

SOURCE TEST REPORT

17-337

Conducted at

Lubeco Inc. 6859 Downey Ave. Long Beach, CA 90805

HEXAVALENT CHROMIUM EMISSIONS FROM A HEATED SODIUM DICHROMATE SEAL TANK AND A SCREENING TEST FOR A CHROMATE SPRAY BOOTH

TESTED:

April 27, 2017

ISSUED:

June 9, 2017

REPORTED BY:

Wayne Stredwick Air Quality Engineer II

REVIEWED BY:

Michael Garibay Supervising Air Quality Engineer

SOURCE TEST ENGINEERING BRANCH

MONITORING AND ANALYSIS DIVISION

Cleaning the air that we breathe...



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BACKGROUND

a. Firm	Lubeco Inc. Facility ID No. 41229
b. Test Location	<u>6859 Downey Ave. Long Beach, CA 90805</u>
c. Unit Tested	Sodium Dichromate Seal Tank
d. Test Requested by	Susan Nakamura, Planning, Rule Development, and Area Sources, (PRDAS) (909)396-3105
e. Reason for Test Request	To Determine Emission Factors
f. Dates of Test	<u>April 27, 2017</u>
g. Source Test Performed by	Bill Welch, Wayne Stredwick <u>Eric Padilla, Jason Aspell</u>
h. Test Arrangements Made Through	Steve Rossi, President <u>Lubeco Inc. (562) 602-1791</u>
i. Source Test Observed by	Steve Rossi, Lubeco Inc. (562) 602-1791 Bruce Armbruster, JE Comp. Services (909) 483-3300



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RESULTS for Hexavalent (Cr VI) at Lubeco Inc.

Parameter	Cr VI (ng/dscm)	Cr VI (lb/hr)	Cr VI (lb/hr-ft ² tank)	Cr VI (lb/hr-ft ² tank- % dichromate)
Run #1 Sodium Dichromate Seal Tank	232,000	1.58 x 10 ⁻⁴	5.27 x 10 ⁻⁶	9.94 x 10 ⁻⁷
Run #2 Sodium Dichromate Seal Tank	292,000	2.03 x 10 ⁻⁴	6.77 x 10 ⁻⁶	1.28 x 10 ⁻⁶
Run #3 Sodium Dichromate Seal Tank	208,000	1.51 x 10 ⁻⁴	5.03 x 10 ⁻⁶	9.49 x 10 ⁻⁷
Sodium Dichromate Seal Tank Average	244,000	1.71 x 10 ⁻⁴	5.69 x 10 ⁻⁶	1.07 x 10 ⁻⁶
Facility Upwind of Dichromate Seal Tank	17	N/A	N/A	N/A
Chromate Spray Booth Exhaust	33	N/A	N/A	N/A



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INTRODUCTION

On April 27, 2017, personnel from the South Coast Air Quality Management District (SCAQMD) Source Test Engineering Branch conducted triplicate source tests for hexavalent chromium emissions from a heated sodium dichromate seal tank at Lubeco Inc., Long Beach, CA. The main objective of the testing was to provide a mass emission rate, which can be used to determine an emissions factor for heated sodium dichromate seal tanks used in plating operations. The second objective was to identify potential sources of emissions as measured by SCAQMD ambient air monitoring in the nearby south Paramount area.

The main focus of this report was to determine an emission factor for sodium dichromate seal tanks. However, Lubeco, Inc. also has three spray booths that are permitted to use chromate based paints. A screening test (sampling for hexavalent chromium concentration only) was also conducted to determine if the chromate spray booths could be a source of the elevated hexavalent chromium ambient levels in the surrounding area in addition to the sodium dichromate seal tank.

The test was requested by the SCAQMD Planning, Rule Development, and Area Sources (PRDAS) Division subsequent to previous screening tests on these tanks. PRDAS will evaluate the test results presented in this report and use the data for determining emission factors for these types of facilities.

The testing on the sodium dichromate seal tank consisted of 3-one hour sampling runs. The dichromate seal tank temperature and bath composition were also determined for a measure of operating conditions.



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EQUIPMENT AND PROCESS DESCRIPTION

Aluminum has been used for many years in the military and aerospace industries. It is essential, however, that improved corrosion properties are imparted in the metal to improve corrosion resistance. Aluminum anodizing has been used for many years to enhance the corrosion performance of aluminum alloys by imparting a thin layer of chromium metal on the aluminum alloy's surface. The surface of the anodized aluminum consists of an inner thin barrier chromium layer and an outer thick chromium porous layer. The outer layer must be sealed or the microscopic holes on the surface will develop corrosion, and so the corrosion resistance of anodized aluminum depends largely on the effectiveness of the sealing operation.

During the sealing, the pores of the anodized aluminum alloy is hydrated, which fills the pores and provides improved corrosion resistance. However, the commonly used sealer contains hexavalent chromium, which is listed as a known carcinogenic. Other sealing processes include; hot water, cobalt acetate, nickel acetate, and trivalent chromium.

Lubeco, Inc. is a plating company located in Long Beach. Lubeco, Inc. was selected as the host facility for the testing due to elevated ambient monitoring readings in the nearby south Paramount area. All tests were conducted on a single tank measuring 10 feet long x 3 feet wide x 4 feet high. The tank was heated to between 200-203 °F, and had a mechanical mixer to keep a uniform temperature throughout the entire sealing process tank. There were no parts in the seal tank during testing.



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	Tank Dimensions	Type of Tank	
	10'L x 3'L x 4'H	Sodium Dichromate S	Seal
	Operating Conditions	Recorded During Run	<u>#1</u>
Plating Solution	n Temperature	203	°F
Plating Solution	n Chromic Acid Content	5.3	% by wt.
Duration of Tes	st Run	60	min /test run
Average Captur	e Velocity into the Enclosure	e 80	ft. /min
Capture Efficie	ncy of Ventilation System	100	%
Ventilation Rate	e	242	acfm
	Operating Conditions	Recorded During Run	<u>#2</u>
Plating Solution	n Temperature	201	°F
Plating Solution	n Chromic Acid Content	5.3	% by weight
Duration of Tes	st Run	60	min /test run
		100	C. / ·

ft./min Average Capture Velocity into the Enclosure 100 Capture Efficiency of Ventilation System 100 % Ventilation Rate 246 acfm

Operating Conditions Recorded During Run #3

Plating Solution Temperature	200	°F
Plating Solution Chromic Acid Content	5.3	% by weight
Duration of Test Run	60	min /test run
Average Capture Velocity into the Enclosure	70	ft. /min
Capture Efficiency of Ventilation System	100	%
Ventilation Rate	254	acfm

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TESTING METHODOLOGY

The testing on the sodium dichromate seal tank consisted of triplicate one hour sampling runs.

A temporary reduced draft ventilation system was designed and constructed both to isolate the process and collect the resulting chromium emissions in a manner to facilitate the emissions measurement. This approach has been successfully employed in past SCAQMD testing on nickel, and chromium plating tanks and is recognized in a chrome testing protocol developed for the SCAQMD and the California Air Resources Board (ARB) (SCAQMD Technical Guidance Document for Rule 1469, dated June 18, 2013). A main concern was that a high flow ventilation system, such as a dedicated side-draft ventilation system may produce higher emissions due to entrainment of large splashed droplets that potentially fall back into the tanks or to the ground and may not become emissions to the atmosphere.

The temporary reduced draft system was designed to simulate emissions to the atmosphere of an unventilated tank. Mass emissions collected in the duct of a ventilated tank may be higher due to this effect. The temporary ventilation system consisted of 5 feet long x 3 feet wide x 5 feet high hood suspended at a distance of 8 inches above the solution surface, covering half of the host tank tested (see Figure 1). The other half of the tank was covered over with plastic. The hood was vented to a small blower which was set to achieve a specific velocity vertically through the hood. A straight run of ducting between the hood and the blower was used to isolate and measure the emissions from the tank. The facility's roll-up doors were left open during all tests so that fresh air was continuously allowed to flow through the building, along with fresh air entering the building from evaporative coolers on the building's roof. The outlet of the test blower was oriented so that the air stream discharged away from the tank being tested and in the downstream direction of the airflow in the building to avoid re-entrainment in the test hood.

The hood and tank cover vent system operated as follows: The air flowed into the hood and traveled upwards through the hood at the specified velocity. Both the hood and the space above the tank acted as a settling zone where larger droplets that would normally not be carried away from the tank are allowed to fall back into the tank. By using a hood that has a similar or lower cross section than the tank, a low dilution air rate can be employed. The use of this low dilution air rate has the advantage of increasing the concentration in the duct which results in a lower relative error in the emission measurement. The approach also has the advantage of making the effects of contamination such as that in the ambient air to be less significant.



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At a ventilation rate of 80-120 ft. /min as determined by a calibrated hot wire anemometer, the height of the hood was sufficient to create a uniform velocity over the lower cross-section of the hood and maintain this uniformity for the lower one third of the hood. This was done to ensure that no high or low velocity zones were present as to defeat the purpose of the hood in its lower section.

As previously approved and documented in the Rule 1469 Technical Guidance Document, the specific velocity was chosen to be approximately 100 ft. /min. This specific velocity was chosen for the following reasons:

- 1. The velocity is considered as the minimum velocity at which 100% capture of actual emissions to the atmosphere can be achieved. This was verified using the small scale capture hood and a smoke test.
- 2. The velocity is sufficiently low as to not overestimate the range of velocities that may be encountered in a building that houses the process. This is important since these internal air currents are responsible for transporting the emissions to the atmosphere. For purposes of comparison, 100 ft. /min equates to 1.14 miles per hour. Assuming that outdoor wind speeds typically vary from 3 -10 mph, it is not unreasonable to assume that 1.14 mph indoor air movements can be induced either by open doors, or the building's ventilation system.
- 3. According to the American Conference of Governmental Industrial Hygienist Industrial Ventilation Manual, 50 fpm is the indoor air speed created by an effective air conditioning system.
- 4. Calculations of settling velocity of small aerosols shows that small aerosol droplets less than 10 microns in diameter are capable of remaining airborne for several minutes, and much longer in moving air.
- 5. Past testing has been successfully employed using similar capture velocities during mist suppressant testing on chromic anodizing tanks.



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SAMPLING AND ANALYTICAL PROCEDURES

Flow Rate

The gas velocity within the sampling duct was measured during each sampling run at eight points within the duct cross section as according to SCAQMD Methods 1.2 and 2.3. This was performed simultaneously with the pollutant sampling using a calibrated standard type Pitot tube with a differential pressure manometer, and a calibrated type "K" thermocouple with a potentiometer (Figure 2). The apparatus was checked for leaks both before and after use by introducing a pressure head and blocking the flow at the Pitot tip. An observation of the resulting stabilization in pressure at the manometer verified the absence of leaks in the system. The stack's access ports were located using the approach of SCAQMD Method 2.3 for ducts of less than 12 inches in diameter. Using this approach, the sampling access ports were located approximately eight stack diameters downstream and greater than two stack diameters upstream from flow disturbances. The velocity access ports and greater than two stack diameters upstream from flow disturbances. This configuration meets the SCAQMD Method 1.2 requirements for measurement site location.

The volumetric flow rate was calculated for each sampling run using the stack's cross sectional area and average gas velocity. The flow rate was corrected to standard conditions by using the stack temperature and pressure along with the barometric pressure measured with a calibrated aneroid barometer. The flow rate was also corrected to dry conditions using the moisture content as determined by the SCAQMD Method 4.1 weight gain from the chromium sampling trains as described in the following section.



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Total and Hexavalent Chromium Sampling – CARB Method 425

A chromium sample was collected during each sampling run using CARB Method 425. The sample was collected from the locations within the sampling duct previously described in the velocity measurements. Each sample was collected over a period of 60 minutes using a sampling train consisting of a glass probe and nozzle connected by a six foot length of non-reactive tubing to the first of two Greenburg-Smith impingers each containing 100 ml of 0.1N sodium bicarbonate, an empty bubbler, and a bubbler containing tared silica gel desiccant (see Figures 3 & 4).

The impinger assembly was connected to a vacuum pump and a calibrated dry gas meter. The sampling apparatus was checked for leaks both before and after sampling by blocking the flow at the probe tip. An observation of the resulting decrease in flow at the meter to less than 0.02 cfm or four percent of the sampling rate indicated an acceptable leak rate. The impinger train was contained within an ice bath to condense water and other condensable matter present in the sample stream.

The impinger train was returned to the SCAQMD laboratory for recovery. The pH of the recovered solution was verified of being greater than 8.0 as specified in CARB Method 425. Hexavalent chromium collected in the nozzle, probe, and impingers was determined using ion chromatography with post column reactor (IC/PCR). Blank, and facility air upwind of the dichromate seal tank sample trains were also brought onto the test site, assembled, leak checked, and analyzed as above for quality control purposes.



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Plating Solution Analysis

Samples of the plating solution were collected at the end of testing. The samples were analyzed for parameters typically monitored in the plating industry and reported with the process information.

Capture Efficiency

The capture efficiency was determined by a smoke test. The smoke test was accomplished using the steam generated by the dichromate seal tank. This technique can be used to verify 100% capture or conversely less than 100% capture by observing the flow of the steam into the capture hood. The observation of complete capture of the steam indicated 100% capture efficiency (see Figure 1).

The height of the capture hood and the ventilation rates were adjusted in an attempt to achieve the 50-100 ft. /min horizontally into the capture hood to ensure complete capture. The vertical velocity did not exceed 50 feet/min so that emissions would not be forced into the sampling ductwork that would otherwise be allowed to settle back into the tank.



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TEST CRITIQUE

Overall, the sampling and analysis was successfully completed and the reported results are all considered to be accurate for the conditions that were tested. This report is limited to the presentation of the test results and a discussion of their accuracy. All issues related to the application of the emission factor results will be left for discussion outside the scope of the presentation of the results.

The blank train result indicated that there was no hexavalent chromium in the sample. The conclusion from this is that the sampling train media did not contribute to contamination of the sampling and that the sampling volumes were sufficient to bring the measured values well above the blank levels and lower detection limits of the analytical methods.

The results of the sampling taken from the ambient air in the workplace background (17 ng/dscm) represented 0.007% of the average hexavalent chromium concentrations during testing. This suggests that the temporary vent system did not contribute to the workplace background readings. Also, the third test run had the lowest hexavalent chromium emissions. With everything being the same during testing, this would say that the exhaust from the temporary enclosure was being exhausted from the incoming air and not being returned to the enclosure.

Parts were not processed during testing, since sealing tanks sit for extended periods of time without parts in them. It is also thought that the heating of the dichromate seal tanks is the cause of hexavalent chromium emissions and processing of parts does not have an effect on emissions.



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Figure 1 - Photograph of Temporary Ventilation System with Sampling Location.



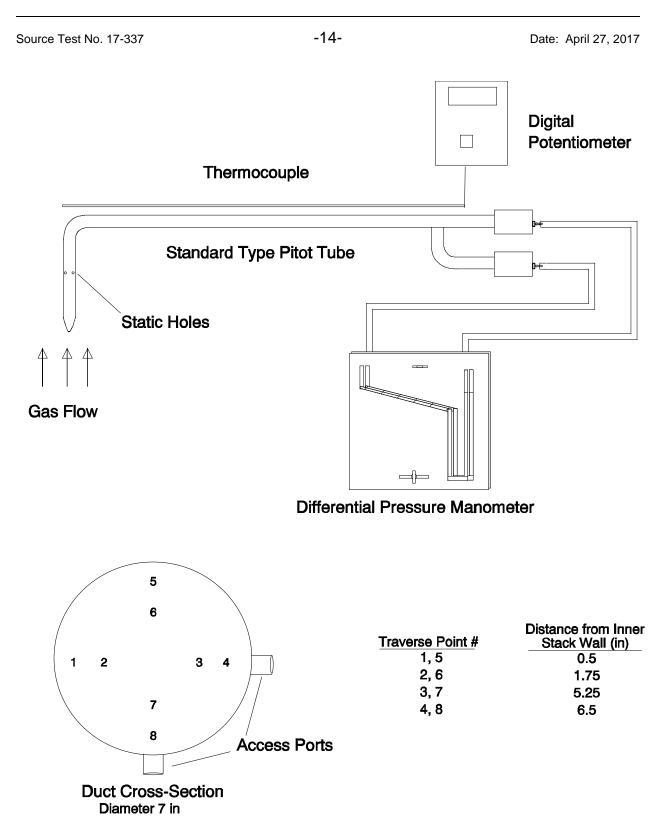


Figure 2 - Flow Rate Measuring Apparatus.



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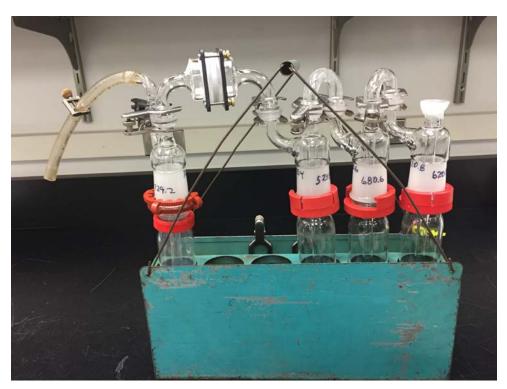


Figure 3 – Photograph of Chromium Sampling Train.



Figure 4 – Photograph of Chromium Sampling System.



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APPENDIX 1

(Source Test Calculations)



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SOURCE TEST CALCULATIONS

Average Velocity and Temperature

	Velocity		Calculated		Velocity		Calculated		Velocity		Calculated
Traverse	Head #1	Temp.	Velocity	Traverse	Head #2		Velocity	Traverse	Head #3		Velocity
Point #	("H ₂ O)	(°F)	(fps)	Point #	("H ₂ O)	(°F)	(fps)	Point #	("H ₂ O)	(°F)	(fps)
1	0.040	128.3	14.07	1	0.030	126.7	12.17	1	0.030	127.7	12.18
2	0.040	127.1	14.05	2	0.040	128.1	14.07	2	0.040	127.7	14.06
3	0.040	125.9	14.04	3	0.050	126.0	15.70	3	0.040	127.5	14.06
4	0.040	125.4	14.03	4	0.040	125.4	14.03	4	0.040	126.7	14.05
5	0.030	126.6	12.17	5	0.050	127.3	15.71	5	0.050	127.0	15.71
6	0.040	127.4	14.06	6	0.050	127.0	15.71	6	0.050	126.1	15.70
7	0.050	126.0	15.70	7	0.050	127.0	15.71	7	0.050	125.5	15.69
8	0.050	126.3	15.70	8	0.050	127.1	15.71	8	0.050	125.1	15.69
	0.041	126.6	14.23		0.045	126.8	14.85		0.044	126.7	14.64
Average ⁻	Temperat	ure (°F)	127	Averag	e Velocity	' (fps) -	14.57				

Run #2

					Itun						
	Velocity		Calculated		Velocity		Calculated		Velocity		Calculated
Traverse	Head #1	Temp.	Velocity	Traverse	Head #2		Velocity	Traverse	Head #3		Velocity
Point #	("H ₂ O)	(°F)	(fps)	Point #	("H ₂ O)	(°F)	(fps)	Point #	("H ₂ O)	(°F)	(fps)
1	0.060	126.6	17.20	1	0.060	128.2	17.23	1	0.060	128.0	17.23
2	0.040	127.2	14.05	2	0.050	127.3	15.71	2	0.040	127.5	14.06
3	0.040	126.5	14.05	3	0.050	127.2	15.71	3	0.040	127.9	14.06
4	0.040	126.9	14.05	4	0.050	127.0	15.71	4	0.040	127.3	14.06
5	0.030	128.4	12.18	5	0.040	127.2	14.05	5	0.030	127.4	12.17
6	0.030	127.7	12.18	6	0.050	127.4	15.72	6	0.040	127.8	14.06
7	0.040	128.1	14.07	7	0.050	127.5	15.72	7	0.040	128.3	14.07
8	0.050	128.6	15.73	8	0.060	128.2	17.23	8	0.050	128.3	15.73
	0.041	127.5	14.19		0.051	127.5	15.89		0.043	127.8	14.43
Average ⁻	Temperati	ure (°F)	128	Average	e Velocity	/ (fps) -	14.83				



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SOURCE TEST CALCULATIONS

-					Null	110					
	Velocity		Calculated		Velocity		Calculated		Velocity		Calculated
Traverse	Head #1	Temp.	Velocity	Traverse	Head #2	Temp.	Velocity	Traverse	Head #3	Temp.	Velocity
Point #	("H ₂ O)	(°F)	(fps)	Point #	("H ₂ O)	(°F)	(fps)	Point #	("H ₂ O)	(°F)	(fps)
1	0.040	122.0	14.0	1	0.040	121.4	13.99	1	0.040	121.0	13.98
2	0.040	120.5	14.0	2	0.040	122.4	14.00	2	0.040	120.8	13.98
3	0.050	120.9	15.6	3	0.050	121.0	15.63	3	0.050	121.4	15.64
4	0.050	120.5	15.6	4	0.050	120.4	15.62	4	0.050	120.6	15.63
5	0.040	120.5	14.0	5	0.040	119.2	13.96	5	0.040	118.3	13.95
6	0.050	120.9	15.6	6	0.050	121.3	15.63	6	0.050	118.4	15.60
7	0.040	120.4	14.0	7	0.050	121.9	15.64	7	0.050	119.6	15.61
8	0.050	121.3	15.6	8	0.050	121.4	15.64	8	0.050	119.9	15.62
	0.045	120.9	14.8		0.046	121.1	15.01		0.046	120.0	15.00
Average Te	emperature	(°F) -	121	Avera	ge Velocity	(fps) -	14.94				

Run #3

Where: Calculated Velocity = 2.9 x [Velocity Head x (460 + Temperature)]^{0.5}



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SOURCE TEST CALCULATIONS Flow Rate and Emissions



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urce Test No. 17-337			-20-				Date: Apr	11 27, 20
				MANAGEMENT D Bar, California 917				
Test	No. 17-337					Test Date:	4/27/2017	
				LCULATIONS				
 Tank Tested:	Sodium Dich							
Sample Train:	Run #1 - Ch	rome Train	#27			Input by:	W. Stredwid	ck
							4457	6 m m
A. Average Traverse Veloci B. Gas Meter Temperature								tps deg F
C. Gas Meter Correction Fa		•	• •					ucgi
D. Average Orifice Pressure								"H20
E. Nozzle Diameter							0.2110	inch
F. Stack Inside Diameter			inch	M. Pitot Correction				
G. Stack Cross Sect. Area				N. Sampling Time				min
H. Average Stack Temp			deg F	O. Nozzle X-Sect				
I. Barometric Pressure J. Gas Meter Pressure (I+(E			"HgA "HgA	P. Hex Chrome S Q. Total Chrome				
K. Static Pressure				R. Water Vapor (-
L. Total Stack Pressure (I+("HgA	S. Gas Volume M				
			х С				. 10.820	asci
PERCENT MOISTURE/GA	S DENSITY Gas Sample ((4							%
PERCENT MOISTURE/GA J. Percent Water Vapor in V. Average Molecular Wei	S DENSITY Gas Sample ((4 ight (Wet):		.0464 x R) +				. 12.79	% ./Mole
PERCENT MOISTURE/GA U. Percent Water Vapor in V. Average Molecular Wei Component	S DENSITY Gas Sample ((4 ight (Wet): Vo	.64 x R)/((0	.0464 x R) + < Moist. F	- T))	Molecu		. 12.79 = Wi	
PERCENT MOISTURE/GA U. Percent Water Vapor in V. Average Molecular Wei Component Water	S DENSITY Gas Sample ((4 ight (Wet): Vo 0.128	.64 x R)/((0 I. Fract.	.0464 x R) + < Moist. F 1.000	- Т))	Molecu 18.0		= W1 2.30	
PERCENT MOISTURE/GA U. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide	S DENSITY Gas Sample ((4 ight (Wet): Vo 0.128 0.0000	.64 x R)/((0 I. Fract.	.0464 x R) + < Moist. F	- Т)) Fract. х	Molecu		. 12.79 = Wi	
PERCENT MOISTURE/GA U. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.0000 0.2090	.64 x R)/((0 I. Fract.	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872	- Т))	Molecu 18.0 44.0 28.0 32.0		= W1 2.30 0.00 5.83	
PERCENT MOISTURE/GA U. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.0000 0.2090	.64 x R)/((0 I. Fract.	.0464 x R) + Moist. F 1.000 0.872 0.872	- Т))	Molecu 18.0 44.0 28.0		= W1 2.30 0.00 0.00	
PERCENT MOISTURE/GA U. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.0000 0.2090	.64 x R)/((0 I. Fract.	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872	- Т))	Molecu 18.0 44.0 28.0 32.0		= W1 2.30 0.00 5.83	
PERCENT MOISTURE/GA J. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.0000 0.2090	.64 x R)/((0 I. Fract.	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872	- Т))	Molecu 18.0 44.0 28.0 32.0	lar Wt. , , , , ,	= W1 2.30 0.00 0.00 5.83 19.45	
PERCENT MOISTURE/GA J. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.0000 0.2090 0.791	.64 x R)/((0 I. Fract.) Dry Basis Dry Basis Dry Basis Dry Basis	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872 0.872	- Т))	Molecu 18.0 44.0 28.0 32.0 28.2	lar Wt. , , , , Sum	= W1 2.30 0.00 5.83 19.45 27.59	
PERCENT MOISTURE/GA J. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correction X. Velocity Pressure Correct	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.0000 0.2090 0.791	.64 x R)/((0 I. Fract.	Moist. F Moist. F 1.000 0.872 0.872 0.872 0.872	- T))	Molecu 18.0 44.0 28.0 32.0 28.2	lar Wt.	= W1 2.30 0.00 5.83 19.45 27.59 1.02 1.01	
PERCENT MOISTURE/GA J. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correction X. Velocity Pressure Correct Y. Corrected Velocity (A x I	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.2090 0.791 Factor (28.95/V ction Factor (29. M x W x X)	.64 x R)/((0 I. Fract.	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872 0.872	- T))	Molecu 18.0 44.0 28.0 32.0 28.2	lar Wt.	$= 0.000 \\ 12.79 \\ 2.30 \\ 0.00 \\ 0.00 \\ 5.83 \\ 19.45 \\ 27.59 \\ 27.59 \\ 1.02 \\ 1.01 \\ 14.93 \\ 14.93 \\ 12.79 \\ $	fps
PERCENT MOISTURE/GA U. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correction X. Velocity Pressure Correct Y. Corrected Velocity (A x I Z. Flow Rate (Y x G x 60)	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.0000 0.2090 0.791	.64 x R)/((0 I. Fract.) Dry Basis Dry Basis Dry Basis Dry Basis Dry Basis)^.5	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872 0.872	- Т))	Molecu 18.0 44.0 28.0 32.0 28.2	lar Wt.	$= W_{1}$ $= 0$ 2.30 0.00 0.00 5.83 19.45 27.59 $- 1.02$ 1.01 14.93 239	fps cfm
PERCENT MOISTURE/GA: U. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correction X. Velocity Pressure Correct Y. Corrected Velocity (A x I Z. Flow Rate (Y x G x 60) AA. Flow Rate (Standard) (2)	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.0000 0.2090 0.791 Factor (28.95/V ction Factor (29. M x W x X) Z x (L/29.92) x [5	.64 x R)/((0 I. Fract.) Dry Basis Dry Basis Dry Basis Dry Basis Dry Basis)^.5	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872 0.872 0.872	- T))	Molecu 18.0 44.0 28.0 32.0 28.2	lar Wt.	$= W_{1}$ $= 0$ 2.30 0.00 0.00 5.83 19.45 27.59 $- 1.02$ 1.01 14.93 239 $- 208$	fps
PERCENT MOISTURE/GA: J. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correction X. Velocity Pressure Correct Y. Corrected Velocity (A × I Z. Flow Rate (Y × G × 60) AA. Flow Rate (Standard) (3 BB. Dry Flow Rate (AA × (1))	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.2090 0.791 Factor (28.95/V ction Factor (29. M x W x X) Z x (L/29.92) x [5 -U/100))	.64 x R)/((0 I. Fract.) Dry Basis Dry Basis Dry Basis Dry Basis)^.5	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872 0.872 0.872	- T))	Molecu 18.0 44.0 28.0 32.0 28.2	lar Wt.	$= W_{1}$ $= 0$ 2.30 0.00 0.00 5.83 19.45 27.59 $- 1.02$ 1.01 14.93 239 $- 208$	fps cfm scfm
PERCENT MOISTURE/GA U. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correction X. Velocity Pressure Correc Y. Corrected Velocity (A x I Z. Flow Rate (Y x G x 60) AA. Flow Rate (Standard) { BB. Dry Flow Rate (AA x (1: SAMPLE CONCENTRATIC CC. Sample Concentration	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.2090 0.2090 0.791 Factor (28.95/V ction Factor (29. M x W x X) Z x (L/29.92) x [5 -U/100)) DN/EMISSION R. [0.01543 x (P/T)	.64 x R)/((0 I. Fract.) Dry Basis Dry Basis Dry Basis Dry Basis Dry Basis)^.5	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872 0.872 0.872	- T))	Molecu 18.0 44.0 28.0 32.0 28.2	lar Wt.	= 000000000000000000000000000000000000	fps cfm scfm dscfm gr/dscf
PERCENT MOISTURE/GA U. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correction X. Velocity Pressure Correct Y. Corrected Velocity (A x I Z. Flow Rate (Y x G x 60) AA. Flow Rate (Standard) (BB. Dry Flow Rate (AA x (1) SAMPLE CONCENTRATIC CC. Sample Concentration CC1. Sample Concentration	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.2090 0.791 Factor (28.95/V ction Factor (29. M x W x X) Z x (L/29.92) x [5 -U/100)) DN/EMISSION R. [0.01543 x (P/T) n (CC x 2288379	.64 x R)/((0 I. Fract.) Dry Basis Dry Basis Dry Basis Dry Basis Dry Basis)^.5	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872 0.872 0.872	- T))	Molecu 18.0 44.0 28.0 32.0 28.2	lar Wt.	= 000000000000000000000000000000000000	fps cfm scfm dscfm gr/dscf ng/dscr
T. Corrected Gas Volume [(PERCENT MOISTURE/GA: U. Percent Water Vapor in V. Average Molecular Wei Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correction X. Velocity Pressure Correct Y. Corrected Velocity (A x I Z. Flow Rate (Y x G x 60) AA. Flow Rate (Standard) { BB. Dry Flow Rate (AA x (1) SAMPLE CONCENTRATIC CC. Sample Concentration DC1. Sample Concentration DD. Sample Concentration EL Hexavalent Chrome En	S DENSITY Gas Sample ((4 ight (Wet): 0.128 0.0000 0.2090 0.2090 0.791 Factor (28.95/V ction Factor (29. M x W x X) Z x (L/29.92) x [5 -U/100)) DN/EMISSION R. [0.01543 x (P/T) n (CC x 2288379 [54,143xCC/	.64 x R)/((0 I. Fract.) Dry Basis Dry Basis Dry Basis Dry Basis Dry Basis)^.5	.0464 x R) + Moist. F 1.000 0.872 0.872 0.872 0.872 0.872 0.872 0.872 0.872	- T))	Molecu 18.0 44.0 28.0 32.0 28.2	lar Wt.	= 0	fps cfm scfm dscfm gr/dscf ng/dscm ppm



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337

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Date: April 27, 2017

SOURCE TEST CALCULATIONS

Flow Rate and Emissions

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT 21865 E. Copley Dr. Diamond Bar, California 91765-4182

	lo. 17-337				Test Date: 4		
		SOUR	CE TEST CA	LCULATIONS			
ank Tested: Sample Train:	Sodium Dichi Run #2 - Chr	romate Sea	al Tank (#14			V. Stredwid	
SUMMARY A. Average Traverse Velocit	tv					14.83	fns
3. Gas Meter Temperature (deg F
C. Gas Meter Correction Fac		•	• •			1.0024	uog.
. Average Orifice Pressure							"H20
. Nozzle Diameter						0.4800	
. Stack Inside Diameter		7	inch	M. Pitot Correction Fact	or	0.99	
6. Stack Cross Sect. Area		0.267	ft2	N. Sampling Time		60	min
I. Average Stack Temp		127.6	deg F	O. Nozzle X-Sect. Area.		0.00126	ft ²
Barometric Pressure		29.35	•	P. Hex Chrome Sample		0.47374	
. Gas Meter Pressure (I+(D		29.59	•	Q. Total Chrome Sampl			•
C. Static Pressure	,,	-0.400	•	R. Water Vapor Conder		169.2	-
. Total Stack Pressure (I+(I		29.32		S. Gas Volume Metered		61.425	
Corrected Gas Volume [(S x 1/20 02) x 57	DO//460 B	- 			57.212	doof
	5 x 5/29.92) x 52	20/(400+D)	× 0			57.212	usci
PERCENT MOISTURE/GAS	S DENSITY						
						40.07	0/
Dereent Weter Vener in /	Cas Cample (14						
J. Percent Water Vapor in (Gas Sample ((4.	.64 x R)/((0	0.0464 x R) +	• 1))		12.07	%
/. Average Molecular Weig	ght (Wet):						
/. Average Molecular Weig	ght (Wet): Vol.	. Fract. x			ular Wt.		% /Mole
/. Average Molecular Weig Component	ght (Wet): Vol.	. Fract. x		ract. x Molect	ular Wt.	= W1	
 Average Molecular Weig Component Vater 	ght (Wet): Vol. 0.121	. Fract. x	Moist. F	ract. x Molece	ular Wt.	= W1	
 Average Molecular Weig Component Vater Carbon Dioxide 	ght (Wet): Vol. 0.121 0.0000 [. Fract. x	Moist. F	ract. x Molece 18.0	ular Wt.	= W1 2.17	
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide 	ght (Wet): Vol. 0.121 0.0000 [0.0000 [. Fract. x	Moist. F 1.000 0.879	ract. x Molect 18.0 44.0	ular Wt.	= W1 2.17 0.00	
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide Dxygen 	ght (Wet): Vol. 0.121 0.0000 E 0.0000 E 0.2090 E	. Fract. x Dry Basis Dry Basis	Moist. F 1.000 0.879 0.879	ract. x Molect 18.0 44.0 28.0	ular Wt.	= W1 2.17 0.00 0.00	
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide Dxygen 	ght (Wet): Vol. 0.121 0.0000 E 0.0000 E 0.2090 E	. Fract. x Dry Basis Dry Basis Dry Basis	Moist. F 1.000 0.879 0.879 0.879	ract. x Molecc 18.0 44.0 28.0 32.0	ular Wt. , , , , ,	= W1 2.17 0.00 0.00 5.88 19.61	
J. Percent Water Vapor in 6 V. Average Molecular Weig Component Water Carbon Dioxide Carbon Monoxide Dxygen Nitrogen & Inerts	ght (Wet): Vol. 0.121 0.0000 E 0.0000 E 0.2090 E	. Fract. x Dry Basis Dry Basis Dry Basis	Moist. F 1.000 0.879 0.879 0.879	ract. x Molecc 18.0 44.0 28.0 32.0	ular Wt.	= W1 2.17 0.00 0.00 5.88	
/. Average Molecular Weig Component Water Carbon Dioxide Carbon Monoxide Dxygen Nitrogen & Inerts	ght (Wet): Vol. 0.121 0.0000 E 0.0000 E 0.2090 E	. Fract. x Dry Basis Dry Basis Dry Basis	Moist. F 1.000 0.879 0.879 0.879	ract. x Molecc 18.0 44.0 28.0 32.0	ular Wt. , , , , ,	= W1 2.17 0.00 0.00 5.88 19.61	
/. Average Molecular Weig Component Water Carbon Dioxide Carbon Monoxide Oxygen	ght (Wet): Vol. 0.121 0.0000 [0.0000 [0.2090 [0.791 [. Fract. x Dry Basis Dry Basis Dry Basis Dry Basis	Moist. F 1.000 0.879 0.879 0.879 0.879	ract. x Molect 18.0 44.0 28.0 32.0 28.2	ular Wt. , , , , , Sum	= W1 2.17 0.00 0.00 5.88 19.61	
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide Dxygen Nitrogen & Inerts CLOW RATE 	ght (Wet): 0.121 0.0000 E 0.0000 E 0.2090 E 0.791 E Factor (28.95/V)	. Fract. × Dry Basis Dry Basis Dry Basis Dry Basis	Moist. F 1.000 0.879 0.879 0.879 0.879	ract. x Molect 18.0 44.0 28.0 32.0 28.2	ular Wt. , , , , , Sum	= W1 2.17 0.00 0.00 5.88 19.61 27.67	
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide Daygen Nitrogen & Inerts FLOW RATE V. Gas Density Correction Velocity Pressure Correct 	ght (Wet): 0.121 0.0000 [0.0000 [0.2090 [0.791 [Factor (28.95/V) ction Factor (29.5	. Fract. × Dry Basis Dry Basis Dry Basis Dry Basis	Moist. F 1.000 0.879 0.879 0.879 0.879	ract. x Molect 18.0 44.0 28.0 32.0 28.2	ular Wt. , , , , , , , , , , , , , , , , , , ,	= W1 2.17 0.00 0.00 5.88 19.61 27.67 1.02	./Mole
 Average Molecular Weig Component Carbon Dioxide Carbon Monoxide Carbon Monoxide Daygen Jitrogen & Inerts COURATE V. Gas Density Correction Velocity Pressure Correct Corrected Velocity (A x N 	ght (Wet): 0.121 0.0000 E 0.0000 E 0.2090 E 0.791 E Factor (28.95/V) ction Factor (29.9 M x W x X)	. Fract. × Dry Basis Dry Basis Dry Basis Dry Basis	Moist. F 1.000 0.879 0.879 0.879 0.879	ract. x Molect 18.0 44.0 28.0 32.0 28.2	ular Wt. , , , , , Sum	= W1 2.17 0.00 0.00 5.88 19.61 27.67 1.02 1.01	./Mole
 Average Molecular Weig Component Carbon Dioxide Carbon Monoxide Carbon Monoxide Daygen Nitrogen & Inerts COV RATE V. Gas Density Correction Velocity Pressure Correct Corrected Velocity (A x M Corrected Velocity (A x M Flow Rate (Y x G x 60) 	ght (Wet): 0.121 0.0000 E 0.0000 E 0.2090 E 0.791 E Factor (28.95/V) Ction Factor (29.9 M x W x X)	. Fract. × Dry Basis Dry Basis Dry Basis Dry Basis	Moist. F 1.000 0.879 0.879 0.879 0.879	ract. x Molect 18.0 44.0 28.0 32.0 28.2	ular Wt. , , , , Sum	= W1 2.17 0.00 0.00 5.88 19.61 27.67 1.02 1.01 15.17 243	./Mole
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide Carbon Monoxide Xygen Jitrogen & Inerts COV RATE Gas Density Correction Velocity Pressure Correct Corrected Velocity (A x M Corrected Velocity (A x M Corrected Velocity (A x M) Flow Rate (Y x G x 60) Ka. Flow Rate (Standard) (Z 	ght (Wet): 0.121 0.0000 E 0.0000 E 0.2090 E 0.791 E Factor (28.95/V) tion Factor (29.9 M x W x X) Z x (L/29.92) x [5	. Fract. × Dry Basis Dry Basis Dry Basis Dry Basis Dry Basis	(Moist. F 1.000 0.879 0.879 0.879 0.879	ract. x Molect 18.0 44.0 28.0 32.0 28.2	ular Wt. , , , Sum	= W1 2.17 0.00 0.00 5.88 19.61 27.67 1.02 1.01 15.17 243 211	./Mole
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide Dxygen Jitrogen & Inerts Corrected Velocity A x M Corrected Velocity (A x 6) Corrected Velocity (A x 6) Flow Rate (Y x G x 60) Flow Rate (Standard) (Z B. Dry Flow Rate (AA x (1- 	ght (Wet): Vol. 0.121 0.0000 [0.2090 [0.791 [Vol. 0.2090 [0.791 [Vol. 0.2090 [0.791 [0.791 [Vol. 0.2090 [0.2090 [0.200 [0.2090 [. Fract. x Dry Basis Dry Basis Dry Basis Dry Basis)^.5	(Moist. F 1.000 0.879 0.879 0.879 0.879	ract. x Molect 18.0 44.0 28.0 32.0 28.2	ular Wt. , , , Sum	= W1 2.17 0.00 0.00 5.88 19.61 27.67 1.02 1.01 15.17 243 211	./Mole fps cfm scfm
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide Dxygen Litrogen & Inerts Corrected Velocity Correction Corrected Velocity (A x N Corrected Velocity (A x	ght (Wet): Vol. 0.121 0.0000 [0.0000 [0.2090 [0.791 [0.791 [Factor (28.95/V) ction Factor (29.5 M x W x X) Z x (L/29.92) x [5 U/100))	. Fract. × Dry Basis Dry Basis Dry Basis Dry Basis Dry Basis)^.5	 Moist. F 1.000 0.879 0.879 0.879 0.879 0.879 	ract. x Molect 18.0 44.0 28.0 32.0 28.2	ular Wt.	= W1 2.17 0.00 0.00 5.88 19.61 27.67 1.02 1.01 15.17 243 211 186	./Mole fps cfm scfm dscfm
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide Darbon Monoxide Corrected Velocity (A x M Corrected Velocity (A x M	ght (Wet): Vol. 0.121 0.0000 [0.0000 [0.2090 [0.791 [0.791 [Vol. Vel.	. Fract. × Dry Basis Dry Basis Dry Basis Dry Basis Dry Basis)^.5	 Moist. F 1.000 0.879 0.879 0.879 0.879 0.879 	ract. x Molect 18.0 44.0 28.0 32.0 28.2	ular Wt.	= W1 2.17 0.00 0.00 5.88 19.61 27.67 1.02 1.01 15.17 243 211 186 1.28E-04	fps cfm scfm dscfm gr/dscf
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide Darbon Monoxide Darbon	ght (Wet): Vol. 0.121 0.0000 [0.0000 [0.2090 [0.791 [0.791 [Viction Factor (29.9 Viction Factor	. Fract. × Dry Basis Dry Basis Dry Basis Dry Basis Dry Basis)^.5	 Moist. F 1.000 0.879 0.879 0.879 0.879 0.879 	ract. x Molect 18.0 44.0 28.0 32.0 28.2	ular Wt.	= Wi 2.17 0.00 0.00 5.88 19.61 27.67 1.02 1.01 15.17 243 211 186 1.28E-04 292,377	fps cfm scfm dscfm gr/dscf ng/dscn
 Average Molecular Weig Component Vater Carbon Dioxide Carbon Monoxide Daygen Nitrogen & Inerts FLOW RATE V. Gas Density Correction 	ght (Wet): Vol. 0.121 0.0000 E 0.0000 E 0.2090 E 0.791 E Vol. 2.2090 E 0.2090 E 0.2090 E 0.791 E Vol. 2.2090 E 0.2090 E 0.2090 E 0.791 E Vol. 2.2090 E 0.2090 E 0.791 E Vol. 2.2090 E 0.2090 E 0.2090 E 0.791 E Vol. 2.2090 E 0.2090 E 0.2090 E 0.791 E Vol. 2.2090 E 0.2090 E 0.791 E Vol. 2.2090 E 0.2090 E 0.791 E Vol. 2.2090 E Vol. 2.208379 [54,143xCC/	. Fract. × Dry Basis Dry Basis Dry Basis Dry Basis Dry Basis)^.5	(Moist. F 1.000 0.879 0.879 0.879 0.879 0.879 0.879 0.879 (Molecular	ract. x Molect 18.0 44.0 28.0 32.0 28.2 Wt.)]	ular Wt.	= W1 2.17 0.00 0.00 5.88 19.61 27.67 1.02 1.01 15.17 243 211 186 1.28E-04	fps cfm scfm dscfm gr/dscf ppm



South Coast Air Quality Management District

21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Date: April 27, 2017

SOURCE TEST CALCULATIONS

Flow Rate and Emissions

-22-

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT 21865 E. Copley Dr. Diamond Bar, California 91765-4182

	No. 17-337							Test Date: 4/27/2017					
				CALCULATIO	-								
ank Tested: Sodium Dichromate Seal Tank (#14)							y: W. Stredwick						
SUMMARY													
A. Average Traverse Veloc							14.94						
B. Gas Meter Temperature								deg F					
C. Gas Meter Correction F							1.0024						
D. Average Orifice Pressul							0.15 0.2240						
E. Nozzle Diameter							0.2240	Inch					
F. Stack Inside Diameter		7	inch	M. Pitot Corre	ction Facto	r	0.99						
G. Stack Cross Sect. Area	l	0.267	ft2	N. Sampling T	ime		60	min					
H. Average Stack Temp		120.7	deg F	O. Nozzle X-S	ect. Area		0.00027	ft ²					
I. Barometric Pressure			0	P. Hex Chrom			0.07207						
J. Gas Meter Pressure (I+)			•		•			mg					
K. Static Pressure		-0.400	"H20	R. Water Vap	or Condens	ed	28.6	mĪ					
L. Total Stack Pressure (I+	+(K/13.6))			S. Gas Volum	e Metered.		13.268	dcf					
PERCENT MOISTURE/GA	AS DENSITY						9.80	dscf					
T. Corrected Gas Volume PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We	AS DENSITY n Gas Sample ((4 eight (Wet):	.64 x R)/((0	.0464 x R) +	· T))			9.80 = Wt /Mole	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We Component	AS DENSITY n Gas Sample ((4 eight (Wet): Vol		.0464 x R) + x Moist. F	· T))	Molecul		= Wt./Mole	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We Component Water	AS DENSITY n Gas Sample ((4 eight (Wet): Vol 0.098	64 x R)/((0 I. Fract.	.0464 x R) + : Moist. F 1.000	· T))	Molecul 18.0		= Wt./Mole 1.76	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We Component Water Carbon Dioxide	AS DENSITY n Gas Sample ((4 eight (Wet): Vol 0.098 0.0000	.64 x R)/((0 I. Fract. >	.0464 x R) + Moist. F 1.000 0.902	· T))	Molecul 18.0 44.0	ar Wt.	= Wt./Mole 1.76 0.00	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We Component Water Carbon Dioxide Carbon Monoxide	AS DENSITY n Gas Sample ((4 eight (Wet): Vol 0.098 0.0000 0.0000	64 x R)/((0 I. Fract. → Dry Basis Dry Basis	.0464 x R) + Moist. F 1.000 0.902 0.902	· T))	Molecul 18.0 44.0 28.0	ar Wt.	= Wt./Mole 1.76 0.00 0.00	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We Component Water Carbon Dioxide Carbon Monoxide Oxygen	AS DENSITY n Gas Sample ((4 eight (Wet): 0.098 0.0000 0.0000 0.2090	I. Fract.	.0464 x R) + Moist. F 1.000 0.902 0.902 0.902	· T))	Molecul 18.0 44.0 28.0 32.0	ar Wt.	= Wt./Mole 1.76 0.00 0.00 6.03	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We Component Water Carbon Dioxide Carbon Monoxide	AS DENSITY n Gas Sample ((4 eight (Wet): 0.098 0.0000 0.0000 0.2090	64 x R)/((0 I. Fract. → Dry Basis Dry Basis	.0464 x R) + Moist. F 1.000 0.902 0.902	· T))	Molecul 18.0 44.0 28.0	ar Wt.	= Wt./Mole 1.76 0.00 0.00	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We Component Water Carbon Dioxide Carbon Monoxide Oxygen	AS DENSITY n Gas Sample ((4 eight (Wet): 0.098 0.0000 0.0000 0.2090	I. Fract.	.0464 x R) + Moist. F 1.000 0.902 0.902 0.902	· T))	Molecul 18.0 44.0 28.0 32.0	ar Wt.	= Wt./Mole 1.76 0.00 0.00 6.03	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We Component Water Carbon Dioxide Carbon Monoxide Oxygen	AS DENSITY n Gas Sample ((4 eight (Wet): 0.098 0.0000 0.0000 0.2090	I. Fract.	.0464 x R) + Moist. F 1.000 0.902 0.902 0.902	· T))	Molecul 18.0 44.0 28.0 32.0	ar Wt. =	= Wt./Mole 1.76 0.00 0.00 6.03 20.12	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts	AS DENSITY n Gas Sample ((4 eight (Wet): 0.098 0.0000 0.0000 0.2090 0.791	I. Fract.	.0464 x R) + Moist. F 1.000 0.902 0.902 0.902 0.902	т))	Molecul 18.0 44.0 28.0 32.0 28.2	ar Wt.	= Wt./Mole 1.76 0.00 0.00 6.03 20.12 27.92	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor ir V. Average Molecular We Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correctio	AS DENSITY n Gas Sample ((4 eight (Wet): 0.098 0.0000 0.0000 0.2090 0.791	I. Fract.	.0464 x R) + Moist. F 1.000 0.902 0.902 0.902 0.902	· Т))	Molecul 18.0 44.0 28.0 32.0 28.2	ar Wt.	= Wt./Mole 1.76 0.00 0.00 6.03 20.12 27.92 1.02	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor in V. Average Molecular We Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correction X. Velocity Pressure Correction	AS DENSITY n Gas Sample ((4 eight (Wet): 0.098 0.0000 0.2090 0.791 n Factor (28.95/V ection Factor (29.	64 x R)/((0 I. Fract.	.0464 x R) + Moist. F 1.000 0.902 0.902 0.902 0.902	· T))	Molecul 18.0 44.0 28.0 32.0 28.2	lar Wt.	= Wt./Mole 1.76 0.00 0.00 6.03 20.12 27.92 1.02 1.02 1.01	%					
PERCENT MOISTURE/G/ U. Percent Water Vapor in V. Average Molecular We Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correctio X. Velocity Pressure Corre Y. Corrected Velocity (A x	AS DENSITY n Gas Sample ((4 eight (Wet): 0.098 0.0000 0.2090 0.791 n Factor (28.95/V ection Factor (29. M x W x X)	I. Fract.	.0464 x R) + Moist. F 1.000 0.902 0.902 0.902 0.902	· T))	Molecul 18.0 44.0 28.0 32.0 28.2	lar Wt.	= Wt./Mole 1.76 0.00 0.00 6.03 20.12 27.92 1.02 1.01 15.21	% 					
PERCENT MOISTURE/G/ U. Percent Water Vapor in V. Average Molecular We Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts	AS DENSITY n Gas Sample ((4 eight (Wet): 0.098 0.0000 0.2090 0.791 n Factor (28.95/V ection Factor (29. M x W x X)	I. Fract.	.0464 x R) + Moist. F 1.000 0.902 0.902 0.902 0.902	· T))	Molecul 18.0 44.0 28.0 32.0 28.2	ar Wt.	= Wt./Mole 1.76 0.00 0.00 20.12 27.92 1.02 1.01 15.21 244	% 					

SAMPLE CONCENTRATION/EMISSION RATE

CC. Sample Concentration [0.01543 x (P/T)] CC1. Sample Concentration (CC x 2288379600)	9.11E-05 gr/dscf 208,433 ng/dscm
DD. Sample Concentration [54,143xCC/ 51.996 (Molecular Wt.)]	9.48E-02 ppm
EE. Hexavalent Chrome Emission Rate (0.00857 x BB xCC)	1.51E-04 lb/hr
FF. Isokinetic Sampling Rate [(G x T x 100)/(N x O x BB)]	102.9 %



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337

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Date: April 27, 2017

SOURCE TEST CALCULATIONS Flow Rate and Emissions

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT 21865 E. Copley Dr. Diamond Bar, California 91765-4182

	No. 17-337	Test Date: 4/27/2017					
			CALCULATIO				
Tank Tested: Sample Train:	Ambient Sample Ambient Background C	hrome Train	#7	Input by:	W. Stredwid	ck	
	-						
SUMMARY A. Average Traverse \	/elocity					fps	
	ature (Use 60 deg.F for Te					deg F	
	on Factor					0	
D. Average Orifice Pre	essure				3.40	"H20	
E. Nozzle Diameter						inch	
E1. Plating Amps						A	
Stack Inside Diame	ter	inch	M. Pitot Corre	ection Factor			
	Area			Time		min	
	ηp			Sect. Area			
	28.80	•		ne Sample Collection		•	
	e (I+(D/13.6)) 29.05	-		me Sample Collection		-	
		"H20	•	or Condensed		ml	
I otal Stack Pressur	re (I+(K/13.6))	"HgA	S. Gas Volum	ne Metered	118.607	dct	
. Corrected Gas Volu	ıme [(S x J/29.92) x 520/(4	60+B) x C			107.253	dscf	
PERCENT MOISTUR	E/GAS DENSITY						
J. Percent Water Var	oor in Gas Sample ((4.64 x	R)/((0.0464)	(R) + T)		0.86	0/_	
		11, ((0.0101)	~		0.00	/0	
			× (() + 1))		0.00	70	
					0.00	70	
V. Average Molecula				Molecular Wt.		/o t./Mole	
V. Average Molecula Component	r Weight (Wet): Vol. Fract.	x Moist. F	ract. x	Molecular Wt.	= W1		
 Average Molecula Component Water 	r Weight (Wet): Vol. Fract. 0.009	x Moist. F 1.000	ract. x	Molecular Wt. 18.0 ,	= Wi 0.15		
/. Average Molecula Component Vater Carbon Dioxide	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis	x Moist. F 1.000 0.991	ract. x	Molecular Wt. 18.0 , 44.0 ,	= Wi 0.15 0.00		
/. Average Molecula Component Vater Carbon Dioxide Carbon Monoxide	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis	x Moist. F 1.000 0.991 0.991	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 ,	= W1 0.15 0.00 0.00		
/. Average Molecula Component Vater Carbon Dioxide Carbon Monoxide Dxygen	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis	x Moist. F 1.000 0.991 0.991 0.991	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 ,	= W1 0.15 0.00 0.00 6.63		
/. Average Molecula Component Water Carbon Dioxide Carbon Monoxide Dxygen	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis	x Moist. F 1.000 0.991 0.991	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 ,	= W1 0.15 0.00 0.00		
V. Average Molecula Component Water Carbon Dioxide Carbon Monoxide Oxygen	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis	x Moist. F 1.000 0.991 0.991 0.991	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , ,	= W1 0.15 0.00 0.00 6.63 22.11		
V. Average Molecula Component Water Carbon Dioxide Carbon Monoxide Dxygen Nitrogen & Inerts	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis	x Moist. F 1.000 0.991 0.991 0.991	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , , Sum	= W1 0.15 0.00 0.00 6.63		
V. Average Molecula Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts	r Weight (Wet): Vol. Fract. 0.0009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis	x Moist. F 1.000 0.991 0.991 0.991	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , , Sum	= W1 0.15 0.00 0.00 6.63 22.11		
V. Average Molecula Component Water Carbon Dioxide Carbon Monoxide Oxygen Nitrogen & Inerts	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis	x Moist. F 1.000 0.991 0.991 0.991	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , Sum	= Wi 0.15 0.00 0.00 6.63 22.11 28.90		
 Average Molecula Component Water Carbon Dioxide Carbon Monoxide Dxygen Nitrogen & Inerts FLOW RATE W. Gas Density Correst 	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis 0.791 Dry Basis	x Moist. F	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , Sum	= Wi 0.15 0.00 0.00 6.63 22.11 28.90 1.00		
 Average Molecula Component Water Carbon Dioxide Carbon Monoxide Dxygen Nitrogen & Inerts FLOW RATE N. Gas Density Correct Velocity Pressure 0 	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis 0.791 Dry Basis cection Factor (28.95/V)^.5 Correction Factor (29.92/L)	x Moist. F 1.000 0.991 0.991 0.991	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , Sum	= W1 0.15 0.00 0.00 6.63 22.11 28.90 1.00	t./Mole	
 Average Molecula Component Water Carbon Dioxide Carbon Monoxide Diygen Nitrogen & Inerts FLOW RATE V. Gas Density Corrected Velocity Corrected Velocity 	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis 0.791 Dry Basis correction Factor (28.95/V)^.5 Correction Factor (29.92/L) (A x M x W x X)	x Moist. F 1.000 0.991 0.991 0.991	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , , Sum	= W1 0.15 0.00 0.00 6.63 22.11 28.90 1.00	fps	
 Average Molecula Component Vater Carbon Dioxide Carbon Monoxide Daygen Nitrogen & Inerts Corrected Velocity Corrected Velocity Corrected Velocity Corrected Velocity Corrected Velocity 	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis 0.791 Dry Basis ection Factor (28.95/V)^.5 Correction Factor (29.92/L) (A x M x W x X)	x Moist. F 1.000 0.991 0.991 0.991	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , , Sum	= W1 0.15 0.00 0.00 6.63 22.11 28.90 1.00	fps cfm	
 Average Molecula Component Vater Carbon Dioxide Carbon Monoxide Dxygen Nitrogen & Inerts FLOW RATE V. Gas Density Correct Velocity Pressure (Corrected Velocity Z. Flow Rate (Y x G x XA. Flow Rate (Standa 	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis 0.791 Dry Basis correction Factor (28.95/V)^.5 Correction Factor (29.92/L) (A x M x W x X)	x Moist. F 1.000 0.991 0.991 0.991 0.991 ^.5.	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , Sum	= W1 0.15 0.00 0.00 6.63 22.11 28.90 1.00	fps cfm scfm	
 Average Molecula Component Water Carbon Dioxide Carbon Monoxide Dxygen Nitrogen & Inerts FLOW RATE Velocity Pressure (Corrected Velocity Corrected Velocity Corrected	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis 0.791 Dry Basis correction Factor (28.95/V)^.5 Correction Factor (29.92/L) (A x M x W x X) 60) ard) (Z x (L/29.92) x [520/(4)]	x Moist. F 1.000 0.991 0.991 0.991 0.991 ^.5.	ract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , Sum	= W1 0.15 0.00 0.00 6.63 22.11 28.90 1.00	fps cfm scfm	
 Average Molecula Component Water Carbon Dioxide Carbon Monoxide Diygen Nitrogen & Inerts FLOW RATE Velocity Pressure (Corrected Velocity Corrected Velocity Corrected	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.2090 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis 0.791 Dry Basis 0.791 Dry Basis 0.791 Ary Basis 0.791 Dry Basis	x Moist. F 1.000 0.991 0.991 0.991 0.991 ^.5	iract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , Sum	= Wi 0.15 0.00 0.00 6.63 22.11 28.90 1.00	fps cfm scfm dscfm	
 Average Molecula Component Water Carbon Dioxide Carbon Monoxide Diygen Nitrogen & Inerts FLOW RATE Velocity Pressure (Corrected Velocity Corrected Velocity Corrected	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.2090 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis	x Moist. F 1.000 0.991 0.991 0.991 0.991 ^.5	Fract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , Sum	= Wi 0.15 0.00 0.00 6.63 22.11 28.90 1.00	fps cfm scfm dscfm gr/dscf	
 Average Molecula Component Vater Carbon Dioxide Carbon Monoxide Daygen Vitrogen & Inerts Corrected Velocity Corrected Velocity Corrected Velocity Flow Rate (Y x G x x x). Flow Rate (Standa B. Dry Flow Rate (Standa B. Dry Flow Rate (AA CAMPLE CONCENTR CC. Sample Concentr CC1. Sample Concent 	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis	x Moist. F 1.000 0.991 0.991 0.991 0.991 ^.5	iract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , Sum	= W1 0.15 0.00 0.00 6.63 22.11 28.90 1.00 	fps cfm scfm dscfm gr/dscf ng/dscf	
 Average Molecula Component Vater Carbon Dioxide Carbon Monoxide Carbon Monoxide Daygen Nitrogen & Inerts Corrected Velocity Corrected Velocity Corrected Velocity Flow Rate (Y x G x A. Flow Rate (Y x G x A. Flow Rate (Standa B. Dry Flow Rate (Ad SAMPLE CONCENTR CC. Sample Concentr COL. Sample Concentr 	r Weight (Wet): Vol. Fract. 0.009 0.0000 Dry Basis 0.0000 Dry Basis 0.2090 Dry Basis 0.2090 Dry Basis 0.791 Dry Basis	x Moist. F 1.000 0.991 0.991 0.991 0.991 ^.5	Fract. x	Molecular Wt. 18.0 , 44.0 , 28.0 , 32.0 , 28.2 , Sum	= W1 0.15 0.00 0.00 6.63 22.11 28.90 1.00 1.00 1.44E-08 32.9 1.50E-05	fps cfm scfm dscfm gr/dscf ng/dscrf ppm	



South Coast Air Quality Management District 21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337

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Date: April 27, 2017

APPENDIX 2

Equipment Information, Field Data, Calibration Data, and Laboratory Results



South Coast Air Quality Management District 21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337

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Date: April 27, 2017

Western Analytical Laboratories 13744 Monte Vista Ave · Chino, CA 91710-5512 · Phone (909) 627-3623 · Fax (909) 627-0491 · www.walab.com

Customer: Address:	South Coast AQMD 21865 E Copley Dr	S465	WAL No.: 705	0256
	Diamond Bar, CA 91765-4182		Date Received:	05/12/17
Attention:	Joan Niertit		Date Of Report:	05/18/17
Sample Id:	Sodium Dichromate Seal		Date Sampled:	
	17 10526-25		P.O.#	2017001307
Tank No:	SDS		Gallons:	
Analysis			Res	ults
DICHROMATE				5.30 % by wt

This analysis has been carried out under controlled laboratory conditions and any suggestions are made solely on that basis.

GC Fax to 909- 396-2099

Report reviewed by Gregory Conti, Laboratory Director

ELAP Accredited Laboratory · Industrial Wastewater · Hazardous Waste · Domestic Water · Stormwater Metal Finishing Solution Analysis And Process Control



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337

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Date: April 27, 2017

Company	Lubeco	Inc.		fac 10# 412	T FOR EQUIPMI	Source Test No.	17-337
Address	6859 D	owney Ave.,	Long Beac	h, CA 90805		Request Date	April 5, 2017
Basic Equipm				al Tank, and Chrom	ate Spray Booth	Control Device	Un-controlled
Analysis/Equip	ment Req	uested By	W.	Stredwick		Date Equipment Needed	April 16, 2017
For Complian	ice, Rule	(s)	Rule Dev	elopment			26 013
Other (specify	y)					Facility ID	No. 41229
Dry Ice Need		/es				Laboratory No. 17	10328
E	uipment	Requested/I		MPLE EQUIPME		REQUEST alysis Requested	Set ID
6- CARB Me				Hexavalent an	d Total Chromium		
with sodium b	bicarbona	te solution		Train No	s: 4,5,1	1. 13.20.27	
and filter in th	he back o	ftrain			ca: Blue B		os · 128
				- Page -	129	.132.	
Probes, tubing	g and tub	e fittings		Acid washed a	and sodium bicarbo	nate rinsed	
		_					
2 donat	Drda	05		Return			
landto	Fi	Ton and		Thain 27	stubing,	anhe	
TEXIMIN	NI SI	lang		20		w probe	
		<u> </u>		13	i black	wproce	
				1 2	· pinnin	ng Cambrient sar	ada) Gilling
1):				$-\frac{1}{r}$	· no tubir		nple), rinning
				5		Wang.	
				Ŧ	: propet.	tubing	
upite and							
ي: م بر سيند ميرون							
1996							
2) 2)						6	
						3	
Simale a	b.1.	ubalia	09:00	1	a stad ick	-	
Swale a	und :	4/27/17	16:00	> per way	ne stredwich		
Sample e		412411		1			
Sample Equi			SA	MPLE EQUIPME	NT CHAIN OF C For (S/T, An		
Sample Equi		Fro	n .	То	Cleanup, Not		Time
C. T. STREET, SALES AND	1,13,20,	27 (90)	10Pm	Wr. ast	sIT	3-26-2017	2:30 PM
r.4,5,7,1		twaa	200	Smilli	Recover	y 04/28/17	08:45 AM
ecovery Sc	umples	C AAA	Phal	Chiette	Andup	5 05/01/17	10:00 AM
		AL ALL	~ ~ ~	(The second seco			



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337

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Date: April 27, 2017

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT 21865 Copley Dr., Diamond Bar, CA 91765-4182

Page 1 of 2

MONITORING & ANALYSIS REPORT OF LABORATORY ANALYSIS

TO Mike Garibay	LABORATORY NO	1710328
Supervising A.Q. Engineer Source Test & Engineering	SOURCE TEST NO	17-337
SAMPLE(S) DESCRIBED AS	DATE RECEIVED	04/28/17
6 Hexavalent Chromium Trains	RULE NO	NA
SAMPLING LOCATION		
Facility ID 41229 Lubeco Inc.	REQUESTED BY	Wayne Stredwick
6859 Downey Ave Long Beach, CA 90805	DATE ANALYZED	4/28/2017
song south, on yours	DATE REPORTED	5/4/2017

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS Moisture and Hexavalent Chromium by CARB 425 (Sodium Bicarbonate(NaHCO3) solution)

0.03

0.00

Train 4 Train 5 Train 7 Train 13 Train 20 Train 27 Moisture gain, g 28.6 169.2 9.0 -0.2 20.0 34.2 Silica gel% expended 99 90 0 99 60 10 -0.0008 -0.0009 Filter gain, g -0.0001 0.0052 0.0071 0.0007 Impinger 1 pH 9-10 9 9-10 9 9 9-10 Impinger 2 pH 9-10 9 9-10 9 9 9-10

Recovery Notes:

Cr⁺⁶ total ug

Train 4: Probe was ~5 feet long and contained moisture. Tubing was ~12 feet long. Container 1 pH = 9

473.74

Train 5: Probe had a significant amount of moisture, Tubing: ~10.5 feet, Probe: ~6 feet. Container 1 pH = 9

Train 7: Ambient sample. No probe, no tubing. Container 1 pH = 9

72.07

Train 13: Blank sample. No probe, no tubing. The inlet to the first impinger was left uncovered near the facility for an undertermined amount of time.

Train 20: No probe. Tubing length \sim 13 feet. Container 1 pH = 9

Train 27: Probe had a significant amount of moisture. Tubing: ~13 feet. Probe: ~4 feet. Container 1 pH = 9.

NOTE: Additional significant figures provided for calculation purposes.

Reviewed By:

Joan Niertit, Principal A.Q. Chemist Laboratory Services

Approved By:

Aaron Katzenstein, Ph.D. Senior Manager Laboratory Services (909) 396-2219

Date Reviewed:

0.10

71.19

<u>os/os/17</u> S/S/17____

Date Approved:



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337

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Date: April 27, 2017

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT 21865 Copley Dr., Diamond Bar, CA 91765-4182 Page 2 of 2

MONITORING & ANALYSIS REPORT OF LABORATORY ANALYSIS

LABORATORY NO 1710328

Wayne Stredwick REQUESTED BY

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS Moisture and Hexavalent Chromium by CARB 425 (Sodium Bicarbonate(NaHCO3) solution)

QUALITY CONTROL

BALANCE CHECK

Lab No.	Result (g)	Limit (g)	Check Status
B17D164-CCV1	100	±0.0005	Pass
B17D164-CCV2	500.0	±0.2	Pass

CCV RECOVERIES

Lab No.	Results (ppt)	Limit (%)	% Recovery
S17E004-CCV1	100	90-110	100
\$17E004-CCV2	99	90-110	99
S17E004-CCV3	. 98	90-110	98
S17E007-CCV1	99	90-110	99
S17E007-CCV2	94	90-110	94
S17E007-CCV3	101	90-110	101
S17E007-CCV4	104	90-110	104
S17E007-CCV5	100	90-110	100
S17E007-CCV6	98	90-110	99

REF B17D164 S17E004 S17E007

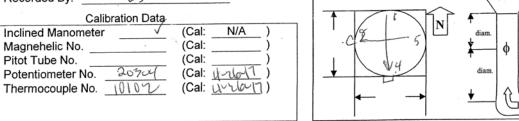


South Coast Air Quality Management District

21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

South Coast Air Quality Management District 4-27-17 Test No. 17-337 Libero LNC, Date: Company: Sampling Location: Sodown #14 Pri Chromabe Seal TUNK RUNH Gas Velocity Data Pass / Fail Pitot Tube Leak Check: (Pass) Fail Pitot Tube Leak Check: Temp. Calc. Velocity Calc. Calc. Velocity Temp. Temp. Time Sample Velocity Point Head (°F) Velocity Head (°F) Velocity Head (°F) Velocity ("H₂O # ("H₂O) (fps) ("H₂O (fps) (fps) 103 127.7 128.3 104 103 126,7 204 04 104 127,7 [27.] 128. \mathcal{L} 125,9 126.0 04 127.5 164 ,05 164 126-7 ,04 125,4 .00 125.4 4 177.0 126.6 105 1.03 105 27.3 5 105 126.1 ,04 1270 .05 220 (0 27,0 105 125.5 126,0 05 .05 27. 105 12511 126.3 .05 105 12 (Average) لان HgA " Static Pressure in Stack: Mendo 0.42 " H₂O) (+16) " HgA Pitot Factor: 1.0 29.35 Barometric Pressure: Recorded By: WS

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Stack: Horizontal / Vertical Rectangular / Circular

Stack

Dimensions

Date: April 27, 2017



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337 -30-Date: April 27, 2017 South Coast Air Quality Management District Test No. 17-337 Company: <u>Cube co luc.</u> Date: 4-27-17 Sampling Location: Sodium Dichromote Sere jank #14 Sample Train: Traverse Source Test Data PUN# Pre-Test Leak Check: Post-Test Leak Check: Filter: _____ cfm @ "Hg vac cfm @ Filter: "Hg vac _ "Hg vac _ "Hg vac (7) cfm @ 3 Probe: 15 Probe: Pitot Tube Leak Check: Pass / Fail Pitot Tube Leak Check: Pass / Fail Time Sample Gas Meter Vacuum " Hg Stack Calculated Probe Filter Imp. Meter Temp. Point Reading (dcf) Velocity Temp. °F Velocity Sampling Orifice Temp. °F Temp. Temp. # Start: 258 Head (fps) Rate ΔP °F °F °F In Out ("H₂O) ("H₂O) (cfm) 10:45 75,343 +7.5 76.820 127.6 14.06 0.176 :64 0,10 63 76 2.0 76 +15 2 78.170 104 127,6 14,06 6,176 0,10 41 79 2.0 81 79,470 1265 14.04 0.177 +225 3 104 0.10 43 83 80 2.0 +30 80,700 1257 14.04 0.170 4 104 43 83 20 0.10 85 +37.5 5 82.100 127.0 15.71 0,189 105 0.12 86 84 2.0 +45 83,525 105 126.8 15.71 0.189 0.12 87 85 2,5 +52.5 7 85.135 .05 1262 15,70 0:189 0:12 89 86 7,5 ą. +60 86,842 105 126.2 15,70 01189 0,13 90 87 7.5 (Net Vol. Uncorr.) Avg. Stack Moisture: $(\rho^{\partial} \ell_{\theta})$ Canister #: K-Factor: 0.5682 Start: "Hg vac WS. Nozzle Diameter: 0,211 Recorded By: 20.35 " HgA Barometric Pressure: Pitot Factor: 1 cD 0.42 ″ H₂O Static Pressure in Stack: +/(-) Calibration Data Ν Inclined Manometer (Cal: N/A diam. Magnehelic No. (Cal:) ø Stack Pitot Tube No. (Cal:) Dimensions Potentiometer No. <u>20304</u> Thermocouple No. <u>10102</u> Gas Meter No. <u>No714</u> (Cal: <u>4-26-17</u>) (Cal: <u>4-26-17</u>) 2 diam ¥ (Cal: 3-24-17) Meter Corr. Factor: 1.0024 Stack: Horizontal (Vertical Sampling Probe: Stainless Steel Borosilicate Quartz Rectangular /(Circular THANK TEMP = 203 OF mechanicae AgitAtion Revision 01/09



South Coast Air Quality Management District

21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

South Coast Air Quality Management District Test No. 17-337 Lubelo INC. Date: Company: 4-27-17 #14 Sampling Location: Sodium DiChonste Serce TAK PUN #2 Gas Velocity Data Pitot Tube Leak Check: Pass / Fail Pitot Tube Leak Check: Pass / Fail Time Sample Velocity Calc. Calc. Temp. Velocity Velocity Calc. Temp. Temp. Point # Head (‴H₂O) (°F) Velocity Head (°F) Velocity Head (°F) Velocity (‴H₂O (fps) (fps) ("H₂O (fps) 12:20 12 4 45 103 128.4 104 103 127.4 1272 26 103 105 104 127. 27.4 127.8 129, 128.3 37 104 105 104 27.5 128.6 100 48 105 178.2 105 128. 3 126.6 106 28.2 1280 106 106 62 104 127.7 105 127.3 iOF 127,5 73 04 26.5 17719 105 127.2 NO A 84 126.9 1270 04 127:3 04 105 (Average) 0.40 " H₂O) Static Pressure in Stack: " HgA (+ /) Barometric Pressure: 29.35 1.0 " HgA Pitot Factor: Recorded By: us Calibration Data N (Cal: Inclined Manometer N/A diam Magnehelic No. (Cal: ø Stack Pitot Tube No. (Cal: Dimensions Potentiometer No. 101020304 (Cal: 4-20-17 dian)

-31-

Date: April 27, 2017

.

(Cal: 4-26-17)

Stack: Horizontal / Vertical

Rectangular / Circular

Thermocouple No. 10102

Revision 02/13



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337

-32-

Date: April 27, 2017

South Coast Air Quality Management District

Т	est No.	<u>17-337</u> Location:	Con	npany:	Lul	ne (O	INC.		D	ate:	4-2	7-17	2
S	ampling	Location:	odium	YICK	omae Traverse	Ser	Test Da	<u>/ #/9</u> uta	r S Run	ample T #∠_	rain:	5	
Fi Pi	ilter: robe:	Leak Check: cfm @ cfm @ e Leak Check:	15	"Hg "Hg	2.1	Jource	Po Filt Pro	st-Test L er: obe: ot Tube	eak Che	eck: cfm @ _ cfm @ _			vac vac
Time	Sample Point #	Reading (dcf)	· · · · ·			Calculated Sampling Rate (cfm)	Orifice △P ("H₂O)	Probe Temp. °F	Filter Temp. °F	Imp. Temp. °F		Temp. F Out	Vacuum " Hg
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+15	346	101,400	0,04	127.7	14.06	0.91	2.88			57	9)	87	10
+ 27.5	37	108,6500	045	128.0	14,92	0.97	3,26			59	93	90	12
+30		116.3300								51	96	93	12
+375					,					46	94	91	12
+45		132.860	, r							47	98	95	12
		140.3500									99		12
1 60	194	141,5000	1940	1 LII	[41]0	01-11	7:76			22	100	78	164
						a contraction of the second							
(Net Vol.	. Uncorr.)		Avg.										
K-Fact	or:(1.5682	Stack	Moistu	re:6	, ^q / C	anister #	ŧ:		Start	:	″I	Hg vac
Nozzle Diameter: $O, 46$ " Recorded By: ω Barometric Pressure: $2-4, 25$ "HgA Pitot Factor: $/_{10}$ Static Pressure in Stack: $+/(-)$ $0, 40$ "H ₂ O													
Inclined Magne Pitot Tu Potenti Thermo Gas Mo	d Manor helic No ube No. iometer ocouple eter No. Corr. Fa	Calibration E meter 0. No. 10102 No.	Data ((Cal: Cal: Cal: _ <u>4</u> Cal: <u>4</u> Cal: <u>4</u> Cal: <u>3</u>	N/A -76-17 -76-17 -76-17 -79-17)))					diam. diam.	Sta	ck nensions
Sampli	ng Prob	e: Stainless S	teel Bord	osilicate	Quartz 71m× Mechm	ieme = Manz A	Stack 201°F Grf at lon	/	zontal / Ve	ertical)	Recta	ingular / ₍	Circular



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

-33-Source Test No. 17-337 Date: April 27, 2017 South Coast Air Quality Management District Date: 4-27-17 Test No. 17-337 Lubelo INC. Company: Sudium Pichante Serve Sampling Location: TMK Row #3 Gas Velocity Data Pass / Fail Pitot Tube Leak Check: (Pass //Fail Pitot Tube Leak Check: (Velocity Sample Point Velocity Head Temp. (°F) Calc. Velocity Temp. Calc. Temp. (°F) Calc. Time Velocity Head (°F) Velocity Head ("H₂O Velocity # ("H₂O) (fps) (‴H₂O (fps) (fps) 104 122 ,04 21.4 104 121.0 122.4 ,04 120.8 104 120.5 .04 3 120,9 :05 121.0 ,05 121.4 105 4 120,5 105 120,4 105 105 120.6 5 ,04 104 119.2 164 1 8.3 120.5 1213 119.4 120.9 105 6 ,05 105 119.6 120.4 105 1219 105 104 1214 105 1199 121,3 105 105 4 (Average) 0.40 (+/0_ " H₂O) " HgA Static Pressure in Stack: Pitot Factor: " HgA 1.0 Barometric Pressure: 24.35 Recorded By: ws Calibration Data Ν (Cal: N/A **Inclined Manometer** diam (Cal: Magnehelic No. φ Stack (Cal: 9-26-17 Pitot Tube No. 10102) Dimensions

diam

Rectangular / Circular

Horizontal / Vertical

Stack:

(Cal:

(Cal: 4-2017

)

Potentiometer No.

Thermocouple No. 1002

20304



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337 -34-Date: April 27, 2017 South Coast Air Quality Management District Test No. 17-337 Lubeco 4-27-17 Company: WC. Date: Surium Dictromate Ser Sampling Location: Sample Train: TANK PUN#3 Traverse Source Test Data Pre-Test Leak Check: Post-Test Leak Check: Filter: ___ cfm @ "Hg vac _ cfm @ Filter: "Hg vac "Hg vac "Hg vac Probe: C cfm @ 15 Probe: Õ cfm @ Pitot Tube Leak Check: Pass / Fail Pitot Tube Leak Check: Pass/Fail Sample Time Gas Meter Stack Calculated Probe Filter Imp. Meter Temp. Vacuum Point Reading (dcf) Velocity Velocity Orifice Temp. Temp. °F ' Ha Temp. Sampling Temp. # Head °F (fps) Rate $\triangle \mathbf{P}$ Start:/50,282 °F °F °F In Out 2:07 ("H₂O) ("H₂O) (cfm) Do 12/15 13.99 0.492 0:13 17.5 6.04 1 151.900 64 94 2.0 95 HS 2 153,500 0.04 121.2 13,98 0,192 0.13 96 95 58 2.0 +27.5 155,155 0.05 121.1 15.63 6.214 0.16 97 96 2.5 55 0,05 119,3 15,61 0,215 0,16 +30 156.700 96 95 48 2.5 0:04 119.3 13,96 0.192 0.13 +37.5 58,350 59 96 95 20 +45 60,150 0.05 120,2 15.62 0.215 0.16 97 96 600 7.5 +525 101,950 0.05 120.6 15.63 0.215 0.16 7 97 96 2.5 0.05 120.9 15.63 0.215 0.16 thed 63,550 97 54 96 25 (Net Vol. Uncorr.) Avg. 600 K-Factor: 0,5682 Stack Moisture: Canister #: Start: "Hg vac ws Nozzle Diameter: 0,234 Recorded By: " HgA Barometric Pressure: 29. Pitot Factor: 10 ″ H₂O Static Pressure in Stack: +/(-) 0,40 **Calibration Data** Ν Inclined Manometer (Cal: N/A 8 diam Magnehelic No. (Cal: ø Stack Pitot Tube No. (Cal:) Dimensions (Cal: 4-26-17) Potentiometer No. 20304 Thermocouple No. (Cal: 4-26-17) 10102 6 _ Gas Meter No. 20714 (Cal: 3-24-17) Meter Corr. Factor: 1,0024 TANK TEMP = 200 Stack: Rectangular (Circular Sampling Probe: Stainless Steel / Borosilicate / Quartz Horizontal / Vertical 90-180 ATTMIN INTO Revision 01/09

Mechanica Asitation



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

ce Test N	No. 17-3	337	-35-								Date: April 27, 2017		
			So	outh Co	oast Air (Quality N	lanagen	nent Dis	strict				
т	est No	337 	- 8 Com	1.1		1 4							
s	ampling	Location:	A.	npany:	FIS	LVDE	co	(ODE))ate: ample∃	4-27	1-17	
					Traverse	e Source	Test Da		3	ampie	rain:	+	
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P	itot Tub	e Leak Check	Pass	Hg s / Fail	j vac		Pro Pit	obe: ot Tube	Leak Ch	cfm @ neck:	/ <u>/</u> Pass /	_ ″Hg ∖ Fail	vac
Time	Sample	Gas Meter	Sta	ick		Calculated		Probe	Filter	Imp.	Meter	Temp.	Vacuum
	Point #	Reading (dcf) Start:	Velocity Head		Velocity (fps)	Sampling	Orifice	Temp.	Temp.	Temp.	Wieter	F	" Hg
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						and the state of the							
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Gas Met		N0715	(Ca		23/17)		ŀ	←		★	ît	<u> </u>	
Aeter Co	orr. Fact	tor: 0.99			· · ·	[C		
Sampling	g Probe	Stainless Ste	el / Borosi	licate / Q	uartz		Stack:	Horizo	ntal / Verti	cal	Rectang	gular / C	ircular



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337 -36-Date: April 27, 2017 South Coast Air Quality Management District 337 Date: <u>4/27/17</u> Sample Train: <u>20</u> Company: Lubeco Test No. 17-828 33 Sampling Location: pray Booth Stach **Traverse Source Test Data** Pre-Test Leak Check: Post-Test Leak Check: Filter: _____ cfm @ "Hg vac _ cfm @ _ Filter: "Hg vac Probe: 003 cfm @ ____ "Hg vac _____"Hg vac Probe: 0-006 cfm @ 17 Pitot Tube Leak Check: Pitot Tube Leak Check: Pass / Fail Pass / Fail Time Sample Point Gas Meter Probe Meter Temp. Stack Calculated Filter Imp. Vacuum Reading (dcf) " Hg Velocity Velocity Orifice °F Temp. Sampling Temp. Temp. Temp. # °F Rate ΔP Head (fps) Start: 465.708 °F °F °F In Out ("H₂O) (cfm) ("H₂O) 11!" 480.08 3.40 37 86 84 10 495.52 3.40 39 91 86 10 +15 +30 509.88 3.40 38 95 88 10 145 524.755 Stopped - operator 3.40 99 72 10 41 3.40 +60 539.72 93 47 99 10 +75 554.57 3.30 94 90 10 36 +90 569.28 3.30 39 99 94 10 + 105 584.315 3.30 37 100 94 10 +120 (Net Vol. Uncorr.) 118.607 Avg. K-Factor: 0.5526 Stack Moisture: Canister #: Start: "Hg vac " Recorded By: Éľ Nozzle Diameter: ____ " HgA 28.80 Barometric Pressure: Pitot Factor: ″ H₂O Static Pressure in Stack: +/-___ Calibration Data N Inclined Manometer (Cal: N/A diam Magnehelic No. (Cal: ø Stack Pitot Tube No. (Cal: Dimensions Potentiometer No. No315 (Cal: 3/23/17 dian Thermocouple No. (Cal: Gas Meter No. رد (Cal: ر _NO 715 Meter Corr. Factor: 0.9910

Rectangular / Circular

Stack: Horizontal / Vertical

Sampling Probe: Stainless Steel / Borosilicate / Quartz



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337		-37-	Date: April 27, 2017
	327	STAND TRIAL 2 3 1 2 2 3 3 3 3	SOUTH DRY G
	1 1 1	ARD DRY With CFM 1/4 1/4 1/2 1/2 1/2 1/2 1/2 1/2 3/4 3/4	SOUTH COAST AJ DRY GAS METER DRY GAS METER
	1.0097 1.0096 1.0130	STANDARD DRY GAS METER ID#: With Coefficient of TRIAL CFM U/C TEMP 1 1/4 0.3168 74 2 1/4 0.3158 74 3 1/4 0.3158 74 1 1/2 0.5311 74 2 1/2 0.5283 74 3 1/2 0.5472 74 1 3/4 0.7782 74 2 3/4 0.7861 74	SOUTH COAST AIR QUALITY MANAGEMENT DIS DRY GAS METER CALIBRATION WORKSHEET DRY GAS METER COEFFICIENT CALCULATIONS
	74 74 74	R ID#: ent of TEMP 74 74 74 74 74 74 74 74 74 74	TY MANI ATION I IENT CJ
	ى م م	H200 5.2 5.2 8 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	AGEMEN NORK SH
	1.0033 1.0032 1.0066	7812470 1.0000 Corrected FlowRate 0.3089 0.3079 0.3079 0.5172 0.5172 0.5155 0.5172 0.5356 0.77662 0.7740	SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT DRY GAS METER CALIBRATION WORKSHEET DRY GAS METER COEFFICIENT CALCULATIONS
	1.0157 1.0177 1.0189	DRY GAS U/: TEMP FlowRate 0.3188 74 0.3188 74 0.3186 74 0.3186 74 0.5267 74 0.5267 74 0.5289 74 0.5289 74 0.7843 74 0.7890 74	
	74 74 74	GAS M PEMP ate 74 74 74 74 74 74 74 74 74	
	6.05 6.05	DRY GAS METER N0714 U/: TEMP H2O Corre lowRate Flow 8 74 0.8 0.3 8 74 0.8 0.3 6 74 1.88 0.5 9 74 3.6 0.7 9 74 3.6 0.7	
CORRECTION	1.0021 1.0041 1.0052	TER N0714 H2O Corrected FlowRate 0.8 0.3105 0.8 0.3105 0.8 0.3103 0.8 0.5192 88 0.5192 88 0.5144 88 0.5144 88 0.5144 88 0.5165 3.6 0.7692 3.6 0.7739	
V FACTOR:	1.0012 0.9991 1.0013	COEF 0.9950 1.0010 0.9922 1.0012 1.0012 1.0369 0.9960 0.9997 1.0002	DATE : PERFORMED BY:
	1.0006	AVE: 0.9960 1.0145 0.9986	ВҮ:
1.0024		OVERALL 1.0024	Page 3 March 24, 20 W. Stredwick



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337	7		-38-	Date: April 27, 2017
DRY GAS METER ID :	ω N -1	ω N → ω N →	TRIAL 1 2 3	DATE:
METER IC		1/2 1/2 3/4 3/4	CFM 1/4 1/4 1/4	3/23/2017
	1.0267 1.0289 1.0302	0.5498 0.5500 0.5496 0.7928 0.7907 0.7907	U/C FlowRate 0.2976 0.1764 0.2959	
N0715	74 74 74	74 74 74	TEMP 74 74 74	SO
	9.6 9.6	5.6 2.2 5.6 5.6	H20 PR	DRY GAS
	1.0227 1.0249 1.0262	0.5380 0.5381 0.5377 0.7822 0.7800 0.7801	DRY GAS METER ID : Corrected U/C FlowRate FlowRate 0.2904 0.2969 0.1721 0.2948 0.2887 0.2941	SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT DRY GAS METER CALIBRATION WORKSHEET DRY GAS METER COEFFICIENT CALCULATIONS
	1.0046 1.0033 1.0052	0.5351 0.5350 0.5355 0.7697 0.7678 0.7668	FER ID : U/C FlowRate 0.2969 0.2948 0.2941	CALIBRAT
	74 74 74	74 74 74	ТЕМР 74 74 74	ION WOR
	6.55 6.55	1.975 1.975 1.975 3.85 3.85 3.85	N0715 H2O 0.7 0.7 0.7	NT DISTR KSHEET
CORRE	0.9934 0.9921 0.9939	0.5233 0.5232 0.5237 0.7561 0.7543 0.7533	Corrected FlowRate 0.2894 0.2874 0.2867	RCT
CORRECTION FACTOR:	1.0295 1.0331 1.0324	1.0280 1.0286 1.0268 1.0345 1.0345 1.0355	COEF 1.0032 0.5988 1.0072	
ACTOR:	1.0317	1.0278 1.0347	AVE: 0.8697	PERFOI
0.9910			OVERALL 0.9910	PERFORMED BY: W.Stredwick



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337 -39-Date: April 27, 2017 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT DATA SHEET FOR THERMOCOUPLE/POTENTIOMETER CALIBRATION Field Meter STQC# : CO3014 20309 Ref. Thermometer # : ASTA 08343 Temperature Source(s): Julie Furnkie Date: <u>4-76-17</u> Calibration By: <u>w.S</u> Calibration Period: Semiannual Bimonthly_ Other 20304 (030) Lead Wire Lead Wire STQC#_ STQC# Temp.* Α в (B-A)100 в (B-A)100 ** Α Α ** Sensor Ref. STQC# Temp. Ch#1 Ch#2 | Ch#1 Ch#2 Ch#1 Ch#2 Ch#1 Ch#2 COMMENTS 32 32 32 33 33 10102 10162 215 214 215 214 214 $\dot{\gamma}$ 10102 655 1055 656 655 656 1 All temperatures are in degrees F. "Percent (%) difference should not exceed +/- 1.5%. Page Number



21865 E. Copley Drive, Diamond Bar, CA 91765-4182 (909) 396-2000

Source Test No. 17-337 -40-Date: April 27, 2017 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT DATA SHEET FOR THERMOCOUPLE/POTENTIOMETER CALIBRATION :NO314 + NO315 Field Meter STQC# Date: 3-24-17 Ref. Thermometer # :<u>ASTM 08343</u> Temperature Source(s):<u>Jara Fusion</u> Calibration By: Calibration Period; Semiannual Bimonthly Other N0314 NUJIS Lead Wire Lead Wire •• STQC# STQC# Temp.* Α в (B-A)100 в (B-A)100 ** A A ** Sensor Ref. STQC# Ch#1 Temp. Ch#2 Ch#1 Ch#2 Ch#1 Ch#2 Ch#1 Ch#2 COMMENTS 2/2 (0112 10/02

* All temperatures are in degrees F.

**Percent (%) difference should not exceed +/- 1.5%.

Page Number