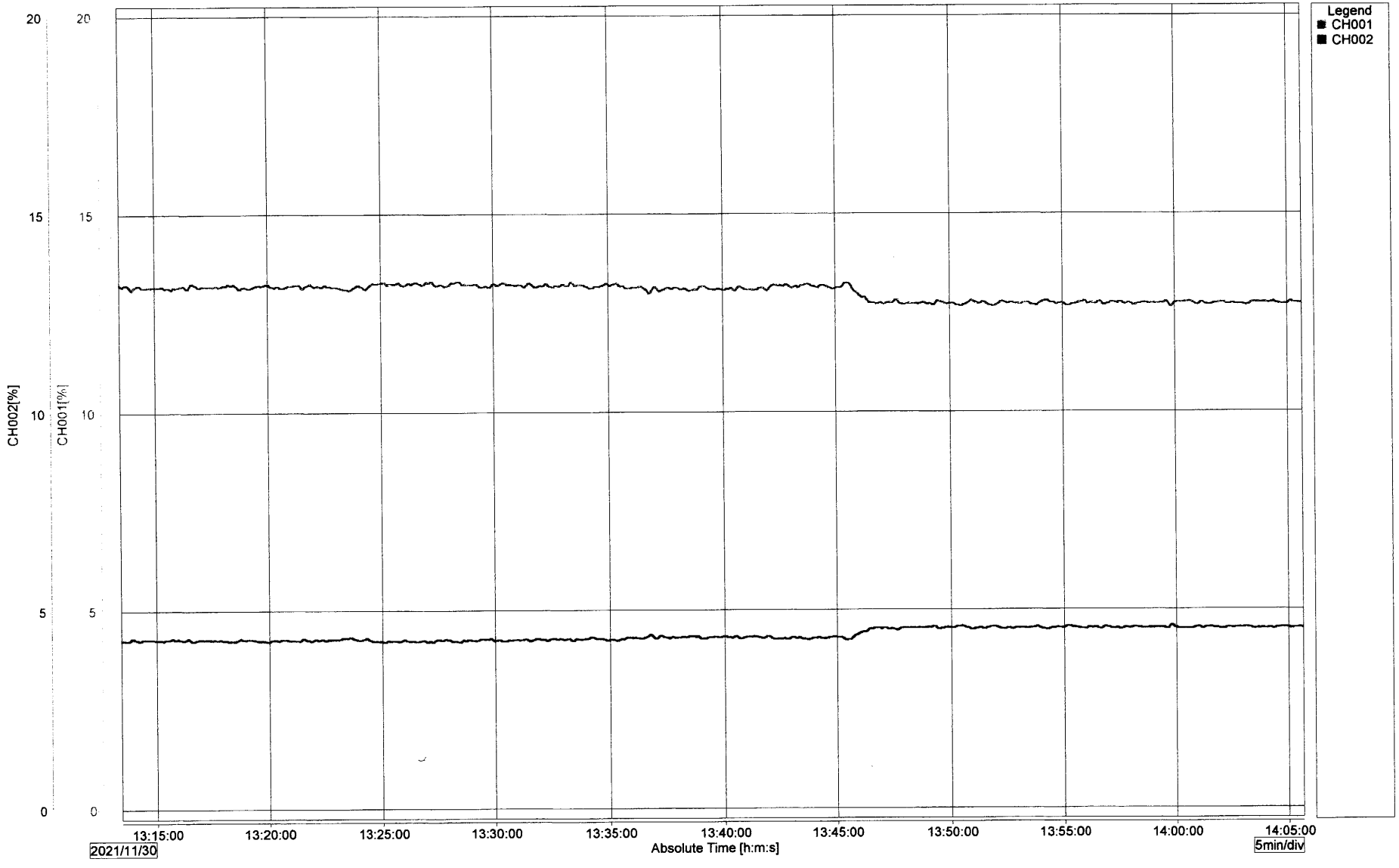

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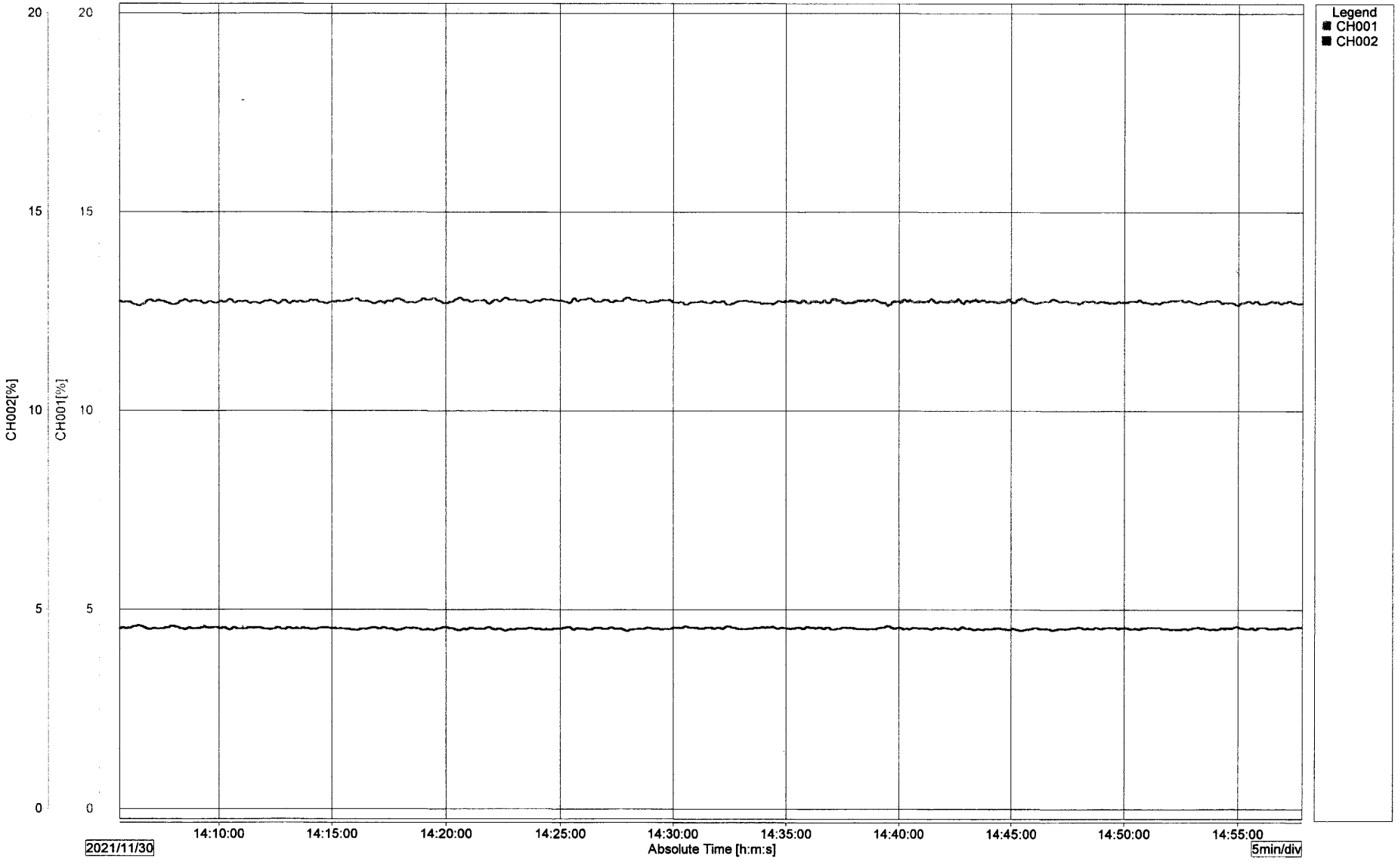

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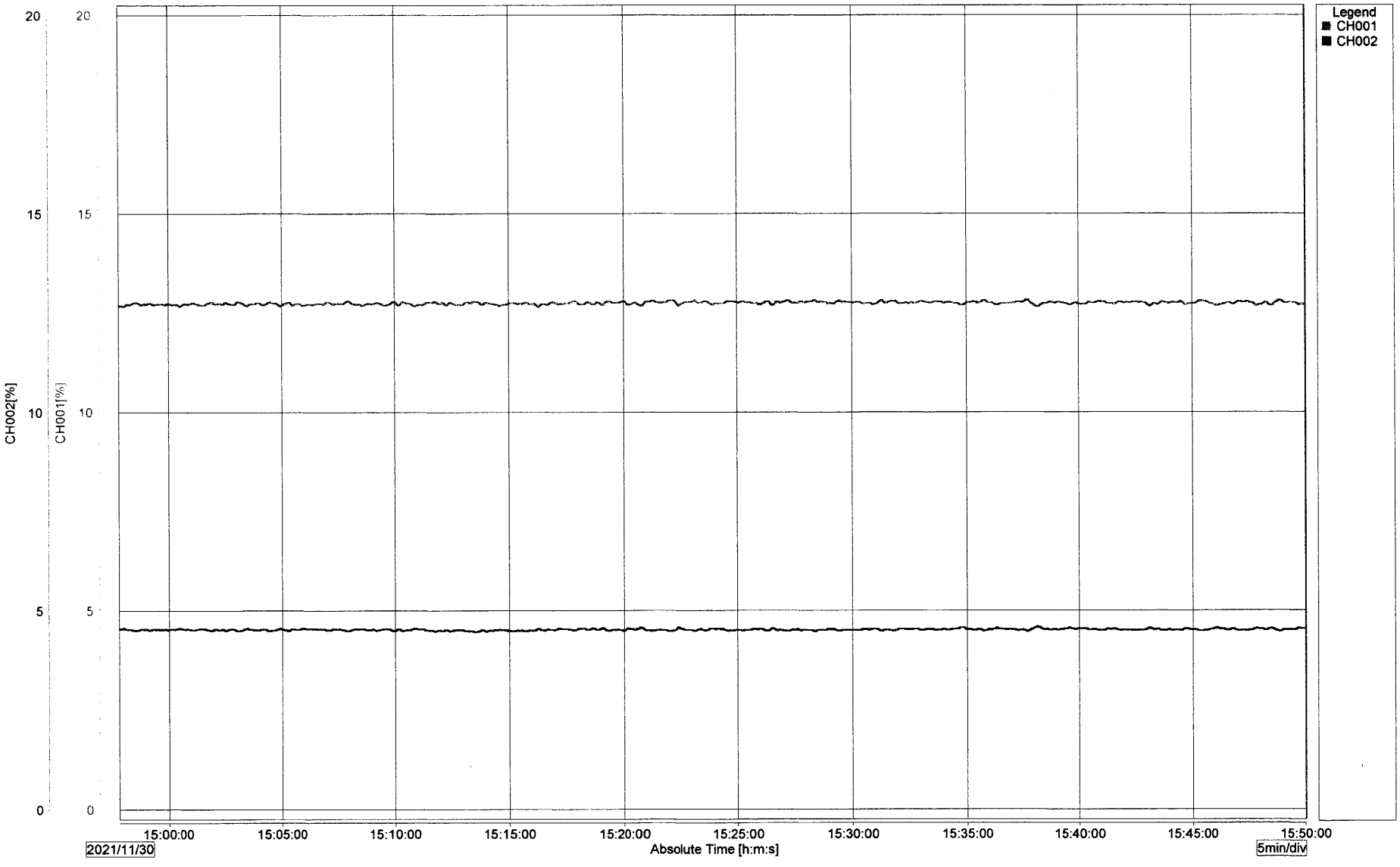

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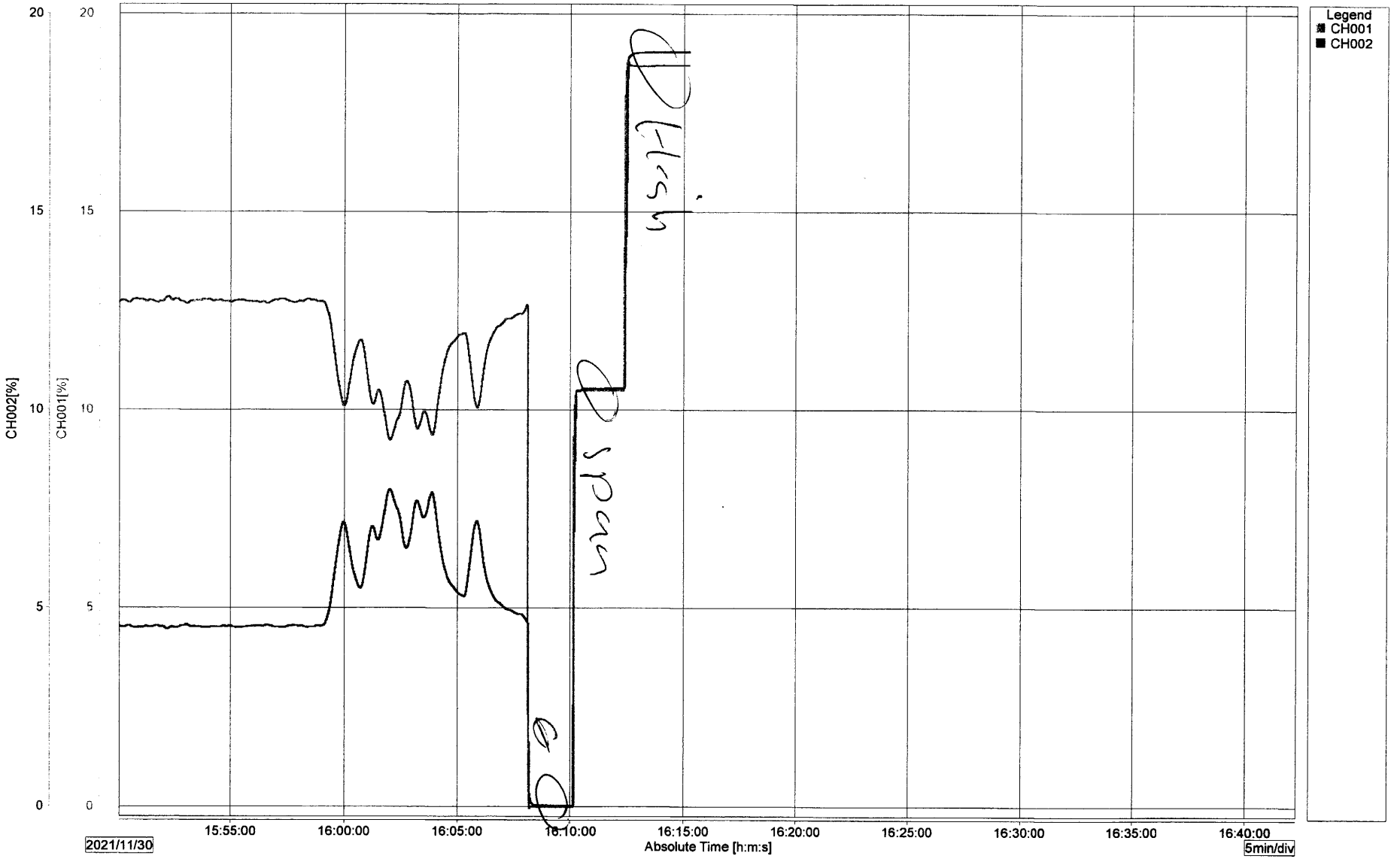

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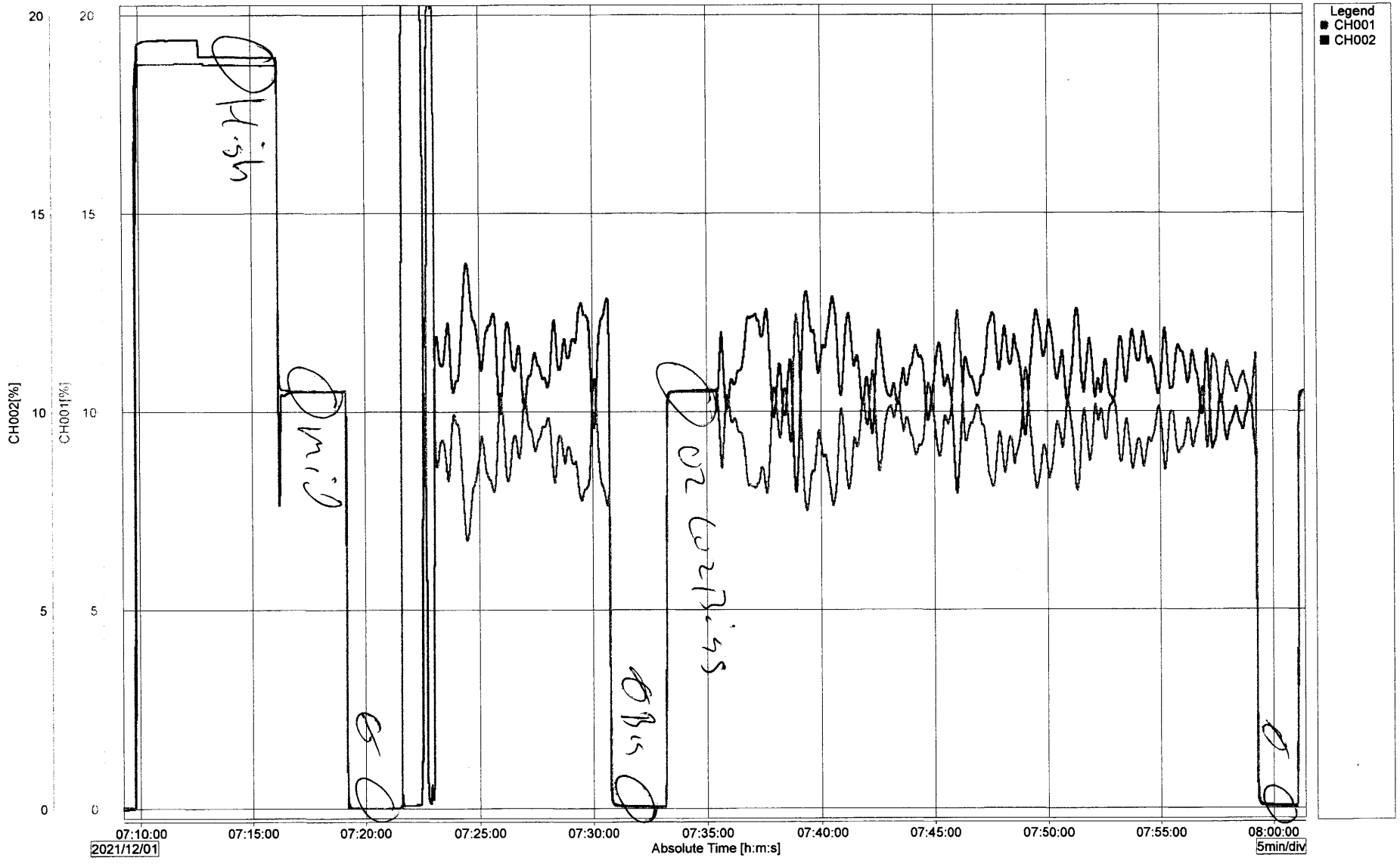

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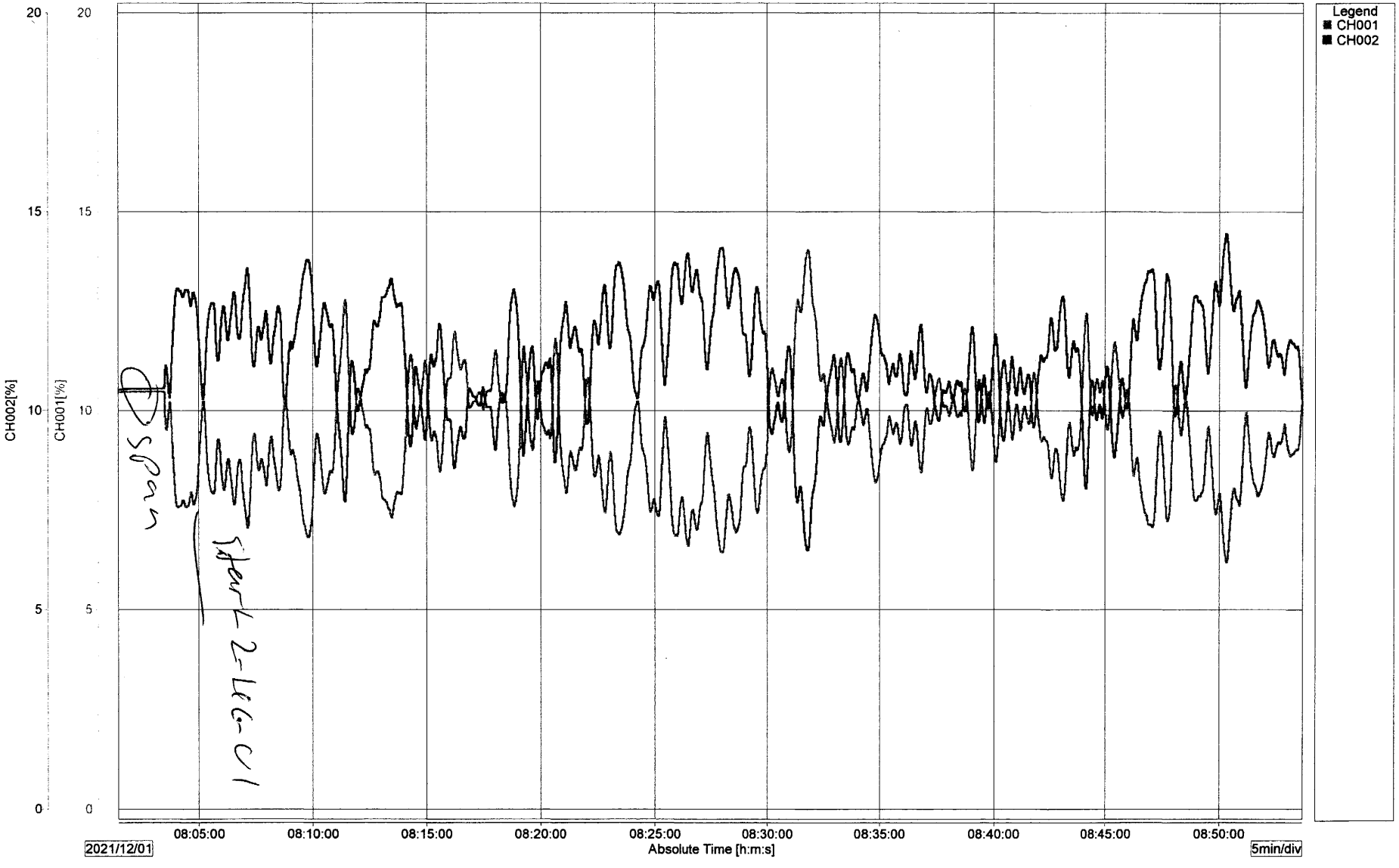

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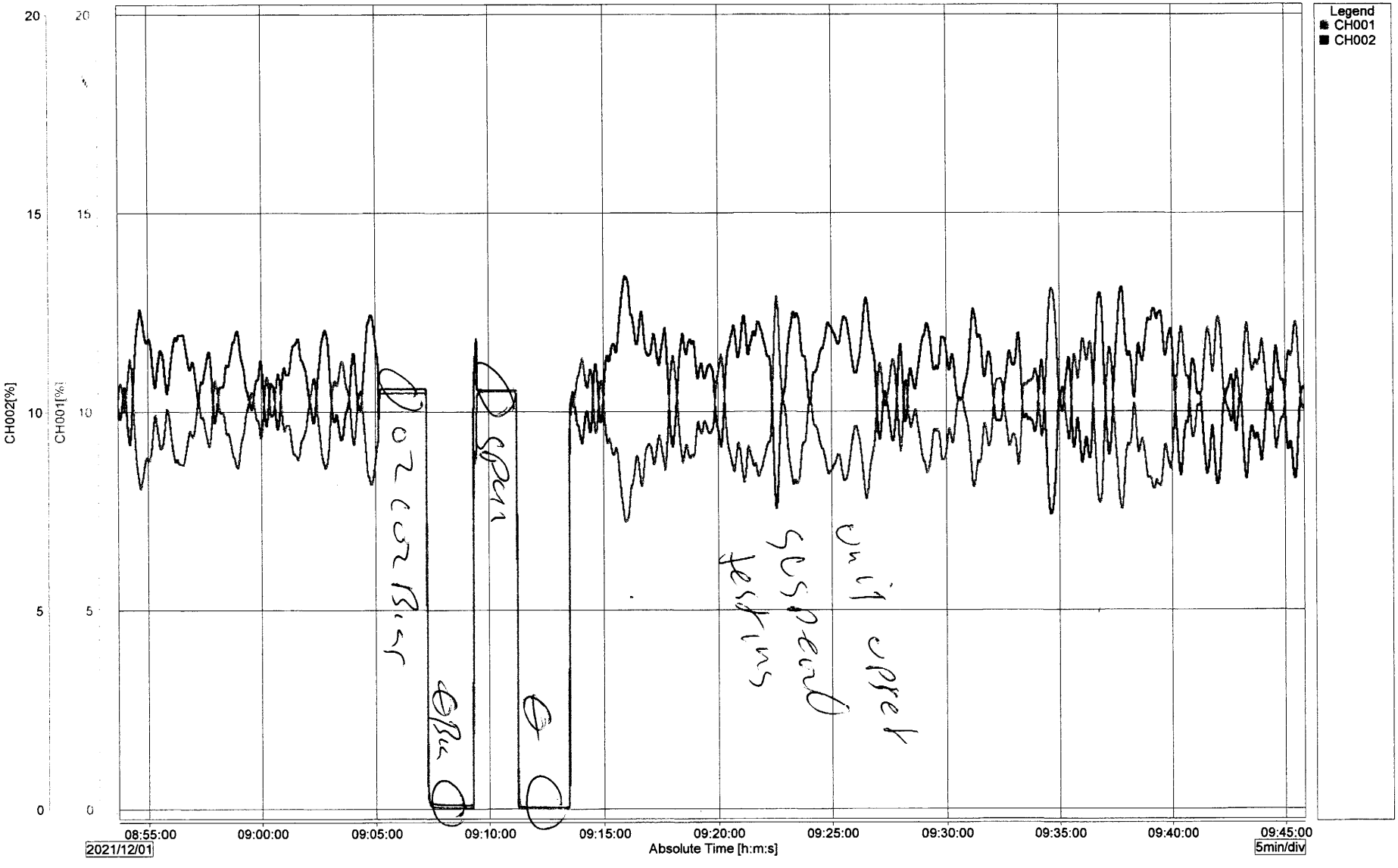

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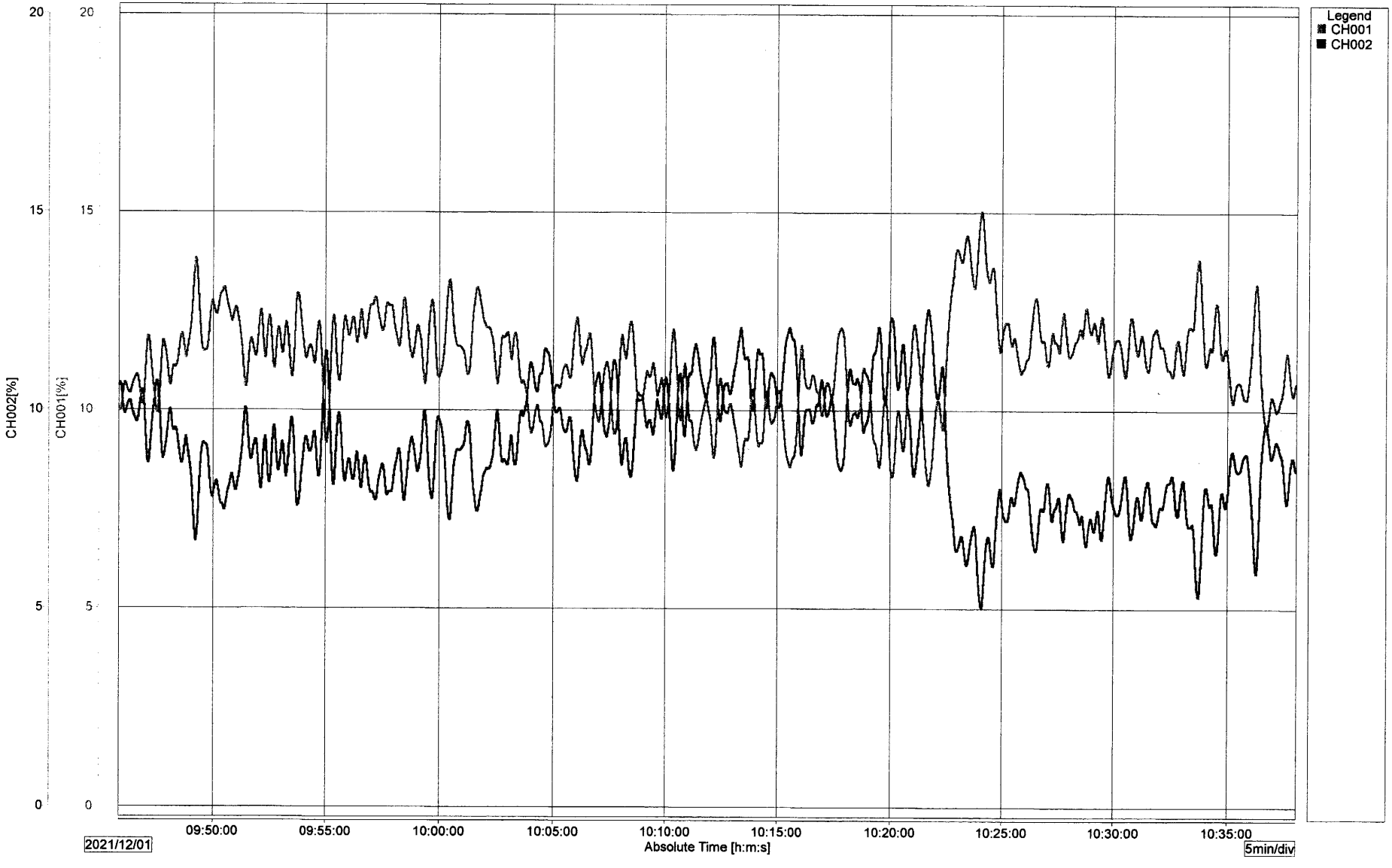

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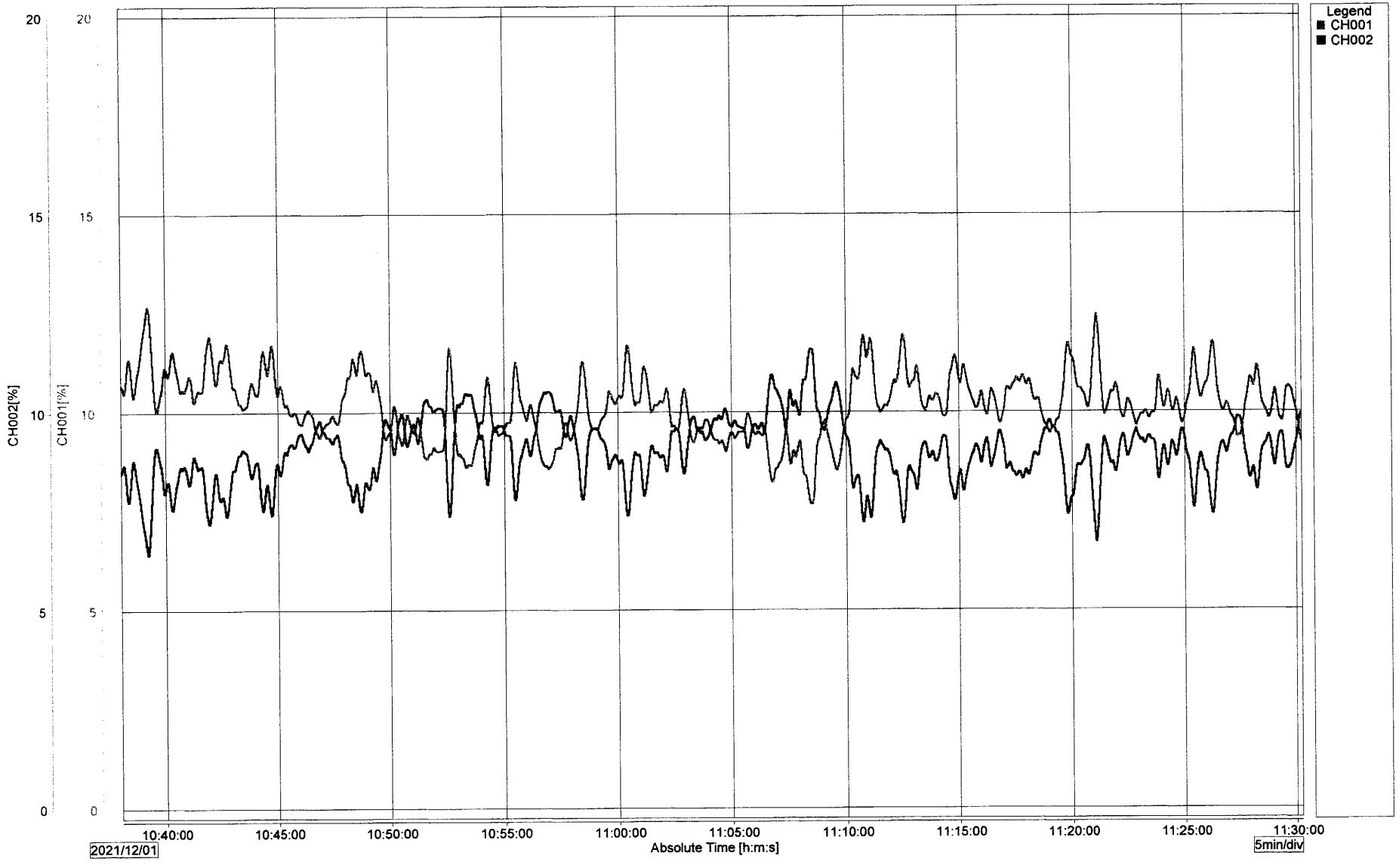

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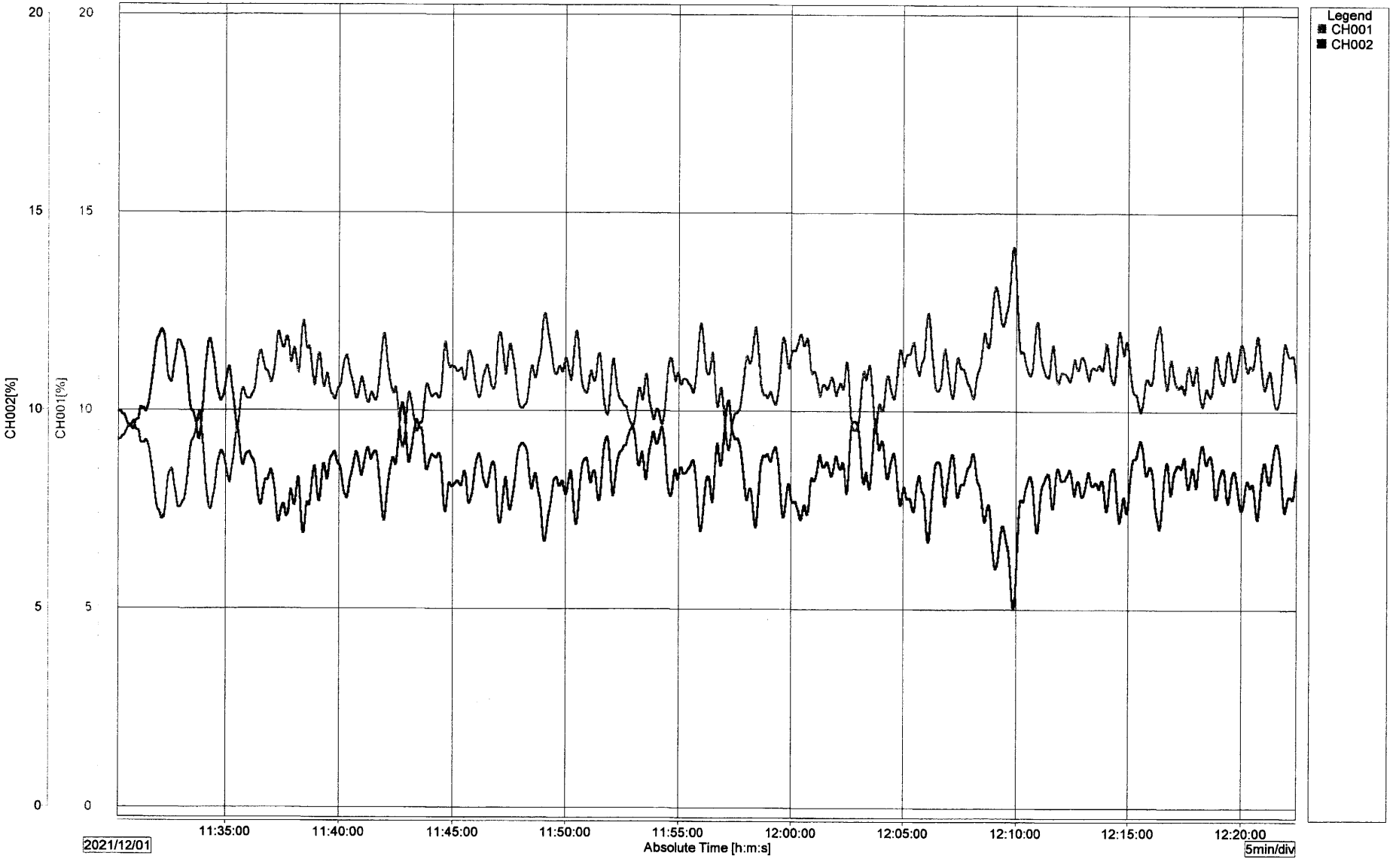

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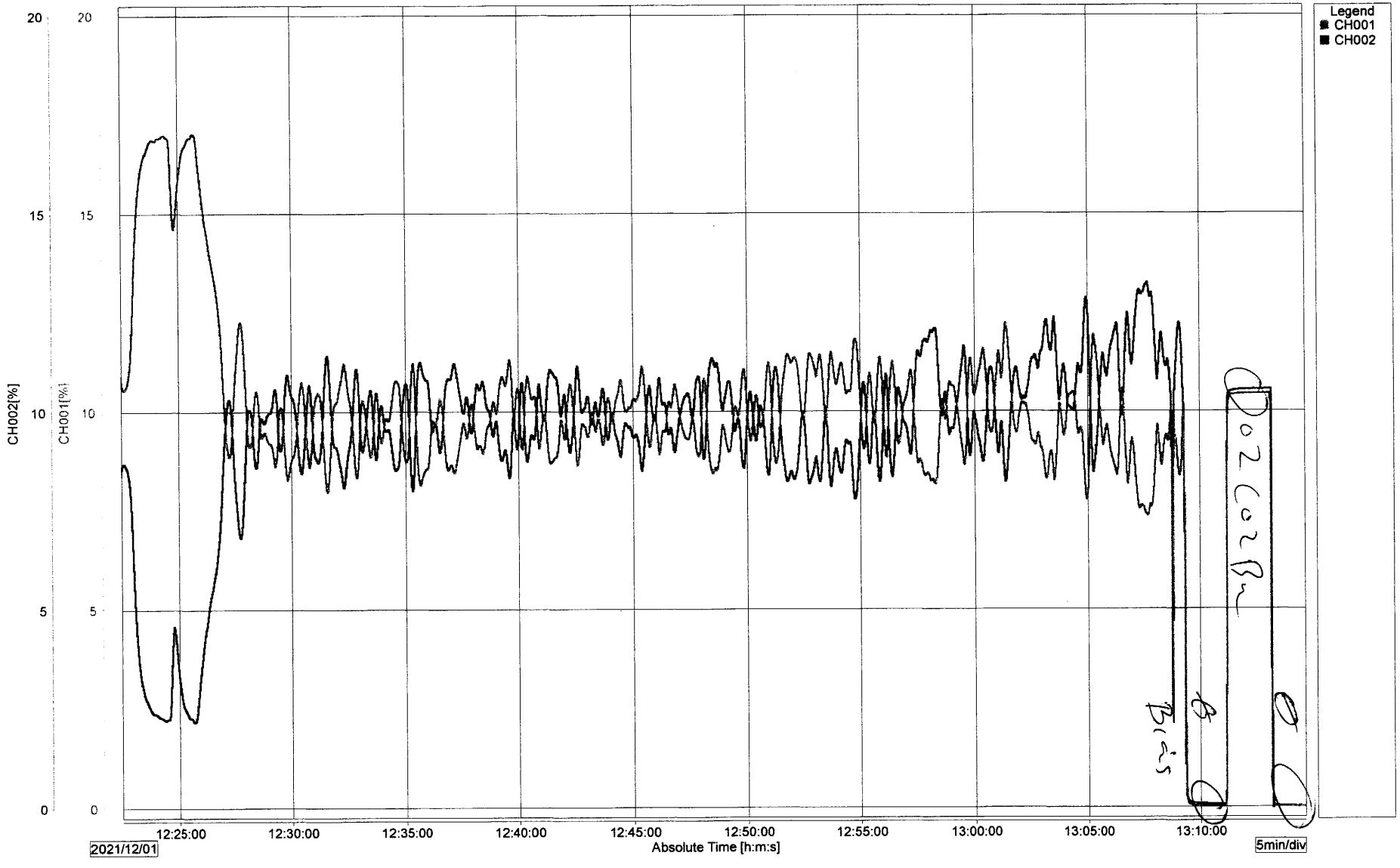

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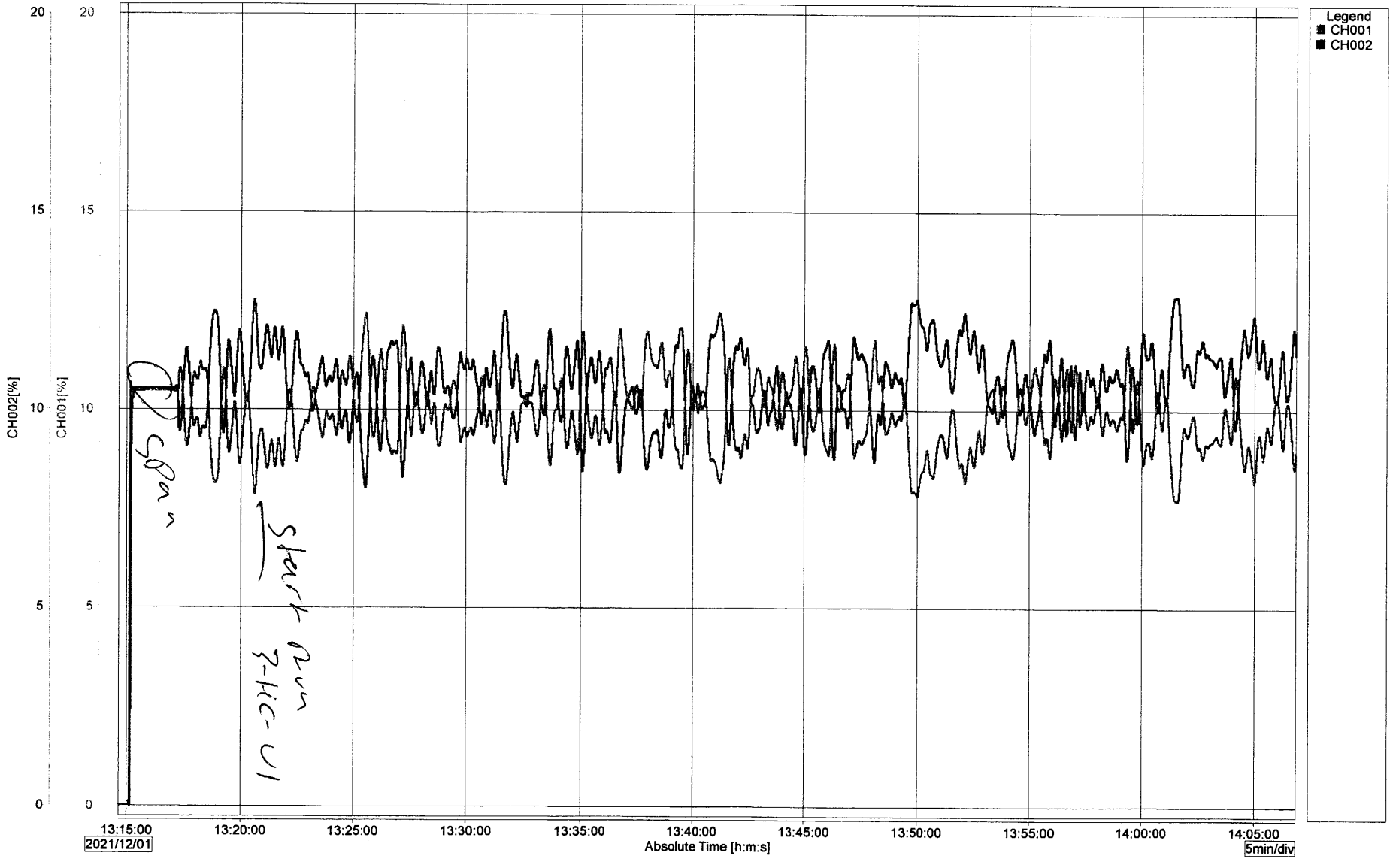

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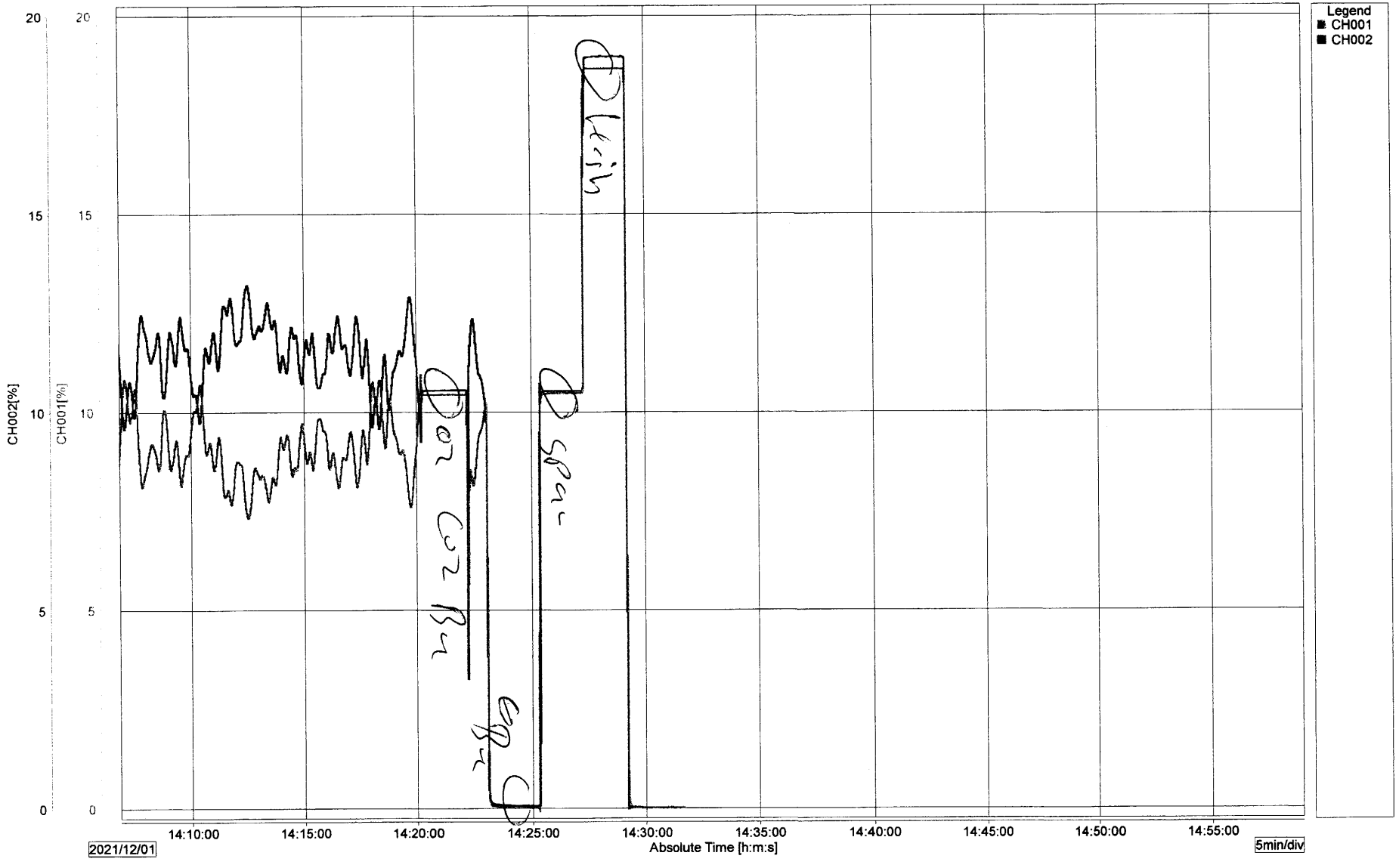

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Print Groups : GROUP 1
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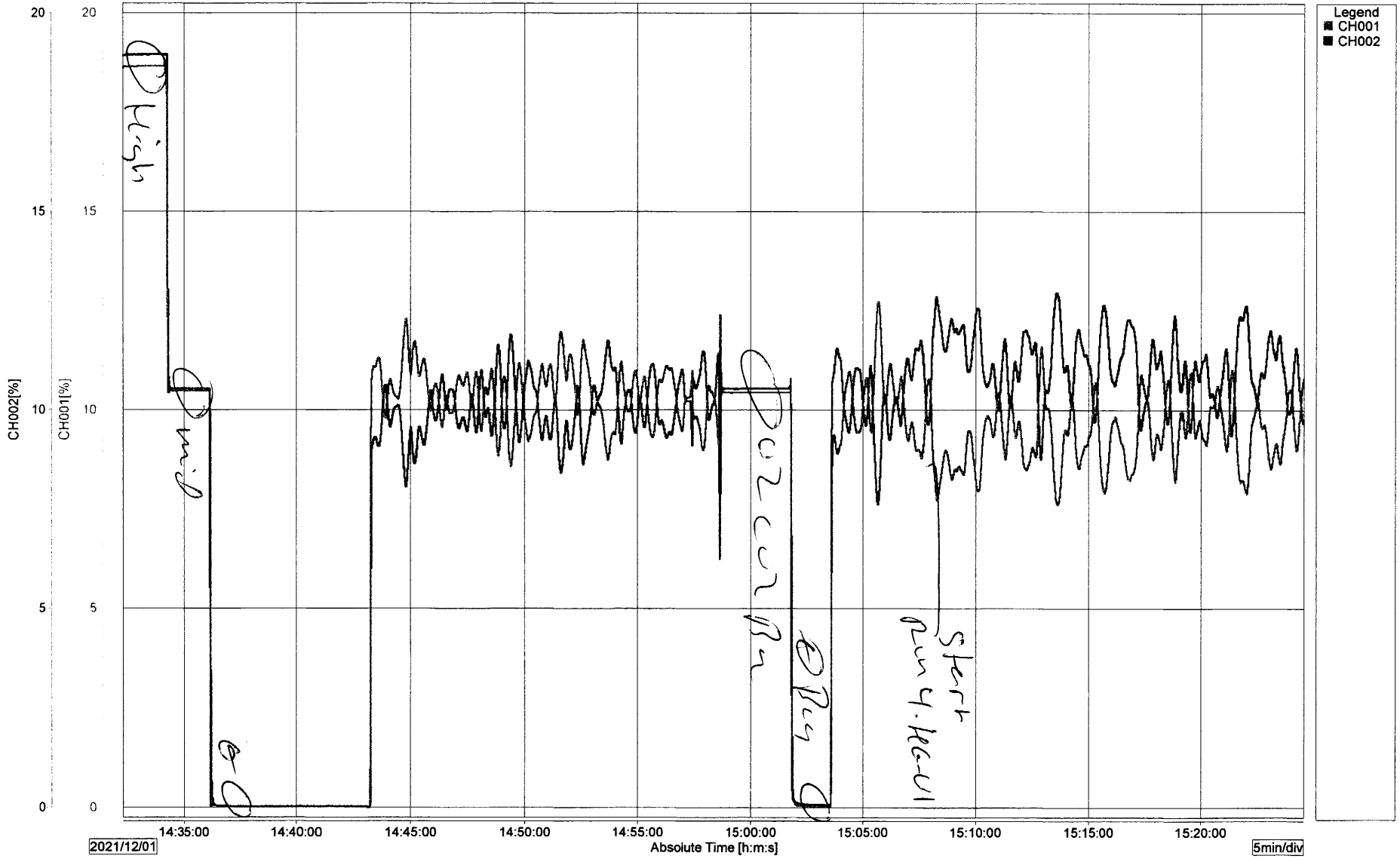

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Print Groups : GROUP 1
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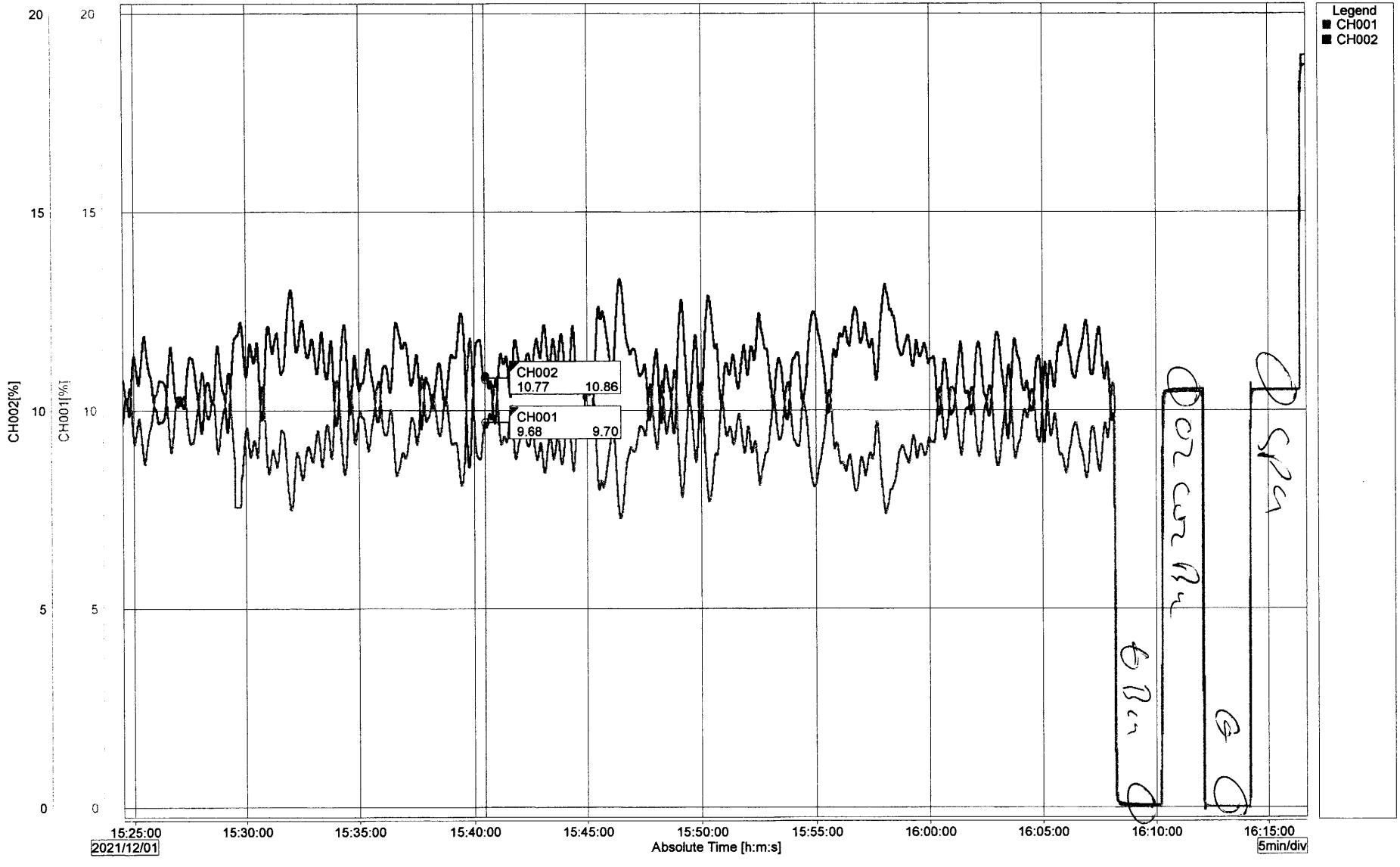

Signature1 : No Sig.
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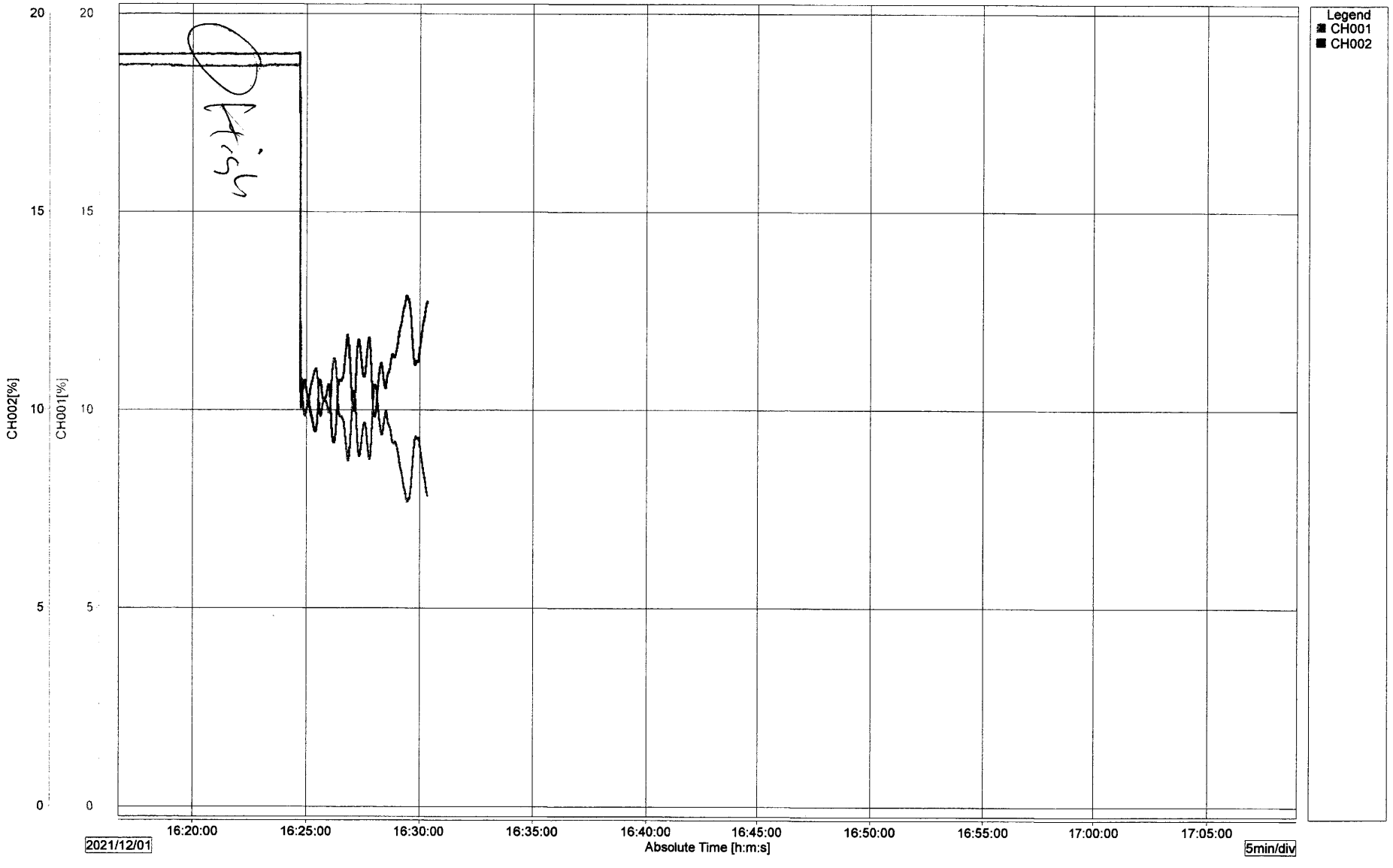
Signature3 : No Sig.

Print Groups : GROUP 1
Print Range : 2021/12/01 14:32:18.000 - 2021/12/01 16:30:22.000



Appendix A.1.4
Unit 1 Mercury Data

MONTROSE AIR QUALITY SERVICES

METHOD 30B SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: PW ~~11/29/2021~~ 11/30/21
RUN NO: 1-HG-Unit 1
OPERATOR: Patrick Whitman
METER BOX NO: 20-WCS
METER ΔH@: n/a
METER Yd: A = 0.9988 20 B = 1.0004
STACK AREA, FT²: 38.84
TRAVERSE POINTS, MIN/POINT: n/a
TARGET SAMPLING RATE: 0.7 L/M
Probe Condition, pre/post test: ✓/✓
Silica Gel Expended, Y/N: N
P, static in. H_2O: +.53

AMBIENT TEMPERATURE: 70°F
BAROMETRIC PRESSURE: 30.12
ASSUMED MOISTURE: n/a
PITOT TUBE COEFF, Cp: n/a
PROBE ID NO/MATERIAL/TYPE: 137
PROBE LENGTH: 6'
TRAP NO/DESC: A OLG11155
TRAP NO/DESC: B OLC145401 - SPIKED 200 NS

TRAIN "A" LEAK CHECK:
PRE-TEST: <.2 L/min @ 10" POST TEST: <.2 L/min @ 10"
TRAIN "B" LEAK CHECK:
PRE-TEST: <.2 L/min @ 10" POST TEST: <.2 L/min @ 10"

CHAIN OF CUSTODY: SAMPLE CUSTODIAN PW
SAMPLER DW
SAMPLE CUSTODIAN PW

Point	Time	Meter Volume, liters A	Meter Volume, liters B	Meter Temp A & B, °F In / Out	Meter Temp A & B, °F In / Out	Stack Temp, °F	Probe Temp °F	Rotameter Setting A	Rotameter Setting B	Vacuum, In. Hg A	Vacuum, In. Hg B
6	0857	5876.122	3638.043	60	61	359	287	0.7	0.7	4"	4"
5	0907	5882.788	3644.708	67	69	360	284				
4	0917	5889.535	3651.363	68	69	359	285				
3	0927	5896.195	3658.125	69	70	358	286				
2	0937	5903.996	3667.715	70	71	357	287				
1	0947	5911.335	3675.843	71	72	357	288				
END	0957	5918.470	3683.624								
Average:											

Comments:

MONTROSE AIR QUALITY SERVICES

METHOD 30B SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 12/1/2021
RUN NO: 2-HG-Unit 1
OPERATOR: Patrick Whitman
METER BOX NO: 20-WCS
METER ΔH@: n/a
METER Yd: 20A = 0.9988 20B = 1.0004
STACK AREA, FT²: 38.84
TRAVERSE POINTS, MIN/POINT: n/a
TARGET SAMPLING RATE: 0.7 L/M
Probe Condition, pre/post test: ✓/✓
Silica Gel Expended, Y/N: N
P, static in. H_2O: +.54

AMBIENT TEMPERATURE: 72°F
BAROMETRIC PRESSURE: 30.18
ASSUMED MOISTURE: n/a
PITOT TUBE COEFF, Cp: n/a
PROBE ID NO/MATERIAL/TYPE: 137
PROBE LENGTH: 6'
TRAP NO/DESC: A OL607940 Pre 12/1/21
TRAP NO/DESC: B OLC145879 200 ng Spike

TRAIN "A" LEAK CHECK:
PRE-TEST: <.2 L/min @10" POST TEST: <.2 L/min @10"
TRAIN "B" LEAK CHECK:
PRE-TEST: <.2 L/min @10" POST TEST: <.2 L/min @10"

CHAIN OF CUSTODY: SAMPLE CUSTODIAN PW
SAMPLER DW
SAMPLE CUSTODIAN PW

Point	Time	Meter Volume, liters A	Meter Volume, liters B	Meter Temp A & B, °F In / Out	Meter Temp A & B, °F In / Out	Stack Temp, °F	Probe Temp °F	Rotameter Setting A	Rotameter Setting B	Vacuum, In. Hg A	Vacuum, In. Hg B
6	0805	5919.200	3685.000	55	56	351	285	0.7	0.7	4"	4"
5	0815	5926.435	3691.885	60	61	351	286				
4	0825	5934.884	3699.831	61	63	353	287				
3	0835	5943.333	3707.775	64	65	352	288				
2	0845	5951.785	3715.730	65	67	353	289				
1	0855	5960.230	3723.675	67	68	352	290				
END	0905	5968.745	3729.886								
Average:											

Comments:

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MONTROSE AIR QUALITY SERVICES

METHOD 30B SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 12/1/2021
RUN NO: 3-HG-Unit 1
OPERATOR: Patrick Whitman
METER BOX NO: 20-WCS
METER ΔH@: n/a
METER Yd: 20A = 0.9988 20B = 1.0004
STACK AREA, FT²: 38.84
TRAVERSE POINTS, MIN/POINT: n/a
TARGET SAMPLING RATE: 0.7 L/M
Probe Condition, pre/post test: ✓/✓
Silica Gel Expended, Y/N: N
P, static in. H_2O: +.54

AMBIENT TEMPERATURE: 75°F
BAROMETRIC PRESSURE: 30.18
ASSUMED MOISTURE: n/a
PITOT TUBE COEFF, Cp: n/a
PROBE ID NO/MATERIAL/TYPE: 137
PROBE LENGTH: 6'
TRAP NO/DESC: A OL611075
TRAP NO/DESC: B OLC145873 200 ng Spike

TRAIN "A" LEAK CHECK:
PRE-TEST: 2.2 L/min @10" POST TEST: 2.2 L/min @10"
TRAIN "B" LEAK CHECK:
PRE-TEST: 2.2 L/min @10" POST TEST: 2.2 L/min @10"

CHAIN OF CUSTODY: SAMPLE CUSTODIAN PW
SAMPLER DW
SAMPLE CUSTODIAN PW

Point	Time	Meter Volume, liters A	Meter Volume, liters B	Meter Temp A & B, °F In / Out	Meter Temp A & B, °F In / Out	Stack Temp, °F	Probe Temp °F	Rotameter Setting A	Rotameter Setting B	Vacuum, In. Hg A	Vacuum, In. Hg B
6	1320	6000.600	3760.000	78	78	356	284	0.7	0.7	4"	4"
5	1330	6007.525	3767.230	81	83	355	288				
4	1340	6014.935	3774.555	84	86	354	289				
3	1350	6022.240	3781.620	88	89	355	291				
2	1400	6029.755	3789.335	90	92	354	292				
1	1410	6037.280	3796.810	91	93	355	294				
END	1420	6043.283	3802.773								
Average:											

Comments:

MONTROSE
AIR QUALITY SERVICES

METHOD 30B SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 1 Stack Breaching
DATE: 12/1/2021
RUN NO: ~~PV 12/1/21 1-HG-Unit 2~~ 4-Hg-Unit 1
OPERATOR: Patrick Whitman
METER BOX NO: 20-WCS
METER ΔH@: n/a
METER Yd: 20A = 0.9988 20B = 1.0004
STACK AREA, FT²: 38.84
TRAVERSE POINTS, MIN/POINT: n/a
TARGET SAMPLING RATE: 0.7 L/M
Probe Condition, pre/post test: N/
Silica Gel Expended, Y/N:
P, static in. H_2O: 7.54

AMBIENT TEMPERATURE: 82°F
BAROMETRIC PRESSURE: 30.18
ASSUMED MOISTURE: n/a
PITOT TUBE COEFF, Cp: n/a
PROBE ID NO/MATERIAL/TYPE: 137
PROBE LENGTH: 6'
TRAP NO/DESC: A OL611224
TRAP NO/DESC: B OLC145895 200 ng Spike
TRAIN "A" LEAK CHECK:
PRE-TEST: <.2 L/min @10" POST TEST: <.2 L/min @10"
TRAIN "B" LEAK CHECK:
PRE-TEST: <.2 L/min @10" POST TEST: <.2 L/min @10"
CHAIN OF CUSTODY: SAMPLE CUSTODIAN PW
SAMPLER DW
SAMPLE CUSTODIAN PW

Point	Time	Meter Volume, liters A	Meter Volume, liters B	Meter Temp A & B, °F In / Out	Meter Temp A & B, °F In / Out	Stack Temp, °F	Probe Temp °F	Rotameter Setting A	Rotameter Setting B	Vacuum, In. Hg A	Vacuum, In. Hg B
6	1508	6044.200	3803.750	88	89	365	278	1.0	1.0	4"	4"
5	1518	6054.385	3813.915	88	90	366	284				
4	1528	6064.575	3824.110	89	91	367	289				
3	1538	6074.946	3834.214	88	90	367	291				
2	1548	6085.113	3844.444	88	89	366	292				
1	1558	6096.455	3855.110	89	89	367	294				
END	1608	6106.896	3865.097								
Average:											

Comments:

Date of last revision 10/19/2018

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Appendix A.1.5
Unit 1 Stack Flow & Moisture Data

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman
TEST DATE: 11/30/2021
BAR. PRESSURE: 30.12
TC READOUT ID: TRC-42 PtC-42
DP INDICATOR ID: 17-WCS
TC ID: #013
DP INDICATOR TYPE: 0-10" Manometer
PITOT TUBE ID: #013 Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 1 Ps: 6.53
Start: 0857 Stop: 0937

Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F
5, 55.3"	1.3	357	5	.94	357	5	1.4	357
4, 45.9"	.98	356	4	.98	358	4	1.3	358
3, 36.5"	.96	355	3	1.0	358	3	1.5	357
2, 27.1"	1.0	355	2	1.1	357	2	1.6	356
1, 17.7	1.3	357	1	1.0	356	1	1.3	357
5	1.5	357	5	1.5	357	5	1.4	357
4	1.4	358	4	1.3	357	4	1.5	356
3	.94	357	3	.94	358	3	1.4	357
2	.72	355	2	.86	358	2	1.3	357
1	.68	354	1	.82	355	1	1.3	356

	Probe Temp. °F	Filter Temp. °C		Heated Line Temp. °F	Chiller Temp. °C			
1	N/A	N/A		311	02.6			
2								
3								

MOISTURE DATA FOR TEST RUNS 1 THROUGH 1

METER ID: 17-WCS METER Yd: 0.998 BALANCE CHECK WEIGHT: 500.0/ 500

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T imp	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
0857	494.000	1.0	62	61	47	5"	#1	H_2O	882.8	794.0	
0917	505.185	1.0	69	67	47	5"	#2	H_2O	729.1	723.4	
0937	516.510	1.0	74	73	48	5"	#3	Empty	677.3	675.8	
0957	527.436						#4	Silica Gel	976.8	966.2	
							Total	Line rinse		50	

Pre-Test Leak Check: 0.005 CFM @ 15 in. Hg., Post-Test Leak Check: 0.005 CFM @ 15 in. Hg

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman TEST DATE: PW ~~11/30/2021~~ 12/1/21
BAR. PRESSURE: PW ~~30.18~~ 30.16 TC READOUT ID: ~~TRC-42~~ PTC-42
DP INDICATOR ID: 17-WCS TC ID: #013
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #013 Cp: 0.84
ZERO: ✓ LEVEL: ✓ LEAK CHECK PRE- ✓ POST- ✓

Run #: 2	Ps: 1.54							
Start: 0805	Stop: 0905							
Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F
5, 55.3"	1.5	353	5	1.5	351	5	1.2	353
4, 45.9"	1.6	353	4	1.4	352	4	1.3	354
3, 36.5"	1.4	355	3	1.0	353	3	.96	353
2, 27.1"	1.4	354	2	.98	353	2	.84	354
1, 17.7	1.3	353	1	.91	352	1	.78	353
5	1.3	354	5	1.2	354	5	1.3	354
4	1.5	354	4	1.1	355	4	1.0	355
3	1.4	355	3	1.0	355	3	.98	354
2	1.3	355	2	1.0	354	2	1.1	353
1	1.1	354	1	.96	353	1	.95	353
	Probe Temp. °F	Filter Temp. °C		Heated Line Temp. °F	Chiller Temp. °C			
1	N/A	N/A		313	20.8			
2								
3								

MOISTURE DATA FOR TEST RUNS 2 THROUGH 2

METER ID: 17-WCS METER Yd: 0.998 BALANCE CHECK WEIGHT: 500.0/ 500

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
0805	532.000	1.0	60	56	51	5"	#1	H_2O	862.5	777.2	
0825	540.875	1.0	62	60	49	5"	#2	H_2O	732.1	729.1	
0845	551.650	1.0	64	63	54	5"	#3	Empty	678.8	677.3	
0905	562.724						#4	Silica Gel	984.6	976.8	
							Total	Line rinse		50	

Pre-Test Leak Check: 0.005 CFM @ 15 in. Hg., Post-Test Leak Check: 0.005 CFM @ 15 in. Hg

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit - 1
PERFORMED BY: Patrick Whitman
TEST DATE: 12/1/2021
BAR. PRESSURE: 30.18
TC READOUT ID: TRC-42 PTC-42
DP INDICATOR ID: 17-WCS
TC ID: #013
DP INDICATOR TYPE: 0-10" Manometer
PITOT TUBE ID: #013
Cp: 0.84
ZERO: √ LEVEL: √
LEAK CHECK PRE- √ POST- √

Run #: 3 Ps: 8.54
Start: 1320 Stop: 1420

Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F
5, 55.3"	1.6	354	5	1.4	353	5	1.5	353
4, 45.9"	1.4	355	4	1.2	354	4	1.2	354
3, 36.5"	1.3	352	3	1.0	355	3	.90	355
2, 27.1"	1.2	354	2	.98	354	2	.82	355
1, 17.7	1.3	354	1	.88	354	1	.71	353
5	1.4	354	5	.95	357	5	1.3	352
4	1.5	353	4	.88	355	4	.96	353
3	1.3	352	3	.93	354	3	.98	352
2	1.3	353	2	.97	354	2	1.0	352
1	1.2	353	1	1.0	352	1	1.0	352

	Probe Temp. °F	Filter Temp. °C		Heated Line Temp. °F	Chiller Temp. °C
1				312	22.8
2					
3					

MOISTURE DATA FOR TEST RUNS 3 THROUGH 3

METER ID: 17-WCS METER Yd: 0.998 BALANCE CHECK WEIGHT: 500.0/ 500

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1320	588.000	1.0	78	76	52	5"	#1	H_2O	885.2	804.8	
1340	599.545	1.0	88	86	50	5"	#2	H_2O	734.8	732.3	
1400	610.920	1.0	90	92	54	5"	#3	Empty	679.1	677.8	
1420	622.328						#4	Silica Gel	997.8	989.1	
							Total	Line rinse		50	

Pre-Test Leak Check: 0.005 CFM @ 15 in. Hg., Post-Test Leak Check: 0.005 CFM @ 15 in. Hg

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit -~~2~~ 1 PW 12/1/21
PERFORMED BY: Patrick Whitman
TEST DATE: 12/1/2021
BAR. PRESSURE: 30.16
TC READOUT ID: TRC-42 DTC-42
DP INDICATOR ID: 17-WCS
TC ID: #013
DP INDICATOR TYPE: 0-10" Manometer
PITOT TUBE ID: #013 Cp: 0.84
ZERO: √ LEVEL: √
LEAK CHECK PRE- √ POST- √

Run #: 4 Ps: 1.54
Start: 1508 Stop: 1608

Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F
5, 55.3"	1.6	365	5	1.5	365	5	1.5	365
4, 45.9"	1.4	367	4	1.3	364	4	1.0	366
3, 36.5"	1.4	366	3	.99	366	3	.88	366
2, 27.1"	1.3	365	2	.92	365	2	.73	365
1, 17.7	1.2	365	1	.78	364	1	.65	365
5	1.4	364	5	1.0	365	5	1.2	364
4	1.4	365	4	.97	364	4	.95	365
3	1.5	365	3	.93	365	3	.98	365
2	1.3	364	2	.90	365	2	1.0	365
1	1.3	365	1	1.0	365	1	1.1	364
	Probe Temp. °F	Filter Temp. °C		Heated Line Temp. °F	Chiller Temp. °C			
1				312	00.8			
2								
3								

MOISTURE DATA FOR TEST RUNS 4 THROUGH 4

METER ID: 17-WCS METER Yd: 0.998 BALANCE CHECK WEIGHT: 500.0/ 500

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1508	622.800	1.0	87	86	55	5"	#1	H_2O	851.8	770.3	
1528	634.780	1.0	88	86	56	5"	#2	H_2O	740.2	734.8	
1548	646.550	1.0	88	85	57	5"	#3	Empty	681.6	679.1	
1608	657.166						#4	Silica Gel	1004.6	997.8	
							Total	Line rinse		50	

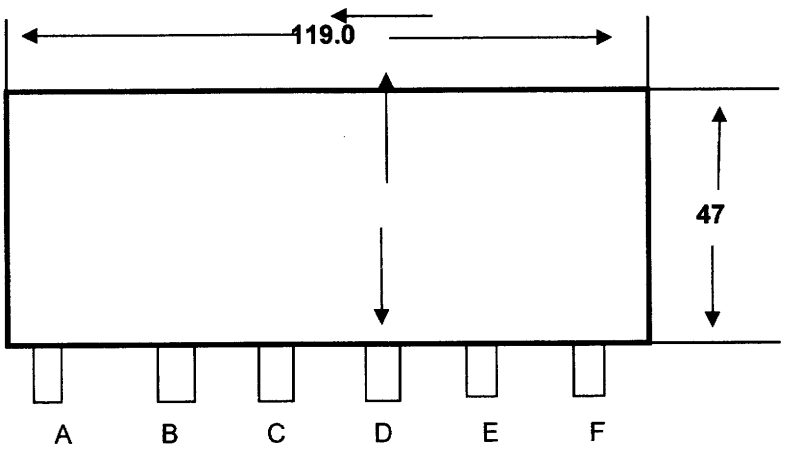
Pre-Test Leak Check: <0.005 CFM @ 15 in. Hg., Post-Test Leak Check: <0.005 CFM @ 15 in. Hg

Appendix A.2
Unit 2 Data

Appendix A.2.1
Unit 2 Sample Location

Client: Desert View Power Date: 12/2/2021

Sample Location: Unit 1-2 Prepared By: Dave Wonderly



H (in.)	**119.0**
W (in.)	**47.0**
Nipple length	**13.0**
Distance between points	**9.40**
Stack Area (ft^2)	**38.84**

Point No.	Sample Point	
1	4.7	17.7
2	14.1	27.1
3	23.5	36.5
4	32.9	45.9
5	42.3	55.3

Appendix A.2.2
Unit 2 CEM Data

Desert View Power UNIT 2

Date	Time	O2 %	CO2 %	
12/2/2021	7:27:00	0.017	0.022	
12/2/2021	7:28:00	15.674	15.481	
12/2/2021	7:29:00	18.989	18.968	
12/2/2021	7:30:00	18.996	18.972	High
12/2/2021	7:31:00	11.99	11.822	
12/2/2021	7:32:00	10.663	10.543	
12/2/2021	7:33:00	10.664	10.543	Mid
12/2/2021	7:34:00	2.682	2.509	
12/2/2021	7:35:00	0.011	0.038	Zero
12/2/2021	7:36:00	5.208	5.073	
12/2/2021	7:37:00	9.652	10.995	
12/2/2021	7:38:00	9.849	10.715	
12/2/2021	7:39:00	10.475	10.22	
12/2/2021	7:40:00	10.49	10.173	
12/2/2021	7:41:00	10.261	10.419	
12/2/2021	7:42:00	9.318	11.336	
12/2/2021	7:43:00	9.067	11.567	
12/2/2021	7:44:00	10.241	10.534	
12/2/2021	7:45:00	10.657	10.528	O2 CO2 Bias
12/2/2021	7:46:00	10.54	10.44	
12/2/2021	7:47:00	0.216	0.302	
12/2/2021	7:48:00	0.046	0.113	Zero Bias
12/2/2021	7:49:00	4.071	5.105	
12/2/2021	7:50:00	9.919	10.653	
12/2/2021	7:51:00	9.492	11.186	
12/2/2021	7:52:00	8.803	11.869	
12/2/2021	7:53:00	8.578	12.044	
12/2/2021	7:54:00	9.123	11.511	
12/2/2021	7:55:00	9.28	11.374	
12/2/2021	7:56:00	9.855	10.799	
12/2/2021	7:57:00	9.418	11.238	
12/2/2021	7:58:00	9.747	10.949	
12/2/2021	7:59:00	9.723	10.902	
12/2/2021	8:00:00	10.126	10.496	
12/2/2021	8:01:00	9.343	11.347	
12/2/2021	8:02:00	9.487	11.161	
12/2/2021	8:03:00	9.685	10.992	
12/2/2021	8:04:00	9.514	11.176	
12/2/2021	8:05:00	10.054	10.594	
12/2/2021	8:06:00	9.549	11.136	
12/2/2021	8:07:00	10	10.643	
12/2/2021	8:08:00	9.606	11.085	

Desert View Power UNIT 2

Date	Time	O2 %	CO2 %
12/2/2021	8:09:00	9.733	10.923
12/2/2021	8:10:00	10.314	10.353
12/2/2021	8:11:00	9.586	11.143
12/2/2021	8:12:00	9.309	11.361
12/2/2021	8:13:00	9.921	10.727
12/2/2021	8:14:00	9.251	11.434
12/2/2021	8:15:00	9.356	11.325
12/2/2021	8:16:00	9.516	11.161
12/2/2021	8:17:00	9.824	10.824
12/2/2021	8:18:00	9.607	11.081
12/2/2021	8:19:00	9.295	11.395
12/2/2021	8:20:00	9.261	11.431
12/2/2021	8:21:00	8.327	12.338
12/2/2021	8:22:00	8.785	11.865
12/2/2021	8:23:00	9.764	10.891
12/2/2021	8:24:00	9.788	10.893
12/2/2021	8:25:00	9.099	11.617
12/2/2021	8:26:00	8.546	12.124
12/2/2021	8:27:00	9.172	11.544
12/2/2021	8:28:00	8.143	12.482
12/2/2021	8:29:00	8.991	11.695
12/2/2021	8:30:00	10.527	10.127
12/2/2021	8:31:00	10.091	10.647
12/2/2021	8:32:00	9.182	11.556
12/2/2021	8:33:00	10.039	10.635
12/2/2021	8:34:00	10	10.715
12/2/2021	8:35:00	9.667	11.019
12/2/2021	8:36:00	10.302	10.422
12/2/2021	8:37:00	9.78	10.877
12/2/2021	8:38:00	10.381	10.32
12/2/2021	8:39:00	10.388	10.338
12/2/2021	8:40:00	10.326	10.398
12/2/2021	8:41:00	9.84	10.861
12/2/2021	8:42:00	9.877	10.837
12/2/2021	8:43:00	9.998	10.709
12/2/2021	8:44:00	10.537	10.15
12/2/2021	8:45:00	10.057	10.686
12/2/2021	8:46:00	9.569	11.098
12/2/2021	8:47:00	9.069	11.618
12/2/2021	8:48:00	9.985	10.781
12/2/2021	8:49:00	9.558	11.112
12/2/2021	8:50:00	10.115	10.6
12/2/2021	8:51:00	9.688	11.055

Desert View Power UNIT 2

Date	Time	O2 %	CO2 %	
12/2/2021	8:52:00	8.608	12.171	
12/2/2021	8:53:00	8.822	11.846	
12/2/2021	8:54:00	9.45	11.237	
12/2/2021	8:55:00	9.861	10.873	
12/2/2021	8:56:00	9.374	11.404	
12/2/2021	8:57:00	8.711	11.973	
12/2/2021	8:58:00	9.606	11.103	
12/2/2021	8:59:00	9.351	11.361	
12/2/2021	9:00:00	9.827	10.904	
12/2/2021	9:01:00	10.382	10.338	
12/2/2021	9:02:00	10.282	10.495	
12/2/2021	9:03:00	9.869	10.841	
Run 1 Average		9.62	11.07	
12/2/2021	9:04:00	9.038	10.675	
12/2/2021	9:05:00	6.241	7.635	
12/2/2021	9:06:00	0.051	0.153	Zero Bias
12/2/2021	9:07:00	5.86	5.987	
12/2/2021	9:08:00	10.626	10.567	O2 CO2 Bias
12/2/2021	9:09:00	1.064	1.455	
12/2/2021	9:10:00	0.008	0.071	Zero
12/2/2021	9:11:00	1.948	1.714	
12/2/2021	9:12:00	10.652	10.576	Span
12/2/2021	9:13:00	10.106	10.813	
12/2/2021	9:14:00	9.863	10.853	
12/2/2021	9:15:00	9.992	10.727	
12/2/2021	9:16:00	10.14	10.601	
12/2/2021	9:17:00	10.298	10.419	
12/2/2021	9:18:00	10.294	10.46	
12/2/2021	9:19:00	10.073	10.657	
12/2/2021	9:20:00	9.616	11.092	
12/2/2021	9:21:00	10.051	10.672	
12/2/2021	9:22:00	9.804	10.936	
12/2/2021	9:23:00	9.482	11.237	
12/2/2021	9:24:00	9.492	11.226	
12/2/2021	9:25:00	9.085	11.608	
12/2/2021	9:26:00	9.872	10.836	
12/2/2021	9:27:00	9.849	10.889	
12/2/2021	9:28:00	9.146	11.579	
12/2/2021	9:29:00	9.654	11.07	
12/2/2021	9:30:00	9.812	10.931	
12/2/2021	9:31:00	9.089	11.629	
12/2/2021	9:32:00	10.324	10.409	

Desert View Power UNIT 2

Date	Time	O2 %	CO2 %	
12/2/2021	9:33:00	9.439	11.319	
12/2/2021	9:34:00	9.108	11.623	
12/2/2021	9:35:00	8.577	12.155	
12/2/2021	9:36:00	8.615	12.12	
12/2/2021	9:37:00	9.18	11.518	
12/2/2021	9:38:00	9.922	10.821	
12/2/2021	9:39:00	10.408	10.298	
12/2/2021	9:40:00	7.726	7.374	
12/2/2021	9:41:00	0.05	0.178	Zero Bias
12/2/2021	9:42:00	4.563	4.582	
12/2/2021	9:43:00	10.613	10.576	O2 CO2 Bias
12/2/2021	9:44:00	10.53	10.657	
12/2/2021	9:45:00	9.934	10.798	
12/2/2021	9:46:00	8.952	11.745	
12/2/2021	9:47:00	9.058	11.661	
12/2/2021	9:48:00	9.772	10.947	
12/2/2021	9:49:00	10.458	10.275	
12/2/2021	9:50:00	8.778	11.959	
12/2/2021	9:51:00	8.823	11.873	
12/2/2021	9:52:00	8.673	12.012	
12/2/2021	9:53:00	9.451	11.258	
12/2/2021	9:54:00	8.817	11.884	
12/2/2021	9:55:00	9.479	11.238	
12/2/2021	9:56:00	10.243	10.467	
12/2/2021	9:57:00	10.143	10.597	
12/2/2021	9:58:00	10.153	10.58	
12/2/2021	9:59:00	9.942	10.788	
12/2/2021	10:00:00	8.824	11.915	
12/2/2021	10:01:00	10.312	10.388	
12/2/2021	10:02:00	10.12	10.626	
12/2/2021	10:03:00	9.133	11.596	
12/2/2021	10:04:00	9.12	11.578	
12/2/2021	10:05:00	9.561	11.164	
12/2/2021	10:06:00	10.083	10.628	
12/2/2021	10:07:00	10.194	10.544	
12/2/2021	10:08:00	11.173	9.548	
12/2/2021	10:09:00	9.988	10.756	
12/2/2021	10:10:00	9.437	11.298	
12/2/2021	10:11:00	9.799	10.91	
12/2/2021	10:12:00	10.092	10.654	
12/2/2021	10:13:00	9.297	11.421	
12/2/2021	10:14:00	9.991	10.724	

Desert View Power UNIT 2

Date	Time	O2 %	CO2 %
12/2/2021	10:15:00	10.142	10.588
12/2/2021	10:16:00	9.746	11.013
12/2/2021	10:17:00	9.544	11.185
12/2/2021	10:18:00	10.142	10.581
12/2/2021	10:19:00	9.29	11.453
12/2/2021	10:20:00	9.677	11.052
12/2/2021	10:21:00	10.095	10.64
12/2/2021	10:22:00	9.793	10.946
12/2/2021	10:23:00	9.299	11.446
12/2/2021	10:24:00	9.838	10.888
12/2/2021	10:25:00	10.189	10.564
12/2/2021	10:26:00	10.113	10.625
12/2/2021	10:27:00	10.455	10.32
12/2/2021	10:28:00	9.328	11.417
12/2/2021	10:29:00	9.942	10.816
12/2/2021	10:30:00	9.078	11.661
12/2/2021	10:31:00	9.149	11.627
12/2/2021	10:32:00	8.538	12.206
12/2/2021	10:33:00	9.356	11.39
12/2/2021	10:34:00	9.218	11.524
12/2/2021	10:35:00	9.933	10.83
12/2/2021	10:36:00	8.678	12.089
12/2/2021	10:37:00	10.232	10.506
12/2/2021	10:38:00	9.96	10.806
12/2/2021	10:39:00	10.259	10.484
12/2/2021	10:40:00	10.557	10.212
12/2/2021	10:41:00	8.9	11.894
12/2/2021	10:42:00	10.186	10.542
12/2/2021	10:43:00	9.791	10.994
12/2/2021	10:44:00	8.745	12.03
12/2/2021	10:45:00	8.818	11.928
12/2/2021	10:46:00	9.707	11.033
12/2/2021	10:47:00	9.8	10.975
12/2/2021	10:48:00	9.897	10.895
12/2/2021	10:49:00	9.844	10.908
12/2/2021	10:50:00	9.769	11.016
12/2/2021	10:51:00	8.254	12.49
12/2/2021	10:52:00	8.952	11.808
12/2/2021	10:53:00	9.962	10.769
12/2/2021	10:54:00	9.584	11.187
12/2/2021	10:55:00	9.493	11.265
12/2/2021	10:56:00	9.632	11.147
12/2/2021	10:57:00	9.481	11.289

Desert View Power UNIT 2

Date	Time	O2 %	CO2 %	
12/2/2021	10:58:00	9.279	11.478	
Run 2 Average		9.66	11.08	
12/2/2021	10:59:00	10.398	10.695	
12/2/2021	11:00:00	10.633	10.608	O2 CO2 Bias
12/2/2021	11:01:00	3.935	3.985	
12/2/2021	11:02:00	0.052	0.15	Zero Bias
12/2/2021	11:03:00	9.361	8.66	
12/2/2021	11:04:00	10.663	10.593	Span
12/2/2021	11:05:00	2.995	2.979	
12/2/2021	11:06:00	-0.004	0.059	Zero
12/2/2021	11:07:00	1.257	1.6	
12/2/2021	11:08:00	9.352	11.413	
12/2/2021	11:09:00	9.479	11.247	
12/2/2021	11:10:00	10.871	9.835	
12/2/2021	11:11:00	10.308	10.439	
12/2/2021	11:12:00	10.935	9.811	
12/2/2021	11:13:00	11.117	9.724	
12/2/2021	11:14:00	10.358	10.417	
12/2/2021	11:15:00	9.471	11.32	
12/2/2021	11:16:00	9.3	11.455	
12/2/2021	11:17:00	10.101	10.592	
12/2/2021	11:18:00	9.851	10.96	
12/2/2021	11:19:00	9.382	11.368	
12/2/2021	11:20:00	9.631	11.112	
12/2/2021	11:21:00	8.669	12.1	
12/2/2021	11:22:00	9.272	11.442	
12/2/2021	11:23:00	9.851	10.897	
12/2/2021	11:24:00	9.42	11.37	
12/2/2021	11:25:00	9.712	10.224	
12/2/2021	11:26:00	10.633	10.595	O2 CO2 Bias
12/2/2021	11:27:00	4.04	3.92	
12/2/2021	11:28:00	0.057	0.141	Zero Bias
12/2/2021	11:29:00	4.331	6.925	
12/2/2021	11:30:00	7.901	12.798	
12/2/2021	11:31:00	9.698	10.962	
12/2/2021	11:32:00	8.927	11.838	
12/2/2021	11:33:00	10.342	10.38	
12/2/2021	11:34:00	10.026	10.723	
12/2/2021	11:35:00	9.958	10.813	
12/2/2021	11:36:00	10.525	10.181	
12/2/2021	11:37:00	10.117	10.637	
12/2/2021	11:38:00	10.211	10.519	

Desert View Power UNIT 2

Date	Time	O2 %	CO2 %
12/2/2021	11:39:00	10.266	10.515
12/2/2021	11:40:00	9.978	10.768
12/2/2021	11:41:00	10.102	10.614
12/2/2021	11:42:00	10.217	10.512
12/2/2021	11:43:00	10.313	10.446
12/2/2021	11:44:00	9.772	10.946
12/2/2021	11:45:00	10.068	10.696
12/2/2021	11:46:00	9.532	11.156
12/2/2021	11:47:00	10.057	10.688
12/2/2021	11:48:00	10.79	9.906
12/2/2021	11:49:00	10.544	10.215
12/2/2021	11:50:00	9.769	10.985
12/2/2021	11:51:00	9.577	11.181
12/2/2021	11:52:00	9.016	11.729
12/2/2021	11:53:00	9.277	11.427
12/2/2021	11:54:00	9.625	11.103
12/2/2021	11:55:00	9.193	11.555
12/2/2021	11:56:00	9.184	11.542
12/2/2021	11:57:00	8.83	11.875
12/2/2021	11:58:00	9.251	11.521
12/2/2021	11:59:00	9.042	11.65
12/2/2021	12:00:00	9.549	11.173
12/2/2021	12:01:00	8.867	11.844
12/2/2021	12:02:00	9.156	11.541
12/2/2021	12:03:00	8.366	12.396
12/2/2021	12:04:00	9.267	11.415
12/2/2021	12:05:00	9.078	11.63
12/2/2021	12:06:00	9.278	11.459
12/2/2021	12:07:00	9.3	11.43
12/2/2021	12:08:00	8.983	11.737
12/2/2021	12:09:00	9.478	11.186
12/2/2021	12:10:00	9.627	11.156
12/2/2021	12:11:00	9.342	11.352
12/2/2021	12:12:00	9.564	11.173
12/2/2021	12:13:00	9.992	10.678
12/2/2021	12:14:00	10.001	10.721
12/2/2021	12:15:00	9.819	10.967
12/2/2021	12:16:00	9.771	10.912
12/2/2021	12:17:00	10.516	10.203
12/2/2021	12:18:00	9.585	11.137
12/2/2021	12:19:00	9.267	11.496
12/2/2021	12:20:00	9.202	11.525
12/2/2021	12:21:00	8.91	11.777

Desert View Power UNIT 2

Date	Time	O2 %	CO2 %	
12/2/2021	12:22:00	9.799	10.935	
12/2/2021	12:23:00	9.729	11.003	
12/2/2021	12:24:00	9.633	11.091	
12/2/2021	12:25:00	10.122	10.601	
12/2/2021	12:26:00	10.217	10.513	
12/2/2021	12:27:00	10.45	10.291	
12/2/2021	12:28:00	9.926	10.869	
12/2/2021	12:29:00	9.429	11.249	
12/2/2021	12:30:00	9.709	11.038	
Run 3 Average		9.67	11.06	
12/2/2021	12:31:00	2.559	3.906	
12/2/2021	12:32:00	0.048	0.112	Zero Bias
12/2/2021	12:33:00	6.545	6.656	
12/2/2021	12:34:00	10.623	10.54	O2 CO2 Bias
12/2/2021	12:35:00	0.87	1.296	
12/2/2021	12:36:00	0.007	0.034	Zero
12/2/2021	12:37:00	9.353	9.113	
12/2/2021	12:38:00	10.651	10.555	Span
12/2/2021	12:39:00	16.835	16.658	
12/2/2021	12:40:00	18.975	19.001	High
12/2/2021	12:41:00	11.722	13.759	
12/2/2021	12:42:00	9.762	10.927	
12/2/2021	12:43:00	9.736	10.994	
12/2/2021	12:44:00	9.27	11.488	
12/2/2021	12:45:00	9.253	11.454	

Appendix A.2.3
Unit 2 Instrument Strip Charts

SPAN GAS RECORD

CLIENT/LOCATION: Desert View Power
Unit 2

DATE: 12/2/2021
BY: DW

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO	CC707347	0.00		
O_2	CC181817	10.60	CC303876	18.99
CO_2	CC181817	10.65	CC303876	18.96

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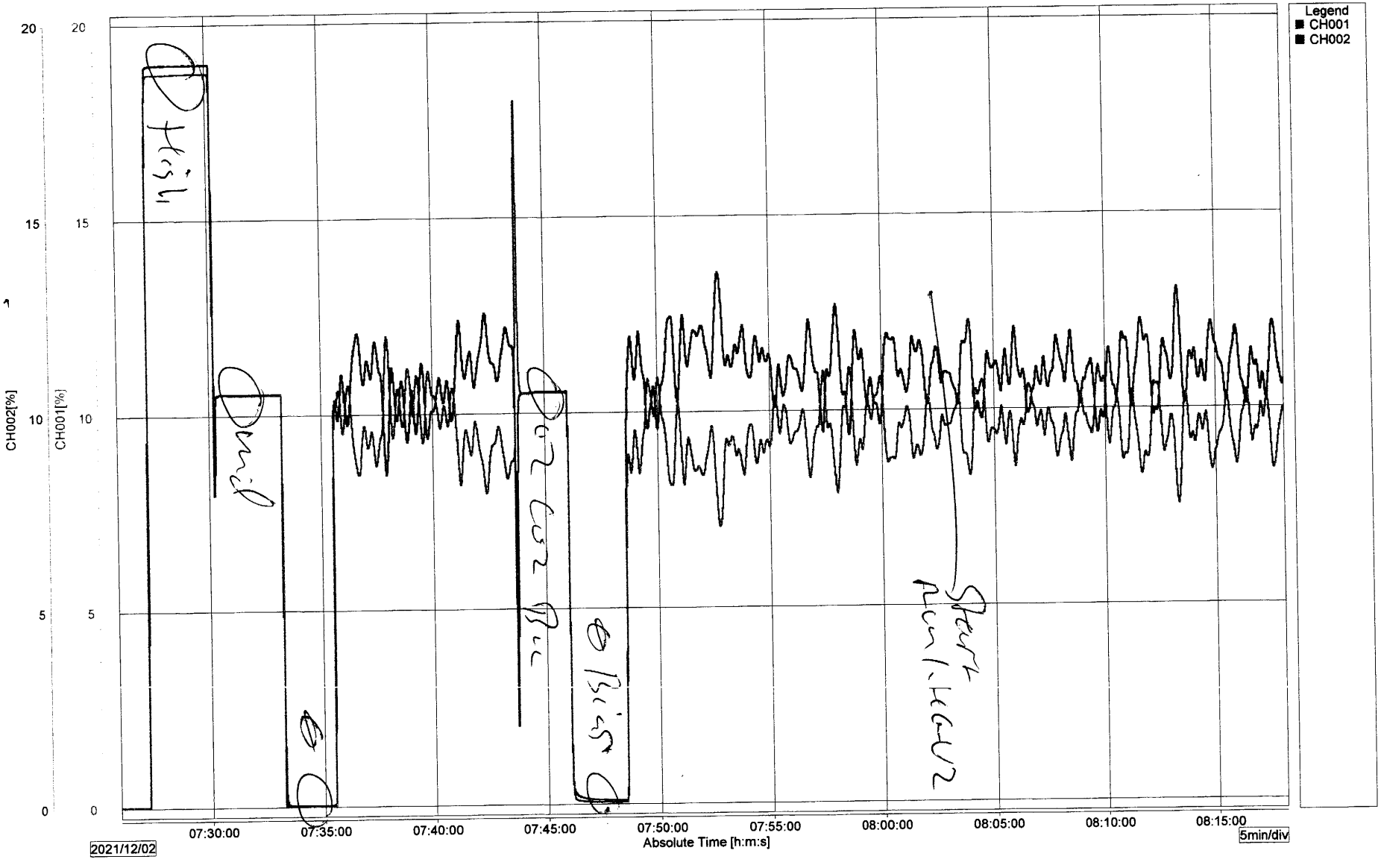
Signature2 : No Sig.
Signature3 : No Sig.

Print Groups : GROUP 1
Print Range : 2021/12/02 07:25:50.000 - 2021/12/02 12:54:48.000



Desert View Unit 2 HC tests

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Signature3 : No Sig.

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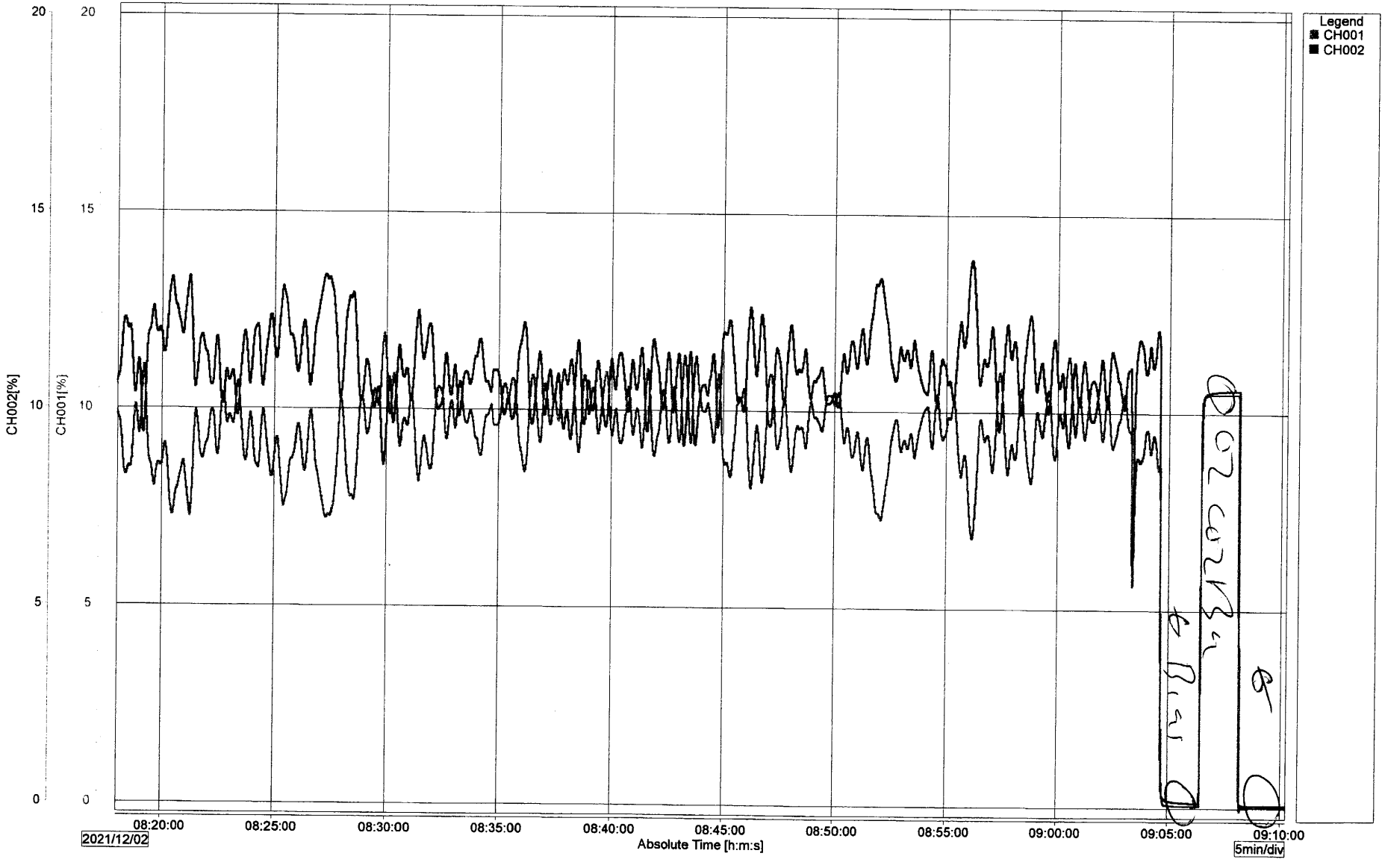

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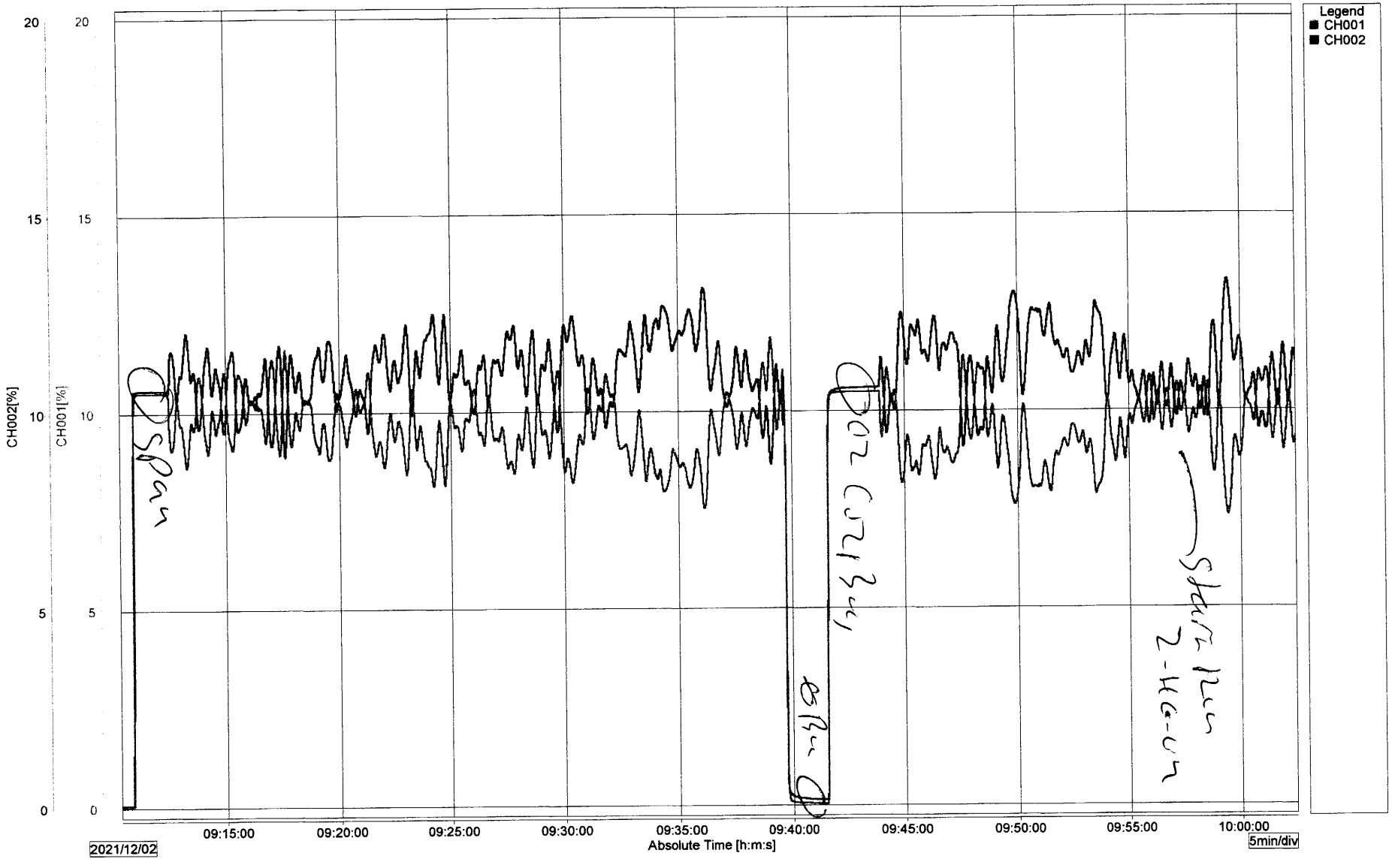

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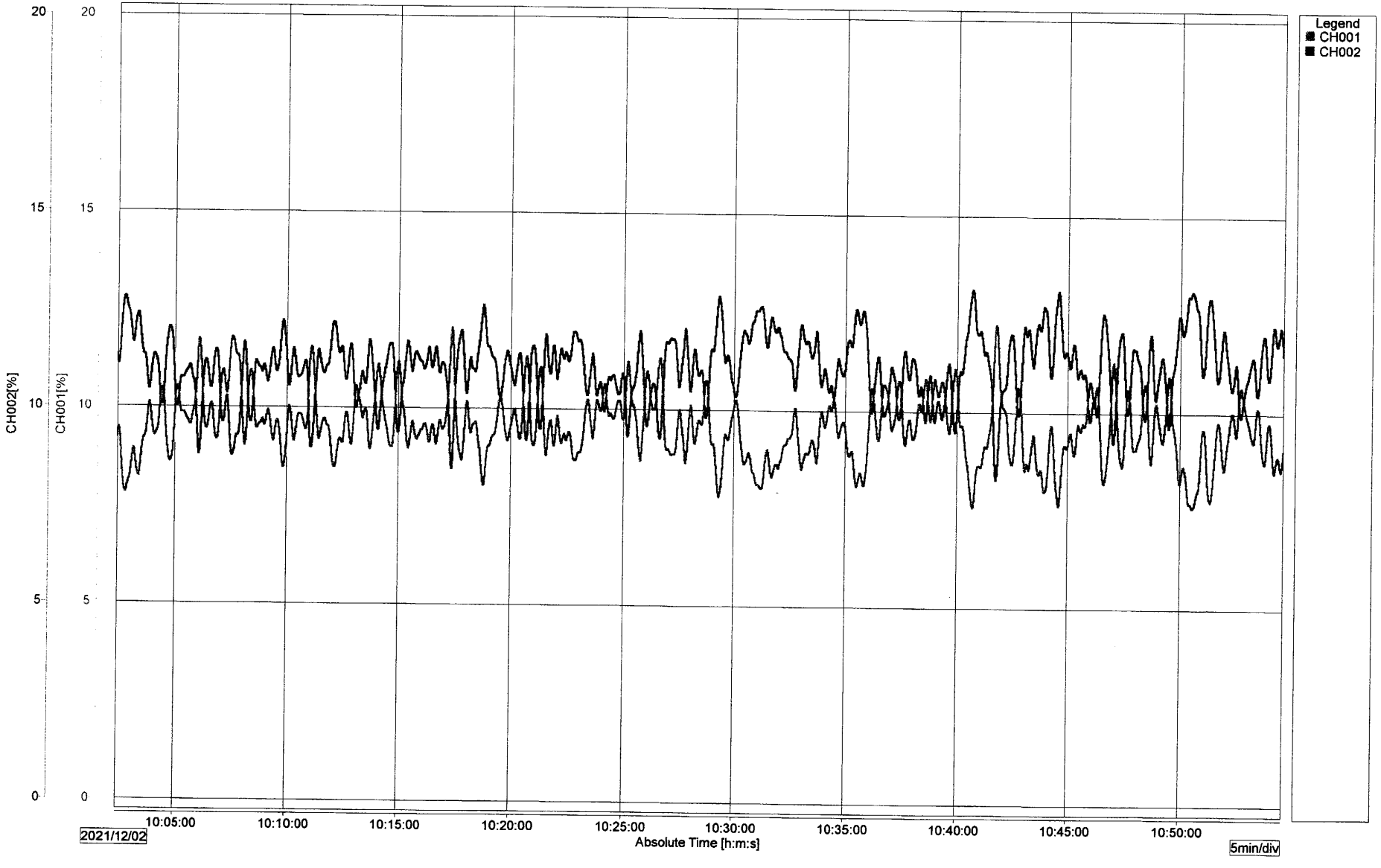

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Print Groups : GROUP 1
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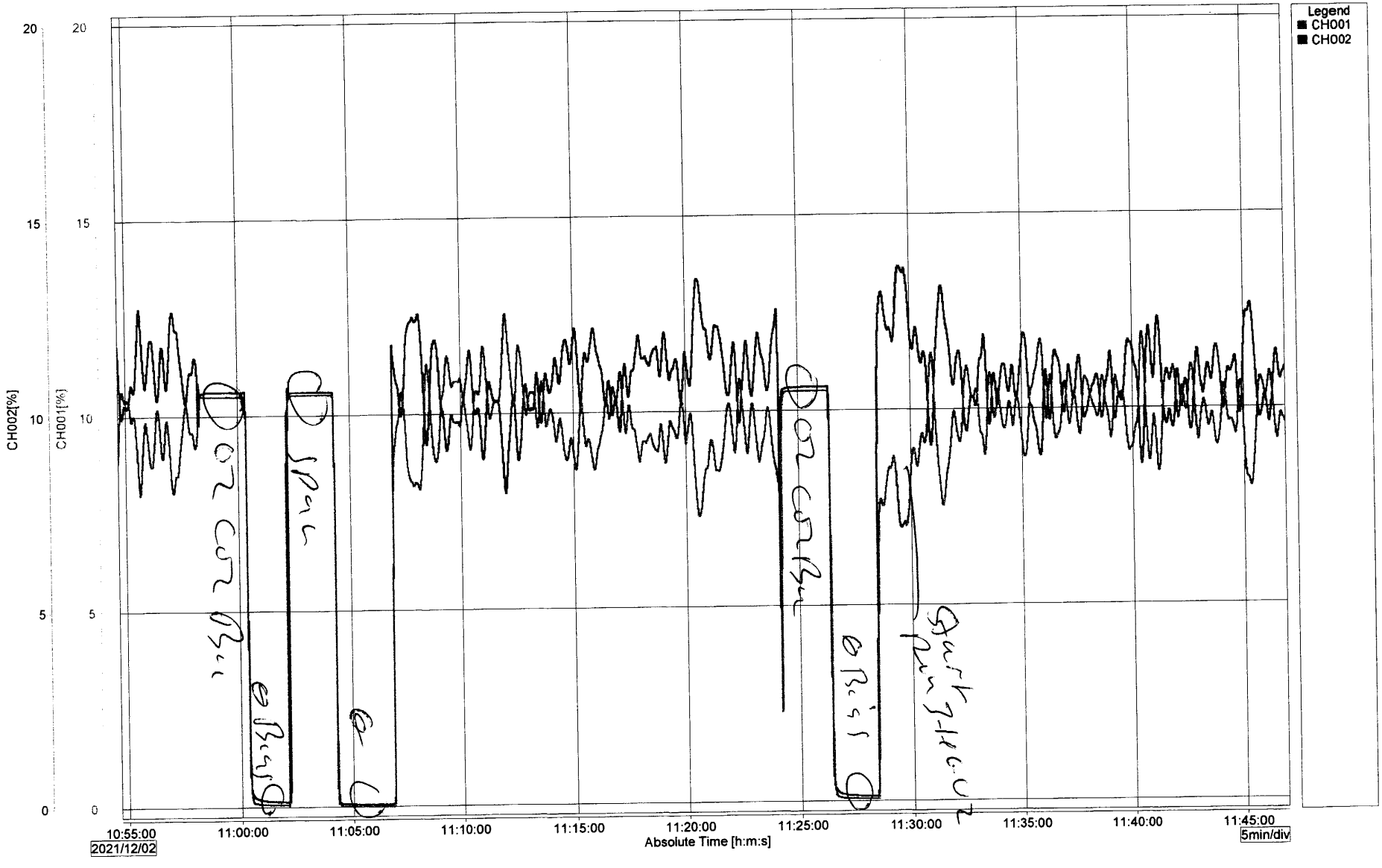

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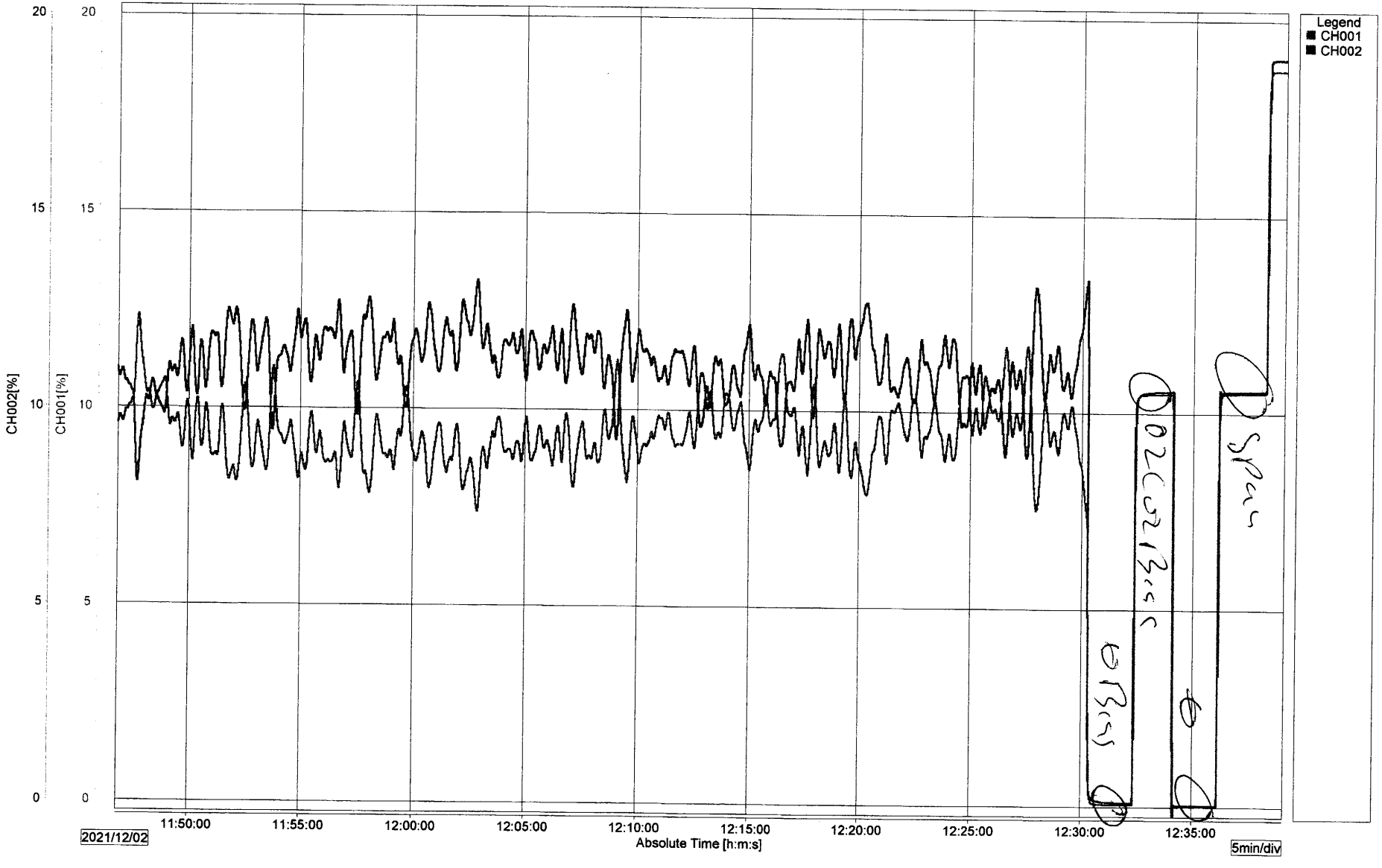
Print Groups : GROUP 1
Print Range : 2021/12/02 07:25:50.000 - 2021/12/02 12:54:48.000



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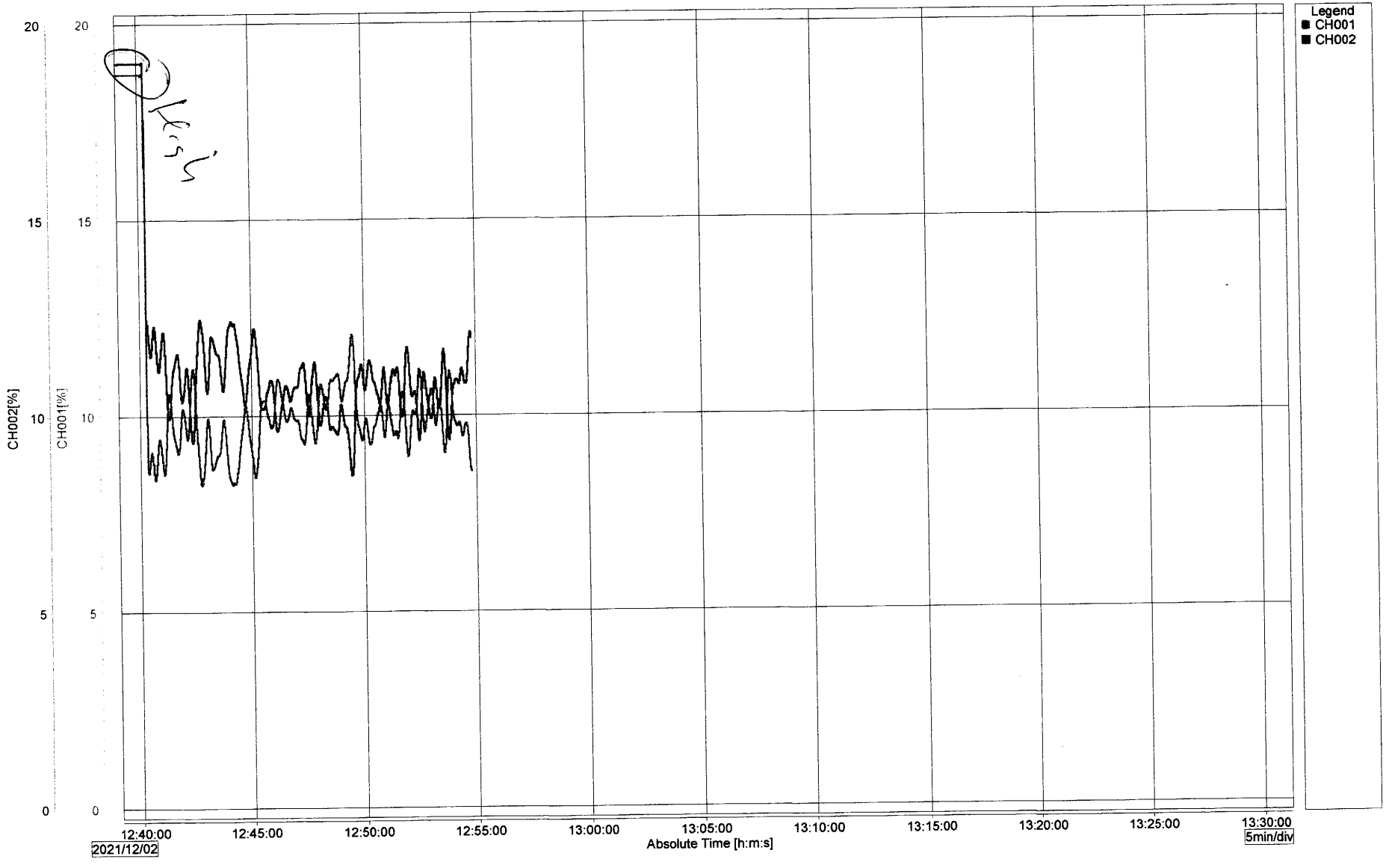
Signature3 : No Sig.

Print Groups : GROUP 1
Print Range : 2021/12/02 07:25:50.000 - 2021/12/02 12:54:48.000



Appendix A.2.4
Unit 2 Mercury Data

MONTROSE
AIR QUALITY SERVICES

METHOD 30B SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 12/2/2021
RUN NO: 1-HG-Unit 2
OPERATOR: Patrick Whitman
METER BOX NO: 20-WCS
METER ΔH@: n/a
METER Yd: 20A = 0.9988 20B = 1.0004
STACK AREA, FT²: 38.84
TRAVERSE POINTS, MIN/POINT: n/a
TARGET SAMPLING RATE: 0.7 L/M
Probe Condition, pre/post test: V/ J
Silica Gel Expended, Y/N: N
P, static in. H_2O: +.55

AMBIENT TEMPERATURE: 72°F
BAROMETRIC PRESSURE: 30.16
ASSUMED MOISTURE: n/a
PITOT TUBE COEFF, Cp: n/a
PROBE ID NO/MATERIAL/TYPE: 137
PROBE LENGTH: 6'
TRAP NO/DESC: A OL611133
TRAP NO/DESC: B OLC145607 200 ng Spike

TRAIN "A" LEAK CHECK:
PRE-TEST: <.2 L/min @10" POST TEST: <.2 L/min @10"
TRAIN "B" LEAK CHECK:
PRE-TEST: <.2 L/min @10" POST TEST: <.2 L/min @10"

CHAIN OF CUSTODY: SAMPLE CUSTODIAN PW
SAMPLER DW
SAMPLE CUSTODIAN PW

Point	Time	Meter Volume, liters A	Meter Volume, liters B	Meter Temp A & B, °F In / Out	Meter Temp A & B, °F In / Out	Stack Temp, °F	Probe Temp °F	Rotameter Setting A	Rotameter Setting B	Vacuum, In. Hg A	Vacuum, In. Hg B
6	0803	6107.500	3865.600	60	60	341	278	1.0	1.0	4"	4"
5	0813	6117.675	3875.930	60	60	342	282				
4	0823	6127.885	3886.220	60	60	341	287				
3	0833	6138.330	3896.455	60	60	342	287				
2	0843	6148.970	3906.835	60	60	342	283				
1	0853	6159.845	3917.640	61	61	342	287				
END	0903	6170.259	3927.908								
Average:											

Comments:

DS1831146
Santa Ana\Forms\Field Datasheets

Date of last revision 10/19/2018

MONTROSE AIR QUALITY SERVICES

METHOD 30B SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 12/2/2021
RUN NO: 2-HG-Unit 2
OPERATOR: Patrick Whitman
METER BOX NO: 20-WCS
METER ΔH@: n/a
METER Yd: 20A = 0.9988 20B = 1.0004
STACK AREA, FT²: 38.84
TRAVERSE POINTS, MIN/POINT: n/a
TARGET SAMPLING RATE: 0.7 L/M
Probe Condition, pre/post test: ✓/✓
Silica Gel Expended, Y/N: N
P, static in. H_2O: -.55

AMBIENT TEMPERATURE: 74°F
BAROMETRIC PRESSURE: 30.16
ASSUMED MOISTURE: n/a
PITOT TUBE COEFF, Cp: n/a
PROBE ID NO/MATERIAL/TYPE: 137
PROBE LENGTH: 6'
TRAP NO/DESC: A OL611066
TRAP NO/DESC: B OL566977 200 ng Spike

TRAIN "A" LEAK CHECK:
PRE-TEST: L.2 L/min @10" POST TEST: L.2 L/min @10"
TRAIN "B" LEAK CHECK:
PRE-TEST: L.2 L/min @ 10" POST TEST: L.2 L/min @10"
CHAIN OF CUSTODY: SAMPLE CUSTODIAN PW
SAMPLER DW
SAMPLE CUSTODIAN PW

Point	Time	Meter Volume, liters A	Meter Volume, liters B	Meter Temp A & B, °F In / Out	Meter Temp A & B, °F In / Out	Stack Temp, °F	Probe Temp °F	Rotameter Setting A	Rotameter Setting B	Vacuum, In. Hg A	Vacuum, In. Hg B
6	0958	6170.440	3928.230	71	72	342	277	.95	.95	4"	4"
5	1008	6179.945	3937.485	73	74	345	279				
4	1018	6189.425	3946.730	74	76	347	284				
3	1028	6198.955	3955.985	76	78	348	282				
2	1038	6208.420	3965.775	79	80	348	282				
1	1048	6217.925	3975.725	79	81	347	286				
END	1058	6227.638	3985.386								
Average:											

Comments:

Date of last revision 10/19/2018

DS1831146
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MONTROSE AIR QUALITY SERVICES

METHOD 30B SAMPLING SYSTEM DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION: Unit 2 Stack Breaching
DATE: 12/2/2021
RUN NO: 3-HG-Unit 2
OPERATOR: Patrick Whitman
METER BOX NO: 20-WCS
METER ΔH@: n/a
METER Yd: 20A = 0.9988 20B = 1.0004
STACK AREA, FT²: 38.84
TRAVERSE POINTS, MIN/POINT: n/a
TARGET SAMPLING RATE: 0.7 L/M
Probe Condition, pre/post test: N/J
Silica Gel Expended, Y/N: N
P, static in. H_2O: +.55

AMBIENT TEMPERATURE: 82°F
BAROMETRIC PRESSURE: 30.16
ASSUMED MOISTURE: n/a
PITOT TUBE COEFF, Cp: n/a
PROBE ID NO/MATERIAL/TYPE: 137
PROBE LENGTH: 6'
TRAP NO/DESC: A OL611120
TRAP NO/DESC: B OLC145330 200 ng Spike

TRAIN "A" LEAK CHECK:
PRE-TEST: <.2 L/min @10" POST TEST: <.2 L/min @10"
TRAIN "B" LEAK CHECK:
PRE-TEST: <.2 L/min @ 10" POST TEST: <.2 L/min @10"

CHAIN OF CUSTODY: SAMPLE CUSTODIAN PW
SAMPLER DW
SAMPLE CUSTODIAN PW

Point	Time	Meter Volume, liters A	Meter Volume, liters B	Meter Temp A & B, °F In / Out	Meter Temp A & B, °F In / Out	Stack Temp, °F	Probe Temp °F	Rotameter Setting A	Rotameter Setting B	Vacuum, In. Hg A	Vacuum, In. Hg B
6	1130	6229.700	3986.700	85	85	346	277	0.95	0.95	4"	4"
5	1140	6229.330	3995.440	86	85	349	285				
4	1150	6248.975	4005.775	86	85	350	288				
3	1200	6258.480	4015.700	86	87	350	291				
2	1210	6268.155	4025.555	86	87	350	294				
1	1220	6277.848	4034.880	86	87	351	298				
END	1230	6287.802	4044.606								
Average:											

Comments:

Date of last revision 10/19/2018

DS1831146
Santa Ana\Forms\Field Datasheets

Appendix A.2.5
Unit 2 Stack Flow & Moisture Data

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman
TEST DATE: 12/2/2021
BAR. PRESSURE: 30.16
TC READOUT ID: TRC-42 PTC-42
DP INDICATOR ID: CC-2
TC ID: #013
DP INDICATOR TYPE: 0-10" Manometer
PITOT TUBE ID: #013
Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 1 Ps: 1.55
Start: 0803 Stop: 0903

Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F
5, 55.3"	1.5	340	5	1.1	340	5	1.4	341
4, 45.9"	1.41	341	4	1.3	342	4	1.5	342
3, 36.5"	1.5	341	3	1.2	341	3	1.1	341
2, 27.1"	1.6	341	2	.98	342	2	.92	342
1, 17.7	1.5	340	1	.87	342	1	.78	341
5	1.5	340	5	.97	341	5	1.1	341
4	1.5	340	4	.93	342	4	.90	342
3	1.4	341	3	.95	342	3	.95	342
2	1.4	340	2	.94	341	2	1.0	341
1	1.3	341	1	1.0	340	1	1.2	341

	Probe Temp. °F	Filter Temp. °C		Heated Line Temp. °F	Chiller Temp. °C
1				311	00.8
2					
3					

MOISTURE DATA FOR TEST RUNS 1 THROUGH 1

METER ID: 1-P&M METER Yd: 1.014 BALANCE CHECK WEIGHT: 500.0/ 500

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T imp	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
0803	20.000	1.0	60	58	44	5"	#1	H_2O	815.4	770.8	
0823	31.055	1.0	62	60	46	5"	#2	H_2O	740.2	740.2	
0843	41.850	1.0	63	60	47	5"	#3	Empty	680.9	681.6	
0903	52.538						#4	Silica Gel	1015.1	1004.6	
							Total	Line rinse		50	

Pre-Test Leak Check: 0.005 CFM @ 15 in. Hg., Post-Test Leak Check: 0.005 CFM @ 15 in. Hg

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman TEST DATE: 12/2/2021
BAR. PRESSURE: 30.16 TC READOUT ID: TRC-42 PTC-42
DP INDICATOR ID: CC-2 TC ID: #013
DP INDICATOR TYPE: 0-10" Manometer PITOT TUBE ID: #013 Cp: 0.84
ZERO: √ LEVEL: √ LEAK CHECK PRE- √ POST- √

Run #: 2 Ps: 4.85
Start: 0958 Stop: 1058

Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F
5, 55.3"	1.3	346	5	.88	345	5	1.4	346
4, 45.9"	.86	347	4	.96	346	4	1.5	347
3, 36.5"	.94	346	3	.85	347	3	1.4	347
2, 27.1"	1.1	347	2	.98	347	2	1.5	347
1, 17.7	1.2	345	1	.95	346	1	1.3	346
5	1.4	342	5	1.0	345	5	1.4	345
4	1.3	344	4	1.1	344	4	1.4	346
3	1.1	345	3	.98	345	3	1.5	347
2	.84	346	2	.87	346	2	1.5	347
1	.76	345	1	.79	345	1	1.5	346
	Probe Temp. °F	Filter Temp. °C		Heated Line Temp. °F	Chiller Temp. °C			
1				312	00.8			
2								
3								

MOISTURE DATA FOR TEST RUNS 2 THROUGH 2

METER ID: 1-P&M METER Yd: 1.014 BALANCE CHECK WEIGHT: 500.0/ 500

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
0958	60.000	1.0	64	62	44	5"	#1	H_2O	826.1	742.9	
1018	71.420	1.0	69	66	49	5"	#2	H_2O	744.7	740.2	
1038	82.885	1.0	74	71	52	5"	#3	Empty	683.2	680.9	
1058	93.946						#4	Silica Gel	1024.0	1015.5	
							Total	Line rinse		50	

Pre-Test Leak Check: 0.005 CFM @ 15 in. Hg., Post-Test Leak Check: 0.005 CFM @ 15 in. Hg

FLUE GAS VELOCITY AND MOISTURE DATA AND WORKSHEET

CLIENT: Desert View Power
LOCATION/UNIT: Unit - 2
PERFORMED BY: Patrick Whitman
TEST DATE: 12/2/2021
BAR. PRESSURE: 30.16
TC READOUT ID: TRC-42 DTC-42
DP INDICATOR ID: CC-2
TC ID: #013
DP INDICATOR TYPE: 0-10" Manometer
PITOT TUBE ID: #013 Cp: 0.84
ZERO: ✓ LEVEL: ✓
LEAK CHECK PRE- ✓ POST- ✓

Run #: 3 Ps: 1.55
Start: 1130 Stop: 1230

Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F	Sample Point	Velocity Head inches H_2O	Temp, °F
5, 55.3"	1.4	350	5	1.2	347	5	1.4	346
4, 45.9"	1.5	351	4	1.0	349	4	1.3	347
3, 36.5"	1.4	351	3	.98	350	3	1.1	348
2, 27.1"	1.5	350	2	.92	350	2	.88	350
1, 17.7	1.5	349	1	.86	350	1	.75	350
5	1.5	348	5	.88	347	5	.97	350
4	1.4	349	4	.85	348	4	.85	351
3	1.4	350	3	.90	349	3	.98	351
2	1.3	351	2	1.0	350	2	1.0	350
1	1.5	350	1	.96	349	1	1.2	350
	Probe Temp. °F	Filter Temp. °C		Heated Line Temp. °F	Chiller Temp. °C			
1				312	00.8			
2								
3								

MOISTURE DATA FOR TEST RUNS 3 THROUGH 3

METER ID: 1-P&M METER Yd: 1.014 BALANCE CHECK WEIGHT: 500.0/ 500

Dry Gas Meter							Impinger Data				
Time	Volume	Delta H	Tm (in)	Tm (out)	T_{imp}	Vacuum	No.	Material	End Wt.	Start Wt.	Diff.
1130	95.000	1.0	78	76	52	5"	#1	H_2O	861.6	784.3	
1150	106.135	1.0	82	80	50	5"	#2	H_2O	746.6	744.7	
1210	117.650	1.0	83	81	50	5"	#3	Empty	683.0	683.2	
1230	127.935						#4	Silica Gel	1029.9	1024.0	
							Total	Line rinse		50	

Pre-Test Leak Check: 0.0005 CFM @ 15 in. Hg., Post-Test Leak Check: 0.0005 CFM @ 15 in. Hg

Appendix A.3
Laboratory Reports

Appendix A.3.1
Mercury Laboratory Data

Mercury by EPA Method 30B
Sorbent Trap Analysis Calibration

Client	Desert View
Test Site	U1
Project Number	PROJ-011502
Analyzer Number	RA915-3576
Date	11/30/21
Analyst	Van der Jagt

INITIAL ANALYZER CALIBRATION

Standard Number	Actual ng of Hg	Area Response	RF (Area/ng)	Measured ng of Hg	% Recover	90-110% ?
1	50	9,710	191	50.1	100.3	Y
2	100	19,570	194	101.9	101.9	Y
3	500	96,490	193	505.6	101.1	Y
4	1000	190,900	191	1,001.1	100.1	Y
5	2000	368,300	184	1,932.2	96.6	Y
6			#DIV/0!	-0.8	#DIV/0!	#DIV/0!

CALIBRATION RESULTS:

191	RF Average
3.86	RF Std. Dev.
6.30	RF % RSD
0.0052484	1/Mean RF
0.99962	R-Squared

QA CHECKS

Standard Type	Actual ng of Hg	Area Response	RF (Area/ng)	Calculated Value (ng)	% Recovery
Ind. Std.	500	94,220	N/A	494.50	98.9
Blank	0	157	N/A	0.82	
Low Std.	50.0	9,710		MDL *:	0.9

(Between MDL and lowest std)

* MDL value from the MDL study

CONTINUING CALIBRATION VERIFICATION

Sample	Actual ng of Hg	Area Response	Calculated Value (ng)	% Recovery	
CCV-1	200	35,220	184.85	92.4	Y
CCV-2			0.00	#DIV/0!	#DIV/0!
CCV-3			0.00	#DIV/0!	#DIV/0!
CCV-4			0.00	#DIV/0!	#DIV/0!
CCV-5			0.00	#DIV/0!	#DIV/0!
CCV-6			0.00	#DIV/0!	#DIV/0!
CCV-7			0.00	#DIV/0!	#DIV/0!
CCV-8			0.00	#DIV/0!	#DIV/0!
CCV-9			0.00	#DIV/0!	#DIV/0!
CCV-10			0.00	#DIV/0!	#DIV/0!
CCV-11			0.00	#DIV/0!	#DIV/0!
CCV-12			0.00	#DIV/0!	#DIV/0!
CCV-13			0.00	#DIV/0!	#DIV/0!

Mercury by EPA Method 30B
Sorbent Trap Analysis Calibration

Client	Desert View
Test Site	U1
Project Number	PROJ-011502
Analyzer Number	RA915-3576
Date	12/1/21
Analyst	Van der Jagt

INITIAL ANALYZER CALIBRATION

Standard Number	Actual ng of Hg	Area Response	RF (Area/ng)	Measured ng of Hg	% Recover	90-110% ?
1	10	1,787	160	9.0	90.5	Y
2	50	9,225	181	51.1	102.2	Y
3	100	18,560	184	103.9	103.9	Y
4	500	90,130	180	508.8	101.8	Y
5	1000	179,800	180	1,016.1	101.6	Y
6	2000	342,300	171	1,935.3	96.8	Y

CALIBRATION RESULTS:

177	RF Average
9.57	RF Std. Dev.
6.30	RF % RSD
0.0056570	1/Mean RF
0.99999	R-Squared

QA CHECKS

Standard Type	Actual ng of Hg	Area Response	RF (Area/ng)	Calculated Value (ng)	% Recovery
Ind. Std.	500	89,210	N/A	504.66	100.9
Blank	0	188	N/A	1.06	
Low Std.	10.0	1,787		MDL *:	0.9

(Between MDL and lowest std)

* MDL value from the MDL study

CONTINUING CALIBRATION VERIFICATION

Sample	Actual ng of Hg	Area Response	Calculated Value (ng)	% Recovery	
CCV-1	250	45,930	259.83	103.9	Y
CCV-2	250	43,130	243.99	97.6	Y
CCV-3	250	43,870	248.17	99.3	Y
CCV-4	250	44,410	251.23	100.5	Y
CCV-5			0.00	#DIV/0!	#DIV/0!
CCV-6			0.00	#DIV/0!	#DIV/0!
CCV-7			0.00	#DIV/0!	#DIV/0!
CCV-8			0.00	#DIV/0!	#DIV/0!
CCV-9			0.00	#DIV/0!	#DIV/0!
CCV-10			0.00	#DIV/0!	#DIV/0!
CCV-11			0.00	#DIV/0!	#DIV/0!
CCV-12			0.00	#DIV/0!	#DIV/0!
CCV-13			0.00	#DIV/0!	#DIV/0!

Table 4.3
Summary of Results - Total Vapor Phase Mercury
Montrose Air Quality Services

Client: Green Leaf Power Desert View
Location: Mecca, CA

	Unit 1					
	Run 1	Run 2	Run 3	Run 4	Average	Limit
Date:	11/30/21	12/1/21	12/1/21	12/1/21		
Start Time:	0857	0805	1320	1508		
Stop Time:	0957	0905	1420	1608		
Sample Length (minutes):	60	60	60	60		
EPA Method 30B						
Total Vapor Phase Mercury (Hg)						
Hg Mass - Average (ng):	196.4 ADL	176.9 ADL	98.0 ADL	233.5 ADL	202.3 DLL	
Hg Emission Concentration (µg/dscm):	4.443 ADL	3.680 ADL	2.354 ADL	3.884 ADL	4.0 DLL	
Hg Emission Rate (lb/hr):	1.64E-03 ADL	1.39E-03 ADL	8.75E-04 ADL	1.43E-03 ADL	1.5E-03 DLL	
Hg Emission Rate (lb/MMBtu of heat input):	4.71E-06 ADL	3.89E-06 ADL	2.55E-06 ADL	4.10E-06 ADL	**3.8E-06 DLL**	5.7E-06
Stack Gas Parameters						
Oxygen (%):	9.5	9.4	9.8	9.5	9.6	
Stack Temperature (°F):	358	352	355	366	358	
Stack Gas Airflow (kdscf/hr)	5,926	6,035	5,957	5,885	5951	
Stack Gas Airflow (dscf/min):	98,766	100,578	99,289	98,091	99181	
Process Parameters						
Total Heat Input Rate (MMBtu/hr):	348.9	358.7	342.7	347.7	349.5	
Fuel Factor (dscf/MMBtu):	9,240	9,240	9,240	9,240	9,240	
Steam Rate (lb/hr):	180,000	180,000	180,000	180,000	180,000	
	0	0	0	0		
	0	0	0	0		

BDL (below detection level) - all analytical values used to calculate and report an in-stack emissions value are less than the reported detection level(s)
DLL (detection level limited) - at least one but not all values used to calculate and report an in-stack emissions value are less than the reported detection level(s)
ADL (above detection level) - all analytical values used to calculate and report an in-stack emissions value are greater than the reported detection level(s)

MONTROSE AIR QUALITY SERVICES

Montrose Air Quality Services
4150 B Place N, Suite 106
Auburn, WA, 98001
253-480-3801

Turn-Around Time
☐ Standard
☐ 24 Hour RUSH
■ Other

30B Mercury Sorbent Trap Analysis Summary

Client Name:	Green Leaf Power Desert View	**Date:**	11/30/2021-12/1/2021	**Analyst Name:**	Van der Jagt
Location:	Mecca, CA	**Component ID:**	Montrose 30B Sampler		
Unit Name, Serial #:	Unit 1	**Analyzer ID:**	3576	**Reference Method:**	EPA Method 30B

Sample ID	Tube ID	Sample Date	Sample Time (Start)	Sample Time (Stop)	Sample Time (Duration)	Sorbent Bed Volume (L)	Sorbent Bed Volume (cc)	Sorbent Bed Temperature (°C)	Sorbent Bed Temperature (°F)	Desorption Date	Desorption Time 1	Desorption Time 2	Desorption Time 3	Desorption Time 4	Desorption Concentration (ng)	Desorption Concentration (ng/L)	Desorption Concentration (ug/m3)	Average Field Spike Recovery (%)	Sorbent Bed Breakthrough (%)	Sorbent Bed Breakthrough (ug)	Sorbent Bed Breakthrough (ug/m3)	Sorbent Bed Breakthrough (ug/m3)
1-A	OL611155	11/30/2021	8:57	9:57	42.348	0.999	30.12	67.5	68	11/30/2021	192.2	1.28			42.620	193.5	4.540		0.67%	--	2.2%	92.3%
1-B	OLC145401	11/30/2021	8:57	9:57	45.581	1.000	30.12	68.7	68	11/30/2021	397.9	1.36		200	45.847	199.3	4.346	4.443	0.34%	95.6%	--	90.2%
2-A	OL607940	12/1/2021	8:05	9:05	49.545	0.999	30.18	62.0	68	12/1/2021	182.5	1.68			50.489	184.2	3.648		0.92%	--	0.9%	99.3%
2-B	OLC145879	12/1/2021	8:05	9:05	44.886	1.000	30.18	63.3	68	12/1/2021	368.2	1.41		200	45.698	169.6	3.712	3.680	0.38%	101.5%	--	89.9%
3-A	OL611075	12/1/2021	13:20	14:20	42.683	0.999	30.18	85.3	68	12/1/2021	109.0	0.79			41.636	109.8	2.637		0.72%	--		81.9%
3-B	OLC145873	12/1/2021	13:20	14:20	42.773	1.000	30.18	86.8	68	12/1/2021	286.0	0.28		200	41.675	86.3	2.070	2.354	0.10%	88.4%	--	82.0%
4-A	OL611224	12/1/2021	15:08	16:08	62.696	0.999	30.18	88.3	68	12/1/2021	233.8	0.72			60.823	234.5	3.856		0.31%	--	0.7%	119.7%
4-B	OLC145895	12/1/2021	15:08	16:08	61.347	1.000	30.18	89.8	68	12/1/2021	429.7	2.84		200	59.447	232.5	3.912	3.884	0.66%	100.6%	--	117.0%
5-A									68						0.000	0.0	#DIV/0!		#DIV/0!	--	#DIV/0!	0.0%
5-B		1/0/1900	0:00	0:00					68						0.000	0.0	#DIV/0!	#DIV/0!	#DIV/0!	--	--	0.0%
6-A									68						0.000	0.0	#DIV/0!		#DIV/0!	--	#DIV/0!	0.0%
6-B		1/0/1900	0:00	0:00					68						0.000	0.0	#DIV/0!	#DIV/0!	#DIV/0!	--	--	0.0%
																		Average Field Spike Recovery >>	**97%**			

Less than 0.9 is considered "LDL". Sample concentration must be a minimum of 5 times the detection limit to constitute a valid test run

MONTROSE AIR QUALITY SERVICES

30B Run 1 Summary

Run 1 - 11/30/21 - 08:57 to 09:57

Client:	Green Leaf Power Desert View	Analyst:	Van der Jagt
Location:	Mecca, CA	Reference Method:	EPA Method 30B
Unit Name, Serial #:	Unit 1		

Trap A Data	**1-A**	**Trap A QA/QC**		
Serial Number:	OL611155	Breakthrough, %:	0.7%	< 20%
Section 1 result (ng):	192.2			
Section 2 result (ng):	1.28	Recovery sample volume, %	92.3%	80% to 120%
		Leak Check:	PASS	
		Flow Rate Maintained	PASS	
Total mercury (ng/sample):	193.5	Breakthrough:	PASS	
Sample volume (sL):	42.620			
Result (ug/m^3)	**4.54**	Recovery sample volume:	PASS	

Trap B Data	**1-B**	**Trap B QA/QC**		
Serial Number:	OLC145401	Breakthrough, %:	0.3%	< 20%
Section 1 result (ng):	397.9	Spike Recovered, %	95.6%	85% to 115%
Section 2 result (ng):	1.36	Recovery sample volume, %	90.2%	80% to 120%
		Leak Check:	PASS	
Spike level (ng)	200.0	Flow Rate Maintained	PASS	
Total mercury (ng/sample):	199.3	Breakthrough:	PASS	
Sample volume (sL):	45.847	Spike Recovery:	PASS	
Result (ug/m^3)	**4.35**	Recovery sample volume:	PASS	
Trap A & B Relative Deviation %	2.18% < 10%			

Average µg/m^3 dry: 4.443

QA Criteria

A. Average Spike Recovery must be within 85% and 115%

B. Breakthrough must be ≤10% of Section 1 Mass for Hg concentrations ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

C. Tube Correlation (A+B) must be ≤ 10% relative deviation ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

D. CCV must be within ≤10% of verification standard

MONTROSE AIR QUALITY SERVICES

30B Run 2 Summary

Run 2 - 12/01/21 - 08:05 to 09:05

Client:	Green Leaf Power Desert View	Analyst:	Van der Jagt
Location:	Mecca, CA	Reference Method:	EPA Method 30B
Unit Name, Serial #:	Unit 1		

Trap A Data	**2-A**	**Trap A QA/QC**		
Serial Number:	OL607940	Breakthrough, %:	0.9%	< 20%
Section 1 result (ng):	182.5			
Section 2 result (ng):	1.68	Recovery sample volume, %	99.3%	80% to 120%
		Leak Check:	PASS	
		Flow Rate Maintained	PASS	
Total mercury (ng/sample):	184.2	Breakthrough:	PASS	
Sample volume (sL):	50.489			
Result (ug/m^3)	**3.65**	Recovery sample volume:	PASS	

Trap B Data	**2-B**	**Trap B QA/QC**		
Serial Number:	OLC145879	Breakthrough, %:	0.4%	< 20%
Section 1 result (ng):	368.2	Spike Recovered, %	101.5%	85% to 115%
Section 2 result (ng):	1.41	Recovery sample volume, %	89.9%	80% to 120%
		Leak Check:	PASS	
Spike level (ng)	200.0	Flow Rate Maintained	PASS	
Total mercury (ng/sample):	169.6	Breakthrough:	PASS	
Sample volume (sL):	45.698	Spike Recovery:	PASS	
Result (ug/m^3)	**3.71**	Recovery sample volume:	PASS	

Trap A & B Relative Deviation %	0.86%	< 10%

Average µg/m^3 dry: 3.680

QA Criteria

A. Average Spike Recovery must be within 85% and 115%

B. Breakthrough must be ≤10% of Section 1 Mass for Hg concentrations ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

C. Tube Correlation (A+B) must be ≤ 10% relative deviation ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

D. CCV must be within ≤10% of verification standard

MONTROSE AIR QUALITY SERVICES

30B Run 3 Summary

Run 3 - 12/01/21 - 13:20 to 14:20

Client:	Green Leaf Power Desert View	Analyst:	Van der Jagt
Location:	Mecca, CA	Reference Method:	EPA Method 30B
Unit Name, Serial #:	Unit 1		

Trap A Data	**3-A**	**Trap A QA/QC**		
Serial Number:	OL611075	Breakthrough, %:	0.7%	< 20%
Section 1 result (ng):	109.0			
Section 2 result (ng):	0.79	Recovery sample volume, %	81.9%	80% to 120%
		Leak Check:	PASS	
		Flow Rate Maintained	PASS	
Total mercury (ng/sample):	109.8	Breakthrough:	PASS	
Sample volume (sL):	41.636			
Result (ug/m^3)	**2.64**	Recovery sample volume:	PASS	

Trap B Data	**3-B**	**Trap B QA/QC**		
Serial Number:	OLC145873	Breakthrough, %:	0.1%	< 20%
Section 1 result (ng):	286.0	Spike Recovered, %	88.4%	85% to 115%
Section 2 result (ng):	0.28	Recovery sample volume, %	82.0%	80% to 120%
		Leak Check:	PASS	
Spike level (ng)	200.0	Flow Rate Maintained	PASS	
Total mercury (ng/sample):	86.3	Breakthrough:	PASS	
Sample volume (sL):	41.675	Spike Recovery:	PASS	
Result (ug/m^3)	**2.07**	Recovery sample volume:	PASS	

Trap A & B Relative Deviation %	12.04%	< 10%

Average µg/m^3 dry: 2.354

QA Criteria

A. Average Spike Recovery must be within 85% and 115%

B. Breakthrough must be ≤10% of Section 1 Mass for Hg concentrations ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

C. Tube Correlation (A+B) must be ≤ 10% relative deviation ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

D. CCV must be within ≤10% of verification standard

MONTROSE AIR QUALITY SERVICES

30B Run 4 Summary

Run 4 - 12/01/21 - 15:08 to 16:08

Client:	Green Leaf Power Desert View	Analyst:	Van der Jagt
Location:	Mecca, CA	Reference Method:	EPA Method 30B
Unit Name, Serial #:	Unit 1		

Trap A Data	**4-A**	**Trap A QA/QC**		
Serial Number:	OL611224	Breakthrough, %:	0.3%	< 20%
Section 1 result (ng):	233.8			
Section 2 result (ng):	0.72	Recovery sample volume, %	119.7%	80% to 120%
		Leak Check:	PASS	
		Flow Rate Maintained	PASS	
Total mercury (ng/sample):	234.5	Breakthrough:	PASS	
Sample volume (sL):	60.823			
Result (ug/m^3)	**3.86**	Recovery sample volume:	PASS	

Trap B Data	**4-B**	**Trap B QA/QC**		
Serial Number:	OLC145895	Breakthrough, %:	0.7%	< 20%
Section 1 result (ng):	429.7	Spike Recovered, %	100.6%	85% to 115%
Section 2 result (ng):	2.84	Recovery sample volume, %	117.0%	80% to 120%
		Leak Check:	PASS	
Spike level (ng)	200.0	Flow Rate Maintained	PASS	
Total mercury (ng/sample):	232.5	Breakthrough:	PASS	
Sample volume (sL):	59.447	Spike Recovery:	PASS	
Result (ug/m^3)	**3.91**	Recovery sample volume:	PASS	

Trap A & B Relative Deviation %	0.72%	< 10%

Average µg/m^3 dry: 3.884

QA Criteria

A. Average Spike Recovery must be within 85% and 115%

B. Breakthrough must be ≤10% of Section 1 Mass for Hg concentrations ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

C. Tube Correlation (A+B) must be ≤ 10% relative deviation ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

D. CCV must be within ≤10% of verification standard

Mercury by EPA Method 30B
Sorbent Trap Analysis Calibration

Client	Desert View
Test Site	U1
Project Number	PROJ-011502
Analyzer Number	RA915-3576
Date	12/2/21
Analyst	Van der Jagt

INITIAL ANALYZER CALIBRATION

Standard Number	Actual ng of Hg	Area Response	RF (Area/ng)	Measured ng of Hg	% Recover	90-110% ?
1	10	1,698	165	9.2	92.5	Y
2	50	9,565	190	53.5	107.0	Y
3	100	18,290	182	102.5	102.5	Y
4	500	90,420	181	508.1	101.6	Y
5	1000	171,500	171	964.0	96.4	Y
6	2000	353,800	177	1,988.9	99.4	Y

CALIBRATION RESULTS:

178	RF Average
10.02	RF Std. Dev.
6.30	RF % RSD
0.0056225	1/Mean RF
0.99930	R-Squared

QA CHECKS

Standard Type	Actual ng of Hg	Area Response	RF (Area/ng)	Calculated Value (ng)	% Recovery
Ind. Std.	500	89,890	N/A	505.40	101.1
Blank	0	53	N/A	0.30	
Low Std.	10.0	1,698		MDL *:	0.9

(Between MDL and lowest std)

* MDL value from the MDL study

CONTINUING CALIBRATION VERIFICATION

Sample	Actual ng of Hg	Area Response	Calculated Value (ng)	% Recovery	
CCV-1	300	54,870	308.50	102.8	Y
CCV-2	250	44,870	252.28	100.9	Y
CCV-3	250	45,760	257.28	102.9	Y
CCV-4			0.00	#DIV/0!	#DIV/0!
CCV-5			0.00	#DIV/0!	#DIV/0!
CCV-6			0.00	#DIV/0!	#DIV/0!
CCV-7			0.00	#DIV/0!	#DIV/0!
CCV-8			0.00	#DIV/0!	#DIV/0!
CCV-9			0.00	#DIV/0!	#DIV/0!
CCV-10			0.00	#DIV/0!	#DIV/0!
CCV-11			0.00	#DIV/0!	#DIV/0!
CCV-12			0.00	#DIV/0!	#DIV/0!
CCV-13			0.00	#DIV/0!	#DIV/0!

Table 4.3
Summary of Results - Total Vapor Phase Mercury
Montrose Air Quality Services

Client: **Green Leaf Power Desert View**
Location: **Mecca, CA**

	Unit 2				
	Run 1	Run 2	Run 3	Average	Limit
Date:	12/2/21	12/2/21	12/2/21		
Start Time:	0803	0958	1130		
Stop Time:	0903	1058	1230		
Sample Length (minutes):	60	60	60		
EPA Method 30B					
Total Vapor Phase Mercury (Hg)					
Hg Mass - Average (ng):	301.9 ADL	197.2 ADL	174.9 ADL	224.6 DLL	
Hg Emission Concentration (µg/dscm):	4.721 ADL	3.475 ADL	3.093 ADL	3.8 DLL	
Hg Emission Rate (lb/hr):	1.79E-03 ADL	1.30E-03 ADL	1.16E-03 ADL	1.4E-03 DLL	
Hg Emission Rate (lb/MMBtu of heat input):	5.03E-06 ADL	3.72E-06 ADL	3.31E-06 ADL	**3.0E-06 DLL**	5.7E-06
Stack Gas Parameters					
Oxygen (%):	9.6	9.6	9.6	9.6	
Stack Temperature (°F):	342	346	349	346	
Stack Gas Airflow (kdscf/hr)	6,078	6,012	6,034	6041	
Stack Gas Airflow (dscf/min):	101,307	100,197	100,565	100690	
Process Parameters					
Total Heat Input Rate (MMBtu/hr):	356.3	350.5	351.8	352.9	
Fuel Factor (dscf/MMBtu):	9,240	9,240	9,240	9,240	
Steam Rate (lb/hr):	180,000	180,000	180,000	180,000	
	0	0	0		
	0	0	0		

BDL (below detection level) - all analytical values used to calculate and report an in-stack emissions value are less than the reported detection level(s)
DLL (detection level limited) - at least one but not all values used to calculate and report an in-stack emissions value are less than the reported detection level(s)
ADL (above detection level) - all analytical values used to calculate and report an in-stack emissions value are greater than the reported detection level(s)

MONTROSE AIR QUALITY SERVICES

Montrose Air Quality Services
4150 B Place N, Suite 106
Auburn, WA, 98001
253-480-3801

Turn-Around Time
☐ Standard
☐ 24 Hour RUSH
■ Other

30B Mercury Sorbent Trap Analysis Summary

Client Name:	Green Leaf Power Desert View	**Date:**	2-Dec-21	**Analyst Name:**	Van der Jagt
Location:	Mecca, CA	**Component ID:**	Montrose 30B Sampler		
Unit Name, Serial #:	Unit 2	**Analyzer ID:**	3576	**Reference Method:**	EPA Method 30B

Site		Sampling Conditions								Analytical Parameters					Results Calculation				QA/QC Calculations			
Sample ID	Vial ID	Date Sampled	Start Time (hh:mm)	Stop Time (hh:mm)	Total Run Time (min)	Flow Factor	Barometric Pressure (in Hg)	Meter Box Temperature (°F)	Ambient Temperature (°F)	Date Analyzed	Weight Stage 1 (ug)	Weight Stage 2 (ug)	Weight Stage 3 (ug)	Weight Stage 4 (ug)	Total Hg Stage 1 (ug)	Total Hg Stage 2 (ug)	Total Hg Stage 3 (ug)	Total Hg Stage 4 (ug)	Field Spike Recovery (%)	Field Blank Recovery (%)	Lab Blank Recovery (%)	Lab Spike Recovery (%)
1-A	OL611133	12/2/2021	8:03	9:03	62.759	0.999	30.16	60.2	68	12/2/2021	287.7	1.71			64.138	289.4	4.512		0.59%	--	4.4%	108.7%
1-B	OLC145607	12/2/2021	8:03	9:03	62.308	1.000	30.16	60.2	68	12/2/2021	513.3	1.08		200	63.779	314.4	4.929	4.721	0.21%	113.6%	--	108.1%
2-A	OL611066	12/2/2021	9:58	10:58	57.198	0.999	30.16	75.3	68	12/2/2021	204.8	1.54			56.799	206.3	3.633		0.75%	--	4.5%	96.3%
2-B	OL566977	12/2/2021	9:58	10:58	57.156	1.000	30.16	76.8	68	12/2/2021	387.7	0.33		200	56.693	188.0	3.317	3.475	0.09%	91.6%	--	96.1%
3-A	OL611120	12/2/2021	11:30	12:30	58.12	0.999	30.16	85.8	68	12/2/2021	185.8	0.79			56.608	186.6	3.296		0.43%	--	6.6%	96.0%
3-B	OLC145330	12/2/2021	11:30	12:30	57.906	1.000	30.16	86.0	68	12/2/2021	362.7	0.43		200	56.469	163.1	2.889	3.093	0.12%	88.7%	--	95.7%
4-A		12/2/2021				0.999	30.16	88.3	68	12/2/2021					0.000	0.0	#DIV/0!		#DIV/0!	--	#DIV/0!	0.0%
4-B		12/2/2021	0:00	0:00		1.000	30.16	89.8	68	12/2/2021					0.000	0.0	#DIV/0!	#DIV/0!	#DIV/0!	--	--	0.0%
5-A									68	12/2/2021					0.000	0.0	#DIV/0!		#DIV/0!	--	#DIV/0!	0.0%
5-B		1/0/1900	0:00	0:00					68	12/2/2021					0.000	0.0	#DIV/0!	#DIV/0!	#DIV/0!	--	--	0.0%
6-A									68	12/2/2021					0.000	0.0	#DIV/0!		#DIV/0!	--	#DIV/0!	0.0%
6-B		1/0/1900	0:00	0:00					68	12/2/2021					0.000	0.0	#DIV/0!	#DIV/0!	#DIV/0!	--	--	0.0%
																		Average Field Spike Recovery >>		**98%**		

Less than 0.9 is considered "LDL". Sample concentration must be a minimum of 5 times the detection limit to constitute a valid test run

MONTROSE AIR QUALITY SERVICES

30B Run 1 Summary

Run 1 - 12/02/21 - 08:03 to 09:03

Client:	Green Leaf Power Desert View	Analyst:	Van der Jagt
Location:	Mecca, CA	Reference Method:	EPA Method 30B
Unit Name, Serial #:	Unit 2		

Trap A Data	**1-A**	**Trap A QA/QC**		
Serial Number:	OL611133	Breakthrough, %:	0.6%	< 20%
Section 1 result (ng):	287.7			
Section 2 result (ng):	1.71	Recovery sample volume, %	108.7%	80% to 120%
		Leak Check:	PASS	
		Flow Rate Maintained	PASS	
Total mercury (ng/sample):	289.4	Breakthrough:	PASS	
Sample volume (sL):	64.138			
Result (ug/m^3)	**4.51**	Recovery sample volume:	PASS	

Trap B Data	**1-B**	**Trap B QA/QC**		
Serial Number:	OLC145607	Breakthrough, %:	0.2%	< 20%
Section 1 result (ng):	513.3	Spike Recovered, %	113.6%	85% to 115%
Section 2 result (ng):	1.08	Recovery sample volume, %	108.1%	80% to 120%
		Leak Check:	PASS	
Spike level (ng)	200.0	Flow Rate Maintained	PASS	
Total mercury (ng/sample):	314.4	Breakthrough:	PASS	
Sample volume (sL):	63.779	Spike Recovery:	PASS	
Result (ug/m^3)	**4.93**	Recovery sample volume:	PASS	

Trap A & B Relative Deviation %	4.42%	< 10%

Average µg/m^3 dry: 4.721

QA Criteria

A. Average Spike Recovery must be within 85% and 115%

B. Breakthrough must be ≤10% of Section 1 Mass for Hg concentrations ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

C. Tube Correlation (A+B) must be ≤ 10% relative deviation ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

D. CCV must be within ≤10% of verification standard

MONTROSE AIR QUALITY SERVICES

30B Run 2 Summary

Run 2 - 12/02/21 - 09:58 to 10:58

Client:	Green Leaf Power Desert View	Analyst:	Van der Jagt
Location:	Mecca, CA	Reference Method:	EPA Method 30B
Unit Name, Serial #:	Unit 2		

Trap A Data	**2-A**	**Trap A QA/QC**		
Serial Number:	OL611066	Breakthrough, %:	0.8%	< 20%
Section 1 result (ng):	204.8			
Section 2 result (ng):	1.54	Recovery sample volume, %	96.3%	80% to 120%
		Leak Check:	PASS	
		Flow Rate Maintained	PASS	
Total mercury (ng/sample):	206.3	Breakthrough:	PASS	
Sample volume (sL):	56.799			
Result (ug/m^3)	**3.63**	Recovery sample volume:	PASS	

Trap B Data	**2-B**	**Trap B QA/QC**		
Serial Number:	OL566977	Breakthrough, %:	0.1%	< 20%
Section 1 result (ng):	387.7	Spike Recovered, %	91.6%	85% to 115%
Section 2 result (ng):	0.33	Recovery sample volume, %	96.1%	80% to 120%
		Leak Check:	PASS	
Spike level (ng)	200.0	Flow Rate Maintained	PASS	
Total mercury (ng/sample):	188.0	Breakthrough:	PASS	
Sample volume (sL):	56.693	Spike Recovery:	PASS	
Result (ug/m^3)	**3.32**	Recovery sample volume:	PASS	
Trap A & B Relative Deviation %	4.55% < 10%			

Average µg/m^3 dry: 3.475

QA Criteria

A. Average Spike Recovery must be within 85% and 115%

B. Breakthrough must be ≤10% of Section 1 Mass for Hg concentrations ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

C. Tube Correlation (A+B) must be ≤ 10% relative deviation ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

D. CCV must be within ≤10% of verification standard

MONTROSE AIR QUALITY SERVICES

30B Run 3 Summary

Run 3 - 12/02/21 - 11:30 to 12:30

Client:	Green Leaf Power Desert View	Analyst:	Van der Jagt
Location:	Mecca, CA	Reference Method:	EPA Method 30B
Unit Name, Serial #:	Unit 2		

Trap A Data	**3-A**	**Trap A QA/QC**		
Serial Number:	OL611120	Breakthrough, %:	0.4%	< 20%
Section 1 result (ng):	185.8			
Section 2 result (ng):	0.79	Recovery sample volume, %	96.0%	80% to 120%
		Leak Check:	PASS	
		Flow Rate Maintained	PASS	
Total mercury (ng/sample):	186.6	Breakthrough:	PASS	
Sample volume (sL):	56.608			
Result (ug/m^3)	**3.30**	Recovery sample volume:	PASS	

Trap B Data	**3-B**	**Trap B QA/QC**		
Serial Number:	OLC145330	Breakthrough, %:	0.1%	< 20%
Section 1 result (ng):	362.7	Spike Recovered, %	88.7%	85% to 115%
Section 2 result (ng):	0.43	Recovery sample volume, %	95.7%	80% to 120%
		Leak Check:	PASS	
Spike level (ng)	200.0	Flow Rate Maintained	PASS	
Total mercury (ng/sample):	163.1	Breakthrough:	PASS	
Sample volume (sL):	56.469	Spike Recovery:	PASS	
Result (ug/m^3)	**2.89**	Recovery sample volume:	PASS	

Trap A & B Relative Deviation %	6.59%	< 10%

Average µg/m^3 dry: 3.093

QA Criteria

A. Average Spike Recovery must be within 85% and 115%

B. Breakthrough must be ≤10% of Section 1 Mass for Hg concentrations ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

C. Tube Correlation (A+B) must be ≤ 10% relative deviation ≥ 1µg/m3 or ≤ 20% or ≤ 0.20 µg/m3 absolute difference for stack concentrations ≤ 1 µg/m3

D. CCV must be within ≤10% of verification standard

List of Measurements
Show for this week

N	Sample description	Mass/Volume	Concentration	Units	Date	Time
Measured	Interval, s	Area	Height	Calibration	Interpolation	ΔD
Cref	d, %	Operator				

42 CCV3_250ng 1.0 mg 259.90 g/kg 02.12.2021 12:44:16
02.12.2021 07:09:37 14439.00 - 14574.00 45760 7527.0 Desert View_12.2.21
one point 0.8 MAQS-CHICAGO
41 U2-R3-B-B-OLC145330 1.0 mg 0.43 g/kg 02.12.2021 12:38:51
02.12.2021 07:09:37 14147.00 - 14254.00 75 6.3 Desert View_12.2.21
one point 0.0 MAQS-CHICAGO
40 U2-R3-B-F-OLC145330 1.0 mg 362.70 g/kg 02.12.2021 12:36:37
02.12.2021 07:09:37 14000.00 - 14121.00 63850 3497.5 Desert View_12.2.21
one point 0.0 MAQS-CHICAGO
39 U2-R3-A-B-OL611120 1.0 mg 0.79 g/kg 02.12.2021 12:33:48
02.12.2021 07:09:37 13827.00 - 13955.00 139 6.4 Desert View_12.2.21
one point 0.8 MAQS-CHICAGO
38 U2-R3-A-F-OL611120 1.0 mg 185.80 g/kg 02.12.2021 12:31:12
02.12.2021 07:09:37 13684.00 - 13801.00 32700 2446.1 Desert View_12.2.21
one point 1.6 MAQS-CHICAGO
37 CCV2_250ng 1.0 mg 254.90 g/kg 02.12.2021 11:13:27
02.12.2021 07:09:37 12764.00 - 12879.00 44870 8553.1 Desert View_12.2.21
one point 6.3 MAQS-CHICAGO
36 U2-R2-B-B-OL566977 1.0 mg 0.33 g/kg 02.12.2021 11:10:27
02.12.2021 07:09:37 12589.00 - 12702.00 58 7.2 Desert View_12.2.21
one point 2.8 MAQS-CHICAGO
35 U2-R2-B-F-OL566977 1.0 mg 387.70 g/kg 02.12.2021 11:07:58
02.12.2021 07:09:37 12423.00 - 12557.00 68260 3345.4 Desert View_12.2.21
one point 0.8 MAQS-CHICAGO
34 U2-R2-A-B-OL611066 1.0 mg 1.54 g/kg 02.12.2021 11:03:52
02.12.2021 07:09:37 12195.00 - 12314.00 272 8.3 Desert View_12.2.21
one point 0.8 MAQS-CHICAGO
33 U2-R2-A-F-OL611066 1.0 mg 204.80 g/kg 02.12.2021 11:01:40
02.12.2021 07:09:37 12024.00 - 12137.00 36060 2973.7 Desert View_12.2.21
one point 0.0 MAQS-CHICAGO
32 U2-R1-A-F-OL611066 1.0 mg 204.80 g/kg 02.12.2021 11:00:52
02.12.2021 07:09:37 12024.00 - 12137.00 36060 2973.7 Desert View_12.2.21
one point 0.0 MAQS-CHICAGO
31 U2-R1-B-B-OLC145607 1.0 mg 1.08 g/kg 02.12.2021 09:20:37
02.12.2021 07:09:37 5650.00 - 5754.00 191 7.2 Desert View_12.2.21
one point 1.6 MAQS-CHICAGO
30 CCV1_300ng 1.0 mg 311.70 g/kg 02.12.2021 09:17:34
02.12.2021 07:09:37 5837.00 - 6025.00 54870 7700.1 Desert View_12.2.21
one point 1.6 MAQS-CHICAGO
29 U2-R1-B-F-OLC145607 1.0 mg 1.08 g/kg 02.12.2021 09:12:59
02.12.2021 07:09:37 5650.00 - 5754.00 191 7.2 Desert View_12.2.21
one point 1.6 MAQS-CHICAGO
28 U2-R1-B-F-OLC145607 1.0 mg 513.30 g/kg 02.12.2021 09:10:41
02.12.2021 07:09:37 5493.00 - 5615.00 90370 6021.6 Desert View_12.2.21
one point 2.4 MAQS-CHICAGO

27 U2-R1-A-B-OL611133 1.0 mg 1.71 g/kg 02.12.2021 09:07:49
02.12.2021 07:09:37 5331.00 - 5448.00 301 9.7 Desert View_12.2.21
one point 1.6 MAQS-CHICAGO
26 U2-R1-A-F-OL611133 1.0 mg 287.70 g/kg 02.12.2021 09:05:25
02.12.2021 07:09:37 5177.00 - 5304.00 50640 4773.5 Desert View_12.2.21
one point 3.2 MAQS-CHICAGO
25 ICV1_500ng 1.0 mg 510.60 g/kg 02.12.2021 08:24:21
02.12.2021 07:09:37 4301.00 - 4419.00 89890 12073.1 Desert View_12.2.21
one point 5.6 MAQS-CHICAGO
24 CCV4_250ng 1.0 mg 248.40 g/kg 01.12.2021 16:21:48
01.12.2021 07:09:42 10844.00 - 10947.00 44410 6944.7 Desert View_12.1.21
one point 0.0 MAQS-CHICAGO
23 R4-B-B-OLC145895 1.0 mg 2.84 g/kg 01.12.2021 16:18:59
01.12.2021 07:09:42 10680.00 - 10780.00 508 17.5 Desert View_12.1.21
one point 0.0 MAQS-CHICAGO
22 R4-B-F-OLC145895 1.0 mg 429.70 g/kg 01.12.2021 16:16:49
01.12.2021 07:09:42 10521.00 - 10652.00 76810 4975.6 Desert View_12.1.21
one point 0.0 MAQS-CHICAGO
21 R4-A-B-OL611224 1.0 mg 0.72 g/kg 01.12.2021 16:12:30
01.12.2021 07:09:42 10300.00 - 10396.00 129 7.6 Desert View_12.1.21
one point 0.8 MAQS-CHICAGO
20 R4-A-F-OL611224 1.0 mg 233.80 g/kg 01.12.2021 16:10:26
01.12.2021 07:09:42 10151.00 - 10274.00 41790 2952.3 Desert View_12.1.21
one point 0.8 MAQS-CHICAGO
19 CCV3_250ng 1.0 mg 245.40 g/kg 01.12.2021 14:45:28
01.12.2021 07:09:42 9291.00 - 9402.00 43870 5597.0 Desert View_12.1.21
one point 2.4 MAQS-CHICAGO
18 R3-B-F-OLC145873 1.0 mg 0.28 g/kg 01.12.2021 14:30:01
01.12.2021 07:09:42 8393.00 - 8488.00 50 4.0 Desert View_12.1.21
one point 2.5 MAQS-CHICAGO
17 R3-B-F-OLC145873 1.0 mg 286.00 g/kg 01.12.2021 14:27:57
01.12.2021 07:09:42 8249.00 - 8365.00 51150 3651.1 Desert View_12.1.21
one point 3.3 MAQS-CHICAGO
16 R3-A-B-OL611075 1.0 mg 0.79 g/kg 01.12.2021 14:24:10
01.12.2021 07:09:42 8057.00 - 8142.00 141 5.3 Desert View_12.1.21
one point 2.5 MAQS-CHICAGO
15 R3-A-F-OL611075 1.0 mg 109.00 g/kg 01.12.2021 14:22:14
01.12.2021 07:09:42 7909.00 - 8029.00 19500 1097.4 Desert View_12.1.21
one point 0.8 MAQS-CHICAGO
14 CCV2_250ng 1.0 mg 241.20 g/kg 01.12.2021 13:49:19
01.12.2021 07:09:42 5984.00 - 6079.00 43130 6468.3 Desert View_12.1.21
one point 4.1 MAQS-CHICAGO
13 CCV1_250ng 1.0 mg 256.90 g/kg 01.12.2021 09:28:43
01.12.2021 07:09:42 5704.00 - 5813.00 45930 6475.4 Desert View_12.1.21
one point 4.9 MAQS-CHICAGO
12 R2-B-B-OLC145879 1.0 mg 1.41 g/kg 01.12.2021 09:16:37
01.12.2021 07:09:42 5002.00 - 5099.00 252 10.9 Desert View_12.1.21
one point 1.6 MAQS-CHICAGO
11 R2-B-F-OLC145879 1.0 mg 368.20 g/kg 01.12.2021 09:14:06
01.12.2021 07:09:42 4824.00 - 4948.00 65820 4133.1 Desert View_12.1.21

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 one point      4.0                     MAQS-CHICAGO
10      R2-A-B-OL607940 1.0 mg  1.68    g/kg    01.12.2021      09:09:49
01.12.2021 07:09:42     4619.00 - 4695.00       301     8.4     Desert View_12.1.21
 one point      3.2                     MAQS-CHICAGO
9       R2-A-F-OL607940 1.0 mg  182.50  g/kg    01.12.2021      09:07:55
01.12.2021 07:09:42     4461.00 - 4582.00       32630   2550.6  Desert View_12.1.21
 one point      2.4                     MAQS-CHICAGO
8       ICV1_500ng      1.0 mg  499.00  g/kg    01.12.2021      08:21:14
01.12.2021 07:09:42     4116.00 - 4231.00       89210   12413.2 Desert View_12.1.21
 one point      0.8                     MAQS-CHICAGO
7       CCV1_200ng      1.0 mg  189.60  g/kg    30.11.2021      10:19:18
30.11.2021 09:03:16     3044.00 - 3138.00       35220   5822.6  Desert View_11.30.21
 one point      0.8                     MAQS-CHICAGO
6       R1-B-B-OLC145401        1.0 mg  1.36    g/kg    30.11.2021      10:14:51
30.11.2021 09:03:16     2783.00 - 2875.00       252     14.6    Desert View_11.30.21
 one point      0.0                     MAQS-CHICAGO
5       R1-B-F-OLC145401        1.0 mg  397.90  g/kg    30.11.2021      10:14:46
30.11.2021 09:03:16     2592.00 - 2717.00       73920   4332.3  Desert View_11.30.21
 one point      0.0                     MAQS-CHICAGO
4       R1-A-B-OL611155 1.0 mg  397.90  g/kg    30.11.2021      10:12:11
30.11.2021 09:03:16     2592.00 - 2717.00       73920   4332.3  Desert View_11.30.21
 one point      0.0                     MAQS-CHICAGO
3       R1-A-B-OL611155 1.0 mg  1.28    g/kg    30.11.2021      10:08:05
30.11.2021 09:03:16     2384.00 - 2474.00       237     13.5    Desert View_11.30.21
 one point      0.9                     MAQS-CHICAGO
2       R1-A-F-OL611155 1.0 mg  192.20  g/kg    30.11.2021      10:05:27
30.11.2021 09:03:16     2207.00 - 2318.00       35700   2290.0  Desert View_11.30.21
 one point      0.0                     MAQS-CHICAGO
1       ICV1_500ng      1.0 mg  507.20  g/kg    30.11.2021      09:33:51
30.11.2021 09:03:16     1687.00 - 1808.00       94220   13596.5 Desert View_11.30.21
 one point      1.6                     MAQS-CHICAGO
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List of Measurements
Show for this week

N	Sample description	Mass/Volu	Concentra	Units	Date	Time	Measured	Interval, s	Area	Height	Calibration	Interpolat	ΔD	Cref	d, %	Operator
42	CCV3_250ng	1.0 mg	259.9	µg/kg	02.12.202:	12:44:16	02.12.2021 07:09:37	14439.00 - 14574.00	45760	7527	Desert View_12.2.21	one point		0.8		MAQS-CHICAGO
41	U2-R3-B-B-OLC145330	1.0 mg	0.43	µg/kg	02.12.202:	12:38:51	02.12.2021 07:09:37	14147.00 - 14254.00	75	6.3	Desert View_12.2.21	one point		0		MAQS-CHICAGO
40	U2-R3-B-F-OLC145330	1.0 mg	362.7	µg/kg	02.12.202:	12:36:37	02.12.2021 07:09:37	14000.00 - 14121.00	63850	3497.5	Desert View_12.2.21	one point		0		MAQS-CHICAGO
39	U2-R3-A-B-OL611120	1.0 mg	0.79	µg/kg	02.12.202:	12:33:48	02.12.2021 07:09:37	13827.00 - 13955.00	139	6.4	Desert View_12.2.21	one point		0.8		MAQS-CHICAGO
38	U2-R3-A-F-OL611120	1.0 mg	185.8	µg/kg	02.12.202:	12:31:12	02.12.2021 07:09:37	13684.00 - 13801.00	32700	2446.1	Desert View_12.2.21	one point		1.6		MAQS-CHICAGO
37	CCV2_250ng	1.0 mg	254.9	µg/kg	02.12.202:	11:13:27	02.12.2021 07:09:37	12764.00 - 12879.00	44870	8553.1	Desert View_12.2.21	one point		6.3		MAQS-CHICAGO
36	U2-R2-B-B-OL566977	1.0 mg	0.33	µg/kg	02.12.202:	11:10:27	02.12.2021 07:09:37	12589.00 - 12702.00	58	7.2	Desert View_12.2.21	one point		2.8		MAQS-CHICAGO
35	U2-R2-B-F-OL566977	1.0 mg	387.7	µg/kg	02.12.202:	11:07:58	02.12.2021 07:09:37	12423.00 - 12557.00	68260	3345.4	Desert View_12.2.21	one point		0.8		MAQS-CHICAGO
34	U2-R2-A-B-OL611066	1.0 mg	1.54	µg/kg	02.12.202:	11:03:52	02.12.2021 07:09:37	12195.00 - 12314.00	272	8.3	Desert View_12.2.21	one point		0.8		MAQS-CHICAGO
33	U2-R2-A-F-OL611066	1.0 mg	204.8	µg/kg	02.12.202:	11:01:40	02.12.2021 07:09:37	12024.00 - 12137.00	36060	2973.7	Desert View_12.2.21	one point		0		MAQS-CHICAGO
32	U2-R1-A-F-OL611066	1.0 mg	204.8	µg/kg	02.12.202:	11:00:52	02.12.2021 07:09:37	12024.00 - 12137.00	36060	2973.7	Desert View_12.2.21	one point		0		MAQS-CHICAGO
31	U2-R1-B-B-OLC145607	1.0 mg	1.08	µg/kg	02.12.202:	9:20:37	02.12.2021 07:09:37	5650.00 - 5754.00	191	7.2	Desert View_12.2.21	one point		1.6		MAQS-CHICAGO
30	CCV1_300ng	1.0 mg	311.7	µg/kg	02.12.202:	9:17:34	02.12.2021 07:09:37	5837.00 - 6025.00	54870	7700.1	Desert View_12.2.21	one point		1.6		MAQS-CHICAGO
29	U2-R1-B-F-OLC145607	1.0 mg	1.08	µg/kg	02.12.202:	9:12:59	02.12.2021 07:09:37	5650.00 - 5754.00	191	7.2	Desert View_12.2.21	one point		1.6		MAQS-CHICAGO
28	U2-R1-B-F-OLC145607	1.0 mg	513.3	µg/kg	02.12.202:	9:10:41	02.12.2021 07:09:37	5493.00 - 5615.00	90370	6021.6	Desert View_12.2.21	one point		2.4		MAQS-CHICAGO
27	U2-R1-A-B-OL611133	1.0 mg	1.71	µg/kg	02.12.202:	9:07:49	02.12.2021 07:09:37	5331.00 - 5448.00	301	9.7	Desert View_12.2.21	one point		1.6		MAQS-CHICAGO
26	U2-R1-A-F-OL611133	1.0 mg	287.7	µg/kg	02.12.202:	9:05:25	02.12.2021 07:09:37	5177.00 - 5304.00	50640	4773.5	Desert View_12.2.21	one point		3.2		MAQS-CHICAGO
25	ICV1_500ng	1.0 mg	510.6	µg/kg	02.12.202:	8:24:21	02.12.2021 07:09:37	4301.00 - 4419.00	89890	12073.1	Desert View_12.2.21	one point		5.6		MAQS-CHICAGO
24	CCV4_250ng	1.0 mg	248.4	µg/kg	01.12.202:	16:21:48	01.12.2021 07:09:42	10844.00 - 10947.00	44410	6944.7	Desert View_12.1.21	one point		0		MAQS-CHICAGO
23	R4-B-B-OLC145895	1.0 mg	2.84	µg/kg	01.12.202:	16:18:59	01.12.2021 07:09:42	10680.00 - 10780.00	508	17.5	Desert View_12.1.21	one point		0		MAQS-CHICAGO
22	R4-B-F-OLC145895	1.0 mg	429.7	µg/kg	01.12.202:	16:16:49	01.12.2021 07:09:42	10521.00 - 10652.00	76810	4975.6	Desert View_12.1.21	one point		0		MAQS-CHICAGO
21	R4-A-B-OL611224	1.0 mg	0.72	µg/kg	01.12.202:	16:12:30	01.12.2021 07:09:42	10300.00 - 10396.00	129	7.6	Desert View_12.1.21	one point		0.8		MAQS-CHICAGO
20	R4-A-F-OL611224	1.0 mg	233.8	µg/kg	01.12.202:	16:10:26	01.12.2021 07:09:42	10151.00 - 10274.00	41790	2952.3	Desert View_12.1.21	one point		0.8		MAQS-CHICAGO
19	CCV3_250ng	1.0 mg	245.4	µg/kg	01.12.202:	14:45:28	01.12.2021 07:09:42	9291.00 - 9402.00	43870	5597	Desert View_12.1.21	one point		2.4		MAQS-CHICAGO
18	R3-B-F-OLC145873	1.0 mg	0.28	µg/kg	01.12.202:	14:30:01	01.12.2021 07:09:42	8393.00 - 8488.00	50	4	Desert View_12.1.21	one point		2.5		MAQS-CHICAGO
17	R3-B-F-OLC145873	1.0 mg	286	µg/kg	01.12.202:	14:27:57	01.12.2021 07:09:42	8249.00 - 8365.00	51150	3651.1	Desert View_12.1.21	one point		3.3		MAQS-CHICAGO
16	R3-A-B-OL611075	1.0 mg	0.79	µg/kg	01.12.202:	14:24:10	01.12.2021 07:09:42	8057.00 - 8142.00	141	5.3	Desert View_12.1.21	one point		2.5		MAQS-CHICAGO
15	R3-A-F-OL611075	1.0 mg	109	µg/kg	01.12.202:	14:22:14	01.12.2021 07:09:42	7909.00 - 8029.00	19500	1097.4	Desert View_12.1.21	one point		0.8		MAQS-CHICAGO
14	CCV2_250ng	1.0 mg	241.2	µg/kg	01.12.202:	13:49:19	01.12.2021 07:09:42	5984.00 - 6079.00	43130	6468.3	Desert View_12.1.21	one point		4.1		MAQS-CHICAGO
13	CCV1_250ng	1.0 mg	256.9	µg/kg	01.12.202:	9:28:43	01.12.2021 07:09:42	5704.00 - 5813.00	45930	6475.4	Desert View_12.1.21	one point		4.9		MAQS-CHICAGO
12	R2-B-B-OLC145879	1.0 mg	1.41	µg/kg	01.12.202:	9:16:37	01.12.2021 07:09:42	5002.00 - 5099.00	252	10.9	Desert View_12.1.21	one point		1.6		MAQS-CHICAGO
11	R2-B-F-OLC145879	1.0 mg	368.2	µg/kg	01.12.202:	9:14:06	01.12.2021 07:09:42	4824.00 - 4948.00	65820	4133.1	Desert View_12.1.21	one point		4		MAQS-CHICAGO
10	R2-A-B-OL607940	1.0 mg	1.68	µg/kg	01.12.202:	9:09:49	01.12.2021 07:09:42	4619.00 - 4695.00	301	8.4	Desert View_12.1.21	one point		3.2		MAQS-CHICAGO
9	R2-A-F-OL607940	1.0 mg	182.5	µg/kg	01.12.202:	9:07:55	01.12.2021 07:09:42	4461.00 - 4582.00	32630	2550.6	Desert View_12.1.21	one point		2.4		MAQS-CHICAGO
8	ICV1_500ng	1.0 mg	499	µg/kg	01.12.202:	8:21:14	01.12.2021 07:09:42	4116.00 - 4231.00	89210	12413.2	Desert View_12.1.21	one point		0.8		MAQS-CHICAGO
7	CCV1_200ng	1.0 mg	189.6	µg/kg	30.11.202:	10:19:18	30.11.2021 09:03:16	3044.00 - 3138.00	35220	5822.6	Desert View_11.30.21	one point		0.8		MAQS-CHICAGO
6	R1-B-B-OLC145401	1.0 mg	1.36	µg/kg	30.11.202:	10:14:51	30.11.2021 09:03:16	2783.00 - 2875.00	252	14.6	Desert View_11.30.21	one point		0		MAQS-CHICAGO
5	R1-B-F-OLC145401	1.0 mg	397.9	µg/kg	30.11.202:	10:14:46	30.11.2021 09:03:16	2592.00 - 2717.00	73920	4332.3	Desert View_11.30.21	one point		0		MAQS-CHICAGO
4	R1-A-B-OL611155	1.0 mg	397.9	µg/kg	30.11.202:	10:12:11	30.11.2021 09:03:16	2592.00 - 2717.00	73920	4332.3	Desert View_11.30.21	one point		0		MAQS-CHICAGO
3	R1-A-B-OL611155	1.0 mg	1.28	µg/kg	30.11.202:	10:08:05	30.11.2021 09:03:16	2384.00 - 2474.00	237	13.5	Desert View_11.30.21	one point		0.9		MAQS-CHICAGO
2	R1-A-F-OL611155	1.0 mg	192.2	µg/kg	30.11.202:	10:05:27	30.11.2021 09:03:16	2207.00 - 2318.00	35700	2290	Desert View_11.30.21	one point		0		MAQS-CHICAGO
1	ICV1_500ng	1.0 mg	507.2	µg/kg	30.11.202:	9:33:51	30.11.2021 09:03:16	1687.00 - 1808.00	94220	13596.5	Desert View_11.30.21	one point		1.6		MAQS-CHICAGO

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OL611155

☒ **Unspiked** ☐ **Spiked At:**_____
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) ✓

QA/QC Signature (Spike)_____

Production Lot: U-FEE Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS ☐300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date:_____ Spike Time:_____ Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

Boiler ID: Unit 1

Sampling Location: Stack
(stack, FGD inlet, etc.)

Run Number (optional): 1

Sampling Train (circle one): (A) B

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes:_____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°):_____

Ave Trap Temp (F°):_____

Ave Flow Rate (cc/min):_____

Total Volume (L)_____ or (dscm):_____

Estimated Ave Hg Concentration (µg/dscm):_____

Circle Event if Occurred During Sampling:
STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng):_____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12/30/21	10:10	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12/30/21	10:30	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

Best Before: June 2024

1 440 264 2500 office
1 888 876 2611 toll free
www.ohiolumex.com
mail@ohiolumex.com
30350 Bruce Industrial Pkwy.
Cleveland, OH 44139 USA

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OLC145401

☐ **Unspiked** ☒ **Spiked At:** 200ng
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) _____

QA/QC Signature (Spike) _____

Production Lot: S-3EE5 Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS 300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date: 8/12/2020 Spike Time: 0923 Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

Boiler ID: Unit 1

Sampling Location: Stack
(stack, FGD inlet, etc.)

Run Number (optional): 1

Sampling Train (circle one): A (B)

PRE-Run Leak Check (circle one): (PASS) FAIL

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): (PASS) FAIL

Notes: _____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°): _____

Ave Trap Temp (F°): _____

Ave Flow Rate (cc/min): _____

Total Volume (L) _____ or (dscm): _____

Estimated Ave Hg Concentration (µg/dscm): _____

Circle Event if Occurred During Sampling:

STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng): _____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		11/30/21	10:10	Seal intact as received Yes ☐ No ☐
Trap analyzed by		11/30/21	10:30	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

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1 440 264 2500 office
1 888 876 2611 toll free
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mail@ohiolumex.com
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Cleveland, OH 44139 USA

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OL607940

☒ **Unspiked** ☐ **Spiked At:**_____
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) _____

QA/QC Signature (Spike) _____

Production Lot: U-FEE Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS ☐300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date:_____ Spike Time:_____

Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

Boiler ID: M1

Sampling Location: _____ (stack, FGD inlet, etc.)

Run Number (optional): 2

Sampling Train (circle one): (A) B

Notes: _____

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): **PASS** **FAIL**

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°): _____

Ave Trap Temp (F°): _____

Ave Flow Rate (cc/min): _____

Total Volume (L)_____ or (dscm):_____

Estimated Ave Hg Concentration (µg/dscm): _____

Circle Event if Occurred During Sampling:

STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng): _____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12-1-21	9:15	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12-1-21	9:19	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

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1 888 876 2611 toll free
www.ohiolumex.com
mail@ohiolumex.com
30350 Bruce Industrial Pkwy.
Cleveland, OH 44139 USA

OHIO LUMEX

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OLC145879

☐ **Unspiked** ☒ **Spiked At:** 200ng
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) _____

QA/QC Signature (Spike) YH

Production Lot: S-3EE5 Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS 300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date: 8/12/2020 Spike Time: 0923 Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

Boiler ID: U1

Sampling Location: _____ (stack, FGD inlet, etc.)

Run Number (optional): 2

Sampling Train (circle one): A (B)

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes: _____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°): _____

Ave Trap Temp (F°): _____

Ave Flow Rate (cc/min): _____

Total Volume (L) _____ or (dscm): _____

Estimated Ave Hg Concentration (µg/dscm): _____

Circle Event if Occurred During Sampling:

STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng): _____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12-1-21	9:15	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12-1-21	9:15	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

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1 888 876 2611 toll free
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mail@ohiolumex.com
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Cleveland, OH 44139 USA

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OL611075

☒ **Unspiked** ☐ **Spiked At:**_____
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) ✓

QA/QC Signature (Spike)_____

Production Lot: U-FEE Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS ☐300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date:_____ Spike Time:_____ Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

Boiler ID: U1

Sampling Location: 3
(stack, FGD inlet, etc.)

Run Number (optional):_____

Sampling Train (circle one): (A) B

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes:_____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°):_____

Ave Trap Temp (F°):_____

Ave Flow Rate (cc/min):_____

Total Volume (L)_____or (dscm):_____

Estimated Ave Hg Concentration (µg/dscm):_____

Circle Event if Occurred During Sampling:

STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng):_____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12-1-21	14:30	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12-1-21	14:32	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

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1 888 876 2611 toll free
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mail@ohiolumex.com
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Cleveland, OH 44139 USA

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OLC145873

☐ **Unspiked** ☒ **Spiked At:** 200ng
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) _____

QA/QC Signature (Spike) _____

Production Lot: S-3EE5 Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS ☐300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date: 8/12/2020 Spike Time: 0923 Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert Vista

Boiler ID: M1

Sampling Location: _____ (stack, FGD inlet, etc.)

Run Number (optional): 3

Sampling Train (circle one): A (B)

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes: _____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°): _____

Ave Trap Temp (F°): _____

Ave Flow Rate (cc/min): _____

Total Volume (L) _____ or (dscm): _____

Estimated Ave Hg Concentration (µg/dscm): _____

Circle Event if Occurred During Sampling:
STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng): _____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12-1-21	14:30	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12-1-21	14:30	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

Best Before: August 2023

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1 888 876 2611 toll free
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mail@ohiolumex.com
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Cleveland, OH 44139 USA

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OL611224

☒ **Unspiked** ☐ **Spiked At:**_____
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) ✓

QA/QC Signature (Spike)_____

Production Lot: U-FEE Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS ☐300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date:_____ Spike Time:_____

Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Boiler ID: U1

Run START: _____ Date _____ Time

Sampling Location: _____ *(stack, FGD inlet, etc.)*

Run Number (optional): 4

Run END: _____ Date _____ Time

Sampling Train (circle one): (A) B

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes:_____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°):_____

Estimated Ave Hg Concentration (µg/dscm):_____

Ave Trap Temp (F°):_____

Circle Event if Occurred During Sampling:

Ave Flow Rate (cc/min):_____

STARTUP **SHUTDOWN**

Total Volume (L)_____or (dscm):_____

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng):_____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12-1-21	16:15	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12-1-21	16:15	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

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1 888 876 2611 toll free
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mail@ohiolumex.com
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Cleveland, OH 44139 USA

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OLC145895

☐ **Unspiked** ☒ **Spiked At:** 200ng
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) _____

QA/QC Signature (Spike) _____

Production Lot: S-3EE5 Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS ☐300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date: 8/12/2020 Spike Time: 0923 Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

Boiler ID: U1

Sampling Location: _____ (stack, FGD inlet, etc.)

Run Number (optional): 4

Sampling Train (circle one): A (B)

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes: _____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°): _____

Ave Trap Temp (F°): _____

Ave Flow Rate (cc/min): _____

Total Volume (L) _____ or (dscm): _____

Estimated Ave Hg Concentration (µg/dscm): _____

Circle Event if Occurred During Sampling:
STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng): _____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12-1-21	16:15	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12-1-21	16:15	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

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1 440 264 2500 office
1 888 876 2611 toll free
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mail@ohiolumex.com
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Cleveland, OH 44139 USA

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OL611133

☒ **Unspiked** ☐ **Spiked At:**_____
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) _____

QA/QC Signature (Spike) _____

Production Lot: U-FEE Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS ☐300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date:_____ Spike Time:_____ Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

Boiler ID: U 2

Sampling Location: _____ (stack, FGD inlet, etc.)

Run Number (optional): 1

Sampling Train (circle one): (A) B

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes:_____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°):_____

Ave Trap Temp (F°):_____

Ave Flow Rate (cc/min):_____

Total Volume (L)_____ or (dscm):_____

Estimated Ave Hg Concentration (µg/dscm):_____

Circle Event if Occurred During Sampling:
STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng):_____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12-2-21	9:15	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12-2-21	9:15	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

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1 888 876 2611 toll free
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mail@ohiolumex.com
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Cleveland, OH 44139 USA

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OLC145607

☐ **Unspiked** ☒ **Spiked At:** 200ng
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) _____

QA/QC Signature (Spike) TH L

Production Lot: S-3EE5 Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS ☐300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date: 8/12/2020 Spike Time: 0923 Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Boiler ID: U 2

Run START: _____ Date _____ Time

Sampling Location: _____ *(stack, FGD inlet, etc.)*

Run Number (optional): 1

Run END: _____ Date _____ Time

Sampling Train (circle one): **A** **B**

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes: _____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°): _____

Estimated Ave Hg Concentration (µg/dscm): _____

Ave Trap Temp (F°): _____

Circle Event if Occurred During Sampling:

STARTUP **SHUTDOWN**

Ave Flow Rate (cc/min): _____

Total Volume (L) _____ or (dscm): _____

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng): _____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab	[illegible]	12-2-21	9:15	Seal intact as received Yes ☐ No ☐
Trap analyzed by	[illegible]	12-2-21	9:15	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

Best Before: August 2023

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1 888 876 2611 toll free
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Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OL611066

☒ **Unspiked** ☐ **Spiked At:**_____
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) ✓

QA/QC Signature (Spike)_____

Production Lot: U-FEE Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS ☐300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date:_____ Spike Time:_____ Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

Boiler ID: U2

Sampling Location: _____ (stack, FGD inlet, etc.)

Run Number (optional): 2

Sampling Train (circle one): (A) B

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes:_____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°):_____

Ave Trap Temp (F°):_____

Ave Flow Rate (cc/min):_____

Total Volume (L)_____ or (dscm):_____

Estimated Ave Hg Concentration (µg/dscm):_____

Circle Event if Occurred During Sampling:
STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng):_____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12-2-21	11:10	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12-2-21	11:10	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

Best Before: June 2024

1 440 264 2500 office
1 888 876 2611 toll free
www.ohiolumex.com
mail@ohiolumex.com
30350 Bruce Industrial Pkwy.
Cleveland, OH 44139 USA

OHIO LUMEX

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OL566977

☐ **Unspiked** ☒ **Spiked At:** 200ng
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) ~

QA/QC Signature (Spike) [illegible]

Production Lot: S-3EE5 Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS 300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date: 8/12/2020 Spike Time: 0923 Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

Boiler ID: U2

Sampling Location: _____ (stack, FGD inlet, etc.)

Run Number (optional): 2

Sampling Train (circle one): A (B)

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes: _____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°): _____

Ave Trap Temp (F°): _____

Ave Flow Rate (cc/min): _____

Total Volume (L) _____ or (dscm): _____

Estimated Ave Hg Concentration (µg/dscm): _____

Circle Event if Occurred During Sampling:

STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng): _____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab	[illegible]	12-2-21	11:10	Seal intact as received Yes ☐ No ☐
Trap analyzed by	[illegible]	12-2-21	11:10	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

Best Before: August 2023

1 440 264 2500 office
1 888 876 2611 toll free
www.ohiolumex.com
mail@ohiolumex.com
30350 Bruce Industrial Pkwy.
Cleveland, OH 44139 USA

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OL611120

☒ **Unspiked** ☐ **Spiked At:**_____
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) ✓

QA/QC Signature (Spike)_____

Production Lot: U-FEE Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS ☐300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date:_____ Spike Time:_____ Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

Boiler ID: U2

Sampling Location: _____ (stack, FGD inlet, etc.)

Run Number (optional): 3

Sampling Train (circle one): (A) B

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Run START: _____ Date _____ Time

Run END: _____ Date _____ Time

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes:_____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°):_____

Ave Trap Temp (F°):_____

Ave Flow Rate (cc/min):_____

Total Volume (L)_____ or (dscm):_____

Estimated Ave Hg Concentration (µg/dscm):_____

Circle Event if Occurred During Sampling:

STARTUP **SHUTDOWN**

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng):_____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12-2-21	12:40	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12-2-21	12:40	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

Best Before: June 2024

1 440 264 2500 office
1 888 876 2611 toll free
www.ohiolumex.com
mail@ohiolumex.com
30350 Bruce Industrial Pkwy.
Cleveland, OH 44139 USA

Ohio Lumex Co., Inc.
Sorbent Trap Chain of Custody Form

Trap ID
OLC145330

☐ **Unspiked** ☒ **Spiked At:** 200ng
Spiking Method Cold Vapor Adsorption Via Impinger Sparging
Certified Accuracy ± 10%, Traceable to NIST

QA/QC Signature (Trap Assembly) _____

QA/QC Signature (Spike) _____

Production Lot: S-3EE5 Carbon Lot: 4C

☐High Flow ☐Coil Pre-filter ☒240 mm
☐Static Pre-filter ☐AGS 300 mm
☐Fluffy Pre-filter ☐185 mm ☐450 mm

Spike Date: 8/12/2020 Spike Time: 0923 Type of Trap: 30B

TO BE FILLED OUT BY SAMPLING TECHNICIAN

Plant/Source: Desert View

PRE-Run Leak Check (circle one): **PASS** **FAIL**

Boiler ID: U 2

Run START: _____ Date _____ Time

Sampling Location: _____ *(stack, FGD inlet, etc.)*

Run Number (optional): 3

Run END: _____ Date _____ Time

Sampling Train (circle one): **A** **B**

POST-Run Leak Check (circle one): **PASS** **FAIL**

Notes: _____

SAMPLING CONDITIONS AND PARAMETERS

Ave Duct Temp (F°): _____

Estimated Ave Hg Concentration (µg/dscm): _____

Ave Trap Temp (F°): _____

Circle Event if Occurred During Sampling:

STARTUP **SHUTDOWN**

Ave Flow Rate (cc/min): _____

Total Volume (L) _____ or (dscm): _____

For CEMENT KILNS Only
No. of RAW MILL OFF Events During Sampling: _____

REQUIRED IF RETURNING TO OHIO LUMEX FOR ANALYSIS

Estimated Hg Mass in Section 1 of Sorbent Trap (ng): _____

Note: Analyzer calibration range will be set based on this value. Leaving this blank may result in out-of-calibration analysis. Please contact us if you require assistance estimating this value.

Chain Of Custody

Signatures along with Date/Time required for insertion, removal, lab receiving and lab analysis of trap.

	Signature	Date	Time	Security Seal
Trap inserted by				**If Applicable** Place Chain of Custody seal here (See Security Seal Instruction Sheet)
Trap removed and sealed by				
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Courier/Other (If Applicable)				Seal intact as received Yes ☐ No ☐
Trap received by lab		12-2-21	12:40	Seal intact as received Yes ☐ No ☐
Trap analyzed by		12-2-21	12:40	Seal intact as received Yes ☐ No ☐

Make sure all of your sampling conditions prevent moisture condensation in the trap media. Moisture condensation is a major cause of breakthrough and spike loss in sorbent traps and should be prevented at all costs. Deactivated glass and glass wool Impregnated Activated Carbon – Refer to SDS

Best Before: August 2023

1 440 264 2500 office
1 888 876 2611 toll free
www.ohiolumex.com
mail@ohiolumex.com
30350 Bruce Industrial Pkwy.
Cleveland, OH 44139 USA

Appendix A.3.2
Fuel Analysis Data

A. J. EDMOND COMPANY

CHEMISTS / ENGINEERS
1530 West 16th Street
Long Beach, California 90813
Phone: (562) 437-1802 Fax: (562) 590-0482
website: http://www.ajedmondco.com

ANALYTICAL LABORATORIES
CARGO SURVEYS
BARGE SURVEYS
COMMODITY SURVEYS
INSPECTORS
CONSULTANTS
MANUFACTURING
SAMPLING SYSTEMS

December 10, 2021

Desert View Power
62-300 Gene Welmas Drive
P.O. Box 758
Mecca, CA 92254

Attn: Mr. Steve Kozlowski

Project Number: 111900
Source: Desert View Power

LABORATORY ANALYSES

Date	Sample Description	Commodity Description	Mercury Dry Basis ASTM D6722, ppm
12/2/2021	U-1 0900 11/30/2021	Biomass - Solid	0.028
12/2/2021	U-1 0900 12/01/2021	Biomass - Solid	0.020
12/2/2021	U-2 0900 12/02/2021	Biomass - Solid	0.011
12/2/2021	U-2 1100 12/02/2021	Biomass - Solid	0.007

Samples were submitted by the customer to A. J. Edmond Company for laboratory analysis.

JNP

Respectfully Submitted
A. J. EDMOND COMPANY
by JD Rolle
Jeffrey G Rolle, President

ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS. AUTHORIZATION FOR DISCLOSURE OF OUR FINDINGS IS RESERVED PENDING APPROVAL OF ALL PRINCIPALS AND THE A. J. EDMOND COMPANY AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC, AND OURSELVES.

Form 5.10f10-0

Appendix A.4
Calibration Data

EPA SPAN GAS RECORD

ENT/LOCATION: Desert View Power DATE: 11/30/2021

BY: RD

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO	CC707347	0.00		
O_2	CC181817	10.60	CC303876	18.99
CO_2	CC181817	10.65	CC303876	18.96

PRE-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2				
Analyzer Span	18.99	18.96				
Zero Gas Value	0.0	0.0				--
Analyzer Reads	0.02	0.03				--
Error (% of cal span)	0.1%	0.1%				PASS
High Gas Value	18.99	18.96				--
Analyzer Reads	19.00	18.97				--
Error (% of cal span)	0.0%	0.0%				PASS
Mid Gas Value	10.60	10.65				--
Analyzer Reads	10.67	10.53				--
Error (% of cal span)	0.4%	-0.6%				PASS
Linearity at Mid Point	0.3%	-0.7%				

POST-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2				
Analyzer Span	18.99	18.96				
Zero Gas Value	0.0	0.0				--
Analyzer Reads	0.01	-0.02				--
Error (% of cal span)	0.1%	-0.1%				PASS
High Gas Value	18.99	18.96				--
Analyzer Reads	19.02	19.02				--
Error (% of cal span)	0.1%	0.3%				PASS
Mid Gas Value	10.60	10.65				--
Analyzer Reads	10.68	10.53				--
Error (% of cal span)	0.4%	-0.6%				PASS

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

EPA SPAN GAS RECORD

ENT/LOCATION: Desert View Power DATE: 12/1/2021

BY: RD

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO	CC707347	0.00		
O_2	CC181817	10.60	CC303876	18.99
CO_2	CC181817	10.65	CC303876	18.96

PRE-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2				
Analyzer Span	18.99	18.96				
Zero Gas Value	0.0	0.0				--
Analyzer Reads	0.01	0.01				--
Error (% of cal span)	0.1%	0.0%				PASS
High Gas Value	18.99	18.96				--
Analyzer Reads	19.00	18.95				--
Error (% of cal span)	0.1%	-0.1%				PASS
Mid Gas Value	10.60	10.65				--
Analyzer Reads	10.67	10.50				--
Error (% of cal span)	0.4%	-0.8%				PASS
Linearity at Mid Point	0.3%	-0.8%				

POST-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2				
Analyzer Span	18.99	18.96				
Zero Gas Value	0.0	0.0				--
Analyzer Reads	0.00	0.02				--
Error (% of cal span)	0.0%	0.1%				PASS
High Gas Value	18.99	18.96				--
Analyzer Reads	18.97	18.97				--
Error (% of cal span)	-0.1%	0.0%				PASS
Mid Gas Value	10.60	10.65				--
Analyzer Reads	10.64	10.52				--
Error (% of cal span)	0.2%	-0.7%				PASS

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

EPA SPAN GAS RECORD

LIENT/LOCATION: Desert View Power

DATE: 11/30/2021

BY: DW

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO	CC707347	0.00		
O_2	CC181817	10.60	CC303876	18.99
CO_2	CC181817	10.65	CC303876	18.96

PRE-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2				
Analyzer Span	18.99	18.96				
Zero Gas Value	0.0	0.0				--
Analyzer Reads	0.02	0.03				--
Error (% of cal span)	0.1%	0.1%				PASS
High Gas Value	18.99	18.96				--
Analyzer Reads	19.00	18.97				--
Error (% of cal span)	0.0%	0.0%				PASS
Mid Gas Value	10.60	10.65				--
Analyzer Reads	10.67	10.53				--
Error (% of cal span)	0.4%	-0.6%				PASS
Linearity at Mid Point	0.3%	-0.7%				

POST-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2				
Analyzer Span	18.99	18.96				
Zero Gas Value	0.0	0.0				--
Analyzer Reads	0.01	-0.02				--
Error (% of cal span)	0.1%	-0.1%				PASS
High Gas Value	18.99	18.96				--
Analyzer Reads	19.02	19.02				--
Error (% of cal span)	0.1%	0.3%				PASS
Mid Gas Value	10.60	10.65				--
Analyzer Reads	10.68	10.53				--
Error (% of cal span)	0.4%	-0.6%				PASS

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

EPA SPAN GAS RECORD

LIENT/LOCATION: Desert View Power

DATE: 12/1/2021

BY: DW

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO	CC707347	0.00		
O_2	CC181817	10.60	CC303876	18.99
CO_2	CC181817	10.65	CC303876	18.96

PRE-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2				
Analyzer Span	18.99	18.96				
Zero Gas Value	0.0	0.0				--
Analyzer Reads	0.01	0.01				--
Error (% of cal span)	0.1%	0.0%				PASS
High Gas Value	18.99	18.96				--
Analyzer Reads	19.00	18.95				--
Error (% of cal span)	0.1%	-0.1%				PASS
Mid Gas Value	10.60	10.65				--
Analyzer Reads	10.67	10.50				--
Error (% of cal span)	0.4%	-0.8%				PASS
Linearity at Mid Point	0.3%	-0.8%				

POST-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2				
Analyzer Span	18.99	18.96				
Zero Gas Value	0.0	0.0				--
Analyzer Reads	0.00	0.02				--
Error (% of cal span)	0.0%	0.1%				PASS
High Gas Value	18.99	18.96				--
Analyzer Reads	18.97	18.97				--
Error (% of cal span)	-0.1%	0.0%				PASS
Mid Gas Value	10.60	10.65				--
Analyzer Reads	10.64	10.52				--
Error (% of cal span)	0.2%	-0.7%				PASS

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

EPA SPAN GAS RECORD

ENT/LOCATION: Desert View Power DATE: 12/2/2021

BY: DW

	MID SPAN CYLINDER		HIGH SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO	CC707347	0.00		
O_2	CC181817	10.60	CC303876	18.99
CO_2	CC181817	10.65	CC303876	18.96

PRE-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2				
Analyzer Span	18.99	18.96				
Zero Gas Value	0.0	0.0				--
Analyzer Reads	0.01	0.04				--
Error (% of cal span)	0.1%	0.2%				PASS
High Gas Value	18.99	18.96				--
Analyzer Reads	19.00	18.97				--
Error (% of cal span)	0.0%	0.1%				PASS
Mid Gas Value	10.60	10.65				--
Analyzer Reads	10.66	10.54				--
Error (% of cal span)	0.3%	-0.6%				PASS
Linearity at Mid Point	0.3%	-0.7%				

POST-TEST INSTRUMENT CALIBRATION ERROR

	ANALYZER					STATUS
	O_2	CO_2				
Analyzer Span	18.99	18.96				
Zero Gas Value	0.0	0.0				--
Analyzer Reads	0.01	0.03				--
Error (% of cal span)	0.0%	0.2%				PASS
High Gas Value	18.99	18.96				--
Analyzer Reads	18.98	19.00				--
Error (% of cal span)	-0.1%	0.2%				PASS
Mid Gas Value	10.60	10.65				--
Analyzer Reads	10.65	10.56				--
Error (% of cal span)	0.3%	-0.5%				PASS

% ERROR CALCULATION:
(AS FOUND - ACTUAL VALUE)/HIGH SPAN * 100%
ALLOWABLE DEVIATION IS 2% OF HIGH SPAN

PRAXAIR
Making our planet more productive

Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles, CA 90058
Tel: 323-585-2154
Fax: 714-542-6689

Customer & Order Information

MONTROSE AIR QUALITY SERVICES

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

Certificate Issuance Date: **6/2/2021**
Certification Date: **6/2/2021**
Lot Number: **N70086114704**
Part Number: **NI 5.5CE-AS**
DocNumber: **403204**

N2

CERTIFICATE OF ANALYSIS

Nitrogen, 5.5 Continuous Emission Monitoring Zero

CC707347
F.O.
5-27-2021

Analytes	Specification	Analytical Results	Analytical Reference	Analytical Uncertainty
Nitrogen	**≥ 99.9995 %**	**≥ 99.9995 %**	**4**	**N/A**
Carbon Dioxide	**≤ 1 ppm**	**≤ 0.2 ppm**	**2**	**± 10%**
Carbon Monoxide	**≤ 0.5 ppm**	**≤ 0.1 ppm**	**2**	**± 15%**
Total Hydrocarbons	**≤ 0.1 ppm**	**≤ 0.1 ppm**	**5**	**± 15%**
Oxides of Nitrogen	**≤ 0.1 ppm**	**≤ 0.1 ppm**	**7**	**± 15%**
Oxygen	**≤ 0.5 ppm**	**≤ 0.5 ppm**	**6**	**± 15%**
Sulfur Dioxide	**≤ 0.1 ppm**	**≤ 0.1 ppm**	**1**	**± 15%**
Water	**≤ 2 ppm**	**≤ 0.5 ppm**	**3**	**± 10%**

Cylinder Style: **AS**
Cylinder Pressure @ 70 F: **2000 psig**
Cylinder Volume: **142 ft3**
Valve Outlet Connection: **CGA 580**
Fill Date: **5/27/2021**
Analysis Date: **5/27/2021**
Filling Method: **Pressure/Temperature**
Cylinder Number(s): **CC83158, CC268909, CC707347, CC247174, EB0034510, CC325846, SA20269, CC273087, DT0036637, CC702575, DT0036735, EB0092916, DT0028884**
Analyzed Cylinder Number(s): **CC83158**

Analyst: **Amalia Real**
Approved Signer: **Ying Yu**

Key to Analytical Techniques:

Reference	Analytical Instrument - Analytical Principle
1	Ametek 921CE S/N AW-921-S321 - UV Spectrometry
2	Horiba Instruments Inc. GA-360E - NDIR
3	Meeco Aquavolt PLUS - Specific Water Analyzer
4	N/A - By Difference of Typical Impurities
5	Rosemount/Beckman 400A - FID Total Hydrocarbon Analyzer
6	Servomex DF310E SN# PT-25457-V6 - Electrolytic Cell/Electrochemical
7	Thermo Electron 42i-LS S/N 1030645077 - Chemiluminescence

LO 6-18-2021

This analysis of the product described herein was prepared by Praxair Distribution, Inc. using instruments whose calibration is certified using Praxair Distribution, Inc. Reference Materials which are traceable to the International System of Units (SI) through either weights traceable to the National Institute of Standards and Technology (NIST) or Measurement Canada, or through NIST Standard Reference Materials or equivalent where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by mole unless otherwise noted. Analytical uncertainty is expressed as a Relative % unless otherwise noted.

IMPORTANT
The information contained herein has been prepared at your request by personnel within Praxair Distribution, Inc. While we believe the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall liability of Praxair Distribution, Inc. arising out of the use of the information contained herein exceed the fee established for providing such information.

PRAXAIR
Making our planet more productive

DocNumber: 311316

Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22020

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

MONTROSE

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

Certificate Issuance Date: 08/10/2020
Praxair Order Number: 71392656
Part Number: NI CD10.5O6E-AS
Customer PO Number: 79384599

Fill Date: 08/04/2020
Lot Number: 70086021701
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

ProSpec EZ Cert

Expiration Date:	08/10/2028	NIST Traceable
Cylinder Number:	CC181817	Expanded Uncertainty
10.65 %	Carbon dioxide	± 0.5 %
10.60 %	Oxygen	± 0.4 %
Balance	Nitrogen	

Certification Information:

Certification Date: 08/10/2020 *Term:* 96 Months *Expiration Date:* 08/10/2028

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1

Do Not Use this Standard if Pressure is less than 100 PSIG.

CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. **Component:** Carbon dioxide

Requested Concentration: 10.5 %
Certified Concentration: 10.65 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 07/23/2020

Reference Standard: Type / Cylinder #: GMIS / CC134179
Concentration / Uncertainty: 16.02 % ±0.286%
Expiration Date: 07/10/2022
Traceable to: SRM # / Sample # / Cylinder #: SRM 1675b / 6-F-51 / CAL014538
SRM Concentration / Uncertainty: 13.963% / ±0.034%
SRM Expiration Date: 05/16/2022

First Analysis Data:							Date	08/10/2020
Z:	0	R:	16.02	C:	10.64	Conc:	10.64	
R:	16.02	Z:	0	C:	10.66	Conc:	10.66	
Z:	0	C:	10.66	R:	16.04	Conc:	10.66	
UOM:	%					Mean Test Assay:	10.65	%

Second Analysis Data:							Date	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%					Mean Test Assay:		%

2. **Component:** Oxygen

Requested Concentration: 10.5 %
Certified Concentration: 10.60 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 07/23/2020

Reference Standard: Type / Cylinder #: NTRM / DT0010287
Concentration / Uncertainty: 9.875 % ±0.4%
Expiration Date: 11/18/2022
Traceable to: SRM # / Sample # / Cylinder #: NTRM / 170701 / NTRM DT0010287
SRM Concentration / Uncertainty: 9.875% / ±0.040%
SRM Expiration Date: 11/18/2022

First Analysis Data:							Date	08/10/2020
Z:	0	R:	9.88	C:	10.6	Conc:	10.59	
R:	9.88	Z:	0	C:	10.6	Conc:	10.59	
Z:	0	C:	10.62	R:	9.89	Conc:	10.61	
UOM:	%					Mean Test Assay:	10.6	%

Second Analysis Data:							Date	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%					Mean Test Assay:		%

Analyzed By Jose Vasquez

Certified By Jenna Lockman

O2 10.60
CO2 10.65
CC181817
EXP. 8-10-2028
F22026

LO 12-18-2020

Information contained herein has been prepared at the request of the customer by the experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specified analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

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Making our planet more productive

DocNumber: 315926

MONTROSE

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, CA 92705

Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22020

...F ANALYSIS / EPA PROTOCOL GAS

Certificate Issuance Date: 10/21/2020
Praxair Order Number: 26485426
Part Number: NI CD19O2E-AS
Customer PO Number: VERBAL: LUIS

Fill Date: 10/16/2020
Lot Number: 70086029004
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 2000 psig 156 ft3

Certified Concentration

Expiration Date:	**10/21/2028**	NIST Traceable
Cylinder Number:	**CC303876**	Expanded Uncertainty
18.96 %	**Carbon dioxide**	**± 0.4 %**
18.99 %	**Oxygen**	**± 0.2 %**
Balance	**Nitrogen**	

ProSpec EZ Cert

Certification Information:

Certification Date: 10/21/2020 *Term:* 96 Months *Expiration Date:* 10/21/2028

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Uncertainty above is expressed as relative expanded uncertainty at a level of confidence of approximately 95% with a coverage factor k = 2. Do Not Use this Standard if Pressure is less than 100 PSIG.

CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. ***Component:*** **Carbon dioxide**

Requested Concentration: 19 %
Certified Concentration: 18.96 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 09/22/2020

First Analysis Data:							Date	10/21/2020
Z:	0	R:	19.92	C:	18.95	Conc:	18.95	
R:	19.92	Z:	0	C:	18.97	Conc:	18.97	
Z:	0	C:	18.97	R:	19.93	Conc:	18.97	
UOM:	%					Mean Test Assay:	18.96	%

Reference Standard: Type / Cylinder #: GMIS / CC188344
Concentration / Uncertainty: 19.92 % ±0.296%
Expiration Date: 02/20/2028
Traceable to: SRM # / Sample # / Cylinder #: RGM#CC28033 / N/A / RGM#CC28033
SRM Concentration / Uncertainty: 19.67% / ±0.04%
SRM Expiration Date: 07/15/2021

Second Analysis Data:							Date	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%					Mean Test Assay:		%

2. ***Component:*** **Oxygen**

Requested Concentration: 19 %
Certified Concentration: 18.99 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 09/22/2020

First Analysis Data:							Date	10/21/2020
Z:	0	R:	20.9	C:	18.98	Conc:	18.97	
R:	20.9	Z:	0	C:	19.02	Conc:	19.01	
Z:	0	C:	19.02	R:	20.94	Conc:	19.01	
UOM:	%					Mean Test Assay:	18.99	%

Reference Standard: Type / Cylinder #: GMIS / ND29287
Concentration / Uncertainty: 20.90 % ±0.111%
Expiration Date: 09/01/2028
Traceable to: SRM # / Sample # / Cylinder #: SRM 2659a / 71-E-19 / FF22331
SRM Concentration / Uncertainty: 20.863% / ±0.021%
SRM Expiration Date: 08/23/2021

Second Analysis Data:							Date	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%					Mean Test Assay:		%

Analyzed By Jose Vasquez

Certified By Jenna Lockman

O2 18.99
CO2 18.96
CC303876
EXP. 10/21/28
F22020

LO 11/2/2020

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

Barometric Pressure Determination

Date: 11/30/21

Time: Nov 30 7:40 am PST

Data By: RD

Reference: https://forecast.weather.gov/MapClick.php?lat=33.6278

Reference Barometer ID	Palm Springs, Regional Airport (KTRM)
Reference Barometer Location	Lat: 33.62667°NLon: 116.15944°WElev: -125ft.
Reference Barometer Other Info.	Nov 30 7:40 am PST
Reference Barometer Indication, corrected to sea	**30.01**
Reference Barometer Reference Elevation	-125.00
Reference Barometer Actual Pressure	30.14
Test Barometer Location/Site	
Location/Site Elevation	**-127**
Location/Site Barometric Pressure	30.14
Sampling Location Height (above/below site elevatior	**20**
Sampling Location Barometric Pressure	**30.12**

Barometric Pressure Determination

Date: 12/01/21

Time: Dec 1 7:07 am PST

Data By: RD

Reference: https://forecast.weather.gov/MapClick.php?lat=33.6278

Reference Barometer ID	Palm Springs, Regional Airport (KTRM)
Reference Barometer Location	Lat: 33.62667°NLon: 116.15944°WElev: -125ft.
Reference Barometer Other Info.	Dec 1 7:07 am PST
Reference Barometer Indication, corrected to sea	**30.07**
Reference Barometer Reference Elevation	-125.00
Reference Barometer Actual Pressure	30.20
Test Barometer Location/Site	
Location/Site Elevation	**-127**
Location/Site Barometric Pressure	30.20
Sampling Location Height (above/below site elevatior	**20**
Sampling Location Barometric Pressure	**30.18**

Barometric Pressure Determination

Date: 12/02/21

Time: Dec 2 6:55 am PST

Data By: RD

Reference: https://forecast.weather.gov/MapClick.php?lat=33.6278

Reference Barometer ID	Palm Springs, Regional Airport (KTRM)
Reference Barometer Location	Lat: 33.62667°NLon: 116.15944°WElev: -125ft.
Reference Barometer Other Info.	Dec 2 6:55 am PST
Reference Barometer Indication, corrected to sea	**30.05**
Reference Barometer Reference Elevation	-125.00
Reference Barometer Actual Pressure	30.18
Test Barometer Location/Site	
Location/Site Elevation	**-127**
Location/Site Barometric Pressure	30.18
Sampling Location Height (above/below site elevatior	**20**
Sampling Location Barometric Pressure	**30.16**

IAS ACCREDITED Calibration Laboratory

CERTIFICATE OF CALIBRATION

CUSTOMER:	MONTROSE	CALIBRATION DATE:	10/14/21
PO NUMBER:		CALIBRATION DUE:	10/14/22
INST. MANUFACTURER:	APEX INSTRUMENTS	PROCEDURE:	NAVAIR 17-20MG-02
INST. DESCRIPTION:	AIR SAMPLER	CALIBRATION FLUID:	AIR @ 14.7 PSIA 70 F
MODEL NUMBER:	XC-260	STANDARD(S) USED:	A5, A24 DUE 05-2022
SERIAL NUMBER:	1110016; ID# 00222517	NIST TRACE #' S:	1329407628, 89576, 1617259390
RATED ACCURACY:	+/- 1 % RD.	AMBIENT CONDITIONS:	758 mm HGA 41 % RH 73 F
UNCERTAINTY GIVEN:	TOTAL measurement uncertainty: +/- .190 % RD. K=2	CERTIFICATE FILE #:	481162.481163.21

NOTES: AS RECEIVED/ AS LEFT WITHIN SPECS. REFERENCE CONDITIONS ARE: 760 mm HGA 70 F. DECISION RULE: NO PFA % TAKEN

481162

TEST POINT NUMBER	UUT INDICATED M3/HR PD.METER	DM.STD. ACTUAL M3/HR PD.METER	CORRRECTION FACTOR	UUT INDICATED FLOWMETER SCCM	DM.STD. ACTUAL FLOWMETER SCCM
1	0.02027	0.020	0.9867	0.2	0.215
1	0.03019	0.030	0.9937	0.6	0.617
1	0.05014	0.050	0.9972	0.8	0.819
2	0.1008	0.100	0.9921	1.1	1.122
3	0.2503	0.250	0.9988	1.4	1.423
4	0.4983	0.500	1.0034	TEMPERATURE F DEG.	TEMPERATURE F DEG.
5	0.9966	1.000	1.0034	71	71.02
6	1.4932	1.500	1.0046		
7	1.9915	2.000	1.0043		
8	2.4903	2.500	1.0039		
		AVERAGE	0.99880		

481163

TEST POINT NUMBER	UUT INDICATED M3/HR PD.METER	DM.STD. ACTUAL M3/HR PD.METER	CORRRECTION FACTOR	UUT INDICATED FLOWMETER SCCM	DM.STD. ACTUAL FLOWMETER SCCM
1	0.02021	0.020	0.9896	0.2	0.216
1	0.03015	0.030	0.9950	0.6	0.617
1	0.05010	0.050	0.9980	0.8	0.818
2	0.1004	0.100	0.9960	1.1	1.121
3	0.2496	0.250	1.0016	1.4	1.422
4	0.4975	0.500	1.0050	TEMPERATURE F DEG.	TEMPERATURE F DEG.
5	0.9954	1.000	1.0046	70	70.03
6	1.4924	1.500	1.0051		
7	1.9909	2.000	1.0046		
8	2.4895	2.500	1.0042		
		AVERAGE	1.00038		

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) and the Unit Under Test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed according to the shown procedure. The use of IAS/ILAC logo indicates calibrations are in accordance to ISO/IEC 17025:2017.

Dick Munns Company : 11133 Winners Circle, Los Alamitos, CA 90720
Phone: 714-827-1215 : www.dickmunns.com

This Calibration Certificate shall not be reproduced except in full, without approval by Dick Munns Company. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Issuing Date: 10/14/2021 Approved By: QA Technician

Calibrated at: ✓ Lab
___ On-Site (Customer's)

Page 1 of 1

SEMI-ANNUAL DRY GAS METER/ORIFICE CALIBRATION

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: C:\Users\dwonderly\Information\Calibrations\Dry Gas Meters\1-P&M\2021\[1P&M Semi Annual Cal 8-6-2021.xls]WCS
File Modified From: APEX 522 Series Meter box Calibration
Revised: 4/8/2005

Model #:
ID #: 1 P&M
Date: 8/6/2021
Bar. Pressure: 29.85 (in. Hg)
Performed By: L.Olivares

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
					Initial Temps.		Final Temps.					Ambient Temperature		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.13	26.00	946.330	951.690	5.360	80.0	79.0	81.0	80.0	AA-33	0.1574	18.0	75.0	76.0	75.5
0.13	26.00	951.690	957.055	5.365	81.0	80.0	81.0	80.0	AA-33	0.1574	18.0	76.0	77.0	76.5
0.13	26.00	957.055	962.425	5.370	81.0	80.0	81.0	80.0	AA-33	0.1574	18.0	77.0	78.0	77.5
0.62	12.00	899.550	904.940	5.390	81.0	77.0	81.0	78.0	QI-48	0.3434	17.0	73.0	73.0	73.0
0.62	12.00	904.940	910.325	5.385	81.0	78.0	81.0	78.0	QI-48	0.3434	17.0	73.0	74.0	73.5
0.62	12.00	910.325	915.725	5.400	81.0	78.0	81.0	78.0	QI-48	0.3434	17.0	74.0	74.0	74.0
1.90	7.00	927.090	932.550	5.460	87.0	78.0	88.0	78.0	QI-63	0.5994	17.0	74.0	75.0	74.5
1.90	7.00	932.550	938.025	5.475	88.0	78.0	88.0	79.0	QI-63	0.5994	17.0	75.0	75.0	75.0
1.90	7.00	938.025	943.495	5.470	88.0	79.0	88.0	79.0	QI-63	0.5994	17.0	75.0	74.0	74.5
3.50	5.00	881.000	886.230	5.230	79.0	76.0	82.0	76.0	AA-73	0.8121	17.0	72.0	73.0	72.5
3.50	5.00	886.230	891.460	5.230	82.0	76.0	85.0	77.0	AA-73	0.8121	17.0	73.0	73.0	73.0
3.50	5.00	891.460	896.695	5.235	85.0	77.0	87.0	77.0	AA-73	0.8121	17.0	73.0	74.0	73.5

DRY GAS METER		ORIFICE				DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR				
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)		Y Value (number)	dH@ Value (in H2O)	Individual Run 0.95 < Y < 1.05?	Individual Orifice Ymax - Ymin < 0.010?	Orifice Average 0.98 < Y/Yd < 1.02?	Orifice Average dH@ - dH@ av < 0.155?
5.228	148.1	5.279	149.5	5.369		1.010	1.732	Pass			
5.228	148.1	5.274	149.4	5.374		1.009	1.734	Pass			
5.233	148.2	5.269	149.2	5.379		1.007	1.737	Pass			
					Average	**1.008**	**1.734**		**Pass**	**Pass**	**Pass**
5.271	149.3	5.328	150.9	5.393		1.011	1.734	Pass			
5.264	149.1	5.325	150.8	5.396		1.012	1.734	Pass			
5.278	149.5	5.323	150.7	5.398		1.008	1.735	Pass			
					Average	**1.010**	**1.734**		**Pass**	**Pass**	**Pass**
5.322	150.7	5.417	153.4	5.499		1.018	1.747	Pass			
5.332	151.0	5.415	153.3	5.502		1.016	1.747	Pass			
5.324	150.8	5.417	153.4	5.499		1.017	1.744	Pass			
					Average	**1.017**	**1.746**		**Pass**	**Pass**	**Pass**
5.160	146.1	5.252	148.8	5.312		1.018	1.753	Pass			
5.144	145.7	5.250	148.7	5.314		[redacted]	1.753	Pass			
5.134	145.4	5.248	148.6	5.317			1.753	Pass			
					Average		**1.753**		**Pass**	**Pass**	**Pass**

Average Yd: 1.014 **dH@: 1.742**

Q @ dH = 1: 0.568

SIGNED: Signature on file

Date: 8/6/2021

BI-MONTHLY DRY GAS METER CALIBRATION CHECK

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: C:\Users\dwonderly\Information\Calibrations\Dry Gas Meters\1-P&M\2021\[1P&M Bi Monthly Cal 10-1-2021.xls]WCS
File Modified From: APEX 522 Series Meter box Calibration
Revised: 3/21/2002

Model #:
ID #: 1-P&M
Date: 10/1/2021
Bar. Pressure: 29.88 (in. Hg)
Performed By: P.Whitman
Yd from previous semi-annual calibration: 1.014

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
					Initial Temps.		Final Temps.					Ambient Temperature		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.65	12.00	942.900	948.320	5.420	79.0	77.0	80.0	78.0	QI-48	0.3434	17.0	67.0	67.0	67.0
0.65	12.00	948.320	953.740	5.420	80.0	78.0	82.0	79.0	QI-48	0.3434	17.0	67.0	67.0	67.0
0.65	12.00	953.740	959.155	5.415	82.0	79.0	84.0	80.0	QI-48	0.3434	17.0	67.0	67.0	67.0
1.90	7.00	920.200	925.640	5.440	78.0	75.0	78.0	75.0	QI-63	0.5994	17.0	67.0	68.0	67.5
1.90	7.00	925.640	931.085	5.445	78.0	75.0	79.0	76.0	QI-63	0.5994	17.0	68.0	66.0	67.0
1.90	7.00	931.085	936.535	5.450	79.0	76.0	79.0	76.0	QI-63	0.5994	17.0	66.0	66.0	66.0

DRY GAS METER		ORIFICE				DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)		Y Value (number)	dH@ Value (in H2O)
5.314	150.5	5.364	151.9	5.363		1.009	1.795
5.301	150.1	5.364	151.9	5.363		1.012	1.792
5.282	149.6	5.364	151.9	5.363		1.016	1.789
					Average	**1.012**	**1.792**
5.370	152.1	5.459	154.6	5.463		1.017	1.732
5.369	152.1	5.461	154.7	5.460		1.017	1.729
5.369	152.1	5.466	154.8	5.455		1.018	1.724
					Average	**1.017**	**1.728**

Average Yd: 1.015 dH@: 1.760

0.000 Q @ dH = 1: 0.565

The Average Yd must be within +/- 2% of the most recent semi-annual calibration Yd. If not, perform 4-point calibration.

SIGNED: _____ Date: _____

SEMI-ANNUAL DRY GAS METER/ORIFICE CALIBRATION

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: C:\Users\dwonderly\Information\Calibrations\Dry Gas Meters\17-WCS\2021\[17WCS Semi Annual Cal 8-23-2021.xls]WCS
File Modified From: APEX 522 Series Meter box Calibration
Revised: 4/8/2005

Model #: C5000
ID #: 17WCS
Date: 8/23/2021
Bar. Pressure: 29.81 (in. Hg)
Performed By: P. Whitman

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
					Initial Temps.		Final Temps.					Ambient Temperature		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.13	26.00	946.275	951.670	5.395	75.0	72.0	76.0	73.0	AA-33	0.1574	17.0	72.0	76.0	74.0
0.13	26.00	951.670	957.065	5.395	76.0	73.0	77.0	74.0	AA-33	0.1574	17.0	76.0	76.0	76.0
0.13	26.00	957.065	962.463	5.398	77.0	74.0	78.0	74.0	AA-33	0.1574	17.0	76.0	76.0	76.0
0.62	12.00	997.580	1003.065	5.485	86.0	80.0	86.0	80.0	QI-48	0.3434	17.0	77.0	77.0	77.0
0.62	12.00	1003.065	1008.555	5.490	86.0	80.0	87.0	80.0	QI-48	0.3434	17.0	77.0	77.0	77.0
0.62	12.00	1008.555	1014.037	5.482	87.0	80.0	87.0	81.0	QI-48	0.3434	17.0	77.0	77.0	77.0
2.00	7.00	963.030	968.540	5.510	81.0	76.0	82.0	77.0	QI-63	0.5994	17.0	76.0	76.0	76.0
2.00	7.00	968.540	974.055	5.515	82.0	77.0	83.0	77.0	QI-63	0.5994	17.0	76.0	76.0	76.0
2.00	7.00	974.055	979.564	5.509	83.0	77.0	83.0	78.0	QI-63	0.5994	17.0	76.0	76.0	76.0
3.60	5.00	981.235	986.565	5.330	83.0	78.0	84.0	79.0	AA-73	0.8121	16.0	77.0	77.0	77.0
3.60	5.00	986.565	991.890	5.325	84.0	79.0	86.0	79.0	AA-73	0.8121	16.0	77.0	76.0	76.5
3.60	5.00	991.890	997.262	5.372	86.0	79.0	86.0	80.0	AA-73	0.8121	16.0	76.0	77.0	76.5

DRY GAS METER		ORIFICE				DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR				
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)		Y Value (number)	dH@ Value (in H2O)	Individual Run 0.95 < Y < 1.05?	Individual Orifice Ymax - Ymin < 0.010?	Orifice Average 0.98 < Y/Yd < 1.02?	Orifice Average dH@ - dH@ av < 0.155?
5.314	150.5	5.279	149.5	5.361		0.993	1.752	**Pass**			
5.304	150.2	5.269	149.2	5.371		0.993	1.755	**Pass**			
5.300	150.1	5.269	149.2	5.371		0.994	1.754	**Pass**			
					Average	**0.994**	**1.754**		**Pass**	**Pass**	**Pass**
5.320	150.7	5.301	150.1	5.413		0.996	1.741	**Pass**			
5.322	150.7	5.301	150.1	5.413		0.996	1.741	**Pass**			
5.310	150.4	5.301	150.1	5.413		0.998	1.739	**Pass**			
					Average	**0.997**	**1.740**		**Pass**	**Pass**	**Pass**
5.402	153.0	5.402	153.0	5.507		1.000	1.852	**Pass**			
5.399	152.9	5.402	153.0	5.507		1.001	1.850	**Pass**			
5.389	152.6	5.402	153.0	5.507		1.003	1.848	**Pass**			
					Average	**1.001**	**1.850**		**Pass**	**Pass**	**Pass**
5.227	148.0	5.223	147.9	5.334		0.999	1.813	**Pass**			
5.212	147.6	5.226	148.0	5.332		1.003	1.809	**Pass**			
5.251	148.7	5.226	148.0	5.332		0.995	1.808	**Pass**			
					Average	**0.999**	**1.810**		**Pass**	**Pass**	**Pass**

Average Yd: 0.998 dH@: 1.789

Q @ dH = 1: 0.561

SIGNED: Signature on file

Date: 8/23/2021

MONTROSE
AIR QUALITY SERVICES

THERMOCOUPLE CALIBRATION

Thermocouple ID: 13
Date: 7/6/2021
Performed By: RD/DA/RM

Calibrated Digital Temperature Readout ID: PTC-66
T1 Reference Thermometer ID: 313010
T2 Reference Thermometer ID: 242196
T3 Reference Thermometer ID: 242167

T/C I.D. 13	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T3 (OIL)	PTC-66	357	357	357	357	358	358	358	358	1.0	0.1%	Pass
T2 (Boiling H_2O)	PTC-66	212	212	212	212	212	212	212	212	0.0	0.0%	Pass
T1 (Ice/Water)	PTC-66	33	33	33	33	32	32	32	32	1.0	0.2%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

MONTROSE
AIR QUALITY SERVICES

DIGITAL TEMPERATURE READOUT CALIBRATION

Digital Temperature Readout ID: PTC-42
Readout Description: Handheld
Date: 7/6/2021
Performed By: RD/DA/RM

Calibrated Thermocouple ID: TC-CAL
T1 Reference Thermometer ID: 313010
T2 Reference Thermometer ID: 242196
T3 Reference Thermometer ID: 242167

T/C I.D. TC-CAL	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T3 (OIL)	PTC-42	358	358	358	358	358	358	358	358	0.0	0.0%	Pass
T2 (Boiling H_2O)	PTC-42	212	212	212	212	212	212	212	212	0.0	0.0%	Pass
T1 (Ice/Water)	PTC-42	32	32	32	32	32	32	32	32	0.0	0.0%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

Thermocouple Source Readings

	T/C Source S/N	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	T/C Source °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T4 (~650 F)	129103	649	649	649	649	650	650	650	650	1.0	0.1%	Pass
T3 (~370 F)	129103	370	370	370	370	370	370	370	370	0.0	0.0%	Pass
T2 (~212 F)	129103	212	212	212	212	212	212	212	212	0.0	0.0%	Pass
T1 (~32 F)	129103	33	33	33	33	32	32	32	32	1.0	0.2%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

MONTROSE AIR QUALITY SERVICES

DIGITAL TEMPERATURE READOUT CALIBRATION

Digital Temperature Readout ID: 17-WCS
Readout Description: Control Box
Date: 7/6/2021
Performed By: RD/DA/RM

Calibrated Thermocouple ID: TC-CAL
T1 Reference Thermometer ID: 313010
T2 Reference Thermometer ID: 242196
T3 Reference Thermometer ID: 242167

T/C I.D. TC-CAL	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T3 (OIL)	17-WCS	358	358	358	358	358	358	358	358	0.0	0.0%	Pass
T2 (Boiling H_2O)	17-WCS	212	212	212	212	212	212	212	212	0.0	0.0%	Pass
T1 (Ice/Water)	17-WCS	32	32	32	32	32	32	32	32	0.0	0.0%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

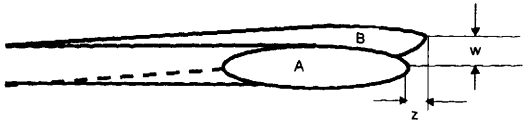
Thermocouple Source Readings

	T/C Source S/N	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	T/C Source °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T4 (~650 F)	129103	649	649	649	649	650	650	650	650	1.0	0.1%	Pass
T3 (~370 F)	129103	370	370	370	370	370	370	370	370	0.0	0.0%	Pass
T2 (~212 F)	129103	212	212	212	212	212	212	212	212	0.0	0.0%	Pass
T1 (~32 F)	129103	31	31	31	31	32	32	32	32	1.0	0.2%	Pass

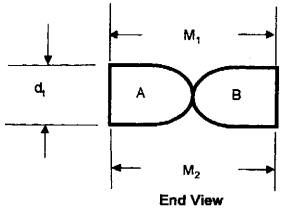
1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

MONTROSE

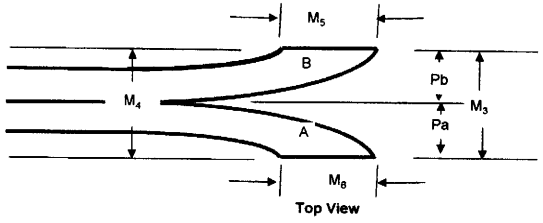
S Type Pitot Tube Dimensional Calibration Record



Side View



End View



Top View

Acceptability Criteria			z < 1/8"	w < 1/32"	Yes	"3/16" < Dt < 3/8"	n/a	n/a	n/a	n/a	n/a	n/a	10 degrees	5 degrees	1.05 Dt < P < 1.5 Dt	
Pitot ID	Date	Calibrated By	Side View, Impact openings Properly aligned, z < 1/8"	Side View, Impact openings Properly aligned, w < 1/32"	Pa = Pb	Tubing Diameter, dt	M1	M2	M3	M4	M5	M6	Average Face Opening Plane Angle, offset from perpendicular to transverse axis	Average Face Opening Plane Frontal Angle from parallel to Longitudinal Axis	Ratio of P/Dt	Status
013	7/6/21	RD	Y	Y	Y	0.370	0.948	0.949	1.005	0.956	0.415	0.410	-0.1	3.4	1.3	Pass

Notes: Reference "A Type-S Pitot Tube Calibration Study", Robert F. Vollaro, October 15, 1975
If tube is not visibly deformed it is assumed that Pa = Pb = .5 x avg. of M1 & M2, and that average face opening plane angles represent individual angles to tube axis

ISO 17025:2017
ACCREDITED LABORATORY
Cert# CL-122

ACCREDITED
Calibration Laboratory

20-WCS

CERTIFICATE OF CALIBRATION

CUSTOMER:	**MONTROSE**	**CALIBRATION DATE:**	01/07/22
PO NUMBER:		**CALIBRATION DUE:**	01/07/23
INST. MANUFACTURER:	APEX INSTRUMENTS	**PROCEDURE:**	NAVAIR 17-20MG-02
INST. DESCRIPTION:	AIR SAMPLER	**CALIBRATION FLUID:**	AIR @ 14.7 PSIA 70 F
MODEL NUMBER:	XC-260	**STANDARD(S) USED:**	A5, A24 DUE 05-2022
SERIAL NUMBER:	1110016; ID# 00222517	**NIST TRACE #' S:**	1329407628, 89576, 1617259390
RATED ACCURACY:	+/- 1 % RD.	**AMBIENT CONDITIONS:**	763 mm HGA 49 % RH 70 F
UNCERTAINTY GIVEN:	TOTAL measurement uncertainty: +/- .190 % RD. K=2	**CERTIFICATE FILE #:**	481162.481163.22

NOTES: AS RECEIVED/ AS LEFT WITHIN SPECS. REFERENCE CONDITIONS ARE: 760 mm HGA 70 F. DECISION RULE: NO PFA % TAKEN

481162

TEST POINT NUMBER	UUT INDICATED M3/HR PD.METER	DM.STD. ACTUAL M3/HR PD.METER	CORRRECTION FACTOR	UUT INDICATED FLOWMETER SCCM	DM.STD. ACTUAL FLOWMETER SCCM
1	0.02024	0.020	0.9881	0.2	0.214
1	0.03017	0.030	0.9944	0.6	0.618
1	0.05013	0.050	0.9974	0.8	0.820
2	0.1010	0.100	0.9901	1.1	1.122
3	0.2501	0.250	0.9996	1.4	1.423
4	0.4979	0.500	1.0042	TEMPERATURE	TEMPERATURE
5	0.9961	1.000	1.0039	F DEG.	F DEG.
6	1.4928	1.500	1.0048	70	70.03
7	1.9917	2.000	1.0042		
8	2.4899	2.500	1.0041		
		AVERAGE	0.99908		

481163

TEST POINT NUMBER	UUT INDICATED M3/HR PD.METER	DM.STD. ACTUAL M3/HR PD.METER	CORRRECTION FACTOR	UUT INDICATED FLOWMETER SCCM	DM.STD. ACTUAL FLOWMETER SCCM
1	0.02022	0.020	0.9891	0.2	0.215
1	0.03018	0.030	0.9940	0.6	0.616
1	0.05012	0.050	0.9976	0.8	0.819
2	0.1008	0.100	0.9921	1.1	1.123
3	0.2499	0.250	1.0004	1.4	1.425
4	0.4981	0.500	1.0038	TEMPERATURE	TEMPERATURE
5	0.9958	1.000	1.0042	F DEG.	F DEG.
6	1.4930	1.500	1.0047	69	69.02
7	1.9914	2.000	1.0043		
8	2.4891	2.500	1.0044		
		AVERAGE	0.99946		

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) and the Unit Under Test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed according to the shown procedure. The use of IAS/ILAC logo indicates calibrations are in accordance to ISO/IEC 17025:2017

Dick Munns Company · 11133 Winners Circle, Los Alamitos, CA 90720
Phone: 714-827-1215 · www.dickmunns.com

This Calibration Certificate shall not be reproduced except, in full, without approval by Dick Munns Company. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Issuing Date: 01/07/2022 Approved By: Cal. Technician: Calibrated at: ✓ Lab ___ On-Site (Customer's)

BI-MONTHLY DRY GAS METER CALIBRATION CHECK

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: M:\Santa Ana\Equipment\Test Equipment\Calibrations\Dry Gas Meters\17-WCS\2021\[17WCS Bimonthly Cal 12-30-2021.xls]WCS
File Modified From: APEX 522 Series Meter box Calibration
Revised: 3/21/2002

Model #: E.S C-5000
ID #: 17-WCS
Date: 12/30/2021
Bar. Pressure: 29.76 (in. Hg)
Performed By: L.Olivares
Reviewed By: M.Chowsanitphon
Yd from previous semi-annual calibration: 0.998

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
		Volume	Volume	Volume	Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual	Ambient Temperature		
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.62	12.00	815.035	820.515	5.480	69.0	65.0	70.0	65.0	QI-48	0.3434	17.0	57.0	57.0	57.0
0.62	12.00	820.515	826.015	5.500	70.0	65.0	71.0	66.0	QI-48	0.3434	17.0	57.0	58.0	57.5
0.62	12.00	826.015	831.480	5.465	71.0	66.0	72.0	67.0	QI-48	0.3434	17.0	58.0	58.0	58.0
2.00	7.00	795.795	801.300	5.505	60.0	58.0	62.0	59.0	QI-63	0.5994	16.0	58.0	58.0	58.0
2.00	7.00	801.300	806.820	5.520	62.0	59.0	65.0	60.0	QI-63	0.5994	16.0	58.0	58.0	58.0
2.00	7.00	806.820	812.335	5.515	65.0	60.0	66.0	61.0	QI-63	0.5994	16.0	58.0	58.0	58.0

DRY GAS METER		ORIFICE				DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)		Y Value (number)	dH@ Value (in H2O)
5.465	154.8	5.393	152.7	5.312		0.987	1.727
5.477	155.1	5.391	152.7	5.314		0.984	1.727
5.432	153.8	5.388	152.6	5.317		0.992	1.725
					Average	**0.988**	**1.726**
5.588	158.2	5.486	155.4	5.414		0.982	1.855
5.584	158.1	5.486	155.4	5.414		0.982	1.851
5.563	157.5	5.486	155.4	5.414		0.986	1.848
					Average	**0.984**	**1.851**

Average Yd: 0.986 dH@: 1.789

Pass Q @ dH = 1: 0.561

The Average Yd must be within +/- 2% of the most recent semi-annual calibration Yd. If not, perform 4-point calibration.

SIGNED: Signature on File

Date: 12/30/2021

SEMI-ANNUAL DRY GAS METER/ORIFICE CALIBRATION

Orifice Method - Triplicate Runs/Four Calibration Points
English Meter Box Units, English K' Factor
Filename: M:\Santa Ana\Equipment\Test Equipment\Calibrations\Dry Gas Meters\1-P&M\2022\[1P&M Semi Annual Cal 1-5-2022.xls]WCS
File Modified From: APEX 522 Series Meter box Calibration
Revised: 4/8/2005

Model #: Rockwell International S-275
ID #: 1 P&M
Date: 1/5/2022
Bar. Pressure: 29.96 (in. Hg)
Performed By: L.Olivares
Reviewed By: M.Chowsanitphon

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
					Initial Temps.		Final Temps.					Ambient Temperature		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.12	26.00	909.300	914.535	5.235	66.0	64.0	65.0	64.0	AA-33	0.1574	18.0	64.0	64.0	64.0
0.12	26.00	914.535	919.770	5.235	65.0	64.0	65.0	64.0	AA-33	0.1574	18.0	64.0	64.0	64.0
0.12	26.00	919.770	925.010	5.240	65.0	64.0	65.0	64.0	AA-33	0.1574	18.0	64.0	64.0	64.0
0.62	12.00	892.300	897.610	5.310	69.0	63.0	68.0	64.0	QI-48	0.3434	18.0	64.0	64.0	64.0
0.62	12.00	897.610	902.920	5.310	68.0	64.0	68.0	64.0	QI-48	0.3434	18.0	64.0	64.0	64.0
0.62	12.00	902.920	908.235	5.315	68.0	64.0	68.0	64.0	QI-48	0.3434	18.0	64.0	64.0	64.0
1.90	7.00	874.300	879.680	5.380	72.0	62.0	73.0	63.0	QI-63	0.5994	16.0	63.0	63.0	63.0
1.90	7.00	879.680	885.060	5.380	73.0	63.0	74.0	63.0	QI-63	0.5994	16.0	63.0	64.0	63.5
1.90	7.00	885.060	890.440	5.380	74.0	63.0	74.0	63.0	QI-63	0.5994	16.0	64.0	64.0	64.0
3.50	5.00	856.000	861.160	5.160	70.0	60.0	73.0	61.0	AA-73	0.8121	15.0	62.0	62.0	62.0
3.50	5.00	861.160	866.330	5.170	73.0	61.0	75.0	61.0	AA-73	0.8121	15.0	62.0	62.0	62.0
3.50	5.00	866.330	871.505	5.175	75.0	61.0	76.0	62.0	AA-73	0.8121	15.0	62.0	62.0	62.0

DRY GAS METER		ORIFICE				DRY GAS METER CALIBRATION FACTOR	ORIFICE CALIBRATION FACTOR	Individual Run	Individual Orifice	Orifice Average	Orifice Average
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)		Y Value (number)	dH@ Value (in H2O)	0.95 < Y < 1.05?	Ymax - Ymin < 0.010?	0.98 < Y/Yd < 1.02?	dH@ - dH@ av < 0.155?
5.274	149.4	5.356	151.7	5.311		1.016	1.605	**Pass**			
5.276	149.4	5.356	151.7	5.311		1.015	1.605	**Pass**			
5.281	149.6	5.356	151.7	5.311		1.014	1.605	**Pass**			
					Average	**1.015**	**1.605**		**Pass**	**Pass**	**Pass**
5.343	151.3	5.393	152.7	5.347		1.009	1.744	**Pass**			
5.343	151.3	5.393	152.7	5.347		1.009	1.742	**Pass**			
5.348	151.5	5.393	152.7	5.347		1.008	1.742	**Pass**			
					Average	**1.009**	**1.743**		**Pass**	**Pass**	**Pass**
5.415	153.4	5.497	155.7	5.440		1.015	1.754	**Pass**			
5.408	153.1	5.494	155.6	5.442		1.016	1.754	**Pass**			
5.405	153.1	5.491	155.5	5.445		1.016	1.755	**Pass**			
					Average	**1.016**	**1.754**		**Pass**	**Pass**	**Pass**
5.229	148.1	5.325	150.8	5.259		1.018	1.763	**Pass**			
5.224	148.0	5.325	150.8	5.259		1.019	1.762	**Pass**			
5.219	147.8	5.325	150.8	5.259		[redacted]	1.760	**Pass**			
					Average	**1.019**	**1.762**		**Pass**	**Pass**	**Pass**

Average Yd: 1.015 **dH@: 1.716**

Q @ dH = 1: 0.573

SIGNED: Signature on File

Date: 1/5/2022

MONTROSE AIR QUALITY SERVICES

DIGITAL TEMPERATURE READOUT CALIBRATION

Digital Temperature Readout ID: 20-WCS
Readout Description: Control Box
Date: 1/4/2022
Performed By: JG, NG, RM, DA, AS

Calibrated Thermocouple ID: TC-CAL
T1 Reference Thermometer ID: 661731
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002770

T/C I.D. TC-CAL	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T3 (OIL)	20-WCS	347	347	347	347	350	350	350	350	3.0	0.4%	Pass
T2 (Boiling H_2O)	20-WCS	211	211	211	211	212	212	212	212	1.0	0.1%	Pass
T1 (Ice/Water)	20-WCS	29	29	29	29	32	32	32	32	3.0	0.6%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

Thermocouple Source Readings

	T/C Source S/N	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	T/C Source °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T4 (~650 F)	129103	649	649	649	649	650	650	650	650	1.0	0.1%	Pass
T3 (~370 F)	129103	368	368	368	368	370	370	370	370	2.0	0.2%	Pass
T2 (~212 F)	129103	211	211	211	211	212	212	212	212	1.0	0.1%	Pass
T1 (~32 F)	129103	30	30	30	30	32	32	32	32	2.0	0.4%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

MONTROSE AIR QUALITY SERVICES

DIGITAL TEMPERATURE READOUT CALIBRATION

Digital Temperature Readout ID: 17-WCS
Readout Description: Control Box
Date: 1/4/2022
Performed By: JG, NG, RM, DA, AS

Calibrated Thermocouple ID: TC-CAL
T1 Reference Thermometer ID: 661731
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002770

T/C I.D. TC-CAL	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T3 (OIL)	17-WCS	349	349	349	349	350	350	350	350	1.0	0.1%	Pass
T2 (Boiling H_2O)	17-WCS	214	214	214	214	212	212	212	212	2.0	0.3%	Pass
T1 (Ice/Water)	17-WCS	30	30	30	30	32	32	32	32	2.0	0.4%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

Thermocouple Source Readings

	T/C Source S/N	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	T/C Source °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T4 (~650 F)	129103	651	651	651	651	650	650	650	650	1.0	0.1%	Pass
T3 (~370 F)	129103	371	371	371	371	370	370	370	370	1.0	0.1%	Pass
T2 (~212 F)	129103	214	214	214	214	212	212	212	212	2.0	0.3%	Pass
T1 (~32 F)	129103	32	32	32	32	32	32	32	32	0.0	0.0%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

MONTROSE AIR QUALITY SERVICES

DIGITAL TEMPERATURE READOUT CALIBRATION

Digital Temperature Readout ID: PTC-42
Readout Description: Handheld
Date: 1/5/2022
Performed By: JG, NG, RM, DA, AS

Calibrated Thermocouple ID: TC-CAL
T1 Reference Thermometer ID: 661731
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002770

T/C I.D. TC-CAL	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T3 (OIL)	PTC-42	354	354	354	354	354	354	354	354	0.0	0.0%	Pass
T2 (Boiling H_2O)	PTC-42	212	212	212	212	212	212	212	212	0.0	0.0%	Pass
T1 (Ice/Water)	PTC-42	37	37	37	37	32	32	32	32	5.0	1.0%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

Thermocouple Source Readings

	T/C Source S/N	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	T/C Source °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T4 (~650 F)	129103	650	650	650	650	650	650	650	650	0.0	0.0%	Pass
T3 (~370 F)	129103	370	370	370	370	370	370	370	370	0.0	0.0%	Pass
T2 (~212 F)	129103	212	212	212	212	212	212	212	212	0.0	0.0%	Pass
T1 (~32 F)	129103	38	38	38	38	32	32	32	32	6.0	1.2%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

MONTROSE
AIR QUALITY SERVICES

THERMOCOUPLE CALIBRATION

Thermocouple ID: 13
Date: 1/4/2022
Performed By: JG, NG, RM, DA, A

Calibrated Digital Temperature Readout ID: PTC -79
T1 Reference Thermometer ID: 661731
T2 Reference Thermometer ID: 805002770
T3 Reference Thermometer ID: 805002770

T/C I.D. 13	Readout I.D.	T/C - Readout °F Reading 1	Reading 2	Reading 3	Average	Reference Thermometer °F Reading 1	Reading 2	Reading 3	Average	Difference °F	%, (°R)	
T3 (OIL)	PTC -79	338	338	338	338	345	345	345	345	7.0	0.9%	Pass
T2 (Boiling H_2O)	PTC -79	218	218	218	218	212	212	212	212	6.0	0.9%	Pass
T1 (Ice/Water)	PTC -79	37	37	36	37	32	32	32	32	4.7	0.9%	Pass

1) Difference % (°R) = Difference (°F) / (Average Tref + 460)
2) Pass if all Differences are less than 1.5% (°R)

APPENDIX B
PLANT PROCESS DATA

Run 1 HG-U1

TIME_STAMP	FI-1040	TIME_STAMP	FI-1040
Unit-1	Steam Flow	Unit-2	Steam Flow
2021-11-30 08:37:00	160.86	2021-11-30 08:37:00	123.99
2021-11-30 08:52:00	191.39	2021-11-30 08:52:00	112.29
2021-11-30 09:07:00	187.64	2021-11-30 09:07:00	131.85
2021-11-30 09:22:00	170.49	2021-11-30 09:22:00	113.36
2021-11-30 09:37:00	180.11	2021-11-30 09:37:00	119.04
Average	178.098	Average	120.106

Run 2 HG-U1

Unit-1	Steam Flow	Unit-2	Steam Flow
2021-12-01 07:45:00	172.06	2021-12-01 07:45:00	137
2021-12-01 08:00:00	207.48	2021-12-01 08:00:00	118.97
2021-12-01 08:15:00	175	2021-12-01 08:15:00	129.36
2021-12-01 08:30:00	200.83	2021-12-01 08:30:00	120.85
2021-12-01 08:45:00	186.75	2021-12-01 08:45:00	125.56
Average	188.424	Average	126.348

Run 3 HG-U1

Unit-1	Steam Flow	Unit-2	Steam Flow
2021-12-01 13:00:00	181	2021-12-01 13:00:00	129.21
2021-12-01 13:15:00	161.89	2021-12-01 13:15:00	116.93
2021-12-01 13:30:00	170.51	2021-12-01 13:30:00	116.69
2021-12-01 13:45:00	189.35	2021-12-01 13:45:00	129
2021-12-01 14:00:00	181	2021-12-01 14:00:00	124.92
Average	176.75	Average	123.35

Run 4 HG-U1

Unit-1	Steam Flow	Unit-2	Steam Flow
2021-12-01 14:48:00	172.08	2021-12-01 14:48:00	118.39
2021-12-01 15:03:00	183.19	2021-12-01 15:03:00	132.6
2021-12-01 15:18:00	191.44	2021-12-01 15:18:00	129.15
2021-12-01 15:33:00	172.71	2021-12-01 15:33:00	116.65
2021-12-01 15:48:00	172.71	2021-12-01 15:48:00	124.73
Average	178.426	Average	124.304

Run 1 HG-U2

Unit-1	Steam Flow	Unit-2	Steam Flow
2021-12-02 07:43:00	140.74	2021-12-02 07:43:00	176.54
2021-12-02 07:58:00	130.51	2021-12-02 07:58:00	194.52
2021-12-02 08:13:00	134.72	2021-12-02 08:13:00	172.18
2021-12-02 08:28:00	127.8	2021-12-02 08:28:00	187.14
2021-12-02 08:43:00	131.59	2021-12-02 08:43:00	184.65
Average	133.072	Average	183.006

Run 2 HG-U2

Unit-1	Steam Flow	Unit-2	Steam Flow
2021-12-02 09:38:00	135.55	2021-12-02 09:38:00	181.14
2021-12-02 09:53:00	128.45	2021-12-02 09:53:00	170.08
2021-12-02 10:08:00	135.66	2021-12-02 10:08:00	186.07
2021-12-02 10:23:00	125.71	2021-12-02 10:23:00	172.63
2021-12-02 10:38:00	127.43	2021-12-02 10:38:00	182.44
Average	130.56	Average	178.472

Run 3 HG-U2

Unit-1	Steam Flow	Unit-2	Steam Flow
2021-12-02 11:10:00	125.57	2021-12-02 11:10:00	167.6
2021-12-02 11:25:00	134.28	2021-12-02 11:25:00	186.69
2021-12-02 11:40:00	127.25	2021-12-02 11:40:00	187.02
2021-12-02 11:55:00	136.59	2021-12-02 11:55:00	168.52
2021-12-02 12:10:00	136.59	2021-12-02 12:10:00	174.82
Average	132.06	Average	176.93

APPENDIX C
CALCULATIONS

Appendix C.1
General Emissions Calculations

GENERAL EMISSIONS CALCULATIONS

GENERAL EMISSIONS CALCULATIONS

I. Stack Gas Velocity

A. Stack gas molecular weight, lb/lb-mole

$MW_{dry} = 0.44 * \% CO_2 + 0.32 * \% O_2 + 0.28 * \% N_2$

$MW_{wet} = MW_{dry} * (1 - B_{wo}) + 18 * B_{wo}$

B. Absolute stack pressure, iwg

$$P_s = P_{bar} + \frac{P_{sg}}{13.6}$$

C. Stack gas velocity, ft/sec

$$V_s = 2.9 * C_p * \sqrt{\Delta P} * \sqrt{T_s} * \sqrt{\frac{29.92 * 28.95}{P_s * MW_{wet}}}$$

II. Moisture

A. Sample gas volume, dscf

$$V_{mstd} = 0.03342 * V_m * \left(P_{bar} + \frac{\Delta H}{13.6}\right) * \frac{T_{ref}}{T_m} * Y_d$$

B. Water vapor volume, scf

$$V_{wstd} = 0.0472 * V_{ic} * \frac{T_{ref}}{528°R}$$

C. Moisture content, dimensionless

$$B_{wo} = \frac{V_{wstd}}{(V_{mstd} + V_{wstd})}$$

III. Stack Gas Volumetric Flow Rate

A. Actual stack gas volumetric flow rate, wacfm

$Q = V_s * A_s * 60$

B. Standard stack gas flow rate, dscfm

$$Q_{sd} = Q * (1 - B_{wo}) * \frac{T_{ref}}{T_s} * \frac{P_s}{29.92}$$

IV. Gaseous Mass Emission Rates, lb/hr

$$M = \frac{ppm * MW_i * Q_{sd} * 60}{SV * 10^6}$$

V. Emission Rates, lb/MMBtu

$$\frac{lb}{MMBtu} = \frac{ppm * MW_i * F}{SV * 10^6} * \frac{20.9}{20.9 - \% O_2}$$

VI. Percent Isokinetic

$$I = \frac{17.32 * T_s (V_{mstd})}{(1 - B_{wo})\ 0 * V_s * P_s * Dn^2} * \frac{520°R}{T_{ref}}$$

VII. Particulate Emissions

(a) Grain loading, gr/dscf
$C = 0.01543\ (M_n/V_{m\ std})$

(b) Grain loading at 12% CO_2, gr/dscf
$C_{12\%}\ CO_2 = C\ (12/\%\ CO_2)$

(c) Mass emissions, lb/hr
$M = C * Q_{sd} * (60\ min/hr) / (7000\ gr/lb)$

(d) Particulate emission factor

$$lb/10^6\ Btu = Cx \frac{1\ lb}{7000\ gr} * F * \frac{20.9}{20.9 - \% O_2}$$

Nomenclature:

A_s	=	stack area, ft^2
B_{wo}	=	flue gas moisture content, dimensionless
$C_{12\%CO2}$	=	particulate grain loading, gr/dscf corrected to 12% CO_2
C	=	particulate grain loading, gr/dscf
C_p	=	pitot calibration factor, dimensionless
Dn	=	nozzle diameter, inches
F	=	fuel F-Factor, dscf/MMBtu @ 0% O_2
H	=	orifice differential pressure, iwg
I	=	% isokinetics
M_n	=	mass of collected particulate, mg
M_i	=	mass emission rate of specie i, lb/hr
MW	=	molecular weight of flue gas, lb/lb-mole
M_{wi}	=	molecular weight of specie i:
	SO_2:	64
	NO_x:	46
	CO:	28
	HC:	16
0	=	sample time, minutes
ΔP	=	average velocity head, iwg = $(\sqrt{\Delta P})^2$
P_{bar}	=	barometric pressure, inches Hg
P_s	=	stack absolute pressure, inches Hg
P_{sg}	=	stack static pressure, iwb
Q	=	wet stack flow rate at actual conditions, wacfm
Q_{sd}	=	dry standard stack flow rate, dscfm
SV	=	specific molar volume of an ideal gas at standard conditions, ft^3/lb-mole
T_m	=	meter temperature, °R
T_{ref}	=	reference temperature, °R
T_s	=	stack temperature, °R
V_s	=	stack gas velocity, ft/sec
V_{lc}	=	volume of liquid collected in impingers, ml
V_m	=	uncorrected dry meter volume, dcf
V_{mstd}	=	dry meter volume at standard conditions, dscf
V_{wstd}	=	volume of water vapor at standard conditions, scf
Y_d	=	meter calibration coefficient

Appendix C.2
Unit 1 Calculations

Appendix C.2.1
Unit 1 Gaseous Stack Flow & Moisture Calculations

Montrose AQS
Run 1 CEMS
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	1-O2/CO2-U1	
Date:	11/30/2021	
Start Time:	8:57	
Station:	Desert View Power	
Unit:	Unit 1	
Test Condition:	Full Load	
Performed By:	DW	

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.12	"Hg
Meter No.	17-WCS	
Meter Y_d:	0.9980	
Meter Pressure:	1.0	iwg
Pstack:	0.53	iwg
Pstack:	30.16	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	882.8	794.0	88.8
2/H2O	729.1	723.4	5.7
3/Empty	677.3	675.8	1.5
4/S.G.	976.8	966.2	10.6
Rinse			0.0
Total			106.6

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	494.000	62	61
		69	67
Stop	527.436	74	70
Total	33.436		67.2

Summary

Sample Volume:	33.722	dscf
H_2O Volume :	5.032	scf
Moisture Content:	13.0	%

METHOD 3A, 6C, 7E DATA

	O_2	CO_2
Analyzer Span	18.99	18.96
Actual Span Value	10.6	10.65
Pre Test Zero Direct	0.02	0.03
Pre Test Span Direct	10.67	10.53
Pre-test Zero	0.01	0.09
Pre-test Span	10.62	10.57
Average	9.55	11.14
Post Test Zero Direct	0.00	0.03
Post Test Span Direct	10.66	10.57
Post-test Zero	0.01	0.09
Post-test Span	10.63	10.59
Average	9.55	11.14
Corr. Results	9.53	11.22
Cal Error <2%, Bias <5%; Drift <3%		
Calibrtion Error	0.4%	-0.6%
Pre-Test Zero Bias	0.0%	0.3%
Pre-Test Span Bias	-0.3%	0.2%
Post-Test Zero Bias	0.1%	0.3%
Post-Test Span Bias	-0.2%	0.1%
Zero Drift	0.0%	0.0%
Span Drift	0.0%	0.1%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.30	1.1402	357	79.57
4	0.98	0.9899	356	69.04
3	0.96	0.9798	355	68.29
2	1.00	1.0000	355	69.70
1	1.30	1.1402	357	79.57
5	1.50	1.2247	357	85.47
4	1.40	1.1832	358	82.62
3	0.94	0.9695	357	67.66
2	0.72	0.8485	355	59.14
1	0.68	0.8246	354	57.44
5	0.94	0.9695	357	67.66
4	0.98	0.9899	358	69.13
3	1.00	1.0000	358	69.83
2	1.10	1.0488	357	73.19
1	1.00	1.0000	356	69.74
5	1.50	1.2247	357	85.47
4	1.30	1.1402	357	79.57
3	0.94	0.9695	358	67.70
2	0.86	0.9274	358	64.75
1	0.82	0.9055	355	63.12
5	1.40	1.1832	357	82.57
4	1.30	1.1402	358	79.62
3	1.50	1.2247	357	85.47
2	1.60	1.2649	356	88.22
1	1.30	1.1402	357	79.57
5	1.40	1.1832	357	82.57
4	1.50	1.2247	356	85.42
3	1.04	1.0198	357	71.17
2	1.30	1.1402	357	79.57
1	1.30	1.1402	356	79.52
Average	1.1476	1.0713	356.7	74.74

TEST SUMMARY

O_2:	9.527	% dry
	8.290	% wet
CO_2:	11.221	% dry
	9.764	% wet
H_2O:	13.0	%
MW:	28.60	lb/lb-mole
Flow:	174,184	wacfm
	98.77	mdscfm
	5926.00	kdscfh

Montrose AQS
Run 2 CEMS
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION

GENERAL

Test:	2-O2/CO2-U1
Date:	12/1/2021
Start Time:	8:05
Station:	Desert View Power
Unit:	Unit 1
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION

SAMPLE TRAIN

Barom. Pressure:		psi
	30.18	"Hg
Meter No.	17-WCS	
Meter Ca	0.9980	
Meter Pressure:	1.0	iwg
Pstack:	0.54	iwg
Pstack:	30.22	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.64	ft2

METHOD 4 DATA

Impingers

#/Matl.	End	Start	Diff.
1/H2O	862.8	777.2	85.6
2/H2O	732.1	729.1	3.0
3/Empty	678.8	677.3	1.5
4/S.G.	984.6	976.8	7.8
Rinse			0.0
Total			97.9

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	530.000	60	58
		62	60
Stop	562.724	64	63
Total	32.724		61.2

Summary

Sample Volume:	33.450	dscf
H2O Volume:	4.621	scf
Moisture Content:	12.1	%

METHOD 3A, 6C, 7E DATA

	O2	CO2
Analyzer Span	18.99	18.96
Actual Span Value	10.6	10.65
Pre Test Zero Direct	0.01	0.01
Pre Test Span Direct	10.67	10.50
Pre-test Zero	0.04	0.08
Pre-test Span	10.62	10.54
Average	9.44	11.24
Post Test Zero Direct	0.01	0.04
Post Test Span Direct	10.65	10.55
Post-test Zero	0.02	0.10
Post-test Span	10.62	10.57
Average	9.44	11.24
Corr. Results	9.42	11.35
Cal Error <2%, Bias <5%; Drift <3%		
Calibrtion Error	0.4%	-0.8%
Pre-Test Zero Bias	0.1%	0.4%
Pre-Test Span Bias	-0.3%	0.2%
Post-Test Zero Bias	0.1%	0.3%
Post-Test Span Bias	-0.2%	0.1%
Zero Drift	-0.1%	0.1%
Span Drift	0.0%	0.2%

METHOD 2 DATA

Point	dP (in. H2O)	dP^½ (in. H2O)^½	Temp (°F)	Velocity (fps)
5	1.50	1.2247	353	85.00
4	1.60	1.2649	353	87.79
3	1.40	1.1832	355	82.22
2	1.40	1.1832	354	82.17
1	1.30	1.1402	353	79.13
5	1.30	1.1402	354	79.18
4	1.50	1.2247	354	85.05
3	1.40	1.1832	355	82.22
2	1.30	1.1402	355	79.23
1	1.10	1.0488	354	72.83
5	1.50	1.2247	351	84.89
4	1.40	1.1832	352	82.07
3	1.00	1.0000	353	69.40
2	0.98	0.9899	353	68.70
1	0.91	0.9539	352	66.16
5	1.20	1.0954	354	76.07
4	1.10	1.0488	355	72.88
3	1.00	1.0000	355	69.49
2	1.00	1.0000	354	69.44
1	0.96	0.9798	353	68.00
5	1.20	1.0954	353	76.03
4	1.30	1.1402	354	79.18
3	0.96	0.9798	353	68.00
2	0.84	0.9165	354	63.65
1	0.78	0.8832	353	61.29
5	1.30	1.1402	354	79.18
4	1.00	1.0000	355	69.49
3	0.98	0.9899	354	68.75
2	1.10	1.0488	353	72.79
1	0.95	0.9747	353	67.64
Average	1.1648	1.0793	353.6	74.93

TEST SUMMARY

O2:	9.424	% dry
	8.280	% wet
CO2:	11.349	% dry
	9.971	% wet
H2O:	12.1	%
MW:	28.71	lb/lb-mole
Flow:	174,618	wacfm
	100.55	mdscfm
	6033.24	kdscfh

Montrose AQS
Run 3 CEMS
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION
GENERAL

Test:	3-O2/CO2-U1
Date:	12/1/2021
Start Time:	13:20
Station:	Desert View Power
Unit:	Unit 1
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.18	"Hg
Meter No.	17-WCS	
Meter Y_d	0.9980	
Meter Pressure:	1.0	iwg
Pstack:	0.54	iwg
Pstack:	30.22	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	885.0	804.8	80.2
2/H2O	734.8	732.3	2.5
3/Empty	679.1	677.8	1.3
4/S.G.	997.8	989.1	8.7
Rinse			0.0
Total			92.7

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	588.000	78	76
		88	86
Stop	622.328	90	92
Total	34.328		85.0

Summary

Sample Volume:	33.555	dscf
H_2O Volume :	4.375	scf
Moisture Content:	11.5	%

METHOD 3A, 6C, 7E DATA

	O_2	CO_2
Analyzer Span	18.99	18.96
Actual Span Value	10.6	10.65
Pre Test Zero Direct	0.00	0.02
Pre Test Span Direct	10.65	10.52
Pre-test Zero	0.02	0.08
Pre-test Span	10.62	10.55
Average	9.80	10.89
Post Test Zero Direct	0.00	0.02
Post Test Span Direct	10.65	10.52
Post-test Zero	0.02	0.08
Post-test Span	10.61	10.55
Average	9.80	10.89
Corr. Results	9.79	11.00

Cal Error <2%, Bias <5%; Drift <3%

Calibrtion Error	0.3%	-0.7%
Pre-Test Zero Bias	0.1%	0.3%
Pre-Test Span Bias	-0.2%	0.1%
Post-Test Zero Bias	0.1%	0.3%
Post-Test Span Bias	-0.2%	0.1%
Zero Drift	0.0%	0.0%
Span Drift	0.0%	0.0%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.60	1.2649	354	87.78
4	1.40	1.1832	355	82.17
3	1.30	1.1402	352	79.03
2	1.20	1.0954	354	76.02
1	1.30	1.1402	354	79.13
5	1.40	1.1832	354	82.11
4	1.50	1.2247	353	84.94
3	1.30	1.1402	352	79.03
2	1.30	1.1402	353	79.08
1	1.20	1.0954	353	75.98
5	1.40	1.1832	353	82.06
4	1.20	1.0954	354	76.02
3	1.00	1.0000	355	69.44
2	0.98	0.9899	354	68.70
1	0.88	0.9381	354	65.10
5	0.95	0.9747	357	67.77
4	0.88	0.9381	355	65.14
3	0.93	0.9644	354	66.93
2	0.97	0.9849	354	68.35
1	1.00	1.0000	352	69.31
5	1.50	1.2247	353	84.94
4	1.20	1.0954	354	76.02
3	0.90	0.9487	355	65.88
2	0.82	0.9055	355	62.88
1	0.71	0.8426	353	58.44
5	1.30	1.1402	352	79.03
4	0.96	0.9798	353	67.96
3	0.98	0.9899	352	68.62
2	1.00	1.0000	352	69.31
1	1.00	1.0000	352	69.31
Average	1.1238	1.0601	353.6	73.55

TEST SUMMARY

O_2:	9.789	% dry
	8.660	% wet
CO_2:	10.996	% dry
	9.728	% wet
H_2O:	11.5	%
MW:	28.75	lb/lb-mole
Flow:	171,404	wacfm
	99.38	mdscfm
	5963.03	kdscfh

Montrose AQS
Run 4 CEMS
DATA AND WORKSHEET
Desert View Power UNIT 1

PRE-TEST INFORMATION GENERAL		
Test:	4-O2/CO2-U1	
Date:	12/1/2021	
Start Time:	15:08	
Station:	Desert View Power	
Unit:	Unit 1	
Test Condition:	Full Load	
Performed By:	DW	

PRE-TEST INFORMATION SAMPLE TRAIN		
Barom. Pressure:		psi
	30.18	"Hg
Meter No.	17-WCS	
Meter Y_d	0.9980	
Meter Pressure:	1.0	iwg
Pstack:	0.54	iwg
Pstack:	30.22	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft2

METHOD 4 DATA

Impingers

#/Matl.	End	Start	Diff.
1/H2O	851.8	770.3	81.5
2/H2O	740.2	734.8	5.4
3/Empty	681.6	679.1	2.5
4/S.G.	1004.6	997.8	6.8
Rinse			0.0
Total			96.2

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	622.800	87	86
		88	86
Stop	657.166	88	85
Total	34.366		86.7

Summary

Sample Volume:	33.490	dscf
H_2O Volume :	4.541	scf
Moisture Content:	11.9	%

METHOD 3A, 6C, 7E DATA

	O_2	CO_2
Analyzer Span	18.99	18.96
Actual Span Value	10.6	10.65
Pre Test Zero Direct	0.02	0.02
Pre Test Span Direct	10.64	10.52
Pre-test Zero	0.02	0.08
Pre-test Span	10.60	10.53
Average	9.50	11.13
Post Test Zero Direct	0.00	0.02
Post Test Span Direct	10.64	10.52
Post-test Zero	0.01	0.07
Post-test Span	10.61	10.53
Average	9.50	11.13
Corr. Results	9.49	11.26
Cal Error <2%, Bias <5%; Drift <3%		
Calibrtion Error	0.2%	-0.7%
Pre-Test Zero Bias	0.0%	0.3%
Pre-Test Span Bias	-0.2%	0.0%
Post-Test Zero Bias	0.1%	0.3%
Post-Test Span Bias	-0.2%	0.1%
Zero Drift	0.0%	-0.1%
Span Drift	0.0%	0.0%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.60	1.2649	365	88.41
4	1.40	1.1832	367	82.80
3	1.40	1.1832	366	82.75
2	1.30	1.1402	365	79.69
1	1.20	1.0954	365	76.57
5	1.40	1.1832	364	82.65
4	1.40	1.1832	365	82.70
3	1.50	1.2247	365	85.60
2	1.30	1.1402	364	79.64
1	1.30	1.1402	365	79.69
5	1.50	1.2247	365	85.60
4	1.30	1.1402	364	79.64
3	0.99	0.9950	366	69.59
2	0.92	0.9592	365	67.04
1	0.78	0.8832	364	61.69
5	1.00	1.0000	365	69.89
4	0.97	0.9849	364	68.80
3	0.93	0.9644	365	67.40
2	0.90	0.9487	365	66.31
1	1.00	1.0000	365	69.89
5	1.50	1.2247	365	85.60
4	1.00	1.0000	366	69.94
3	0.88	0.9381	366	65.61
2	0.73	0.8544	365	59.72
1	0.65	0.8062	365	56.35
5	1.20	1.0954	364	76.52
4	0.95	0.9747	365	68.12
3	0.98	0.9899	365	69.19
2	1.00	1.0000	365	69.89
1	1.10	1.0488	364	73.26
Average	1.1216	1.0590	365.0	74.02

TEST SUMMARY

O_2:	9.488	% dry
	8.355	% wet
CO_2:	11.261	% dry
	9.917	% wet
H_2O:	11.9	%
MW:	28.73	lb/lb-mole
Flow:	172,495	wacfm
	98.18	mdscfm
	5891.03	kdscfh

Appendix C.2.2
Unit 1 Mercury Calculations

Date	Start Time	End Time	Run #	Trap #	Spiked / Unspiked	Start Vol, l	Stop Vol,l	Total Vol,l	Total Vol, m3	Total Vol,ft3	Meter No.	Yd	delta H	Meter Temp	Stack Temp	Trap Temp	Vacuum	P bar	Ref Temp	Vm std, dscm	Vm std, dscf
11/30/2021	8:57	9:57	1-Hg-U1-A	OL611155	Unspiked	5876.122	5918.470	42.348	0.042348	1.4953	20-A	0.99880	0.00	67.5	358.3	286.2	4.0	30.12	68	0.04261	1.50466
11/30/2021	8:57	9:57	1-Hg-U1-B	OLC145401	Spiked	3638.043	3683.624	45.581	0.045581	1.6095	20-B	1.00040	0.00	68.7	358.3	286.2	4.0	30.12	68	0.04584	1.61855
12/1/2021	8:05	9:05	2-Hg-U1-A	OL607940	Unspiked	5919.200	5968.745	49.545	0.049545	1.7494	20-A	0.9988	0.00	62.2	352.0	287.5	4.0	30.18	68	0.05046	1.78190
12/1/2021	8:05	9:05	2-Hg-U1-B	OLC145879	Spiked	3685.000	3729.886	44.886	0.044886	1.5849	20-B	1.0004	0.00	64.0	352.0	287.5	4.0	30.18	68	0.04563	1.61127
12/1/2021	13:20	14:20	3-Hg-U1-A	OL611075	Unspiked	6000.600	6043.283	42.683	0.042683	1.5071	20-A	0.9988	0.00	85.3	354.8	289.7	4.0	30.18	68	0.04163	1.46989
12/1/2021	13:20	14:20	3-Hg-U1-B	OLC145873	Spiked	3760.000	3802.773	42.773	0.042773	1.5103	20-B	1.0004	0.00	86.8	354.8	289.7	4.0	30.18	68	0.04167	1.47130
12/1/2021	15:08	16:08	4-Hg-U1-A	OL611224	Unspiked	6044.200	6106.896	62.696	0.062696	2.2138	20-A	0.9988	0.00	88.3	366.2	288.0	4.0	30.18	68	0.06081	2.14728
12/1/2021	15:08	16:08	4-Hg-U1-B	OLC145895	Spiked	3803.750	3865.097	61.347	0.061347	2.1662	20-B	1.0004	0.00	89.7	366.2	288.0	4.0	30.18	68	0.05945	2.09934

Run: 1-Hg-U1-A 1-Hg-U1-B

Point	BeginTime	EndTime	Clock	GasMeterA	GasMeterB	DeltaP	OrificePres Actual A	OrificePres Actual B	StackTempA	StackTempB	Probe Temp A	Probe Temp B	TrapTemp A	TrapTemp B	Dry Gas A	Dry Gas B	Pump Vac A	Pump Vac B	Sample Rate A	Sample Rate B	Notes
	0	10	8:57	5876.122	3638.043	n/a	0	0	359	359	287	287	287	287	60	61	4	4	0.7	0.7	
	10	20	9:07	5882.788	3644.708	n/a	0	0	360	360	284	284	284	284	67	69	4	4	0.7	0.7	
	20	30	9:17	5889.535	3651.363	n/a	0	0	359	359	285	285	285	285	68	69	4	4	0.7	0.7	
	30	40	9:27	5896.195	3658.125	n/a	0	0	358	358	286	286	286	286	69	70	4	4	0.7	0.7	
	40	50	9:37	5903.996	3667.715	n/a	0	0	357	357	287	287	287	287	70	71	4	4	0.7	0.7	
	50	60	9:47	5911.335	3675.843	n/a	0	0	357	357	288	288	288	288	71	72	4	4	0.7	0.7	
	60		9:57	5918.470	3683.624																
				42.348	45.581				358.3						67.5	68.7					

Run: 2-Hg-U1-A 2-Hg-U1-B

Point	BeginTime	EndTime	Clock	GasMeterA	GasMeterB	DeltaP	OrificePres Actual A	OrificePres Actual B	StackTempA	StackTempB	Probe Temp A	Probe Temp B	TrapTemp A	TrapTemp B	Dry Gas A	Dry Gas B	Pump Vac A	Pump Vac B	Sample Rate A	Sample Rate B	Notes
	0	10	8:05	5919.200	3685.000	n/a	0	0	351	351	285	285	285	285	55	60	4	4	0.7	0.7	
	10	20	8:15	5926.435	3691.885	n/a	0	0	351	351	286	286	286	286	60	61	4	4	0.7	0.7	
	20	30	8:25	5934.384	3699.831	n/a	0	0	353	353	287	287	287	287	62	63	4	4	0.7	0.7	
	30	40	8:35	5946.333	3707.775	n/a	0	0	352	352	288	288	288	288	64	65	4	4	0.7	0.7	
	40	50	8:45	5951.785	3715.730	n/a	0	0	353	353	289	289	289	289	65	67	4	4	0.7	0.7	
	50	60	8:55	5960.230	3723.675	n/a	0	0	352	352	290	290	290	290	67	68	4	4	0.7	0.7	
	60		9:05	5968.745	3729.886																
				49.545	44.886				352.0						62.2	64.0					

Run: 3-Hg-U1-A 3-Hg-U1-B

Point	BeginTime	EndTime	Clock	GasMeterA	GasMeterB	DeltaP	OrificePres Actual A	OrificePres Actual B	StackTempA	StackTempB	Probe Temp A	Probe Temp B	TrapTemp A	TrapTemp B	Dry Gas A	Dry Gas B	Pump Vac A	Pump Vac B	Sample Rate A	Sample Rate B	Notes
	0	10	13:20	6000.600	3760.000	n/a	0	0	356	356	284	284	284	284	78	79	4	4	0.7	0.7	
	10	20	13:30	6007.525	3767.230	n/a	0	0	355	355	288	288	288	288	81	83	4	4	0.7	0.7	
	20	30	13:40	6014.935	3774.555	n/a	0	0	354	354	289	289	289	289	84	86	4	4	0.7	0.7	

	30	40	13:50	6022.240	3781.620	n/a	0	0	355	355	291	291	291	291	88	89	4	4	0.7	0.7		
	40	50	14:00	6029.758	3789.335	n/a	0	0	354	354	292	292	292	292	90	92	4	4	0.7	0.7		
	50	60	14:10	6037.280	3796.810	n/a	0	0	355	355	294	294	294	294	91	93	4	4	0.7	0.7		
	60		14:20	6043.283	3802.773																	
				42.683	42.773				354.8						85.3	86.8						

Run: 1-Hg-U1-A 4-Hg-U1-B

Point	BeginTime	EndTime	Clock	GasMeterA	GasMeterB	DeltaP	OrificePres Actual A	OrificePres Actual B	StackTempA	StackTempB	Probe Temp A	Probe Temp B	TrapTemp A	TrapTemp B	Dry Gas A	Dry Gas B	Pump Vac A	Pump Vac B	Sample Rate A	Sample Rate B	Notes
	0	10	15:08	6044.200	3803.750	n/a	0	0	365	365	278	278	278	278	88	89	4	4	1	1	
	10	20	15:18	6054.385	3813.915	n/a	0	0	366	366	284	284	284	284	88	90	4	4	1	1	
	20	30	15:28	6064.575	3824.110	n/a	0	0	367	367	289	289	289	289	89	91	4	4	1	1	
	30	40	15:38	6074.946	3824.110	n/a	0	0	367	367	291	291	291	291	88	90	4	4	1	1	
	40	50	15:48	6085.113	3844.444	n/a	0	0	366	366	292	292	292	292	88	89	4	4	1	1	
	50	60	15:58	6096.455	3855.110	n/a	0	0	366	366	294	294	294	294	89	89	4	4	1	1	
	60		16:08	6106.896	3865.097				367	367											
				62.696	61.347				366.3						88.3	89.7					

Test Number	1-Hg-U1-A	1-Hg-U1-B	2-Hg-U1-A	2-Hg-U1-B	3-Hg-U1-A	3-Hg-U1-B	4-Hg-U1-A	4-Hg-U1-B		Average
Date	11/30/2021	11/30/2021	11/30/2021	11/30/2021	12/1/2021	12/1/2021	12/1/2021	12/1/2021		
Start Time	8:57	8:57	8:05	8:05	13:20	13:20	15:08	15:08		
End Time	9:57	9:57	9:05	9:05	14:20	14:20	16:08	16:08		
Test Type	Total Hg	Total Hg	Total Hg	Total Hg	Total Hg	Total Hg	Total Hg	Total Hg		
Spiked	No	Yes	No	Yes	No	Yes	No	Yes		
Sorbent ID	OL611155	OLC145401	OL607940	OLC145879	OL611075	OLC145873	OL611224	OLC145895		
Operating Condition	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		
Sorbent Trap Result										
Average if paired samples, result if single, ug/dsm3		**4.44**		**3.68**		**2.35**		**3.88**		
Sampling Data										
Total volume, dsm3	0.04261	0.04584	0.05046	0.04563	0.04163	0.04167	0.06081	0.05945		
Total volume, dscf	1.50466	1.61855	1.78190	1.61127	1.46989	1.47130	2.14728	2.09934		
Moisture, %, from Flow test	12.984	12.984	12.138	12.138	11.535	11.535	11.940	33.490		
Stack O2, %	9.53	9.53	9.42	9.42	9.79	9.79	9.49	9.49		
Stack CO2, %	11.22	11.22	11.35	11.35	11.00	11.00	11.26	11.26		
Fuel F_d Factor, dscf/MMBtu @ 68°	9,240	9,240	9,240	9,240	9,240	9,240	9,240	9,240		
Fuel F_d Factor, dscf/MMBtu @ 60°	9,100	9,100	9,100	9,100	9,100	9,100	9,100	9,100		
Flow, dscfm	98,767	98,767	100,554	100,554	99,384	99,384	98,184	98,184		
Laboratory Data										
ng, Sec 1	192.20	197.90	182.50	168.20	109.00	86.00	233.80	229.70		
ng, Sec 2	1.28	1.36	1.68	1.41	0.79	0.28	0.72	2.84		
ng, total	193.48	199.26	184.18	169.61	109.79	86.28	234.52	232.54		
Spike level, ng		**200**		**200**		**200**		**200**		
Spike result ng, Sec 1		397.90		368.20		286.00		429.70		
Spike result ng, Sec 2		1.36		1.41		0.28		2.84		
Spike result ng, total		399.26		369.61		286.28		432.54		
Results										
Total ug/dscm	4.540	4.347	3.650	3.717	2.637	2.071	3.856	3.911		4.004
Total ug/dscf	0.129	0.123	0.103	0.105	0.075	0.059	0.109	0.111		0.113
Total lb/hr	1.68E-03	1.61E-03	1.37E-03	1.40E-03	9.81E-04	7.70E-04	1.42E-03	1.44E-03		1.49E-03
Total lb/MMBtu	4.81E-06	4.60E-06	3.83E-06	3.90E-06	2.86E-06	2.25E-06	4.07E-06	4.13E-06		4.22E-06
QA/QC					Not Used					
Spike , ug/dsm3		8.71		8.10		6.87		7.28		
Spike , expected, ug/dsm3		4.36		4.38		4.80		3.36		
Spike, actual (spike-sample), ug/dsm3		4.17		4.45		4.23		3.42		
% recovery		95.6%		101.5%		88.2%		101.6%		
									Limit	
Breaktrough,on sample, Sec 2, %	0.7%	0.7%	0.9%	0.8%	0.7%	0.3%	0.3%	1.2%		
Relative Percent Difference on paired samples		2.2%		0.9%		12.0%		0.7%	10.0%	

Note: <10% breakthrough is criteria in most cases
< 10% RPD is criteria for paired trains in most cases
85%-115% average spike recovery is Method 30B criteria
Low sample levels show more variation

Mercury			
ug/dscm	4.004	**MACT Limit**	
lb/hr (as Hg)	0.00149		
lb/MMBtu	4.22E-06	**5.70E-06**	74.11%

Appendix C.3
Unit 2 Calculations

Appendix C.3.1
Unit 2 Gaseous Stack Flow & Moisture Calculations

Montrose AQS
Run 1 CEMS
DATA AND WORKSHEET
Desert View Power Unit 2

PRE-TEST INFORMATION
GENERAL

Test:	1-O2/CO2-U2
Date:	12/2/2021
Start Time:	8:03
Station:	Desert View Power
Unit:	Unit 2
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION
SAMPLE TRAIN

Barom. Pressure:		psi
	30.16	"Hg
Meter No.	1-P&M	
Meter Y_d:	1.0140	
Meter Pressure:	1.0	iwg
Pstack:	0.55	iwg
Pstack:	30.20	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft2

METHOD 4 DATA
Impingers

#/Matl.	End	Start	Diff.
1/H2O	865.4	770.8	94.6
2/H2O	740.2	740.2	0.0
3/Empty	680.9	681.6	-0.7
4/S.G.	1015.1	1004.6	10.5
Rinse			0.0
Total			104.4

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	20.000	60	58
		62	60
Stop	52.532	63	60
Total	32.532		60.5

Summary

Sample Volume:	33.808	dscf
H_2O Volume :	4.928	scf
Moisture Content:	12.7	%

METHOD 3A, 6C, 7E DATA

	O_2	CO_2
Analyzer Span	18.99	18.96
Actual Span Value	10.6	10.65
Pre Test Zero Direct	0.01	0.04
Pre Test Span Direct	10.66	10.54
Pre-test Zero	0.05	0.11
Pre-test Span	10.66	10.53
Average	9.62	11.07
Post Test Zero Direct	0.01	0.07
Post Test Span Direct	10.65	10.58
Post-test Zero	0.05	0.15
Post-test Span	10.63	10.57
Average	9.62	11.07
Corr. Results	9.58	11.19
Cal Error <2%, Bias <5%; Drift <3%		
Calibrtion Error	0.3%	-0.6%
Pre-Test Zero Bias	0.2%	0.4%
Pre-Test Span Bias	0.0%	-0.1%
Post-Test Zero Bias	0.2%	0.4%
Post-Test Span Bias	-0.1%	0.0%
Zero Drift	0.0%	0.2%
Span Drift	-0.2%	0.2%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.50	1.2247	340	84.47
4	1.40	1.1832	341	81.66
3	1.50	1.2247	341	84.53
2	1.60	1.2649	341	87.30
1	1.50	1.2247	340	84.47
5	1.50	1.2247	340	84.47
4	1.50	1.2247	340	84.47
3	1.40	1.1832	341	81.66
2	1.40	1.1832	340	81.61
1	1.30	1.1402	341	78.69
5	1.10	1.0488	340	72.34
4	1.30	1.1402	342	78.74
3	1.20	1.0954	341	75.60
2	0.98	0.9899	342	68.36
1	0.87	0.9327	342	64.41
5	0.97	0.9849	341	67.97
4	0.93	0.9644	342	66.60
3	0.95	0.9747	342	67.31
2	0.94	0.9695	341	66.91
1	1.00	1.0000	340	68.97
5	1.40	1.1832	341	81.66
4	1.50	1.2247	342	84.58
3	1.10	1.0488	341	72.38
2	0.92	0.9592	342	66.24
1	0.78	0.8832	341	60.95
5	1.10	1.0488	341	72.38
4	0.90	0.9487	342	65.51
3	0.95	0.9747	342	67.31
2	1.00	1.0000	341	69.02
1	1.20	1.0954	341	75.60
Average	1.1769	1.0849	341.1	74.87

TEST SUMMARY

O_2:	9.582	% dry
	8.363	% wet
CO_2:	11.187	% dry
	9.764	% wet
H_2O:	12.7	%
MW:	28.62	lb/lb-mole
Flow:	174,485	wacfm
	101.31	mdscfm
	6078.44	kdscfh

Montrose AQS
Run 2 CEMS
DATA AND WORKSHEET
Desert View Power Unit 2

PRE-TEST INFORMATION

GENERAL

Test:	2-O2/CO2-U2
Date:	12/2/2021
Start Time:	9:58
Station:	Desert View Power
Unit:	Unit 2
Test Condition:	Full Load
Performed By:	DW

PRE-TEST INFORMATION

SAMPLE TRAIN

Barom. Pressure:		psi
	30.16	"Hg
Meter No.	1-P&M	
Meter Yd:	1.0140	
Meter Pressure:	1.0	iwg
Pstack:	0.55	iwg
Pstack:	30.20	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft2

METHOD 4 DATA

Impingers

#/Matl.	End	Start	Diff.
1/H2O	826.1	742.9	83.2
2/H2O	744.3	740.2	4.1
3/Empty	683.2	680.9	2.3
4/S.G.	1024.0	1015.1	8.9
Rinse			0.0
Total			98.5

Dry Gas Meter

Time	Vol.	Tm(in)	Tm(out)
Start	60.000	64	62
		69	66
Stop	93.946	74	71
Total	33.946		67.7

Summary

Sample Volume:	34.798	dscf
H2O Volume:	4.649	scf
Moisture Content:	11.8	%

METHOD 3A, 6C, 7E DATA

	O2	CO2
Analyzer Span	18.99	18.96
Actual Span Value	10.6	10.65
Pre Test Zero Direct	0.01	0.07
Pre Test Span Direct	10.65	10.58
Pre-test Zero	0.05	0.18
Pre-test Span	10.61	10.58
Average	9.66	11.08
Post Test Zero Direct	0.00	0.06
Post Test Span Direct	10.66	10.59
Post-test Zero	0.05	0.15
Post-test Span	10.63	10.61
Average	9.66	11.08
Corr. Results	9.64	11.15
Cal Error <2%, Bias <5%; Drift <3%		
Calibrtion Error	0.3%	-0.4%
Pre-Test Zero Bias	0.2%	0.6%
Pre-Test Span Bias	-0.2%	0.0%
Post-Test Zero Bias	0.3%	0.5%
Post-Test Span Bias	-0.2%	0.1%
Zero Drift	0.0%	-0.1%
Span Drift	0.1%	0.2%

METHOD 2 DATA

Point	dP (in. H2O)	dP^2 (in. H2O)	Temp (°F)	Velocity (fps)
5	1.30	1.1402	346	78.78
4	0.86	0.9274	347	64.12
3	0.94	0.9695	346	66.99
2	1.10	1.0488	347	72.51
1	1.20	1.0954	345	75.64
5	1.40	1.1832	342	81.55
4	1.30	1.1402	344	78.68
3	1.10	1.0488	345	72.42
2	0.84	0.9165	346	63.33
1	0.76	0.8718	345	60.20
5	0.88	0.9381	345	64.78
4	0.96	0.9798	346	67.70
3	0.85	0.9220	347	63.74
2	0.98	0.9899	347	68.44
1	0.95	0.9747	346	67.35
5	1.00	1.0000	345	69.05
4	1.10	1.0488	344	72.38
3	0.98	0.9899	345	68.36
2	0.87	0.9327	346	64.45
1	0.79	0.8888	345	61.38
5	1.40	1.1832	346	81.76
4	1.50	1.2247	347	84.68
3	1.40	1.1832	347	81.81
2	1.50	1.2247	347	84.68
1	1.30	1.1402	346	78.78
5	1.40	1.1832	345	81.71
4	1.40	1.1832	346	81.76
3	1.50	1.2247	347	84.68
2	1.50	1.2247	347	84.68
1	1.50	1.2247	346	84.63
Average	1.1380	1.0668	345.8	73.70

TEST SUMMARY

O2:	9.636	% dry
	8.501	% wet
CO2:	11.153	% dry
	9.838	% wet
H2O:	11.8	%
MW:	28.74	lb/lb-mole
Flow:	171,752	wacfm
	100.20	mdscfm
	6012.08	kdscfh

Montrose AQS
Run 3 CEMS
DATA AND WORKSHEET
Desert View Power UNIT 2

PRE-TEST INFORMATION GENERAL		
Test:	3-O2/CO2-U2	
Date:	12/2/2021	
Start Time:	11:30	
Station:	Desert View Power	
Unit:	Unit 2	
Test Condition:	Full Load	
Performed By:	DW	
PRE-TEST INFORMATION SAMPLE TRAIN		
Barom. Pressure:		psi
	30.16	"Hg
Meter No.	1-P&M	
Meter Y_d	1.0140	
Meter Pressure:	1.0	iwg
Pstack:	0.55	iwg
Pstack:	30.20	"Hg
Cp:	0.84	
Tref:	68	°F
Stack Area:	38.84	ft2

METHOD 4 DATA

Impingers			
#/Matl.	End	Start	Diff.
1/H2O	861.6	784.3	77.3
2/H2O	746.6	744.7	1.9
3/Empty	683.0	683.2	-0.2
4/S.G.	1029.9	1024.0	5.9
Rinse			0.0
Total			84.9

Dry Gas Meter			
Time	Vol.	Tm(in)	Tm(out)
Start	95.000	78	76
		82	80
Stop	127.935	83	81
Total	32.935		80.0

Summary		
Sample Volume:	32.990	dscf
H_2O Volume :	4.007	scf
Moisture Content:	10.8	%

METHOD 3A, 6C, 7E DATA

	O_2	CO_2
Analyzer Span	18.99	18.96
Actual Span Value	10.6	10.65
Pre Test Zero Direct	0.00	0.06
Pre Test Span Direct	10.66	10.59
Pre-test Zero	0.06	0.14
Pre-test Span	10.63	10.60
Average	9.67	11.06
Post Test Zero Direct	0.01	0.03
Post Test Span Direct	10.65	10.56
Post-test Zero	0.05	0.11
Post-test Span	10.62	10.54
Average	9.67	11.06
Corr. Results	9.64	11.15
Cal Error <2%, Bias <5%; Drift <3%		
Calibrtion Error	0.3%	-0.3%
Pre-Test Zero Bias	0.3%	0.4%
Pre-Test Span Bias	-0.2%	0.0%
Post-Test Zero Bias	0.2%	0.4%
Post-Test Span Bias	-0.1%	-0.1%
Zero Drift	0.0%	-0.2%
Span Drift	-0.1%	-0.3%

METHOD 2 DATA

Point	dP (in. H_2O)	dP^2 (in. H_2O^2)	Temp (°F)	Velocity (fps)
5	1.40	1.1832	350	81.79
4	1.50	1.2247	351	84.72
3	1.40	1.1832	351	81.84
2	1.50	1.2247	350	84.66
1	1.50	1.2247	349	84.61
5	1.50	1.2247	348	84.56
4	1.40	1.1832	349	81.74
3	1.40	1.1832	350	81.79
2	1.30	1.1402	351	78.87
1	1.50	1.2247	350	84.66
5	1.20	1.0954	347	75.59
4	1.00	1.0000	349	69.09
3	0.98	0.9899	350	68.43
2	0.92	0.9592	350	66.31
1	0.86	0.9274	350	64.11
5	0.88	0.9381	347	64.73
4	0.85	0.9220	348	63.65
3	0.90	0.9487	349	65.54
2	1.00	1.0000	350	69.13
1	0.96	0.9798	349	67.69
5	1.40	1.1832	346	81.59
4	1.30	1.1402	347	78.67
3	1.10	1.0488	348	72.41
2	0.88	0.9381	350	64.85
1	0.75	0.8660	350	59.87
5	0.97	0.9849	350	68.08
4	0.85	0.9220	351	63.77
3	0.98	0.9899	351	68.48
2	1.00	1.0000	350	69.13
1	1.20	1.0954	350	75.73
Average	1.1325	1.0642	349.4	73.54

TEST SUMMARY

O_2:	9.639	% dry
	8.595	% wet
CO_2:	11.152	% dry
	9.944	% wet
H_2O:	10.8	%
MW:	28.85	lb/lb-mole
Flow:	171,370	wacfm
	100.61	mdscfm
	6036.65	kdscfh

Appendix C.3.2
Unit 2 Mercury Calculations

Date	Start Time	End Time	Run #	Trap #	Spiked / Unspiked	Start Vol, l	Stop Vol,l	Total Vol,l	Total Vol, m3	Total Vol,ft3	Meter No.	Yd	delta H	Meter Temp	Stack Temp	Trap Temp	Vacuum	P bar	Ref Temp	Vm std, dscm	Vm std, dscf
12/2/2021	8:03	9:03	1-Hg-U2-A	OL611133	Unspiked	6107.500	6170.259	62.759	0.062759	2.2160	20-A	0.99880	0.00	60.2	341.7	284.0	4.0	30.16	68	0.06413	2.26432
12/2/2021	8:03	9:03	1-Hg-U2-B	OLC145607	Spiked	3865.600	3927.908	62.308	0.062308	2.2001	20-B	1.00040	0.00	60.2	341.7	284.0	4.0	30.16	68	0.06377	2.25165
12/2/2021	9:58	10:58	2-Hg-U2-A	OL611066	Unspiked	6170.440	6227.638	57.198	0.057198	2.0197	20-A	0.9988	0.00	75.3	346.2	282.3	4.0	30.16	68	0.05679	2.00522
12/2/2021	9:58	10:58	2-Hg-U2-B	OL566977	Spiked	3928.230	3985.386	57.156	0.057156	2.0182	20-B	1.0004	0.00	76.8	346.2	282.3	4.0	30.18	68	0.05672	2.00267
12/2/2021	11:30	12:30	3-Hg-U2-A	OL611120	Unspiked	6229.700	6287.802	58.102	0.058102	2.0516	20-A	0.9988	0.00	85.8	349.3	288.8	4.0	30.16	68	0.05658	1.99773
12/2/2021	11:30	12:30	3-Hg-U2-B	OLC145330	Spiked	3986.700	4044.606	57.906	0.057906	2.0447	20-B	1.0004	0.00	86.0	349.3	288.8	4.0	30.16	68	0.05646	1.99357

Run: 1-Hg-U2-A 1-Hg-U2-B

Point	BeginTime	EndTime	Clock	GasMeterA	GasMeterB	DeltaP	OrificePres Actual A	OrificePres Actual B	StackTempA	StackTempB	Probe Temp A	Probe Temp B	TrapTemp A	TrapTemp B	Dry Gas A	Dry Gas B	Pump Vac A	Pump Vac B	Sample Rate A	Sample Rate B	Notes
	0	10	8:03	6107.500	3865.600	n/a	0	0	341	341	278	278	278	278	60	60	4	4	1	1	
	10	20	8:13	6117.675	3875.930	n/a	0	0	342	342	282	282	282	282	60	60	4	4	1	1	
	20	30	8:23	6127.855	3886.220	n/a	0	0	341	341	287	287	287	287	60	60	4	4	1	1	
	30	40	8:33	6138.330	3896.455	n/a	0	0	342	342	287	287	287	287	60	60	4	4	1	1	
	40	50	8:43	6148.970	3906.835	n/a	0	0	342	342	283	283	283	283	60	60	4	4	1	1	
	50	60	8:53	6159.845	3917.640	n/a	0	0	342	342	287	287	287	287	61	61	4	4	1	1	
	60		9:03	6170.259	3927.908																
				62.759	62.308				341.7						60.2	60.2					

Run: 2-Hg-U2-A 2-Hg-U2-B

Point	BeginTime	EndTime	Clock	GasMeterA	GasMeterB	DeltaP	OrificePres Actual A	OrificePres Actual B	StackTempA	StackTempB	Probe Temp A	Probe Temp B	TrapTemp A	TrapTemp B	Dry Gas A	Dry Gas B	Pump Vac A	Pump Vac B	Sample Rate A	Sample Rate B	Notes
	0	10	9:58	6170.440	3928.230	n/a	0	0	342	342	277	277	277	277	71	72	4	4	0.95	0.95	
	10	20	10:08	6179.945	3937.485	n/a	0	0	345	345	279	279	279	279	73	74	4	4	0.95	0.95	
	20	30	10:18	6189.425	3946.730	n/a	0	0	347	347	284	284	284	284	74	76	4	4	0.95	0.95	
	30	40	10:28	6198.955	3955.985	n/a	0	0	348	348	286	286	286	286	76	78	4	4	0.95	0.95	
	40	50	10:38	6208.420	3965.775	n/a	0	0	348	348	282	282	282	282	79	80	4	4	0.95	0.95	
	50	60	10:48	6217.925	3975.725	n/a	0	0	347	347	286	286	286	286	79	81	4	4	0.95	0.95	
	60		10:58	6227.638	3985.386																
				57.198	57.156				346.2						75.3	76.8					

Run: 3-Hg-U2-A 3-Hg-U2-B

Point	BeginTime	EndTime	Clock	GasMeterA	GasMeterB	DeltaP	OrificePres Actual A	OrificePres Actual B	StackTempA	StackTempB	Probe Temp A	Probe Temp B	TrapTemp A	TrapTemp B	Dry Gas A	Dry Gas B	Pump Vac A	Pump Vac B	Sample Rate A	Sample Rate B	Notes
	0	10	11:30	6229.700	3986.700	n/a	0	0	346	346	277	277	277	277	85	85	4	4	0.95	0.95	
	10	20	11:40	6239.330	3995.440	n/a	0	0	349	349	285	285	285	285	86	85	4	4	0.95	0.95	
	20	30	11:50	6248.975	4005.775	n/a	0	0	350	350	288	288	288	288	86	85	4	4	0.95	0.95	
	30	40	12:00	6258.480	4015.700	n/a	0	0	350	350	291	291	291	291	86	87	4	4	0.95	0.95	
	40	50	12:10	6268.155	4025.555	n/a	0	0	350	350	294	294	294	294	86	87	4	4	0.95	0.95	
	50	60	12:20	6277.848	4034.880	n/a	0	0	351	351	298	298	298	298	86	87	4	4	0.95	0.95	
	60		12:30	6287.802	4044.606																
				58.102	57.906				349.3						85.8	86.0					

Test Number	1-Hg-U2-A	1-Hg-U2-B	2-Hg-U2-A	2-Hg-U2-B	3-Hg-U2-A	3-Hg-U2-B			Average
Date	12/2/2021	12/2/2021	12/2/2021	12/2/2021	12/2/2021	12/2/2021			
Start Time	8:03	8:03	9:58	9:58	11:30	11:30			
End Time	9:03	9:03	10:58	10:58	12:30	12:30			
Test Type	Total Hg	Total Hg	Total Hg	Total Hg	Total Hg	Total Hg			
Spiked	No	Yes	No	Yes	No	Yes			
Sorbent ID	OL611133	OLC145607	OL611066	OL566977	OL611120	OLC145330			
Operating Condition	Normal	Normal	Normal	Normal	Normal	Normal			
Sorbent Trap Result									
Average if paired samples, result if single, ug/dsm3		**4.72**		**3.47**		**3.09**			
Sampling Data									
Total volume, dsm3	0.06413	0.06377	0.05679	0.05672	0.05658	0.05646			
Total volume, dscf	2.26432	2.25165	2.00522	2.00267	1.99773	1.99357			
Moisture, %, from Flow test	12.721	12.721	11.786	11.786	10.831	10.831			
Stack O2, %	9.58	9.58	9.64	9.64	9.64	9.64			
Stack CO2, %	11.19	11.19	11.15	11.15	11.15	11.15			
Fuel F_d Factor, dscf/MMBtu @ 68°	9,240	9,240	9,240	9,240	9,240	9,240			
Fuel F_d Factor, dscf/MMBtu @ 60°	9,100	9,100	9,100	9,100	9,100	9,100			
Flow, dscfm	101,307	101,307	100,201	100,201	100,611	100,611			
Laboratory Data									
ng, Sec 1	287.70	313.30	204.80	187.70	185.80	162.70			
ng, Sec 2	1.71	1.08	1.54	0.33	0.79	0.43			
ng, total	289.41	314.38	206.34	188.03	186.59	163.13			
Spike level, ng		**200**		**200**		**200**			
Spike result ng, Sec 1		513.30		387.70		362.70			
Spike result ng, Sec 2		1.08		0.33		0.43			
Spike result ng, total		514.38		388.03		363.13			
Results									
Total ug/dscm	4.513	4.930	3.633	3.315	3.298	2.889			3.763
Total ug/dscf	0.128	0.140	0.103	0.094	0.093	0.082			0.107
Total lb/hr	1.71E-03	1.87E-03	1.36E-03	1.24E-03	1.24E-03	1.09E-03			1.42E-03
Total lb/MMBtu	4.80E-06	5.25E-06	3.89E-06	3.55E-06	3.53E-06	3.09E-06			4.02E-06
rAverage		5.03E-06		3.72E-06		3.31E-06			
QA/QC									
Spike , ug/dsm3		8.07		6.84		6.43			
Spike , expected, ug/dsm3		3.14		3.53		3.54			
Spike, actual (spike-sample), ug/dsm3		3.55		3.21		3.13			
% recovery		113.3%		91.0%		88.5%			
Breaktrough,on sample, Sec 2, %	0.6%	0.3%	0.8%	0.2%	0.4%	0.3%			
		143.9%							
Relative Percent Difference on paired samples		4.4%		4.6%		6.6%			

Note. <10% breakthrough is criteria in most cases
< 10% RPD is criteria for paired trains in most cases
85%-115% average spike recovery is Method 30B criteria
Low sample levels show more variation

Mercury			
ug/dscm	3.763	**MACT Limit**	
lb/hr (as Hg)	0.00142		
lb/MMBtu	4.02E-06	**5.70E-06**	70.47%

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APPENDIX D
QUALITY ASSURANCE

Appendix D.1
Quality Assurance Program Summary

QUALITY ASSURANCE PROGRAM SUMMARY

As part of Montrose Air Quality Services, LLC's (MAQS) ASTM D7036-04 certification, MAQS is committed to providing emission related data which is complete, precise, accurate, representative, and comparable. MAQS' quality assurance program and procedures are designed to ensure that the data meet or exceed the requirements of each test method for each of these items. The quality assurance program consists of the following items:

- Assignment of an Internal QA Officer
- Development and use of an internal QA Manual
- Personnel training
- Equipment maintenance and calibration
- Knowledge of current test methods
- Chain-of-custody
- QA reviews of test programs

Assignment of an Internal QA Officer: MAQS has assigned an internal QA Officer who is responsible for administering all aspects of the QA program.

Internal Quality Assurance Manual: MAQS has prepared a QA Manual according to the requirements of ASTM D7036-04 and guidelines issued by EPA. The manual documents and formalizes all of MAQS' QA efforts. The manual is revised upon periodic review and as MAQS adds capabilities. The QA manual provides details on the items provided in this summary.

Personnel Testing and Training: Personnel testing and training is essential to the production of high quality test results. MAQS training programs include:

- A requirement for all technical personnel to read and understand the test methods performed
- A requirement for all technical personnel to read and understand the MAQS QA Manual
- In-house testing and training
- Quality Assurance meetings
- Third party testing where available
- Maintenance of training records.

Equipment Maintenance and Calibration: All laboratory and field equipment used as a part of MAQS' emission measurement programs is maintained according to manufacturer's recommendations. A summary of the major equipment maintenance schedules is summarized in Table 1. In addition to routine maintenance, calibrations are performed on all sampling equipment according to the procedures outlined in the applicable test method. The calibration intervals and techniques for major equipment components is summarized in Table 2. The calibration technique may vary to meet regulatory agency requirements.

Knowledge of Current Test Methods: MAQS maintains current copies of EPA, ARB, and SCAQMD Source Test Manuals and Rules and Regulations.

Chain-of-Custody: MAQS maintains chain-of-custody documentation on all data sheets and samples. Samples are stored in a locked area accessible only to MAQS source test personnel. Data sheets are kept in the custody of the originator, program manager, or in locked storage until return to MAQS office. Electronic field data is duplicated for backup on secure storage media. The original data sheets are used for report preparation and any additions are initialed and dated.

QA Reviews: Periodic field, laboratory, and report reviews are performed by the in-house QA coordinator. Periodically, test plans are reviewed to ensure proper test methods are selected and reports are reviewed to ensure that the methods were followed and any deviations from the methods are justified and documented.

ASTM D7036-04 Required Information

Uncertainty Statement

MAQS is qualified to conduct this test program and has established a quality management system that led to accreditation with ASTM Standard D7036-04 (Standard Practice for Competence of Air Emission Testing Bodies). MAQS participates in annual functional assessments for conformance with D7036-04 which are conducted by the American Association for Laboratory Accreditation (A2LA). All testing performed by MAQS is supervised on site by at least one Qualified Individual (QI) as defined in D7036-04 Section 8.3.2. Data quality objectives for estimating measurement uncertainty within the documented limits in the test methods are met by using approved test protocols for each project as defined in D7036-04 Sections 7.2.1 and 12.10. Additional quality assurance information is presented in the report appendices.

Performance Data

Performance data are available for review.

Qualified Personnel

A qualified individual (QI), defined by performance on a third party or internal test on the test methods, is present on each test event.

Plant Entry and Safety Requirements

Plant Entry

All test personnel are required to check in with the guard at the entrance gate or other designated area. Specific details are provided by the facility and project manager.

Safety Requirements

All personnel shall have the following personal protective equipment (PPE) and wear them where designated:

- Hard Hat
- Safety Glasses
- Steel Toe Boots
- Hearing Protection
- Gloves
- High Temperature Gloves (if required)

The following safety measures will be followed:

- Good housekeeping
- SDS for all on-site hazardous materials
- Confine selves to necessary areas (stack platform, mobile laboratory, CEMS data acquisition system, control room, administrative areas)
- Knowledge of evacuation procedures

Each facility will provide plant specific safety training.

TABLE 1
EQUIPMENT MAINTENANCE SCHEDULE

Equipment	Acceptance Limits	Frequency of Service	Methods of Service
Pumps	1. Absence of leaks 2. Ability to draw manufacturers required vacuum and flow	As recommended by manufacturer	1. Visual inspection 2. Clean 3. Replace parts 4. Leak check
Flow Meters	1. Free mechanical movement	As recommended by manufacturer	1. Visual inspection 2. Clean 3. Calibrate
Sampling Instruments	1. Absence of malfunction 2. Proper response to zero span gas	As recommended by manufacturer	As recommended by manufacturer
Integrated Sampling Tanks	1. Absence of leaks	Depends on nature of use	1. Steam clean 2. Leak check
Mobile Van Sampling System	1. Absence of leaks	Depends on nature of use	1. Change filters 2. Change gas dryer 3. Leak check 4. Check for system contamination
Sampling Lines	1. Sample degradation less than 2%	After each test series	1. Blow dry, inert gas through line until dry

TABLE 2
MAJOR SAMPLING EQUIPMENT CALIBRATION REQUIREMENTS

Sampling Equipment	Calibration Frequency	Calibration Procedure	Acceptable Calibration Criteria
Continuous Analyzers	Before and After Each Test Day	3-point calibration error test	< 2% of analyzer range
Continuous Analyzers	Before and After Each Test Run	2-point sample system bias check	< 5% of analyzer range
Continuous Analyzers	After Each Test Run	2-point analyzer drift determination	< 3% of analyzer range
CEMS System	Beginning of Each Day	leak check	< 1 in. Hg decrease in 5 min. at > 20 in. Hg
Continuous Analyzers	Semi-Annually	3-point linearity	< 1% of analyzer range
NO_x Analyzer	Daily	NO_2 -> NO converter efficiency	> 90%
Differential Pressure Gauges (except for manometers)	Semi-Annually	Correction factor based on 5-point comparison to standard	+/- 5%
Differential Pressure Gauges (except for manometers)	Bi-Monthly	3-point comparison to standard, no correction factor	+/- 5%
Barometer	Semi-Annually	Adjusted to mercury-in-glass or National Weather Service Station	+/- 0.1 inches Hg
Dry Gas Meter	Semi-Annually	Calibration check at 4 flow rates using a NIST traceable standard	+/- 2%
Dry Gas Meter	Bi-Monthly	Calibration check at 2 flow rates using a NIST traceable standard	+/- 2% of semi-annual factor
Dry Gas Meter Orifice	Annually	4-point calibration for ΔH@	--
Temperature Sensors	Semi-Annually	3-point calibration vs. NIST traceable standard	+/- 1.5%

Note: Calibration requirements that meet applicable regulatory agency requirements will be used.

Appendix D.2
CARB, SCAQMD, and STAC Certifications

State of California

California Air Resources Board

Approved Independent Contractor

Montrose Air Quality Services, LLC

This is to certify that the company listed above has been approved by the California Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, through June 30, 2022, for those test methods listed below:

CARB Source Test Methods:
1, 2, 3, 205, 6, 8, 17, 20
100 (CO, CO_2, NO_x, O_2, SO_2, THC)

Catherine Dunwoody, Chief
Monitoring and Laboratory Division

State of California

California Air Resources Board

Approved Independent Contractor

Montrose Air Quality Services, LLC

This is to certify that the company listed above has been approved by the California Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, through June 30, 2022, for the test methods listed below:

U.S. EPA Source Test Methods 201A, 202 and 205
Visible Emissions Evaluation

Catherine Dunwoody, Chief
Monitoring and Laboratory Division

MONTROSE AIR QUALITY SERVICES

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

September 1, 2021

Mr. John Peterson
Montrose Air Quality Services, LLC
1631 E. Saint Andrew Place
Santa Ana, CA 92705

Subject: LAP Approval Notice
Reference # 96LA1220

Dear Mr. Peterson:

We have reviewed your renewal letter under the South Coast Air Quality Management District's Laboratory Approval Program (LAP). We are pleased to inform you that your firm is approved for the period beginning September 30, 2021, and ending September 30, 2022 for the following methods, subject to the requirements in the LAP Conditions For Approval Agreement and conditions listed in the attachment to this letter:

South Coast AQMD Methods 1-4	South Coast AQMD Methods 5.1, 5.2, 5.3, 6.1
South Coast AQMD Methods 10.1 and 100.1	South Coast AQMD Methods 25.1 and 25.3 (Sampling)
USEPA CTM-030 and ASTM D6522-00	Rule 1121/ 1146.2 Protocol

Rule 1420/1420.1/1420.2 – (Lead) Source and Ambient Sampling

Your LAP approval to perform nitrogen oxide emissions compliance testing for Rule 1121/ 1146.2 Protocols includes satellite facilities located at:

McKenna Boiler 1510 North Spring Street Los Angeles, CA 90012	Noritz America Corp. 11160 Grace Avenue Fountain Valley, CA 92708	Ajax Boiler, Inc. 2701 S. Harbor Blvd. Santa Ana, CA 92704
VA Laundry Bldg., Greater LA Healthcare Sys. 508 Constitution Avenue Los Angeles, CA 90049	So Cal Gas – Engr Analysis Ctr, Bldg H 8101 Rosemead Blvd Pico Rivera, CA 90660	

Thank you for participating in the LAP. Your cooperation helps us to achieve the goal of the LAP: to maintain high standards of quality in the sampling and analysis of source emissions. You may direct any questions or information to LAP Coordinator, Colin Eckerle. He may be reached by telephone at (909) 396-2476, or via e-mail at ceckerle@aqmd.gov.

Sincerely,

D. Sarkar

Dipankar Sarkar
Program Supervisor
Source Test Engineering

DS:CE
Attachment

210901 LapRenewal.doc

STAC STACK TESTING ACCREDITATION COUNCIL

A2LA American Association for Laboratory Accreditation

Accredited Air Emission Testing Body

A2LA has accredited

MONTROSE AIR QUALITY SERVICES

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this laboratory is accredited to perform testing activities in compliance with ASTM D7036:2004 - Standard Practice for Competence of Air Emission Testing Bodies.

Presented this 11th day of February 2020.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3925.01
Valid to February 28, 2022

This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.

MONTROSE AIR QUALITY SERVICES

Appendix D.3
Individual QI Certifications

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

DAVE A. WONDERLY

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 29TH DAY OF NOVEMBER 2018 AND EFFECTIVE UNTIL NOVEMBER 28TH, 2023

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakainis, QSTI/QSTO Review Board

Tina Sanderson, QSTI/QSTO Review Board

J. Wade Bice, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Bruce Randall QSTI/QSTO Review Board

CERTIFICATE NO. 2009-298

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

DAVE A. WONDERLY

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 29TH DAY OF NOVEMBER 2018 AND EFFECTIVE UNTIL NOVEMBER 28TH, 2023

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

Tina Sanderson, QSTI/QSTO Review Board

J. Wade Bice, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Bruce Randall QSTI/QSTO Review Board

CERTIFICATE NO. 2009-298

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

DAVE A. WONDERLY

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 28TH DAY OF SEPTEMBER 2018 AND EFFECTIVE UNTIL SEPTEMBER 27TH, 2023

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

Tina Sanderson, QSTI/QSTO Review Board

J. Wade Bice, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Bruce Randall QSTI/QSTO Review Board

CERTIFICATE NO. 2009-298

APPENDIX E
SAMPLE LOCATION STRATIFICATION & DISTURBED ABSENCE OF FLOW REPORT

STACK GAS STRATIFICATION AND ABSENCE OF FLOW DISTURBANCE TESTING AT COLMAC MECCA PROJECT

Prepared For:

UC Operating Service
Mecca, California

For Submittal To:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Diamond Bar, California

Prepared By:

Edward J. Filadelfia

CARNOT
Tustin, California

JULY 1994

1140985/R106E622.T

CARNOT

REVIEW AND CERTIFICATION

All work, calculations, and other activities and tasks performed and documented in this report were carried out under my direction and supervision.

Date 10/14/94

Edward J. Filadelfia
Senior Engineer

I have reviewed, technically and editorially, details, calculations, results, conclusions and other appropriate written material contained herein, and hereby certify that the presented material is authentic and accurate.

Date 10/14/94

Edward J. Filadelfia
Senior Engineer

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SECTION 1.0

INTRODUCTION

Carnot was contracted by UC Operating Service (UCOS) to determine the suitability of the alternate sample location accessible from the stack inlet duct. Tests were conducted to determine the level of stack gas stratification and flow disturbance. The tests were performed at this location to satisfy the requirements of alternate sample location CFR 40 Appendix A Method 1. The tests were performed using the standard methods in Chapter X of the SCAQMD's Source Test Manual.

The flow disturbance and gaseous stratification tests were performed on June 27-28, 1994. The test program was coordinated by Greg Deedon of UCOS and Edward Filadelfia of Carnot. The Carnot test team consisted of Edward Filadelfia, Dave Wonderly, and Chris Hone. Unit operation was established and maintained by UCOS personnel.

The results of the tests are summarized in Tables 1-1 and 1-2. These results show that the sample location meets the requirements of the SCAQMD and EPA by demonstrating that the stack gas stratification is less than 10% and the average resultant flow angle is less than 20 degrees with a standard deviation of less than 10 degrees.

A description of the unit is presented in Section 2.0. Test procedures and locations are presented in Section 3.0. Test results are presented in Section 4.0. Tests procedure descriptions, field data sheets, calculations, and control room data are included in the Appendices.

TABLE 1-1
SUMMARY OF GASEOUS STRATIFICATION
COLMAC ENERGY PROJECT
JULY 1994

Parameter	Unit 1 % Stratification	Unit 2 % Stratification	SCAQMD Limit, %
O_2, %	0.4%	1.0%	≤10

TABLE 1-2
SUMMARY OF FLOW DISTURBANCE MEASUREMENTS
COLMAC ENERGY PROJECT
JULY 1994

Parameter	Unit 1 Measured	Unit 2 Measured	SCAQMD Limit, %	EPA Limit, %
Average Resultant Angle, Degrees	5.6°	5.9°	≤20	≤20
Standard Deviation, Degrees	3.3°	4.0°	≤10	N/A

SECTION 2.0

UNIT DESCRIPTION

The Colmac Energy Plant consists of two 297 MMBtu/hour, circulating bed boilers, the combined units are designed to produce 47 MW of net electrical output. Each unit is equipped with the following pollution control systems:

1. An ammonia injection system for control of NO_x emissions.

2. Cyclonic mixing of injected ammonia with flue gas to provide for a minimum amount of ammonia slip (emission).

3. A limestone injection system to limit emissions of SO_2.

4. A reverse air baghouse to restrict opacity and emissions of sulfates and particulate to very low levels.

SECTION 3.0

TEST DESCRIPTION

3.1 TEST CONDITIONS

All tests were performed with the unit operating at full load. Tests were conducted while the unit was firing bio mass and operating under normal conditions. Unit operations were established by UCOS operators.

3.2 SAMPLE LOCATION

Measurements were made from Units 1 and 2 inlet ducts to the stack. A schematic of the Sample location is shown in Figure 3-1. Chapter X sampling consisted of 40 point traverse for stratification, and a 42 point traverse for flow disturbances.

3.3 TEST PROCEDURES

Tests were performed using methods from the SCAQMD's Source Test Manual. These methods are contained in Chapter X - Section 1 for disturbed flow and Section 13 for gaseous stratification. Table 3-1 presents the test methods used in this program. O_2 concentrations were measured using Carnot's mobile emission monitoring system. Flow angles were measured using a United Sensor 3D probe. A description of the Carnot's Continuous Emissions Monitoring System and the standard measurement procedures are presented in Appendix A. A summary of the procedures used for gaseous stratification and disturbed flow are presented below.

3.3.1 Gaseous Stratification

Chapter X (Non-Standard Methods and Techniques), Chapter 13 of the SCAQMD Source Test Manual defines gaseous stratification as the presence of a difference, in excess of 10 percent, between any two points in the same cross sectional plane. Stratification can be determined for either pollutant gases (e.g., NO_x) or diluent gases (e.g., O_2, CO_2) in units of concentration. For this test program, the O_2 concentration was used to measure the level of stack gas stratification.

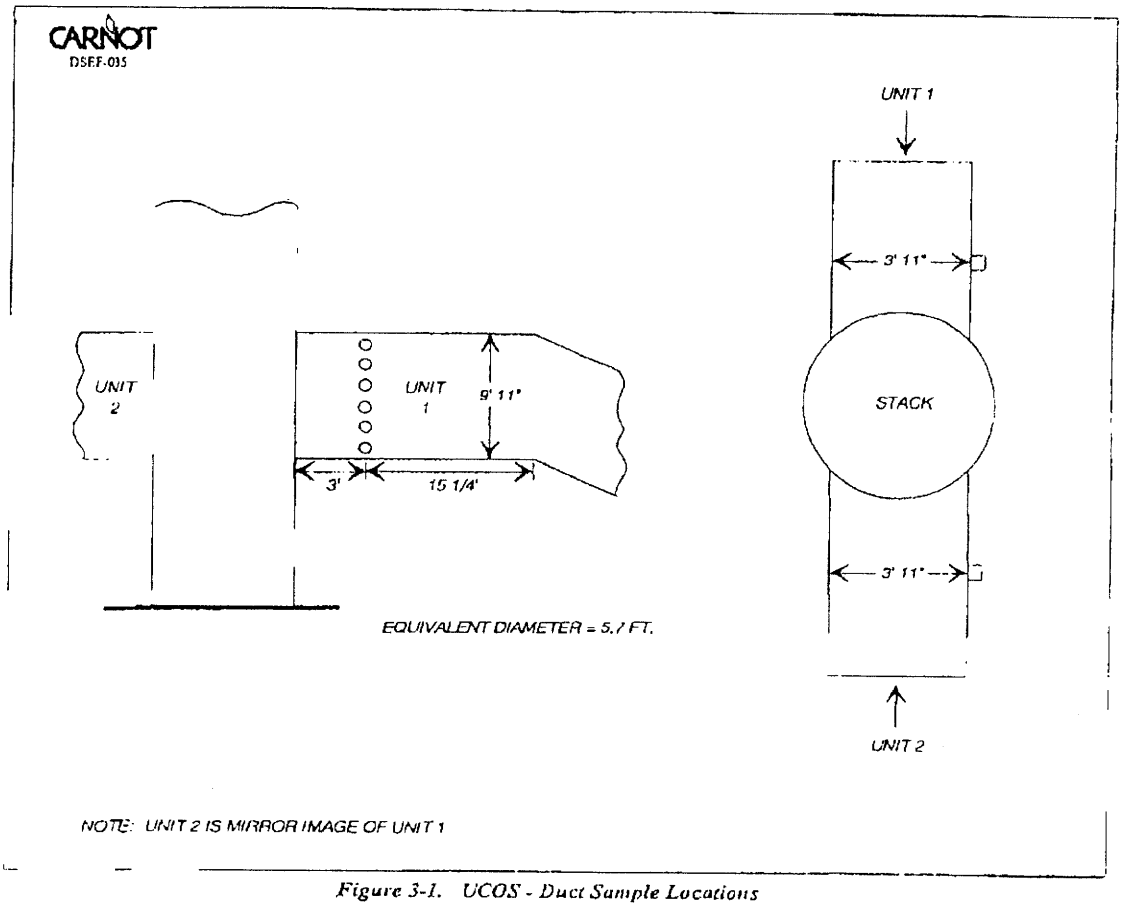


Figure 3-1. UCOS - Duct Sample Locations

Due to variations in process O_2 concentrations, two O_2 analyzers were used. The first O_2 analyzer was used as a reference point and located at the center of the duct. The second was located at 40 traverse points during the test. Gases were monitored for three minutes at each traverse point.

TABLE 3-1
TEST PROCEDURES
COLMAC ENERGY PROJECT
JULY 1994

Parameter	Units	Measurement Principle	Reference Method	Comments
O_2	%	Electrochemical Call	EPA 3A	40 point traverse for gaseous stratification according to Chapter X, Section 13
Flow Angle	Degrees	3D probe for pitch and yaw	1.1	42 point traverse for disturbed flow according to Chapter X, Section 1

SECTION 4.0

RESULTS

4.1 GASEOUS STRATIFICATION

The results of the gaseous stratification tests are summarized in Table 4-1. The results show that the O_2 concentration stratification levels for both sample locations were below the limit of 10%.

TABLE 4-1
GASEOUS STRATIFICATION
COLMAC ENERGY PROJECT
JULY 1994

Parameter	Percent Stratification
Unit 1 O_2, %	0.4 %
Unit 2 O_2, %	1.0 %

4.2 FLOW DISTURBANCE

The results of the flow disturbance measurements made with the 3-dimensional velocity probe are presented in Table 4-2. The results of these tests show that the average resultant flow angle was below the limit of 20 degrees with a standard deviation of less than 10 degrees for both sample locations.

TABLE 4-2
FLOW DISTURBANCE RESULTS
COLMAC ENERGY PROJECT
JULY 1994

Parameter	Unit 1 3D Probe	Unit 2 3D Probe
Avg. Yaw Angle, degrees	2.0	4.4
Avg. Pitch Angle, degrees	-0.4	-1.0
Avg. Resultant Angle, degrees	5.6	5.9
Standard Deviation, degrees	3.3	4.0

APPENDIX A
MEASUREMENT PROCEDURES

Continuous Emissions Monitoring System

Oxygen (O_2) by Continuous Analyzer

Three-Dimensional Velocity Testing

Continuous Emissions Monitoring System

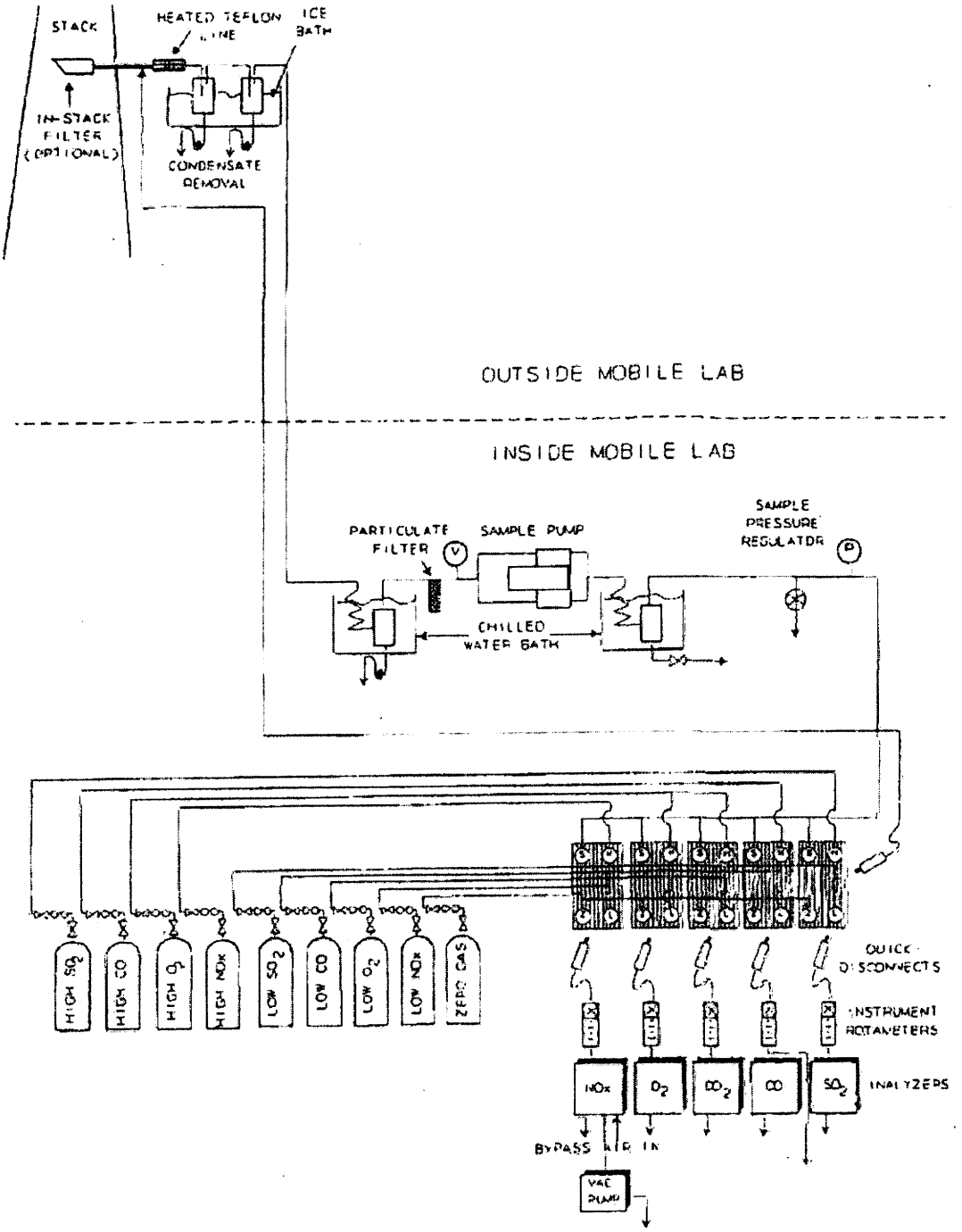
O_2, CO, CO_2, NO, NO_x and SO_2 are measured using an extractive continuous emissions monitoring (CEM) package, shown in the following figure. This package is comprised of three basic subsystems. They are: (1) the sample acquisition and conditioning system, (2) the calibration gas system, and (3) the analyzers themselves. This section presents a description of the sampling and calibration systems. Descriptions of the analyzers used in this program and the corresponding reference test methods follow. Information regarding quality assurance information on the system, including calibration routines and system performance data follows.

The sample acquisition and conditioning system contains components to extract a representative sample from the stack or flue, transport the sample to the analyzers, and remove moisture and particulate material from the sample. In addition to performing the tasks above, the system must preserve the measured species and deliver the sample for analysis intact. The sample acquisition system extracts the sample through a stainless steel probe. The probe is insulated or heated as necessary to avoid condensation. If the particulate loading in the stack is high, a sintered stainless steel filter is used on the end of the probe.

Where water soluble NO_2 and/or SO_2 are to be measured, the sample is drawn from the probe through a heated teflon sample line into an on-stack cooled (approximately 35-40°F) water removal trap. The trap consists of stainless steel flasks in a bath of ice and water. This design removes the water vapor by condensation. The contact between the sample and liquid water is minimized and the soluble NO_2 and SO_2 are conserved. This system meets the requirements of EPA Method 20. The sample is then drawn through a teflon transport line, particulate filter, secondary water removal and into the sample pump. The pump is a dual head, diaphragm pump. All sample-wetted components of the pump are stainless steel or teflon. The pressurized sample leaving the pump flows through a third condensate trap in a refrigerated water bath (≈38°F) for final moisture removal. A drain line and valve are provided to constantly expel any condensed moisture from the dryer at this point. After the dryer, the sample is directed into a distribution manifold. Excess sample is vented through a back-pressure regulator, maintaining a constant pressure of 5-6 psig to the analyzer rotameters.

The calibration system is comprised of two parts: the analyzer calibration, and the system bias check (dynamic calibration). The analyzer calibration equipment includes pressurized cylinders of certified span gas. The gases used are, as a minimum, certified to 1% by the manufacturer. Where necessary to comply with reference method requirements EPA Protocol 1 gases are used. The cylinders are equipped with pressure regulators which supply the calibration gas to the analyzers at the same pressure and flow rate as the sample. The selection of zero, span, or sample gas directed to each analyzer is accomplished by operation of the sample/calibration selector fittings.

The system bias check is accomplished by transporting the same gases used to zero and span the analyzers to the sample system as close as practical to the probe inlet. This is done either by attaching the calibration gas supply line to the probe top with flexible tubing or by actuation of a solenoid valve located at the sample conditioner inlet (probe exit). The span gas is exposed to the same elements as the sample and the system response is documented. The analyzer indications for the system calibration check must agree within 5% of the analyzer calibration. Values are adjusted and changes/repairs are made to the system to compensate for any difference in analyzer readings. Specific information on the analytical equipment and test methods used is provided in the following pages.



Schematic of CEM System

Method:	**Oxygen (O_2) by Continuous Analyzer**
Applicable Reference Methods:	EPA 3A, EPA 20, ARB 100, BA ST-14, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned, and conveyed to the instrument for direct readout of O_2 concentration.
Analyzer:	Teledyne Model 326A
Measurement Principle:	Electrochemical cell
Ranges:	0-5, 0-10, 0-25 % O_2
Accuracy:	1 % of full scale
Output:	0-100 mV, linear
Interferences:	Halogens and halogenated compounds will cause a positive interference. Acid gases will consume the fuel cell and cause a slow calibration drift.
Response Time:	90% <7 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. If Method 20 is used, that method's specific procedures for selecting sample points are used. Otherwise, stratification checks are performed at the start of a test program to select single or multiple-point sample locations.
Analytical Procedure:	An electrochemical cell is used to measure O_2 concentration. Oxygen in the flue gas diffuses through a Teflon membrane and is reduced on the surface of the cathode. A corresponding oxidation occurs at the anode internally, and an electric current is produced that is proportional to the concentration of oxygen. This current is measured and conditioned by the instrument's electronic circuitry to give an output in percent O_2 by volume.
Special Calibration Procedure:	The measurement cells used with the O_2 instrument have to be replaced on a regular basis. After extended use, the cell tend to produce a nonlinear response. Therefore, a three-point calibration is performed at the start of each test day to check for linearity. If the response is not linear ($\pm$ 2% of scale), the cell is replaced.

Method:	Three-Dimensional Velocity Testing
Applicable Ref. Method:	EPA Method 1, ANSI ASME PTC 11 - 1984
Applicability of Method:	When a sample location to be used for velocity or particulate tests does not meet the traditional Method 1 criteria of being at least two duct diameters downstream and one-half diameter upstream of any flow disturbance, this alternate method is used to evaluate the suitability of the location. A three-dimensional velocity probe is used to measure pitch and yaw angle at a minimum of 40 traverse points for round ducts and 42 points for rectangular ducts. If the average resultant angle is less than 20° and the standard deviation is less than 10°, the sample location is deemed acceptable. Velocity and particulate traverses are then performed at the same traverse points using standard Method 2 and 5 equipment and procedures.
Principle:	The instrument measures yaw and pitch angles of fluid flow, as well as total and static pressures.
Analyzer:	United Sensor Three-Dimensional Directional Probe
Sampling Procedure:	Each probe has five measuring holes in its tip. A centrally located pressure hole measures pressure P1, while two lateral pressure holes measure pressures P2 and P3. If the probe is rotated manually until P2 and P3 are identical as a readout on the manometer, the yaw angle of flow is then indicated by the number of degrees rotated. When the yaw angle has been determined, an additional differential pressure P4 - P5 is measured by pressure holes located above and below the total pressure (P1) hole. Pitch angle is determined by calculating (P4 - P5)/(P1 - P2) and using the calibration data for the individual probe and interpolating between the bracketing data. At any particular pitch angle, the velocity pressure coefficient (Pt - Ps)/(P1 -P2) can also be interpolated from the calibration data and Pt - Ps and Ps calculated. Note that this probe also allows for very accurate gas flow measurements, in addition to the EPA Method 1 procedures that allow it to be used for determination of flow angle.

Definitions:

P_1 = Total Pressure
P_2 = Static Pressure
P_3 = Static Pressure
P_4 = Pitch Pressure
P_5 = Pitch Pressure

$P_1 - P_2$ = Velocity Head Pressure

$\frac{P_4 - P_5}{P_1 - P_2}$ = Pitch angle calculated on calibration curve

Calculations:

Velocity (fps) in direction of flow

$$V_s = 2.90\ C_P\sqrt{\Delta P\ T_s}\ \sqrt{\left(\frac{29.92}{P_S}\right)\left(\frac{28.95}{MW_{wet}}\right)}$$

where:
C_P = Pitot Calibration factor
ΔP = Average velocity, head, iwg $(\overline{\sqrt{\Delta P}})^2$
T_s = Stack Temperature, °R
P_s = Stack Pressure (iwg)
MW_{wet} = Molecular weight, wet

Resultant angle:

$$R = \left|\frac{\cos^{-1}(\cos\phi_{Y,R}\cos\phi_{P,R})}{0.0175}\right|$$

where:
$\phi_{Y,R}$ = Yaw Angle in Radians
$\phi_{P,R}$ = Pitch Angle in Radians
R = Resultant Angle in Degrees

Pitch Angle Curve Fit Equation (Degrees)

$$\phi_P = A_1\left(\frac{P_4-P_5}{P_1-P_2}\right) + A_2\left(\frac{P_4-P_5}{P_1-P_2}\right)^2 - A_3\left(\frac{P_4-P_5}{P_1-P_2}\right)^3 - A_4\left(\frac{P_4-P_5}{P_1-P_2}\right)^4 + A_5\left(\frac{P_4-P_3}{P_1-P_2}\right)^5 + A_6\left(\frac{P_4-P_5}{P_1-P_2}\right)^6$$

Pitot coefficient curve fit equation (used to calculate corrected axial velocities)

$$\frac{P_t-P_s}{P_1-P_2} = B_1 + B_2\,\phi_P + B_3 + \phi_P + B_4\,\phi_P^3 + B_5\,\phi_P^4 + B_6\,\phi_P^5 + B_7\,\phi_P^6$$

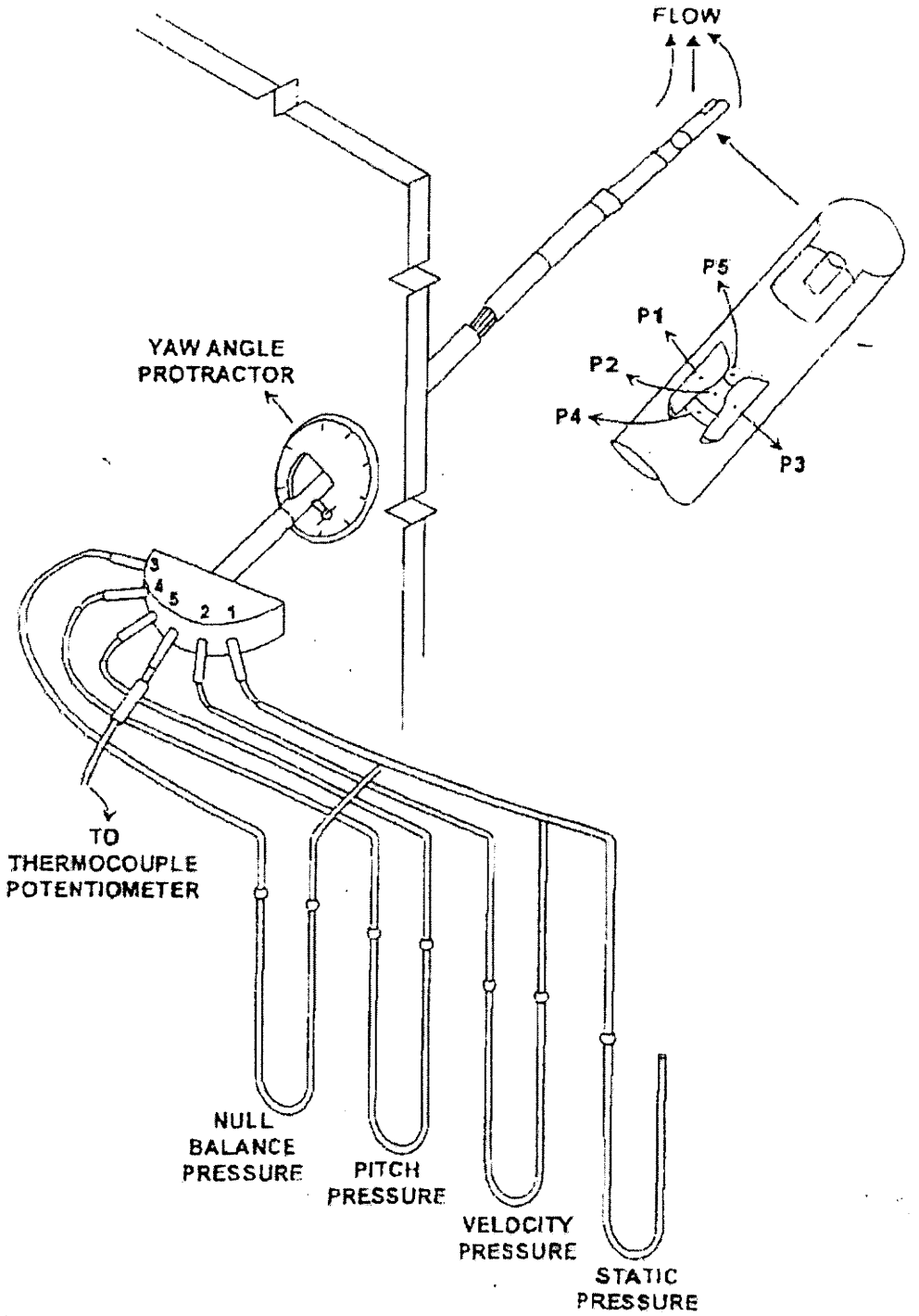


Figure Five Hole Probe

3-DIMENSIONAL VELOCITY PROBE CALIBRATION FACTORS

Probe	B-2455
A_1	63.09
A_2	23.69
A_3	24.505
A_4	33.312
A_5	7.5203
A_6	11.669
B_1	0.997
B_2	7×10^{-3}
B_3	3×10^{-5}
B_4	8×10^{-7}
B_5	1×10^{-9}
B_6	3×10^{-10}
B_7	3×10^{-2}

APPENDIX B
QUALITY ASSURANCE

Appendix B.1

Quality Assurance Program Summary

QUALITY ASSURANCE PROGRAM SUMMARY AND ARB CERTIFICATION

Carnot ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance (QA) program. The program is developed and administered by an internal QA Officer and encompasses seven major areas:

1. Development and use of an internal QA manual.
2. QA reviews of reports, laboratory work, and field testing.
3. Equipment calibration and maintenance.
4. Chain of custody.
5. Training.
6. Knowledge of current test methods.
7. Agency certification.

Each of these areas is discussed individually below.

Quality Assurance Manual. Carnot has prepared a QA Manual according to EPA guidelines. The manual serves to document and formalize all of Carnot's QA efforts. The manual is constantly updated, and each member of the Source Test Division is required to read and understand its contents. The manual includes details on the other six QA areas discussed below.

QA Reviews. Carnot's review procedure includes review of each source test report by the QA Officer, and spot check reviews of laboratory and field work.

The most important review is the one that takes place before a test program begins. The QA Officer works closely with Source Test Division personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of any interferences or other restrictions that might preclude use of standard test procedures, and evaluation and/or development of alternate procedures.

Equipment Calibration and Maintenance. The equipment used to conduct the emissions measurements is maintained according to the manufacturer's instructions to ensure proper operation. In addition to the maintenance program, calibrations are carried out on each measurement device according to the schedule outlined by the California Air Resources Board (CARB). The schedule for maintenance and calibrations are given in Tables B-1 and B-2. Quality control checks are also conducted in the field for each test program. The following is a partial list of checks made as part of each CEM system test series.

- Sample acquisition and conditioning system leak check.
- 2-point analyzer calibrations (all analyzers)
- 3-point analyzer calibrations (analyzers with potential for linearity errors).
- Complete system calibration check ("dynamic calibration" through entire sample system).

- Periodic analyzer calibration checks (once per hour) are conducted at the start and end of each test run. Any change between pre- and post-test readings are recorded.

- All calibrations are conducted using gases certified by the manufacturer to be + 1% of label value (NBS traceable).

Calibration and CEM performance data are fully documented, and are included in each source test report.

Chain of Custody. Carnot maintains full chain of custody documentation on all samples and data sheets. In addition to normal documentation of changes between field sample custodians, laboratory personnel, and field test personnel, Carnot documents every individual who handles any test component in the field (e.g., probe wash, impinger loading and recovery, filter loading and recovery, etc.).

Samples are stored in a locked area to which only Source Test Division personnel have access. Neither other Carnot employees nor cleaning crews have keys to this area.

Data sheets are copied immediately upon return from the field, and this first generation copy is placed in locked storage. Any notes made on original sheets are initialed and dated.

Training. Personnel training is essential to ensure quality testing. Carnot has formal and informal training programs which include:

1. Attendance at EPA-sponsored training courses.
2. Enrollment in EPA correspondence courses.
3. A requirement for all technicians to read and understand Carnot's QA Manual.
4. In-house training and QA meetings on a regular basis.
5. Maintenance of training records.

Knowledge of Current Test Methods. With the constant updating of standard test methods and the wide variety of emerging test methods, it is essential that any qualified source tester keep abreast of new developments. Carnot subscribes to services which provide updates on EPA and CARB reference methods, and on EPA, CARB and SCAQMD rules and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences. Carnot personnel maintain membership in the Air and Waste Management Association, the Source Evaluation Society, and the ASME Environmental Control Division.

AGENCY CERTIFICATION

Carnot is certified by the CARB as an independent source test contractor for gaseous and particulate measurements. Carnot is certified by the SCAQMD as an independent source test contractor for gaseous and particulate measurements using SCAQMD Methods 1, 2, 3, 4, 5, 6, 7 and 100.1. Carnot also participates in EPA QA audit programs for Methods 5, 6 and 7.

TABLE B-1
SAMPLING INSTRUMENTS AND EQUIPMENT CALIBRATION SCHEDULE
As Specified by the CARB

Instrument Type	Frequency of Calibration	Standard of Comparison or Method of Calibration	Acceptance Limits
Orifice Meter (large)	12 months	Calibrated dry test meter	± 2% of volume measured
Dry Gas Meter	12 months or when repaired	Calibrated dry test meter	± 2% of volume measured
S-Type Pitot (for use with EPA-type sampling train	6 months	EPA Method 2	Cp constant (+5%) over working range; difference between average Cp for each leg must be less than 2%
Vacuum Gauges Pressure Gauges	6 months	Manometer	± 3%
Field Barometer	6 months	Mercury barometer	± 0.2" Hg
Temperature Measurement	6 months	NBS mercury thermometer or NBS calibrated platinum RTD	± 4°F for <400°F ± 1.5% for >400°F
Temperature Readout Devices	6 months	Precision potentiometer	± 2% full scale reading
Analytical Balance	12 months (cbeck prior to each use)	Should be performed by manufacturer or qualified laboratory	± 0.3 mg of stated weight
Probe Nozzles	12 Months	Nozzle diameter check micrometer	Range < ± 0.10 mm for three measurements
Continuous Analyzers	Depends upon use, frequency and performance	As specified by manufacturers operating manuals, EPA NBS gases and/or reference methods	Satisfy all limits specified in operating specifications

TABLE B-2
EQUIPMENT MAINTENANCE SCHEDULE
Based on Manufacturer's Specifications and Carnot Experience

Equipment	Performance Requirement	Maintenance Interval	Corrective Action
Pumps	1. Absence of leaks 2. Ability to draw manufacturer required vacuum and flow	Every 500 hours of operation or 6 months, whichever is less	1. Visual inspection 2. Clean 3. Replace worn parts 4. Leak check
Flow Measuring Device	1. Free mechanical movement 2. Absence of malfunction	Every 500 hours of operation or 6 months, whichever is less After each test, if used in H_2S sampling or other corrosive atmospheres	1. Visual inspection 2. Clean 3. Calibrate
Sampling Instruments	1. Absence of malfunction 2. Proper response to zero, span gas	As required by the manufacturer	As recommended by manufacturer
Integrated Sampling Tanks	Absence of leaks	Depends on nature of use	1. Steam clean 2. Leak check
Mobile Van Sampling Systems	Absence of leaks	Depends on nature of use	1. Change filters 2. Change gas dryer 3. Leak check 4. Check for system contamination
Sampling Lines	Sample degradation less than 2%	After each test or test series	Blow filtered air through line until dry

Appendix B.2

ARB Certification

State of California
AIR RESOURCES BOARD

Executive Order G-94-028

Approval to Carnot
To Conduct Testing as an Independent Contractor

WHEREAS, the Air Resources Board (ARB), pursuant to Section 41512 of the California Health and Safety Code, has established the procedures contained in Section 91200-91220, Title 17, California Code of Regulations, to allow the use of independent testers for compliance tests required by the ARB; and

WHEREAS, pursuant to Sections 91200-91220, Title 17, California Code of Regulations, the Executive Officer has determined that Carnot meets the requirements of the ARB for conducting ARB Test Methods 1, 2, 3, 4, 5, 6, 8, 10, and 100 (NOx, O2) when the following conditions are met:

1. Carnot conducts ARB Test Method 100 for O2 using a Teledyne 326 analyzer with either a A5 or a B1 sensor, or a paramagnetic analyzer.

NOW, THEREFORE, BE IT ORDERED that Carnot is granted an approval, from the date of execution of this order, until June 30, 1995 to conduct the tests listed above, subject to compliance with Section 91200-91220, Title 17, California Code of Regulations.

BE IT FURTHER ORDERED that during the approved period the Executive Officer or his or her authorized representative may field audit one or more tests conducted pursuant to this order for each type of testing listed above.

Executed this 29TH day of JUNE 1994, at Sacramento, California.

James J. Morgester, Chief
Compliance Division

STATE OF CALIFORNIA

AIR RESOURCES BOARD
2020 L STREET
P.O. BOX 2815
SACRAMENTO, CA 95812

RECEIVED
JUL 13 1994
CARNOT

PETE WILSON, Governor

July 8, 1994

Mr. Michael L. Schmitt
Carnot
15991 Red Hill Avenue, Suite 110
Tustin, California 92680

Dear Mr. Schmitt:

Testing Approval

We are pleased to inform you that we have renewed your approval to conduct the types of testing listed in the enclosed Executive Order. This approval is valid until June 30, 1995 during which time a field audit of your company's testing ability may be conducted. We have also enclosed a certificate of approval.

Should you have any questions or need further assistance, please contact Ms. Kathryn Gugeler at (916) 327-1521 or Mr. David Tribble at (916) 323-2217. All correspondence should be addressed to me at the post office box above.

Sincerely,

James J. Morgester, Chief
Compliance Division

Enclosures

cc: Mr. Ed Jeung
Department of Health Services
Air and Industrial Hygiene Laboratory
2151 Berkeley Way
Berkeley, California 94704

State of California

Air Resources Board

Approved Independent Contractor

Carnot

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to Section 91207, Title 17, California Code of Regulations, until June 30, 1995, for those test methods listed below:

ARB Source Test Methods:
1, 2, 3, 4, 5, 6, 8, 10, 100(NOx, O2)

James J. Morgester, Chief
Compliance Division

Laura McKinney, Manager
Certification and Investigation Section

Appendix B.3

Calibration Data

CARNOT
SPAN GAS RECORD

CLIENT/LOCATION: UCOS - Colmac DATE: 6/27/98

BY: GS

GAS	SPAN CYLINDER		AUX. SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO		99.999 %		
NOx	AAL3583	88.54	AAL12400	47.51
O_2	ALM045927	8.937	ALM05739	12.45
CO				
CO_2	ALM 045927	22.43	ALM05739	15.16
SO_2				

CARNOT
INSTRUMENT LINEARITY

	ANALYZER				
	O_2	CO_2	CO	NOx	SO_2
ANALYZER RANGE	0-25	—	—	0-100	—
SET TO HIGH STD (80-90% OF RANGE)	20.9	—	—	88.5	—
ACTUAL VALUE OF LOW STD	12.45	—	—	47.51	—
AS-FOUND LOW STD (50-60% OF RANGE)	12.33	—	—	48.9	—
DIFFERENCE IN % OF FULL SCALE	0.5	—	—	+1.3	—

% ERROR CALCULATION:

$$\frac{(\text{AS FOUND} - \text{ACTUAL VALUE OF SPAN})}{\text{RANGE}} \times 100$$

ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIP CHART).

PMF-009

CARNOT

CARNOT
SPAN GAS RECORD

CLIENT/LOCATION: UCOS Colmac DATE: 6-28-94

BY: D.W.

GAS	SPAN CYLINDER		AUX. SPAN CYLINDER	
	CYLINDER NO.	CONCENTRATION	CYLINDER NO.	CONCENTRATION
ZERO				
NOx	AAL3583	88.54	AAL12400	47.51
O_2	ALM-045927	8.937	ALM5739	12.45
CO				
CO_2				
SO_2				

CARNOT
INSTRUMENT LINEARITY

	ANALYZER				
	O_2	CO_2	CO	NOx	SO_2
ANALYZER RANGE	0-25			0-100	
SET TO HIGH STD (80-90% OF RANGE)	20.74			88.5	
ACTUAL VALUE OF LOW STD	12.45			47.51	
AS-FOUND LOW STD (50-60% OF RANGE)	12.55			47.00	
DIFFERENCE IN % OF FULL SCALE	.5%			.5%	

% ERROR CALCULATION:

$$\frac{(\text{AS FOUND} - \text{ACTUAL VALUE OF SPAN})}{\text{RANGE}} \times 100$$

ALLOWABLE DEVIATION IS 2% OF FULL SCALE (2 SQUARES ON STRIP CHART).

CARNOT

PMF-039

CARNOT
CEM PERFORMANCE DATA

CLIENT/LOCATION: UCOS-Colmac DATE: 6/28/94

BY: [illegible]

SYSTEM CONFIGURATION F600				
ANALYZERS IN SERVICE				
ANALYZERS:	O_2	CO_2	CO	NOx
MODEL:	Teledyne	PIR 2000	48	10S
SERIAL NO.:				

PROBE	MAIN	AUX	SAMPLE CONDITIONER	
LENGTH:	6'	4'	CONDENSER-VACUUM SIDE (CHECK FLOW):	✓
LINER MATERIAL:	SS	SS	CONDENSER-PRESSURE SIDE (CHECK FLOW):	✓
HEATED PROBE (Y/N):	no	no	CONDENSER TEMPERATURE:	40
HEATED LINE (Y/N):	yes	yes	FILTER CONDITION (COND. OR DATE LAST CHANGED):	5/24/94

SAMPLE LINE			SYSTEM LEAK CHECK	MAIN	AUX
LENGTH:	50'	50'	PRE-TEST (cfh):	0.0	0.0
LINER MATERIAL:	teflon	teflon	POST-TEST (cfh):		
SYSTEM BIAS LINE:	teflon	teflon	LEAK RATE (%) = POST-TEST (cfh) / SYSTEM FLOW RATE (cfm) x 60 x 100 = _____ %		

ON-STACK CONDITIONER		NOx CONVERSION EFFICIENCY	
IN SERVICE (Y/N):	yes	HIGH CAL NOx	
KNOCK-OUT CONDITION (CHECK FLOW):	✓	HIGH CAL NO (AS FOUND)	1
COOLANT:	ICE	LOW CAL NOx	
		LOW CAL NO (AS FOUND)	1

OPERATING CONDITIONS	
SAMPLE PRESSURE:	SYSTEM RESPONSE TIME CHECK
SAMPLE VACUUM:	UPSCALE: _____ sec.
NOx VACUUM:	DOWNSCALE: _____ sec.

PMF-011

CARNOT

Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411 (909) 887-2571 FAX: (909) 887-0549

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
CARNOT
RICK MADRIGAL
15991 RED HILL AVE
TUSTIN, CA 92680

Assay Laboratory
Scott Specialty Gases
2600 Cajon Boulevard
San Bernardino, CA 92411

Purchase Order 1818
Project # 30380.003

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September 1993.

Cylinder Number ALM045739 Certification Date 03-15-94 Exp. Date 03-15-97
Cylinder Pressure+ 2000 PSIG

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
(CARBON DIOXIDE)	15.16 %	± 1 % NIST Traceable
(OXYGEN)	12.45 %	
(Nitrogen)	Balance Gas	

+Do not use when cylinder pressure is below 150 psig.
*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement process.

REFERENCE STANDARD

Type/Sample No.	Expiration Date	Cylinder Number	Concentration
GMIS	06-94	A018082	18.97 % CO2 IN N2
GMIS	06-94	A6513	12.45 % O2 IN N2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
CO2:Horiba / OPE-135C / 56553902	02-22-94	NDIR
O2:Horiba / OPE-335 / 850557042	02-25-94	Magnetopneumatic

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Carbon Dioxide

First Triad Analysis — Date: 03-15-94 Response Units: mv

Z1= 0.00	R1= 97.0	T1= 85.9
R2= 97.0	Z2= 0.00	T2= 85.8
Z3= 0.00	T3= 85.8	R3= 97.0

Avg. Conc. of Cust Cyl. 15.16 %

Second Triad Analysis — Date: Response Units: mv

Z1=	R1=	T1=
R2=	Z2=	T2=
Z3=	T3=	R3=

Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration= Ax^3+Bx^2+Cx+D
A =0.000007988
B =-0.0002002
C =0.1000
D =-0.0001333

Oxygen

First Triad Analysis — Date: 03-15-94 Response Units: mv

Z1= 0.00	R1= 94.1	T1= 49.8
R2= 94.1	Z2= 0.00	T2= 49.8
Z3= 0.00	T3= 49.8	R3= 94.1

Avg. Conc. of Cust Cyl. 12.45 %

Second Triad Analysis — Date: Response Units: mv

Z1=	R1=	T1=
R2=	Z2=	T2=
Z3=	T3=	R3=

Avg. Conc. of Cust Cyl.

Calibration Curve — Concentration= Ax + B
A =0.2500
B =-0.004586

Date: Response Units: mv

Z1=	R1=	T1=
R2=	Z2=	T2=
Z3=	T3=	R3=

Avg. Conc. of Cust Cyl.

Date: Response Units: mv

Z1=	R1=	T1=
R2=	Z2=	T2=
Z3=	T3=	R3=

Avg. Conc. of Cust Cyl.

Concentration=

Special Notes:

ANALYST

Scott Specialty Gases, Inc.

2600 CAJON BOULEVARD, SAN BERNARDINO, CA 92411 (909) 887-2571 FAX: (909) 887-0549

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer	Assay Laboratory		
CARNOT	Scott Specialty Gases	Purchase Order	1914
RICK MADRIGAL	2600 Cajon Boulevard	Project #	30667 009
15991 RED HILL AVE	San Bernardino, CA 92411		
SUITE 110			
TUSTIN, CA 92680			

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September 1993.

Cylinder Number ALM045927 Certification Date 03-30-94 Exp. Date 03-30-97
Cylinder Pressure+ 1900 PSIG

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
(CARBON DIOXIDE)	22.43 %	± 1 % NIST Traceable
(OXYGEN)	8.937 %	
(Nitrogen)	Balance Gas	

+Do not use when cylinder pressure is below 150 psig.
*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type/Sample No.	Expiration Date	Cylinder Number	Concentration
CRM1675	06-94	ALM001136	14.08 % CO2/N2
GMIS	06-94	A10868	9.520 % O2/N2

INSTRUMENTATION

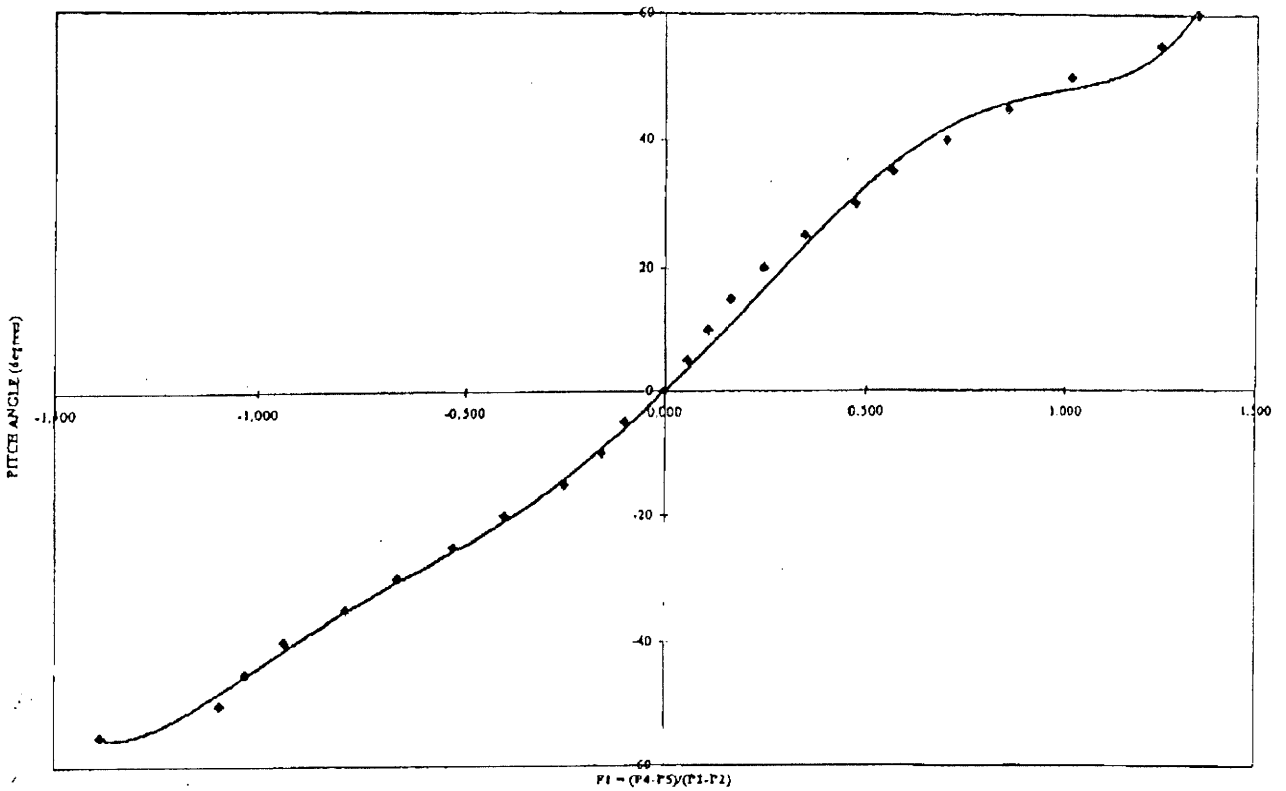
Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
CO2:PIR2000-ACUBLEND	03-24-94	NDIR
O2:Horiba / OFE-335 / 850557042	03-30-94	Magnetopneumatic

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Carbon Dioxide	Date: 03-30-94 Response Units: mv Z1= 0.00 R1= 72.9 T1= 92.2 R2= 72.9 Z2= 0.00 T2= 92.2 Z3= 0.00 T3= 92.2 R3= 72.9 Avg. Conc. of Cust Cyl. 22.43 %	Date: Response Units: mv Z1= R1= T1= R2= Z2= T2= Z3= T3= R3= Avg. Conc. of Cust Cyl.	Concentration= $Ax^4+Bx^3+Cx^2+DX+E$ A =0.0000001942 B =-0.00001975 C =0.001882 D =0.08535 E =0.002942
Oxygen	Date: 03-30-94 Response Units: mv Z1= 0.00 R1= 95.3 T1= 89.4 R2= 95.3 Z2= 0.00 T2= 89.4 Z3= 0.00 T3= 89.3 R3= 95.3 Avg. Conc. of Cust Cyl. 8.937 %	Date: Response Units: mv Z1= R1= T1= R2= Z2= T2= Z3= T3= R3= Avg. Conc. of Cust Cyl.	Concentration= Ax + B A =0.09999 B =0.0004275
	Date: Response Units: mv Z1= R1= T1= R2= Z2= T2= Z3= T3= R3=	Date: Response Units: mv Z1= R1= T1= R2= Z2= T2= Z3= T3= R3=	Concentration=

Analyst: [signature]

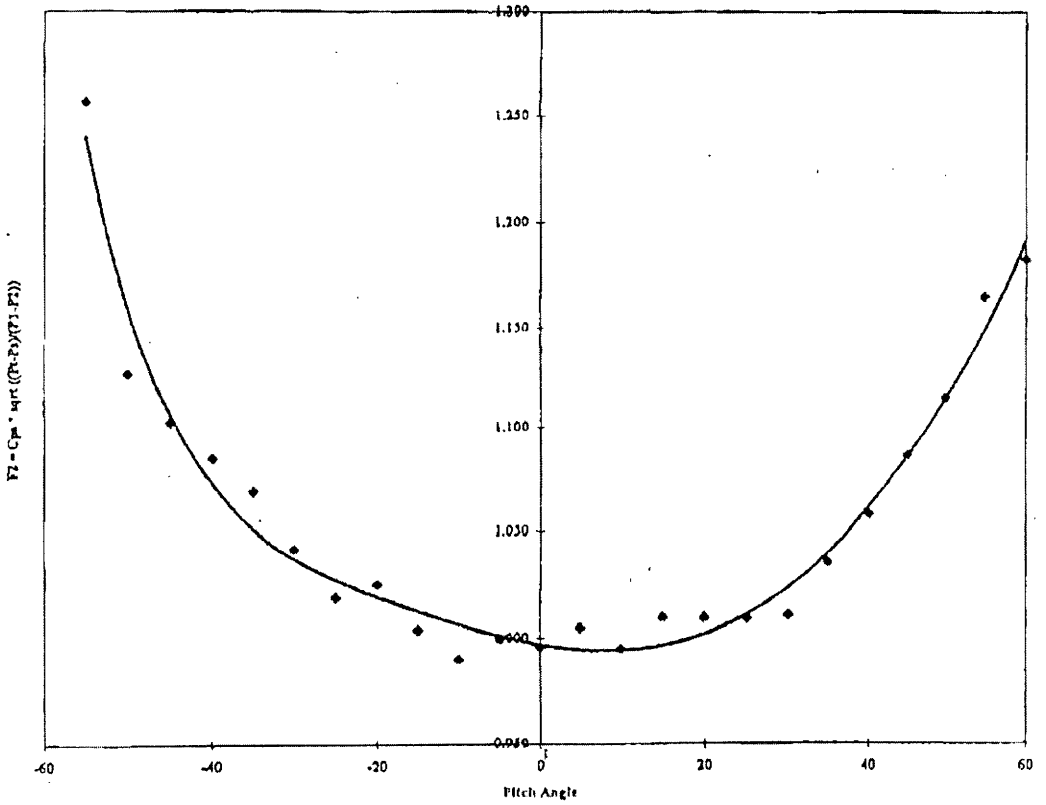
CARNOT
3-DIMENSIONAL VELOCITY PROBE CALIBRATION
PITCH ANGLE vs. F1
PROBE ID: B-2455



Pitch Angle = 63.09X + 23.69X^2 - 24.505X^3 - 33.312X^4 + 7.5203X^5 + 11.669X^6

Performed By: MM/RM
Date: 5/13/94

CARNOT
3-DIMENSIONAL VELOCITY PROBE CALIBRATION
F2 vs. PITCH ANGLE
PROBE ID: B-2455



$F2 = 0.997 + 0.0007X + 3E\text{-}5X^2 + 8E\text{-}7X^3 + 1E\text{-}8X^4 - 3E\text{-}10X^5 + 3E\text{-}12X^6$

Performed By: MM/RM
Date: 5/18/94

APPENDIX C
DATA SHEETS

Appendix C.1

Sample Locations

CARNOT

SAMPLING POINT LOCATION DATA - EPA METHOD 1

PLANT: Ucos - Colmac DATA BY: EP

DATE: 6/27/96

TEST LOCATION: Unit 2 Duct

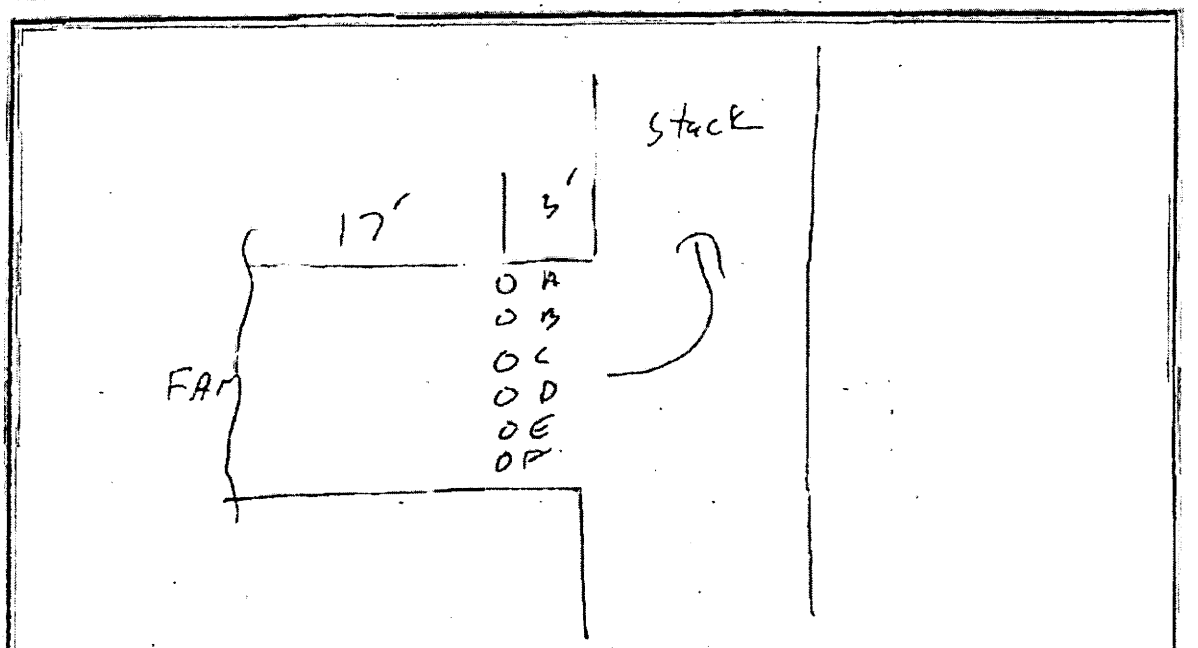


Diagram of Sampling Location

UPSTREAM DIST./DIA.: 17/

DOWNSTREAM DIST./DIA.: 3/

COUPLING LENGTH: 8"

NO. OF SAMPLING PTS.: 42

STACK DIMENSION: 47" x 119"

STACK AREA, FT²: 38.8

SAMPLE POINT	% OF DIAMETER	IN. FROM NEAR WALL	IN. FROM NOZZLE*
1		3.4	11.42
2		10.3	19.3
3		17.14	25.14
4		24	32
5		30.86	38.86
6		37.7	45.71
7		44.5	52.57

*INCHES FROM WALL PLUS COUPLING LENGTH

CARNOT

PMF-002

Appendix C.2

CEM Data

(1)

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCU - Colmac
DATE: 6/28/94
OPERATOR: EP
TEST LOCATION: Unit 1 outlet
TEST NUMBERS: 1-1- Stack

AMBIENT TEMP., DB/WB: ~115
BAROMETRIC PRESSURE: 29.80
DUCT STATIC PRESSURE: -0.7
FUEL: Bio Mass

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	Ref DRY, UNCORRECTED							CORRECTED TO ___% ___, DRY		
			O_2	O_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
		zero span	.3/12.2	.1/12.2								
1-1	~~1218~~ 1221	A5	6.9	6.9								
	1221 1224	A4	7.2	7.1								
	1224 1227	A3	6.7	6.7								
	1227 1230	A2	7.0	7.2								
*	1230 1233	A1	7.1	8.0								
	1236 1239	B5	6.5	6.5								
	1239 1242	B4	6.7	6.7								
	1242 1245	B3	6.9	6.6								
	1245 1248	B2	6.3	6.2								
	1248 1251	B1	6.5	6.5								

COMMENTS:

CARNOT

PMF-013

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS-Colmac
DATE: 6/28/94
OPERATOR: EP
TEST LOCATION: Unit 1
TEST NUMBERS: 1-1- Start

AMBIENT TEMP., DB/WB:
BAROMETRIC PRESSURE:
DUCT STATIC PRESSURE:
FUEL: Bio Mass

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	Ref DRY, UNCORRECTED							CORRECTED TO ___% ___, DRY		
			O_2	CO_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
	1254/1257	C5	6.6	6.5								
	1257/1300	C4	6.3	6.2								
	1300/1303	C3	6.4	6.4								
	1303/1306	C2	6.9	6.8								
	1306/1309	C1	6.7	6.7								
	1312/1315	D5	6.7	6.6								
	1315/1318	D4	6.7	6.8								
	1318/1321	D3	6.7	6.7								
	1321/1324	D2	6.6	6.6								
	1324/1327	D1	6.7	6.7								

COMMENTS:

CARNOT

PMF-013

(3)

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS-Colmac
DATE: 6/28/94
OPERATOR: SG
TEST LOCATION: Unit 2 Outlet
TEST NUMBERS: 1-1- Stroo

AMBIENT TEMP., DB/WB:
BAROMETRIC PRESSURE:
DUCT STATIC PRESSURE:
FUEL:

TEST NO	SAMPLE TIME	SAMPLE POINT/ CONDITION	DRY, UNCORRECTED (Rob)							CORRECTED TO ___% ___, DRY		
			O_2	O_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
1-1	1330/1333	E-5	7.0	6.9								
	1337/1330	E-4	6.6	6.6								
	1336/1339	E-3	6.6	6.6								
	1334/1342	E-2	6.9	6.8								
	1342/1345	E-1	6.9	6.6								
	1348/1351	F-5	6.5	6.5								
	1351/1354	F-4	6.2	6.2								
	1354/1357	F-3	6.8	6.8								
	1357/1400	F-2	6.8	6.8								
	1400/1403	F-1	6.8	6.8								
	1430/1409	A-1	6.5	6.5								
	SYS	Zero/SPAN	.1/12.1	.1/12.1								

COMMENTS:

CARNOT

PMF-013

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS - Gilmore

DATE: 6/28/94

OPERATOR: EF

TEST LOCATION: 2-2-CEM

TEST NUMBERS:

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL:

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	DRY, UNCORRECTED							CORRECTED TO ___% ___, DRY		
			O_2	O_2 REF	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
	SYS	zero / span	.3 / 12.2	.1 / 12.4								
	933 / 936	F5	7.0	7.0								
	934 / 939	F4	6.4	6.5								
	939 / 942	F3	7.3	7.4								
	942 / 945	F2	7.0	7.0								
	945 / 948	F1	6.7	6.7								
	951 / 954	E5	6.5	6.5								
	958 / 957	E-4	6.7	6.8								
	957 / 1000	E-3	7.1	7.1								
	1000 / 1003	E-2	6.9	7.0								
	1003 / 1006	E-1	6.7	6.8								

COMMENTS:

CARNOT

PMF-013

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: UCOS - Colmac

DATE: 6/28/94

OPERATOR: EC

TEST LOCATION:

TEST NUMBERS:

AMBIENT TEMP., DB/WB:

BAROMETRIC PRESSURE:

DUCT STATIC PRESSURE:

FUEL:

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	DRY, UNCORRECTED							CORRECTED TO ___% ___, DRY		
			Ref O_2	O_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
2-2	1009/1012	D-5	6.9	7.0								
	1012/1015	D-4	6.3	6.4								
	1015/1018	D-3	7.2	7.2								
	1018/1021	D-2	7.7	7.7								
	1021/1024	D-1	7.0	7.0								
	1033/1036	C-5	6.5	6.4								
	1030/1039	C-4	6.6	6.6								
	1039/1042	C-3	6.5	6.6								
	1042/1045	C-2	6.4	6.4								
	1045/1048	C-1	7.4	7.5								

COMMENTS:

CARNOT

PMF-013

CARNOT
CONTINUOUS EMISSIONS MEASUREMENTS

CLIENT: VCOS - Colmac

DATE: 6/28/96

OPERATOR: [illegible]

TEST LOCATION: outlet #2

TEST NUMBERS: 2-2-ST

AMBIENT TEMP., DB/WB: 105

BAROMETRIC PRESSURE: 29.92

DUCT STATIC PRESSURE:

FUEL: Bio Mass

TEST NO.	SAMPLE TIME	SAMPLE POINT/ CONDITION	Ref DRY, UNCORRECTED							CORRECTED TO ___% ___ DRY		
			O_2	O_2	CO	NOx	NO	NO_2	SO_2	CO	NOx	SO_2
	1051/1054	B-5	6.0	6.1								
	1054/1057	B-4	6.2	6.3								
	1057/1100	B-3	6.5	6.6								
	1100/1103	B-2	6.7	6.8								
	1103/1106	B-1	6.6	6.7								
	1109/1112	A-5	7.1	7.3								
	1112/1115	A-4	6.7	6.9								
	1115/1118	A-3	7.4	7.5								
	1118/1121	A-2	6.7	6.8								
	1121/1124	A-1	6.4	6.6								
	SYS	200/[illegible]	.3/12.2	.1/12.4								

COMMENTS:

PMF-013

CARNOT

Appendix C.3

3D Flow Data

CARNOT

3-DIMENSIONAL VELOCITY DATA

Client/Location: UCOS Colmac

Sample Location: Unit 1 outlet

Unit No: 1

Test No: 1-3-BD-traverse

Barometric Pressure (in Hg):

Static Pressure in Stack (iwg):

Date: 6-28-94

Data Taken By: Dave Womble

Test Description: 3-D traverse

Pitot I.D. No.:

Pre-Test Leak Check: o.k

Post-Test Leak Check: O.K

Time	Port	Point	Yaw Angle (Degrees)	Velocity (P1-P2)	Pitch (P4-P5)	Temperature (F)
	D	7	-10	.45	0	413
		6	-6	.47	0	413
		5	-5	.43	+.01	414
1215		4	0	.40	+.01	414
		3	-1	.39	+.01	416
		2	0	.34	+0	416
		1	0	.31	+.01	415
	BC	7	-10	.4	-.04	415
	BC	6	-10	.35	-.02	416
		5	-5	.37	-0	416
		4	0	.35	0	417
		3	+5	.41	+.01	417
		2	+8	.4	+.02	417
		1	+10	.33	+.03	417
	B	7	-5	.56	0	416
		6	-10	.57	0	417
		5	-6	.48	0	417
		4	-8	.34	-.02	417
		3	0	.26	+.03	417
		2	+7	.26	+.03	417
		1	+8	.28	+.01	417

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees

3D_DATA.XLS
2/14/94
8:03 PM

CARNOT

3-DIMENSIONAL VELOCITY DATA

Client/Location: UCOS Colmac

Date: 6-28

Sample Location: unit 1 outlet

Data Taken By: Dave W.

Unit No: 1

Test Description: 3-D traverse

Test No: 1-3-3D-traverse

Pitot I.D. No.:

Barometric Pressure (in Hg): 29.80

Pre-Test Leak Check

Static Pressure in Stack (iwg):

Post-Test Leak Check:

Time	Port	Point	Yaw Angle (Degrees)	Velocity (P1-P2)	Pitch (P4-P5)	Temperature (F)
	A	7	-10	.59	-.03	415
		6	-8	.48	-.03	416
		5	-6	.48	-.03	418
		4	0	.5	-.05	418
		3	0	.57	-.04	419
		2	0	.6	-.05	419
		1	0	.6	-.03	419
	E	7	~~+5~~	.57	.0	419
		6	-8	.55	0	420
		5	0	.56	0	420
		4	0	.6	0	420
		3	-3	.58	0	420
		2	-2	.6	+.03	420
		1	-2	.58	+.02	420
	C	7	-4	.5	-.01	418
		6	0	.6	-.03	418
		5	+2	.55	-.04	419
		4	0	.52	-.04	419
		3	0	.62	-.04	419
		2	0	.62	-.04	419
		1	0	.60	-.03	419

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

3D_DATA.XLS
2/14/94
8:03 PM

CARNOT

3-DIMENSIONAL VELOCITY DATA

Client/Location: UCCF

Sample Location: Unit 2 outlet

Unit No: 2

Test No: 2-2-3D

Barometric Pressure (in Hg):

Static Pressure in Stack (iwg): -0.75

Date: 8-28-94

Data Taken By: D. W

Test Description: 3-D

Pitot I.D. No.:

Pre-Test Leak Check

Post-Test Leak Check:

Time	Port	Point	Yaw Angle (Degrees)	Velocity (P1-P2)	Pitch (P4-P5)	Temperature (F)
1035	A	7	-6	.55	-.05	439
		6	-9	.45	-.05	439
		5	-12	.45	-.05	439
		4	-3	.5	-.05	439
		3	-9	.6	-.04	439
		2	-8	.6	-.05	439
		1	-8	.55	-.00	440
	B	7	+5	.7	-.00	439
		6	-7	.65	0	439
		5	0	.57	0	439
		4	-1	.48	0	439
		3	-2	.72	0	439
		2	-3	.25	0	438
		1	-15	.27	-.02	438
	C	7	0	.41	-.01	437
		6	0	.42	-.02	436
		5	0	.37	-.01	437
		4	-2	.37	+.01	437
		3	-6	.36	+.02	437
		2	-7	.4	+.02	437
		1	-9	.36	+.02	437

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

3D_DATA.XLS
2/14/94
8:03 PM

CARNOT

3-DIMENSIONAL VELOCITY DATA

Client/Location: UCOS Colmac

Sample Location: Outlet

Unit No: 2

Test No: 2-2-3D-Vel

Barometric Pressure (in Hg): 29.82

Static Pressure in Stack (in g):

Date: 6-27-94

Data Taken By: Dave Wonderly

Test Description: 3-D

Pitot I.D. No.:

Pre-Test Leak Check: O.K

Post-Test Leak Check: O.K

Time	Port	Point	Yaw Angle (Degrees)	Velocity (P1-P2)	Pitch (P4-P5)	Temperature (F)
	F	7	-7°	.55	-.05	
		6	-7°	.57	-.04	446
		5	-7°	.50	-.06	441
		4	-6°	.59	-.03	443
		3	-1	.66	-.03	441
		2	-8°	.69	0	442
		1	-10	.52	+.07	445
	E	7	-9°	.52	0	441
		6	-10°	.52	+.01	442
		5	-5°	.54	+.02	442
		4	-7°	.55	0	442
		3	-3°	.53	0	441
		2	-9°	.53	0	441
		1	-10°	.55	+.02	440
	D	7	0	.49	0	440
		6	+1	.45	+.02	438
		5	-2	.42	+.02	437
		4	0	.39	+.01	437
		3	0	.36	0	437
		2	-3°	.30	-.01	437
		1	+2	.25	0	437

Note: Clockwise rotation of the probe corresponds to a positive yaw angle: > 0 or > 90 degrees.

3D_DATA.XLS
2/14/94
8:03 PM

APPENDIX D
CALCULATIONS

3D VELOCITY - DATA AND WORKSHEET

Client:	UCOS COLMAC
Unit:	#1
Sample Location:	Outlet duct
Test No.:	1-1-36
Probe ID No.:	B-2131
Unit Load:	
Test Date:	6/28/94
Time (Start/Stop):	0950/1145

Date:	
Data By:	DF
Baro. Pressure, in Hg.:	29.90
Static Pressure, in WG:	-0.78
Abs. Pressure, in Hg.:	29.84
Average O2, % dry:	6.70
Average CO2, % dry:	12.00
Moisture Content, %:	15.00
Molecular Weight, wet:	28.36

Sample Point		Yaw Angle deg.	Pitch P4-P5 in WG	Total P1-P2 in WG	Stack Temp. F	P4-P5/ P1-P2 in WG	Pitch Angle deg.	Pt-Ps/ P1-P2 in WG	Pt-Ps in WG	Result Angle deg.	Velocity uncorr.* fps	Velocity Axial fps
A	7	-10	-0.03	0.58	415	-0.05	-3.2	1.00	0.58	10.5	66.1	65.0
A	6	-8	-0.03	0.48	416	-0.06	-3.8	1.00	0.48	8.9	60.2	59.4
A	5	-6	-0.03	0.48	418	-0.06	-3.8	1.00	0.48	7.1	60.2	59.8
A	4	0	-0.05	0.50	418	-0.10	-6.1	1.00	0.50	6.1	61.5	61.2
A	3	0	-0.04	0.57	419	-0.07	-4.3	1.00	0.57	4.3	65.7	65.5
A	2	0	-0.05	0.60	419	-0.08	-5.1	1.00	0.60	5.1	67.4	67.2
A	1	0	-0.03	0.60	419	-0.05	-3.1	1.00	0.60	3.1	67.4	67.3
E	7	-5	0.00	0.53	419	0.00	0.0	1.00	0.53	5.0	63.2	63.0
E	6	-8	0.00	0.55	420	0.00	0.0	1.00	0.55	8.0	64.4	63.8
E	5	0	0.00	0.56	420	0.00	0.0	1.00	0.56	0.0	65.0	65.0
E	4	0	0.00	0.60	420	0.00	0.0	1.00	0.60	0.0	67.3	67.3
E	3	-3	0.00	0.58	420	0.00	0.0	1.00	0.58	3.0	66.2	66.1
E	2	-2	0.03	0.60	420	0.05	3.2	1.00	0.60	3.8	67.2	67.1
E	1	-2	0.02	0.58	420	0.03	2.2	1.00	0.58	3.0	66.1	66.0
F	7	-4	-0.01	0.50	418	-0.02	-1.3	1.00	0.50	4.2	61.4	61.2
F	6	0	-0.03	0.60	418	-0.05	-3.1	1.00	0.60	3.1	67.3	67.2
F	5	2	-0.04	0.55	419	-0.07	-4.5	1.00	0.55	4.9	64.5	64.3
F	4	0	-0.04	0.52	419	-0.08	-4.7	1.00	0.52	4.7	62.8	62.5
F	3	0	-0.04	0.62	419	-0.06	-4.0	1.00	0.62	4.0	68.5	68.3
F	2	0	-0.04	0.62	419	-0.06	-4.0	1.00	0.62	4.0	68.5	68.3
F	1	0	-0.03	0.60	419	-0.05	-3.1	1.00	0.60	3.1	67.4	67.3
D	7	-10	0.00	0.45	413	0.00	0.0	1.00	0.45	10.0	58.1	57.2
D	6	-6	0.01	0.47	413	0.02	1.4	1.00	0.47	6.2	59.3	59.0
D	5	-5	0.01	0.43	414	0.02	1.5	1.00	0.43	5.2	56.8	56.5
D	4	0	0.01	0.40	414	0.03	1.6	1.00	0.40	1.6	54.7	54.7
D	3	1	0.01	0.39	416	0.03	1.6	1.00	0.39	1.9	54.1	54.1
D	2	0	0.00	0.34	416	0.00	0.0	1.00	0.34	0.0	50.6	50.6
D	1	0	0.01	0.31	415	0.03	2.1	1.00	0.31	2.1	48.2	48.2
C	7	-10	-0.04	0.40	415	-0.10	-6.1	1.00	0.40	11.7	54.9	53.8
C	6	-10	-0.02	0.35	416	-0.06	-3.5	1.00	0.35	10.6	51.4	50.5
C	5	-5	0.00	0.37	416	0.00	0.0	1.00	0.37	5.0	52.7	52.5
C	4	0	0.00	0.35	417	0.00	0.0	1.00	0.35	0.0	51.3	51.3
C	3	5	0.01	0.41	417	0.02	1.6	1.00	0.41	5.2	55.5	55.3
C	2	8	0.02	0.40	417	0.05	3.2	1.00	0.40	8.6	54.8	54.2
C	1	10	0.03	0.33	417	0.09	5.9	0.99	0.33	11.6	49.8	48.7
B	7	-9	0.00	0.58	416	0.00	0.0	1.00	0.58	9.0	66.0	65.2
B	6	-10	0.00	0.57	417	0.00	0.0	1.00	0.57	10.0	65.5	64.5
B	5	-6	0.00	0.48	417	0.00	0.0	1.00	0.48	6.0	60.1	59.8
B	4	-8	0.02	0.34	417	0.06	3.8	0.99	0.34	8.8	50.5	49.9
B	3	0	0.03	0.26	417	0.12	7.6	0.99	0.26	7.6	44.2	43.8
B	2	7	0.03	0.26	417	0.12	7.6	0.99	0.26	10.3	44.2	43.5
B	1	8	0.01	0.28	417	0.04	2.3	1.00	0.28	8.3	45.9	45.4

RESULTS

0.48

Yaw Angle:	2.0 degrees	Stack Temperature:	417 F
Pitch Angle:	-0.4 degrees	Velocity*:	59.45 fps (feet per sec.)
Resultant Angle:	5.6 degrees	Axial Velocity:	59.08 fps
Standard Deviation:	3.3 degrees		

*velocity in the direction of flow

CARNOT
15991 Red Hill Ave., Suite 110
714-259-9520
FAX 714-259-0372

40985 XLS/1-1-36

STRATIFICATION CHECK

Client: UCOS COLMAC
Project #: 1409-40950
Unit No: 1.0
Date: 6/28/94

Point	O_2 pt	Ref O_2	% Diff	Point	O_2 pt	Ref O_2	% Diff
A5	6.9	6.9	0.0%	D5	6.5	6.4	-1.6%
A4	7.2	7.1	-1.4%	D4	6.6	6.6	0.0%
A3	6.7	6.7	0.0%	D3	6.7	6.7	0.0%
A2	7.0	7.2	2.8%	D2	6.6	6.6	0.0%
A1	6.5	6.5	0.0%	D1	6.7	6.7	0.0%
B5	6.5	6.5	0.0%	E5	7.0	6.9	-1.4%
B4	6.7	6.7	0.0%	E4	6.6	6.6	0.0%
B3	6.7	6.6	-1.5%	E3	6.6	6.6	0.0%
B2	6.3	6.2	-1.6%	E2	6.9	6.8	-1.5%
B1	6.5	6.5	0.0%	E1	6.7	6.6	-1.5%
C5	6.6	6.5	-1.5%	F5	6.5	6.5	0.0%
C4	6.3	6.2	-1.6%	F4	6.2	6.2	0.0%
C3	6.4	6.4	0.0%	F3	6.8	6.8	0.0%
C2	6.9	6.8	-1.5%	F2	6.8	6.8	0.0%
C1	6.7	6.7	0.0%	F1	6.8	6.8	0.0%

O2 Stratification= -0.4%

CARNOT
15991 Red Hill Ave. Suite 110
Tustin, California 92680
714-259-9520
FAX 714-259-0372

40985.XLS/1-1-Strat

10/3/94
8:40 AM

3D VELOCITY - DATA AND WORKSHEET

Client:	UCOS COLMAC	Date:	
Unit:	# 2	Data By:	EF
Sample Location:	Outlet duct	Baro. Pressure, in Hg.:	29.90
Test No.:	2-2-3d	Static Pressure, in WC:	-0.78
Probe ID No.:	B-2131	Abs. Pressure, in Hg.:	29.84
Unit Load:		Average O2, % dry:	6.70
Test Date:	6/28/94	Average CO2, % dry:	12.00
Time (Start/Stop):	0950/1145	Moisture Content, %:	15.00
		Molecular Weight, wet:	28.36

Sample Point		Yaw Angle deg.	Pitch P4-P5 in WG	Total P1-P2 in WG	Stack Temp F	P4-P5/ P1-P2 in WG	Pitch Angle deg.	Pt-Ps/ P1-P2 in WG	Pt-Ps in WG	Result Angle deg.	Velocity uncorr.* fps	Axial fps
A	7	-6	-0.05	0.55	439	-0.09	-5.5	1.00	0.55	8.1	65.3	64.6
A	6	-9	-0.05	0.45	439	-0.11	-6.7	1.00	0.45	11.2	59.1	58.0
A	5	-12	-0.05	0.45	439	-0.11	-6.7	1.00	0.45	13.7	59.1	57.4
A	4	-3	-0.05	0.50	439	-0.10	-6.1	1.00	0.50	6.8	62.3	61.8
A	3	-9	-0.04	0.60	439	-0.07	-4.1	1.00	0.60	9.9	68.1	67.1
A	2	-8	-0.05	0.60	439	-0.08	-5.1	1.00	0.60	9.5	68.2	67.3
A	1	-8	0.00	0.55	440	0.00	0.0	1.00	0.55	8.0	65.2	64.5
B	7	5	0.00	0.70	439	0.00	0.0	1.00	0.70	5.0	73.5	73.2
B	6	-3	0.00	0.65	439	0.00	0.0	1.00	0.65	3.0	70.8	70.7
B	5	0	0.00	0.57	439	0.00	0.0	1.00	0.57	0.0	66.3	66.3
B	4	-1	0.00	0.48	439	0.00	0.0	1.00	0.48	1.0	60.9	60.8
B	3	-2	0.00	0.32	439	0.00	0.0	1.00	0.32	2.0	49.7	49.7
B	2	-3	0.00	0.25	438	0.00	0.0	1.00	0.25	3.0	43.9	43.8
B	1	-15	-0.02	0.27	438	-0.07	-4.5	1.00	0.27	15.7	45.7	44.0
C	7	0	-0.01	0.41	437	-0.02	-1.5	1.00	0.41	1.5	56.2	56.2
C	6	0	-0.02	0.42	436	-0.05	-2.9	1.00	0.42	2.9	56.9	56.8
C	5	0	-0.02	0.37	437	-0.05	-3.3	1.00	0.37	3.3	53.4	53.3
C	4	-2	-0.01	0.37	437	-0.03	-1.7	1.00	0.37	2.6	53.4	53.3
C	3	-6	0.02	0.36	437	0.06	3.6	0.99	0.36	7.0	52.6	52.2
C	2	-3	0.02	0.40	437	0.05	3.2	1.00	0.40	4.4	55.4	55.3
C	1	-9	0.02	0.36	437	0.06	3.6	0.99	0.36	9.7	52.6	51.8
F	7	-7	-0.05	0.55	440	-0.09	-5.5	1.00	0.55	8.9	65.3	64.5
F	6	-3	-0.04	0.53	440	-0.08	-4.6	1.00	0.53	5.5	64.1	63.8
F	5	-6	-0.06	0.50	441	-0.12	-7.2	1.00	0.50	9.4	62.4	61.5
F	4	-1	-0.03	0.59	443	-0.05	-3.1	1.00	0.59	3.3	67.7	67.6
F	3	-8	-0.03	0.66	441	-0.05	-2.8	1.00	0.66	8.5	71.5	70.7
F	2	-10	0.00	0.60	442	0.00	0.0	1.00	0.60	10.0	68.1	67.1
F	1	-9	0.07	0.52	445	0.13	8.9	0.99	0.52	12.6	63.4	61.9
E	7	-10	0.00	0.52	441	0.00	0.0	1.00	0.52	10.0	63.4	62.4
E	6	-5	0.01	0.52	442	0.02	1.2	1.00	0.52	5.1	63.4	63.2
E	5	-7	0.02	0.54	442	0.04	2.4	1.00	0.54	7.4	64.6	64.1
E	4	-3	0.00	0.55	441	0.00	0.0	1.00	0.55	3.0	65.2	65.1
E	3	-9	0.00	0.53	441	0.00	0.0	1.00	0.53	9.0	64.0	63.2
E	2	-10	0.00	0.53	441	0.00	0.0	1.00	0.53	10.0	64.0	63.0
E	1	0	0.02	0.55	440	0.04	2.3	1.00	0.55	2.3	65.1	65.1
D	7	1	0.00	0.49	440	0.00	0.0	1.00	0.49	1.0	61.5	61.5
D	6	-2	0.02	0.45	438	0.04	2.8	1.00	0.45	3.5	58.8	58.7
D	5	0	0.02	0.42	437	0.05	3.1	1.00	0.42	3.1	56.8	56.7
D	4	0	0.01	0.39	437	0.03	1.6	1.00	0.39	1.6	54.8	54.7
D	3	0	0.00	0.36	437	0.00	0.0	1.00	0.36	0.0	52.6	52.6
D	2	-3	-0.01	0.30	437	-0.03	-2.1	1.00	0.30	3.6	48.1	48.0
D	1	2	0.00	0.25	437	0.00	0.0	1.00	0.25	2.0	43.9	43.8

RESULTS

Yaw Angle:	4.4	degrees	Stack Temperature:	439	F
Pitch Angle:	-1.0	degrees	Velocity*:	60.18	fps (feet per sec.)
Resultant Angle:	5.9	degrees	Axial Velocity:	59.71	fps
Standard Deviation:	4.0	degrees			

*velocity in the direction of flow

CARNOT
15991 Red Hill Ave., Suite 110
Tustin, California 92680
714-259-9520
FAX 714-259-0372

40985 XLS/2-2-3d

10/13/94
5:31 AM

STRATIFICATION CHECK

Client: UCOS COLMAC
Project #: 1409-40985
Unit No: 2
Date: 6/28/94

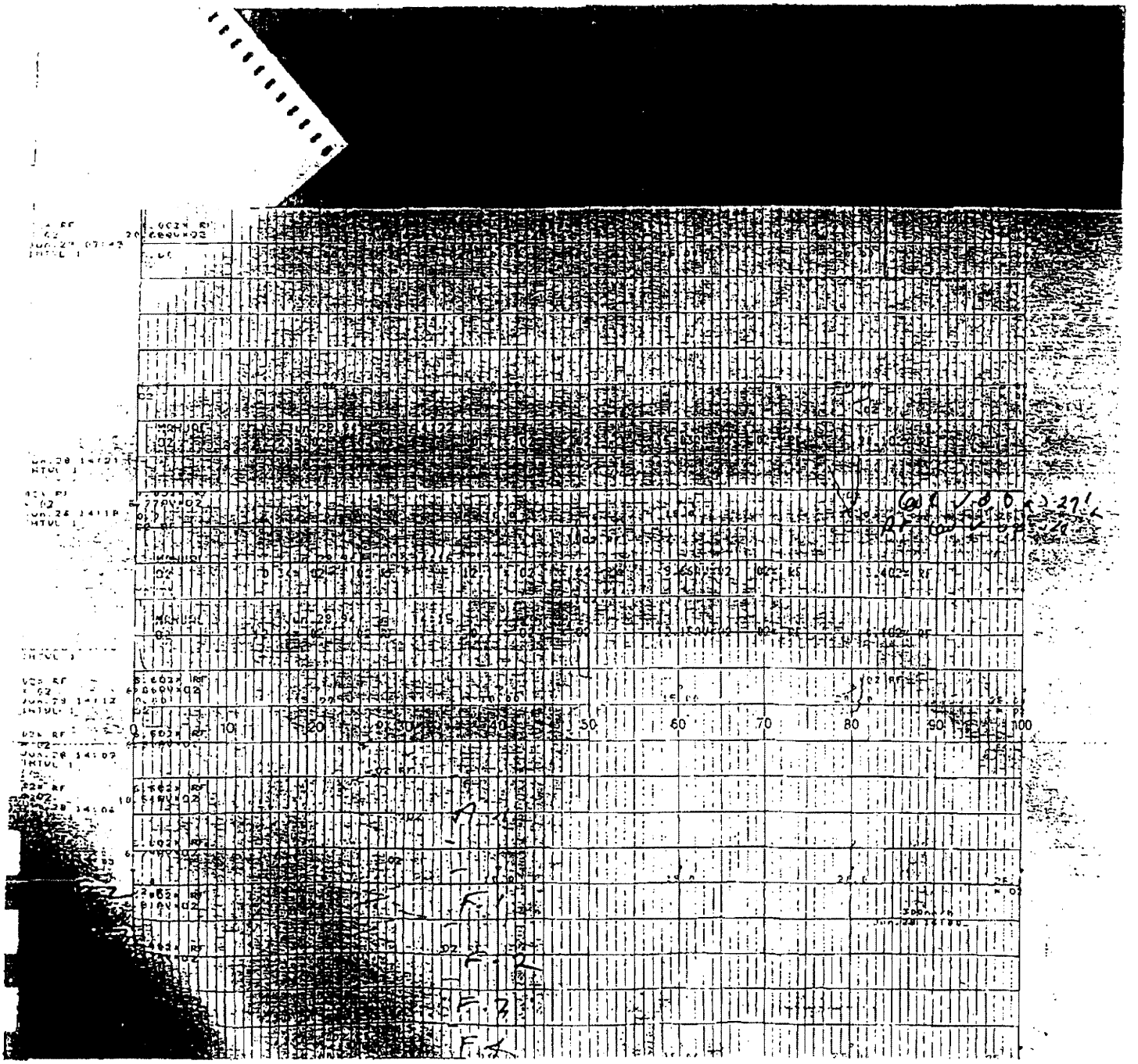
Point	O_2 pt	Ref O_2	% Diff	Point	O_2 pt	Ref O_2	% Diff
F5	7.0	7.0	0.0%	C5	6.5	6.4	-1.6%
F4	6.4	6.5	1.5%	C4	6.6	6.6	0.0%
F3	7.3	7.4	1.4%	C3	6.5	6.6	1.5%
F2	7.0	7.0	0.0%	C2	6.4	6.4	0.0%
F1	6.7	6.7	0.0%	C1	7.4	7.5	1.3%
E5	6.5	6.5	0.0%	B5	6.0	6.1	1.6%
E4	6.7	6.8	1.5%	B4	6.2	6.3	1.6%
E3	7.1	7.1	0.0%	B3	6.5	6.6	1.5%
E2	6.9	7.0	1.4%	B2	6.7	6.8	1.5%
E1	6.7	6.8	1.5%	B1	6.6	6.7	1.5%
D5	6.9	7.0	1.4%	A5	7.1	7.3	2.7%
D4	6.3	6.4	1.6%	A4	6.7	6.9	2.9%
D3	7.2	7.2	0.0%	A3	7.4	7.5	1.3%
D2	7.7	7.7	0.0%	A2	6.7	6.8	1.5%
D1	7.0	7.0	0.0%	A1	6.4	6.6	3.0%

O2 Stratification= 1.0%

CARNOT
15991 Red Hill Ave. Suite 110
Tustin, California 92680
714-259-9520
FAX 714-259-0372

APPENDIX E

STRIP CHARTS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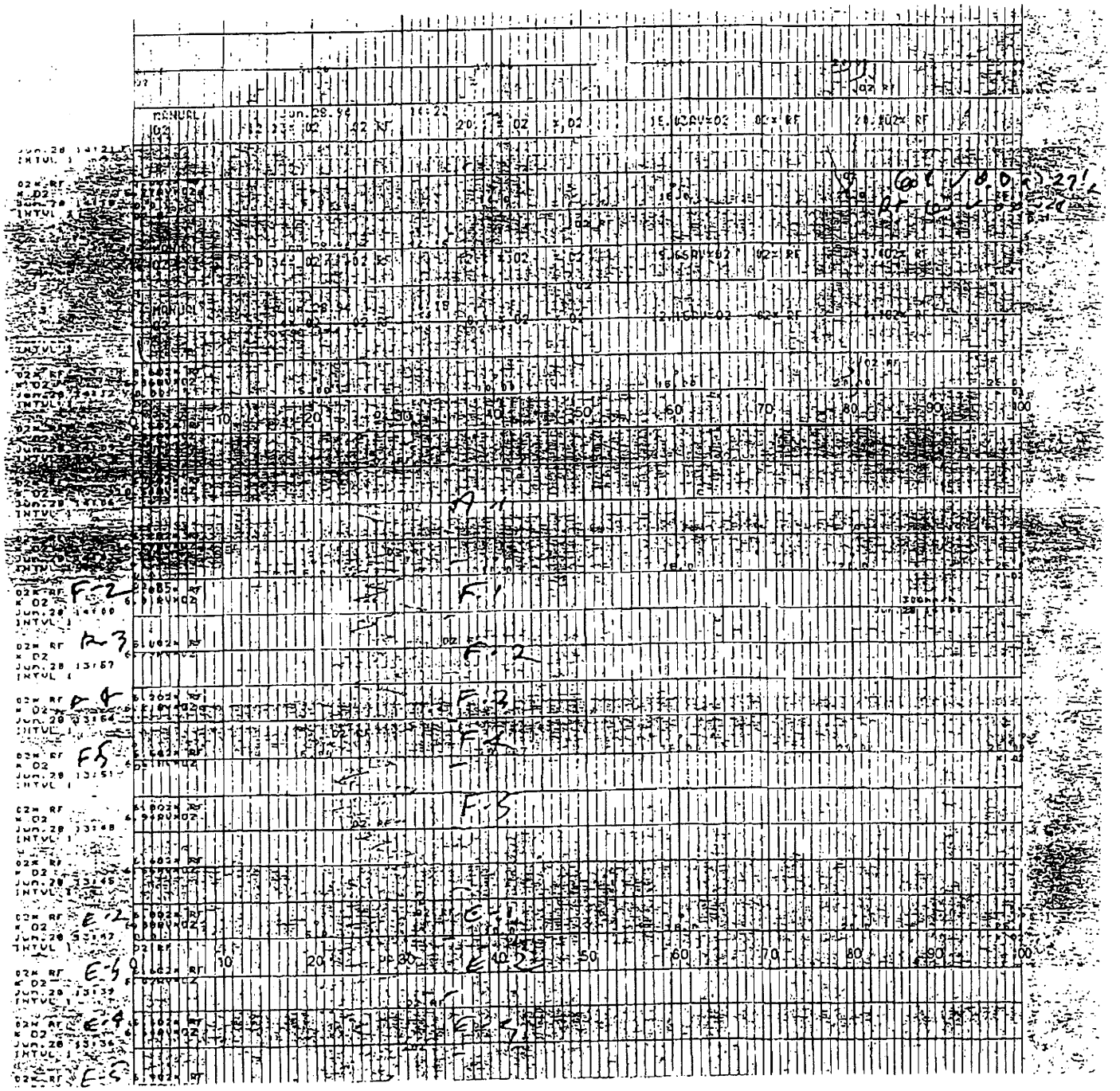

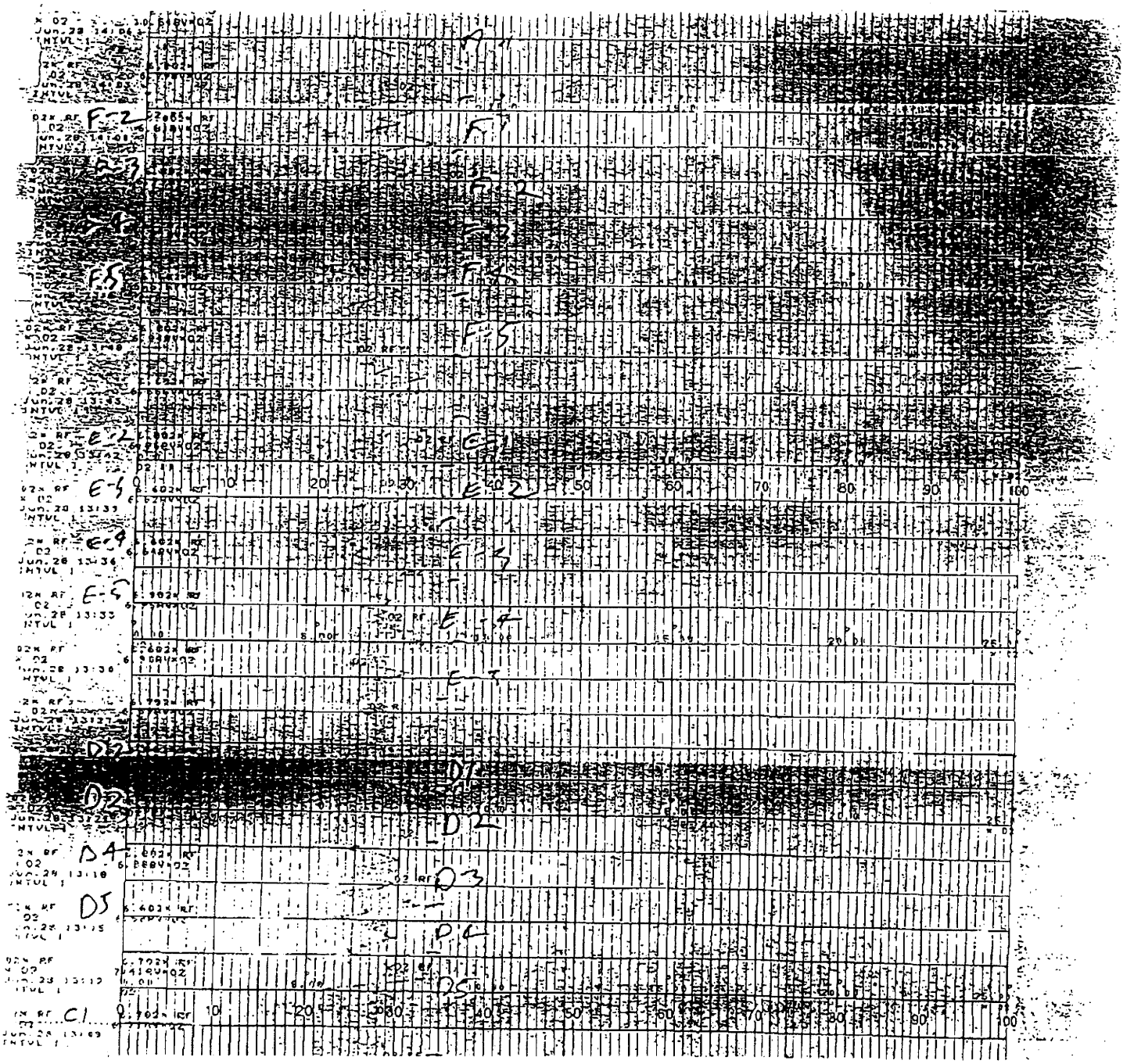

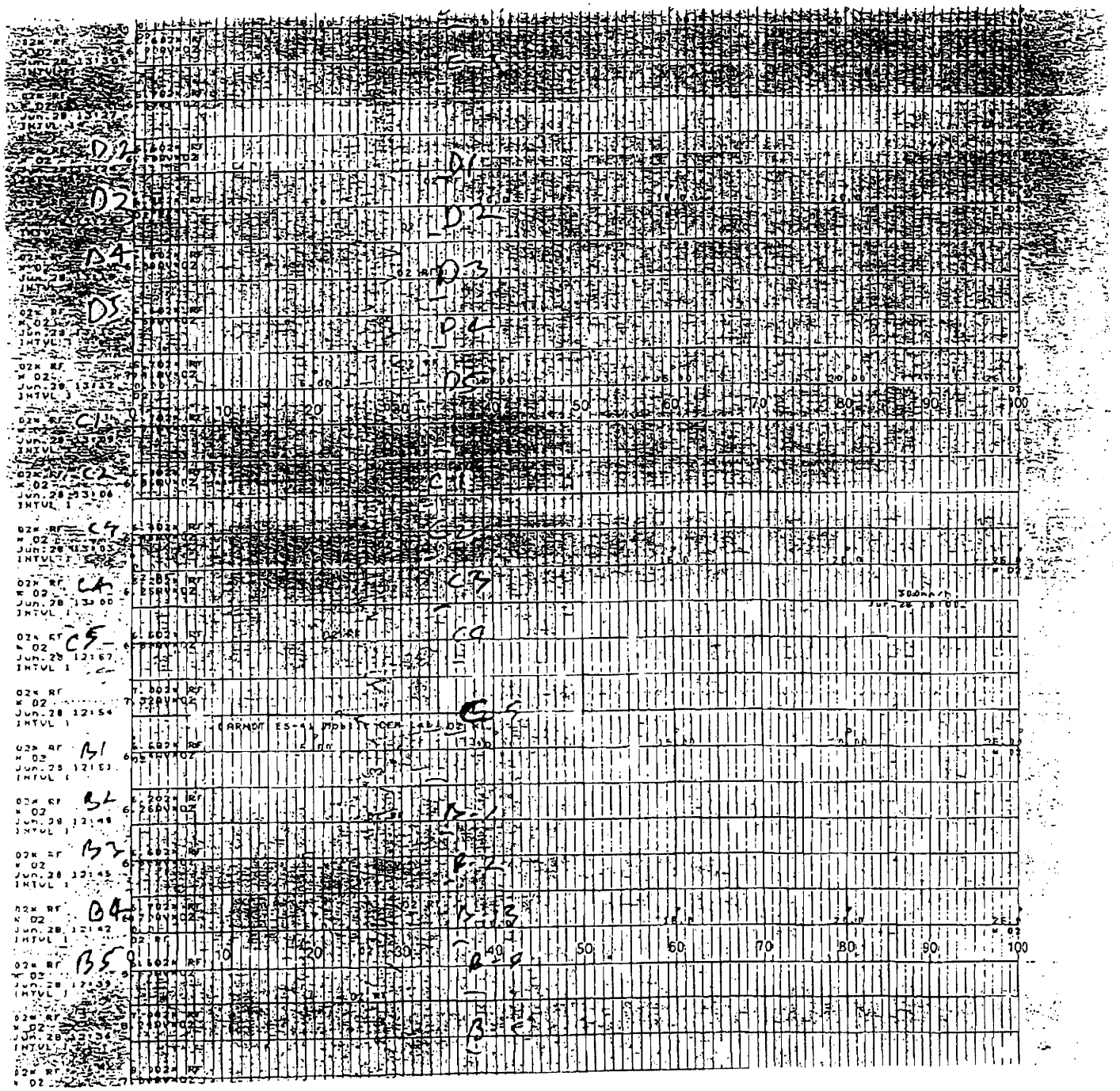
D2
D2
D4
D5
C1
C2
C4
C5
B1
B2
B3
B4
B5
10
20
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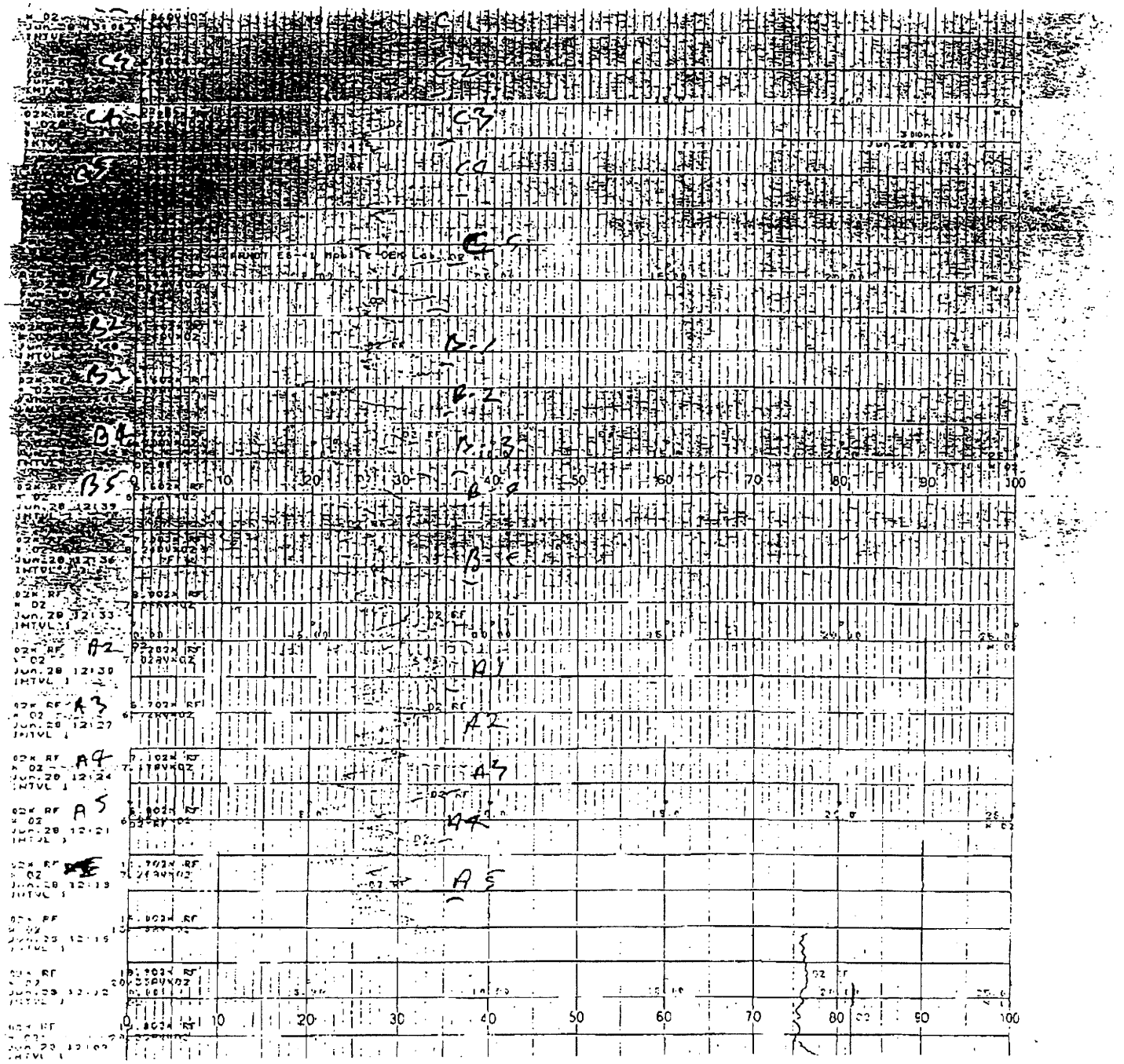
C3
C4
C5
B1
B2
B3
B4
B5
A2
A3
A4
A5
10
20
30
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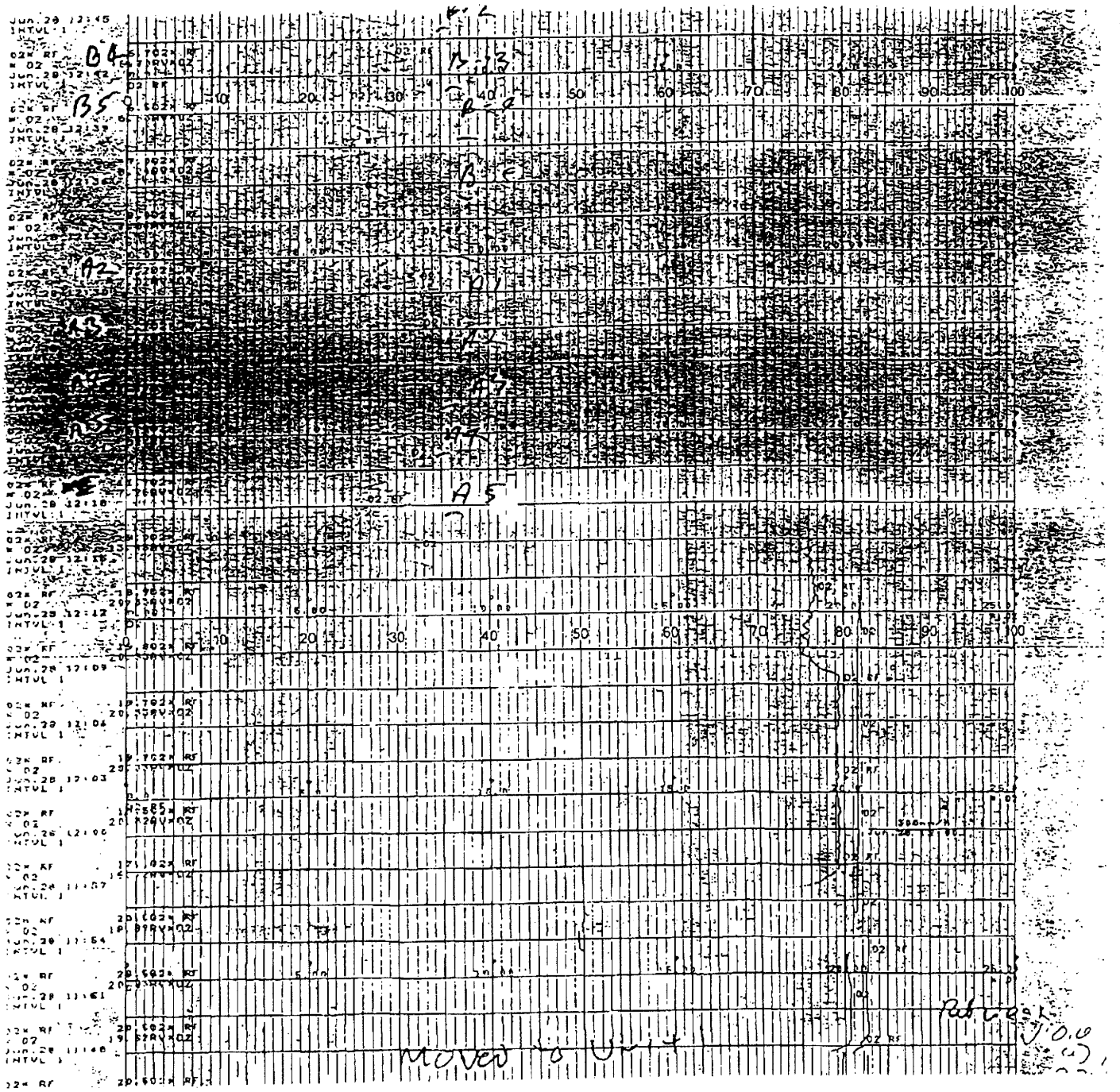
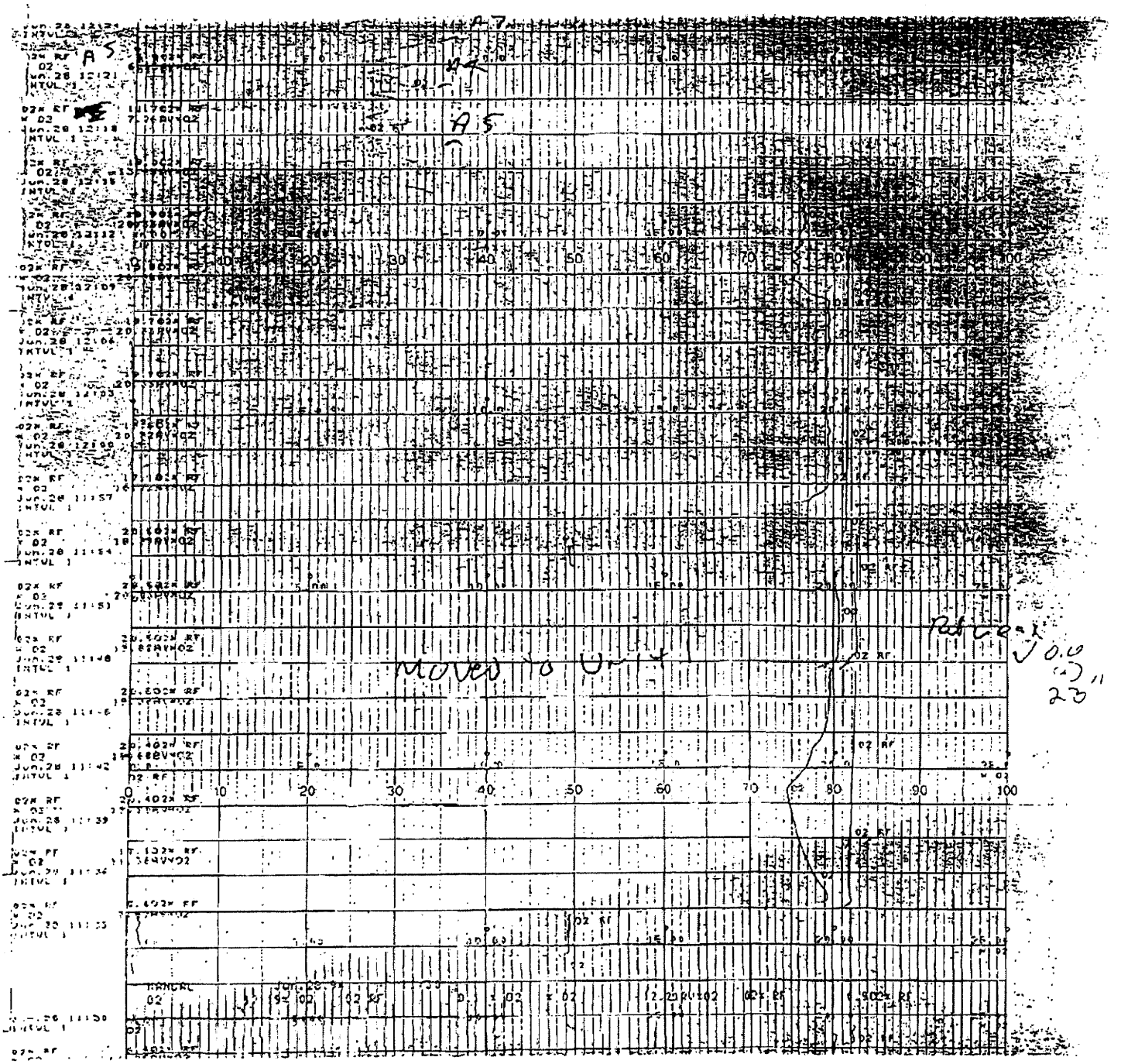
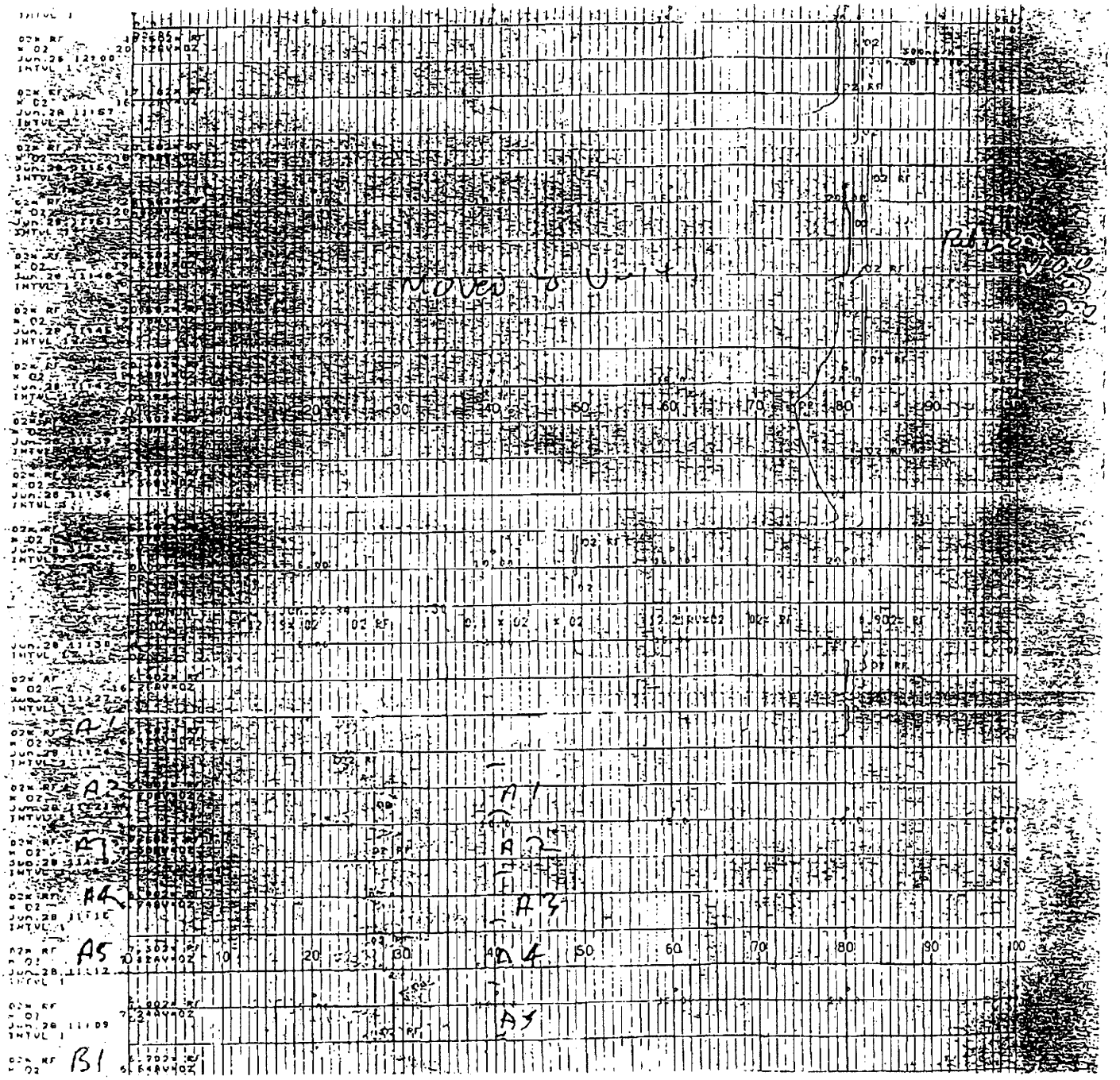
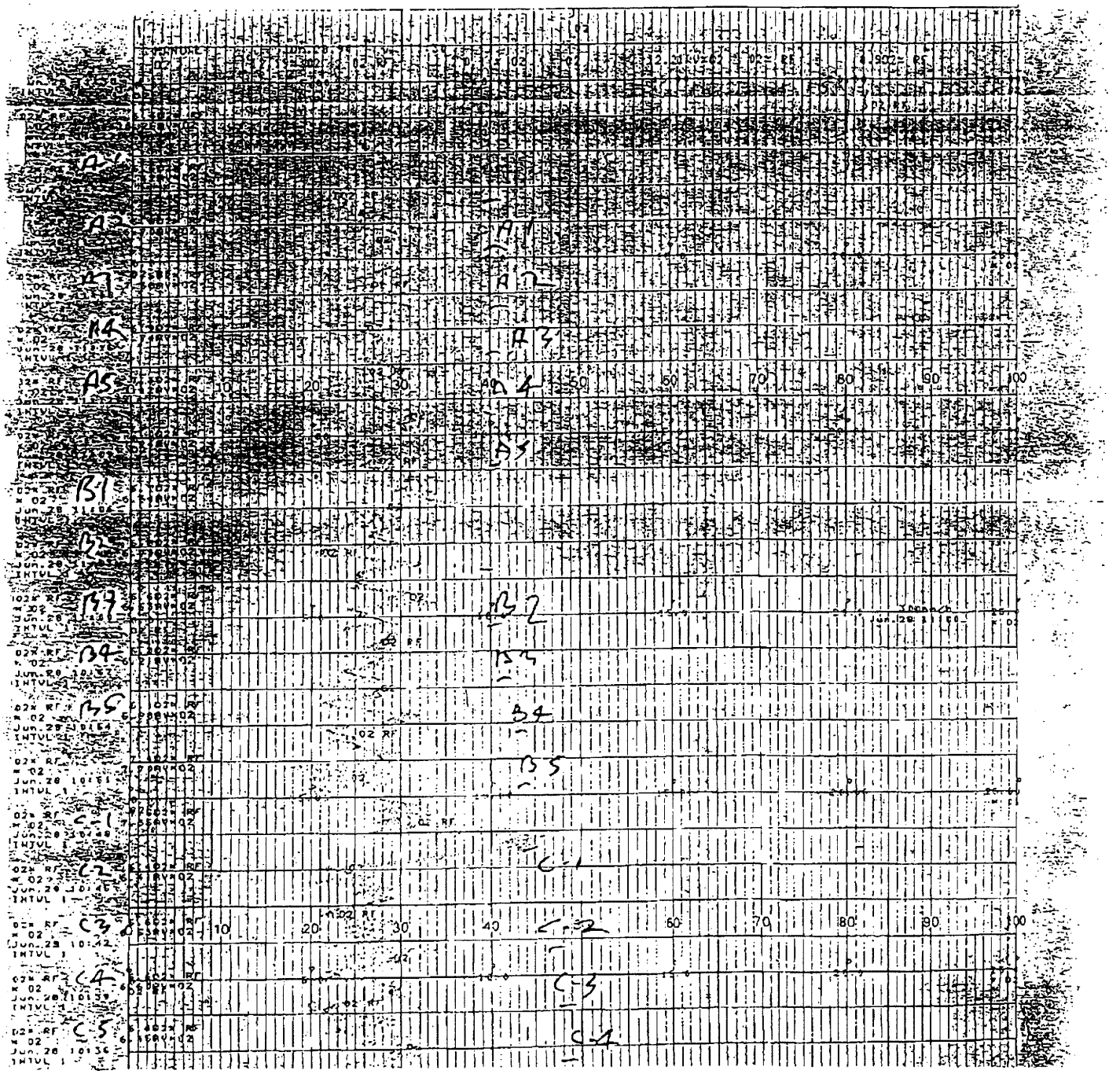
50
60
70
80
90
100


B4
B5
A2
A3
A5
Moved to Unit


A5
A7
A5
Moved to Unit
0
10
20
30
40
50
60
70
80
90
100


Moved to Unit
A1
A2
A3
A4
A5
B1


A1
A2
A3
A4
A5
B1
B2
B3
B4
B5
C-1
C2
C3
C4
C5
10
20
30
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70
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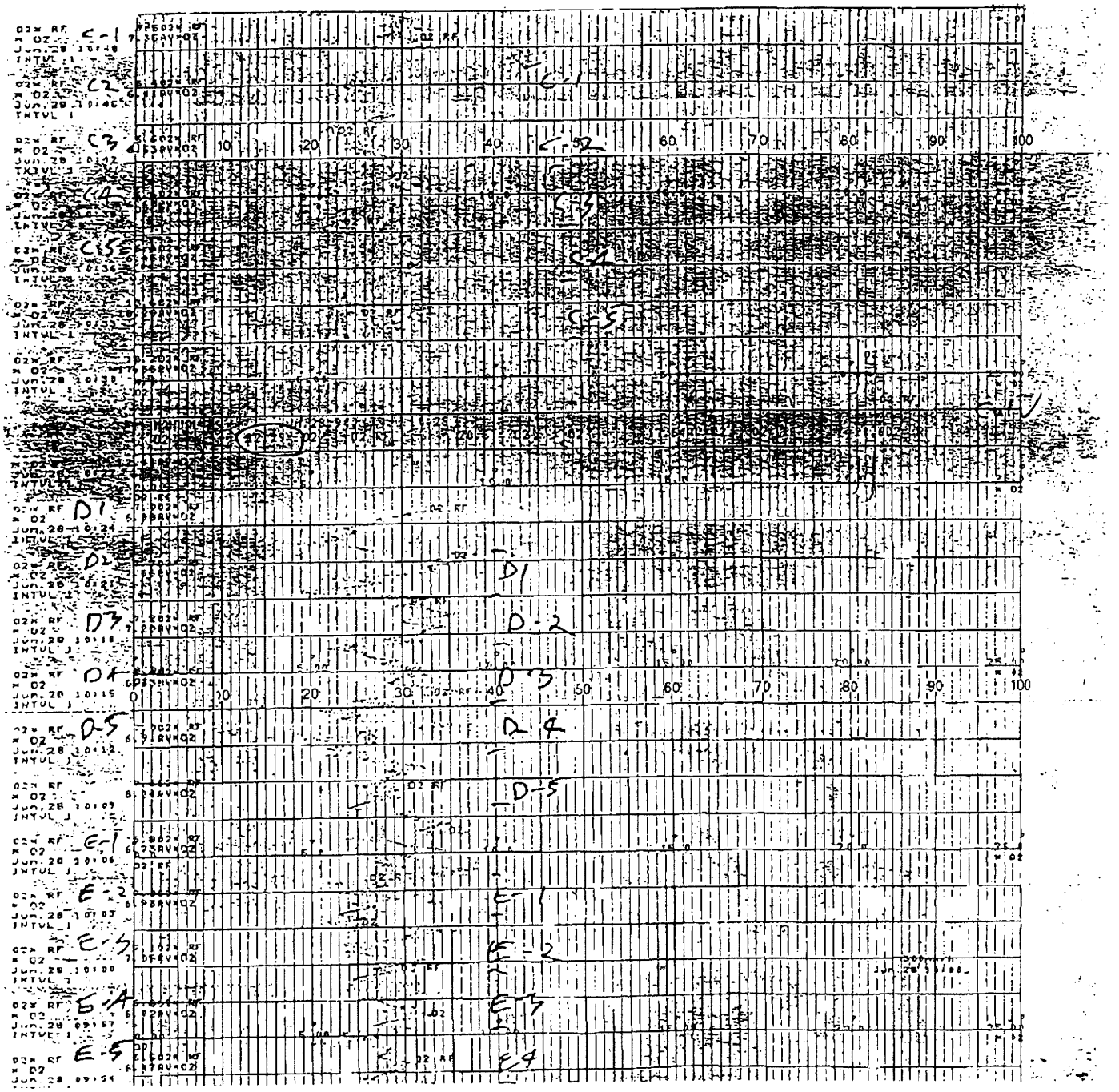
100


C-1
C2
C3
C4
C5
D1
D2
D3
D4
D-5
E-1
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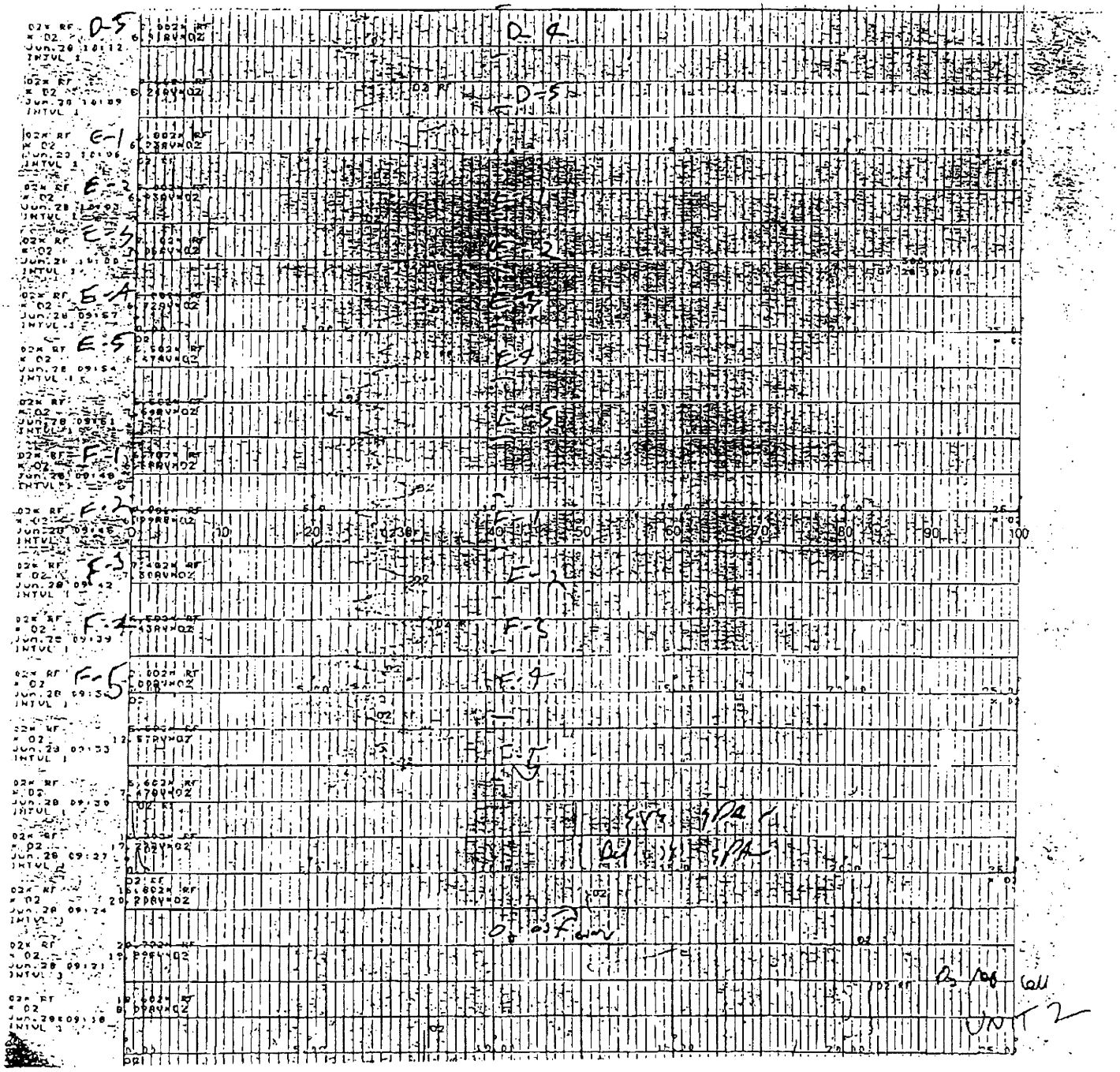
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E-2
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E-4
E-5
F-1
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If you have any questions, please contact one of the following individuals by email or phone.

Name: Mr. David Wonderly
Title: Client Project Manager
Region: West
Email: DWonderly@montrose-env.com
Phone: (714) 279-6777

Name: Mr. Matt McCune
Title: Regional Vice President
Region: West
Email: MMccune@montrose-env.com
Phone: (714) 279-6777