State of Oregon
Department of Environmental Quality Memorandum

Date: June 26, 2014

To: File/George Davis
From: Mike Eisele

Subject: Source Test Review Report
ESCO Corporation
Permit Number: 26-2068-TV-01

Test Date: January 21-24, 2014
Date Report Received: March 7, 2014
Source Testers: Horizon Engineering
DEQ Observed: Yes

I) Source Description: Metal foundry.

II) Process (es)/Emissions Unit(s) Tested: Inlet and outlet of the baghouse associated with the Doghouse pouring and with the Doghouse shakeout.

III) Test Purpose: To determine the amount of particulate matter (PM) going in to and out of each baghouse.

IV) Testing Location(s):

Pouring Baghouse Inlet Duct:

Diameter:	59.4"
Distance A (Method 1):	~312" (5.3 Diameter)
Distance B (Method 1):	~360" (6.1 Diameters)
Number traverse points utilized:	24

Pouring Baghouse Exhaust:

Diameter:	59.8"
Distance A (Method 1):	91" (1.5 Diameter)
Distance B (Method 1):	343" (5.8 Diameters)
Number traverse points utilized:	20

Shakeout Baghouse Inlet Duct:

Diameter:	23"
Distance A (Method 1):	65" (2.8 Diameter)
Distance B (Method 1):	60" (2.6 Diameters)
Number traverse points utilized:	24

Shakeout Baghouse Exhaust Duct:

Diameter:	23.8"
Distance A (Method 1):	112" (4.7 Diameter)
Distance B (Method 1):	93" (3.9 Diameters)
Number traverse points utilized:	24

V) Testing Methodology: The following testing methods were utilized during the testing program:
Flow Rate & Moisture Content: EPA Methods 1, 2, & 4
Total Particulate: ODEQ Method 5

VI) Summary of Results: The testing parameters, test results, and operating parameters are summarized in Tables 1 & 2:

TABLE 1: Pouring Baghouse Inlet and Outlet

TESTING PARAMETERS (PM)	Run 1 Inlet	Run 1 Outlet	Run 2 Outlet	Run 3 Outlet	Average Outlet
Test Date	1/21/14	1/21/14	1/22/14	1/23/14	--
Test Time	0934-1444	0934-1444	0943-1616	0933-1449	--
Exhaust Gas Temperature (°F)	55	55	54	56	55
Exhaust Gas Moisture (%)	0.5	0.2	0.1	0.2	0.2
Exhaust Gas Velocity (m/s)	16	17	16	17	17
Exhaust Gas Flow Rate (dscfm)	64200	67100	66300	67200	66900
PM Sample Volume (dscf)	173	218	256	191	222
Total Mass of PM Collected (mg)	13.4	5.1	5.0	5.8	5.3
Total Particulate (PM) Emissions:					
• gr/dscf	0.0012	0.00036	0.00030	0.00046	0.00037
• lb/hr	0.66	0.21	0.17	0.27	0.22
• lb/ton	0.31	0.099	0.080	0.085	0.088
Total Particulate (PM) Emissions at method detection limit (20mg):					
• gr/dscf	0.0018	0.0014	0.0012	0.0016	0.0014
• lb/hr	0.98	0.82	0.68	0.92	0.81
• lb/ton	0.46	0.39	0.32	0.29	0.33
Isokinetic Variation	101	105	104	105	90-110
Production (tons metal poured/hr)	2.12	2.12	2.15	3.15	2.47
Baghouse Pressure Drop (inches H_20)	4.2	4.2	4.3	4.3	4.3

TABLE 2: Shakeout Baghouse Inlet and Outlet

TESTING PARAMETERS (PM)	Run 1 Inlet	Run 1 Outlet	Run 2 Outlet	Run 3 Outlet	Average Outlet
Test Date	1/24/14	1/22/14	1/23-24/14	1/24/14	--
Test Time	1218-1611	1334-1627	1312-0849	1218-1611	--
Exhaust Gas Temperature (°F)	62	62	64	71	66
Exhaust Gas Moisture (%)	0.6	1.4	1.1	0.7	1.1
Exhaust Gas Velocity (m/s)	28	26	26	26	26
Exhaust Gas Flow Rate (dscfm)	16000	15900	15800	15600	15800
PM Sample Volume (dscf)	86	139	219	119	159
Total Mass of PM Collected (mg)	1740	21.5	38.3	32.9	30.9
Total Particulate (PM) Emissions:					
• gr/dscf	0.31	0.0024	0.0027	0.0042	0.0031
• lb/hr	42.8	0.32	0.37	0.57	0.42
• lb/ton	7.7	0.08	0.12	0.10	0.10
Isokinetic Variation	104	98	99	98	98
Production (tons metal poured/hr)	5.58	4.27	3.08	5.58	4.31
Baghouse Pressure Drop (inches H_20)	5.0	5.0	5.0	5.0	5.0

VII) Concerns & Comments:

1) The barometric pressure reported for 1/21/2014 was 30.9"Hg. This is an extremely high barometric pressure for Portland and may have been a misreading. Historical data from Portland weather stations show the barometric pressure to be 30.3"Hg corrected to sea leave. Esco is about 100ft above sea level so the barometric pressure should have been ~30.2"Hg. This would change the results by about 2%.
2) On page 62, the initial silica gel weight should read 620 grams.
3) On page 71, the shakeout inlet filter was not quite weighed to a constant weight, consecutive weighings had a difference of 0.6 mg. A constant weight is reached when consecutive weighings are less than or equal to 0.5 mg. This variance from the method did not play a significant role as the total weight gain of the filter was 1600mg.
4) Each sample point was not sampled for the same length of time because the length of each test run was not known until near the end of each run due to the variability of the processes.

VIII) Overall Evaluation: The test methods conducted and the data provided were sufficient to evaluate the emission units tested.

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