South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

SOURCE TEST REPORT

13-306 and 13-307

CONDUCTED AT

Exide Technologies
2700 S. Indiana Street
Vernon, CA 90058

SCREENING TESTS FOR MULTIPLE METAL AND SPECIATED ORGANIC EMISSIONS FROM THE HARD LEAD BAGHOUSE EXHAUST STACK

TESTED:	July 18, 2013 and August 8, 2013
LAB DATA RECEIVED:	August 28, 2013
ISSUED:	October 17, 2013
REPORTED BY:	Jason Aspell Air Quality Engineer II

REVIEWED BY:

Michael Garibay
Supervising Air Quality Engineer

SOURCE TEST ENGINEERING BRANCH

MONITORING & ANALYSIS DIVISION

Cleaning the air that we breathe...™

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SUMMARY

a. Firm .... Exide Technologies

b. Test Location .... 2700 S. Indiana St., Vernon, CA 90023

c. Unit Tested .... Hard Lead Baghouse (Device ID C46)

d. Test Requested by .... Barry Wallerstein, D. Env; Executive Officer (909) 396-3131

e. Reason for Test Request .... Testing of multiple metal and speciated organic emission rates

f. Dates of Test .... July 18, 2013 and August 8, 2013

g. Source Test Performed by .... R. Lem, C. Willoughby E. Padilla, W. Stredwick, J. Aspell

h. Test Arrangements Made Through .... Ed Mopas (Environmental Manager) Exide Technologies (323) 262-1101 x 259

i. Source Test Observed by .... Process Information Taken By Michal Haynes AQ Inspector III (909) 396-2369

j. Company I.D. No. 124838

k. Permit No. .... RECLAIM/Title V Facility Permit

l. Application No. 501060

EXECUTIVE SUMMARY

In March 2013, the South Coast Air Quality Management District (SCAQMD) approved the Health Risk Assessment for the Exide Technologies facility in Vernon that was submitted to meet the requirements of Assembly Bill (AB) 2588 and SCAQMD Rule 1402. In response to the high levels of toxic air contaminants (TAC) reported, modifications were made to equipment at the facility in an attempt to mitigate the toxic emissions. Specifically, an isolation door was installed on the feed chute of the Blast Furnace to keep the Blast Furnace closed during times when material is not being charged to the furnace. This was designed to direct emissions to the Afterburner and Neptune Scrubber control system, instead of routing the emissions to the Hard Lead Baghouse, which is not designed to properly control emissions from the Blast Furnace Feed Chute. Arsenic emissions from the Hard Lead Baghouse contributed approximately 90% of the facility's health risk. In addition, 1,3-butadiene emissions, a toxic organic compound, from the same exhaust stack contributed 4% of the facility's risk.

An early screening source test was performed on the Hard Lead Baghouse on July 18, 2013. An additional test that was conducted on August 8 is included in this report for informational purposes that will be included as a part of future compliance testing. Testing was done for multiple metals (including lead and arsenic) and speciated organic emissions while the facility's Blast Furnace, Reverbatory (Reverb) Furnace and Refining Kettles were in operation. At the time of the July 18 test, the facility was not capable of full-scale production. A full set of comprehensive, acceptable source tests will be conducted for permit requirements and Health Risk Assessment purposes once the facility resumes full operation.

Although these two tests were not comprehensive enough to be used directly for Health Risk Assessment purposes, they give an early indication of improvements. However, an adequate determination of the effectiveness of the isolation door cannot be made without additional source tests, which are being conducted. Source test observations have concluded that the fugitive emissions from the Blast and Reverb Furnaces are often controlled by more than just one air pollution control system, which were not included with this testing. The additional testing will include testing of multiple sources to get a better representation of the facility-wide health risk that reflects updated operating conditions at Exide Technologies.

RESULTS

Table 1. Summary of Test Conditions

		Test No. 1	Test No. 2
Date		July 18, 2013	August 8, 2013
Time	HH:MM	12:00 - 14:15	11:10 – 13:45
Sampling time	min	120	120
Exhaust Flow Rate	acfm	106, 000*	106,000
	dscfm	93,000*	93,000
Charge Rate During Sampling+			
Blast Furnace	ton/hr	3.84	5.31
Reverb Furnace	ton/hr	14.75	6.3
Percent of Permitted Limit During Sampling#			
Blast Furnace	%	51.7	71.4
Reverb Furnace	%	80.6	34.6
Overall Charge (Day and Night Shift)			
Blast Furnace	tons	116.6	113.5
Reverb Furnace	tons	342	263
Overall Percent of Permitted Limit (Day and Night Shift)			
Blast Furnace	%	65.4	66.0
Reverb Furnace	%	77.9	59.9
Kettle Arsenic Additions	lb	0	0
Time of Arsenic Addition	HH:MM	N/A	N/A

* Corrected exhaust rate to Test No. 2 exhaust rate. See Test Critique for details.
+ Charge rate based on material charged during test period.
# Test period charge rate extrapolated to 24 hours divided by daily permit limit of equipment.

Table 2. Summary of Test Results for Metal Emissions from Hard Lead Baghouse

	Test No. 1 7/18/13*	Test No. 2 8/8/13
	lb/hr	lb/hr
Lead	6.33×10^{-3}	2.23×10^{-2}
Arsenic	1.02×10^{-3}	7.31×10^{-4}
Cadmium	2.32×10^{-4}	2.87×10^{-4}
Manganese	1.22×10^{-4}	3.03×10^{-4}
Nickel	2.61×10^{-4}	3.98×10^{-4}
Chromium	9.10×10^{-5}	1.75×10^{-4}
Antimony	8.14×10^{-5}	1.06×10^{-4}
Selenium	4.31×10^{-5}	4.68×10^{-5}
Barium	3.91×10^{-3}	7.99×10^{-4}
Zinc	2.90×10^{-3}	8.77×10^{-3}
Tin**	1.64×10^{-3}	1.22×10^{-3}
Titanium	8.86×10^{-5}	2.34×10^{-4}
Copper	4.55×10^{-4}	2.19×10^{-3}
Cobalt	Non-detect	3.09×10^{-5}
Iron	Non-detect	1.15×10^{-2}

* Emission rates for Test No. 1 are based on the exhaust flow rate for Test No. 2. See Test Critique for details.

** Tin concentration of blank impingers was 60% of sampling train impinger concentration. Tin is present in the hydrogen peroxide impinger solution as a stabilizer.

Note: For comparison purposes, previously measured arsenic emissions from the October 2010 and May 2012 tests for this exhaust stack used for the HRA were 7.59×10^{-2} lb/hr and 2.12×10^{-2} lb/hr.

Table 3. Summary of Test No. 1 Results for Speciated Organic Emissions from Hard Lead Baghouse*

Compound	ppb	lb/hr+	Compound	ppb	lb/hr+
1,3-butadiene	14.9	1.19×10^{-2}	propane	116	7.55×10^{-2}
benzene	40.9	4.71×10^{-2}	isobutane	7.7	6.60×10^{-3}
acrolein	0.9	7.45×10^{-4}	1-butene	20.2	1.67×10^{-2}
acetone	12.8	1.10×10^{-2}	n-butane	8.2	7.03×10^{-3}
methylene chloride	0.3	3.76×10^{-4}	n-pentane	17.7	1.88×10^{-2}
MEK	0.8	8.51×10^{-4}	1-hexene	2.2	2.73×10^{-3}
chloroform	0.1	1.76×10^{-4}	n-hexane	0.7	8.90×10^{-4}
toluene	8.9	1.21×10^{-2}	n-heptane	0.6	8.87×10^{-4}
ethylbenzene	2.2	3.45×10^{-3}	n-octane	0.2	3.37×10^{-4}
m+p xylenes	1.1	1.72×10^{-3}	n-nonane	0.2	3.78×10^{-4}
styrene	19.6	3.01×10^{-2}	n-decane	0.1	2.10×10^{-4}
o-xylene	0.5	7.83×10^{-4}	n-undecane	0.2	4.61×10^{-4}
isoprene	8.7	8.75×10^{-3}	n-dodecane	0.1	2.51×10^{-4}
acetylene and ethylene	301	1.20×10^{-1}	thiophene	12.4	1.54×10^{-2}
ethane	449	1.99×10^{-1}	2,4-dimethyl-1-heptene	11.3	2.10×10^{-2}
propylene	78.3	4.86×10^{-2}	acetonitrile	14.4	8.72×10^{-3}

* EPA Method TO-15 sample analysis for Test No. 2 was not available at of emissions calculation and will be reported as part of a subsequent report.

+ Emission rates for Test No. 1 are based flow rates from Test No. 2. See Test Critique for details.

Note: For comparison purposes, previously measured 1,3-butadiene emissions used for the HRA were 0.345 lb/hr and 0.150 lb/hr, respectively for March 2011 and June 2012 tests, for this exhaust stack.

INTRODUCTION

On July 18, 2013, engineers from the SCAQMD conducted a source test for multiple metal and speciated organic emissions from the Hard Lead Baghouse exhaust stack at Exide Technologies in Vernon. A series of tests has been performed in response to high levels of toxic air contaminants (arsenic in particular) from the Hard Lead Baghouse that were detected during previous source tests used to determine the facility-wide health risk. These tests were performed as part of an early screening source test program that is being conducted to monitor emissions until Exide is able to perform another set of comprehensive acceptable source tests at full capacity that can be used for permit and Health Risk Assessment purposes.

EQUIPMENT AND PROCESS DESCRIPTION

Exide Technologies is a Cycle 1 RECLAIM facility for NOx and SOx, and is in the Title V permitting program. The facility operates a secondary lead smelting process to recover lead from recycled automotive batteries.

The facility receives lead-acid batteries from off-site collection facilities and breaks them down in the Raw Material Preparation System (RMPS) using a hammer mill. The components are then drained of acid and separated into metallic lead, polypropylene, rubber and plastic fractions. Emissions from this process are vented to a packed bed scrubber followed by a HEPA filter.

Following the RMPS, the metallic portion is fed to the furnaces for smelting. This consists of two different streams, the Reverb Furnace to process lead acid and battery scrap, and the Blast Furnace to process lead slag and scrap. The emissions from Reverb Feed Hopper are controlled by the MAC Baghouse. The Reverb Feed Hopper feeds the 8 MMBTU/hr natural gas-fired Rotary Kiln Dryer. The Kiln Dryer is used to drive off moisture and other contaminants prior to feeding the furnace, which is vented to a baghouse with Teflon-coated bags. The scrap is then fed to the 30 MMBTU/hr natural gas-fired Reverb Furnace. The lead is reduced in the furnace and slag is removed from the bottom to feed the Blast Furnace, while the crude lead is refined further in the soft lead process. The soft lead refined in this process is typically 99.9% pure lead. Emissions from the Reverb Furnace are quenched before entering the Reverb Baghouse, which is followed by the Venturi and Neptune scrubbers. The crude lead removed from the Reverb Furnace is fed into receiving kettles and then refined in four refining kettles. Emissions from this refining process are collected and controlled by the Soft Lead Baghouse. On the south side of the building, the slag from the Reverb Furnace is fed into the top of a 4 MMBTU/hr coke and natural gas-fired Blast Furnace. Lead removed from this process is further refined into hard lead. Emissions from the Blast Furnace are vented to a 10 MMBTU/hr natural gas-fired afterburner, the Blast Baghouse, and then manifolded with the exhaust from the Reverb Furnace to the Venturi and Neptune Scrubbers.

The Blast Furnace feed chute, located on top of the Blast Furnace, was recently equipped with an isolation door in March/April 2013 for the purpose of addressing the high arsenic emissions from the Hard Lead Baghouse stack. When the furnace is not being charged, the door remains closed. The feed cart is loaded in the Blast Feed Room and is hoisted with cables to the top of the furnace. As the cart approaches the top of the furnace, it mechanically opens the isolation door and the contents of the cart are unloaded into the furnace. Dust created during the charging is collected by various ducts surrounding the door that vent the emissions to the Hard Lead Baghouse. As the Feed Cart begins its descent back down to the Feed Room, the door closes again. A schematic diagram of this process is located in Figure 1.

SAMPLING AND ANALYTICAL PROCEDURES

Source testing was conducted on the Hard Lead Baghouse exhaust stack at Exide Technologies (Figure 2). Testing consisted of single run sampling performed for multiple metals using California Air Resources Board (CARB) Method 436. Fixed gases testing, to determine the molecular weight of the stack gases pursuant to SCAQMD Method 10.1, and speciated organic emissions testing, following U.S. EPA Method TO-15, were both performed using integrated 6-liter summa canister samples.

Gas Flow Rate

The gas velocity was measured during the sampling run in accordance with SCAQMD Methods 1.1 and 2.1. This was done using an S type Pitot tube (permanently attached to the probe, with the impact opening of the Pitot tube even with the nozzle entry plane) with a differential pressure manometer, and a type "K" thermocouple (also permanently attached to the probe so that the tip of the sensor extended beyond the leading edge of the probe sheath, and touching no metal) with a digital potentiometer (Figure 3). The apparatus was leak checked both before and after use by introducing a pressure head of at least 80 percent of full scale and blocking the flow at the Pitot tip. An observation of the resulting non-diminishing pressure for at least 15 seconds at the manometer verified the absence of leaks in the system.

The access ports on the stack were greater than five diameters downstream and greater than four stack diameters upstream from any flow disturbances along the vertical exhaust stack. Velocity sampling was performed at 24 traverse points positioned across the ports along the stack diameter. Details regarding traverse point locations and locations of the access ports for the exhaust stack can be found in Figure 4 of this report.

The volumetric flow rate was calculated from the exhaust stack cross sectional area and average gas velocities. The absence of cyclonic flow conditions was verified during previous source tests. 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 rates were also corrected to dry conditions using the moisture content as determined by SCAQMD Method 4.1 weight gain from the multiple metals samples described in the following sections.

Multiple Metals Sampling and Analysis

Testing was conducted using CARB Method 436. Each sampling train consisted of a borosilcate probe and nozzle, which was used to draw the stack sample isokinetically from the source. The sample was then drawn through two impingers each filled with an aqueous solution of 5% nitric acid and 10% hydrogen peroxide, an empty impinger, a 2" Teflon-coated glass fiber filter, and an impinger bubbler filled with tared silica gel. Each sampling train was connected to a leak free vacuum pump, a dry gas meter, and a calibrated orifice. The impingers were contained in a dry ice bath to condense water vapor and other condensable matter present in the sample stream (Figures 5 and 6). The method option for two impingers containing an acidic potassium permanganate solution used solely to collect mercury vapor emissions was not used because previous testing did not indicate that mercury emissions were significant. A modification was made by moving the filter prior to the impinger containing the silica gel.

Based upon previous testing for metals on this equipment, it was determined that 120 minute sampling time would give analytical results above the detection limits for lead, arsenic and other metals.

The SCAQMD laboratory analyzed the metals in the samples by EPA Method 200.7. Particulates deposited in the filter, probe, nozzle and impingers were acid digested and analyzed by ICP/MS (Inductively Coupled Plasma Mass Spectrometry) by the SCAQMD laboratory. Moisture content was determined gravimetrically and volumetrically.

Speciated Organic Compounds Sampling and Analysis

Testing was conducted using U.S. EPA Method TO-15. The sample was collected continuously from the exhaust stack. The gas sampling apparatus consisted of a stainless steel probe, a Teflon line, and a specially prepared 6-liter summa canister. The equipment is similar to that decribed in Figure 7 used for Integrated Gas Sampling (SCAQMD Method 10.1) except no rotameter was used. Analysis involves using a high resolution gas chromatograph coupled with a mass spectrometer. Previous testing on similar sources using this method has shown it yields similar results obtained simultaneously with CARB Method 422.

Integrated Gas Sampling and Analysis

An integrated gas sample was collected continuously from the exhaust stack during each day of testing. The gas sampling apparatus consisted of a stainless steel probe, a Teflon line, and a 6-liter summa canister (Figure 7). The sample was collected at a rate of approximately 0.10 liters per minute controlled by a rotameter.

The samples were analyzed by the SCAQMD laboratory for carbon monoxide, carbon dioxide, and oxygen. The gases were separated by gas chromatography. The carbon dioxide was determined by a gas chromatograph with a nickel catalyzed methanizer and flame ionization detector (GC/Ni-FID). Carbon monoxide was combusted to carbon dioxide and analyzed by SCAQMD Method 25.1. Oxygen was analyzed by thermal conductivity.

TEST CRITIQUE

It should be noted that the test on July 8 was conducted only for screening purposes. There were sampling complications during the first screening test, but they did not adversely affect the final results of the testing program. Although the second test on August 8 was conducted as part of a more comprehensive compliance test program, it is included with this report to correct the complications with the July 8 test. These issues have been addressed and remedied for future testing, and are discussed in further detail in this section. The August 8 test will be reported in full on a subsequent date.

The testing was conducted on a pre-scheduled basis during normal working hours, to gather multiple metal and speciated organics emissions data to monitor emissions from the facility. Upon arrival to the facility on July 18, 2013 for the first test, SCAQMD Source Test staff was notified that the Reverb Furnace was down due to a leak from the launders. This would have had some effect on emissions to the Hard Lead Baghouse since fugitive emissions from the Kiln Dryer, which feeds the Reverb Furnace and was therefore not operating as well, are collected by the Hard Lead Baghouse. In addition, additional flow may be available from the Neptune/Venturi Scrubber to exhaust the Blast Furnace during the Reverb Furnace shut down, which could possibly result in less fugitive Blast Furnace emissions vented to the Hard Lead Baghouse. The Reverb Furnace was repaired and operational at least 30 minutes prior to sampling. Once sampling commenced, no process interruptions occurred. There were no operational delays for the second test on August 8, 2013.

During sampling on both days, fugitive emissions were seen exiting various processes. These fugitive emissions were collected by the Torit Cartridge/HEPA Filter system that provides control of the air within the building. The building containing the process equipment is required to be maintained under negative pressure and therefore all of the air exiting the building is collected by air pollution control equipment. Previous test reports have recommended the simultaneous testing of the Hard Lead and Soft Lead Baghouse stacks with the Venturi/Neptune stack, but if less than 100% collection efficiency is observed, then it might also be necessary to test the North and South Torit stacks as well, since they provide control of the general building ventilation.

The measured velocity heads of the first screening test of the Hard Lead Baghouse was significantly less than previous tests conducted. It was later determined during the second test that the umbilical line for the Pitot tube had a blockage from moisture condensed in the line resulting in the low measurements. For the second test, a separate velocity traverse was performed. The velocity traverse agreed closely with past tests on this exhaust stack. To obtain a better representation for the first screening test, the exhaust rate was corrected to the exhaust rate measured during the second test. The resulting first test mass emissions after the correction are consistent with the second test.

As with previous tests since the installation of the isolation door, the feed rate for the Blast Furnace was less than 80% of the permitted limit. However, the Reverb Furnace was operated at 80.6% of its permitted limit for the first screening test, which would have satisfied the permit condition requirement for a Health Risk Assessment test.

No arsenic was scheduled to be added to the refining kettles during the source tests. Four of the kettles, which are vented to the Hard Lead baghouse, were in use during each of the tests.

Finalized fixed gases results or Test No. 2 TO-15 results were not yet available from the SCAQMD Laboratory, and will be reported in full in a subsequent source test report

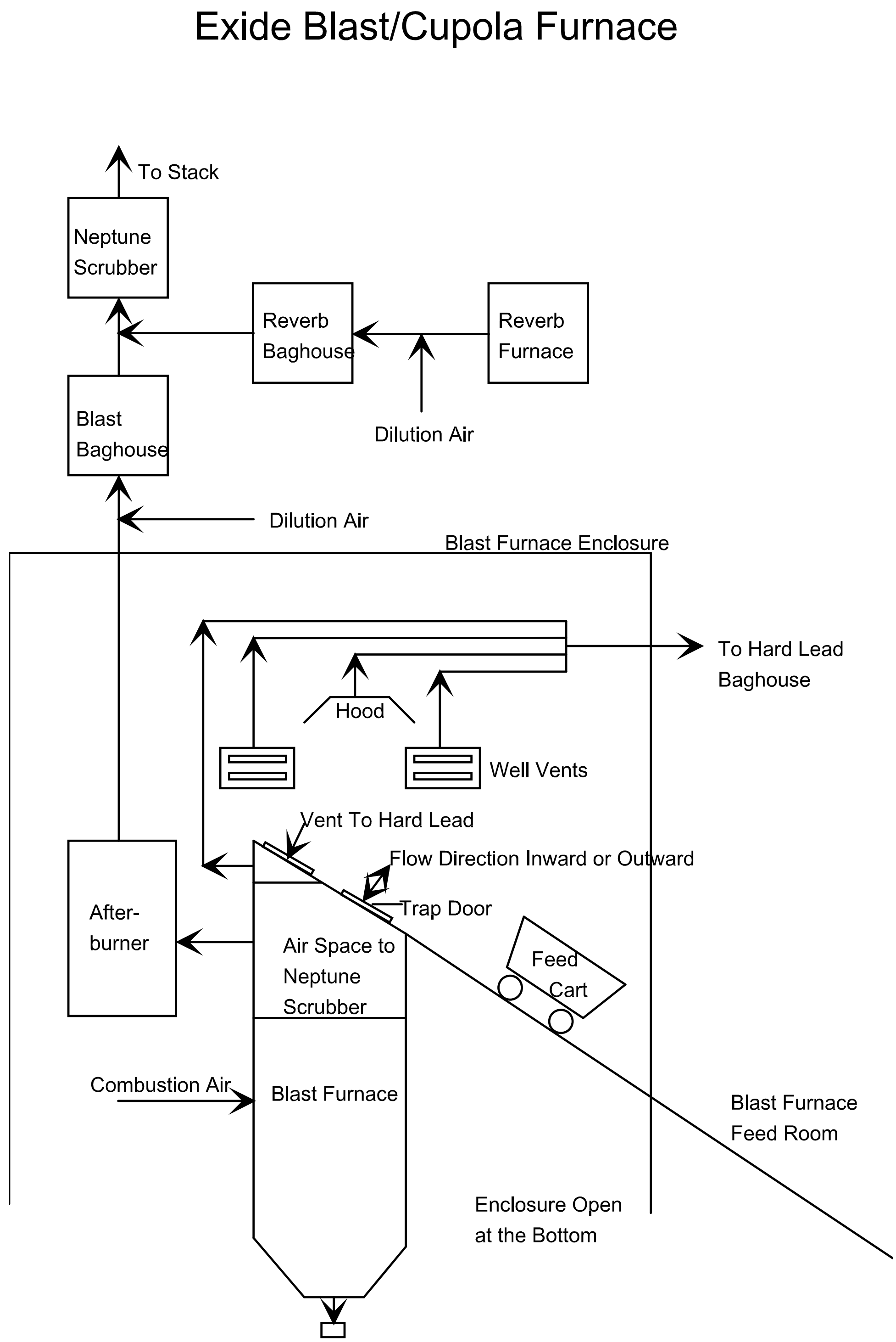


Figure 1: Blast Furnace Feed and Exhaust Schematic Diagram

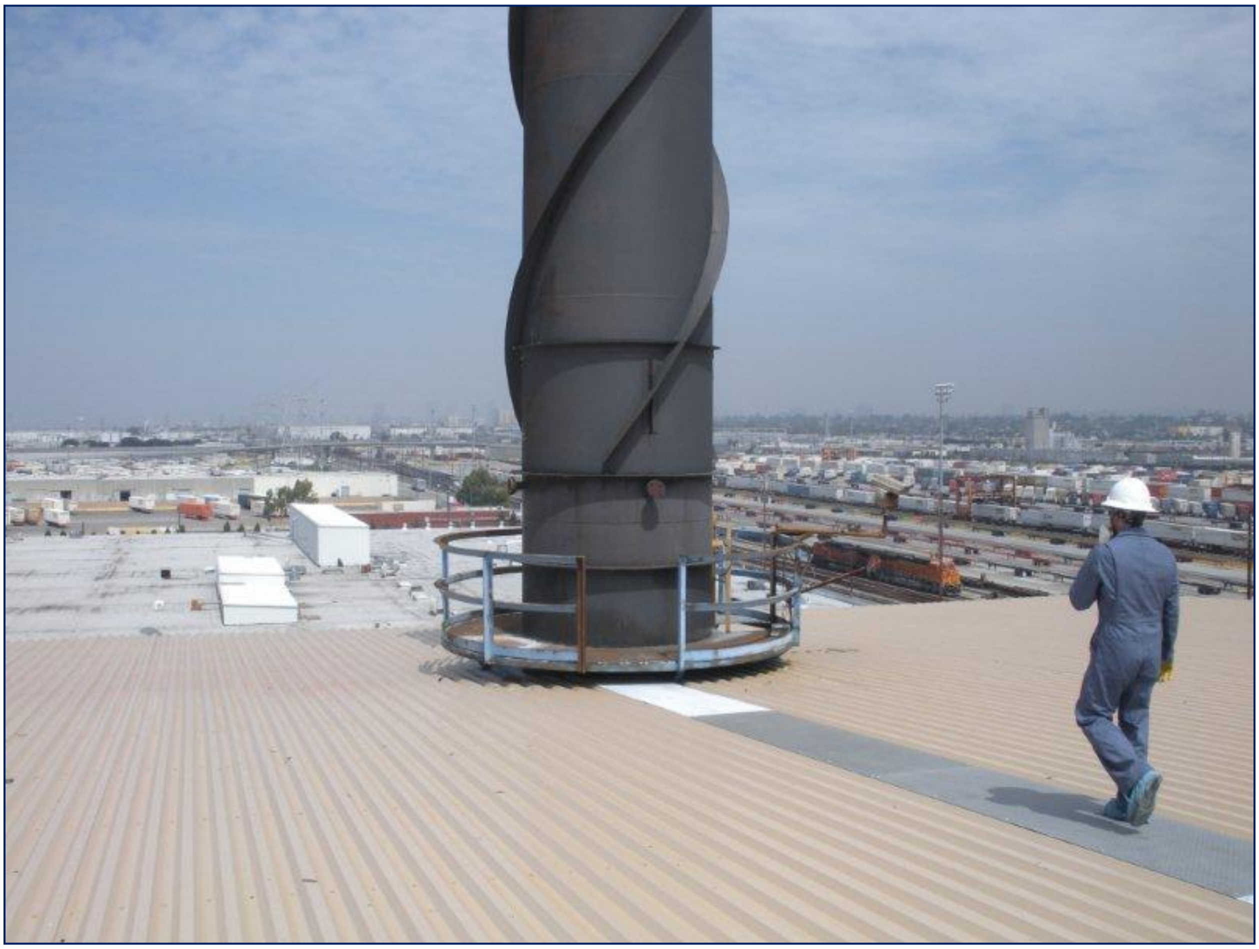


Figure 2: Hard Lead Baghouse Exhaust Stack

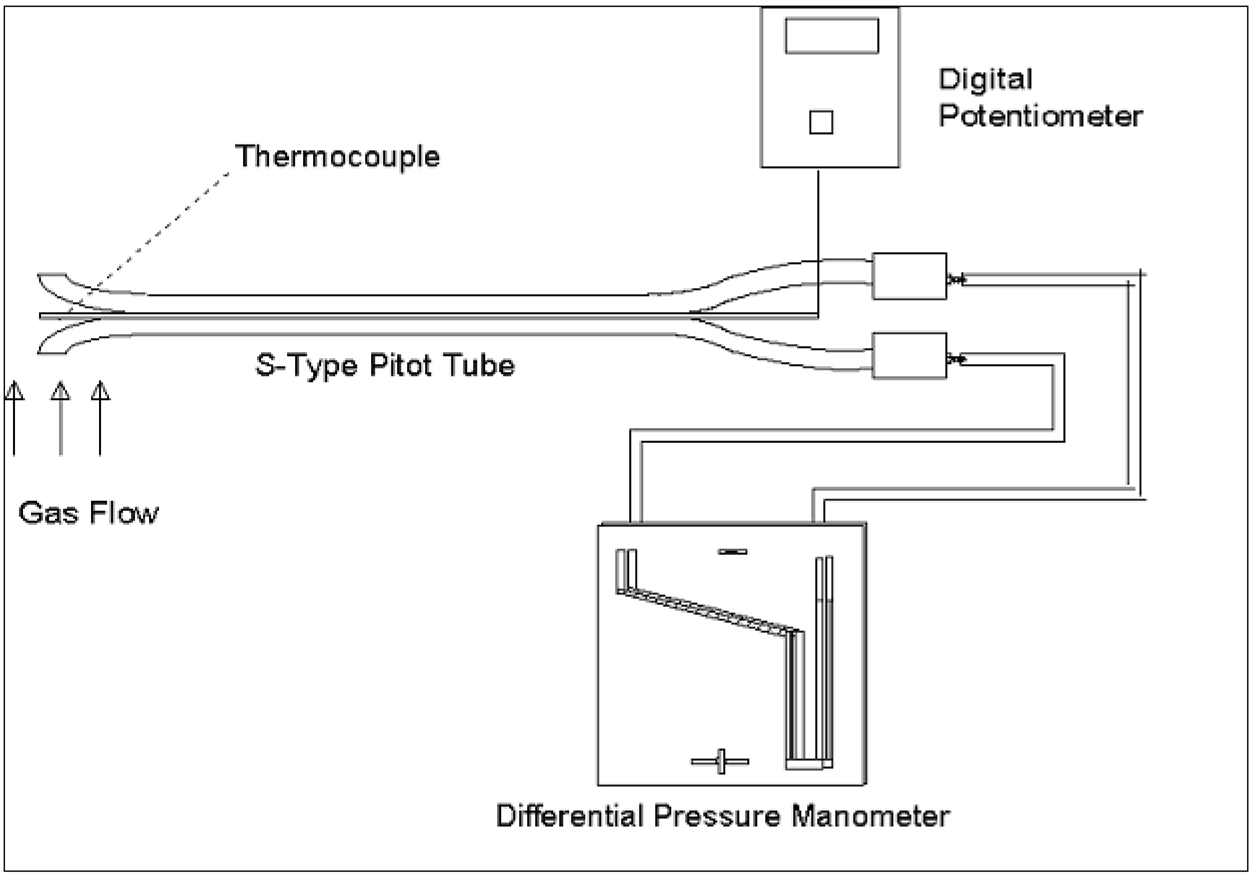
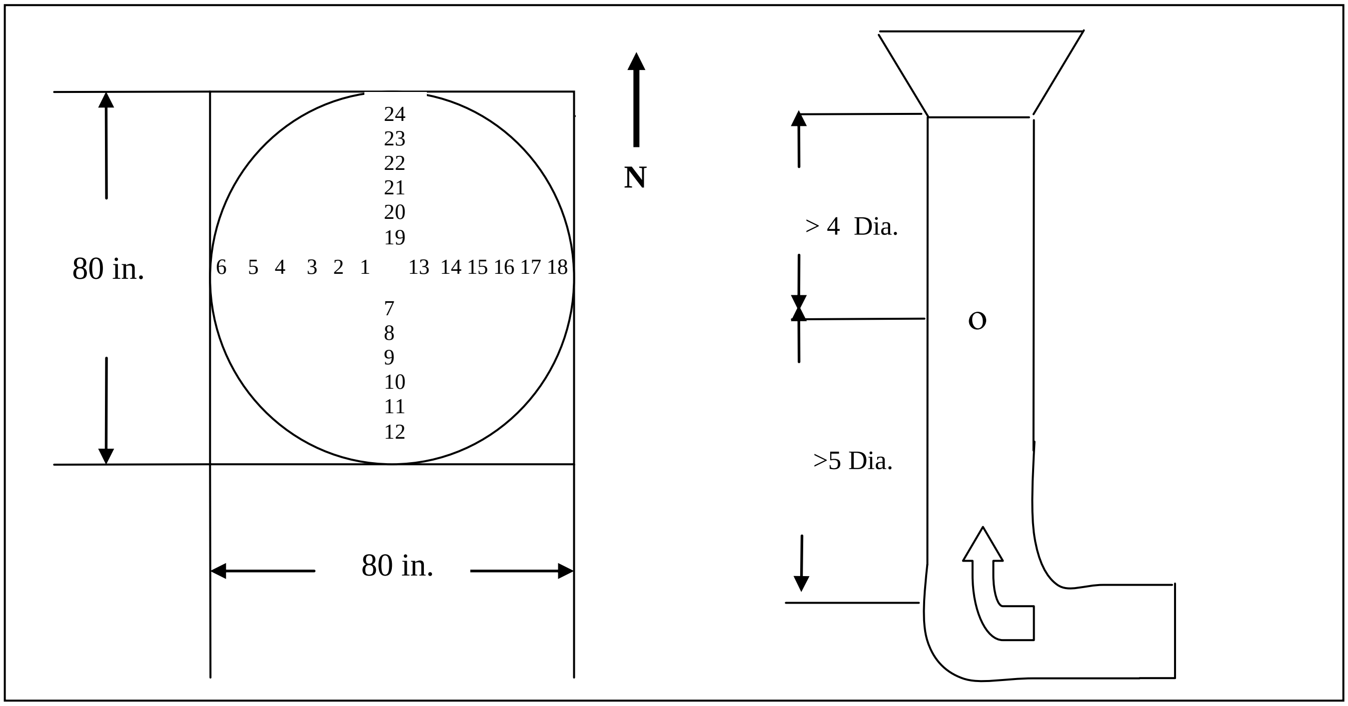


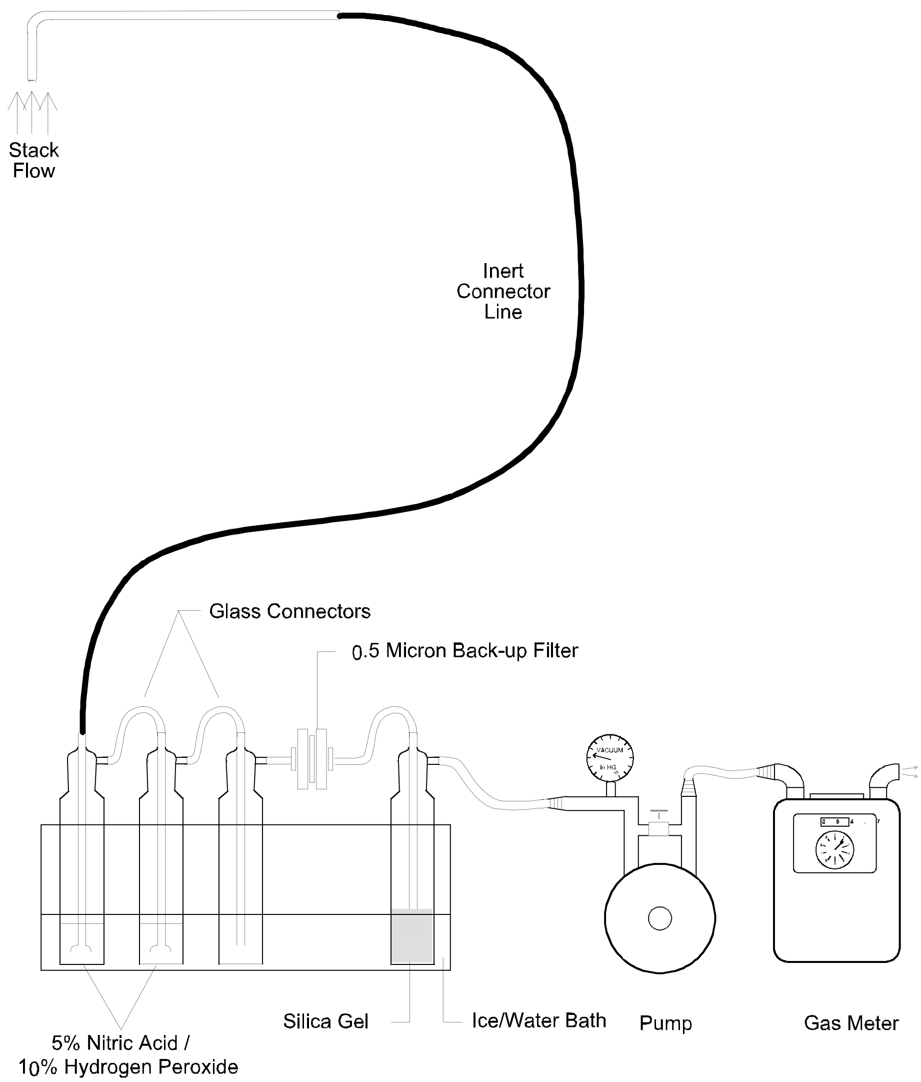
Figure 3: SCAQMD Methods 1.1 and 2.1

Stack Orientation: Vertical, Circular



Traverse Point Number	Distance from inner stack wall (in.)
1, 7, 13, 19	28.45
2, 8, 14, 20	20.00
3, 9, 15, 21	14.18
4, 10, 16, 22	9.45
5, 11, 17, 23	5.36
6, 12, 18, 24	1.70

Figure 4: Hard Lead Baghouse Stack Diagram and Sampling Locations



<u>Figure 5: CARB Method 436 Sampling Train Diagram</u>
<u>(modified by moving filter before the fourth impinger)</u>

Figure 6: CARB Method 436 Field Sampling Train and Probe

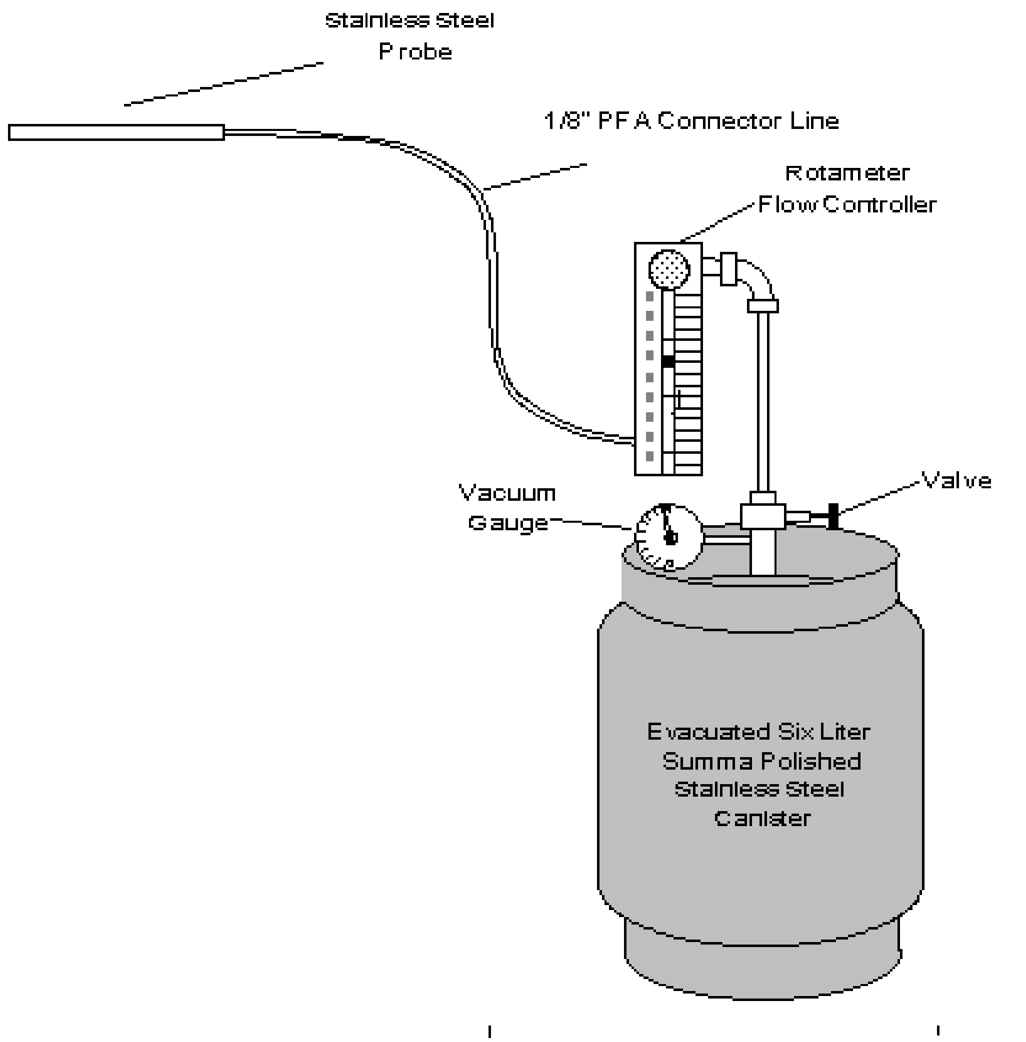


Figure 7: SCAQMD Method 10.1

CALCULATIONS

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

Test No. 1 Test Date: 7/18/13

SOURCE TEST CALCULATIONS

Sampling Location: Exide Tech. - Hard Lead Baghouse Exhaust
Sample Train: 20 Input by: J. Aspell

SUMMARY

A. Average Traverse Velocity........ 35.12 fps
B. Gas Meter Temperature (Use 60 deg.F for Temp Comp. Meters)........ 91.39583 deg F
C. Gas Meter Correction Factor........ 1.0085
D. Average Orifice Pressure........ 0.70 "H₂0
E. Nozzle Diameter........ 0.2230 inch

F1. Stack Diameter or Dimension #1.... 80 inch
F2. Stack Dim #2 (blank if circular)........ inch
G. Stack Cross Sect. Area........ 34.907 ft2
H. Average Stack Temp........ 121.6 deg F
I. Barometric Pressure........ 29.80 "HgA
J. Gas Meter Pressure (I+(D/13.6))..... 29.85 "HgA
K. Static Pressure........ -0.05 "H₂0
L. Total Stack Pressure (I+(K/13.6)).... 29.80 "HgA

M. Pitot Correction Factor........ 0.84
N. Sampling Time........ 120 min
O. Nozzle X-Sect. Area........ 0.00027 ft
P. Net Sample Collection........ mg
Q. Net Solid Collection........ mg
R. Water Vapor Condensed........ 17.9 ml
S. Gas Volume Metered........ 54.137 dcf

T. Corrected Gas Volume [(S x J/29.92) x 520/(460+B) x C........ 51.370 dscf

PERCENT MOISTURE/GAS DENSITY

U. Percent Water Vapor in Gas Sample ((4.64 x R)/((0.0464 x R) + T))........ 1.59 %

V. Average Molecular Weight (Wet):

Component	Vol. Fract.		x	Moist. Fract.	x	Molecular Wt.	=	Wt./Mole
Water	0.016			1.000		18.0	,	0.29
Carbon Dioxide	0.001	Dry Basis		0.984		44.0	,	0.03
Carbon Monoxide	0.000	Dry Basis		0.984		28.0	,	0.00
Oxygen	0.209	Dry Basis		0.984		32.0	,	6.58
Nitrogen & Inerts	0.790	Dry Basis		0.984		28.2	,	21.93
							,	
							Sum	28.83

FLOW RATE

W. Gas Density Correction Factor (28.95/V)^.5........ 1.00
X. Velocity Pressure Correction Factor (29.92/L)^.5........ 1.00
Y. Corrected Velocity (A x M x W x X)*........ 50.61 fps
Z. Flow Rate* (Y x G x 60)........ 106008 cfm
AA. Flow Rate (Standard)* {Z x (L/29.92) x [520/(460+H)]}........ 94549 scfm
BB. Dry Flow Rate* (AA x (U/100))........ 93029 dscfm

SAMPLE CONCENTRATION/EMISSION RATE

GG. Isokinetic Sampling Rate* [(G x T x 100)/(N x O x BB)]........ 59.2 %

	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Antimony
Net Sample (mg)	0.00425	0.00097	0.00038	0.02644	0.00051	0.00109	0.00034
Sample Conc. (gr/dscf)	1.28E-06	2.91E-07	1.14E-07	7.94E-06	1.53E-07	3.27E-07	1.02E-07
Mass Emission (lb/hr)	1.02E-03	2.32E-04	9.10E-05	6.33E-03	1.22E-04	2.61E-04	8.14E-05
Emission Conc. (ug/dscf)	0.08272	0.01888	0.007396	0.514616	0.0099264	0.021215	0.006618
Emission Conc.(ug/dscm)	2.920845	0.66664	0.261158	18.17109	0.3505014	0.749111	0.233668

	Barium	Zinc	Selenium	Tin	Titanium	Copper
Net Sample (mg)	0.01634	0.0121	0.00018	0.00683	0.00037	0.0019
Sample Conc. (gr/dscf)	4.91E-06	3.63E-06	5.41E-08	2.05E-06	1.11E-07	5.71E-07
Mass Emission (lb/hr)	3.91E-03	2.90E-03	4.31E-05	1.64E-03	8.86E-05	4.55E-04
Emission Conc. (ug/dscf)	0.318034	0.235509	0.003503	0.132936	0.0072015	0.036981
Emission Conc.(ug/dscm)	11.22979	8.315816	0.123706	4.693969	0.2542853	1.305789

* Due to pitot tube blockage, velocity and flow rates were corrected to levels of second screening test to obtain a more representative emission rate.

CALCULATIONS

RUN NO. 1

Traverse Point #	Velocity Head #1 ("H_2O)	Temp. (°F)	Calculated Velocity (fps)	Traverse Point #	Gas Meter Temp In (°F)	Gas Meter Temp Out (°F)	Average Gas Meter Temp (°F)	Traverse Point #	Orifice Pressure (" H_2O)
1	0.07	111	18.33	1	87	85	86.00	1	0.199
2	0.01	119	6.98	2	87	86	86.50	2	0.025
3	0.05	119	15.60	3	86	86	86.00	3	0.125
4	0.12	119	24.17	4	90	87	88.50	4	0.302
5	0.08	117	19.70	5	90	88	89.00	5	0.203
6	0.10	108	21.86	6	90	89	89.50	6	0.257
7	0.25	120	34.92	7	91	90	90.50	7	0.632
8	0.30	121	38.29	8	91	90	90.50	8	0.757
9	0.32	124	39.64	9	92	90	91.00	9	0.806
10	0.32	123	39.61	10	94	91	92.50	10	0.81
11	0.35	123	41.43	11	95	92	93.50	11	0.89
12	0.30	123	38.35	12	96	93	94.50	12	0.765
13	0.36	123	42.01	13	92	92	92.00	13	0.912
14	0.38	123	43.16	14	93	92	92.50	14	0.964
15	0.35	124	41.46	15	94	93	93.50	15	0.89
16	0.28	124	37.08	16	94	93	93.50	16	0.712
17	0.30	125	38.42	17	95	94	94.50	17	0.764
18	0.32	123	39.61	18	95	94	94.50	18	0.818
19	0.42	125	45.46	19	92	91	91.50	19	1.06
20	0.40	124	44.32	20	92	91	91.50	20	1.01
21	0.41	125	44.91	21	92	91	91.50	21	1.03
22	0.35	125	41.50	22	94	92	93.00	22	0.887
23	0.31	126	39.09	23	95	92	93.50	23	0.785
24	0.45	124	47.01	24	95	93	94.00	24	1.146

Average Temperature (°F) -	121.583	Average Velocity (fps) -	35.12
Avg Gas Meter Temperature (°F	91.3958	Average Orifice Press. ("H_2O) -	0.70

CALCULATIONS

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

Test No. 1 Test Date: 8/8/13

SOURCE TEST CALCULATIONS

Sampling Location: Exide Hard Lead Baghouse Exhaust
Sample Train: 10 Input by: J. Aspell

SUMMARY

A. Average Traverse Velocity	32.54	fps
B. Gas Meter Temperature (Use 60 deg.F for Temp Comp. Meters)	83.1875	deg F
C. Gas Meter Correction Factor	1.0085	
D. Average Orifice Pressure	0.65	"H2O
E. Nozzle Diameter	0.1700	inch

F1. Stack Diameter or Dimension #1	80	inch	M. Pitot Correction Factor	0.84	
F2. Stack Dim #2 (blank if circular)		inch	N. Sampling Time	120	min
G. Stack Cross Sect. Area	34.907	ft2	O. Nozzle X-Sect. Area	0.00016	ft
H. Average Stack Temp	118.8	deg F	P. Net Sample Collection	0	mg
I. Barometric Pressure	30.01	"HgA	Q. Net Solid Collection	0	mg
J. Gas Meter Pressure (I+(D/13.6))	30.06	"HgA	R. Water Vapor Condensed	16	ml
K. Static Pressure	-0.60	"H2O	S. Gas Volume Metered	46.847	dcf
L. Total Stack Pressure (I+(K/13.6))	29.97	"HgA			

T. Corrected Gas Volume [(S x J/29.92) x 520/(460+B) x C .... 45.436 dscf

PERCENT MOISTURE/GAS DENSITY

U. Percent Water Vapor in Gas Sample ((4.64 x R)/((0.0464 x R) + T)) .... 1.61 %

V. Average Molecular Weight (Wet):

Component	Vol. Fract.		x Moist. Fract.	x Molecular Wt.	= Wt./Mole
Water	0.016		1.000	18.0	0.29
Carbon Dioxide	0.000	Dry Basis	0.984	44.0	0.01
Carbon Monoxide	0.000	Dry Basis	0.984	28.0	0.00
Oxygen	0.208	Dry Basis	0.984	32.0	6.55
Nitrogen & Inerts	0.792	Dry Basis	0.984	28.2	21.97
				Sum	28.82

FLOW RATE

W. Gas Density Correction Factor (28.95/V)^.5	1.00	
X. Velocity Pressure Correction Factor (29.92/L)^.5	1.00	
Y. Corrected Velocity* (A x M x W x X)	50.61	fps
Z. Flow Rate* (Y x G x 60)	106008	cfm
AA. Flow Rate (Standard)* {Z x (L/29.92) x [520/(460+H)]}	94549	scfm
BB. Dry Flow Rate* (AA x (U/100))	93029	dscfm

* Values taken from velocity traverse conducted immediately after sampling because of blocked pitot tube

SAMPLE CONCENTRATION/EMISSION RATE

	Arsenic	Cadmium	Chromium	Lead	Manganese	Nickel	Antimony
Net Sample (mg)	0.0027	0.00106	0.000646	0.0823	0.00112	0.00147	0.00039
Sample Conc. (gr/dscf)	9.17E-07	3.60E-07	2.19E-07	2.79E-05	3.80E-07	4.99E-07	1.32E-07
Mass Emission (lb/hr)	7.31E-04	2.87E-04	1.75E-04	2.23E-02	3.03E-04	3.98E-04	1.06E-04
Emission Conc. (ug/dscf)	0.059415	0.023326	0.014216	1.811051	0.024646	0.032348	0.008582
Emission Conc.(ug/dscm)	2.097936	0.823634	0.501951	63.94821	0.870255	1.14221	0.303035

	Barium	Zinc	Selenium	Tin	Titanium	Copper	Cobalt	Iron
Net Sample (mg)	0.00295	0.0324	0.000173	0.00451	0.000863	0.008099	0.000114	0.04254
Sample Conc. (gr/dscf)	1.00E-06	1.10E-05	5.88E-08	1.53E-06	2.93E-07	2.75E-06	3.87E-08	1.44E-05
Mass Emission (lb/hr)	7.99E-04	8.77E-03	4.68E-05	1.22E-03	2.34E-04	2.19E-03	3.09E-05	1.15E-02
Emission Conc. (ug/dscf)	0.064916	0.712978	0.003807	0.099245	0.018991	0.178222	0.002509	0.936113
Emission Conc.(ug/dscm)	2.29219	25.17524	0.134423	3.504331	0.670563	6.293032	0.08858	33.05415

CALCULATIONS

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

Test No. 2 Test Date: 8/8/13

SOURCE TEST CALCULATIONS

Sampling Location: Exide Hard Lead Baghouse Velocity Traverse
Sample Train: N/A Input by: J. Aspell

SUMMARY

A. Average Traverse Velocity	60.28	fps
B. Gas Meter Temperature (Use 60 deg.F for Temp Comp. Meters)	83.1875	deg F
C. Gas Meter Correction Factor	1.0085	
D. Average Orifice Pressure	0.65	"H2O
E. Nozzle Diameter	0.1700	inch

F1. Stack Diameter or Dimension #1	80	inch	M. Pitot Correction Factor	0.84	
F2. Stack Dim #2 (blank if circular)		inch	N. Sampling Time	120	min
G. Stack Cross Sect. Area	34.907	ft2	O. Nozzle X-Sect. Area	0.00016	ft
H. Average Stack Temp	123.9	deg F	P. Net Sample Collection	0	mg
I. Barometric Pressure	30.01	"HgA	Q. Net Solid Collection	0	mg
J. Gas Meter Pressure (I+(D/13.6))	30.06	"HgA	R. Water Vapor Condensed	16	ml
K. Static Pressure	-0.60	"H2O	S. Gas Volume Metered	46.847	dcf
L. Total Stack Pressure (I+(K/13.6))	29.97	"HgA			

T. Corrected Gas Volume [(S x J/29.92) x 520/(460+B) x C .... 45.436 dscf

PERCENT MOISTURE/GAS DENSITY

U. Percent Water Vapor in Gas Sample ((4.64 x R)/((0.0464 x R) + T)) .... 1.61 %

V. Average Molecular Weight (Wet):

Component	Vol. Fract.		x Moist. Fract.	x Molecular Wt.		= Wt./Mole
Water	0.016		1.000	18.0	,	0.29
Carbon Dioxide	0.000	Dry Basis	0.984	44.0	,	0.01
Carbon Monoxide	0.000	Dry Basis	0.984	28.0	,	0.00
Oxygen	0.208	Dry Basis	0.984	32.0	,	6.55
Nitrogen & Inerts	0.792	Dry Basis	0.984	28.2	,	21.97
					,	
					Sum	28.82

FLOW RATE

W. Gas Density Correction Factor (28.95/V)^.5	1.00	
X. Velocity Pressure Correction Factor (29.92/L)^.5	1.00	
Y. Corrected Velocity (A x M x W x X)	50.71	fps
Z. Flow Rate (Y x G x 60)	106213	cfm
AA. Flow Rate (Standard) {Z x (L/29.92) x [520/(460+H)]}	94732	scfm
BB. Dry Flow Rate (AA x (U/100))	93209	dscfm

SAMPLE CONCENTRATION/EMISSION RATE

CC. Sample Concentration [0.01543 x (P/T)]	0.00000	gr/dscf
DD. Sample Concentration [54,143xC((Molecular Wt.)]	#DIV/0!	ppm
EE. Sample Emission Rate (0.00857 x BB xCC)	0.000	lb/hr
FF. Solid Emission Rate [(.0001322 x Q x BB)/T]	0.000	lb/hr
GG. Isokinetic Sampling Rate [(G x T x 100)/(N x O x BB)]	90.0	%

CALCULATIONS

Run No. 1

Traverse Point #	Velocity Head #1 ("H_2O)	Temp. (°F)	Calculated Velocity (fps)	Traverse Point #	Gas Meter Temp In (°F)	Gas Meter Temp Out (°F)	Average Gas Meter Temp (°F)	Traverse Point #	Orifice Pressure (" H_2O)
1	0.03	114	12.03	1	79	78	78.50	1	0.07
2	0.02	115	9.83	2	78	80	79.00	2	0.04
3	0.02	117	9.85	3	80	79	79.50	3	0.04
4	0.02	115	9.83	4	81	78	79.50	4	0.04
5	0.11	117	23.10	5	81	79	80.00	5	0.24
6	0.10	117	22.03	6	81	79	80.00	6	0.22
7	0.05	116	15.56	7	82	80	81.00	7	0.11
8	0.09	121	20.97	8	82	80	81.00	8	0.2
9	0.12	119	24.17	9	83	81	82.00	9	0.26
10	0.08	119	19.74	10	83	81	82.00	10	0.18
11	0.11	119	23.14	11	84	81	82.50	11	0.24
12	0.07	119	18.46	12	85	82	83.50	12	0.15
13	0.14	118	26.09	13	85	83	84.00	13	0.31
14	0.16	118	27.89	14	85	83	84.00	14	0.35
15	0.14	119	26.11	15	86	83	84.50	15	0.31
16	0.14	122	26.18	16	86	84	85.00	16	0.31
17	0.80	120	62.47	17	86	85	85.50	17	1.78
18	0.70	120	58.43	18	86	84	85.00	18	1.55
19	0.57	121	52.77	19	84	84	84.00	19	1.26
20	0.83	121	63.68	20	86	84	85.00	20	1.84
21	0.80	122	62.58	21	89	85	87.00	21	1.78
22	0.72	121	59.31	22	90	85	87.50	22	1.61
23	0.64	121	55.92	23	90	86	88.00	23	1.43
24	0.53	121	50.89	24	91	86	88.50	24	1.19

Average Temperature (°F) -	118.833	Average Velocity (fps) -	32.54
Avg Gas Meter Temperature (°F	83.1875	Average Orifice Press. ("H_2O) -	0.65

CALCULATIONS

Velocity Traverse

Traverse Point #	Velocity Head #1 ("H_2O)	Temp. (°F)	Calculated Velocity (fps)	Traverse Point #	Gas Meter Temp In (°F)	Gas Meter Temp Out (°F)	Average Gas Meter Temp (°F)	Traverse Point #	Orifice Pressure (" H_2O)		
1	0.78	125	61.95	1				1			
2	0.74	125	60.34	2				2			
3	0.77	125	61.55	3				3			
4	0.76	125	61.15	4				4			
5	0.80	125	62.74	5				5			
6	0.84	125	64.29	6				6			
7	0.83	124	63.85	7				7			
8	0.87	124	65.37	8				8			
9	0.86	123	64.94	9				9			
10	0.82	122	63.35	10				10			
11	0.70	123	58.58	11				11			
12	0.49	122	48.97	12				12			
13	0.82	124	63.46	13				13			
14	0.84	124	64.23	14				14			
15	0.84	124	64.23	15				15			
16	0.90	125	66.54	16				16			
17	0.85	124	64.61	17				17			
18	0.78	125	61.95	18				18			
19	0.78	124	61.89	19				19			
20	0.73	124	59.88	20				20			
21	0.67	124	57.36	21				21			
22	0.65	124	56.50	22				22			
23	0.58	123	53.33	23				23			
24	0.26	121	35.64	24				24			
Average Temperature (°F) -			123.917	Average Velocity (fps) -			60.28				
Avg Gas Meter Temperature (°F			#DIV/0!	Average Orifice Press. ("H_2O) -			#DIV/0!				

CALCULATIONS

EPA Method TO-15 Calculations			
Measured Flowrate*	93209	dscfm	
Compound	**Conc. (ppb)**	**MW**	**lb/hr**
1,3 butadiene	14.9	54.09	1.19E-02
benzene	40.9	78.11	4.71E-02
acrolein	0.9	56.06	7.45E-04
acetone	12.8	58.08	1.10E-02
methylene chloride	0.3	84.93	3.76E-04
MEK	0.8	72.11	8.51E-04
chloroform	0.1	119.38	1.76E-04
toluene	8.9	92.13	1.21E-02
ethylbenzene	2.2	106.16	3.45E-03
m+p xylenes	1.1	106.17	1.72E-03
styrene	19.6	104.14	3.01E-02
o-xylene	0.5	106.17	7.83E-04
isoprene	8.7	68.12	8.75E-03
Acetylene+ethylene	301	27.045	1.20E-01
ethane	449	30.07	1.99E-01
propylene	78.3	42.08	4.86E-02
propane	116	44.1	7.55E-02
isobutane	7.7	58.12	6.60E-03
1-butene	20.2	56.11	1.67E-02
n-butane	8.2	58.12	7.03E-03
n-pentane	17.7	72.15	1.88E-02
1-hexene	2.2	84.16	2.73E-03
n-hexane	0.7	86.18	8.90E-04
n-heptane	0.6	100.21	8.87E-04
n-octane	0.2	114.23	3.37E-04
n-nonane	0.2	128.2	3.78E-04
n-decane	0.1	142.29	2.10E-04
n-undecane	0.2	156.31	4.61E-04
n-dodecane	0.1	170.33	2.51E-04
thiophene	12.4	84.14	1.54E-02
2,4 dimethyl-1-heptene	11.3	126.24	2.10E-02
acetonitrile	14.4	41.05	8.72E-03
lb/hr = (ppbv/1000)* (Q*60)*MW/379/1000000			
* Corrected to Screening Test No. 2 flow rate			

APPENDICES

APPENDIX A

Field Data

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, California 91765

South Coast Air Quality Management District

Test No. 13-306 Company: Exide Date: 7-18-13
Sampling Location: Hard Lead Exhaust Stack Sample Train: 20

Traverse Source Test Data

Pre-Test Leak Check:
Filter: ______ cfm @ ______ "Hg vac
Probe: 0.002 cfm @ 15 "Hg vac
Pitot Tube Leak Check: Pass / Fail

Post-Test Leak Check:
Filter: ______ cfm @ ______ "Hg vac
Probe: 0 cfm @ 2.5 "Hg vac
Pitot Tube Leak Check: Pass / Fail

Time	Sample Point #	Gas Meter Reading (dcf)	Stack Velocity Head ("H_2O)	Stack Temp. °F	Calculated Velocity (fps)	Calculated Sampling Rate (cfm)	Calculated Orifice ΔP ("H_2O)	Probe Temp. °F	Filter Temp. °F	Imp. Temp. °F	Meter Temp. °F In	Meter Temp. °F Out	Vacuum " Hg
		Start: 720,025											
1200	W-1	721,500	0.07	111	19.72	0.24	0.199			50	87	85	1
	2	722,600	0.01	119	6.97	0.08	0.025			55	87	86	1
	3	723,315	0.05	119	15.60	0.19	0.125			49	86	86	1
	4	724,280	0.12	119	24.17	0.29	0.302			53	90	87	1
	5	725,275	0.08	117	19.70	0.24	0.203			49	90	88	1
	6	726,990	0.10	108	21.86	0.27	0.257			50	90	89	1
12:32	S-7	729,055	0.25	120	34.92	0.42	0.632			54	91	90	1
	8	731,640	0.30	121	38.29	0.46	0.757			55	91	90	2
	9	734,270	0.32	124	39.64	0.48	0.806			48	92	90	2
	10	736,9010	0.32	123	39.61	0.48	0.810			49	94	91	2
	11	739,500	0.35	123	41.43	0.50	0.890			50	95	92	2
	12	741,778	0.30	123	38.35	0.46	0.765			47	96	93	2
											~~92~~	~~93~~	~~2~~
1310	E13	744.440	0.36	123	42.01	0.51	0.912			55	92	92	2
	14	747.330	0.38	123	43.16	0.52	0.964			50	93	92	2
	15	749.990	0.35	124	41.46	0.50	0.890			50	94	93	2
	16	752.535	0.28	124	37.08	0.45	0.712			48	94	93	2
	17	754.690	0.30	125	38.42	0.46	0.764			45	95	94	2
	18	757.392	0.32	123	39.61	0.48	0.818			47	95	94	2
13:45	19N	760.145	0.42	125	45.46	0.55	1.06			58	92	91	2
	20	763,025	0.40	124	44.32	0.53	1.01			57	92	91	2
	21	766.000	0.41	125	44.91	0.54	1.03			58	92	91	2
	22	768.720	0.35	125	41.49	0.49	0.887			55	94	92	2
	23	771,210	0.31	126	39.09	0.47	.785			60	95	92	2
	24	774,162	0.45	124	47.01	0.57	1.146			55	95	93	2.5
(Net Vol. Uncorr.)			Avg.										

E3401 30

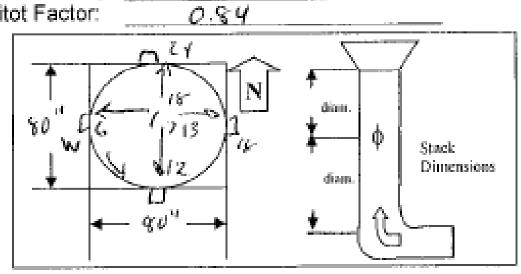
K-Factor: 0.5639 Stack Moisture: 1% Canister #: 54049 Start: 30 "Hg vac

Nozzle Diameter: 0.223 "
Barometric Pressure: 29.80 " HgA
Static Pressure in Stack: +/- 0.05 " H_2O

Recorded By: W.S.
Pitot Factor: 0.84

Calibration Data

Inclined Manometer		(Cal: N/A)
Magnehelic No.		(Cal:)
Pitot Tube No.	N0412	(Cal: 6-21-13)
Potentiometer No.	N0313	(Cal: 6-21-13)
Thermocouple No.	N0412	(Cal: 7-2-13)
Gas Meter No.	N0713	(Cal: 6-21-13)
Meter Corr. Factor:	1.0085	



Sampling Probe: Stainless Steel / Borosilicate / Quartz

Stack: Horizontal / Vertical Rectangular / Circular

Revision 01/09

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
TCA TEST DATA SHEET

Date: 7/17/13 Page No.: ______

Test No.: 13-306 Recorded by: [illegible]

Company/Sampling Location: Exide

Basic and Control Equipment: Hard lead baghouse

SAMPLE A

Tank # 54049 Trap # N/A Control # N/A

Pre-Test Leak Check: Gauge -30 ΔP ______

Post-Test Leak Check: Gauge ______ ΔP ______

Barometric Pressure ______ "HgA

TIME	VACUUM ("Hg)	FLOW (cc/min)	COMMENTS
0	30		
5	25		
10	18		
15	10		
20	3		
25	1		

SAMPLE B

Tank # E-3401 Trap # N/A Control # N/A

Pre-Test Leak Check: Gauge -30 ΔP ______

Post-Test Leak Check: Gauge ______ ΔP ______

Static Pressure ______ "HgA (± ______ "H2O)

TIME	VACUUM ("Hg)	FLOW (cc/min)	COMMENTS
0	30		
5	25		
10	19		
15	12		
20	8		
25	2		

TCA SAMPLING INTERVAL TABLE (Δ P)

Min cc	70	200	400	600	800	1000	1200	1400	1600
15	2.65	2.90							
20	2.20	2.45	2.70						
25	1.90	2.15	2.30	2.70					
30	1.65	1.85	2.00	2.40	2.85				
35	1.40	1.60	1.80	2.10	2.50	2.85			
40	1.20	1.40	1.60	1.90	2.25	2.50	2.95		
45	1.05	1.25	1.40	1.70	2.00	2.25	2.60	3.00	
50	0.95	1.15	1.25	1.50	1.85	2.05	2.40	2.70	
55	0.85	1.05	1.15	1.35	1.65	1.85	2.15	2.45	2.80
60	0.80	0.95	1.05	1.25	1.55	1.70	2.00	2.30	2.55
65	0.70	0.85	0.95	1.15	1.40	1.60	1.90	2.15	2.40
70	0.65	0.80	0.90	1.05	1.30	1.50	1.75	2.00	2.25
75	0.60	0.75	0.80	1.00	1.25	1.40	1.65	1.90	2.15
80	0.55	0.65	0.75	0.90	1.15	1.30	1.55	1.80	2.05
85	0.50	0.60	0.70	0.85	1.10	1.25	1.50	1.75	1.95
90	0.50	0.55	0.65	0.80	1.05	1.25	1.50	1.65	1.90

South Coast Air Quality Management District

Test No. 13-307 Company: EXIDE Date: 8/8/13
Sampling Location: HARD LEAD B/H - EXH Sample Train: 10

Traverse Source Test Data

Pre-Test Leak Check:
Filter: ____ cfm @ ____ "Hg vac
Probe: 0.00 cfm @ 15 "Hg vac
Pitot Tube Leak Check: Pass / Fail

Post-Test Leak Check:
Filter: ____ cfm @ ____ "Hg vac
Probe: 0 cfm @ 8 "Hg vac
Pitot Tube Leak Check: Pass / Fail

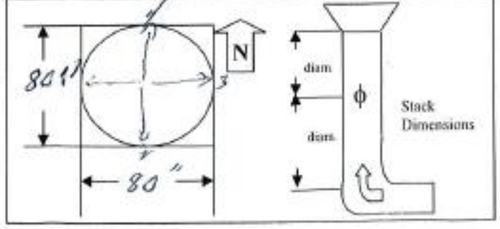
Time	Sample Point #	Gas Meter Reading (dcf)	Stack Velocity Head ("H_2O)	Stack Temp. °F	Calculated Velocity (fps)	Calculated Sampling Rate (cfm)	Calculated Orifice ΔP ("H_2O)	Probe Temp. °F	Filter Temp. °F	Imp. Temp. °F	Meter Temp. °F In	Meter Temp. °F Out	Vacuum " Hg
11:10		Start: 774.496											
+5	W 1	775.35	.03	114	12.03	0.14	.07			50	79	78	<1
	2	775.91	.02	115	9.83	0.11	.04			49	78	80	<1
	3	776.38	.02	117	9.85	.11	.04			53	80	79	<1
	4	777.0	.02	115	9.83	.11	.04			54	81	78	<1
	5	778.25	.11	117	23.1	.27	.24			53	81	79	1
	6	779.66	0.10	117	22.0	.25	.22			57	81	79	1
	S 1	780.65	.05	116	15.56	.18	.11			51	82	80	<1
	2	781.73	.09	121	20.97	.24	.20			53	82	80	1
	3	783.26	0.12	119	24.17	.28	.26			48	83	81	1
	4	784.52	0.08	119	19.74	.23	.18			47	83	81	1
	5	785.74	0.11	119	23.14	.27	.24			49	84	81	1
	6	786.96	0.07	119	18.46	.21	.15			45	85	82	1
	E 1	788.53	0.14	118	26.10	.30	.31			48	85	83	1
	2	790.20	0.16	118	27.89	.32	.35			46	85	83	1
	3	791.80	0.14	119	26.11	.30	.31			50	86	83	1
Pitot switched	4	793.42	0.14	122	26.18	0.30	.31			48	86	84	1
	5	797.0	0.80	124	60.47	.72	1.78			46	86	85	4
	6	800.60	0.70	120	58.43	.67	1.55			43	86	84	4
	N 1	803.60	0.57	121	52.77	.60	1.26			44	86	84	4
	2	807.25	0.83	121	63.68	.73	1.84			44	86	84	6
	3	811.20	0.80	122	62.58	.72	1.78			48	89	85	7
	4	814.90	0.72	121	59.31	.68	1.61			50	90	85	7
	5	818.30	0.64	121	55.92	.64	1.43			47	90	86	5
	6	821.343	0.53	121	50.89	.58	1.19			47	91	86	3
Stop 1:45 PM													
(Net Vol. Uncorr.)			Avg.										

K-Factor: 0.5639 Stack Moisture: ~ 1% Canister #: ____ Start: ____ "Hg vac

Nozzle Diameter: 0.174 Recorded By: RL
Barometric Pressure: 30.0 " HgA Pilot Factor: 0.84
Static Pressure in Stack: +(-) 0.6 " H_2O

Calibration Data

Inclined Manometer ✓	(Cal: N/A)
Magnehelic No. 30403	(Cal: 8/6/13)
Pitot Tube No. S04-15	(Cal: 4/12/13)
Potentiometer No. NO3/3	(Cal: 6/21/13)
Thermocouple No. S01-15	(Cal: 6/21/13)
Gas Meter No. NO7/3	(Cal: 6/21/13)
Meter Corr. Factor: 1.0085	



Sampling Probe: Stainless Steel / Borosilicate / Quartz Stack: Horizontal / Vertical Rectangular / Circular

Revision 01/09

South Coast Air Quality Management District

Test No. 13-307 Company: EXIDE Date: 8/8/13
Sampling Location: HARD LEAD B/H - EXH Sample Train: ______

Traverse Source Test Data

Pre-Test Leak Check:
Filter: ______ cfm @ ______ "Hg vac
Probe: ______ cfm @ ______ "Hg vac
Pitot Tube Leak Check: Pass / Fail

Post-Test Leak Check:
Filter: ______ cfm @ ______ "Hg vac
Probe: ______ cfm @ ______ "Hg vac
Pitot Tube Leak Check: Pass / Fail

VELOCITY P CHECK

Time	Sample Point #	Gas Meter Reading (dcf)	Stack Velocity Head ("H_2O)	Stack Temp. °F	Calculated Velocity (fps)	Calculated Sampling Rate (cfm)	Orifice ΔP ("H_2O)	Probe Temp. °F	Filter Temp. °F	Imp. Temp. °F	Meter Temp. °F In	Meter Temp. °F Out	Vacuum " Hg
2:10		Start:											
	1		0.79	125									
	2		0.74	125									
	3		0.77	125									
	4		0.76	125									
	5		0.80	125									
	6		0.84	123									
	7		0.83	124									
	8		0.87	124									
	9		0.86	123									
	10		0.82	122									
	11		0.70	123									
	12		0.49	122									
	13			0.82	124								
	14			0.84	124								
	15			0.84	124								
	16			0.90	125								
	17			0.85	124								
	18			0.78	125								
	19			0.79	124								
	20			0.73	124								
	21			0.67	124								
	22			0.65	124								
	23			0.58	123								
	24			0.26	121								
(Net Vol. Uncorr.)			Avg.										

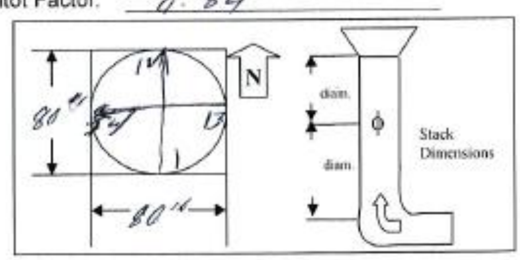
K-Factor: ______ Stack Moisture: ______ Canister #: ______ Start: ______ "Hg vac

Nozzle Diameter: ______ "
Barometric Pressure: ______ " HgA
Static Pressure in Stack: + / - ______ " H_2O

Recorded By: RC
Pitot Factor: 0.84

Calibration Data

Inclined Manometer		(Cal: N/A)
Magnehelic No.		(Cal:)
Pitot Tube No.	30483	(Cal: 8/6/13)
Potentiometer No.	20304	(Cal: 8/6/13)
Thermocouple No.	50112	(Cal: 8/6/13)
Gas Meter No.		(Cal:)
Meter Corr. Factor:		



Sampling Probe: Stainless Steel / Borosilicate / Quartz

Stack: Horizontal / Vertical Rectangular / Circular

Revision 01/09

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, California 91765

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
TCA TEST DATA SHEET (METHOD 25.1)

Date: 8/8/13

Test No.:

Page No.:

Recorded By: CW

Company/Sampling Location: Exide

Basic and Control Equipment:

Barometric Pressure: ________ "HgA

Static Pressure: +/- ________ "H_2O

SAMPLE A

Tank #: 54185 Trap #: ________ Reg. #: ________

Pre-Test Leak Check: Gauge Reading: ________ Pass / Fail

Post-Test Leak Check: Gauge Reading: ________ Pass / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments
11:48	30		
11:54	29		
12:00	25		
12:06	20		
12:12	16		
12:18	13		

SAMPLE B

Tank #: E3385 Vial #: ________ Reg. #: ________

Pre-Test Leak Check: Gauge Reading: ________ Pass / Fail

TO-15

Post-Test Leak Check: Gauge Reading: ________ Pass / Fail

Time	Vacuum ("Hg)	Flow (cc/min)	Comments
11:48	30		
11:48	0		

TCA SAMPLING INTERVAL TABLE (ΔP)

Min. \ °F	70	200	400	600	800	1000	1200	1400	1600
15	2.65	2.9							
20	2.20	2.45	2.7						
25	1.90	2.15	2.30	2.70					
30	1.65	1.85	2.00	2.40	2.85				
35	1.40	1.60	1.80	2.10	2.50	2.85			
40	1.20	1.40	1.60	1.90	2.25	2.50	2.95		
45	1.05	1.25	1.40	1.70	2.00	2.25	2.60	3.00	
50	0.95	1.15	1.25	1.50	1.85	2.05	2.40	2.70	
55	0.85	1.05	1.15	1.35	1.65	1.85	2.15	2.45	2.80
60	0.80	0.95	1.05	1.25	1.55	1.70	2.00	2.30	2.55
65	0.70	0.85	0.95	1.15	1.40	1.60	1.90	2.15	2.40
70	0.65	0.80	0.90	1.05	1.30	1.50	1.75	2.00	2.25
75	0.60	0.75	0.80	1.00	1.25	1.40	1.65	1.90	2.15
80	0.55	0.65	0.75	0.90	1.15	1.30	1.55	1.80	2.05
85	0.50	0.60	0.70	0.85	1.10	1.25	1.50	1.75	1.95
90	0.50	0.55	0.65	0.80	1.05	1.25	1.50	1.65	1.90

Revision: April 20, 2011

APPENDIX B

Process Data

Appendix B has been removed from this file because it may contain proprietary information.

APPENDIX C

Calibration Records

Appendix C has been removed from this file because it may contain proprietary information.

APPENDIX D

District Laboratory Data

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

MONITORING AND ANALYSIS
REPORT OF LABORATORY ANALYSIS
(Page 1 of 2)

TO: Mike Garibay, Supervisor
Source Test Engineering

LABORATORY NO. 1320008-03 to -08

REFERENCE NO. ICP-MS-YS-5-49

SUBMITTED ON: 7/19/2013

REQUESTED BY: Jason Aspell

SOURCE TEST NO.: 13-306

SAMPLE DESCRIBED AS:

Solutions and filters from three CARB Method 436 (Excl. mercury) source test trains; Trains, #7, #13 and #20 (See details on page 2)

SAMPLE SOURCE:
Exide Technologies
2700 S. Indiana St.
Vernon, CA 90058

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Analytical Method

Analysis of Metals by Inductively Coupled Plasma - Mass Spectrometry

Aliquots of solutions from impingers, housing, tubing, probe and blank were treated with nitric acid prior to analysis. Filters samples were digested in a microwave oven using 1:1 Ultrapure Nitric Acid. Analysis for metals was performed in accordance with AQMD Method #0005, (*Standard Operating Procedure for the Analysis of Metals in Filters by Inductively Coupled Plasma - Mass Spectrometer*).

Results:

See attachment.

Date Approved: 8/16/13

Approved By: Rudy Eden

Rudy Eden, Sr. Manager
Laboratory & Source Test Engineering

(Page 2 of 2)

Exide Technologies: 2700 S. Indiana St., Vernon, CA 90058

LN 1320008-03 to -08

Metal analysis results for source test performed at Exide Technologies (Source Test # 13-306)

	Train #7 impinger and housing	Train #20 impinger and housing	Train #20 tubing and probe	Blank	Filter from Train #7	Filter from Train #20
	1320008-03	1320008-04	1320008-05	1320008-06	1320008-07	1320008-08
Element	ng/mL	ng/mL	ng/mL	ng/mL	µg/filter	µg/filter
Antimony	<0.18	0.44	0.85	<0.18	0.01	<0.01
Arsenic	0.06	7.37	6.96	<0.60	<0.02	0.02
Barium	1.16	37.1	<0.60	0.91	1.09	1.67
Beryllium	<0.06	<0.06	<0.06	<0.06	<0.02	<0.02
Cadmium	0.39	1.86	1.25	0.16	<0.03	<0.03
Chromium	<0.60	0.76	<0.60	<0.60	0.06	0.08
Cobalt	0.08	<0.60	<0.60	<0.60	<0.02	<0.02
Copper	6.89	3.25	3.08	<0.60	<0.02	0.03
Lead	12.7	37.7	60.7	1.07	0.06	0.12
Manganese	0.35	0.83	0.57	<0.12	0.05	0.07
Nickel	0.39	0.85	3.89	0.08	0.02	0.03
Selenium	<0.24	0.47	<0.24	<0.24	<0.02	<0.02
Thallium	<0.60	<0.60	<0.60	<0.60	<0.02	<0.02
Tin	9.78	16.3	0.76	44.3	<0.02	0.22
Titanium	0.75	0.92	<0.60	<0.60	<0.02	<0.02
Vanadium	<0.60	<0.60	<0.60	<0.60	<0.02	<0.02
Zinc	30.5	21.4	7.66	1.51	1.79	2.18

SOURCE TEST REQUEST FOR EQUIPMENT/ANALYSIS

Company: Exide Technologies
Source Test No.: 13-306
Address: 2700 S. Indiana St.
Request Date: June 26, 2013
Basic Equipment: Blast Furnace, Refining Kettles
Control Device: Hard Lead Baghouse
Analysis/Equipment Requested By: Mohsen Nazemi
Date Equipment Needed: ~~July 4~~ ~~July 9~~, 2013 (AM) July 17
For Compliance, Rule(s): 1402, 1420, 1420.1
Other (specify):

SAMPLE EQUIPMENT REQUEST

Prep Reference:
Prep Laboratory No.: 1317614
Dry Ice Needed: ☒

Quantity and Description	I.D. Nos.	
3 CARB Method 436 Trains (excl. mercury)	Trains Nos: 7, 13, 20	I
2 – 6L Canisters (Fixed Gases)	54049, 54775	
2 EPA Method TO-15 Canister	E3401, E3718 GB 7/2/13	
		II
2 glass probes, teflon sample line and 2 sets of 3		
teflon connectors for washing.	Reference: Blue Book No 41	
	pages: 30, 31	

SAMPLE EQUIPMENT ANALYSIS REQUEST

Source Test No.: 13-306
Analysis Laboratory No.: 1320008 TRAINS

Sample Description	Analysis Requested
54049	Fixed Gases
E3401	TO-15
Train 20, Probe 6a Sample Line + Connectors	Multiple Metals
II Train 7	Mult Metal (Blank)
Train 13, Can E3718, Can 54775	Not Used

SAMPLE EQUIPMENT CHAIN OF CUSTODY

Sample Equipment #	From	To	For (S/T, Analysis, Cleanup, Not Used)	Date	Time
I	[signature]	[signature]	Testing	07/17/13	13:25
III	[signature]	[signature]	Analysis	7/19/13	8:16

Revision: January 2012

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

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS

TO: Mike Garibay, Supervising AQ Engineer
Source Testing

SAMPLE DESCRIPTION:

Hard lead baghouse
Canister #E3401

SAMPLE LOCATION:

Exide Technologies
2700 S. Indiana St.
Vernon, CA 90057

LABORATORY NO:	1320007-01
REFERENCE NO:	MSF-7-39
DATE SAMPLED:	07/17/13
DATE RECEIVED:	07/19/13
DATE ANALYZED:	08/09/13
ANALYZED BY:	Yadira De Haro-Hammock
REQUESTED BY:	Jason Aspell

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography(GC) - Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Note: See attached results.

Date Approved: 8/20/13

Approved By: Rudy Eden
Rudy Eden, Sr. Manager
Laboratory Services Branch
(909) 396-2391

C:\Users\sbarbosa\Documents\Exide\LN 1320007 Exide.xlsx

LAB NO: 1320007-01
Location: Exide Technologies

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography(
Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Sample Date	07/17/13
Canister	E3401
Total NMOC, ppbc	**3210**

Compound	Conc. (ppb)
ethanol	N.D.
vinyl chloride	N.D.
1,3-butadiene	14.9
2-propenal (Acrolein)	0.9
acetone	12.8
methylene chloride	0.3
methyl tert butyl ether	N.D.
2-butanone (MEK)	0.8
chloroform	0.1
1,2-dichloroethane	<0.1
benzene	40.9
carbon tetrachloride	N.D.
1,2-dichloropropane	N.D.
trichloroethylene	<0.1
toluene	8.9
1,2-dibromoethane	N.D.
tetrachloroethylene	<0.1
ethylbenzene	2.2
m+p-xylenes	1.1
Styrene	19.6
o-xylene	0.5
1,4-dichlorobenzene	N.D.
1,2-dichlorobenzene	N.D.
isoprene	8.7

LAB NO: 1320007-01
Location: Exide Technologies

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Qualitative Analysis and Quantitation of Toxic Organics by Gas Chromatography/
Mass Spectrometry(MS) and Flame Ionization Detection(FID)

Sample Date	07/17/13
Canister	E3401
Total NMOC, ppbc	**3210**
Compound	**Conc. (ppb)**
acetylene+ethylene	301
ethane	449
propylene	78.3
propane	116
isobutane	7.7
1-butene	20.2
n-butane	8.2
n-pentane	17.7
1-hexene	2.2
n-hexane	0.7
n-heptane	0.6
n-octane	0.2
n-nonane	0.2
n-decane	0.1
n-undecane	0.2
n-dodecane	0.1

Additional Compound (Concentrations estimated within ± 50%)

thiophene	12.4
2,4-dimethyl-1-heptene	11.3
acetonitrile	14.4

NMOC = Non-Methane Organic Compounds
N.D. = Not Detected

C:\Users\sbarbosa\Documents\Exide\LN 1320007 Exide.xlsx

SOURCE TEST REQUEST FOR EQUIPMENT/ANALYSIS

Company: Exide Technologies
Source Test No.: 13-306
Address: 2700 S. Indiana St.
Request Date: June 26, 2013
Basic Equipment: Blast Furnace, Refining Kettles
Control Device: Hard Lead Baghouse
Analysis/Equipment Requested By: Mohsen Nazemi
Date Equipment Needed: ~~July 4~~ ~~July 9~~, 2013 (AM) July 17
For Compliance, Rule(s): 1402, 1420, 1420.1
Other (specify):

SAMPLE EQUIPMENT REQUEST

Prep Reference:
Prep Laboratory No.:
Dry Ice Needed ☒

Quantity and Description	I.D. Nos.	
3 CARB Method 436 Trains (excl. mercury)	Trains Nos: 7, 13, 20	I
2 – 6L Canisters (Fixed Gases)	54049, 54775	
2 EPA Method TO-15 Canister	E3401, E3718 GB 7/2/13	
2 glass probes, teflon sample line and 2 sets of 3		II
teflon connectors for washing.	Reference: Blue Book No 4	
	pages: 30, 31	

SAMPLE EQUIPMENT ANALYSIS REQUEST

Source Test No.: 13-306
Analysis Laboratory No.: [illegible]

Sample Description	Analysis Requested
54049	Fixed Gases
E3401	TO-15
Train 20, Probe 6 & Sample Line + Connectors	Multiple Metals
Train 7	Mult Metal (Blank)
Train 13, Can E3718, Can 54775	Not Used

III

SAMPLE EQUIPMENT CHAIN OF CUSTODY

Sample Equipment #	From	To	For (S/T, Analysis, Cleanup, Not Used)	Date	Time
I	[signature]	[signature]	Testing	07/17/13	13:25
III	[signature]	[signature]	Analysis	7/19/13	8:16

Revision: January 2012

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

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS

TO	Mike Garibay, Supervising AQ Engineer Source Test Engineering	**LABORATORY NO.**	1320008
		ST NO	13-306
SAMPLE(S) DESCRIBED AS	Two CARB 436 Trains	**DATE RECEIVED**	7/19/2013
		PROJECT/ RULE	1401, 1420, 1420.1
SAMPLING LOCATION	Exide Technologies 2700 S Indiana St Vernon CA 90023	**REQUESTED BY**	Jason Aspell
		DATE ANALYZED	7/19/2013

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Moisture and multiple metals by CARB 436. (1)

MOISTURE	**TRAIN 20**	**TRAIN 7**
Moisture gain, g	17.9	<1
Silica gel%	60	<1
Notes	~ 6.5' probe, 12' Teflon, no moisture visible. Clear colorless liquid.	No probe or tubing submitted. Clear colorless liquid.
RECOVERY VOLUMES		
Probe, mL	187.3	NA (2)
Impinger, mL	396.6	377.0
Filter, mL	NA (3)	NA (3)

NOTE (1) Additional significant figures provided for calculation purposes.
(2) Probe and tubing not supplied
(3) Filter recovered without liquid. See ICP MS preparation for volume.

Date Approved: 8/23/13

Approved By: [signature]
Rudy Eden, Senior Manager
Laboratory Services
(909) 396-2391

TRAIN 20

MOISTURE GAIN

IMP	PREPD AS	TARE	FINAL	Net, g	Total
1	Not present				
2	100 mL	663.8	670.5	6.7	
3	100 mL	644.9	645.9	1	
4	MT	447.1	448.7	1.6	
5	SiO2	722.6	731.2	8.6	17.9

NOTES ~ 6.5' probe, 12' Teflon, no moisture visible. Clear colorless liquid.

RECOVERY DATA		TARE	FINAL	NET GRAMS
Container 1	FILTER	0.2011	0.201	-0.0001
Container 2	PROBE&TUBE	36.5	223.8	187.3
Container 3	IMP&FLTRHOLDR	66.5	463.1	396.6

TRAIN 7 (FIELD BLANK)

MOISTURE GAIN

IMP	PREPD AS	TARE	FINAL	Net, g	Total
1	Not present				
2	100 mL	667.7	667.6	-0.1	
3	100 mL	635.6	635.5	-0.1	
4	MT	561	561	0	
5	SiO2	693.9	693.9	0	-0.2

NOTES: No probe or tubing submitted. Clear colorless liquid.

RECOVERY DATA		TARE	FINAL	NET GRAMS
Container 1	FILTER	0.2081	0.208	-0.0001
Container 2	NONE	0	0	0
Container 3	IMPNGR	67.2	444.2	377.0

8-23-13

SOURCE TEST REQUEST FOR EQUIPMENT/ANALYSIS

Company: Exide Technologies
Source Test No.: 13-306
Address: 2700 S. Indiana St
Request Date: June 26, 2013
Basic Equipment: Blast Furnace, Refining Kettles
Control Device: Hard Lead Baghouse
Analysis/Equipment Requested By: Mohsen Nazemi
Date Equipment Needed: ~~July 9~~ ~~July 11~~ July 17, 2013 (AM)
For Compliance, Rule(s): 1402, 1420, 1420.1
Other (specify):

SAMPLE EQUIPMENT REQUEST

Prep Reference:
Prep Laboratory No.:
Dry Ice Needed: ☒

Quantity and Description	I.D. Nos.
3 CARB Method 436 Trains (excl. mercury)	Trains No. 7, 13, 20
2 – 6L Canisters (Fixed Gases)	54049, 54775
2 EPA Method TO-15 Canister	E3401, E3718 gB 7/2/13
	I
2 glass probes, teflon sample line and 2 sets of 3 teflon connectors for washing.	II
	Reference: Blue Book No. 41 Pages: 30, 31

SAMPLE EQUIPMENT ANALYSIS REQUEST

Source Test No.: 13-306
Analysis Laboratory No.: 1320008

Sample Description	Analysis Requested: TRAINS
I 54049	Fixed Gases
E3401	TO-15
Train 20, Probes 6n Sample Line + Connectors	Multiple Metals
II Train 7	Mult Metal (Blank)
Train 13, Can E3718, Can. 54775	Not Used

SAMPLE EQUIPMENT CHAIN OF CUSTODY

Sample Equipment #	From	To	For (S/T, Analysis, Cleanup, Not Used)	Date	Time
I	[signature]	[signature]	Testing	07/17/13	13:25
I/II	[signature]	[signature]	Analysis	7/19/13	8:16

Revision: January 2012

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

MONITORING AND ANALYSIS
REPORT OF LABORATORY ANALYSIS

(Page 1 of 2)

TO: Mike Garibay, Supervising A.Q. Engineer
Monitoring/Source Testing
Science & Technology Advancement

LABORATORY NO. 1322105-02 to - 08

REFERENCE NO. ICPMS-YS-5-57

SAMPLES DESCRIBED AS:

Solutions and filters from CARB Method 436 (Excl. mercury) performed at Exide Technologies. Samples consist of solutions and filters from source test trains # 10 & #15. (See details on page 2)

SUBMITTED ON: 7/30/2013

REQUESTED BY: Mike Garibay

SAMPLE SOURCE:

Exide Technologies
2700 Indiana St.
Vernon, CA 90058

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS

Analysis of Metal by Inductively Coupled Plasma - Mass Spectrometry

Aliquots of solutions from impingers, housing, tubing, probe and blank were treated with nitric acid prior to analysis. Filters samples were digested in a microwave oven using 1:1 Ultrapure Nitric Acid. Analysis for metals was performed in accordance with AQMD Method #0005, (*Standard Operating Procedure for the Analysis of Metals in Filters by Inductively Coupled Plasma - Mass Spectrometer*).

Results:
Results for solutions are given in ppb (ng/ml). Concentrations of metals on filters are given in ng/filter. Where results were found to be below the Method Reporting Limit (MRL), a < MRL value in ppb is reported. For example, if the MRL for a compound is 0.5 ppb and a sample was found to be not detected for that compound, the reported value is <0.5 ppb. Please see next page for full results.

Date Approved: 8/28/13

Approved By: Rudy Eden
Rudy Eden, Sr. Manager
Laboratory & Source Test Engineering

(Page 2 of 2)

Lab. ID	1322105-02	1322105-03	1322105-04	1322105-05	1322105-06	1322105-07	1322105-08
	Blank Reagent 5%HNO3 + 10% H2O2	Container #2 Train #10 Probe + Line	Container #3 Train #10 Impinger + Front of filter housing	Container #3 Blank Train #15 Impinger + Front of filter housing	Container #2 Blank Train #15 Tubing + Probe	Train#10 Container#1	Train #15 Filter Blank
Element	ng/mL	ng/mL	ng/mL	ng/mL	ng/mL	ng/filter	ng/filter
Antimony	<0.18	0.59	0.78	<0.18	<0.18	10	8
Arsenic	<0.06	2.63	6.26	0.12	0.19	20	<2
Barium	<0.06	0.82	2.25	1.53	<0.06	2,000	1,320
Beryllium	<0.06	<0.06	<0.06	<0.06	<0.06	<2	<2
Cadmium	0.48	0.91	2.52	0.76	<0.12	<3	<3
Chromium	<0.60	<0.60	1.51	<0.60	<0.60	90	70
Cobalt	<0.06	<0.06	0.31	0.13	<0.06	<2	5
Copper	1.03	23.1	12.5	15.8	2.69	40	70
Iron	<0.06	51.4	93.1	23.9	4.66	560	640
Lead	0.19	52	202	19.2	3.19	120	40
Manganese	<0.120	1.06	2.31	0.91	0.14	110	60
Nickel	0.128	4.19	2.22	1.12	0.80	30	20
Selenium	<0.240	<0.24	0.47	<0.24	<0.24	<6	<6
Thallium	<0.60	<0.60	<0.60	<0.60	<0.60	<20	<20
Tin*	51.5	0.63	11.5	10.6	<0.60	180	<20
Titanium	<0.60	1.09	1.9	1.37	<0.60	<20	<20
Vanadium	<0.60	<0.60	<0.60	<0.60	<0.60	<20	<20
Zinc	4.31	48.5	61.1	24.3	8.57	2,620	2,110

*Tin can be used as a stabilizer in H2O2 by the manufacturer.

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

MONITORING & ANALYSIS
REPORT OF LABORATORY ANALYSIS

TO	Mike Garibay, Supervising AQ Engineer Source Test Engineering	**LABORATORY NO.**	1322105
		ST NO	13-307
SAMPLE(S) DESCRIBED AS	Two CARB 436 Trains	**DATE RECEIVED**	8/9/2013
		PROJECT/ RULE	1401, 1407, 1420, 1420.1
SAMPLING LOCATION	Exide Technologies 2700 S Indiana St Vernon CA 90023	**REQUESTED BY**	Jason Aspell
		DATE ANALYZED	8/9/2013

ANALYTICAL WORK PERFORMED, METHOD OF ANALYSIS AND RESULTS
Moisture and multiple metals by CARB 436. [1]

MOISTURE	**TRAIN 10**	**TRAIN 15**
Moisture gain, g	16	<1
Silica gel%	50-55	<1
Notes	Probe #9, ~ 12' Teflon, no moisture or deposit visible. Clear colorless liquid.	Blank probe submitted. Clear colorless liquid in impingers.
RECOVERY VOLUMES		
Probe, mL	149.6	105.9
Impinger, mL	368.3	277.8
Filter, mL	NA [2]	NA [2]

NOTE (1) Additional significant figures provided for calculation purposes.
(2) Filter recovered without liquid. See ICP MS preparation for volume.

Date Approved: 8/23/13

Approved By: Rudy Eden
Rudy Eden, Senior Manager
Laboratory Services
(909) 396-2391

TRAIN 10

MOISTURE GAIN

IMP	PREPD AS	TARE	FINAL	Net, g	Total
1	Not present				
2	100 mL	621.7	626.1	4.4	
3	100 mL	691.8	692.3	0.5	
4	MT	559.8	561.5	1.7	
5	SiO2	723.9	733.3	9.4	16.0

NOTES Probe #9, ~ 12' Teflon, no moisture or deposit visible. Clear colorless liquid.

RECOVERY DATA		TARE	FINAL	NET GRAMS
Container 1	FILTER	0.198	0.1973	-0.0007
Container 2	PROBE&TUBE	26.4	176.0	149.6
Container 3	IMP&FLTRHOLDR	56.1	424.4	368.3

TRAIN 15 (FIELD BLANK)

MOISTURE GAIN

IMP	PREPD AS	TARE	FINAL	Net, g	Total
1	Not present				
2	100 mL	654.9	654.8	-0.1	
3	100 mL	641.2	641.2	0	
4	MT	520.1	520.1	0	
5	SiO2	712.9	713	0.1	0

NOTES: Blank probe submitted. Clear colorless liquid in impingers.

RECOVERY DATA		TARE	FINAL	NET GRAMS
Container 1	FILTER	0.2108	0.2104	-0.0004
Container 2	PROBE	36.6	142.5	105.9
Container 3	IMPNGR	54.8	332.6	277.8

✓ JW 8-23-13