



**Results of the
EPA Information Collection Request (ICR)**

Test Location
Metropolitan Wastewater Treatment Plant
Emission Units 1, 2 & 3(EU035, EU036, EU037)
Wastewater Treatment Plant
2400 Childs Road
St. Paul, Minnesota 55106-6724
AQ Facility ID: 12300053-006
AQ File Number: 879

Prepared for:

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Report # 902630 Metro
February 8-12, 2010

Prepared By:

A handwritten signature in black ink that reads "Brian Durkop".

Brian Durkop
Vice President

REPORT CERTIFICATIONS**1.) Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures:**

"I certify under penalty of law that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this test report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Brian DarkopPrint Name: Brian DarkopTitle: Vice PresidentDate: 3-25-10**2.) Certification of analytical procedures by the person responsible for the laboratory analysis of field samples:**

"I certify under penalty of law that the analytical procedures were performed in accordance with the requirements of the test methods and that the data presented for use in this test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Mark CarlsonPrint Name: Mark CarlsonTitle: Project SupervisorDate: 3-25-10**3.) Certification of test report by senior staff person at the testing company who is responsible for compiling and checking the test report:**

"I certify under penalty of law that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed the sampling and analysis related to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the test report."

Signature: Brian DarkopPrint Name: Brian DarkopTitle: Vice PresidentDate: 3-25-10**4.) Certification of test report by owner or operator of the emission facility:**

"I certify under penalty of law that the information submitted in this test report accurately reflects the operating conditions at the emission facility during this performance test and describes the date and nature of all operational and maintenance activities that were performed on the process and control equipment during the month prior to the performance test. Based on my inquiry of the person or persons who performed the operational and maintenance activities, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained in the cover letter or attachments submitted with this report."

Signature: David QuastPrint Name: David QuastTitle: Principal EngineerDate: 3-23-10

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SECTION 1.0

EXECUTIVE SUMMARY

This report presents the results of a source test performed by Eagle Mountain Scientific, Inc. (EMSI) at the Metropolitan Council Environmental Services, Metropolitan Wastewater Treatment Plant (Metro) on Units 1, 2 and 3 (EU035, EU036, EU037) located in St. Paul Minnesota. The testing was performed on February 8-12, 2010 to meet the requirements of the US EPA Section 114 Information Collection Request (ICR). EMSI conducted U. S. EPA (EPA) ICR approved testing methods. This report describes the procedures used to complete the testing and the results of these tests.

Mr. Adam Duske, Mr. Brian Durkop, Mr. Nathan Traut, Mr. Mark Carlson, and Mr. Nathan Kizer performed the testing. There were no MPCA representatives present during this performance test. Met Council personnel recorded the process operating conditions and provided the final process data averages for inclusion in this report.

1.1 Summary of Test Methods

Table 1.1
Metropolitan Council Environmental Services
Wastewater Treatment Plant
Units 1, 2 & 3 (EU035, EU036, EU037)
Test Methods Per Unit
February 8-12, 2010

METHOD	PURPOSE	RUN TIME (Minutes)	# OF RUNS	TEST LOCATION
EPA 6C	Determination of Sulfur Dioxide	60	3	Stack
EPA 7E	Determination of Oxides of Nitrogen	60	3	Stack
EPA 10	Determination of Carbon Monoxide	60	3	Stack
EPA 23	Determination of Dioxin / Furans / PCBs / PAH *	240	3	Stack
OTM27	Determination of Particulate Matter Less Than 2.5 microns	240	3	Stack
OTM28	Determination of Condensable Particulate Matter	240	3	Stack

* Test conducted on Units 1 and 2 only

1.2 Summary of Test Results

Table 1.2
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 1 (EU035)
February 8-9, 2010

GROUP	PARAMETER	UNITS	TEST 1	TEST 2	TEST 3	AVERAGE
CEMS	Sulfur Dioxide	ppmvd @ 7% O ₂	<0.0	<0.0	<0.0	<0.0
	Nitrogen Oxides		25.52	25.67	34.25	28.48
	Carbon Monoxide		0.7	0.5	<0.0	+0.4
Dioxin/ Furans	2378-TCDD	ng/dscm @ 7% O ₂	<0.0117	<0.0116	<0.0114	<0.0116
	12378-PeCDD		<0.0117	<0.0116	<0.0114	<0.0116
	123478-HxCDD		<0.0117	<0.0116	<0.0114	<0.0116
	123678-HxCDD		<0.0117	<0.0116	<0.0114	<0.0116
	123789-HxCDD		<0.0117	<0.0116	<0.0114	<0.0116
	1234678-HpCDD		<0.0117	<0.0116	<0.0114	<0.0116
	OCDD		<0.1173	<0.1159	<0.1144	<0.1159
	2378-TCDF		<0.0117	<0.0116	<0.0114	<0.0116
	12378-PeCDF		<0.0117	<0.0116	<0.0114	<0.0116
	23478-PeCDF		<0.0117	<0.0116	<0.0114	<0.0116
	123478-HxCDF		<0.0117	<0.0116	<0.0114	<0.0116
	123678-HxCDF		<0.0117	<0.0116	<0.0114	<0.0116
	234678-HxCDF		<0.0117	<0.0116	<0.0114	<0.0116
	123789-HxCDF		<0.0117	<0.0116	<0.0114	<0.0116
	1234678-HpCDF		<0.0117	<0.0116	<0.0114	<0.0116
	1234789-HpCDF		<0.0117	<0.0116	<0.0114	<0.0116
	OCDF		<0.1173	<0.1159	<0.1144	<0.1159
PCB	3,4',4,5'-TetraCB (#81)	ng/dscm @ 7% O ₂	<0.0586	<0.0579	<0.0571	<0.0579
	3,3',4,4'-TetraCB (#77)		<0.0586	<0.0579	<0.0571	<0.0579
	2',3,4,4',5-PentaCB (#123)		<0.0586	<0.0579	<0.0571	<0.0579
	2,3',4,4',5-PentaCB (#118)		<0.0586	<0.0579	<0.0571	<0.0579
	2,3,4,4',5-PentaCB (#114)		<0.0586	<0.0579	<0.0571	<0.0579
	2,3,3',4,4'-PentaCB (#105)		<0.0586	<0.0579	<0.0571	<0.0579
	3,3',4,4',5-PentaCB (#126)		<0.0586	<0.0579	<0.0571	<0.0579
	2,3',4,4',5,5'-HexaCB (#167)		<0.0586	<0.0579	<0.0571	<0.0579
	2,3,3,4,4,5-HexaCB (#156/#157)		<0.1172	<0.1158	<0.1143	<0.1158
	3,3',4,4',5,5'-HexaCB (#169)		<0.0586	<0.0579	<0.0571	<0.0579
	2,3,3',4,4',5,5'-HeptaCB (#189)		<0.0586	<0.0579	<0.0571	<0.0579
PAH	Naphthalene	ug/dscm @ 7% O ₂	0.1583	0.1505	0.1634	0.1574
	2-Methylnaphthalene		0.0349	0.0342	0.0226	0.0306
	2-Chloronaphthalene		0.0001	0.0001	<0.00004	+0.0001
	Acenaphthylene		0.0032	0.0064	0.0017	0.0038
	Acenaphthene		0.0020	0.0021	0.0016	0.0019
	Fluorene		0.0054	0.0097	0.0021	0.0057
	Phenanthrene		0.0361	0.0420	0.0169	0.0316
	Anthracene		0.0032	0.0035	0.0019	0.0029
	Fluoranthene		0.0229	0.0273	0.0087	0.0196
	Pyrene		0.0121	0.0156	0.0070	0.0116
	Benzo(a)anthracene		0.0015	0.0021	0.0007	0.0015

	Chrysene		0.0067	0.0098	0.0036	0.0067
	Benzo(b)fluoranthene		0.0018	0.0020	0.0006	0.0015
	Benzo(k)fluoranthene		0.0002	0.0004	0.0010	0.0005
	Benzo(e)pyrene		0.0031	0.0046	0.0036	0.0038
	Benzo(a)pyrene		0.0007	0.0009	0.0010	0.0009
	Perylene		<0.0001	<0.0001	<0.0001	<0.0001
	Indeno (1,2,3 -cd) pyrene		<0.0001	<0.0001	<0.0001	<0.0001
	Dibenz(a,h)anthracene		<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(g,h,i)perylene		0.0044	0.0066	0.0069	0.0060
PM2.5	Total PM2.5	lb/ton dry sludge	+0.0312	+0.0172	+0.0268	+0.0251
	Filterable PM2.5		<0.0083	+0.0105	<0.0078	+0.0089
	Organic		0.0100	<0.0038	0.0070	+0.0069
	Aqueous		0.0129	<0.0030	0.0124	+0.0094
	Total Particulate Matter		+0.0354	+0.0210	+0.0310	+0.0291

< Below Detection Limit (BDL)

+ Detection Limit Limited (DLL)

Table 1.3
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 2 (EU035)
February 9-10, 2010

GROUP	PARAMETER	UNITS	TEST 1	TEST 2	TEST 3	AVERAGE
CEMS	Sulfur Dioxide	ppmvd @ 7% O ₂	<0.0	<0.0	<0.0	<0.0
	Nitrogen Oxides		12.93	13.58	13.58	13.36
	Carbon Monoxide		1.7	1.5	1.3	1.5
Dioxin/ Furans	2378-TCDD	ng/dscm @ 7% O ₂	<0.0116	<0.0113	<0.0119	<0.0116
	12378-PeCDD		<0.0116	<0.0113	<0.0119	<0.0116
	123478-HxCDD		<0.0116	<0.0113	<0.0119	<0.0116
	123678-HxCDD		<0.0116	<0.0113	<0.0119	<0.0116
	123789-HxCDD		<0.0116	<0.0113	<0.0119	<0.0116
	1234678-HpCDD		<0.0116	<0.0113	<0.0119	<0.0116
	OCDD		<0.1162	<0.1126	<0.1186	<0.1158
	2378-TCDF		<0.0116	<0.0113	<0.0119	<0.0116
	12378-PeCDF		<0.0116	<0.0113	<0.0119	<0.0116
	23478-PeCDF		<0.0116	<0.0113	<0.0119	<0.0116
	123478-HxCDF		<0.0116	<0.0113	<0.0119	<0.0116
	123678-HxCDF		<0.0116	<0.0113	<0.0119	<0.0116
	234678-HxCDF		<0.0116	<0.0113	<0.0119	<0.0116
	123789-HxCDF		<0.0116	<0.0113	<0.0119	<0.0116
	1234678-HpCDF		<0.0116	<0.0113	<0.0119	<0.0116
	1234789-HpCDF		<0.0116	<0.0113	<0.0119	<0.0116
	OCDF		<0.1162	<0.1126	<0.1186	<0.1158
PCB	3,4',4,5'-TetraCB (#81)	ng/dscm @ 7% O ₂	<0.0581	<0.0562	<0.0592	<0.0578
	3,3',4,4'-TetraCB (#77)		<0.0581	<0.0562	<0.0592	<0.0578
	2',3,4,4',5-PentaCB (#123)		<0.0581	<0.0562	<0.0592	<0.0578
	2,3',4,4',5-PentaCB (#118)		<0.0581	<0.0562	<0.0592	<0.0578
	2,3,4,4',5-PentaCB (#114)		<0.0581	<0.0562	<0.0592	<0.0578

	2,3,3',4,4'-PentaCB (#105)		<0.0581	<0.0562	<0.0592	<0.0578
	3,3',4,4',5-PentaCB (#126)		<0.0581	<0.0562	<0.0592	<0.0578
	2,3',4,4',5,5'-HexaCB (#167)		<0.0581	<0.0562	<0.0592	<0.0578
	2,3,3,4,4,5-HexaCB (#156/#157)		<0.1161	<0.1125	<0.1185	<0.1157
	3,3',4,4',5,5'-HexaCB (#169)		<0.0581	<0.0562	<0.0592	<0.0578
	2,3,3',4,4',5,5'-HeptaCB (#189)		<0.0581	<0.0562	<0.0592	<0.0578
PAH	Naphthalene	ug/dscm @ 7% O2	0.1579	0.1597	0.1623	0.1600
	2-Methylnaphthalene		0.0273	0.0256	0.0227	0.0252
	2-Chloronaphthalene		0.0001	0.0001	0.0001	0.0001
	Acenaphthylene		0.0021	0.0017	0.0015	0.0018
	Acenaphthene		0.0021	0.0020	0.0014	0.0019
	Fluorene		0.0031	0.0019	0.0024	0.0025
	Phenanthrene		0.0173	0.0165	0.0141	0.0160
	Anthracene		0.0010	0.0008	0.0011	0.0009
	Fluoranthene		0.0121	0.0086	0.0091	0.0099
	Pyrene		0.0102	0.0067	0.0081	0.0084
	Benzo(a)anthracene		0.0015	0.0008	0.0014	0.0012
	Chrysene		0.0069	0.0033	0.0058	0.0053
	Benzo(b)fluoranthene		0.0012	0.0006	0.0011	0.0009
	Benzo(k)fluoranthene		0.0006	0.0005	0.0006	0.0006
	Benzo(e)pyrene		0.0028	0.0021	0.0027	0.0025
	Benzo(a)pyrene		0.0008	<0.0001	<0.0001	+0.0003
	Perylene		<0.0001	<0.0001	<0.0001	<0.0001
	Indeno (1,2,3 -cd) pyrene		<0.0001	<0.0001	<0.0001	<0.0001
	Dibenz(a,h)anthracene		<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(g,h,i)perylene		0.0069	0.0041	0.0070	0.0060
PM2.5	Total PM2.5	lb/ton dry sludge	+0.0229	+0.0251	+0.0406	+0.0295
	Filterable PM2.5		<0.0086	<0.0082	+0.0134	+0.0101
	Organic		0.0069	<0.0041	0.0161	+0.0090
	Aqueous		0.0073	0.0128	0.0110	0.0104
	Total Particulate Matter		+0.0272	+0.0400	+0.0628	+0.0433

< Below Detection Limit (BDL)
+ Detection Limit Limited (DLL)

Table 1.4
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 3 (EU035)
February 11-12, 2010

GROUP	PARAMETER	UNITS	TEST 1	TEST 2	TEST 3	AVERAGE
CEMS	Sulfur Dioxide	ppmvd @	<0.0	<0.0	<0.0	<0.0
	Nitrogen Oxides	7% O ₂	15.05	16.02	36.63	22.56
	Carbon Monoxide		3.4	0.3	0.1	1.3
PM2.5	Total PM2.5	lb/ton dry sludge	+0.0258	+0.0229	+0.0268	+0.0252
	Filterable PM2.5		<0.0078	<0.0078	+0.0104	+0.0087
	Organic		<0.0039	0.0117	0.0088	+0.0081
	Aqueous		0.0141	<0.0035	0.0074	+0.0083
	Total Particulate Matter		+0.0321	+0.0315	+0.0306	+0.0314

< Below Detection Limit (BDL)

+ Detection Limit Limited (DLL)

1.3 Summary of Production and Operating Parameters

The primary process parameters monitored during the test are reported in the following tables. A large number of parameters were monitored by the plant during the ICR test. The complete list and average values obtained during each run are provided in Section 2.0 of this report.

Table 1.5
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 1 (EU035)
CEMS (SO₂, NO_x, CO)
February 8, 2010

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	3.7	4.0	4.0	3.9
Nat Gas Usage (scfh)	360	733	733	609
Steam Prod (lb/hr)	21,515	21,237	21,237	21,330
Venturi Water Flow (gpm)	215	241	241	232
Scrubber (pH)	6.0	6.0	6.0	6.0
Venturi DP (inH2O)	25	25	25	25
Opacity (%)	0.6	0.6	0.6	0.6
Carbon Inj Rate (lb/hr)	4.1	3.9	3.9	4.0
Baghouse DP (inH2O)	5.4	5.5	5.5	5.5
WESP Sec Voltage (kvolts)	33.5	34.4	34.4	34.1

Table 1.6
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 2 (EU036)
CEMS (SO₂, NO_x, CO)
February 10, 2010

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	3.6	3.6	3.6	3.6
Nat Gas Usage (scfh)	332	332	332	332
Steam Prod (lb/hr)	24,110	24,110	24,110	24,110
Venturi Water Flow (gpm)	203	203	203	203
Scrubber (pH)	6.0	6.0	6.0	6.0
Venturi DP (inH20)	25	25	25	25
Opacity (%)	0.4	0.4	0.4	0.4
Carbon Inj Rate (lb/hr)	5.6	5.6	5.6	5.6
Baghouse DP (inH20)	6.0	6.0	6.0	6.0
WESP Sec Voltage (kvolts)	36.8	36.8	36.8	36.8

Table 1.7
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 3 (EU037)
CEMS (SO₂, NO_x, CO)
February 11, 2010

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	3.4	3.4	3.4	3.4
Nat Gas Usage (scfh)	2,637	2,637	0	1,758
Steam Prod (lb/hr)	19,002	19,002	19,862	19,289
Venturi Water Flow (gpm)	266	266	273	268
Scrubber (pH)	5.3	5.3	5.5	5.4
Venturi DP (inH20)	25	25	25	25
Opacity (%)	1.9	1.9	1.8	1.9
Carbon Inj Rate (lb/hr)	7.6	7.6	7.6	7.6
Baghouse DP (inH20)	5.0	5.0	5.1	5.0
WESP Sec Voltage (kvolts)	28.1	28.1	27.8	28.0

Table 1.8
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 1 (EU035)
Dioxin/Furans/PCB's/PAH
February 8-9, 2010

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	3.7	4.0	3.7	3.8
Nat Gas Usage (scfh)	360	733	415	503
Steam Prod (lb/hr)	21,515	21,237	22,009	21,587
Venturi Water Flow (gpm)	215	241	229	228
Scrubber (pH)	6.0	6.0	6.0	6.0
Venturi DP (inH20)	25	25	25	25
Opacity (%)	0.6	0.6	0.5	0.6
Carbon Inj Rate (lb/hr)	4.1	3.9	4.2	4.1
Baghouse DP (inH20)	5.4	5.5	6.0	5.6
WESP Sec Voltage (kvolts)	33.5	34.4	33.0	33.6

Table 1.9
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 2 (EU036)
Dioxin/Furans/PCB's/PAH
February 9-10, 2010

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	3.4	3.6	3.3	3.4
Nat Gas Usage (scfh)	11	332	1,135	493
Steam Prod (lb/hr)	23,773	24,110	23,851	23,911
Venturi Water Flow (gpm)	230	203	212	215
Scrubber (pH)	6.0	6.0	6.0	6.0
Venturi DP (inH20)	25	25	25	25
Opacity (%)	0.3	0.4	0.3	0.3
Carbon Inj Rate (lb/hr)	5.7	5.6	5.5	5.6
Baghouse DP (inH20)	6.0	6.0	6.3	6.1
WESP Sec Voltage (kvolts)	33.7	36.8	35.8	35.4

Table 1.10
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 1 (EU035)
Particulate Matter Less Than 2.5 Microns
February 8-9, 2010

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	3.7	4.0	3.7	3.8
Nat Gas Usage (scfh)	360	733	415	503
Steam Prod (lb/hr)	21,515	21,237	22,009	21,587
Venturi Water Flow (gpm)	215	241	229	228
Scrubber (pH)	6.0	6.0	6.0	6.0
Venturi DP (inH20)	25	25	25	25
Opacity (%)	0.6	0.6	0.5	0.6
Carbon Inj Rate (lb/hr)	4.1	3.9	4.2	4.1
Baghouse DP (inH20)	5.4	5.5	6.0	5.6
WESP Sec Voltage (kvolts)	33.5	34.4	33.0	33.6

Table 1.11
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 2 (EU036)
Particulate Matter Less Than 2.5 Microns
February 9-10, 2010

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	3.4	3.6	3.3	3.4
Nat Gas Usage (scfh)	11	332	1,135	493
Steam Prod (lb/hr)	23,773	24,110	23,851	23,911
Venturi Water Flow (gpm)	230	203	212	215
Scrubber (pH)	6.0	6.0	6.0	6.0
Venturi DP (inH20)	25	25	25	25
Opacity (%)	0.3	0.4	0.3	0.3
Carbon Inj Rate (lb/hr)	5.7	5.6	5.5	5.6
Baghouse DP (inH20)	6.0	6.0	6.3	6.1
WESP Sec Voltage (kvolts)	33.7	36.8	35.8	35.4

Table 1.12
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 3 (EU037)
Particulate Matter Less Than 2.5 Microns
February 11-12, 2010

PARAMETER	TEST 1	TEST 2	TEST 3	AVERAGE
Dry Sludge Feed Rate (tph)	3.4	3.4	3.4	3.4
Nat Gas Usage (scfh)	2,637	0	0	879
Steam Prod (lb/hr)	19,002	19,862	19,865	19,576
Venturi Water Flow (gpm)	266	273	260	266
Scrubber (pH)	5.3	5.5	5.5	5.4
Venturi DP (inH2O)	25	25	25	25
Opacity (%)	1.9	1.8	1.7	1.8
Carbon Inj Rate (lb/hr)	7.6	7.6	7.3	7.5
Baghouse DP (inH2O)	5.0	5.1	5.3	5.1
WESP Sec Voltage (kvolts)	28.1	27.8	28.7	28.2

1.4 Errors and Omissions

Errors and omissions that occurred during this project and in this report are outlined in this subsection to correct mistakes, clarify data, and to discuss field changes to the proposed test protocol.

Nearly all PAH compounds were detected in the train blank. These detected values were due to the very low detection levels in the analytical procedures. The blank was reported in Appendix D of this report and for evaluation of the level of detection that can be attributed to the source. The reported values were not blank corrected but careful consideration must be made regarding the level of detection in the train blank when evaluating the results.

Sampling for scrubber solids was not conducted during the stack test due to an oversight during the testing. Met Council provided estimates of the scrubber solids based their experience and knowledge of the units. Met Council routinely conducts testing for the determination of solids and has a very good handle of the normal level of solids. Therefore, this estimate can be used with a high degree of certainty. The data can be found in Appendix C of this report.

Except as noted, testing was conducted according to the approved test protocol and the procedures utilized to complete the project were conducted according to the protocol.

1.5 Summary of Report Organization

This report is organized in the following manner. Section 2.0 provides detailed test results for the individual test runs. Section 3.0 provides a summary of the testing procedures.

The following information is located in appendices A through F, respectively: copies of the field data sheets, calculated field data results, process operations data, laboratory test analyses, equipment calibrations.

SECTION 2.0

TEST RESULTS

The testing was conducted in conformance to applicable US EPA and MPCA methodologies and rules. The testing project was conducted according to the approved test plan submitted to the MPCA.

2.1 Continuous Emissions Monitoring (CEMS) Results

EPA Methods 6C, 7E and 10 were conducted for the determination of Sulfur Dioxide, Oxides of Nitrogen and Carbon Monoxide. Table 2.1 to 2.3 report the results from Unit 1 (EU035), Unit 2 (EU036) and Unit 3 (EU037).

Table 2.1
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 1 (EU035)
February 8, 2010
Determination of Sulfur Dioxide, Nitrogen Oxides and Carbon Monoxide (CEMS)

Client: Met Council		Plant: Metro	
Date(s): February 8, 2010		EPA Method(s): 6C, 7E, 10	
Run #:	Run 1	Run 2	Run 3
Date:.....	2/8/2010	2/8/2010	2/8/2010
Time:.....	10:00 - 11:00	12:30 - 13:30	13:43 - 14:43
			Average
Process Conditions			
Wet Sludge Feed (tons/hr)	13.6	14.0	14.0
Sludge Solids Content (%).....	27.5	28.6	28.6
Dry Sludge Feed (tons/hr)	3.7	4.0	4.0
Natural Gas (cu ft/hr).....	360	733	733
Reactor Bed Temp (°F).....	1,410	1,413	1,413
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	6.0	5.6	5.6
Steam Production (lbs/hr)	21,515	21,237	21,237
FBR Opacity (%)	0.6	0.6	0.6
Control Equipment (Carbon Injection)			
Injection Rate (lbs/hr)	4.1	3.9	3.9
Injection Temp (°F)	360	359	359
Control Equipment (Baghouse)			
Pressure Drop (inH ₂ O).....	5.4	5.5	5.5
Control Equipment (Wet Scrubber)			
Ring Jet ΔP (inH ₂ O).....	25	25	25
Scrub Water Inlet Temp (F)....	57	58	58
Aft Scrub Gas Temp (F)	61	61	61
Venturi Water Flow (gpm)	215	241	241
Scrubber Water (pH).....	6.0	6.0	6.0

Control Equipment (ESP)

Secondary Voltage (kVolts)....	33.5	34.4	34.4	34.1
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Test Results - Nitrogen Oxides

NOx Raw (ppm)	21.2	19.9	25.7	22.3
NOx Drift Corr. (ppm).....	20.8	20.3	26.4	22.5
NOx (ppm@7% O2).....	25.52	25.67	34.25	28.48

Calibration Gas Values - Nitrogen Oxides

NOx Span (ppm).....	101.6	101.6	101.6	101.6
Zero Gas (ppm).....	0.0	0.0	0.0	0.0
Mid Gas (ppm).....	50.3	50.3	50.3	50.3
High Gas (ppm)	101.6	101.6	101.6	101.6

Calibration Results - Nitrogen Oxides

NOx CE Zero (%).....	0.0	0.0	0.0	0.0
NOx CE Mid (%).....	0.2	0.1	0.1	0.1
NOx CE High (%)	1.7	0.9	0.9	1.1
NOx SB Zero Pre (%).....	0.0	0.0	0.0	0.0
NOx SB Zero Post (%)	0.0	0.0	0.0	0.0
NOx SB Span Pre (%)	3.0	-0.9	-1.4	0.2
NOx SB Span Post (%).....	-1.5	-1.4	-1.4	-1.4
NOx Zero Drift (%)	0.0	0.0	0.0	0.0
NOx Span Drift (%).....	-4.4	-0.5	0.0	-1.6

Test Results - Carbon Monoxide

CO Raw (ppm).....	0.6	0.4	0.0	0.3
CO Drift Corr. (ppm).....	0.6	0.4	0.0	0.3
CO (ppm@7% O2)	0.7	0.5	0.0	0.4

Calibration Gas Values - Carbon Monoxide

CO Span (ppm).....	101.0	101.0	101.0	101.0
Zero Gas (ppm).....	0.0	0.0	0.0	0.0
Mid Gas (ppm).....	50.7	50.7	50.7	50.7
High Gas (ppm)	101.0	101.0	101.0	101.0

Calibration Results - Carbon Monoxide

CO CE Zero (%)	0.0	0.0	0.0	0.0
CO CE Mid (%).....	1.3	1.3	1.3	1.3
CO CE High (%).....	1.0	1.0	1.0	1.0
CO SB Zero Pre (%).....	0.0	0.0	0.0	0.0
CO SB Zero Post (%)	0.0	0.0	0.0	0.0
CO SB Span Pre (%).....	0.0	-0.7	-0.7	-0.5
CO SB Span Post (%)	-0.7	-0.7	-1.0	-0.8
CO Zero Drift (%)	0.0	0.0	0.0	0.0
CO Span Drift (%)	-0.7	0.0	-0.2	-0.3

Test Results - Sulfur Dioxide

SO2 Raw (ppm)	0.0	0.0	0.0	0.0
SO2 Drift Corr. (ppm)	0.0	0.0	0.0	0.0
SO2 (ppm@7% O2).....	0.0	0.0	0.0	0.0

Calibration Gas Values - Sulfur Dioxide

SO2 Span (ppm)	101.0	101.0	101.0	101.0
Zero Gas (ppm).....	0.0	0.0	0.0	0.0

Mid Gas (ppm).....	50.5	50.5	50.5	50.5
High Gas (ppm)	101.0	101.0	101.0	101.0

Calibration Results - Sulfur Dioxide

SO2 CE Zero (%).....	0.9	0.9	0.9	0.9
SO2 CE Mid (%)	-0.1	-0.1	-0.1	-0.1
SO2 CE High (%).....	-0.7	-0.7	-0.7	-0.7
SO2 SB Zero Pre (%)	-0.1	-0.7	-0.7	-0.5
SO2 SB Zero Post (%).....	-0.7	-0.7	-0.7	-0.7
SO2 SB Span Pre (%)	-1.8	-2.6	-2.9	-2.4
SO2 SB Span Post (%)	-2.6	-2.9	-2.4	-2.6
SO2 Zero Drift (%).....	-0.6	0.0	0.0	-0.2
SO2 Span Drift (%)	-0.8	-0.4	0.5	-0.2

Test Results – Oxygen

O2 Raw (%)	9.5	9.7	10.0	9.7
O2 Drift Corr. (%)	9.6	9.9	10.2	9.9

Calibration Gas Values - Oxygen

O2 Span (%)	19.9	19.9	19.9	19.9
Zero Gas (%).....	0.0	0.0	0.0	0.0
Mid Gas (%)	10.1	10.1	10.1	10.1
High Gas (%)	19.9	19.9	19.9	19.9

Calibration Results – Oxygen

O2 CE Zero (%).....	0.0	0.0	0.0	0.0
O2 CE Mid (%).....	-0.8	-0.8	-0.8	-0.8
O2 CE High (%)	-0.3	-0.3	-0.3	-0.3
O2 SB Zero Pre (%).....	0.0	0.0	0.0	0.0
O2 SB Zero Post (%)	0.0	0.0	0.0	0.0
O2 SB Span Pre (%)	1.2	-0.3	-0.1	0.3
O2 SB Span Post (%).....	-0.3	-0.1	-0.2	-0.2
O2 Zero Drift (%).....	0.0	0.0	0.0	0.0
O2 Span Drift (%).....	-1.5	0.2	-0.1	-0.5

Test Results - Carbon Dioxide

CO2 Raw (%)	9.6	9.4	9.3	9.4
CO2 Drift Corr. (%).....	9.6	9.3	9.2	9.3

Calibration Gas Values - Carbon Dioxide

CO2 Span (%).....	19.7	19.7	19.7	19.7
Zero Gas (%).....	0.0	0.0	0.0	0.0
Mid Gas (%)	10.1	10.1	10.1	10.1
High Gas (%)	19.7	19.7	19.7	19.7

Calibration Results - Carbon Dioxide

CO2 CE Zero (%)	0.5	0.5	0.5	0.5
CO2 CE Mid (%)	0.6	0.6	0.6	0.6
CO2 CE High (%).....	0.5	0.5	0.5	0.5
CO2 SB Zero Pre (%)	0.5	0.5	0.6	0.5
CO2 SB Zero Post (%)	0.5	0.6	1.0	0.7
CO2 SB Span Pre (%).....	-1.3	0.0	0.0	-0.4
CO2 SB Span Post (%)	0.0	0.0	0.0	0.0
CO2 Zero Drift (%)	0.0	0.1	0.4	0.2
CO2 Span Drift (%)	1.3	0.0	0.0	0.4

Table 2.2
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 2 (EU036)
February 10, 2010

Determination of Sulfur Dioxide, Nitrogen Oxides and Carbon Monoxide (CEMS)

Client: <i>Met Council</i>	Plant: <i>Metro</i>
Date(s): <i>February 10, 2010</i>	EPA Method(s): <i>6C, 7E, 10</i>

Run #:	Run 1	Run 2	Run 3	
Date:.....	2/10/2010	2/10/2010	2/10/2010	
Time:.....	7:37 - 8:37	8:50 - 9:50	10:02 - 11:02	Average

Process Conditions

Wet Sludge Feed (tons/hr)	13.2	13.2	13.2	13.2
Sludge Solids Content (%).....	27.2	27.2	27.2	27.2
Dry Sludge Feed (tons/hr)	3.6	3.6	3.6	3.6
Natural Gas (cu ft/hr).....	332	332	332	332
Reactor Bed Temp (°F).....	1,411	1,411	1,411	1,411
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	4.4	4.4	4.4	4.4
Steam Production (lbs/hr)	24,110	24,110	24,110	24,110
FBR Opacity (%)	0.4	0.4	0.4	0.4

Control Equipment (Carbon Injection)

Injection Rate (lbs/hr)	5.6	5.6	5.6	5.6
Injection Temp (°F)	349	349	349	349

Control Equipment (Baghouse)

Pressure Drop (inH ₂ O).....	6.0	6.0	6.0	6.0
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Control Equipment (Wet Scrubber)

Ring Jet ΔP (inH ₂ O).....	25	25	25	25
Scrub Water Inlet Temp (F)....	57	57	57	57
Aft Scrub Gas Temp (F)	59	59	59	59
Venturi Water Flow (gpm)	203	203	203	203
Scrubber Water (pH).....	6.0	6.0	6.0	6.0

Control Equipment (ESP)

Secondary Voltage (kVolts)....	36.8	36.8	36.8	36.8
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Test Results - Nitrogen Oxides

NO _x Raw (ppm)	10.6	10.9	10.8	10.8
NO _x Drift Corr. (ppm).....	10.8	11.1	11.0	11.0
NO _x (ppm@7%O ₂).....	12.93	13.51	13.58	13.34

Calibration Gas Values - Nitrogen Oxides

NO _x Span (ppm).....	101.6	101.6	101.6	101.6
Zero Gas (ppm).....	0.0	0.0	0.0	0.0
Mid Gas (ppm).....	50.3	50.3	50.3	50.3
High Gas (ppm)	101.6	101.6	101.6	101.6

Calibration Results - Nitrogen Oxides

NOx CE Zero (%).....	0.0	0.0	0.0
NOx CE Mid (%).....	-1.3	-1.3	-1.3
NOx CE High (%).....	-0.6	-0.6	-0.6
NOx SB Zero Pre (%).....	0.0	0.0	0.0
NOx SB Zero Post (%).....	0.0	0.0	0.0
NOx SB Span Pre (%).....	1.0	0.8	0.6
NOx SB Span Post (%).....	1.0	0.5	0.8
NOx Zero Drift (%).....	0.0	0.0	0.0
NOx Span Drift (%).....	-0.2	-0.3	0.2

Test Results - Carbon Monoxide

CO Raw (ppm).....	1.2	1.1	1.2
CO Drift Corr. (ppm).....	1.2	1.1	1.2
CO (ppm@7% O2).....	1.5	1.3	1.5

Calibration Gas Values - Carbon Monoxide

CO Span (ppm).....	101.0	101.0	101.0
Zero Gas (ppm).....	0.0	0.0	0.0
Mid Gas (ppm).....	50.7	50.7	50.7
High Gas (ppm).....	101.0	101.0	101.0

Calibration Results - Carbon Monoxide

CO CE Zero (%).....	0.0	0.0	0.0
CO CE Mid (%).....	0.3	0.3	0.3
CO CE High (%).....	0.6	0.6	0.6
CO SB Zero Pre (%).....	0.0	0.0	0.0
CO SB Zero Post (%).....	0.0	0.0	0.0
CO SB Span Pre (%).....	0.0	0.0	0.0
CO SB Span Post (%).....	0.0	0.0	0.0
CO Zero Drift (%).....	0.0	0.0	0.0
CO Span Drift (%).....	0.0	0.0	0.0

Test Results - Sulfur Dioxide

SO2 Raw (ppm).....	0.0	0.0	0.0
SO2 Drift Corr. (ppm).....	0.0	0.0	0.0
SO2 (ppm@7% O2).....	0.0	0.0	0.0

Calibration Gas Values - Sulfur Dioxide

SO2 Span (ppm).....	101.0	101.0	101.0
Zero Gas (ppm).....	0.0	0.0	0.0
Mid Gas (ppm).....	50.5	50.5	50.5
High Gas (ppm).....	101.0	101.0	101.0

Calibration Results - Sulfur Dioxide

SO2 CE Zero (%).....	0.3	0.3	0.3
SO2 CE Mid (%).....	-0.5	-0.5	-0.5
SO2 CE High (%).....	0.0	0.0	0.0
SO2 SB Zero Pre (%).....	0.4	-0.2	0.1
SO2 SB Zero Post (%).....	0.1	-0.1	-0.1
SO2 SB Span Pre (%).....	-0.6	-2.5	-1.8
SO2 SB Span Post (%).....	-2.4	-2.5	-2.4
SO2 Zero Drift (%).....	-0.3	0.1	-0.2
SO2 Span Drift (%).....	-1.7	0.0	-0.6

Test Results – Oxygen

O2 Raw (%)	9.4	9.5	9.4
O2 Drift Corr. (%)	9.5	9.6	9.5

Calibration Gas Values - Oxygen

O2 Span (%)	19.9	19.9	19.9
Zero Gas (%).....	0.0	0.0	0.0
Mid Gas (%)	10.1	10.1	10.1
High Gas (%)	19.9	19.9	19.9

Calibration Results – Oxygen

O2 CE Zero (%).....	0.0	0.0	0.0
O2 CE Mid (%).....	-0.5	-0.5	-0.5
O2 CE High (%)	0.0	0.0	0.0
O2 SB Zero Pre (%).....	0.0	0.0	0.0
O2 SB Zero Post (%)	0.0	0.0	0.0
O2 SB Span Pre (%)	1.9	0.0	0.6
O2 SB Span Post (%).....	0.0	0.0	0.0
O2 Zero Drift (%)	0.0	0.0	0.0
O2 Span Drift (%).....	-1.9	0.0	-0.6

Test Results - Carbon Dioxide

CO2 Raw (%)	9.6	9.5	9.5
CO2 Drift Corr. (%).....	9.7	9.6	9.7

Calibration Gas Values - Carbon Dioxide

CO2 Span (%).....	19.7	19.7	19.7
Zero Gas (%).....	0.0	0.0	0.0
Mid Gas (%)	10.1	10.1	10.1
High Gas (%)	19.7	19.7	19.7

Calibration Results - Carbon Dioxide

CO2 CE Zero (%)	0.0	0.0	0.0
CO2 CE Mid (%)	-0.4	-0.4	-0.4
CO2 CE High (%).....	-0.8	-0.8	-0.8
CO2 SB Zero Pre (%)	1.0	1.0	0.7
CO2 SB Zero Post (%)	1.0	1.1	1.0
CO2 SB Span Pre (%).....	-1.6	0.0	-0.5
CO2 SB Span Post (%).....	0.0	0.0	0.0
CO2 Zero Drift (%)	1.0	0.1	0.4
CO2 Span Drift (%).....	1.6	0.0	0.5

Table 2.3
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 3 (EU037)
February 11, 2010

Determination of Sulfur Dioxide, Nitrogen Oxides and Carbon Monoxide (CEMS)

Client: Met Council	Plant: Metro
Date(s): February 11, 2010	EPA Method(s): 6C, 7E, 10

Run #: Run 1	Run 2	Run 3	
Date: 2/11/2010	2/11/2010	2/11/2010	
Time: 8:08 - 9:08	9:35 - 10:35	12:02 - 13:02	Average

Process Conditions

Wet Sludge Feed (tons/hr)	12.2	12.6	12.3
Sludge Solids Content (%).....	27.6	27.3	27.5
Dry Sludge Feed (tons/hr)	3.4	3.4	3.4
Natural Gas (cu ft/hr).....	2,637	0	1,758
Reactor Bed Temp (°F).....	1,426	1,445	1,432
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	5.1	4.7	5.0
Steam Production (lbs/hr)	19,002	19,862	19,289
FBR Opacity (%)	1.9	1.8	1.9

Control Equipment (Carbon Injection)

Injection Rate (lbs/hr)	7.6	7.6	7.6
Injection Temp (°F)	357	358	357

Control Equipment (Baghouse)

Pressure Drop (inH ₂ O)	5.0	5.1	5.0
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Control Equipment (Wet Scrubber)

Ring Jet ΔP (inH ₂ O).....	25	25	25
Scrub Water Inlet Temp (F)....	57	57	57
Aft Scrub Gas Temp (F)	60	61	60
Venturi Water Flow (gpm)	266	273	268
Scrubber Water (pH).....	5.3	5.5	5.4

Control Equipment (ESP)

Secondary Voltage (kVolts)....	28.1	27.8	28.0
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Test Results - Nitrogen Oxides

NO _x Raw (ppm)	12.9	31.2	18.9
NO _x Drift Corr. (ppm).....	12.8	30.2	18.5
NO _x (ppm@7%O ₂).....	15.05	36.63	22.56

Calibration Gas Values - Nitrogen Oxides

NO _x Span (ppm).....	101.6	101.6	101.6
Zero Gas (ppm).....	0.0	0.0	0.0
Mid Gas (ppm).....	50.3	50.3	50.3
High Gas (ppm)	101.6	101.6	101.6

Calibration Results - Nitrogen Oxides

NOx CE Zero (%).....	0.0	0.0	0.0
NOx CE Mid (%).....	0.2	0.2	0.2
NOx CE High (%)	0.4	0.4	0.4
NOx SB Zero Pre (%).....	0.0	0.3	0.3
NOx SB Zero Post (%)	0.3	0.5	0.8
NOx SB Span Pre (%)	-0.8	-0.2	-0.3
NOx SB Span Post (%).....	0.0	1.6	0.5
NOx Zero Drift (%)	0.3	1.0	0.5
NOx Span Drift (%).....	0.8	1.8	0.8

Test Results - Carbon Monoxide

CO Raw (ppm).....	3.0	0.2	0.1	1.1
CO Drift Corr. (ppm).....	2.9	0.2	0.1	1.1
CO (ppm@7% O2).....	3.4	0.3	0.1	1.3

Calibration Gas Values - Carbon Monoxide

CO Span (ppm)	101.0	101.0	101.0	101.0
Zero Gas (ppm).....	0.0	0.0	0.0	0.0
Mid Gas (ppm).....	50.7	50.7	50.7	50.7
High Gas (ppm)	101.0	101.0	101.0	101.0

Calibration Results - Carbon Monoxide

CO CE Zero (%)	0.0	0.0	0.0	0.0
CO CE Mid (%)	1.3	1.3	1.3	1.3
CO CE High (%).....	1.0	1.0	1.0	1.0
CO SB Zero Pre (%)	0.0	0.0	0.0	0.0
CO SB Zero Post (%)	0.0	0.0	0.0	0.0
CO SB Span Pre (%).....	-0.2	-0.4	-0.3	-0.3
CO SB Span Post (%)	-0.4	-0.3	0.0	-0.2
CO Zero Drift (%)	0.0	0.0	0.0	0.0
CO Span Drift (%).....	-0.2	0.1	0.3	0.1

Test Results - Sulfur Dioxide

SO2 Raw (ppm)	0.3	0.1	0.0	0.1
SO2 Drift Corr. (ppm)	0.0	0.0	0.0	0.0
SO2 (ppm@7%O2).....	0.0	0.0	0.0	0.0

Calibration Gas Values - Sulfur Dioxide

SO2 Span (ppm)	101.0	101.0	101.0	101.0
Zero Gas (ppm).....	0.0	0.0	0.0	0.0
Mid Gas (ppm).....	50.5	50.5	50.5	50.5
High Gas (ppm)	101.0	101.0	101.0	101.0

Calibration Results - Sulfur Dioxide

SO2 CE Zero (%).....	0.4	0.4	0.4	0.4
SO2 CE Mid (%)	-0.7	-0.7	-0.7	-0.7
SO2 CE High (%)	-1.3	-1.3	-1.3	-1.3
SO2 SB Zero Pre (%)	0.1	0.0	0.1	0.1
SO2 SB Zero Post (%).....	0.0	0.1	-0.3	-0.1
SO2 SB Span Pre (%)	-1.7	-1.9	-2.7	-2.1
SO2 SB Span Post (%)	-1.9	-2.7	-2.1	-2.2
SO2 Zero Drift (%).....	0.0	0.1	-0.4	-0.1
SO2 Span Drift (%)	-0.2	-0.8	0.6	-0.1

Test Results – Oxygen

O2 Raw (%)	8.9	10.0	9.2	9.4
O2 Drift Corr. (%)	9.0	10.2	9.4	9.5

Calibration Gas Values - Oxygen

O2 Span (%)	19.9	19.9	19.9	19.9
Zero Gas (%).....	0.0	0.0	0.0	0.0
Mid Gas (%)	10.1	10.1	10.1	10.1
High Gas (%)	19.9	19.9	19.9	19.9

Calibration Results – Oxygen

O2 CE Zero (%).....	0.0	0.0	0.0	0.0
O2 CE Mid (%).....	-0.5	-0.5	-0.5	-0.5
O2 CE High (%)	-0.4	-0.4	-0.4	-0.4
O2 SB Zero Pre (%).....	0.0	0.0	0.0	0.0
O2 SB Zero Post (%)	0.0	0.0	0.0	0.0
O2 SB Span Pre (%)	-0.4	-0.2	-0.4	-0.3
O2 SB Span Post (%).....	-0.2	-0.4	-1.0	-0.5
O2 Zero Drift (%)	0.0	0.0	0.0	0.0
O2 Span Drift (%).....	0.2	-0.2	-0.6	-0.2

Test Results - Carbon Dioxide

CO2 Raw (%)	9.7	8.9	9.7	9.4
CO2 Drift Corr. (%).....	9.8	8.9	9.7	9.5

Calibration Gas Values - Carbon Dioxide

CO2 Span (%).....	19.7	19.7	19.7	19.7
Zero Gas (%).....	0.0	0.0	0.0	0.0
Mid Gas (%)	10.1	10.1	10.1	10.1
High Gas (%)	19.7	19.7	19.7	19.7

Calibration Results - Carbon Dioxide

CO2 CE Zero (%)	0.0	0.0	0.0	0.0
CO2 CE Mid (%)	-0.4	-0.4	-0.4	-0.4
CO2 CE High (%).....	-1.6	-1.6	-1.6	-1.6
CO2 SB Zero Pre (%)	0.5	1.0	1.5	1.0
CO2 SB Zero Post (%)	1.0	1.5	2.0	1.5
CO2 SB Span Pre (%).....	0.0	0.0	0.0	0.0
CO2 SB Span Post (%).....	0.0	0.0	0.2	0.1
CO2 Zero Drift (%)	0.5	0.5	0.5	0.5
CO2 Span Drift (%).....	0.0	0.0	0.2	0.1

2.2 Dioxin/Furan Results

The results of the tests performed for the determination of dioxin/furans are reported in Tables 2.4 to 2.5. Three test runs were performed on FBR Unit 1 and 2 with each run at 240 minutes in length. FBR Unit 3 was not tested.

Table 2.4
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 1 (EU035)
February 8-9, 2010
Determination of Dioxin/Furan Emissions from Stationary Sources

Client: Met Council		Plant: Metro	
Date(s): February 8-9, 2010		EPA Method(s): 1-4, 23	
Run #:	Run 1	Run 2	Run 3
Date:.....	2/8/2010	2/8/2010	2/9/2010
Time:.....	7:50 - 11:53	12:38 - 16:46	7:30 - 11:33
			Average
Process Conditions			
Wet Sludge Feed (tons/hr)	13.6	14.0	13.2
Sludge Solids Content (%).....	27.5	28.6	27.7
Dry Sludge Feed (tons/hr)	3.7	4.0	3.7
Natural Gas (cu ft/hr).....	360	733	415
Reactor Bed Temp (°F).....	1,410	1,413	1,415
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	6.0	5.6	5.0
Steam Production (lbs/hr)	21,515	21,237	22,009
FBR Opacity (%)	0.6	0.6	0.5
Control Equipment (Carbon Injection)			
Injection Rate (lbs/hr)	4.1	3.9	4.2
Injection Temp (°F)	360	359	361
Control Equipment (Baghouse)			
Pressure Drop (inH ₂ O).....	5.4	5.5	6.0
Control Equipment (Wet Scrubber)			
Ring Jet ΔP (inH ₂ O).....	25	25	25
Scrub Water Inlet Temp (F)....	57	58	57
Aft Scrub Gas Temp (F)	61	61	61
Venturi Water Flow (gpm)	215	241	229
Scrubber Water (pH).....	6.0	6.0	6.0
Control Equipment (ESP)			
Secondary Voltage (kVolts)....	33.5	34.4	33.0
Stack Conditions			
Doc. Version	ST604-04		
Nozzle (inches)	0.197	0.197	0.197
Delta P (inH ₂ O).....	1.22	1.12	1.13
Delta H (inH ₂ O)	1.60	1.54	1.51

Stack Temp (°F).....	232	234	235	234
Oxygen (%).....	10.0	9.7	9.4	9.7
Carbon Dioxide (%).....	9.2	9.4	9.7	9.4
Vol Liquid Col (ml)	60.7	61.3	60.3	60.8
Moisture (%).....	1.83	1.87	1.87	1.86
Mol Weight, Dry.....	29.9	29.9	29.9	29.9
Mol Weight, Wet	29.7	29.7	29.7	29.7
P. Barometric (inHg).....	29.45	29.45	29.54	29.48
Stack Press (inH2O)	-0.19	-0.19	-0.18	-0.19
Stack Area (ft2).....	7.07	7.07	7.07	7.07
Stack Vel (ft/sec)	70.5	67.8	67.8	68.7
Stack Flow (wacfm).....	29,906	28,774	28,763	29,148
Stack Flow (wscfm)	22,439	21,538	21,572	21,849
Stack Flow (dscfm).....	22,028	21,134	21,168	21,444

Test Results - Dioxin/Furans

Sample Gas Vol (dscf).....	153.529	151.319	149.275	151.374
Isokinetics (%).....	97.0	99.6	98.1	98.2

Lab Results - ng/dscm

2378-TCDD	0.0092	0.0093	0.0095	0.0093
12378-PeCDD.....	0.0092	0.0093	0.0095	0.0093
123478-HxCDD.....	0.0092	0.0093	0.0095	0.0093
123678-HxCDD.....	0.0092	0.0093	0.0095	0.0093
123789-HxCDD.....	0.0092	0.0093	0.0095	0.0093
1234678-HpCDD.....	0.0092	0.0093	0.0095	0.0093
OCDD	0.0920	0.0934	0.0946	0.0933
2378-TCDF.....	0.0092	0.0093	0.0095	0.0093
12378-PeCDF	0.0092	0.0093	0.0095	0.0093
23478-PeCDF	0.0092	0.0093	0.0095	0.0093
123478-HxCDF	0.0092	0.0093	0.0095	0.0093
123678-HxCDF	0.0092	0.0093	0.0095	0.0093
234678-HxCDF	0.0092	0.0093	0.0095	0.0093
123789-HxCDF	0.0092	0.0093	0.0095	0.0093
1234678-HpCDF	0.0092	0.0093	0.0095	0.0093
1234789-HpCDF	0.0092	0.0093	0.0095	0.0093
OCDF.....	0.0920	0.0934	0.0946	0.0933
Total TCDD	0.0092	0.0093	0.0095	0.0093
Total PeCDD	0.0092	0.0093	0.0095	0.0093
Total HxCDD.....	0.0110	0.0093	0.0095	0.0099
Total HpCDD.....	0.0097	0.0093	0.0095	0.0095
Total TCDF.....	0.0092	0.0117	0.0095	0.0101
Total PeCDF	0.0092	0.0093	0.0095	0.0093
Total HxCDF	0.0110	0.0093	0.0095	0.0099
Total HpCDF	0.0092	0.0093	0.0095	0.0093
Total PCDD/PCDF.....	0.2618	0.2637	0.2650	0.2635
Total TEQ	0.0267	0.0271	0.0274	0.0271

Lab Results - lbs/hr

2378-TCDD	7.59E-07	7.39E-07	7.50E-07	7.49E-07
12378-PeCDD.....	7.59E-07	7.39E-07	7.50E-07	7.49E-07
123478-HxCDD.....	7.59E-07	7.39E-07	7.50E-07	7.49E-07
123678-HxCDD.....	7.59E-07	7.39E-07	7.50E-07	7.49E-07
123789-HxCDD.....	7.59E-07	7.39E-07	7.50E-07	7.49E-07
1234678-HpCDD.....	7.59E-07	7.39E-07	7.50E-07	7.49E-07

OCDD	7.59E-06	7.39E-06	7.50E-06	7.49E-06
2378-TCDF.....	7.59E-07	7.39E-07	7.50E-07	7.49E-07
12378-PeCDF	7.59E-07	7.39E-07	7.50E-07	7.49E-07
23478-PeCDF	7.59E-07	7.39E-07	7.50E-07	7.49E-07
123478-HxCDF	7.59E-07	7.39E-07	7.50E-07	7.49E-07
123678-HxCDF	7.59E-07	7.39E-07	7.50E-07	7.49E-07
234678-HxCDF	7.59E-07	7.39E-07	7.50E-07	7.49E-07
123789-HxCDF	7.59E-07	7.39E-07	7.50E-07	7.49E-07
1234678-HpCDF	7.59E-07	7.39E-07	7.50E-07	7.49E-07
1234789-HpCDF	7.59E-07	7.39E-07	7.50E-07	7.49E-07
OCDF.....	7.59E-06	7.39E-06	7.50E-06	7.49E-06
Total TCDD	7.59E-07	7.39E-07	7.50E-07	7.49E-07
Total PeCDD	7.59E-07	7.39E-07	7.50E-07	7.49E-07
Total HxCDD.....	9.11E-07	7.39E-07	7.50E-07	8.00E-07
Total HpCDD.....	7.97E-07	7.39E-07	7.50E-07	7.62E-07
Total TCDF.....	7.59E-07	9.24E-07	7.50E-07	8.11E-07
Total PeCDF	7.59E-07	7.39E-07	7.50E-07	7.49E-07
Total HxCDF	9.11E-07	7.39E-07	7.50E-07	8.00E-07
Total HpCDF	7.59E-07	7.39E-07	7.50E-07	7.49E-07
Total PCDD/PCDF.....	2.16E-05	2.09E-05	2.10E-05	2.12E-05
Total TEQ	2.20E-06	2.14E-06	2.18E-06	2.17E-06

Lab Results - ng/dscm @7% O2

2378-TCDD	0.0117	0.0116	0.0114	0.0116
12378-PeCDD.....	0.0117	0.0116	0.0114	0.0116
123478-HxCDD.....	0.0117	0.0116	0.0114	0.0116
123678-HxCDD.....	0.0117	0.0116	0.0114	0.0116
123789-HxCDD.....	0.0117	0.0116	0.0114	0.0116
1234678-HpCDD.....	0.0117	0.0116	0.0114	0.0116
OCDD	0.1173	0.1159	0.1144	0.1159
2378-TCDF.....	0.0117	0.0116	0.0114	0.0116
12378-PeCDF	0.0117	0.0116	0.0114	0.0116
23478-PeCDF	0.0117	0.0116	0.0114	0.0116
123478-HxCDF	0.0117	0.0116	0.0114	0.0116
123678-HxCDF	0.0117	0.0116	0.0114	0.0116
234678-HxCDF	0.0117	0.0116	0.0114	0.0116
123789-HxCDF	0.0117	0.0116	0.0114	0.0116
1234678-HpCDF	0.0117	0.0116	0.0114	0.0116
1234789-HpCDF	0.0117	0.0116	0.0114	0.0116
OCDF.....	0.1173	0.1159	0.1144	0.1159
Total TCDD	0.0117	0.0116	0.0114	0.0116
Total PeCDD	0.0117	0.0116	0.0114	0.0116
Total HxCDD.....	0.0141	0.0116	0.0114	0.0124
Total HpCDD.....	0.0123	0.0116	0.0114	0.0118
Total TCDF.....	0.0117	0.0145	0.0114	0.0126
Total PeCDF	0.0117	0.0116	0.0114	0.0116
Total HxCDF	0.0141	0.0116	0.0114	0.0124
Total HpCDF	0.0117	0.0116	0.0114	0.0116
Total PCDD/PCDF.....	0.3338	0.3273	0.3203	0.3271
Total TEQ	0.0340	0.0336	0.0332	0.0336

Table 2.5
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 2 (EU036)
February 9-10, 2010
Determination of Dioxin/Furan Emissions from Stationary Sources

Client: Met Council		Plant: Metro	
Date(s): February 9-10, 2010		EPA Method(s): 1-4, 23	
Run #:	Run 1	Run 2	Run 3
Date:.....	2/9/2010	2/10/2010	2/10/2010
Time:.....	12:25 - 16:27	7:36 - 11:38	12:25 - 16:30
			Average
Process Conditions			
Wet Sludge Feed (tons/hr)	13.1	13.2	13.0
Sludge Solids Content (%).....	26.1	27.2	25.3
Dry Sludge Feed (tons/hr)	3.4	3.6	3.3
Natural Gas (cu ft/hr).....	11	332	1135
Reactor Bed Temp (°F).....	1,411	1,411	1,414
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	4.3	4.4	4.4
Steam Production (lbs/hr)	23,773	24,110	23,851
FBR Opacity (%)	0.3	0.4	0.3
Control Equipment (Carbon Injection)			
Injection Rate (lbs/hr)	5.7	5.6	5.5
Injection Temp (°F)	348	349	348
Control Equipment (Baghouse)			
Pressure Drop (inH ₂ O).....	6.0	6.0	6.3
Control Equipment (Wet Scrubber)			
Ring Jet ΔP (inH ₂ O).....	25	25	25
Scrub Water Inlet Temp (F)....	57	57	57
Aft Scrub Gas Temp (F)	60	59	60
Venturi Water Flow (gpm)	230	203	212
Scrubber Water (pH).....	6.0	6.0	6.0
Control Equipment (ESP)			
Secondary Voltage (kVolts)....	33.7	36.8	35.8
Stack Conditions			
Doc. Version	ST604-04		
Nozzle (inches)	0.197	0.197	0.197
Delta P (inH ₂ O).....	1.13	1.18	1.12
Delta H (inH ₂ O)	1.48	1.57	1.51
Stack Temp (°F).....	230	230	230
Oxygen (%).....	9.6	9.5	9.8
Carbon Dioxide (%).....	9.7	9.5	9.3
Vol Liquid Col (ml)	62.4	59.1	62.6
Moisture (%)	1.93	1.79	1.94
Mol Weight, Dry	29.9	29.9	29.9
Mol Weight, Wet	29.7	29.7	29.6

P. Barometric (inHg).....	29.54	29.54	29.54	29.54
Stack Press (inH2O)	-0.29	-0.19	-0.19	-0.22
Stack Area (ft2).....	7.07	7.07	7.07	7.07
Stack Vel (ft/sec)	67.7	69.1	67.4	68.1
Stack Flow (wacfm).....	28,718	29,314	28,567	28,866
Stack Flow (wscfm).....	21,682	22,150	21,572	21,801
Stack Flow (dscfm).....	21,264	21,754	21,153	21,390

Test Results - Dioxin/Furans

Sample Gas Vol (dscf).....	149.533	153.029	149.191	150.584
Isokinetics (%).....	97.8	97.9	98.1	98.0

Lab Results - ng/dscm

2378-TCDD	0.01	0.01	0.01	0.01
12378-PeCDD.....	0.01	0.01	0.01	0.01
123478-HxCDD.....	0.01	0.01	0.01	0.01
123678-HxCDD.....	0.01	0.01	0.01	0.01
123789-HxCDD.....	0.01	0.01	0.01	0.01
1234678-HpCDD.....	0.01	0.01	0.01	0.01
OCDD	0.09	0.09	0.09	0.09
2378-TCDF.....	0.01	0.01	0.01	0.01
12378-PeCDF	0.01	0.01	0.01	0.01
23478-PeCDF	0.01	0.01	0.01	0.01
123478-HxCDF	0.01	0.01	0.01	0.01
123678-HxCDF	0.01	0.01	0.01	0.01
234678-HxCDF	0.01	0.01	0.01	0.01
123789-HxCDF	0.01	0.01	0.01	0.01
1234678-HpCDF	0.01	0.01	0.01	0.01
1234789-HpCDF	0.01	0.01	0.01	0.01
OCDF.....	0.09	0.09	0.09	0.09
Total TCDD	0.01	0.01	0.01	0.01
Total PeCDD	0.01	0.01	0.01	0.01
Total HxCDD.....	0.01	0.01	0.01	0.01
Total HpCDD.....	0.01	0.01	0.01	0.01
Total TCDF.....	0.01	0.01	0.01	0.01
Total PeCDF	0.01	0.01	0.01	0.01
Total HxCDF	0.01	0.01	0.01	0.01
Total HpCDF	0.01	0.01	0.01	0.01
Total PCDD/PCDF.....	0.26	0.26	0.27	0.26
Total TEQ	0.03	0.03	0.03	0.03

Lab Results - lbs/hr

2378-TCDD	7.52E-07	7.52E-07	7.50E-07	7.52E-07
12378-PeCDD.....	7.52E-07	7.52E-07	7.50E-07	7.52E-07
123478-HxCDD.....	7.52E-07	7.52E-07	7.50E-07	7.52E-07
123678-HxCDD.....	7.52E-07	7.52E-07	7.50E-07	7.52E-07
123789-HxCDD.....	7.52E-07	7.52E-07	7.50E-07	7.52E-07
1234678-HpCDD.....	7.52E-07	7.52E-07	7.50E-07	7.52E-07
OCDD	7.52E-06	7.52E-06	7.50E-06	7.52E-06
2378-TCDF.....	7.52E-07	7.52E-07	7.50E-07	7.52E-07
12378-PeCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07
23478-PeCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07
123478-HxCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07
123678-HxCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07
234678-HxCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07

123789-HxCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07
1234678-HpCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07
1234789-HpCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07
OCDF.....	7.52E-06	7.52E-06	7.50E-06	7.52E-06
Total TCDD	7.52E-07	7.52E-07	7.50E-07	7.52E-07
Total PeCDD	7.52E-07	7.52E-07	7.50E-07	7.52E-07
Total HxCDD.....	7.52E-07	7.52E-07	7.50E-07	7.52E-07
Total HpCDD.....	7.52E-07	7.52E-07	7.50E-07	7.52E-07
Total TCDF.....	7.52E-07	7.52E-07	7.50E-07	7.52E-07
Total PeCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07
Total HxCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07
Total HpCDF	7.52E-07	7.52E-07	7.50E-07	7.52E-07
Total PCDD/PCDF.....	2.11E-05	2.11E-05	2.10E-05	2.10E-05
Total TEQ	2.18E-06	2.18E-06	2.18E-06	2.18E-06

Lab Results - ng/dscm @7% O2

2378-TCDD	0.01	0.01	0.01	0.01
12378-PeCDD.....	0.01	0.01	0.01	0.01
123478-HxCDD.....	0.01	0.01	0.01	0.01
123678-HxCDD.....	0.01	0.01	0.01	0.01
123789-HxCDD.....	0.01	0.01	0.01	0.01
1234678-HpCDD.....	0.01	0.01	0.01	0.01
OCDD	0.11	0.12	0.12	0.12
2378-TCDF.....	0.01	0.01	0.01	0.01
12378-PeCDF	0.01	0.01	0.01	0.01
23478-PeCDF	0.01	0.01	0.01	0.01
123478-HxCDF	0.01	0.01	0.01	0.01
123678-HxCDF	0.01	0.01	0.01	0.01
234678-HxCDF	0.01	0.01	0.01	0.01
123789-HxCDF	0.01	0.01	0.01	0.01
1234678-HpCDF	0.01	0.01	0.01	0.01
1234789-HpCDF	0.01	0.01	0.01	0.01
OCDF.....	0.11	0.12	0.12	0.12
Total TCDD	0.01	0.01	0.01	0.01
Total PeCDD	0.01	0.01	0.01	0.01
Total HxCDD.....	0.01	0.01	0.01	0.01
Total HpCDD.....	0.01	0.01	0.01	0.01
Total TCDF.....	0.01	0.01	0.01	0.01
Total PeCDF	0.01	0.01	0.01	0.01
Total HxCDF	0.01	0.01	0.01	0.01
Total HpCDF	0.01	0.01	0.01	0.01
Total PCDD/PCDF.....	0.33	0.32	0.33	0.32
Total TEQ	0.03	0.03	0.03	0.03

2.3 Polychlorinated Biphenyls (PCBs) Results

The results of the tests performed for the determination of PCBs are reported in Tables 2.6 to 2.7. Three test runs were performed on FBR Unit 1 and 2 with each run at 240 minutes in length. FBR Unit 3 was not tested.

Table 2.6
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 1 (EU035)
February 8-9, 2010
Determination of PCB Emissions from Stationary Sources

Client: Met Council		Plant: Metro	
Date(s): February 8-9, 2010		EPA Method(s): 1-4, 23	
Run #:	Run 1	Run 2	Run 3
Date:.....	2/8/2010	2/8/2010	2/9/2010
Time:.....	7:50 - 11:53	12:38 - 16:46	7:30 - 11:33
			Average
Process Conditions			
Wet Sludge Feed (tons/hr)	13.6	14.0	13.2
Sludge Solids Content (%).....	27.5	28.6	27.7
Dry Sludge Feed (tons/hr)	3.7	4.0	3.7
Natural Gas (cu ft/hr).....	360	733	415
Reactor Bed Temp (°F).....	1,410	1,413	1,415
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	6.0	5.6	5.0
Steam Production (lbs/hr)	21,515	21,237	22,009
FBR Opacity (%)	0.6	0.6	0.5
Control Equipment (Carbon Injection)			
Injection Rate (lbs/hr)	4.1	3.9	4.2
Injection Temp (°F)	360	359	361
Control Equipment (Baghouse)			
Pressure Drop (inH ₂ O).....	5.4	5.5	6.0
Control Equipment (Wet Scrubber)			
Ring Jet ΔP (inH ₂ O).....	25	25	25
Scrub Water Inlet Temp (F)....	57	58	57
Aft Scrub Gas Temp (F)	61	61	61
Venturi Water Flow (gpm)	215	241	229
Scrubber Water (pH).....	6.0	6.0	6.0
Control Equipment (ESP)			
Secondary Voltage (kVolts)....	33.5	34.4	33.0
Stack Conditions			
Nozzle (inches)	0.197	0.197	0.197
Delta P (inH ₂ O).....	1.22	1.12	1.13
Delta H (inH ₂ O)	1.60	1.54	1.51
Stack Temp (°F).....	232	234	235

Oxygen (%).....	10.0	9.7	9.4	9.7
Carbon Dioxide (%).....	9.2	9.4	9.7	9.4
Vol Liquid Col (ml)	60.7	61.3	60.3	60.8
Moisture (%).....	1.8	1.9	1.9	1.9
Mol Weight, Dry.....	29.9	29.9	29.9	29.9
Mol Weight, Wet	29.7	29.7	29.7	29.7
P. Barometric (inHg).....	29.45	29.45	29.54	29.48
Stack Press (inH2O)	-0.19	-0.19	-0.18	-0.19
Stack Area (ft2).....	7.07	7.07	7.07	7.07
Stack Vel (ft/sec)	70.5	67.8	67.8	68.7
Stack Flow (wacfm).....	29,906	28,774	28,763	29,148
Stack Flow (wscfm)	22,439	21,538	21,572	21,849
Stack Flow (dscfm).....	22,028	21,134	21,168	21,444

Test Results - Polychlorinated Biphenyls

Sample Gas Vol (dscf).....	153.529	151.319	149.275	151.374
Isokinetics (%).....	97.0	99.6	98.1	98.2

Lab Results - ng/dscm

3,4',4,5'-TetraCB (#81)	0.0460	0.0466	0.0473	0.0466
3,3',4,4'-TetraCB (#77)	0.0460	0.0466	0.0473	0.0466
2',3,4,4',5-PentaCB (#123).....	0.0460	0.0466	0.0473	0.0466
2,3',4,4',5-PentaCB (#118).....	0.0460	0.0466	0.0473	0.0466
2,3,4,4',5-PentaCB (#114)	0.0460	0.0466	0.0473	0.0466
2,3,3',4,4'-PentaCB (#105).....	0.0460	0.0466	0.0473	0.0466
3,3',4,4',5-PentaCB (#126).....	0.0460	0.0466	0.0473	0.0466
2,3',4,4',5,5'-HexaCB (#167) ..	0.0460	0.0466	0.0473	0.0466
2,3,3,4,4,5-HexaCB (156/157)	0.0919	0.0933	0.0946	0.0933
3,3',4,4',5,5'-HexaCB (#169) ..	0.0460	0.0466	0.0473	0.0466
2,3,3',4,4',5,5'-HeptaCB (189)	0.0460	0.0466	0.0473	0.0466

Lab Results - lbs/hr

3,4',4,5'-TetraCB (#81)	3.7958E-09	3.6949E-09	3.7516E-09	3.7475E-09
3,3',4,4'-TetraCB (#77)	3.7958E-09	3.6949E-09	3.7516E-09	3.7475E-09
2',3,4,4',5-PentaCB (#123).....	3.7958E-09	3.6949E-09	3.7516E-09	3.7475E-09
2,3',4,4',5-PentaCB (#118).....	3.7958E-09	3.6949E-09	3.7516E-09	3.7475E-09
2,3,4,4',5-PentaCB (#114)	3.7958E-09	3.6949E-09	3.7516E-09	3.7475E-09
2,3,3',4,4'-PentaCB (#105).....	3.7958E-09	3.6949E-09	3.7516E-09	3.7475E-09
3,3',4,4',5-PentaCB (#126).....	3.7958E-09	3.6949E-09	3.7516E-09	3.7475E-09
2,3',4,4',5,5'-HexaCB (#167) ..	3.7958E-09	3.6949E-09	3.7516E-09	3.7475E-09
2,3,3,4,4,5-HexaCB (156/157)	7.5916E-09	7.3899E-09	7.5033E-09	7.4949E-09
3,3',4,4',5,5'-HexaCB (#169) ..	3.7958E-09	3.6949E-09	3.7516E-09	3.7475E-09
2,3,3',4,4',5,5'-HeptaCB (189)	3.7958E-09	3.6949E-09	3.7516E-09	3.7475E-09

Lab Results - ng/dscm @7% O2

3,4',4,5'-TetraCB (#81)	0.0586	0.0579	0.0571	0.0579
3,3',4,4'-TetraCB (#77)	0.0586	0.0579	0.0571	0.0579
2',3,4,4',5-PentaCB (#123).....	0.0586	0.0579	0.0571	0.0579
2,3',4,4',5-PentaCB (#118).....	0.0586	0.0579	0.0571	0.0579
2,3,4,4',5-PentaCB (#114)	0.0586	0.0579	0.0571	0.0579
2,3,3',4,4'-PentaCB (#105).....	0.0586	0.0579	0.0571	0.0579
3,3',4,4',5-PentaCB (#126).....	0.0586	0.0579	0.0571	0.0579
2,3',4,4',5,5'-HexaCB (#167) ..	0.0586	0.0579	0.0571	0.0579
2,3,3,4,4,5-HexaCB (156/157)	0.1172	0.1158	0.1143	0.1158
3,3',4,4',5,5'-HexaCB (#169) ..	0.0586	0.0579	0.0571	0.0579

2,3,3',4,4',5,5'-HeptaCB (189) 0.0586	0.0579	0.0571	0.0579
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Table 2.7
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 2 (EU036)
February 9-10, 2010
Determination of PCB Emissions from Stationary Sources

Client: Met Council		Plant: Metro	
Date(s): February 9-10, 2010		EPA Method(s): 1-4, 23	
Run #:	Run 1	Run 2	Run 3
Date:.....	2/9/2010	2/10/2010	2/10/2010
Time:.....	12:25 - 16:27	7:36 - 11:38	12:25 - 16:30
			Average
Process Conditions			
Wet Sludge Feed (tons/hr)	13.1	13.2	13.0
Sludge Solids Content (%).....	26.1	27.2	25.3
Dry Sludge Feed (tons/hr)	3.4	3.6	3.3
Natural Gas (cu ft/hr).....	11	332	1135
Reactor Bed Temp (°F).....	1,411	1,411	1,414
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	4.3	4.4	4.4
Steam Production (lbs/hr)	23,773	24,110	23,851
FBR Opacity (%)	0.3	0.4	0.3
Control Equipment (Carbon Injection)			
Injection Rate (lbs/hr)	5.7	5.6	5.5
Injection Temp (°F)	348	349	348
Control Equipment (Baghouse)			
Pressure Drop (inH ₂ O)	6.0	6.0	6.3
Control Equipment (Wet Scrubber)			
Ring Jet ΔP (inH ₂ O)	25	25	25
Scrub Water Inlet Temp (F)....	57	57	57
Aft Scrub Gas Temp (F)	60	59	60
Venturi Water Flow (gpm)	230	203	212
Scrubber Water (pH).....	6.0	6.0	6.0
Control Equipment (ESP)			
Secondary Voltage (kVolts)....	33.7	36.8	35.8
Stack Conditions			
Nozzle (inches)	0.197	0.197	0.197
Delta P (inH ₂ O).....	1.13	1.18	1.12
Delta H (inH ₂ O)	1.48	1.57	1.51
Stack Temp (°F).....	230	230	230
Oxygen (%).....	9.6	9.5	9.8
Carbon Dioxide (%).....	9.7	9.5	9.3
Vol Liquid Col (ml)	62.4	59.1	62.6
Moisture (%).....	1.9	1.8	1.9
Mol Weight, Dry.....	29.9	29.9	29.9

Mol Weight, Wet	29.7	29.6	29.7
P. Barometric (inHg).....	29.54	29.54	29.54
Stack Press (inH2O)	-0.29	-0.19	-0.22
Stack Area (ft2).....	7.07	7.07	7.07
Stack Vel (ft/sec)	67.7	67.4	68.1
Stack Flow (wacfm).....	28,718	28,567	28,866
Stack Flow (wscfm)	21,682	21,572	21,801
Stack Flow (dscfm).....	21,264	21,153	21,390

Test Results - Polychlorinated Biphenyls

Sample Gas Vol (dscf)	149.533	149.191	150.584
Isokinetics (%)	97.8	98.1	98.0

Lab Results - ng/dscm

3,4',4,5'-TetraCB (#81)	0.0472	0.0473	0.0469
3,3',4,4'-TetraCB (#77)	0.0472	0.0473	0.0469
2',3,4,4',5-PentaCB (#123).....	0.0472	0.0473	0.0469
2,3',4,4',5-PentaCB (#118).....	0.0472	0.0473	0.0469
2,3,4,4',5-PentaCB (#114)	0.0472	0.0473	0.0469
2,3,3',4,4'-PentaCB (#105).....	0.0472	0.0473	0.0469
3,3',4,4',5-PentaCB (#126).....	0.0472	0.0473	0.0469
2,3',4,4',5,5'-HexaCB (#167) ..	0.0472	0.0473	0.0469
2,3,3,4,4,5-HexaCB (156/157)	0.0944	0.0946	0.0937
3,3',4,4',5,5'-HexaCB (#169) ..	0.0472	0.0473	0.0469
2,3,3',4,4',5,5'-HeptaCB (189)	0.0472	0.0473	0.0469

Lab Results - lbs/hr

3,4',4,5'-TetraCB (#81)	3.7620E-09	3.7511E-09	3.7580E-09
3,3',4,4'-TetraCB (#77)	3.7620E-09	3.7511E-09	3.7580E-09
2',3,4,4',5-PentaCB (#123).....	3.7620E-09	3.7511E-09	3.7580E-09
2,3',4,4',5-PentaCB (#118).....	3.7620E-09	3.7511E-09	3.7580E-09
2,3,4,4',5-PentaCB (#114)	3.7620E-09	3.7511E-09	3.7580E-09
2,3,3',4,4'-PentaCB (#105).....	3.7620E-09	3.7511E-09	3.7580E-09
3,3',4,4',5-PentaCB (#126).....	3.7620E-09	3.7511E-09	3.7580E-09
2,3',4,4',5,5'-HexaCB (#167) ..	3.7620E-09	3.7511E-09	3.7580E-09
2,3,3,4,4,5-HexaCB (156/157)	7.5241E-09	7.5021E-09	7.5159E-09
3,3',4,4',5,5'-HexaCB (#169) ..	3.7620E-09	3.7511E-09	3.7580E-09
2,3,3',4,4',5,5'-HeptaCB (189)	3.7620E-09	3.7511E-09	3.7580E-09

Lab Results - ng/dscm @7% O2

3,4',4,5'-TetraCB (#81)	0.0581	0.0592	0.0578
3,3',4,4'-TetraCB (#77)	0.0581	0.0592	0.0578
2',3,4,4',5-PentaCB (#123).....	0.0581	0.0592	0.0578
2,3',4,4',5-PentaCB (#118).....	0.0581	0.0592	0.0578
2,3,4,4',5-PentaCB (#114)	0.0581	0.0592	0.0578
2,3,3',4,4'-PentaCB (#105).....	0.0581	0.0592	0.0578
3,3',4,4',5-PentaCB (#126).....	0.0581	0.0592	0.0578
2,3',4,4',5,5'-HexaCB (#167) ..	0.0581	0.0592	0.0578
2,3,3,4,4,5-HexaCB (156/157)	0.1161	0.1185	0.1157
3,3',4,4',5,5'-HexaCB (#169) ..	0.0581	0.0592	0.0578
2,3,3',4,4',5,5'-HeptaCB (189)	0.0581	0.0592	0.0578

2.4 Polycyclic Aromatic Hydrocarbon (PAH) Results

The results of the tests performed for the determination of PAH are reported in Tables 2.8 to 2.9. Three test runs were performed on FBR Unit 1 and 2 with each run at 240 minutes in length. FBR Unit 3 was not tested.

Table 2.8
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 1 (EU035)
February 8-9, 2010
Determination of PAH Emissions from Stationary Sources

Client: Met Council		Plant: Metro	
Date(s): February 8-9, 2010		EPA Method(s): 1-4, 23	
Run #:	Run 1	Run 2	Run 3
Date:.....	2/8/2010	2/8/2010	2/9/2010
Time:.....	7:50 - 11:53	12:38 - 16:46	7:30 - 11:33
			Average
Process Conditions			
Wet Sludge Feed (tons/hr)	13.6	14.0	13.2
Sludge Solids Content (%).....	27.5	28.6	27.7
Dry Sludge Feed (tons/hr)	3.7	4.0	3.7
Natural Gas (cu ft/hr).....	360	733	415
Reactor Bed Temp (°F).....	1,410	1,413	1,415
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	6.0	5.6	5.0
Steam Production (lbs/hr)	21,515	21,237	22,009
FBR Opacity (%)	0.6	0.6	0.5
Control Equipment (Carbon Injection)			
Injection Rate (lbs/hr)	4.1	3.9	4.2
Injection Temp (°F)	360	359	361
Control Equipment (Baghouse)			
Pressure Drop (inH ₂ O).....	5.4	5.5	6.0
Control Equipment (Wet Scrubber)			
Ring Jet ΔP (inH ₂ O).....	25	25	25
Scrub Water Inlet Temp (F)....	57	58	57
Aft Scrub Gas Temp (F)	61	61	61
Venturi Water Flow (gpm)	215	241	229
Scrubber Water (pH).....	6.0	6.0	6.0
Control Equipment (ESP)			
Secondary Voltage (kVolts)....	33.5	34.4	33.0
Stack Conditions			
Nozzle (inches)	0.197	0.197	0.197
Delta P (inH ₂ O).....	1.22	1.12	1.13
Delta H (inH ₂ O)	1.60	1.54	1.51
Stack Temp (°F).....	232	234	235

Oxygen (%).....	10.0	9.7	9.4	9.7
Carbon Dioxide (%).....	9.2	9.4	9.7	9.4
Vol Liquid Col (ml)	60.7	61.3	60.3	60.8
Moisture (%).....	1.8	1.9	1.9	1.9
Mol Weight, Dry.....	29.9	29.9	29.9	29.9
Mol Weight, Wet	29.7	29.7	29.7	29.7
P. Barometric (inHg).....	29.45	29.45	29.54	29.48
Stack Press (inH2O)	-0.19	-0.19	-0.18	-0.19
Stack Area (ft2).....	7.07	7.07	7.07	7.07
Stack Vel (ft/sec)	70.5	67.8	67.8	68.7
Stack Flow (wacfm).....	29,906	28,774	28,763	29,148
Stack Flow (wscfm)	22,439	21,538	21,572	21,849
Stack Flow (dscfm).....	22,028	21,134	21,168	21,444

Test Results - Polyaromatic Hydrocarbons

Sample Gas Vol (dscf).....	153.529	151.319	149.275	151.374
Isokinetics (%).....	97.0	99.6	98.1	98.2

Lab Results - ug/dscm

Naphthalene	0.1241	0.1213	0.1352	0.1269
2-Methylnaphthalene	0.0274	0.0275	0.0187	0.0245
2-Chloronaphthalene.....	0.0001	0.0000	0.0000	0.0000
Acenaphthylene	0.0025	0.0052	0.0014	0.0030
Acenaphthene	0.0016	0.0017	0.0013	0.0015
Fluorene	0.0043	0.0078	0.0018	0.0046
Phenanthrene.....	0.0283	0.0338	0.0140	0.0254
Anthracene	0.0025	0.0028	0.0016	0.0023
Fluoranthene	0.0179	0.0220	0.0072	0.0157
Pyrene	0.0095	0.0126	0.0058	0.0093
Benzo(a)anthracene	0.0012	0.0017	0.0006	0.0012
Chrysene	0.0052	0.0079	0.0030	0.0054
Benzo(b)fluoranthene	0.0014	0.0016	0.0005	0.0012
Benzo(k)fluoranthene	0.0002	0.0003	0.0008	0.0004
Benzo(e)pyrene.....	0.0024	0.0037	0.0030	0.0030
Benzo(a)pyrene.....	0.0005	0.0007	0.0008	0.0007
Perylene	0.0001	0.0001	0.0001	0.0001
Indeno (1,2,3 -cd) pyrene.....	0.0001	0.0001	0.0001	0.0001
Dibenz(a,h)anthracene	0.0001	0.0001	0.0001	0.0001
Benzo(g,h,i)perylene.....	0.0034	0.0053	0.0057	0.0048

Lab Results - lbs/hr

Naphthalene	1.025E-05	9.607E-06	1.073E-05	1.020E-05
2-Methylnaphthalene	2.258E-06	2.180E-06	1.486E-06	1.975E-06
2-Chloronaphthalene.....	5.314E-09	3.695E-09	2.814E-09	3.941E-09
Acenaphthylene	2.088E-07	4.101E-07	1.103E-07	2.431E-07
Acenaphthene	1.321E-07	1.323E-07	1.058E-07	1.234E-07
Fluorene	3.511E-07	6.189E-07	1.396E-07	3.699E-07
Phenanthrene.....	2.334E-06	2.679E-06	1.110E-06	2.041E-06
Anthracene	2.050E-07	2.235E-07	1.261E-07	1.849E-07
Fluoranthene	1.480E-06	1.744E-06	5.740E-07	1.266E-06
Pyrene	7.819E-07	9.976E-07	4.577E-07	7.458E-07
Benzo(a)anthracene	1.002E-07	1.330E-07	4.783E-08	9.369E-08
Chrysene	4.327E-07	6.226E-07	2.364E-07	4.306E-07
Benzo(b)fluoranthene	1.192E-07	1.293E-07	4.127E-08	9.659E-08
Benzo(k)fluoranthene	1.594E-08	2.291E-08	6.659E-08	3.515E-08

Benzo(e)pyrene.....	1.993E-07	2.937E-07	2.382E-07	2.438E-07
Benzo(a)pyrene.....	4.403E-08	5.672E-08	6.659E-08	5.578E-08
Perylene	4.935E-09	4.803E-09	4.877E-09	4.872E-09
Indeno (1,2,3 -cd) pyrene.....	5.694E-09	5.542E-09	5.627E-09	5.621E-09
Dibenz(a,h)anthracene	8.730E-09	8.498E-09	8.629E-09	8.619E-09
Benzo(g,h,i)perylene.....	2.847E-07	4.194E-07	4.539E-07	3.860E-07

Lab Results - ug/dscm @7% O2

Naphthalene	0.1583	0.1505	0.1634	0.1574
2-Methylnaphthalene	0.0349	0.0342	0.0226	0.0306
2-Chloronaphthalene.....	0.0001	0.0001	0.0000	0.0001
Acenaphthylene	0.0032	0.0064	0.0017	0.0038
Acenaphthene	0.0020	0.0021	0.0016	0.0019
Fluorene	0.0054	0.0097	0.0021	0.0057
Phenanthrene.....	0.0361	0.0420	0.0169	0.0316
Anthracene	0.0032	0.0035	0.0019	0.0029
Fluoranthene	0.0229	0.0273	0.0087	0.0196
Pyrene	0.0121	0.0156	0.0070	0.0116
Benzo(a)anthracene	0.0015	0.0021	0.0007	0.0015
Chrysene	0.0067	0.0098	0.0036	0.0067
Benzo(b)fluoranthene	0.0018	0.0020	0.0006	0.0015
Benzo(k)fluoranthene	0.0002	0.0004	0.0010	0.0005
Benzo(e)pyrene.....	0.0031	0.0046	0.0036	0.0038
Benzo(a)pyrene.....	0.0007	0.0009	0.0010	0.0009
Perylene	0.0001	0.0001	0.0001	0.0001
Indeno (1,2,3 -cd) pyrene.....	0.0001	0.0001	0.0001	0.0001
Dibenz(a,h)anthracene	0.0001	0.0001	0.0001	0.0001
Benzo(g,h,i)perylene.....	0.0044	0.0066	0.0069	0.0060

Table 2.9
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 2 (EU036)
February 9-10, 2010
Determination of PAH Emissions from Stationary Sources

Client: Met Council

Date(s): February 9-10, 2010

Plant: Metro

EPA Method(s): 1-4, 23

Run #:	Run 1	Run 2	Run 3	
Date:.....	2/9/2010	2/10/2010	2/10/2010	
Time:.....	12:25 - 16:27	7:36 - 11:38	12:25 - 16:30	Average

Process Conditions

Wet Sludge Feed (tons/hr)	13.1	13.2	13.0	13.1
Sludge Solids Content (%).....	26.1	27.2	25.3	26.2
Dry Sludge Feed (tons/hr)	3.4	3.6	3.3	3.4
Natural Gas (cu ft/hr).....	11	332	1135	493
Reactor Bed Temp (°F).....	1,411	1,411	1,414	1,412
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	4.3	4.4	4.4	4.4
Steam Production (lbs/hr)	23,773	24,110	23,851	23,911
FBR Opacity (%)	0.3	0.4	0.3	0.3

Control Equipment (Carbon Injection)

Injection Rate (lbs/hr)	5.7	5.6	5.5	5.6
Injection Temp (°F)	348	349	348	348

Control Equipment (Baghouse)

Pressure Drop (inH2O)	6.0	6.0	6.3	6.1
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Control Equipment (Wet Scrubber)

Ring Jet ΔP (inH2O)	25	25	25	25
Scrub Water Inlet Temp (F)	57	57	57	57
Aft Scrub Gas Temp (F)	60	59	60	60
Venturi Water Flow (gpm)	230	203	212	215
Scrubber Water (pH)	6.0	6.0	6.0	6.0

Control Equipment (ESP)

Secondary Voltage (kVolts)	33.7	36.8	35.8	35.4
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Stack Conditions

Nozzle (inches)	0.197	0.197	0.197	0.197
Delta P (inH2O)	1.13	1.18	1.12	1.14
Delta H (inH2O)	1.48	1.57	1.51	1.52
Stack Temp (°F)	230	230	230	230
Oxygen (%)	9.6	9.5	9.8	9.6
Carbon Dioxide (%)	9.7	9.5	9.3	9.5
Vol Liquid Col (ml)	62.4	59.1	62.6	61.4
Moisture (%)	1.9	1.8	1.9	1.9
Mol Weight, Dry	29.9	29.9	29.9	29.9
Mol Weight, Wet	29.7	29.7	29.6	29.7
P. Barometric (inHg)	29.54	29.54	29.54	29.54
Stack Press (inH2O)	-0.29	-0.19	-0.19	-0.22
Stack Area (ft2)	7.07	7.07	7.07	7.07
Stack Vel (ft/sec)	67.7	69.1	67.4	68.1
Stack Flow (wacfm)	28,718	29,314	28,567	28,866
Stack Flow (wscfm)	21,682	22,150	21,572	21,801
Stack Flow (dscfm)	21,264	21,754	21,153	21,390

Test Results - Polyaromatic Hydrocarbons

Sample Gas Vol (dscf)	149.533	153.029	149.191	150.584
Isokinetics (%)	97.8	97.9	98.1	98.0

Lab Results - ug/dscm

Naphthalene	0.1284	0.1310	0.1296	0.1297
2-Methylnaphthalene	0.0222	0.0210	0.0182	0.0205
2-Chloronaphthalene	0.0001	0.0001	0.0001	0.0001
Acenaphthylene	0.0017	0.0014	0.0012	0.0014
Acenaphthene	0.0017	0.0017	0.0011	0.0015
Fluorene	0.0025	0.0016	0.0019	0.0020
Phenanthrene	0.0141	0.0136	0.0113	0.0130
Anthracene	0.0008	0.0007	0.0009	0.0008
Fluoranthene	0.0098	0.0070	0.0072	0.0080
Pyrene	0.0083	0.0055	0.0065	0.0068
Benzo(a)anthracene	0.0012	0.0006	0.0011	0.0010
Chrysene	0.0056	0.0027	0.0047	0.0043
Benzo(b)fluoranthene	0.0010	0.0005	0.0008	0.0008
Benzo(k)fluoranthene	0.0005	0.0004	0.0005	0.0005

Benzo(e)pyrene.....	0.0023	0.0017	0.0021	0.0020
Benzo(a)pyrene.....	0.0006	0.0001	0.0001	0.0003
Perylene	0.0001	0.0001	0.0001	0.0001
Indeno (1,2,3 -cd) pyrene.....	0.0001	0.0001	0.0001	0.0001
Dibenz(a,h)anthracene	0.0001	0.0001	0.0001	0.0001
Benzo(g,h,i)perylene.....	0.0056	0.0034	0.0056	0.0048

Lab Results - lbs/hr

Naphthalene	1.023E-05	1.068E-05	1.028E-05	1.040E-05
2-Methylnaphthalene	1.768E-06	1.715E-06	1.440E-06	1.641E-06
2-Chloronaphthalene.....	7.148E-09	4.325E-09	4.501E-09	5.325E-09
Acenaphthylene	1.339E-07	1.113E-07	9.753E-08	1.143E-07
Acenaphthene	1.384E-07	1.354E-07	8.928E-08	1.210E-07
Fluorene	2.013E-07	1.279E-07	1.508E-07	1.600E-07
Phenanthrene.....	1.121E-06	1.106E-06	8.928E-07	1.040E-06
Anthracene	6.207E-08	5.303E-08	6.883E-08	6.131E-08
Fluoranthene	7.825E-07	5.735E-07	5.739E-07	6.433E-07
Pyrene	6.602E-07	4.513E-07	5.158E-07	5.424E-07
Benzo(a)anthracene	9.480E-08	5.134E-08	9.003E-08	7.872E-08
Chrysene	4.458E-07	2.181E-07	3.695E-07	3.445E-07
Benzo(b)fluoranthene	7.750E-08	3.704E-08	6.733E-08	6.062E-08
Benzo(k)fluoranthene	4.082E-08	3.667E-08	3.751E-08	3.833E-08
Benzo(e)pyrene.....	1.798E-07	1.384E-07	1.688E-07	1.623E-07
Benzo(a)pyrene.....	4.909E-08	5.829E-09	5.814E-09	2.025E-08
Perylene	4.891E-09	4.889E-09	4.876E-09	4.885E-09
Indeno (1,2,3 -cd) pyrene.....	5.643E-09	5.641E-09	5.627E-09	5.637E-09
Dibenz(a,h)anthracene	8.653E-09	8.650E-09	8.627E-09	8.643E-09
Benzo(g,h,i)perylene.....	4.477E-07	2.745E-07	4.407E-07	3.877E-07

Lab Results - ug/dscm @7% O2

Naphthalene	0.1579	0.1597	0.1623	0.1600
2-Methylnaphthalene	0.0273	0.0256	0.0227	0.0252
2-Chloronaphthalene.....	0.0001	0.0001	0.0001	0.0001
Acenaphthylene	0.0021	0.0017	0.0015	0.0018
Acenaphthene	0.0021	0.0020	0.0014	0.0019
Fluorene	0.0031	0.0019	0.0024	0.0025
Phenanthrene.....	0.0173	0.0165	0.0141	0.0160
Anthracene	0.0010	0.0008	0.0011	0.0009
Fluoranthene	0.0121	0.0086	0.0091	0.0099
Pyrene	0.0102	0.0067	0.0081	0.0084
Benzo(a)anthracene	0.0015	0.0008	0.0014	0.0012
Chrysene	0.0069	0.0033	0.0058	0.0053
Benzo(b)fluoranthene	0.0012	0.0006	0.0011	0.0009
Benzo(k)fluoranthene	0.0006	0.0005	0.0006	0.0006
Benzo(e)pyrene.....	0.0028	0.0021	0.0027	0.0025
Benzo(a)pyrene.....	0.0008	0.0001	0.0001	0.0003
Perylene	0.0001	0.0001	0.0001	0.0001
Indeno (1,2,3 -cd) pyrene.....	0.0001	0.0001	0.0001	0.0001
Dibenz(a,h)anthracene	0.0001	0.0001	0.0001	0.0001
Benzo(g,h,i)perylene.....	0.0069	0.0041	0.0070	0.0060

2.5 Particulate Matter Results

Other Test Method 027 (OTM-027) and Other Test Method 028 (OTM-028) were conducted for the determination of particulate matter less than 2.5 microns. The cyclone was recovered to and added to the PM2.5 catch for the determination of total particulate matter. All front half and back half fractions were reported in this section. Table 2.10 to 2.12 reports the results from Unit 1 (EU035), Unit 2 (EU036) and Unit 3 (EU037).

Table 2.10
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 1 (EU035)
February 8-9, 2010
Determination of Particulate Matter Less Than 2.5 Microns

Client: Met Council		Plant: Metro	
Date(s): February 8-9, 2010		EPA Method(s): 1-4, OTM-027/028	
Run #:	Run 1	Run 2	Run 3
Date:.....	2/8/2010	2/8/2010	2/9/2010
Time:.....	7:50 - 11:56	12:38 - 16:46	7:30 - 11:32
			Average
Process Conditions			
Wet Sludge Feed (tons/hr)	13.6	14.0	13.2
Sludge Solids Content (%).....	27.5	28.6	27.7
Dry Sludge Feed (tons/hr)	3.7	4.0	3.7
Natural Gas (cu ft/hr).....	360	733	415
Reactor Bed Temp (°F).....	1,410	1,413	1,415
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	6.0	5.6	5.0
Steam Production (lbs/hr)	21,515	21,237	22,009
FBR Opacity (%)	0.6	0.6	0.5
Control Equipment (Carbon Injection)			
Injection Rate (lbs/hr)	4.1	3.9	4.2
Injection Temp (°F)	360	359	361
Control Equipment (Baghouse)			
Pressure Drop (inH ₂ O)	5.4	5.5	6.0
Control Equipment (Wet Scrubber)			
Ring Jet ΔP (inH ₂ O).....	25	25	25
Scrub Water Inlet Temp (F)....	57	58	57
Aft Scrub Gas Temp (F)	61	61	61
Venturi Water Flow (gpm)	215	241	229
Scrubber Water (pH).....	6.0	6.0	6.0
Control Equipment (ESP)			
Secondary Voltage (kVolts)....	33.5	34.4	33.0
Stack Conditions			
Nozzle (inches)	0.153	0.154	0.153

Stack Temp (°F).....	232	231	233	232
Oxygen (%).....	10.0	9.7	9.4	9.7
Carbon Dioxide (%).....	9.2	9.4	9.7	9.4
Moisture (%).....	2.0	2.1	2.1	2.1
Mol Weight, Dry.....	29.9	29.9	29.9	29.9
Mol Weight, Wet.....	29.6	29.6	29.7	29.7
Viscosity of Gas.....	215.9	215.5	215.8	215.7
Stack Press (inH2O)	-0.19	-0.19	-0.18	-0.19
Stack Area (ft2).....	7.07	7.07	7.07	7.07
Stack Vel (ft/sec)	68.1	68.3	66.2	67.5
Stack Flow (wacfm).....	28,894	28,967	28,068	28,643
Stack Flow (wscfm)	21,706	21,763	21,104	21,524
Stack Flow (dscfm).....	21,269	21,297	20,668	21,078

Test Results - PM2.5

Sample Gas Vol (dscf).....	91.355	93.865	95.195	93.472
Isokinetics (%).....	99.3	100.5	106.0	102.0
Point > Min/Max Delta P.....	0	0	0	0
D50	2.45	2.36	2.34	2.38
Acceptable Test Run.....	Yes	Yes	Yes	-

PM 2.5 Filter (mg)	0.5	0.5	0.5	0.5
PM 2.5 Rinse (mg).....	0.5	0.9	0.5	0.6
>2.5 PM Rinse (mg)	0.5	0.5	0.5	0.5
Aqueous (mg)	1.5	0.4	1.5	1.2
Organic (mg).....	1.2	0.5	0.9	0.9
PM2.5 Total (mg)	3.7	2.3	3.4	3.2
Total (mg)	4.2	2.8	3.9	3.7

PM 2.5 Filterable (lbs/hr).....	0.031	0.042	0.029	0.034
>2.5 Filterable (lbs/hr)	0.015	0.015	0.014	0.015
Aqueous (lbs/hr)	0.048	0.012	0.046	0.035
Organic (lbs/hr).....	0.037	0.015	0.026	0.026
PM2.5 Total (lbs/hr)	0.115	0.069	0.099	0.094
Total (lbs/hr)	0.131	0.084	0.115	0.110

PM 2.5 Filterable (gr/dscf).....	0.0002	0.0002	0.0002	0.0002
>2.5 Filterable (gr/dscf)	0.0001	0.0001	0.0001	0.0001
Aqueous (gr/dscf)	0.0003	0.0001	0.0003	0.0002
Organic (gr/dscf).....	0.0002	0.0001	0.0001	0.0001
PM2.5 Total (gr/dscf)	0.0006	0.0004	0.0006	0.0005
Total (gr/dscf)	0.0007	0.0005	0.0006	0.0006

PM 2.5 Filter (lb/ton dry fuel)	0.0083	0.0105	0.0078	0.0089
>2.5 Filter (lb/ton dry fuel)	0.0042	0.0038	0.0039	0.0039
Aqueous (lb/ton dry fuel).....	0.0129	0.0030	0.0124	0.0094
Organic (lb/ton dry fuel)	0.0100	0.0038	0.0070	0.0069
PM2.5 Total (lb/ton dry fuel).....	0.0312	0.0172	0.0268	0.0251
Total (lb/ton dry fuel)	0.0354	0.0210	0.0310	0.0291

Table 2.11
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 2 (EU036)
February 9-10, 2010
Determination of Particulate Matter Less Than 2.5 Microns

Client: Met Council	Plant: Metro
Date(s): February 9-10, 2010	EPA Method(s): 1-4, OTM-027/028

Run #: Run 1	Run 2	Run 3	
Date:..... 2/9/2010	2/10/2010	2/10/2010	
Time:..... 12:25 - 16:27	7:36 - 11:40	12:25 - 16:28	Average

Process Conditions

Wet Sludge Feed (tons/hr)	13.1	13.2	13.0	13.1
Sludge Solids Content (%).....	26.1	27.2	25.3	26.2
Dry Sludge Feed (tons/hr)	3.4	3.6	3.3	3.4
Natural Gas (cu ft/hr).....	11	332	1135	493
Reactor Bed Temp (°F).....	1,411	1,411	1,414	1,412
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	4.3	4.4	4.4	4.4
Steam Production (lbs/hr)	23,773	24,110	23,851	23,911
FBR Opacity (%)	0.3	0.4	0.3	0.3

Control Equipment (Carbon Injection)

Injection Rate (lbs/hr)	5.7	5.6	5.5	5.6
Injection Temp (°F)	348	349	348	348

Control Equipment (Baghouse)

Pressure Drop (inH ₂ O)	6.0	6.0	6.3	6.1
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Control Equipment (Wet Scrubber)

Ring Jet ΔP (inH ₂ O).....	25	25	25	25
Scrub Water Inlet Temp (F)....	57	57	57	57
Aft Scrub Gas Temp (F)	60	59	60	60
Venturi Water Flow (gpm)	230	203	212	215
Scrubber Water (pH).....	6.0	6.0	6.0	6.0

Control Equipment (ESP)

Secondary Voltage (kVolts)....	33.7	36.8	35.8	35.4
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Stack Conditions

Nozzle (inches)	0.154	0.153	0.154	0.154
Stack Temp (°F).....	229	226	226	227
Oxygen (%).....	9.6	9.5	9.8	9.6
Carbon Dioxide (%).....	9.7	9.5	9.3	9.5
Moisture (%).....	2.0	1.9	2.1	2.0
Mol Weight, Dry.....	29.9	29.9	29.9	29.9
Mol Weight, Wet	29.7	29.7	29.6	29.7
Viscosity of Gas.....	215.0	214.3	214.5	214.6
Stack Press (inH ₂ O)	-0.29	-0.19	-0.19	-0.22
Stack Area (ft ²).....	7.07	7.07	7.07	7.07
Stack Vel (ft/sec)	66.8	66.8	67.4	67.0

Stack Flow (wacfm).....	28,312	28,337	28,580	28,410
Stack Flow (wscfm).....	21,408	21,526	21,697	21,544
Stack Flow (dscfm).....	20,977	21,107	21,251	21,112

Test Results - PM2.5

Sample Gas Vol (dscf).....	94.356	94.088	95.442	94.629
Isokinetics (%).....	102.1	102.2	101.1	101.8
Point > Min/Max Delta P.....	0	0	0	0
D50	2.36	2.38	2.35	2.36
Acceptable Test Run.....	Yes	Yes	Yes	-

PM 2.5 Filter (mg)	0.5	0.5	0.5	0.5
PM 2.5 Rinse (mg).....	0.5	0.5	1.0	0.7
>2.5 PM Rinse (mg)	0.5	1.8	2.5	1.6
Aqueous (mg)	0.8	1.5	1.2	1.2
Organic (mg).....	0.8	0.5	1.8	1.0
PM2.5 Total (mg)	2.6	3.0	4.5	3.4
Total (mg)	3.1	4.8	7.0	5.0

PM 2.5 Filterable (lbs/hr).....	0.029	0.030	0.044	0.034
>2.5 Filterable (lbs/hr)	0.015	0.053	0.074	0.047
Aqueous (lbs/hr)	0.025	0.046	0.036	0.036
Organic (lbs/hr).....	0.024	0.015	0.053	0.030
PM2.5 Total (lbs/hr)	0.078	0.090	0.134	0.101
Total (lb/hr).....	0.093	0.144	0.207	0.148

PM 2.5 Filterable (gr/dscf).....	0.0002	0.0002	0.0002	0.0002
>2.5 Filterable (gr/dscf)	0.0001	0.0003	0.0004	0.0003
Aqueous (gr/dscf)	0.0001	0.0003	0.0002	0.0002
Organic (gr/dscf).....	0.0001	0.0001	0.0003	0.0002
PM2.5 Total (gr/dscf)	0.0004	0.0005	0.0007	0.0006
Total (gr/dscf)	0.0005	0.0008	0.0011	0.0008

PM 2.5 Filter (lb/ton dry fuel)	0.0086	0.0082	0.0134	0.0101
>2.5 Filter (lb/ton dry fuel).....	0.0043	0.0148	0.0223	0.0138
Aqueous (lb/ton dry fuel).....	0.0073	0.0128	0.0110	0.0104
Organic (lb/ton dry fuel).....	0.0069	0.0041	0.0161	0.0090
PM2.5 Total (lb/ton dry fuel).....	0.0229	0.0251	0.0406	0.0295
Total (lb/ton dry fuel)	0.0272	0.0400	0.0628	0.0433

Table 2.12
Metropolitan Council Environmental Services
Wastewater Treatment Plant
FBR Unit 3 (EU037)
February 11-12, 2010
Determination of Particulate Matter Less Than 2.5 Microns

Client: Met Council	Plant: Metro
Date(s): February 11-12, 2010	EPA Method(s): 1-4, OTM-027/028

Run #:	Run 1	Run 2	Run 3	
Date:	2/11/2010	2/11/2010	2/12/2010	
Time:	7:32 - 11:34	12:00 - 16:04	8:10 - 12:13	Average

Process Conditions

Wet Sludge Feed (tons/hr)	12.2	12.6	12.6	12.5
Sludge Solids Content (%).....	27.6	27.3	27.5	27.5
Dry Sludge Feed (tons/hr)	3.4	3.4	3.4	3.4
Natural Gas (cu ft/hr).....	2,637	0	0	879
Reactor Bed Temp (°F).....	1,426	1,445	1,452	1,441
FBR Off-Gas Temp (°F).....	1,525	1,525	1,525	1,525
Reactor Off gas O ₂ (%)	5.1	4.7	5.2	5.0
Steam Production (lbs/hr)	19,002	19,862	19,865	19,576
FBR Opacity (%)	1.9	1.8	1.7	1.8

Control Equipment (Carbon Injection)

Injection Rate (lbs/hr)	7.6	7.3	7.5
Injection Temp (°F)	357	357	357

Control Equipment (Baghouse)

Pressure Drop (inH ₂ O)	5.0	5.3	5.1
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Control Equipment (Wet Scrubber)

Ring Jet ΔP (inH ₂ O).....	25	25	25
Scrub Water Inlet Temp (F)....	57	57	57
Aft Scrub Gas Temp (F)	60	60	60
Venturi Water Flow (gpm)	266	260	266
Scrubber Water (pH).....	5.3	5.5	5.4

Control Equipment (ESP)

Secondary Voltage (kVolts)....	28.1	27.8	28.7	28.2
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Stack Conditions

Nozzle (inches)	0.153	0.154	0.154	0.154
Stack Temp (°F).....	232	232	231	231
Oxygen (%).....	9.7	9.0	9.3	9.3
Carbon Dioxide (%).....	9.1	9.9	9.6	9.5
Moisture (%).....	1.84	1.95	1.87	1.89
Mol Weight, Dry.....	29.8	29.9	29.9	29.9
Mol Weight, Wet	29.6	29.7	29.7	29.7
Viscosity of Gas.....	215.9	215.3	215.5	215.6
Stack Press (inH ₂ O)	-0.19	-0.19	-0.15	-0.18
Stack Area (ft ²).....	7.07	7.07	7.07	7.07
Stack Vel (ft/sec)	60.1	60.3	61.4	60.6

Stack Flow (wacfm).....	25,498	25,586	26,058	25,714
Stack Flow (wscfm).....	19,169	19,238	19,564	19,324
Stack Flow (dscfm).....	18,817	18,862	19,198	18,959

Test Results - PM2.5

Sample Gas Vol (dscf).....	93.554	94.309	93.418	93.760
Isokinetics (%).....	114.3	112.9	110.1	112.4
Point > Min/Max Delta P.....	0	0	0	0
D50	2.40	2.38	2.40	2.39
Acceptable Test Run.....	Yes	Yes	Yes	-

PM 2.5 Filter (mg)	0.5	0.5	0.5	0.5
PM 2.5 Rinse (mg).....	0.5	0.5	0.8	0.6
>2.5 PM Rinse (mg)	0.8	1.1	0.5	0.8
Aqueous (mg)	1.8	0.4	0.9	1.1
Organic (mg).....	0.5	1.5	1.1	1.0
PM2.5 Total (mg)	3.3	2.9	3.3	3.2
Total (mg)	4.1	4.0	3.8	4.0

PM 2.5 Filterable (lbs/hr).....	0.027	0.026	0.035	0.029
>2.5 Filterable (lbs/hr)	0.021	0.029	0.014	0.021
Aqueous (lbs/hr)	0.048	0.012	0.025	0.028
Organic (lbs/hr).....	0.013	0.040	0.030	0.028
PM2.5 Total (lbs/hr)	0.088	0.078	0.091	0.086
Total (lbs/hr)	0.109	0.107	0.104	0.107

PM 2.5 Filterable (gr/dscf).....	0.0002	0.0002	0.0002	0.0002
>2.5 Filterable (gr/dscf)2	0.0001	0.0002	0.0001	0.0001
Aqueous (gr/dscf)	0.0003	0.0001	0.0002	0.0002
Organic (gr/dscf).....	0.0001	0.0002	0.0002	0.0002
PM2.5 Total (gr/dscf)	0.0005	0.0005	0.0006	0.0005
Total (gr/dscf)	0.0007	0.0007	0.0006	0.0007

PM 2.5 Filter (lb/ton dry fuel)	0.0078	0.0078	0.0104	0.0087
>2.5 Filter (lb/ton dry fuel).....	0.0063	0.0086	0.0040	0.0063
Aqueous (lb/ton dry fuel).....	0.0141	0.0035	0.0074	0.0083
Organic (lb/ton dry fuel).....	0.0039	0.0117	0.0088	0.0081
PM2.5 Total (lb/ton dry fuel).....	0.0258	0.0229	0.0268	0.0252
Total (lb/ton dry fuel)	0.0321	0.0315	0.0306	0.0314

SECTION 3.0

TEST PROCEDURES

3.1 Determination of Sample Point Locations

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 1

Stack Dimensions (Units 1, 2, and 3 identical)

Inside Diameter:	36	inches
Area:	7.07	ft ²
Distance Upstream of Ports:	615.6	inches
Distance Downstream of Ports:	111.6	inches
Total Number of Points:	12	
Number of Points per Diameter:	6	

Sample Point Dimensions

Point 1	1.58	inches
Point 2	5.26	inches
Point 3	10.66	inches
Point 4	25.34	inches
Point 5	30.74	inches
Point 6	34.42	inches

Cyclonic Flow Test Results (Yaw Angles)

<i>FBR Unit</i>	<i>U1</i>	<i>U2</i>	<i>U3</i>
Point 1	-7	-15	-10
Point 2	-5	-9	-4
Point 3	-5	-4	-3
Point 4	+3	+4	+6
Point 5	+5	+9	+6
Point 6	+7	+19	+9
Point 7	-8	-11	-2
Point 8	+3	-10	-5
Point 9	+8	-6	-2
Point 10	+5	+4	+7
Point 11	+5	+13	+7
Point 12	+1	+16	+6
Absolute Avg	5.2	10.0	5.6

3.2 Determination of Velocity and Volumetric Flow

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2

Measurement System

A combination Stausscheibe (Type S) pitot tube and type K thermocouple were used to measure duct velocity head and temperature. The pitot tube was connected via flexible tubing to an inclined manometer. The thermocouple was connected to a digital potentiometer.

Measurement Procedure

Subsequent to sampling, traverse points were selected based on Method 1 requirements. The locations of the traverse points are presented in Section 3.1 and the reduced field data sheets. A traverse of the stack was performed to determine stack velocity head, temperature distributions, cyclonic flow, and stack static pressure.

Calculations

Method 2 - Stack Absolute Pressure

$$P_s = P_{Barometric} + \left(\frac{P_{sg}}{13.6} \right)$$

P_s = Stack absolute pressure, inHg
 P_{bar} = Barometric pressure, inHg
 P_{sg} = Stack static pressure, IWG

Method 2 - Stack Velocity

$$v_s = K_p C_p (\sqrt{\Delta P})_{avg} \sqrt{\frac{T_{s(avg)}}{P_s M_s}}$$

v_s = Stack velocity, ft/sec
 ΔP = Average velocity head, in H_2O
 C_p = Pitot tube coefficient, dimensionless
 T_s = Stack absolute temperature, °R
 P_s = Stack absolute pressure, inHg
 M_s = Molecular weight of stack gas, wet basis, lb/lb-mole
 K_p = Pitot tube constant, 85.49

Method 2 - Stack Volumetric Flow Rate (actual)

$$Q = v_s * A_s * 60$$

Q = Wet stack gas flow rate at actual conditions, WACFM
 v_s = Stack velocity, ft/sec
 A_s = Stack area, ft^2

Method 2 - Stack Volumetric Flow Rate (wet - Std)

$$Q_{ws} = Q * \frac{T_{std}}{T_s} * \frac{P_s}{P_{std}}$$

Q_{ws} = Wet stack gas flow rate at standard conditions, WSCFM
 T_{std} = Standard absolute temperature, 528 °R
 T_s = Stack absolute temperature, °R
 P_s = Stack absolute pressure, inHg
 P_{std} = Standard absolute pressure, 29.92 inHg

Method 2 - Stack Volumetric Flow Rate (dry - Std)

$$Q_{sd} = Q * (1 - B_{ws}) * \frac{T_{std}}{T_s} * \frac{P_s}{P_{std}}$$

Q_{sd} = Dry stack gas flow rate at standard conditions, DSCFM
 Q = Wet stack gas flow rate at actual conditions, WACFM
 B_{ws} = Flue gas moisture content, proportion by volume, dimensionless
 T_{std} = Standard absolute temperature, 528 °R
 T_s = Stack absolute temperature, °R
 P_s = Stack absolute pressure, inHg
 P_{std} = Standard absolute pressure, 29.92 inHg

3.3 Determination of Molecular Weight and Moisture Content

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 3 and 4

Sampling System

A stainless steel probe was connected to the impinger train, which consisted of a set of pre-weighed impingers connected in series and immersed in an ice bath. The impinger train was followed in series by a carbon vane pump, a dry test meter, and a calibrated orifice connected to an inclined manometer. A Tedlar bag was used to collect an integrated Method 3 sample.

Measurement Procedure

Prior to sampling, a leak check was performed and the leak rate, time, and vacuum was recorded on the stack test data sheet. Following the leak check, the sample probe was inserted into the stack and the pump turned on. The sample time was calculated based on a minimum sample volume of 21 cubic feet and a sample rate of 0.75 cubic feet per minute. At the conclusion of sampling, a final leak check was performed and recorded on the data sheet.

Calculations

Method 3 - Flue Gas Molecular Weight (dry)

$$M_d = (.44 \% CO_2 + .32 \% O_2 + .28 (\% N_2 + \% CO))$$

M_d = Molecular weight of flue gas (dry), lb/lb-mole

Method 3 - Flue Gas Molecular Weight (wet)

$$M_w = (.44 \% CO_2 + .32 \% O_2 + .28 (\% N_2 + \% CO)) \left(1 - \frac{\% H_2O}{100} \right) + .18 \% H_2O$$

M_w = Molecular weight of flue gas (wet), lb/lb-mole

Method 3 - Flue Gas Molecular Weight (wet)

$$M_w = M_d (1 - B_{ws}) + 18.0 B_{ws}$$

M_w = Molecular weight of flue gas (wet), lb/lb-mole

M_d = Molecular weight of flue gas (dry), lb/lb-mole

B_{ws} = Flue gas moisture content, proportion by volume, dimensionless

Method 4 - Flue Gas Moisture Content

$$B_{ws} = \frac{V_{wc (std)}}{(V_{m (std)} + V_{wc (std)})}$$

B_{ws} = Flue gas moisture content, proportion by volume, dimensionless

$V_{wc (std)}$ = Volume of water vapor at standard conditions, SCF

$V_{m (std)}$ = Dry meter volume at standard conditions, DSCF

Method 4 - Volume of Water Vapor (Std)

$$V_{wc (std)} = 0.04715 V_{lc}$$

$V_{wc (std)}$ = Volume of water vapor at standard conditions, SCF

V_{lc} = Volume of liquid collected in the impingers, mL

3.4 Determination of Gaseous Emissions

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 3A, 6C, 7E, 10

Sampling System

A sintered metal filter was connected via a "Swage-Lok" fitting to a heated stainless steel probe. The probe was attached to a heated Teflon sample line maintained a 250°F followed by a sample conditioning system to remove moisture. The dry conditioned sample was transported under pressure via a Teflon sample line to the sample manifold by a Teflon lined diaphragm pump. The sample manifold maintained the proper sample pressure to each analyzer

Calibration Procedure

Once the analyzer had a sufficient warm up period and after all adjustments to the analyzer were complete, a local calibration error check was completed. The local calibration error check consisted of introducing calibration gas directly into the analyzer. These calibrations were performed using three calibration gases: a zero gas (nitrogen); a mid range gas (40% to 60% of the analyzer range); and a high range gas (100% of the analyzer range). All upscale calibration gases were NIST Traceable to 1% (Protocol 1). The analyzer response must be within 2% of the analyzer range or the calibration procedure was repeated. This procedure is completed at the beginning and at the end of the sampling day or when adjustments to the analyzers are necessary.

Following the local calibration error procedures, the system bias check was completed. The system bias consisted of introducing an upscale and zero gas into the sample probe tip allowing the entire system to be evaluated. The upscale gas was selected base on the value that was closest to the expected concentration. The system bias check must be within 5% of the analyzer range or the entire calibration procedure was repeated and the test run thrown out. The system calibration procedure was completed before and after each test period.

The pre and post system bias was used to calculate the analyzer drift over the test period. The calibration procedure was repeated if the difference was greater than 3% of the analyzer range.

Sampling Procedure

Prior to sampling, a leak check of the sample system was conducted by plugging the probe opening. An acceptable leak check was achieved when the sample flow reached zero. Sampling began by adjusting the system pressure to 5 psi and the individual analyzer flow rates to 2 SCFH. The test results were continuously recorded on a strip chart and an ASCII text file for data manipulation.

Calculations

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

- C_{gas} = Effluent gas concentration, dry basis, ppm
 C = Average gas concentration indicated by gas analyzer, dry basis, ppm
 C_o = Average initial and final system cal. bias check response for the zero gas, ppm
 C_{ma} = Actual concentration of upscale calibration gas, ppm
 C_m = Average initial & final system cal bias check responses for upscale cal gas, ppm

$$C_b = \frac{(C_s - C_l)}{S} * 100$$

- C_b = System calibration bias check, % of span
 C_s = System analyzer calibration response, ppm
 C_l = Local analyzer calibration response, ppm
 S = Analyzer span range

$$C_e = \frac{(C_l - C_a)}{S} * 100$$

- C_e = Analyzer calibration error check, % of span
 C_l = Local analyzer calibration response, ppm
 C_a = Actual concentration of calibration gas cylinder, ppm

$$D = \frac{(C_{sf} - C_{si})}{S} * 100$$

- D = Analyzer drift, % of span
 C_{sf} = Final system analyzer calibration response, ppm
 C_{si} = Initial system analyzer calibration response, ppm
 S = Analyzer span range

$$E = \frac{C_{gas} Q_{sd} 60 MW}{10^6 V_i}$$

- E = Pounds per hour of gaseous pollutant, lb/hr
 C_{gas} = Effluent gas concentration, dry basis, ppm
 Q_{sd} = Dry stack gas flow rate at standard conditions, DSCFM
 MW = Molecular weight of pollutant, lb/lb-mole

3.5 Determination of Dioxin/Furans/PCBs/PAH

REF: Code of Federal Regulations, Title 40, Part 60, Appendix A, Methods 2-4, 23

Sampling System

A curved sample nozzle was connected via a "Swage-Lok" fitting to a heated probe liner. The probe liner was attached to a heated glass filter holder containing a pre-screened glass fiber filter. The exit to the filter holder was connected to the condenser followed by the XAD-2 resin trap. The XAD-2 resin trap was connect directly to the impinger train which consisted of a set of pre-weighed impingers connected in series and immersed in an ice bath. The impinger train was followed in series by a carbon vane pump, a dry test meter, and a calibrated orifice connected to an inclined manometer. The CEMS was used to measure the oxygen content for the 7% O₂ correction. Type K thermocouples were used to measure the following temperatures: probe heater, filter heater, impinger outlet, and dry test meter inlet and outlet.

A combination Stausscheibe (Type S) pitot tube and type K thermocouple were used to measure duct velocity head and temperature. The pitot tube was connected via flexible tubing to an inclined manometer. The thermocouple was connected to a digital potentiometer.

Sampling Procedure

Prior to sampling, traverse points were selected based on Method 1 requirements. The locations of the traverse points are presented in the reduced field data sheets. A preliminary traverse of the stack was performed to determine stack velocity head, temperature distributions, cyclonic flow, and stack static pressure. If necessary, preliminary runs by Methods 3 and 4 were performed to determine duct moisture and fixed gas content. Based on this information, a sample nozzle of appropriate inside diameter was selected, and the impinger train charged. Sample time per traverse point was estimated in order to collect the minimum dscf of sample.

The apparatus was assembled as completely as possible in the staging area and transported to the sample site. Potential contamination of the sample train was prevented by sealing all openings with hexane rinsed aluminum foil. Once in the sampling area, the probe and filter heaters were brought to temperatures of 250 ±25°F, and the apparatus was leak checked. Upon successful completion of the leak check, the initial dry test meter reading was recorded, and the probe inserted at the first traverse point.

The stack temperature, dry test meter temperature, and the velocity head across the pitot was measured and recorded on the data sheet. The isokinetic sampling rate in terms of pressure drop across the calibrated orifice was calculated and recorded on the data sheet. The pump and timer were turned on, and the sample rate adjusted to correspond to the calculated isokinetic rate. Once the sample rate was set, the following data was recorded:

- Dry Gas Meter Volume
- Dry test meter outlet temperature
- Sample vacuum

- Probe heater temperature
- Filter heater temperature
- Impinger outlet temperature

At the end of the sample time for the first point, the probe was moved to the next point, and the measurements, calculations and recording of data was repeated. Upon completion of sampling from a port, the pump was turned off and the dry test meter reading recorded. The probe was removed from the stack, and placed in the next sample port. The previously described procedure was repeated for each sample port.

When the sample run was completed, the final dry test meter reading was recorded and the probe removed from the port. A post-test leak check was performed at a vacuum higher than the highest sample vacuum measured during the sample run. The final leak rate was recorded on the data sheet. The sample train was sealed from contamination and transported to the staging area for recovery.

Sample Recovery

Sample was recovered as follows:. The filter was recovered to a labeled petri dish made of glass and labeled container number 1. The nozzle, probe, front half and back half of the filter holder, and the condenser were rinsed 3 times with acetone and methylene chloride and added to container number 2. The same procedure for container number 2 was followed using toluene as the rinse solvent and added to container number 3. All samples were recovered to a labeled, clean amber glass bottle. The liquid level in the bottle was marked upon completion of recovery. The XAD-2 resin trap was sealed and labeled container number 4. All samples were shipped to the laboratory for analysis in a cooler containing ice.

Prior to recovery of the impinger fraction, the exterior of each impinger was cleaned and dried, and the net weight gain of each was determined to the nearest 0.1 gram. The impinger fraction consisted of the liquid impinger catch and rinses of the impingers. The impinger catch was recovered and stored for later analysis in the event that break-through was discovered from the trap. The liquid level of the bottle was marked upon completion of recovery.

A train blank was prepared using the same reagents and using the same recovery for the test samples. The blank containers were clearly labeled, and the liquid levels marked.

Analytical Procedure

The Method 3 sample was analyzed in the field with a fyrite analyzer. The results of this analysis are presented both in the calculated field data and on the field data sheets.

Prior to analysis, the samples were checked for liquid loss. The laboratory analysis was performed by Maxxam Analytical. The procedures used to perform the analysis followed EPA Method 23 requirements. The laboratory results and Quality Control are provided in Appendix D.

3.6 Determination of Particulate Matter Less Than 2.5 Microns

REF: Other Test Method – 027 and 028

Sampling System

A PM-2.5 and 10 head was connected via a "Swage-Lok" fitting to a probe liner. The probe liner was connected to a teflon jumper, which was attached to the impinger train, which consisted of a set of pre-weighed impingers, connected in series and immersed in an ice bath. The impinger train was followed in series by a carbon vane pump, a dry test meter, and a calibrated orifice

connected to an inclined manometer. A Tedlar bag was used to collect an integrated Method 3 sample. Type K thermocouples were used to measure the following temperatures: stack, impinger outlet, and dry test meter inlet and outlet.

A combination Stausscheibe (Type S) pitot tube and type K thermocouple were used to measure duct velocity head and temperature. The pitot tube was connected via flexible tubing to an inclined manometer. The thermocouple was connected to a digital potentiometer.

Sampling Procedure

Prior to sampling, traverse points were selected based on Method 1 requirements. The locations of the traverse points are presented in section 3.1. A preliminary traverse of the stack was performed to determine stack velocity head, temperature distributions, cyclonic flow, and stack static pressure. If necessary, preliminary runs by Methods 3 and 4 were performed to determine duct moisture and fixed gas content. Based on this information, a sample nozzle of appropriate inside diameter was selected, and the impinger train charged. Sample time per traverse point was estimated in order that a minimum of 30 dscf of sample would be collected.

The apparatus was assembled as completely as possible in the staging area and transported to the sample site. Sealing all openings with aluminum foil prevented potential contamination of the sample train. Once in the sampling area the apparatus was leak checked. Upon successful completion of the leak check, the initial dry test meter reading was recorded, and the probe inserted at the first traverse point and the PM-2.5 head was allowed to reach the duct temperature.

The stack temperature, dry test meter temperature, and the velocity head across the pitot was measured and recorded on the data sheet. The anisokinetic sampling rate in terms of pressure drop across the calibrated orifice was calculated and recorded on the data sheet. The pump and timer were turned on, and the sample time was adjusted to correspond to the calculated anisokinetic rate. Once the sample rate was set, the following data was recorded:

- Dry Gas Meter Volume
- Dry test meter outlet temperature
- Sample vacuum
- Impinger outlet temperature

At the end of the sample time for the first point, the probe was moved to the next point, and the measurements, calculations and recording of data was repeated. Upon completion of sampling from a port, the pump was turned off and the dry test meter reading recorded. The probe was removed from the stack, and placed in the next sample port. The previously described procedure was repeated for each sample port.

When the sample run was completed, the final dry test meter reading was recorded and the probe removed from the port. A post-test leak check was performed at a vacuum higher than the highest sample vacuum measured during the sample run. The final leak rate was recorded on the data sheet. The sample train was sealed from contamination and transported to the staging area for recovery.

Sample Recovery

Sample was recovered in two fractions: front half and back half. The front half fraction consisted of the filter itself, as well as, acetone rinses and brushings of the turn around cap, the stem, and the filter housing area before the filter. The filter was recovered to a labeled petri dish made of glass or plastic. Acetone rinses were recovered to a clean-labeled polyethylene bottle. The liquid level in the polyethylene bottle was marked upon completion of recovery.

Prior to recovery of the back half fraction, the exterior of each impinger were cleaned and dried, and the net weight gain of each was determined to the nearest 0.5 gram. The back half fraction consisted of the liquid impinger catch, rinses of the impingers, and all connecting glassware. Glassware rinses were recovered to a clean, labeled polyethylene or glass bottle. The liquid level of the bottle was marked upon completion of recovery.

At the conclusion of each day of sampling, reagent and recovery solvent blanks were collected into the same types of sample containers as were used for the sample recovery. The blank containers were clearly labeled, and the liquid levels marked.

Analytical Procedure

The Method 3 sample was analyzed in the field with a fyrite analyzer. The results of this analysis are presented both in the calculated field data and on the field data sheets.

Prior to analysis, the samples were checked for liquid loss, and the liquid volume of each sample bottle determined. The liquid samples from each run and blanks were transferred to individual tarred beakers, and the liquid allowed to evaporate at ambient temperature and pressure. The front half fraction and solvent blanks were analyzed gravimetrically until two consecutive weightings agreed to within 0.5 mg.

Prior to analysis, back half fractions and blanks were checked for liquid loss, and the liquid volume of each sample bottle determined. The back half fraction was extracted with methylene chloride gravimetrically. Each sample was extracted three times with 125 ml of methylene chloride in a separatory funnel. After each extraction, the organic (solvent) fraction was decanted. The organic fraction was evaporated at ambient temperature and pressure, while the aqueous fraction was evaporated at just below the boiling point of water.

After evaporation, the beakers were desiccated for 24 hours, and weighed until consecutive weightings agreed to within 0.5 mg.

Calculations

$$A_n = \pi r^2$$

A_n = Area of the sample nozzle, ft^2
 r = Radius of the nozzle, ft

$$V_{m(std)} = 17.64 V_m Y \left(\frac{P_{barometric} + \frac{\Delta H}{13.6}}{T_m} \right)$$

$V_{m(std)}$ = Dry meter volume at standard conditions, DSCF
 V_m = Dry meter volume uncorrected, DCF
 Y = Meter calibration coefficient
 P_{bar} = Barometric pressure, inHg
 ΔH = Orifice pressure differential, IWG
 T_m = Meter temperature, $^{\circ}R$
 17.64 = $^{\circ}R/inHg$

$$I = \frac{100 T_s [K_3 V_{lc} + (V_m Y / T_m)(P_{barometric} + \Delta H / 13.6)]}{60 \theta v_s P_s A_n}$$

I = % Anisokinetics
 T_s = Absolute average stack gas temperature, $^{\circ}R$
 K_3 = 0.002669 inHg-ft³/mL- $^{\circ}R$
 V_m = Volume of gas sample as measured by the dry gas meter, DCF
 Y = Dry gas meter calibration factor
 V_{lc} = Volume of liquid collected in the impingers, mL
 θ = Sample time, minutes
 P_{bar} = Barometric pressure at the sampling site, inHg
 ΔH = Average pressure differential across the orifice meter, in H_2O
 v_s = Stack velocity, ft/sec
 P_s = Stack absolute pressure, inHg
 A_n = Cross sectional area of nozzle, ft^2
 T_m = Absolute average dry gas meter temperature, $^{\circ}R$

$$C_s = 0.01543 \left(\frac{M_n}{V_{m(std)}} \right)$$

C_s = Grains per dry standard cubic foot

M_n = Mass of collected particulate, mg
 $V_{m (std)}$ = Dry meter volume at standard conditions, DSCF

$$E = C_s * Q_{sd} * \frac{60 \text{ min/hr}}{7000 \text{ gr/lb}}$$

E = Pounds per hour, particulates
 C_s = Particulate grain loading, gr/DSCF
 Q_{sd} = Dry stack gas flow rate at standard conditions, DSCFM

$$\mu_s = 51.05 + 0.207 T_s + 3.24 \times 10^{-5} T_s^2 + 53.147 f_{O_2} - 74.143 B_{ws}$$

μ_s = Velocity of stack gas, micropoise
 T_s = Average absolute stack gas temperature, $^{\circ}\text{R}$
 f_{O_2} = Stack gas fraction O_2 , by volume, dry basis
 B_{ws} = Flue gas moisture content, proportion by volume, dimensionless

$$Q_s = 0.002837 \mu_s \left(\frac{T_s}{M_w P_s} \right)^{0.2949}$$

Q_s = Total cyclone flow rate at wet cyclone conditions, ft^3/min
 μ_s = Velocity of stack gas, micropoise
 T_s = Average absolute stack gas temperature, $^{\circ}\text{R}$
 M_w = Molecular weight of flue gas (wet), lb/lb-mole
 P_s = Stack absolute pressure, inHg

$$\Delta H = \left(\frac{Q_s (1 - B_{ws}) P_s}{T_s} \right)^2 \left(\frac{T_m M_d (1.083) \Delta H_{@}}{P_{barometric}} \right)$$

ΔH = Orifice pressure head needed for cyclone flow rate, in H_2O
 Q_s = Total cyclone flow rate at wet cyclone conditions, ft^3/min
 B_{ws} = Flue gas moisture content, proportion by volume, dimensionless
 P_s = Stack absolute pressure, inHg
 T_s = Average absolute stack gas temperature, $^{\circ}\text{R}$
 T_m = Absolute average dry gas meter temperature, $^{\circ}\text{R}$
 M_d = Molecular weight of flue gas (dry), lb/lb-mole
 P_{bar} = Barometric pressure, inHg
 $\Delta H_{@}$ = Orifice calibration coefficient, in H_2O

$$V_n = \frac{3.056 Q_s}{D_n^2}$$

V_n = Nozzle velocity, ft/sec
 Q_s = Total cyclone flow rate at wet cyclone conditions, ft³/min
 D_n = Inside diameter of the sample nozzle, inches

$$V_{\min} = V_n \left(0.2457 + \sqrt{0.3072 - \frac{0.2603 \left(\sqrt{Q_s} \right) \mu_s}{V_n^{1.5}}} \right)$$

V_{\min} = Minimum velocity, ft/sec
 V_n = Nozzle velocity, ft/sec
 Q_s = Total cyclone flow rate at wet cyclone conditions, ft³/min
 μ_s = Velocity of stack gas, micropoise

$$V_{\max} = V_n \left(0.4457 + \sqrt{0.5690 + \frac{0.2603 \left(\sqrt{Q_s} \right) \mu_s}{V_n^{1.5}}} \right)$$

V_{\max} = Maximum velocity, ft/sec
 V_n = Nozzle velocity, ft/sec
 Q_s = Total cyclone flow rate at wet cyclone conditions, ft³/min
 μ_s = Velocity of stack gas, micropoise

$$R_{\min} = 0.2457 + \sqrt{0.3072 - \frac{0.2603 \left(\sqrt{Q_s} \right) \mu_s}{V_n^{1.5}}}$$

If R_{\min} is less than 0.5, or if an imaginary number occurs when calculating R_{\min} , use Equation 1 to calculate V_{\min} . Otherwise, use Equation 2.

$$\text{Eq. 1} \quad V_{\min} = V_n (0.5)$$

$$\text{Eq. 2} \quad V_{\min} = V_n R_{\min}$$

V_{\min} = Minimum velocity, ft/sec
 V_n = Nozzle velocity, ft/sec
 Q_s = Total cyclone flow rate at wet cyclone conditions, ft³/min
 μ_s = Velocity of stack gas, micropoise

$$R_{\max} = 0.4457 + \sqrt{0.5690 + \frac{0.2603 \left(\sqrt{Q_s} \right) \mu_s}{V_n^{1.5}}}$$

If R_{\max} is greater than 1.5, use Equation 3 to calculate V_{\max} . Otherwise, use Equation 4.

$$\text{Eq. 3} \quad V_{\max} = V_n (1.5)$$

$$\text{Eq. 4} \quad V_{\max} = V_n R_{\max}$$

V_{\max} = Maximum velocity, ft/sec

V_n = Nozzle velocity, ft/sec

Q_s = Total cyclone flow rate at wet cyclone conditions, ft³/min

μ_s = Velocity of stack gas, micropoise

$$\Delta p_{\min} = 1.3686 \times 10^{-4} \frac{P_s M_w (V_{\min})^2}{T_s C_p^2}$$

Δp_{\min} = Minimum velocity head value during sampling for selected nozzle, in H₂O

P_s = Stack absolute pressure, inHg

M_w = Molecular weight of flue gas (wet), lb/lb-mole

V_{\min} = Minimum velocity, ft/sec

T_s = Average absolute stack gas temperature, °R

C_p = Pitot tube coefficient

$$\Delta p_{\max} = 1.3686 \times 10^{-4} \frac{P_s M_w (V_{\max})^2}{T_s C_p^2}$$

Δp_{\max} = Maximum velocity head value during sampling for selected nozzle, in H₂O

P_s = Stack absolute pressure, inHg

M_w = Molecular weight of flue gas (wet), lb/lb-mole

V_{\max} = Maximum velocity, ft/sec

T_s = Average absolute stack gas temperature, °R

C_p = Pitot tube coefficient

$$t_1 = \sqrt{\frac{\Delta p_1}{\Delta p_{\text{avg}}}} \left(\frac{\text{Total run time}}{\text{Number of points}} \right)$$

t_1 = Dwell time at first traverse point, minutes

Δp_1 = The velocity head at the first traverse point (from a previous traverse), in H₂O

Δp_{avg} = Square of the average square root of the Δp 's (previous vel. traverse), in H₂O

$$t_n = \frac{t_1}{\sqrt{\Delta p_1}} \sqrt{\Delta p_n}$$

t_n = Dwell time at traverse point n, minutes

Δp_n = Measured velocity head at point n, in H_2O
 Δp_1 = Measured velocity head at point 1, in H_2O

$$Q_s = \frac{T_s}{17.64 P_s} \left(\frac{V_{m(std)} + V_{w(std)}}{\theta} \right)$$

Q_s = Total cyclone flow rate at wet cyclone conditions, ft^3/min
 T_s = Average absolute stack gas temperature, $^{\circ}R$
 P_s = Stack absolute pressure, inHg
 $V_{m(std)}$ = Dry meter volume at standard conditions, DSCF
 $V_{wc(std)}$ = Volume of water vapor at standard conditions, SCF
 θ = Sample time, minutes

$$D_{50} = \beta_1 \left(\frac{T_s}{M_w P_s} \right)^{0.2091} \left(\frac{\mu_s}{Q_s} \right)^{0.7091}$$

D_{50} = Diameter of particles having a 50 percent probability of penetration, μm
 β_1 = 0.15625
 μ_s = Velocity of stack gas, micropoise
 T_s = Average absolute stack gas temperature, $^{\circ}R$
 P_s = Stack absolute pressure, inHg
 Q_s = Total cyclone flow rate at wet cyclone conditions, ft^3/min
 M_w = Molecular weight of flue gas (wet), lb/lb-mole

Appendix A
Field Data Sheets

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-8-2010
Facility	Metro	Start/Stop Time	7:50 - 11:56
Unit	FBI 1 (EU035)	Test Method	EPA OTM 027/28
Location	Stack	Run Number	1
Project #	902630	Description	PM2.5
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	15	°F	# Ports	2	Meter Box #	AB1	ID#	232001
Pbar	30.15	In Hg	# Points	12	Nozzle Dia. (in)	0.075	ID#	0.153 225081
Filter #	M58		Time/Pt		Probe ID #		Pitot ID #	
MF #			Port Order	B-A	del H @	2.020		
Pstack	-1.19	In H2O	Pitot Coef	0.84	Meter Factor	1.000		
Sample Time	240	min	Test #	1	Data File Name	Unit 1 Run 1 M202		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.002	12	NT	7:25	Pre	O2	10.0			
Post	0.002	7	NT	11:56	Post	CO2	8.5	9.2		
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	ID #
					#1	374.2	362.6	
					#2	624.0	622.0	
					#3	712.9	709.2	
					#4	894.8	872.3	
					#5			
					#6			
					#7			
					#8			
					Total			

Sample Point	Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter		
Port	Point	(min)	(in. H ₂ O)	(in. H ₂ O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
		0			0							
A	1	21.2	1.28	0.57	8.706	5	229	176	58	58	100	90
A	2	43.0	1.36		17.302	6	231	175	58	58	108	94
A	3	64.6	1.32		26.055	6	232	175	58	56	108	95
A	4	84.0	1.08		35.056	6	232	175	62	55	112	100
A	5	102.1	0.93		41.811	6	232	175	68	54	112	101
A	6	119.1	0.82		48.748	6	232	176	68	54	105	98
B	1	139.9	1.24		56.924	6	232	176	72	55	103	94
B	2	161.7	1.35		65.944	6	232	177	71	54	104	95
B	3	183.7	1.32		76.802	6	232	177	69	54	104	95
B	4	203.7	1.20		83.358	6	232	177	67	54	104	96
B	5	222.4	1.00		91.225	6	232	176	69	55	104	96
B	6	239.5	0.83		98.436	6	230	175	72	59	104	96

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-8-2010
Facility	Metro	Start/Stop Time	12:38 - 16:46
Unit	FBI 1 (EU035)	Test Method	EPA OTM 027/28
Location	Stack	Run Number	2
Project #	902630	Description	PM2.5
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	18	°F	# Ports	2	Meter Box #	AB1	ID#	232001
Pbar	230.15	In Hg	# Points	12	Nozzle Dia. (in)	0.154	ID#	22508269
Filter #	M589		Time/Pt		Probe ID #		Pitot ID #	
MF #			Port Order	B-A	del H @	2.020		
Pstack	-0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.000		
Sample Time	7239.7	min	Test #	1	Data File Name	unit 1 Run 2 m202		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average	
Pre	0.008	7	NT	12:25	Pre	O2	9.7				
Post	0.001	7	NT	16:50	Post	CO2	9.4				
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec						

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	ID #
					#1	374.8	359.3	2630417
					#2	610.2	607.7	261024
					#3	712.3	707.6	261095
					#4	861.7	840.8	261118
					#5			
					#6			
					#7			
					#8			
					Total			

Sample Point	Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter		
Port	Point	(min)	(in. H ₂ O)	(in. H ₂ O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
		0			0							
B	1	20.9	1.25	0.58	8.825	5	232	175	80	63	97	94
B	2	42.5	1.33		17.911	5	232	177	72	54	102	94
B	3	64.1	1.34		27.163	5	232	173	72	54	100	94
B	4	84.7	1.21		35.657	5	232	174	70	54	97	92
B	5	103.5	1.01		43.358	5	232	176	73	56	97	92
B	6	120.8	0.86		50.592	5	230	173	72	57	97	92
A	1	141.9	1.27		59.059	5	228	173	71	59	97	91
A	2	163.8	1.38		68.204	5	231	173	71	57	97	90
A	3	185.5	1.34		77.326	5	232	177	68	56	96	90
A	4	204.4	1.02		85.157	5	232	177	68	54	96	90
A	5	222.9	0.98		92.962	5	232	174	52	68	95	90
A	6	239.7	0.81		99.982	5	232	176	68	54	95	90

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-9-2010
Facility	Metro	Start/Stop Time	7:30 - 11:32
Unit	FBI 1 (EU035)	Test Method	EPA OTM 027/28
Location	Stack	Run Number	3
Project #	902630	Description	PM2.5
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	22	°F	# Ports	2	Meter Box #	AB1	ID#	232001
Pbar	30.15	In Hg	# Points	12	Nozzle Dia. (in)	0.153	ID#	225082
Filter #	M5560		Time/Pt		Probe ID #		Pitot ID #	
MF #			Port Order	A-B	del H @	2.020		
Pstack	-0.18	In H2O	Pitot Coef	0.84	Meter Factor	1.000		
Sample Time	240.6	min	Test #	1	Data File Name	UNIT1 Run 3 m203		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.006	6	NT	7.04	Pre	O2	9.4			
Post	0.010	7	NT	11:36	Post	CO2	9.7			
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)			50ml Rinse	Y
						End	Start	Diff	ID #	
					#1	381.2	362.3		263046	
					#2	625.4	622.0		261031	
					#3	708.1	707.5		261026	
					#4	992.2	972.4		261062	
					#5					
					#6					
					#7					
					#8					
					Total					

Sample Point		Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter	
Port	Point	(min)	(in. H ₂ O)	(in. H ₂ O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
		0			0							
A	1	24.2	1.20	0.59	8.971	5	230	174	80	67	86	80
A	2	43.3	1.31		18.107	5	232	174	69	60	101	86
A	3	65.2	1.28		27.391	5	233	175	67	54	104	90
A	4	84.8	1.02		35.75	5	233	175	67	53	105	93
A	5	103.5	0.94		43.340	5	233	175	67	53	106	95
A	6	121.2	0.83		50.760	5	233	174	68	52	95	92
B	1	142.3	1.19		59.399	5	233	175	69	54	91	87
B	2	164.0	1.26		68.882	5	234	173	67	50	92	85
B	3	185.5	1.24		76.876	5	234	174	67	50	92	86
B	4	205.2	1.03		85.762	5	238	175	68	50	93	86
B	5	223.2	0.87		93.295	5	231	174	69	51	90	85
B	6	240.6	0.81		100.532	5	232	175	66	51	89	83

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-9-2010
Facility	Metro	Start/Stop Time	12:25 - 16:27
Unit	FBI 2 (EU036)	Test Method	EPA OTM 027/28
Location	Stack	Run Number	1
Project #	902630	Description	PM2.5
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	22	°F	# Ports	2	Meter Box #	AB1	ID#	232001
Pbar	30.24	In Hg	# Points	12	Nozzle Dia. (in)	0.154	ID#	225022MCA
Filter #	M58M61		Time/Pt		Probe ID #		Pitot ID #	
MF #			Port Order	A-13	del H @	2020		
Pstack	-0.29	In H2O	Pitot Coef	0.84	Meter Factor	1.000		
Sample Time	240.9	min	Test #	1	Data File Name	Unit 2 Run 1 m 202		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.004	6	NT	12:06	Pre	O2	9.6			
Post	0.003	6	NT	16:30	Post	CO2	9.7			
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	Y	
						End	Start	Diff	ID #
					#1	379.4	359.5		263047
					#2	611.4	608.8		261624
					#3	710.2	709.4		261095
					#4	915.2	897.3		261118
					#5				
					#6				
					#7				
					#8				
					Total				

Sample Point	Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter		
Port	Point	(min)	(in. H2O)	(in. H2O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
A		0			0							
	1	20.1	0.10	0.58	9.174	5	229	174	78	59	84	81
	2	40.3	1.12		16.725	5	229	174	67	50	90	82
	3	60.7	1.13		25.841	5	229	174	67	53	89	82
	4	81.1	1.13		33.501	5	229	175	67	53	90	83
	5	100.2	1.00		41.136	5	230	174	70	53	91	83
	6	118.5	0.91		48.980	5	229	177	67	53	90	83
B	1	138.6	1.11		56.656	5	227	175	67	53	90	83
	2	159.6	1.20		65.487	5	228	175	66	50	89	83
	3	180.2	1.15		73.480	5	229	174	66	51	89	81
	4	200.0	1.07		81.869	5	230	175	67	52	88	80
	5	220.4	1.14		90.26	5	229	175	65	53	88	80
	6	240.9	1.15		98.557	5	229	173	66	54	88	80

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-10-2010
Facility	Metro	Start/Stop Time	7:36 - 11:40
Unit	FBI 2 (EU036)	Test Method	EPA OTM 027/28
Location	Stack	Run Number	2
Project #	902630	Description	PM2.5
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	8	°F	# Ports	2	Meter Box #	AB 1	ID#	232001
Pbar	30.24	In Hg	# Points	12	Nozzle Dia. (in)	0.153	ID#	2250281
Filter #	M58mc 62		Time/Pt		Probe ID #		Pitot ID #	
MF #			Port Order	A-13	del H @	2.020		
Pstack	1.019	In H2O	Pitot Coef	0.84	Meter Factor	1.000		
Sample Time	241.7	min	Test #	1	Data File Name	WATZ Run 1 m202		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average	
Pre	0.009	6	NT	6:58	Pre	O2	9.5				
Post	0.004	6	NT	11:45	Post	CO2	9.5				
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec						

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	Y	N
						End	Start	Diff	ID #
					#1	383.2	2362.7		263046
					#2	624.6	622.2		261031
					#3	704.5	705.8		261026
					#4	877.1	859.0		261009
					#5				
					#6				
					#7				
					#8				
					Total				

Sample Point		Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter	
Port	Point	(min)	(in. H ₂ O)	(in. H ₂ O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
		0			0							
A	1	20.3	1.12	0.58	8.502	5	224	177	72	66	87	75
↓	2	40.6	1.13	↓	16.774	5	226	174	62	58	95	80
	3	61.2	1.15		25.26	5	226	176	62	55	97	84
	4	81.8	1.16		33.748	5	226	176	59	52	95	85
	5	101.4	1.05		41.558	5	226	177	60	51	99	87
	6	120.2	0.96		49.319	5	226	172	58	50	100	89
B	1	140.2	1.09		58.088	5	225	173	60	54	97	90
↓	2	160.8	1.16		66.094	5	226	172	58	50	100	90
	3	181.7	1.19		74.780	5	227	176	58	49	100	91
	4	202.5	1.18		83.435	5	227	174	58	49	104	91
	5	222.5	1.09		92.028	5	226	177	58	48	102	92
	6	241.7	1.00		99.599	5	226	177	58	48	103	93

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-10-2010
Facility	Metro	Start/Stop Time	12:25 - 16:28
Unit	FBI 2 (EU036)	Test Method	EPA OTM 027/28
Location	Stack	Run Number	3
Project #	902630	Description	PM2.5
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	11	°F	# Ports	2	Meter Box #	A31	ID#	232001
Pbar	30.24	In Hg	# Points	12	Nozzle Dia. (in)	0.154	ID#	225082
Filter #	M5163		Time/Pt		Probe ID #		Pitot ID #	
MF #			Port Order	B-A	del H @	2.020		
Pstack	-0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.000		
Sample Time	242.9	min	Test #	1	Data File Name	41.17 2 Run 3 m202		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average	
Pre	0.006	6	NT	12:02	Pre	O2	9.8				
Post	0.004	7	NT	16:33	Post	CO2	9.3				
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec						

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	Y	N
						End	Start	Diff	ID #
					#1	380.3	359.7		263047
					#2	611.3	608.6		261024
					#3	706.6	706.4		261095
					#4	879.0	860.0		261118
					#5				
					#6				
					#7				
					#8				
					Total				

Sample Point	Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter		
Port	Point	(min)	(in. H ₂ O)	(in. H ₂ O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
		0			0							
B	1	20.0	1.10	0.59	8.614	6	226	175	72	59	95	90
	2	40.7	1.17		17.411	5	226	172	63	50	102	91
	3	61.4	1.18		26.205	5	226	177	62	50	103	92
	4	82.2	1.18		34.394	5	226	177	61	50	103	93
	5	102.2	1.10		43.383	5	226	172	61	50	104	94
	6	121.3	1.0		51.429	5	226	176	58	49	104	94
A	1	141.5	1.12		59.892	5	226	176	63	52	102	94
	2	161.8	1.12		68.572	5	226	173	60	50	101	94
	3	182.1	1.14		76.937	5	227	177	59	50	103	93
	4	202.8	1.17		85.352	5	227	174	60	50	104	94
	5	223.4	1.16		94.227	5	227	173	57	49	104	94
	6	242.9	1.04		101.983	5	227	176	60	50	105	95

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-12-2010
Facility	Metro	Start/Stop Time	8:10 - 12:13
Unit	FBI 3 (EU037)	Test Method	EPA OTM 027/28
Location	Stack	Run Number	3
Project #	902630	Description	PM2.5
Operator	NT NIS	Carbon Trap ID	

RUN DATA

Tamb	3	°F	# Ports	2	Meter Box #	AB1	ID#	232001
Pbar	30.11	In Hg	# Points	12	Nozzle Dia. (in)	0.153	ID#	225082
Filter #	MSS 66		Time/Pt		Probe ID #		Pitot ID #	
MF #			Port Order	A-B	del H @	2.020		
Pstack	-0.15	In H2O	Pitot Coef	0.84	Meter Factor	1.000		
Sample Time	241.6	min	Test #	1	Data File Name	LAIT3 RUN 3 m202		

Leak Chk	0.018	CFM	at Vac	Init	7:50	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.003	0.6	NT	12:15			Pre	Post	O2	9.3		
Post									CO2	9.6		

≤ 0.02 cfm or 4 % of Sample Rate Stable @ ≥ 3" 15 sec

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	Y	N
						End	Start	Diff	ID #
					#1	379.6	62.2		263046
					#2	625.0	623.2		261031
					#3	699.1	698.8		261026
					#4	911.2	892.8		261009
					#5				
					#6				
					#7				
					#8				
					Total				

Sample Point		Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter	
Port	Point	(min)	(in. H ₂ O)	(in. H ₂ O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
		0			0							
A	1	19.9	0.90	0.58	8.349	5	228	176	69	62	70	60
↓	2	40.9	1.01		16.527	5	229	177	63	55	84	67
	3	61.8	1.0		25.025	5	230	177	64	55	86	72
	4	81.9	0.92	↓	32.44	5	231	177	63	55	89	76
	5	100.5	0.79		40.104	5	231	177	63	54	90	79
	6	119.3	0.80		47.963	5	232	177	6	54	92	81
B	1	139.1	0.9		55.946	5	231	175	57	54	91	82
↓	2	159.5	0.95		64.247	5	232	173	63	54	93	83
	3	180.5	1.0		72.840	5	232	177	66	55	94	84
	4	201.2	0.98		80.859	5	232	177	64	55	95	85
	5	221.4	0.93		89.041	5	232	177	66	55	97	86
	6	241.6	0.93		97.798	5	232	177	63	55	96	87

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-14-2010
Facility	Metro	Start/Stop Time	7:32 - 11:34
Unit	FBI 3 (EU037)	Test Method	EPA OTM 027/28
Location	Stack	Run Number	1
Project #	902630	Description	PM2.5
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	3	°F	# Ports	2	Meter Box #	AB1 ID# 232001
Pbar	30.18	In Hg	# Points	12	Nozzle Dia. (in)	0.153 ID# 225082
Filter #	M58 MC 64		Time/Pt		Probe ID #	Pitot ID #
MF #			Port Order	A-B	del H @	2.020
Pstack	-0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.000
Sample Time	240.9	min	Test #	1	Data File Name	UNIT 3 Run 1 m202

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.003	7	NT	6.46	Pre	O2	9.7			
Post	0.003	7	NT	11.38	Post	CO2	9.1			
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse Y (N)		
						End	Start	Diff	ID #
					#1	380.3	362.4		2.63046
					#2	624.5	622.4		2.61031
					#3	700.9	701.3		2.61026
					#4	894.8	877.2		2.61009
					#5				
					#6				
					#7				
					#8				
					Total				

Sample Point	Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter		
Port	Point	(min)	(in. H ₂ O)	(in. H ₂ O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
		0			0							
A	1	19.9	0.87	0.59	9.039	5	228	173	68	60	85	69
	2	40.7	0.95		16.641	5	231	172	61	53	91	75
	3	61.6	0.96		25.221	5	232	173	59	50	93	79
	4	82.1	0.92		33.616	5	232	173	59	51	94	82
	5	101.7	0.84		41.38	5	231	177	59	51	97	85
	6	120.2	0.75		48.96	5	230	173	60	51	97	87
B	1	139.4	0.81		56.959	5	231	174	63	57	95	87
	2	159.7	0.91		65.649	5	233	177	61	53	98	88
	3	180.6	0.95		73.754	5	233	172	63	53	98	88
	4	201.5	0.96		82.623	5	233	173	62	53	99	89
	5	221.4	0.87		90.652	5	233	173	63	54	99	89
	6	240.9	0.84		98.718	5	233	175	62	54	100	90

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-11-2010
Facility	Metro	Start/Stop Time	12:00 - 16:04
Unit	FBI 3 (EU037)	Test Method	EPA OTM 027/28
Location	Stack	Run Number	2
Project #	902630	Description	PM2.5
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	7	°F	# Ports	2	Meter Box #	AB1 ID# 232001
Pbar	30.18	In Hg	# Points	12	Nozzle Dia. (in)	0.154 ID# 225082
Filter #	M58		Time/Pt		Probe ID #	Pitot ID #
MF #			Port Order	A-B	del H @	2020
Pstack	-0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.000
Sample Time	242.2	min	Test #	1	Data File Name	Unit 3 Run 2 m202

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.007	6	NT	11:44	Pre	O2	9.8			
Post	0.003	7	NT	16:08	Post	CO2	9.9			

≤ 0.02 cfm or 4 % of Sample Rate Stable @ ≥ 3" 15 sec

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	End	Start	Diff	ID #
					#1	377.6	359.0		263047
					#2	610.9	608.5		261024
					#3	701.5	704.4		261095
					#4	858.5	836.7		261118
					#5				
					#6				
					#7				
					#8				
					Total				

Sample Point		Time	Delta P	Delta H	Meter Reading	Vacuum	Temperatures (°F)				Meter	
Port	Point	(min)	(in. H ₂ O)	(in. H ₂ O)	(acf)	(in. Hg)	Stack	Probe	Filter	Imp Out	In	Out
		0			0							
A	1	20.3	0.9	0.59	8.501	5	228	175	68	53	100	89
↓	2	41.4	0.98		17.185	5	230	173	68	53	100	89
↓	3	62.4	0.97		25.950	5	231	177	69	53	102	91
↓	4	82.8	0.91		34.096	5	232	177	66	53	103	92
	5	102.0	0.81		42.506	5	231	175	65	53	103	92
	6	121.6	0.84		50.697	5	230	176	64	54	103	93
B	1	141.4	0.86		60.333	5	231	176	65	54	103	94
↓	2	161.5	0.89		67.748	5	233	174	64	55	105	94
↓	3	182.0	0.92		75.666	5	233	176	65	57	105	95
	4	202.8	0.95		84.564	5	234	175	65	55	106	95
	5	222.4	0.85		92.890	5	233	173	65	54	106	96
	6	242.2	0.86		101.052	5	233	175	65	54	106	96

Client	Met Council	Test Date	2-8-2010
Facility	Metro	Start/Stop Time	7:50 - 11:53
Unit	FBI 1 (EU035)	Test Method	EPA 23
Location	Stack	Run Number	1
Project #	902630	Description	Dioxin/Furan/PCB's/PAH's
Operator	NT - NK	Carbon Trap ID	

Tamb	15	°F	# Ports	2	Meter Box #	A133	ID# 232003
Pbar	30.15	In Hg	# Points	12	Nozzle Dia. (in)	0.197	ID# 224115
Filter #	Trap #3		Time/Pt	20	Probe ID #	22608	Pitot ID #
MF #			Port Order	A-B	del H @	1.889	
Pstack	0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.011	
Sample Time	240	min	Test #	1	Data File Name	unit 1 run 1 m 23	

Pitot Leak Check		Run
Pre	Post	O2
✓	✓	CO2

Stable @ $\geq 3"$ 15 sec

1	2	3	Average
10.0			
9.5	9.2		

End Vol	Start Vol	Diff	Omit	Description
---------	-----------	------	------	-------------

[illegible]

Impinger
#1
#2
#3
#4
#5
#6
#7
#8
Total

50ml Rinse ~~DN~~
ID #

393.4	361.5	263048
703.6	707.2	261003
691.5	693.3	26173
618.3	615.8	261115
896.4	864.7	261009

[illegible]

Ref °F	Probe TC °F

 $\leq 1.5\%$ (Absolute Temp)

902630 Metro

Client	Met Council	Test Date	2-8-2010
Facility	Metro	Start/Stop Time	12:38 - 16:46
Unit	FBI 1 (EU035)	Test Method	EPA 23
Location	Stack	Run Number	2
Project #	902630	Description	Dioxin/Furans/PCB's/PAH's
Operator	NT NK	Carbon Trap ID	-

Tamb	18	°F	# Ports	2	Meter Box #	A13 5 ID# 232003
Pbar	30.15	In Hg	# Points	12	Nozzle Dia. (in)	0.197 ID# 224115
Filter #	Trap #5		Time/Pt	20	Probe ID #	221018 Pitot ID #
MF #			Port Order	A-B	del H @	1.889
Pstack	-0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.011
Sample Time	240	min	Test #	1	Data File Name	unit 1 Run 2 1123

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.014	12	NT	12:27	Pre	O2	9.7			
Post	0.011	14	NT	16:50	OK	CO2	9.4			

≤ 0.02 cfm or 4 % of Sample Rate Stable @ ≥ 3" 15 sec

End Vol	Start Vol	Diff	Omit	Description	Impinger	End	Start	Diff	ID #
					#1	391.1	361.0		263051
					#2	700.4	702.5		261011
					#3	690.6	692.4		261096
					#4	614.2	610.4		261030
					#5	926.0	894.7		261042
					#6				
					#7				
					#8				
					Total				

[illegible]

Ref °F	Probe TC °F

 $\leq 1.5\%$ (Absolute Temp)

902630 Metro

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-9-2010
Facility	Metro	Start/Stop Time	7:30 11:32
Unit	FBI 1 (EU035)	Test Method	EPA 23
Location	Stack	Run Number	3
Project #	902630	Description	Dioxin/Furans/PCB's/PAH's
Operator	NT NK	Carbon Trap ID	-

RUN DATA

Tamb	22	°F	# Ports	2	Meter Box #	A133	ID#	232003
Pbar	30.1 24	In Hg	# Points	12	Nozzle Dia. (in)	0.197	ID#	224115
Filter #	Trap 8		Time/Pt	20	Probe ID #	221018	Pitot ID #	
MF #			Port Order	B-A	del H @	1.989		
Pstack	-0.18	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	unit1 Run 3 m23		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.009	14	NT	7:05	Pre	O2	9.4			
Post	0.010	12	NT	11:35	Post	CO2	9.7			

≤ 0.02 cfm or 4 % of Sample Rate Stable @ ≥ 3" 15 sec

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	Y	ID #
						End	Start	Diff	
					#1	396.5	362.7		263048
					#2	699.6	708.6		261003
					#3	691.1	691.5		26173
					#4	618.7	616.8		261115
					#5	867.9	838.9		261009
					#6				
					#7				
					#8				
					Total				

Post Field Meter Calibration		Set Vacuum = 17"		Collect 5 cf per run				
Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time

TC Field Calibration	
Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

Comments

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-9-2010
Facility	Metro	Start/Stop Time	12:25 - 16:27
Unit	FBI 2 (EU036)	Test Method	EPA 23
Location	Stack	Run Number	1
Project #	902630	Description	Dioxin/Furans/PCB's/PAH's
Operator	NT NK	Carbon Trap ID	-

RUN DATA

Tamb	22	°F	# Ports	2	Meter Box #	AB 3 ID# 232003
Pbar	30.24	In Hg	# Points	12	Nozzle Dia. (in)	0.197 ID#
Filter #	Trap 7		Time/Pt	20	Probe ID #	221018 Pitot ID #
MF #			Port Order	B-A	del H @	1.889
Pstack	-0.29	In H2O	Pitot Coef	0.84	Meter Factor	1.011
Sample Time	240	min	Test #	1	Data File Name	unit 2 Bui 1 m23

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.006	12	NT	12:08	Pre	O2	9.6			
Post	0.004	13	NT	16:30	Post	CO2	9.7			

≤ 0.02 cfm or 4 % of Sample Rate Stable @ ≥ 3" 15 sec

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse Y (N)		
						End	Start	Diff	ID #
					#1	396.9	670.3	362.3	263051
					#2	694.8	700.3		261011
					#3	688.7	690.6		261096
					#4	615.4	612.3		261030
					#5	951.2	919.1		261042
					#6				
					#7				
					#8				
					Total				

Post Field Meter Calibration Set Vacuum = 17" Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

Comments

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2-10-2010
Facility	Metro	Start/Stop Time	7:36 - 11:38
Unit	FBI 2 (EU036)	Test Method	EPA 23
Location	Stack	Run Number	2
Project #	902630	Description	Dioxin/Furans/PCB's/PAH's
Operator	NT NK	Carbon Trap ID	-

RUN DATA

Tamb	8	°F	# Ports	2	Meter Box #	AB 3	ID#	232003
Pbar	30.24	In Hg	# Points	12	Nozzle Dia. (in)	0.197	ID#	
Filter #	Trap 6		Time/Pt	20	Probe ID #	221018	Pitot ID #	
MF #			Port Order	B-A	del H @	1.089		
Pstack	0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	unit 2 Run 1		m23

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.013	13	NT	7:00	Pre	O2	4.5			
Post	0.010	14	NT	11:40	Post	CO2				

≤ 0.02 cfm or 4 % of Sample Rate Stable @ ≥ 3" 15 sec

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)	50ml Rinse	Y
					#1	389.5	362.1	263048
					#2	698.2	699.5	261003
					#3	690.3	691.0	26173
					#4	617.5	616.3	261115
					#5	915.8	883.3	261062
					#6			
					#7			
					#8			
					Total			

Post Field Meter Calibration Set Vacuum = 17" Collect 5 cf per run

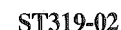
Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

Comments



Client	Met Council	Test Date	2-10-2010
Facility	Metro	Start/Stop Time	12:25 - 16:30
Unit	FBI 2 (EU036)	Test Method	EPA 23
Location	Stack	Run Number	3
Project #	902630	Description	Dioxin/Furans/PCB's/PAH's
Operator	NT NA	Carbon Trap ID	-

Tamb	11	°F	# Ports	2	Meter Box #	AB3 ID# 232003
Pbar	30.24	In Hg	# Points	12	Nozzle Dia. (in)	0.197 ID#
Filter #	Trap 4		Time/Pt	20	Probe ID #	221018 Pitot ID #
MF #			Port Order	A-13	del H @	1.889
Pstack	-0.19	In H ₂ O	Pitot Coef	0.84	Meter Factor	1.011
Sample Time	240	min	Test #	1	Data File Name	unit 2 run 3 m 23

End Vol	Start Vol	Diff	Omit	Description	Impinger	End	Start	Diff	ID #
					#1	392.7	361.9		263051
					#2	692.8	694.7		261011
					#3	687.1	688.7		261096
					#4	614.5	612.0	2.5	261030
					#5	960.1	932.1		261092
					#6				
					#7				
					#8				
					Total				

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
1.14	0	5.935	70	73	55	74	17	10.5
1.14	0	5.959	73	75	55	72	17	10.5
1.14	0	5.985	75	76	55	73	17	10.5

Ref °F	Probe TC °F

 $\leq 1.5\%$ (Absolute Temp)

1.15
Comments

902630 Metro
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RATA DATA SHEET

Client met connect Test Date 2-8-10
 Facility St. Paul Unit 1
 Location Stack Primary File Name _____
 Project # 902630 # Ports _____ Time/Pt _____
 Operator(s) NT NK Test Method Part 75 Part 60 Load L M H

Gas Values	O2	Nox	SO2	CO	CO2	O2 in	SO2 in	
Mid	10.10	50.3	50.5	50.7	10.08			
High	19.92	101.6	101.0	101.0	19.71			
Local Cal								
Pre cal Zero	0.0	0.0	0.95	0.0	0.10			0.0
Pre cal Mid	9.94	50.5	50.4	52.0	10.20			50.38
Pre cal High	19.86	103.3	100.28	102.0	19.80			102.5
Dynamic Cal								
Pre cal Zero	0.0	0.0	0.80	0.0	0.2			0.0
Pre cal Mid	10.18	53.5	48.56	52	9.94			49.5

NOX Full cell after Run 2 "Recal."

RATA	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6	RUN 7	RUN 8	RUN 9	RUN 10	RUN 11	RUN 12
Start	10:00	12:30	13:43									
Stop	11:00	13:30	14:43									
O2 %	9.5	9.7	10									
Nox ppm	21.2	19.9	25.7									
SO2 ppm	0.0	0.0	0.0									
CO ppm	0.6	0.4	0.0									
CO2 %	9.6	9.4	9.3									
O2 % in												
SO2 ppm in												
Post Zero O2	0.0	0.0	0.0									
Post Mid O2	9.88	9.92	9.9									
Post Zero Nox	0.0	0.0	0.0									
Post Mid Nox	49.0	49.0	49.0									
Post Zero SO2	0.24	0.2	0.25									
Post Mid SO2	47.8	47.44	47.96									
Post Zero CO	0.0	0.0	0.0									
Post Mid CO	51.25	51.25	51.0									
Post Zero CO2	0.20	0.22	0.3									
Post Mid CO2	10.2	10.2	10.2									
Post Zero O2in												
Post Mid O2in												
Post Zero SO2in												
Post Mid SO2in												

RATA DATA SHEET

Client	Met Council	Test Date	2-20-2010		
Facility	Metro	Unit	2		
Location	FBI	Primary File Name			
Project #	902630	# Ports	2	Time/Pt	
Operator(s)	NT	Test Method	Part 75	Part 60	Load L M H

Gas Values	O2	Nox	SO2	CO	CO2	O2 in	SO2 in	Gas Bottle Serial #
Mid	10.10	50.3	50.5	50.7	10.08			
High	19.92	101.6	101.0	101.0	19.71			
Local Cal								
Pre cal Zero	0.0	0.0	0.31	0.0	0.0			
Pre cal Mid	10.0	49.0	50.0	51.0	10.0			
Pre cal High	19.92	101.0	100.95	101.6	19.56			
Dynamic Cal								
Pre cal Zero	0.0	0.0	0.72	0.0	0.0			
Pre cal Mid	10.38	49.0	49.36	51.0	9.68			

RATA	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6	RUN 7	RUN 8	RUN 9	RUN 10	RUN 11	RUN 12
Start	7:37	8:50	10:02									
Stop	8:37	9:50	11:02									
O2 %	9.4	9.4	9.5									
Nox ppm	10.6	11.0	10.9									
SO2 ppm	0.0	0.0	0.0									
CO ppm	1.4	1.2	1.1									
CO2 %	9.5	9.6	9.5									
O2 % in												
SO2 ppm in												
Post Zero O2	0.0	0.0	0.0									
Post Mid O2	10.0	10.0	10.0									
Post Zero Nox	0.0	0.0	0.0									
Post Mid Nox	50.0	49.8	49.5									
Post Zero SO2	0.4	0.07	0.20									
Post Mid SO2	47.6	47.5	47.5									
Post Zero CO	0.0	0.0	0.0									
Post Mid CO	51.0	51.0	51									
Post Zero CO2	0.2	0.2	0.22									
Post Mid CO2	10.0	10.0	10.0									
Post Zero O2in												
Post Mid O2in												
Post Zero SO2in												
Post Mid SO2in												

RATA DATA SHEET

Client	Met Council	Test Date	2-11-2010		
Facility	Metro	Unit	3		
Location	FBI	Primary File Name			
Project #	902630	# Ports	2	Time/Pt	
Operator(s)		Test Method	Part 75	Part 60	Load L M H

Gas Values	O2	Nox	SO2	CO	CO2	O2 in	SO2 in	Gas Bottle Serial #
Mid	10.10	50.3	50.5	50.7	10.08			CC1757271 AA069259 CC175979 CC141864
High	19.92	101.6	101.0	101.0	19.71			
Local Cal								
Pre cal Zero	0.0	0.0	0.4	0.0	0.0			
Pre cal Mid	10.0	50.5	49.8	50.0	10.0			
Pre cal High	19.85	102.0	99.73	102.0	19.4			
Dynamic Cal								
Pre cal Zero	0.0	0.0	0.48	0.0	0.1			
Pre cal Mid	9.92	49.7	48.12	51.8	10.0			

RATA	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6	RUN 7	RUN 8	RUN 9	RUN 10	RUN 11	RUN 12
Start	8:08	9:35	12:02									
Stop	9:08	10:35	13:02									
O2 %	8.9	10	9.2									
Nox ppm	12.9	12.7	31.2									
SO2 ppm	0.3	0.1	0.0									
CO ppm	3.0	0.2	0.1									
CO2 %	9.7	8.9	9.7									
O2 % in												
SO2 ppm in												
Post Zero O2	0.0	0.0	0.0									
Post Mid O2	9.96	9.92	9.8									
Post Zero Nox	0.3	0.5	1.5									
Post Mid Nox	50.5	50.3	52.5									
Post Zero SO2	0.44	0.5	0.08									
Post Mid SO2	47.88	47.08	47.7									
Post Zero CO	0.0	0.0	0.0									
Post Mid CO	51.6	51.67	52.0									
Post Zero CO2	0.2	0.3	0.4									
Post Mid CO2	10.0	10	10.4									
Post Zero O2in												
Post Mid O2in												
Post Zero SO2in												
Post Mid SO2in												

VELOCITY TRAVERSE DATA SHEET

Client: Met Council Date: 2-4-10 Facility: Metro
 Job Number: 902630 Unit: FBI 1 Operator(s): NT/BD
 Location: Stack Fuel Type: _____
 Test Number: _____ Stack O₂ (%): _____
 Barometric Pressure: (in. Hg) _____ Stack CO₂ (%): _____
 Stack Pressure(Ps) (in. H₂O): _____ Test Description: Cyclonic Flow Check
 Pitot Tube Coefficient (Cp): 0.84 _____

Traverse Point		Time	ΔP (in. H ₂ O)	T _s (EF)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					
A	1	1400				-7
A	2					-5
A	3					-5
A	4					+3
A	5					+5
A	6					+7
B	1					-8
B	2					+3
B	3					+8
B	4					+5
B	5					+5
B	6					+1

$$V_s = 85.48 C_p \sqrt{\frac{(T_s + 460) \Delta P}{(P_s / 13.6 + P_{BAR}) M_{fg}}}$$

$$M_{fg} = 0.440 (\%CO_2) + 0.320 (\%O_2) + 0.280 (100 - \%O_2 - \%CO_2)$$

VELOCITY TRAVERSE DATA SHEET

Client: Met Council Date: 2-4-10 Facility: Metro
 Job Number: 902630 Unit: FBI 2 Operator(s): NT/BD
 Location: Stack Fuel Type: _____
 Test Number: _____ Stack O₂ (%): _____
 Barometric Pressure: (in. Hg) _____ Stack CO₂ (%): _____
 Stack Pressure(Ps) (in. H₂O): _____ Test Description: Cyclonic Flow Check
 Pitot Tube Coefficient (Cp): 0.84

Traverse Point		Time	ΔP (in. H ₂ O)	T _s (EF)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					
A	1	1420				-15
A	2					-9
A	3					-4
A	4					+4
A	5					+9
A	6					+19
B	1					-11
B	2					-10
B	3					-6
B	4					+4
B	5					+13
B	6					+16

$$V_s = 85.48 C_p$$

$$\sqrt{(T_s + 460) \Delta P}$$

$$(P_s/13.6 + P_{BAR}) M_{fg}$$

$$M_{fg} = 0.440 (\%CO_2) + 0.320 (\%O_2) + 0.280 (100 - \%O_2 - \%CO_2)$$

VELOCITY TRAVERSE DATA SHEET

Client: Met Council Date: 2-4-10 Facility: Metro
 Job Number: 902630 Unit: FBI 3 Operator(s): NT/BD
 Location: Stack Fuel Type: _____
 Test Number: _____ Stack O₂ (%): _____
 Barometric Pressure (in. Hg): _____ Stack CO₂ (%): _____
 Stack Pressure(Ps) (in. H₂O): _____ Test Description: Cyclonic Flow Check
 Pitot Tube Coefficient (Cp): 0.84

Traverse Point		Time	ΔP (in. H ₂ O)	T _s (EF)	Velocity (ft/sec)	Cyclonic Angle
Port	Depth					
A	1	1428				-10
A	2					-4
A	3					-3
A	4					+6
A	5					+6
A	6					+9
B	1					-2
B	2					-5
B	3					-2
B	4					+7
B	5					+7
B	6					+6

$$V_s = 85.48 C_p \sqrt{\frac{(T_s + 460) \Delta P}{(P_s/13.6 + P_{BAR}) M_{fg}}}$$

$$M_{fg} = 0.440 (\%CO_2) + 0.320 (\%O_2) + 0.280 (100 - \%O_2 - \%CO_2)$$

Appendix B

Calculated Field Data Results

**MET Council
Metro
FBR Unit 1**

Date	2/8/2010		2/8/2010		2/8/2010	
Time	10:00 - 11:00		12:30 - 13:30		13:43 - 14:43	
Analyzer Value	Run 1		Run 2		Run 3	
NOx	21.2		19.9		25.7	
CO	0.6		0.4		0.0	
SO2	0.0		0.0		0.0	
O2	9.5		9.7		10.0	
CO2	9.6		9.4		9.3	
Calibration Err	Pre		Pre		Pre	
NOx Zero	0.00		0.00		0.00	
NOx Mid	50.50		50.38		50.38	
NOx High	103.30		102.50		102.50	
CO Zero	0.00		0.00		0.00	
CO Mid	52.00		52.00		52.00	
CO High	102.00		102.00		102.00	
SO2 Zero	0.95		0.95		0.95	
SO2 Mid	50.40		50.40		50.40	
SO2 High	100.28		100.28		100.28	
O2 Zero	0.00		0.00		0.00	
O2 Mid	9.94		9.94		9.94	
O2 High	19.86		19.86		19.86	
CO2 Zero	0.10		0.10		0.10	
CO2 Mid	10.20		10.20		10.20	
CO2 High	19.80		19.80		19.80	
System Bias	Pre	Post	Pre	Post	Pre	Post
NOx Zero	0.00	0.00	0.00	0.00	0.00	0.00
NOx Span	53.50	49.00	49.50	49.00	49.00	49.00
CO Zero	0.00	0.00	0.00	0.00	0.00	0.00
CO Span	52.00	51.25	51.25	51.25	51.25	51.00
SO2 Zero	0.80	0.24	0.24	0.20	0.20	0.25
SO2 Span	48.56	47.80	47.80	47.44	47.44	47.96
O2 Zero	0.00	0.00	0.00	0.00	0.00	0.00
O2 Span	10.18	9.88	9.88	9.92	9.92	9.90
CO2 Zero	0.20	0.20	0.20	0.22	0.22	0.30
CO2 Span	9.94	10.20	10.20	10.20	10.20	10.20
Run Results	Run 1		Run 2		Run 3	
NOx	20.8		20.3		26.4	
CO	0.6		0.4		0.0	
SO2	0.0		0.0		0.0	
O2	9.6		9.9		10.2	
CO2	9.6		9.3		9.2	
NOx @ 7% O2	25.5		25.7		34.2	
CO @ 7% O2	0.7		0.5		0.0	
SO2 @ 7% O2	0.0		0.0		0.0	
Cal Results	Run 1		Run 2		Run 3	
NOx CE Zero	0.0		0.0		0.0	
NOx CE Mid	0.2		0.1		0.1	
NOx CE High	1.7		0.9		0.9	
NOx SB Zero	0.0	0.0	0.0	0.0	0.0	0.0
NOx SB Span	3.0	-1.5	-0.9	-1.4	-1.4	-1.4
NOx Zero Drift	0.0		0.0		0.0	
NOx Span Drift	-4.4		-0.5		0.0	
CO CE Zero	0.0		0.0		0.0	
CO CE Mid	1.3		1.3		1.3	
CO CE High	1.0		1.0		1.0	
CO SB Zero	0.0	0.0	0.0	0.0	0.0	0.0
CO SB Span	0.0	-0.7	-0.7	-0.7	-0.7	-1.0
CO Zero Drift	0.0		0.0		0.0	
CO Span Drift	-0.7		0.0		-0.2	
SO2 CE Zero	0.9		0.9		0.9	
SO2 CE Mid	-0.1		-0.1		-0.1	
SO2 CE High	-0.7		-0.7		-0.7	
SO2 SB Zero	-0.1	-0.7	-0.7	-0.7	-0.7	-0.7
SO2 SB Span	-1.8	-2.6	-2.6	-2.9	-2.9	-2.4
SO2 Zero Drift	-0.6		0.0		0.0	
SO2 Span Drift	-0.8		-0.4		0.5	
O2 CE Zero	0.0		0.0		0.0	
O2 CE Mid	-0.8		-0.8		-0.8	
O2 CE High	-0.3		-0.3		-0.3	
O2 SB Zero	0.0	0.0	0.0	0.0	0.0	0.0
O2 SB Span	1.2	-0.3	-0.3	-0.1	-0.1	-0.2
O2 Zero Drift	0.0		0.0		0.0	
O2 Span Drift	-1.5		0.2		-0.1	
CO2 CE Zero	0.5		0.5		0.5	
CO2 CE Mid	0.6		0.6		0.6	
CO2 CE High	0.5		0.5		0.5	
CO2 SB Zero	0.5	0.5	0.5	0.6	0.6	1.0
CO2 SB Span	-1.3	0.0	0.0	0.0	0.0	0.0
CO2 Zero Drift	0.0		0.1		0.4	
CO2 Span Drift	1.3		0.0		0.0	
Analyzer	Zero	Span	Mid	High	Range	SB
NOx	0.00	50.30	50.30	101.60	101.60	Mid
CO	0.00	50.70	50.70	101.00	101.00	Mid
SO2	0.00	50.50	50.50	101.00	101.00	Mid
O2	0.00	10.10	10.10	19.92	19.92	Mid
CO2	0.00	10.08	10.08	19.71	19.71	Mid

Emission Report

MET Council

St. Paul

Unit: 1

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/08/10	02/08/10	09:59:44	09:59:57	1	10.7	8.6	18.9	0.0	0.0
02/08/10	02/08/10	10:00:00	10:00:59	1	10.8	8.7	19.0	0.0	0.0
02/08/10	02/08/10	10:01:02	10:01:58	1	10.5	8.8	16.1	0.0	0.0
02/08/10	02/08/10	10:02:01	10:02:56	1	10.5	8.8	16.7	0.0	0.0
02/08/10	02/08/10	10:03:00	10:03:59	1	10.7	8.6	18.9	0.0	0.0
02/08/10	02/08/10	10:04:02	10:04:58	1	10.9	8.5	19.9	0.0	0.1
02/08/10	02/08/10	10:05:01	10:05:57	1	10.7	8.6	21.4	0.0	0.1
02/08/10	02/08/10	10:06:00	10:06:59	1	10.8	8.5	22.8	0.0	0.0
02/08/10	02/08/10	10:07:02	10:07:58	1	10.9	8.5	20.6	0.0	0.0
02/08/10	02/08/10	10:08:01	10:08:57	1	10.8	8.6	19.2	0.0	0.1
02/08/10	02/08/10	10:09:00	10:09:59	1	10.7	8.7	22.7	0.0	0.0
02/08/10	02/08/10	10:10:02	10:10:58	1	10.4	8.8	19.8	0.0	0.0
02/08/10	02/08/10	10:11:01	10:11:57	1	10.4	8.8	16.8	0.0	0.1
02/08/10	02/08/10	10:12:00	10:12:59	1	10.7	8.7	18.6	0.0	0.0
02/08/10	02/08/10	10:13:02	10:13:58	1	10.6	8.8	20.6	0.1	0.0
02/08/10	02/08/10	10:14:01	10:14:57	1	10.6	8.7	18.8	0.0	0.0
02/08/10	02/08/10	10:15:00	10:15:59	1	10.6	8.7	16.9	0.0	0.1
02/08/10	02/08/10	10:16:02	10:16:58	1	10.6	8.7	17.4	0.2	0.0
02/08/10	02/08/10	10:17:01	10:17:57	1	10.8	8.6	19.4	0.0	0.0
02/08/10	02/08/10	10:18:00	10:18:59	1	10.7	8.7	17.6	0.0	0.0
02/08/10	02/08/10	10:19:02	10:19:58	1	10.4	8.9	20.6	0.0	0.0
02/08/10	02/08/10	10:20:01	10:20:57	1	10.2	9.0	18.8	0.0	0.0
02/08/10	02/08/10	10:21:01	10:21:56	1	10.1	9.1	17.0	0.0	0.0
02/08/10	02/08/10	10:22:00	10:22:58	1	10.2	9.0	17.6	0.0	0.0
02/08/10	02/08/10	10:23:01	10:23:57	1	10.2	9.0	17.8	0.0	0.0
02/08/10	02/08/10	10:24:00	10:24:58	1	10.1	9.1	20.5	0.0	0.0
02/08/10	02/08/10	10:25:01	10:25:57	1	10.2	9.1	18.7	0.0	0.0
02/08/10	02/08/10	10:26:00	10:26:59	1	10.3	9.0	18.8	0.0	0.0
02/08/10	02/08/10	10:27:02	10:27:57	1	10.1	9.2	16.4	0.0	0.1
02/08/10	02/08/10	10:28:00	10:28:59	1	9.7	9.4	19.1	0.0	0.0
02/08/10	02/08/10	10:29:02	10:29:58	1	9.8	9.3	17.8	0.2	0.0

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/08/10	02/08/10	10:30:01	10:30:59	1	9.8	9.3	17.6	0.0	0.0
02/08/10	02/08/10	10:31:03	10:31:58	1	9.6	9.5	21.2	0.0	0.0
02/08/10	02/08/10	10:32:01	10:32:57	1	9.5	9.6	25.3	0.0	0.0
02/08/10	02/08/10	10:33:00	10:33:58	1	9.6	9.6	27.6	0.0	0.0
02/08/10	02/08/10	10:34:01	10:34:57	1	9.4	9.8	27.5	0.1	0.0
02/08/10	02/08/10	10:35:00	10:35:59	1	8.9	10.1	25.5	0.0	0.0
02/08/10	02/08/10	10:36:02	10:36:57	1	8.7	10.3	31.2	0.6	0.0
02/08/10	02/08/10	10:37:00	10:37:59	1	8.8	10.2	26.6	1.1	0.0
02/08/10	02/08/10	10:38:02	10:38:58	1	8.9	10.2	25.1	0.2	0.0
02/08/10	02/08/10	10:39:01	10:39:59	1	8.8	10.2	24.2	0.5	0.0
02/08/10	02/08/10	10:40:03	10:40:58	1	8.7	10.3	22.5	0.1	0.0
02/08/10	02/08/10	10:41:01	10:41:57	1	8.7	10.2	21.5	0.7	0.0
02/08/10	02/08/10	10:42:00	10:42:59	1	8.6	10.4	28.1	0.4	0.0
02/08/10	02/08/10	10:43:02	10:43:57	1	8.4	10.4	24.1	1.1	0.0
02/08/10	02/08/10	10:44:00	10:44:59	1	8.4	10.5	25.5	1.0	0.0
02/08/10	02/08/10	10:45:02	10:45:58	1	8.3	10.6	23.3	1.0	0.0
02/08/10	02/08/10	10:46:01	10:46:59	1	8.2	10.7	24.3	1.0	0.0
02/08/10	02/08/10	10:47:02	10:47:58	1	7.9	11.1	25.3	2.0	0.0
02/08/10	02/08/10	10:48:01	10:48:57	1	7.1	11.3	20.0	3.9	0.0
02/08/10	02/08/10	10:49:00	10:49:58	1	7.8	11.0	20.6	2.8	0.0
02/08/10	02/08/10	10:50:01	10:50:57	1	7.6	11.2	23.5	2.8	0.0
02/08/10	02/08/10	10:51:00	10:51:59	1	7.8	11.0	21.2	2.8	0.0
02/08/10	02/08/10	10:52:02	10:52:57	1	7.9	11.0	21.8	2.3	0.0
02/08/10	02/08/10	10:53:01	10:53:59	1	7.8	11.0	21.3	1.8	0.0
02/08/10	02/08/10	10:54:02	10:54:58	1	7.9	11.0	21.3	3.5	0.0
02/08/10	02/08/10	10:55:01	10:55:57	1	8.0	10.8	22.3	1.8	0.0
02/08/10	02/08/10	10:56:00	10:56:59	1	7.9	10.9	25.6	1.8	0.0
02/08/10	02/08/10	10:57:02	10:57:57	1	8.1	10.8	20.4	1.7	0.0
02/08/10	02/08/10	10:58:00	10:58:59	1	8.1	10.8	20.4	1.0	0.0
02/08/10	02/08/10	10:59:02	10:59:42	1	7.9	10.9	22.2	1.6	0.0
Average					9.5	9.6	21.2	0.6	0.0
Minimum Value					7.1	8.5	16.1	0.0	0.0
Maximum Value					10.9	11.3	31.2	3.9	0.1

Emission Report

MET Councle

St. Paul

Unit: 1

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/08/10	02/08/10	12:30:02	12:30:57	2	9.2	10.0	17.2	0.0	0.0
02/08/10	02/08/10	12:31:01	12:31:59	2	9.0	10.0	18.9	1.1	0.0
02/08/10	02/08/10	12:32:02	12:32:58	2	8.2	10.5	16.7	1.2	0.0
02/08/10	02/08/10	12:33:01	12:33:57	2	8.9	10.0	17.7	1.2	0.0
02/08/10	02/08/10	12:34:00	12:34:58	2	9.2	9.8	17.1	1.1	0.0
02/08/10	02/08/10	12:35:01	12:35:57	2	9.7	9.4	15.4	0.0	0.0
02/08/10	02/08/10	12:36:00	12:36:59	2	9.9	9.4	19.9	0.1	0.0
02/08/10	02/08/10	12:37:02	12:37:57	2	10.0	9.3	20.5	0.0	0.0
02/08/10	02/08/10	12:38:00	12:38:59	2	9.8	9.4	18.5	0.1	0.0
02/08/10	02/08/10	12:39:02	12:39:58	2	9.9	9.3	20.1	0.0	0.0
02/08/10	02/08/10	12:40:01	12:40:59	2	9.7	9.4	21.1	0.0	0.0
02/08/10	02/08/10	12:41:03	12:41:58	2	10.0	9.2	19.1	0.0	0.0
02/08/10	02/08/10	12:42:01	12:42:57	2	10.0	9.2	17.8	0.0	0.0
02/08/10	02/08/10	12:43:00	12:43:59	2	10.3	9.0	17.6	0.0	0.0
02/08/10	02/08/10	12:44:02	12:44:57	2	10.2	9.1	22.5	0.0	0.0
02/08/10	02/08/10	12:45:00	12:45:59	2	10.1	9.1	18.2	0.0	0.0
02/08/10	02/08/10	12:46:02	12:46:58	2	10.5	8.8	25.9	0.0	0.0
02/08/10	02/08/10	12:47:01	12:47:57	2	10.5	8.8	21.6	0.0	0.0
02/08/10	02/08/10	12:48:00	12:48:58	2	10.5	8.9	19.8	0.0	0.0
02/08/10	02/08/10	12:49:01	12:49:57	2	10.4	9.0	19.4	0.0	0.0
02/08/10	02/08/10	12:50:00	12:50:59	2	10.4	9.0	18.5	0.0	0.0
02/08/10	02/08/10	12:51:02	12:51:57	2	9.8	9.3	21.1	0.0	0.0
02/08/10	02/08/10	12:52:01	12:52:59	2	10.2	9.1	19.3	0.0	0.0
02/08/10	02/08/10	12:53:02	12:53:58	2	10.2	9.1	17.8	0.0	0.0
02/08/10	02/08/10	12:54:01	12:54:57	2	10.2	9.1	17.1	0.0	0.0
02/08/10	02/08/10	12:55:00	12:55:58	2	10.1	9.2	18.0	0.0	0.0
02/08/10	02/08/10	12:56:02	12:56:57	2	10.0	9.2	18.4	0.0	0.0
02/08/10	02/08/10	12:57:00	12:57:59	2	10.0	9.2	16.6	0.0	0.0
02/08/10	02/08/10	12:58:02	12:58:58	2	10.1	9.2	23.1	0.1	0.0
02/08/10	02/08/10	12:59:01	12:59:59	2	10.2	9.1	16.5	0.0	0.0
02/08/10	02/08/10	13:00:02	13:00:58	2	10.2	9.1	17.4	0.0	0.0

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/08/10	02/08/10	13:01:01	13:01:57	2	10.4	9.0	19.8	0.0	0.0
02/08/10	02/08/10	13:02:00	13:02:58	2	10.3	9.1	22.2	0.0	0.0
02/08/10	02/08/10	13:03:01	13:03:57	2	10.1	9.3	18.7	0.0	0.0
02/08/10	02/08/10	13:04:00	13:04:59	2	9.3	9.7	15.2	0.0	0.0
02/08/10	02/08/10	13:05:02	13:05:57	2	9.7	9.5	16.3	0.0	0.0
02/08/10	02/08/10	13:06:00	13:06:59	2	9.6	9.5	16.8	0.0	0.0
02/08/10	02/08/10	13:07:02	13:07:57	2	9.4	9.6	17.6	0.0	0.0
02/08/10	02/08/10	13:08:01	13:08:59	2	9.6	9.5	18.3	0.0	0.0
02/08/10	02/08/10	13:09:02	13:09:58	2	9.6	9.5	18.0	0.0	0.0
02/08/10	02/08/10	13:10:01	13:10:56	2	9.7	9.4	21.9	0.0	0.0
02/08/10	02/08/10	13:11:00	13:11:58	2	9.7	9.4	18.6	0.0	0.0
02/08/10	02/08/10	13:12:01	13:12:57	2	9.9	9.3	16.7	0.0	0.0
02/08/10	02/08/10	13:13:00	13:13:59	2	10.2	9.1	21.3	0.0	0.0
02/08/10	02/08/10	13:14:02	13:14:57	2	10.3	9.1	21.3	0.0	0.0
02/08/10	02/08/10	13:15:00	13:15:59	2	10.1	9.2	19.3	0.0	0.0
02/08/10	02/08/10	13:16:02	13:16:58	2	10.0	9.2	17.2	0.0	0.0
02/08/10	02/08/10	13:17:01	13:17:59	2	10.2	9.0	22.3	0.0	0.0
02/08/10	02/08/10	13:18:02	13:18:58	2	10.3	9.0	23.4	0.0	0.0
02/08/10	02/08/10	13:19:01	13:19:57	2	10.2	9.1	20.0	0.0	0.0
02/08/10	02/08/10	13:20:00	13:20:58	2	9.9	9.3	23.1	0.2	0.0
02/08/10	02/08/10	13:21:02	13:21:57	2	10.1	9.2	17.6	0.0	0.0
02/08/10	02/08/10	13:22:00	13:22:59	2	10.1	9.2	23.0	0.0	0.0
02/08/10	02/08/10	13:23:02	13:23:58	2	10.0	9.1	21.5	0.0	0.0
02/08/10	02/08/10	13:24:01	13:24:56	2	10.3	9.0	19.9	0.0	0.0
02/08/10	02/08/10	13:25:00	13:25:58	2	10.0	9.2	21.9	0.0	0.0
02/08/10	02/08/10	13:26:01	13:26:57	2	9.1	10.1	17.5	0.0	0.0
02/08/10	02/08/10	13:27:00	13:27:59	2	4.8	12.4	40.9	5.5	0.0
02/08/10	02/08/10	13:28:02	13:28:57	2	5.0	12.0	33.3	7.6	0.0
02/08/10	02/08/10	13:29:00	13:29:59	2	8.8	9.8	22.9	4.7	0.0
Average					9.7	9.4	19.9	0.4	0.0
Minimum Value					4.8	8.8	15.2	0.0	0.0
Maximum Value					10.5	12.4	40.9	7.6	0.0

Emission Report

MET Councle

St. Paul

Unit: 1

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/08/10	02/08/10	13:43:04	13:43:59	3	10.1	9.2	23.3	0.0	0.0
02/08/10	02/08/10	13:44:02	13:44:58	3	10.1	9.2	23.7	0.0	0.0
02/08/10	02/08/10	13:45:01	13:45:57	3	9.8	9.5	23.0	0.0	0.0
02/08/10	02/08/10	13:46:00	13:46:59	3	9.4	9.5	22.0	0.0	0.0
02/08/10	02/08/10	13:47:02	13:47:58	3	10.1	9.2	27.1	0.0	0.0
02/08/10	02/08/10	13:48:01	13:48:57	3	9.9	9.3	29.6	0.0	0.0
02/08/10	02/08/10	13:49:00	13:49:59	3	10.2	9.2	25.5	0.0	0.0
02/08/10	02/08/10	13:50:03	13:50:59	3	10.3	9.1	25.3	0.0	0.0
02/08/10	02/08/10	13:51:02	13:51:58	3	10.2	9.2	25.3	0.0	0.0
02/08/10	02/08/10	13:52:01	13:52:57	3	10.1	9.2	26.6	0.0	0.0
02/08/10	02/08/10	13:53:00	13:53:59	3	10.2	9.1	26.8	0.0	0.0
02/08/10	02/08/10	13:54:02	13:54:58	3	10.0	9.3	26.8	0.0	0.0
02/08/10	02/08/10	13:55:01	13:55:57	3	9.8	9.3	21.8	0.0	0.0
02/08/10	02/08/10	13:56:00	13:56:59	3	10.0	9.3	24.7	0.0	0.0
02/08/10	02/08/10	13:57:03	13:57:59	3	10.2	9.1	19.7	0.0	0.0
02/08/10	02/08/10	13:58:02	13:58:58	3	10.2	9.1	27.6	0.0	0.0
02/08/10	02/08/10	13:59:01	13:59:57	3	10.2	9.2	21.7	0.0	0.0
02/08/10	02/08/10	14:00:00	14:00:59	3	9.9	9.3	23.9	0.0	0.0
02/08/10	02/08/10	14:01:02	14:01:58	3	10.3	9.0	21.1	0.4	0.0
02/08/10	02/08/10	14:02:01	14:02:57	3	10.3	9.0	29.2	0.0	0.0
02/08/10	02/08/10	14:03:00	14:03:59	3	10.4	9.0	27.5	0.0	0.0
02/08/10	02/08/10	14:04:02	14:04:59	3	10.2	9.1	29.1	0.0	0.0
02/08/10	02/08/10	14:05:02	14:05:58	3	10.1	9.2	25.1	0.0	0.0
02/08/10	02/08/10	14:06:01	14:06:58	3	9.9	9.3	22.7	0.0	0.0
02/08/10	02/08/10	14:07:01	14:07:57	3	10.0	9.2	28.3	0.1	0.0
02/08/10	02/08/10	14:08:00	14:08:59	3	10.2	9.2	21.7	0.0	0.0
02/08/10	02/08/10	14:09:02	14:09:58	3	10.2	9.1	22.8	0.0	0.0
02/08/10	02/08/10	14:10:01	14:10:57	3	10.0	9.2	24.3	0.1	0.0
02/08/10	02/08/10	14:11:00	14:11:59	3	10.0	9.3	28.5	0.0	0.0
02/08/10	02/08/10	14:12:03	14:12:58	3	9.8	9.4	22.6	0.0	0.0
02/08/10	02/08/10	14:13:01	14:13:57	3	9.9	9.4	22.5	0.0	0.0

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/08/10	02/08/10	14:14:00	14:14:59	3	9.7	9.6	22.0	0.0	0.0
02/08/10	02/08/10	14:15:03	14:15:58	3	9.1	9.8	18.9	0.0	0.0
02/08/10	02/08/10	14:16:02	14:16:57	3	9.6	9.5	20.7	0.0	0.0
02/08/10	02/08/10	14:17:00	14:17:56	3	9.8	9.5	26.4	0.0	0.0
02/08/10	02/08/10	14:18:00	14:18:59	3	9.5	9.5	25.6	0.0	0.0
02/08/10	02/08/10	14:19:02	14:19:58	3	10.0	9.2	28.4	0.0	0.0
02/08/10	02/08/10	14:20:01	14:20:57	3	9.9	9.4	26.5	0.0	0.0
02/08/10	02/08/10	14:21:00	14:21:59	3	9.8	9.4	23.4	0.4	0.0
02/08/10	02/08/10	14:22:02	14:22:58	3	10.0	9.2	26.4	0.0	0.0
02/08/10	02/08/10	14:23:01	14:23:57	3	9.9	9.3	22.4	0.0	0.0
02/08/10	02/08/10	14:24:00	14:24:59	3	9.7	9.4	25.3	0.0	0.0
02/08/10	02/08/10	14:25:02	14:25:58	3	10.0	9.2	23.0	0.0	0.0
02/08/10	02/08/10	14:26:01	14:26:57	3	9.6	9.6	25.6	0.0	0.0
02/08/10	02/08/10	14:27:00	14:27:59	3	9.6	9.5	22.7	0.0	0.0
02/08/10	02/08/10	14:28:02	14:28:58	3	10.0	9.2	27.3	0.0	0.0
02/08/10	02/08/10	14:29:01	14:29:57	3	10.1	9.2	29.3	0.0	0.0
02/08/10	02/08/10	14:30:00	14:30:59	3	9.6	9.6	29.1	0.0	0.0
02/08/10	02/08/10	14:31:02	14:31:58	3	10.0	9.2	30.8	0.0	0.0
02/08/10	02/08/10	14:32:01	14:32:57	3	9.7	9.5	28.4	0.0	0.0
02/08/10	02/08/10	14:33:01	14:33:56	3	9.8	9.4	24.4	0.0	0.0
02/08/10	02/08/10	14:34:00	14:34:59	3	9.8	9.4	30.2	0.0	0.0
02/08/10	02/08/10	14:35:02	14:35:58	3	9.9	9.4	25.8	0.0	0.0
02/08/10	02/08/10	14:36:01	14:36:57	3	9.9	9.3	30.2	0.0	0.0
02/08/10	02/08/10	14:37:00	14:37:59	3	10.0	9.3	34.3	0.0	0.0
02/08/10	02/08/10	14:38:02	14:38:58	3	10.0	9.3	27.2	0.0	0.0
02/08/10	02/08/10	14:39:01	14:39:57	3	10.0	9.3	31.0	0.0	0.0
02/08/10	02/08/10	14:40:00	14:40:59	3	10.0	9.2	27.9	0.0	0.0
02/08/10	02/08/10	14:41:02	14:41:58	3	10.0	9.3	26.8	0.0	0.0
02/08/10	02/08/10	14:42:01	14:42:57	3	9.8	9.5	29.3	0.2	0.0
Average					10.0	9.3	25.7	0.0	0.0
Minimum Value					9.1	9.0	18.9	0.0	0.0
Maximum Value					10.4	9.8	34.3	0.4	0.0

AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2/8/2010
Facility	Metro	Start/Stop Time	7:50 - 11:53
Unit	FBR 1	Test Method	EPA 23
Location	Stack	Run Number	1
Project #	902630	Description	Dioxin/Furan
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	15	°F	# Ports	2	Meter Box #	AB 3	ID#	2320003
Pbar	29.45	In Hg	# Points	12	Nozzle Dia. (in)	0.197	ID#	224115
Filter #	Trap # 3		Time/Pt	20	Probe ID #	221018	Pitot ID #	
MF #			Port Order		del H @	1.889		
Pstack	-0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	unit 1 run 1 M23		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.013	18	nt	7:14	Pre	O2	10.00	10.00	10.00	10.00
Post	0.01	12	nt	11:56	ok	CO2	9.20	9.20	9.20	9.20
					≤ 0.02 cfm or 4 % of Sample Rate Stable @ $\geq 3"$ 15 sec					

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	End	Start	Diff	ID #
					#1	393.4	361.5		261048
					#2	703.6	707.2		261003
					#3	691.5	693.3		261173
					#4	618.3	615.8		261115
					#5	896.4	864.7		261062
					#6				
					#7				
					#8	0.0	0.0		
					Total	3303.2	3242.5	60.7	

Post Field Meter Calibration			Set Vacuum = 17"			Collect 5 cf per run		
Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
Enter on Run 3 Sheet								

TC Field Calibration	
Ref °F	Probe TC °F
≤ 1.5 % (Absolute Temp)	

Comments

Date	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out	
Average					240	1.22	1.60	163.35	8.0	232.3	249.6	251.6	62.4	108.7	93.9
2/8/2010	7:51:02 AM		1	1	1	0.88	1.9	0.708	7.6	227	249.5	252	74.3	88.4	83.8
2/8/2010	7:52:02 AM		1	1	2	0.88	0.91	1.199	4.5	229.8	249.2	250.5	73.8	92.6	83.7
2/8/2010	7:53:02 AM		1	1	3	0.9	1.12	1.755	5.2	230.4	249.6	254.4	73.2	95.7	83.9
2/8/2010	7:54:02 AM		1	1	4	0.91	1.16	2.317	5.4	230.2	249.3	249.7	72.7	98.5	84.1
2/8/2010	7:55:02 AM		1	1	5	0.9	1.19	2.888	5.5	230.3	249.7	253.1	71.5	100.6	84.3
2/8/2010	7:56:02 AM		1	1	6	0.89	1.17	3.455	5.4	230.3	249.4	249.8	70.1	102.2	84.6
2/8/2010	7:57:03 AM		1	1	7	0.9	1.17	4.021	5.4	230.3	249.8	252.4	69	103.5	84.9
2/8/2010	7:58:03 AM		1	1	8	0.89	1.21	4.599	5.6	230.2	249.4	248.9	68.8	104.6	85.2
2/8/2010	7:59:03 AM		1	1	9	0.9	1.17	5.165	5.4	230	249.5	253.7	68.8	105.5	85.5
2/8/2010	8:00:03 AM		1	1	10	0.9	1.17	5.732	5.4	230	249.2	248.9	68	106.2	85.9
2/8/2010	8:01:03 AM		1	1	11	0.93	1.2	6.306	5.5	230	249.8	253.7	67.8	106.8	86.3
2/8/2010	8:02:03 AM		1	1	12	0.9	1.18	6.876	5.5	229.8	249.6	249.1	67.9	107.4	86.6
2/8/2010	8:03:03 AM		1	1	13	0.89	1.17	7.443	5.4	230.4	249.7	254.1	67.8	107.8	87
2/8/2010	8:04:03 AM		1	1	14	0.9	1.16	8.009	5.4	230.2	249.9	251.1	67.7	108.2	87.3
2/8/2010	8:05:03 AM		1	1	15	0.89	1.16	8.576	5.4	230.1	249.4	251.6	67.8	108.5	87.6
2/8/2010	8:06:03 AM		1	1	16	0.9	1.16	9.143	5.4	230.1	249.7	251.6	67.6	108.8	88
2/8/2010	8:07:03 AM		1	1	17	0.9	1.17	9.712	5.5	230.1	249.1	250.6	67.6	109.1	88.3
2/8/2010	8:08:01 AM		1	1	18	0.9	1.2	10.269	5.6	230	249.9	252.8	67.6	109.4	88.7
2/8/2010	8:09:03 AM		1	1	19	0.97	1.25	10.88	5.7	230.5	249.5	250.6	67.5	109.7	89
2/8/2010	8:10:03 AM		1	2	20	1.1	1.43	11.516	6.4	231.1	249.9	252.8	67.6	110.2	89.4
2/8/2010	8:11:03 AM		1	2	21	1.08	1.44	12.156	6.4	231.1	249.1	249.2	67.5	110.6	89.7
2/8/2010	8:12:03 AM		1	2	22	1.09	1.41	12.786	6.3	231	249.7	254.8	67.4	110.8	90
2/8/2010	8:13:03 AM		1	2	23	1.06	1.4	13.415	6.3	230.9	249.5	249.7	67.4	111	90.3
2/8/2010	8:14:01 AM		1	2	24	1.06	1.38	14.018	6.2	231	249.5	253.2	67.1	111.1	90.6
2/8/2010	8:15:01 AM		1	2	25	1.07	1.38	14.645	6.2	230.9	249.4	249.4	66.8	111.2	91
2/8/2010	8:16:01 AM		1	2	26	1.07	1.38	15.271	6.2	230.9	249.6	253.3	66.6	111.4	91.3
2/8/2010	8:17:01 AM		1	2	27	1.07	1.41	15.903	6.3	230.9	249.6	248.7	66.6	111.5	91.6
2/8/2010	8:18:01 AM		1	2	28	1.09	1.47	16.55	6.5	230.8	249.6	254.2	66.4	111.7	91.9
2/8/2010	8:19:03 AM		1	2	29	1.1	1.44	17.212	6.4	230.8	249.4	251.1	66.4	111.8	92.2
2/8/2010	8:20:01 AM		1	2	30	1.06	1.36	17.814	7	230.7	249.4	251.4	66.3	111.9	92.4
2/8/2010	8:21:03 AM		1	2	31	1.08	1.41	18.468	7.5	230.8	249.6	254.7	66.2	111.9	92.7
2/8/2010	8:22:03 AM		1	2	32	1.07	1.43	19.106	7.6	230.7	249.2	249.3	65.7	112	93
2/8/2010	8:23:03 AM		1	2	33	1.08	1.44	19.747	7.6	230.6	249.6	254.5	65.6	112	93.2
2/8/2010	8:24:03 AM		1	2	34	1.07	1.43	20.389	7.6	230.8	249.5	249.1	65.7	112.1	93.5
2/8/2010	8:25:01 AM		1	2	35	1.07	1.43	21.008	7.6	230.7	249.7	253.4	64.9	112.1	93.8
2/8/2010	8:26:01 AM		1	2	36	1.1	1.46	21.655	7.6	230.5	250.1	251.8	64.8	112.2	94.1
2/8/2010	8:27:01 AM		1	2	37	1.08	1.43	22.295	7.6	230.7	249.5	251.2	64.8	112.3	94.3
2/8/2010	8:28:01 AM		1	2	38	1.08	1.45	22.941	7.6	230.6	249.7	250.6	64.7	112.3	94.5
2/8/2010	8:29:03 AM		1	2	39	1.17	1.48	23.615	7.7	231	249.4	252.3	64.7	112.3	94.7
2/8/2010	8:30:01 AM		1	3	40	1.26	1.6	24.275	8.2	231.4	249.6	253.5	64.8	112.5	94.9
2/8/2010	8:31:01 AM		1	3	41	1.25	1.64	24.964	8.3	231.4	249.1	249.6	64.5	112.7	95.1
2/8/2010	8:32:01 AM		1	3	42	1.24	1.68	25.663	8.5	231.4	249.6	253.4	64.5	112.9	95.4
2/8/2010	8:33:03 AM		1	3	43	1.24	1.67	26.382	8.4	231.4	249.2	248.8	64.8	112.9	95.6
2/8/2010	8:34:03 AM		1	3	44	1.22	1.62	27.07	8.2	231.5	249.5	254.8	64.9	113	95.8
2/8/2010	8:35:03 AM		1	3	45	1.23	1.58	27.748	8.1	231.5	249.5	249.3	64.9	112.9	96
2/8/2010	8:36:01 AM		1	3	46	1.26	1.65	28.417	8.3	231.5	249.6	253.7	64.9	112.9	96.3
2/8/2010	8:37:01 AM		1	3	47	1.23	1.66	29.111	8.4	231.5	249.3	250.2	64.9	113	96.5
2/8/2010	8:38:01 AM		1	3	48	1.24	1.6	29.792	8.2	231.5	249.4	252.2	64.9	113	96.6
2/8/2010	8:39:01 AM		1	3	49	1.25	1.67	30.491	8.4	231.4	249.5	249.5	65	113.1	96.8
2/8/2010	8:40:02 AM		1	3	50	1.24	1.68	31.195	8.5	231.4	249.5	252.8	65	113.2	97
2/8/2010	8:41:02 AM		1	3	51	1.25	1.69	31.899	8.5	231.3	249.8	251	64.9	113.2	97.2
2/8/2010	8:42:02 AM		1	3	52	1.24	1.62	32.588	8.3	231.3	249.9	252.7	64.9	113.3	97.3
2/8/2010	8:43:02 AM		1	3	53	1.25	1.65	33.284	8.3	231.1	249.9	252.6	65.1	113.4	97.5
2/8/2010	8:44:02 AM		1	3	54	1.22	1.66	33.983	8.4	231.2	249.2	250.2	65	113.5	97.7
2/8/2010	8:45:02 AM		1	3	55	1.25	1.63	34.674	8.3	231	249.8	253.2	65	113.5	97.8
2/8/2010	8:46:02 AM		1	3	56	1.25	1.62	35.363	8.2	231.1	249.2	249.3	65.1	113.6	98
2/8/2010	8:47:02 AM		1	3	57	1.24	1.66	36.061	8.4	230.9	249.6	254	65	113.7	98.1
2/8/2010	8:48:02 AM		1	3	58	1.23	1.66	36.759	8.5	230.9	249.1	249.2	65.1	113.7	98.3
2/8/2010	8:49:02 AM		1	3	59	1.55	1.7	37.468	8.5	231	249.4	253.1	65.1	113.8	98.4
2/8/2010	8:50:02 AM		1	4	60	1.85	1.96	38.232	9.4	231.2	249.4	249.8	64.8	114.1	98.6
2/8/2010	8:51:02 AM		1	4	61	1.84	2.24	39.048	10.4	231.3	249.7	254.2	64.6	114.3	98.8
2/8/2010	8:52:02 AM		1	4	62	1.85	2.4	39.898	11.1	231.3	249.3	248.7	64.9	114.4	99
2/8/2010	8:53:02 AM		1	4	63	1.58	2.29	40.725	10.8	231.4	249.6	254	65.1	114.2	99.1
2/8/2010	8:54:02 AM		1	4	64	1.54	2.11	41.519	10	231.4	249.8	249.8	65.1	114.1	99.3
2/8/2010	8:55:02 AM		1	4	65	1.55	2.09	42.307	9.9	231.4	249.9	253	65.3	114	99.5
2/8/2010	8:56:01 AM		1	4	66	1.56	2.08	43.072	9.9	231.4	249.8	250.4	65.5	114	99.6
2/8/2010	8:57:01 AM		1	4	67	1.41	2.04	43.853	9.8	231.6	249.7	252.5	65.8	114.1	99.7
2/8/2010	8:58:01 AM		1	4	68	1.37	1.89	44.601	9.2	231.7	249.7	250.1	66.2	114	99.8
2/8/2010	8:59:01 AM		1	4	69	1.37	1.86	45.346	9.1	231.7	249.7	252.8	66.4	114.1	100
2/8/2010	9:00:03 AM		1	4	70	1.35	1.85	46.107	9	231.8	249.2	250.9	66.6	114.2	100.1
2/8/2010	9:01:01 AM		1	4	71	1.35	1.83	46.823	9	231.7	249.2	251.7	66.8	114.3	100.2
2/8/2010	9:02:01 AM		1	4	72	1.36	1.82	47.559	8.9	231.7	249.4	251.6	67	114.4	100.3
2/8/2010	9:03:01 AM		1	4	73	1.35	1.83	48.295	8.9	231.7	249.4	251.2	67.1	114.5	100.4
2/8/2010	9:04:01 AM		1	4	74	1.36	1.83	49.031	8.9	231.5	249.6	252.9	67	114.6	100.5
2/8/2010	9:05:02 AM		1	4	75	1.35	1.83	49.769	8.9	231.6	249.5	250	66.7	114.6	100.6
2/8/2010	9:06:02 AM		1	4	76	1.37	1.83	50.508	8.9	231.5	250.2	253.1	66.4	114.7	100.7
2/8/2010	9:07:02 AM		1	4	77	1.36	1.83	51.245	8.9	231.4	249.5	249.1	66.2	114.7	100.8
2/8/2010	9:08:02 AM		1	4	78	1.36	1.82	51.982	8.9	231.4	249.7	254.7	66.1	114.7	100.9
2/8/2010	9:09:02 AM		1	4	79	1.34	1.82	52.717	8.9	231.5	249.5	249.1	65.9	114.8	101
2/8/2010	9:10:02 AM		1	5	80	1.34	1.82	53.448	8.8	231.5	249.5	253.6	65.8	114.9	101.1
2/8/2010	9:11:02 AM		1	5	81	1.34	1.8	54.178	8.8	231.4	249.6	249.7	65.7	115	101.3
2/8/2010	9:12:02 AM		1	5	82	1.36	1.8	54.907	8.8	231.4	249.6	253.7	65.5	115.1	101.4
2/8/2010	9:13:02 AM		1	5											

2/8/2010	9:15:02 AM	1	5	85	1.36	1.75	57.083	8.7	231.4	249.5	250	65.3	115.2	101.6
2/8/2010	9:16:03 AM	1	5	86	1.33	1.78	57.809	8.7	231.3	249.5	253.2	65.2	115.2	101.7
2/8/2010	9:17:01 AM	1	5	87	1.33	1.77	58.511	8.7	231.4	249.8	251.1	65.1	115.3	101.8
2/8/2010	9:18:01 AM	1	5	88	1.34	1.77	59.238	8.7	231.5	249.8	251.6	65	115.3	101.9
2/8/2010	9:19:03 AM	1	5	89	1.37	1.79	59.99	8.8	231.6	250.3	251.6	65	115.3	102
2/8/2010	9:20:01 AM	1	5	90	1.4	1.81	60.699	8.8	231.6	249.5	250.8	64.8	115.4	102
2/8/2010	9:21:03 AM	1	5	91	1.37	1.82	61.46	8.9	231.5	249.8	253.2	64.9	115.5	102.1
2/8/2010	9:22:01 AM	1	5	92	1.4	1.82	62.17	8.9	230.2	249.4	249	63.9	113.9	100.8
2/8/2010	9:23:01 AM	1	5	93	1.35	1.81	62.907	8.9	228.9	249.4	253.8	63.1	111	99.1
2/8/2010	9:24:01 AM	1	5	94	1.37	1.82	63.642	8.9	228.8	249.4	249.1	63.1	109.7	99
2/8/2010	9:25:01 AM	1	5	95	1.37	1.82	64.376	8.9	229.1	249.5	254	63	109	99
2/8/2010	9:26:02 AM	1	5	96	1.37	1.82	65.112	8.8	229.3	249.5	249.6	62.8	108.5	98.8
2/8/2010	9:27:02 AM	1	5	97	1.37	1.81	65.849	8.8	229.2	249.6	254	62.3	108.1	98.4
2/8/2010	9:28:02 AM	1	5	98	1.38	1.81	66.582	8.8	229.5	249.6	249.8	62.1	108.1	98.3
2/8/2010	9:29:02 AM	1	5	99	1.35	1.81	67.315	8.8	229.5	249.5	252.6	61.9	107.9	98
2/8/2010	9:30:02 AM	1	6	100	1.29	1.75	68.034	8.6	229.6	250	251.7	61.9	107.8	97.8
2/8/2010	9:31:02 AM	1	6	101	1.27	1.72	68.748	8.5	229.5	249.7	251.7	61.5	107.6	97.6
2/8/2010	9:32:02 AM	1	6	102	1.26	1.68	69.451	8.3	229.8	249.9	252.1	61.6	107.7	97.4
2/8/2010	9:33:02 AM	1	6	103	1.26	1.66	70.148	8.2	230.1	249.8	251	61.4	107.8	97.3
2/8/2010	9:34:02 AM	1	6	104	1.26	1.65	70.846	8.2	230.1	249.8	253.2	61.1	107.8	97.1
2/8/2010	9:35:02 AM	1	6	105	1.27	1.65	71.544	8.2	230.4	249.4	249.7	60.8	107.8	96.8
2/8/2010	9:36:02 AM	1	6	106	1.25	1.64	72.236	8.2	230.6	249.7	253.7	60.7	107.9	96.7
2/8/2010	9:37:02 AM	1	6	107	1.28	1.61	72.922	8.1	230.5	249.6	248.9	60.3	107.7	96.3
2/8/2010	9:38:02 AM	1	6	108	1.25	1.63	73.613	8.1	230.6	249.8	253.7	60.1	107.7	95.8
2/8/2010	9:39:02 AM	1	6	109	1.26	1.62	74.304	8.1	230.7	249.5	249.3	60.1	107.7	95.6
2/8/2010	9:40:02 AM	1	6	110	1.29	1.65	75	8.2	230.8	249.6	253.5	60	107.8	95.5
2/8/2010	9:41:02 AM	1	6	111	1.26	1.68	75.704	8.3	230.7	250.1	249.5	59.7	107.8	95.2
2/8/2010	9:42:02 AM	1	6	112	1.28	1.69	76.407	8.3	230.5	249.9	253.2	59.6	107.8	95
2/8/2010	9:43:02 AM	1	6	113	1.25	1.68	77.111	8.3	230.5	250.2	251.1	59.6	107.7	94.8
2/8/2010	9:44:02 AM	1	6	114	1.29	1.67	77.814	8.3	230.5	249.7	251.6	59.5	107.6	94.7
2/8/2010	9:45:02 AM	1	6	115	1.26	1.67	78.514	8.3	230.6	249.7	252.3	59.5	107.6	94.6
2/8/2010	9:46:02 AM	1	6	116	1.28	1.65	79.211	8.2	230.5	249.3	249.8	59.3	107.6	94.5
2/8/2010	9:47:03 AM	1	6	117	1.25	1.66	79.911	8.2	230.5	249.7	253.6	59.3	107.5	94.4
2/8/2010	9:48:03 AM	1	6	118	1.28	1.66	80.609	8.2	230.7	249.5	249.3	59.5	107.6	94.4
2/8/2010	9:49:03 AM	1	6	119	1.25	1.66	81.306	8.2	230.6	249.9	254.3	59.4	107.5	94.2
2/8/2010	9:50:03 AM	2	1	120	1.29	1.67	81.993	8.3	230.6	249.7	249.2	59.3	107.5	94.1
2/8/2010	9:54:01 AM	2	1	121	1.1	1.76	82.712	8	230.1	249.7	251.4	64.8	100	93.7
2/8/2010	9:55:01 AM	2	1	122	1.1	1.48	83.368	7.8	230.4	249.6	250.9	61.2	103.1	93.1
2/8/2010	9:56:01 AM	2	1	123	1.1	1.45	84.016	7.7	230.5	249.6	253.5	60.5	104.6	93.1
2/8/2010	9:57:01 AM	2	1	124	1.09	1.43	84.661	7.6	230.5	249.4	249.3	60.1	105.3	92.9
2/8/2010	9:58:01 AM	2	1	125	1.08	1.44	85.305	7.6	230.4	249.8	253.9	59.7	105.7	92.8
2/8/2010	9:59:01 AM	2	1	126	1.12	1.44	85.952	7.6	230.5	249.7	248.8	59.5	106.1	92.8
2/8/2010	10:00:01 AM	2	1	127	1.09	1.44	86.601	7.7	230.5	249.7	254.4	59.3	106.3	92.7
2/8/2010	10:01:01 AM	2	1	128	1.11	1.43	87.245	7.6	230.6	250	250.6	59.2	106.7	92.8
2/8/2010	10:02:01 AM	2	1	129	1.09	1.43	87.891	7.6	230.6	249.2	252.2	59	106.6	92.7
2/8/2010	10:03:01 AM	2	1	130	1.1	1.44	88.535	7.6	230.5	249.4	251.7	58.9	106.6	92.6
2/8/2010	10:04:01 AM	2	1	131	1.09	1.43	89.18	7.6	230.7	248.8	250.8	59.1	106.8	92.7
2/8/2010	10:05:01 AM	2	1	132	1.1	1.43	89.825	7.6	230.6	249.6	254.1	59.1	106.9	92.6
2/8/2010	10:06:01 AM	2	1	133	1.09	1.44	90.47	7.7	230.7	249.1	248.8	59.3	106.9	92.6
2/8/2010	10:07:01 AM	2	1	134	1.12	1.45	91.121	7.7	230.5	249.4	253.8	59.4	106.9	92.5
2/8/2010	10:08:01 AM	2	1	135	1.08	1.44	91.768	7.7	230.3	249	249.3	59.5	106.9	92.4
2/8/2010	10:09:01 AM	2	1	136	1.11	1.44	92.416	7.7	230.5	249.5	253.5	59.7	106.9	92.4
2/8/2010	10:10:01 AM	2	1	137	1.09	1.45	93.065	7.7	230.4	249.6	250.2	59.7	106.8	92.3
2/8/2010	10:11:01 AM	2	1	138	1.1	1.45	93.713	7.7	230.3	249.9	252.4	59.9	106.7	92.3
2/8/2010	10:12:02 AM	2	1	139	1.17	1.47	94.368	7.8	230.6	250	251.1	60.1	106.8	92.4
2/8/2010	10:13:02 AM	2	2	140	1.16	1.51	95.034	8	230.9	249.7	251	60.2	107	92.5
2/8/2010	10:14:02 AM	2	2	141	1.14	1.51	95.697	8	230.7	249.7	252.7	60.1	106.9	92.4
2/8/2010	10:15:02 AM	2	2	142	1.15	1.51	96.36	8	230.8	249.4	250.4	60.2	106.8	92.3
2/8/2010	10:16:02 AM	2	2	143	1.14	1.51	97.023	8	230.9	249.8	252.1	60.2	106.9	92.4
2/8/2010	10:17:02 AM	2	2	144	1.14	1.5	97.686	7.9	231	249.2	249.9	60.3	107.1	92.6
2/8/2010	10:18:02 AM	2	2	145	1.17	1.5	98.35	8	231	249.6	253.6	60.3	107.1	92.5
2/8/2010	10:19:02 AM	2	2	146	1.14	1.51	99.013	8	231	248.8	249.4	60.3	107.2	92.5
2/8/2010	10:20:02 AM	2	2	147	1.15	1.52	99.678	8	230.9	249.4	253.6	60.5	107.1	92.4
2/8/2010	10:21:02 AM	2	2	148	1.15	1.51	100.341	8	230.9	249	249.6	60.5	107	92.4
2/8/2010	10:22:02 AM	2	2	149	1.14	1.5	101.004	7.9	231.2	249.3	252.8	60.8	107.2	92.6
2/8/2010	10:23:02 AM	2	2	150	1.15	1.5	101.663	7.9	231.1	249.4	249.7	60.7	107.2	92.5
2/8/2010	10:24:00 AM	2	2	151	1.15	1.5	102.301	8	231.1	249.6	254	60.7	107.2	92.4
2/8/2010	10:25:02 AM	2	2	152	1.15	1.51	102.985	8	231.1	249.5	249	60.9	107.1	92.4
2/8/2010	10:26:02 AM	2	2	153	1.16	1.51	103.648	8	231	249.7	253.5	60.9	106.9	92.3
2/8/2010	10:27:02 AM	2	2	154	1.16	1.51	104.313	8	231.3	249.9	249.3	61.2	107.1	92.5
2/8/2010	10:28:02 AM	2	2	155	1.15	1.53	104.979	8	231.4	249.7	253.1	61.1	107.2	92.6
2/8/2010	10:29:02 AM	2	2	156	1.14	1.52	105.646	8	231.4	250.1	249.5	61.1	107.1	92.5
2/8/2010	10:30:02 AM	2	2	157	1.05	1.46	106.295	7.8	231.4	249.6	253.5	61.1	106.9	92.4
2/8/2010	10:31:02 AM	2	2	158	0.95	1.28	106.902	7.2	231.8	249.8	251.3	61.3	106.6	92.4
2/8/2010	10:32:00 AM	2	2	159	1.02	1.31	107.495	7.2	232.5	249.2	251.1	61.6	106.4	92.5
2/8/2010	10:33:00 AM	2	3	160	1.12	1.42	108.134	7.6	233	249.4	253.8	61.5	106.8	92.6
2/8/2010	10:34:00 AM	2	3	161	1.11	1.44	108.779	7.7	233.1	248.7	248.8	61.7	106.9	92.5
2/8/2010	10:35:00 AM	2	3	162	1.1	1.44	109.424	7.7	233.1	249.1	254.8	61.7	106.8	92.4
2/8/2010	10:36:00 AM	2	3	163	1.06	1.44	110.07	7.7	233.4	249	249.5	61.6	106.7	92.4
2/8/2010	10:37:00 AM	2	3	164	1.05	1.42	110.708	7.6	233.7	249.4	252.7	61.5	106.6	92.4
2/8/2010	10:38:00 AM	2	3	165	1.06	1.41	111.345	7.6	234	249.7	251.2	61.4	106.8	92.5
2/8/2010	10:39:00 AM	2	3	166	1.05	1.4	111.979	7.5	234.2	249.7	251.1	61.2	106.9	92.5
2/8/2010	10:40:00 AM	2	3	167	1.06	1.39	112.613	7.5	234.2	250.2	253	61	106.9	92.5
2/8/2010	10:41:00 AM	2	3	168	1.05	1.39	113.246	7.5	234.2	249.7	249.8	60.8	106.8	92.3
2/8/2010	10:42:02 AM	2	3	169	1.05	1.39	113.899	7.5	234.2	249.7	254.6	60.7	106.7	92.3
2/8/2010	10:4													

2/8/2010	10:44:01 AM	2	3	171	1.05	1.36	115.131	7.4	234.6	250	254.5	60.7	106	92.1
2/8/2010	10:45:01 AM	2	3	172	1.04	1.36	115.757	7.4	235.1	249.7	249.8	60.7	106.1	92.3
2/8/2010	10:46:01 AM	2	3	173	1.05	1.36	116.384	7.4	235.4	249.5	252.8	60.7	106.5	92.4
2/8/2010	10:47:01 AM	2	3	174	1.05	1.36	117.011	7.4	235.7	249.6	251.4	60.7	106.6	92.4
2/8/2010	10:48:01 AM	2	3	175	1.03	1.37	117.638	7.4	236	248.9	251.3	60.5	106.6	92.3
2/8/2010	10:49:01 AM	2	3	176	1.04	1.37	118.263	7.4	236.3	249.3	251.2	60.5	106.7	92.3
2/8/2010	10:50:01 AM	2	3	177	1.02	1.37	118.887	7.4	236.5	249	251.9	60.4	106.6	92.3
2/8/2010	10:51:01 AM	2	3	178	1.03	1.34	119.506	7.3	236.6	249.5	251	60.3	106.2	92
2/8/2010	10:52:01 AM	2	3	179	1.1	1.36	120.131	7.4	237	249.3	251.8	60.3	106.2	92.1
2/8/2010	10:53:01 AM	2	4	180	1.14	1.42	120.773	7.6	237.4	249.5	253.5	60.4	106.4	92.2
2/8/2010	10:54:01 AM	2	4	181	1.14	1.44	121.418	7.7	237.4	249.5	250.1	60.4	106.4	92.1
2/8/2010	10:55:01 AM	2	4	182	1.14	1.46	122.067	7.7	237.7	249.6	254.3	60.5	106.6	92.2
2/8/2010	10:56:01 AM	2	4	183	1.15	1.46	122.715	7.7	237.7	249.8	248.8	60.1	106.7	92.2
2/8/2010	10:57:01 AM	2	4	184	1.14	1.47	123.366	7.7	237.6	250	255.2	60.3	106.6	92.1
2/8/2010	10:58:01 AM	2	4	185	1.14	1.46	124.017	7.7	237.7	249.8	250.9	60.4	106.5	92.2
2/8/2010	10:59:01 AM	2	4	186	1.14	1.46	124.667	7.7	237.9	249.8	252.7	60.2	106.8	92.4
2/8/2010	11:00:02 AM	2	4	187	1.13	1.46	125.314	7.7	237.8	250	250.4	59.9	106.6	92.2
2/8/2010	11:01:00 AM	2	4	188	1.2	1.48	125.95	7.8	237.7	249.8	252.3	59.8	106.8	92.2
2/8/2010	11:02:00 AM	2	4	189	1.3	1.6	126.633	8.2	237.5	249.5	250.2	59.7	106.9	92.2
2/8/2010	11:03:02 AM	2	4	190	1.34	1.67	127.351	8.4	237.3	249.5	251.9	59.5	107	92.2
2/8/2010	11:04:00 AM	2	4	191	1.35	1.7	128.033	8.6	237.3	249.5	249.7	59.3	107.1	92.3
2/8/2010	11:05:00 AM	2	4	192	1.36	1.73	128.745	8.7	237.1	249.6	253	59.1	106.8	92
2/8/2010	11:06:00 AM	2	4	193	1.38	1.75	129.458	8.7	237.3	249.8	250.4	59.2	107	92.3
2/8/2010	11:07:00 AM	2	4	194	1.38	1.75	130.173	8.8	237.2	249.7	252.2	58.8	107	92.3
2/8/2010	11:08:02 AM	2	4	195	1.4	1.76	130.915	8.8	237.1	249.9	251.8	58.7	107.1	92.4
2/8/2010	11:09:02 AM	2	4	196	1.4	1.78	131.639	8.9	237.3	249.4	250.3	58.8	107.3	92.5
2/8/2010	11:10:02 AM	2	4	197	1.41	1.8	132.365	8.9	237.2	249.7	252.5	58.7	107.3	92.4
2/8/2010	11:11:00 AM	2	4	198	1.41	1.8	133.066	9	237.3	249.2	250.1	58.8	107.4	92.5
2/8/2010	11:12:00 AM	2	4	199	1.42	1.8	133.792	8.9	237.2	249.6	251.6	59.1	107.4	92.5
2/8/2010	11:13:00 AM	2	5	200	1.43	1.82	134.521	9	237.1	249.2	250.8	59.3	107.6	92.6
2/8/2010	11:14:00 AM	2	5	201	1.41	1.84	135.253	9.1	237	249.4	252.5	59.2	107.5	92.5
2/8/2010	11:15:00 AM	2	5	202	1.43	1.83	135.983	9	236.8	249.4	250.1	59.1	107.4	92.5
2/8/2010	11:16:01 AM	2	5	203	1.42	1.82	136.714	9	236.8	249.9	253.5	59	107.2	92.4
2/8/2010	11:17:01 AM	2	5	204	1.43	1.81	137.45	9	236.7	249.4	248.8	59	107.1	92.5
2/8/2010	11:18:01 AM	2	5	205	1.43	1.83	138.185	9.1	236.6	250.1	255.1	58.8	107.2	92.6
2/8/2010	11:19:01 AM	2	5	206	1.43	1.82	138.911	9	236.3	249.8	249.4	58.8	107.2	92.6
2/8/2010	11:20:01 AM	2	5	207	1.43	1.83	139.642	9.1	236	249.9	253.7	58.9	107.1	92.6
2/8/2010	11:21:01 AM	2	5	208	1.43	1.81	140.373	9.1	235.9	249.9	250.5	58.9	107.1	92.7
2/8/2010	11:22:01 AM	2	5	209	1.4	1.82	141.108	9.1	235.7	249.5	252.6	58.6	107.1	92.6
2/8/2010	11:23:01 AM	2	5	210	1.39	1.82	141.842	9.1	235.5	249.5	250.7	58.6	107.1	92.6
2/8/2010	11:24:01 AM	2	5	211	1.4	1.84	142.575	9.1	235.2	249.5	252.2	58.6	107	92.5
2/8/2010	11:25:01 AM	2	5	212	1.4	1.82	143.309	9.1	235.1	249.7	250.7	58.7	107	92.7
2/8/2010	11:26:01 AM	2	5	213	1.39	1.82	144.043	9.1	235.1	249.4	250.9	58.6	107	92.7
2/8/2010	11:27:01 AM	2	5	214	1.4	1.84	144.776	9.1	235	249.8	253.5	58.8	107.1	92.8
2/8/2010	11:28:02 AM	2	5	215	1.41	1.8	145.509	9.1	234.7	249.5	249.3	58.6	107	92.6
2/8/2010	11:29:01 AM	2	5	216	1.41	1.8	146.238	9.1	234.4	249.8	254.5	58.7	106.7	92.3
2/8/2010	11:30:01 AM	2	5	217	1.41	1.79	146.966	9	234.5	249.5	249.3	58.9	106.8	92.6
2/8/2010	11:31:01 AM	2	5	218	1.41	1.81	147.698	9	234.4	249.9	253.2	58.7	106.9	92.7
2/8/2010	11:32:01 AM	2	5	219	1.35	1.81	148.428	9	234.2	249.5	249	58.7	106.8	92.5
2/8/2010	11:33:02 AM	2	6	220	1.32	1.76	149.148	8.9	234.1	249.6	253.5	58.8	106.7	92.5
2/8/2010	11:34:02 AM	2	6	221	1.32	1.77	149.869	8.8	234.2	249.6	250.8	58.9	106.7	92.7
2/8/2010	11:35:02 AM	2	6	222	1.32	1.74	150.586	8.8	234.1	249.1	251.1	58.7	106.6	92.5
2/8/2010	11:36:02 AM	2	6	223	1.32	1.74	151.301	8.8	234.3	249.4	252.1	58.9	106.6	92.6
2/8/2010	11:37:02 AM	2	6	224	1.31	1.72	152.011	8.7	234.2	249.3	249.9	58.7	106.7	92.5
2/8/2010	11:38:02 AM	2	6	225	1.33	1.72	152.721	8.7	234.1	249.8	253.6	58.8	106.7	92.5
2/8/2010	11:39:02 AM	2	6	226	1.32	1.72	153.43	8.7	234.2	249.7	250	58.8	106.8	92.6
2/8/2010	11:40:02 AM	2	6	227	1.31	1.72	154.14	8.7	234.3	250.2	253.3	58.8	107	92.6
2/8/2010	11:41:02 AM	2	6	228	1.32	1.72	154.85	8.7	234.2	249.5	248.8	58.7	107.1	92.7
2/8/2010	11:42:00 AM	2	6	229	1.31	1.72	155.538	8.7	234.1	249.9	255.1	58.6	107.2	92.6
2/8/2010	11:43:00 AM	2	6	230	1.31	1.71	156.246	8.7	234	249.9	250	58.6	107.3	92.6
2/8/2010	11:44:00 AM	2	6	231	1.34	1.72	156.957	8.7	233.5	249.5	252.2	58.5	106.9	92.3
2/8/2010	11:45:00 AM	2	6	232	1.32	1.71	157.668	8.7	233.4	249.6	253.8	58.5	106.6	92.3
2/8/2010	11:46:00 AM	2	6	233	1.32	1.72	158.38	8.7	233.5	249.2	249.6	58.6	106.5	92.4
2/8/2010	11:47:00 AM	2	6	234	1.32	1.72	159.089	8.7	233.2	249.9	252.4	58.6	106.2	92.3
2/8/2010	11:48:01 AM	2	6	235	1.31	1.71	159.798	8.7	233.4	249.1	249.4	58.7	106.1	92.3
2/8/2010	11:49:01 AM	2	6	236	1.32	1.72	160.507	8.7	233.1	250.2	253.7	58.6	105.9	92.1
2/8/2010	11:50:01 AM	2	6	237	1.33	1.71	161.219	8.7	233.4	249.6	248.9	58.8	105.9	92.3
2/8/2010	11:51:01 AM	2	6	238	1.31	1.72	161.929	8.7	233.4	250.1	254.5	58.7	106	92.3
2/8/2010	11:52:01 AM	2	6	239	1.33	1.73	162.642	8.8	233.2	249.9	250.7	58.6	106.1	92.3
2/8/2010	11:53:01 AM	2	6	240	1.32	1.74	163.35	8.8	233.2	244.7	250.9	58.8	106	92.2

EPA REFERENCE METHOD 23

Determination of Dioxin/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Description	Dioxin/Furan
Location	Stack	Run No.	1
Pbar (inHg)	29.45	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	60.7
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	7.07
Dry MW	29.9	Wet MW	29.7
Nozzle Diameter (in)	0.197	Press Stack (Ps)	-0.19
Avg O2 (%)	10.00	Avg CO2 (%)	9.20

Traverse Point		Time (min)	Delta P (in.H2O)	Delta H (inH2O)	Meter Reading (acf)	Vacuum (in. Hg)	Stack Temp (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Impinger Temp (°F)	Meter In Temp (°F)	Meter Out Temp (°F)
Port	Point											
			See Automated Box 1-Minute Data Sheet									
Averages		240	1.22	1.60	163.350	8.0	232	250	252	62	109	94

Sample Gas Volume 153.529 dscf
 Water Vapor 2.862 scf
 Moisture Content 1.83 %
 Avg. Stack Velocity 70.51 ft/sec
 4230.87 ft/min
 Stack Flow 29906 wacfm
 22439 wscfm
 22028 dscfm

% Isokinetic 97.0 %

EMSI



AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2/8/2010
Facility	Metro	Start/Stop Time	12:38 - 16:46
Unit	FBR 1	Test Method	EPA 23
Location	Stack	Run Number	2
Project #	902630	Description	Dioxin/Furan
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	18	°F	# Ports	2	Meter Box #	AB 3	ID#	2320003
Pbar	29.45	In Hg	# Points	12	Nozzle Dia. (in)	0.197	ID#	224115
Filter #	Trap # 5		Time/Pt	20	Probe ID #	221018	Pitot ID #	
MF #			Port Order	a-b	del H @	1.889		
Pstack	-0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	Unit 1 Run 2 M23		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.014	12	nt	12:27	Pre	O2	9.70	9.70	9.70	9.70
Post	0.011	14	nt	16:50	ok	CO2	9.40	9.40	9.40	9.40

≤ 0.02 cfm or 4 % of Sample Rate Stable @ ≥ 3" 15 sec

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)			50ml Rinse	Y	N
						End	Start	Diff	ID #		
					#1	391.1	361.0			263051	
					#2	700.4	702.5			261011	
					#3	690.6	692.4			261096	
					#4	614.2	610.4			261030	
					#5	926.0	894.7			261042	
					#6						
					#7						
					#8	0.0	0.0				
					Total	3322.3	3261.0	61.3			

Post Field Meter Calibration			Set Vacuum = 17"			Collect 5 cf per run		
Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
Enter on Run 3 Sheet								

TC Field Calibration	
Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

Comments

Date	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out	
Average					240	1.12	1.54	159.888	10.5	234.0	249.5	251.8	58.3	103.9	90.7
2/8/2010	12:38:55 PM		1	1	1	1.14	1.66	0.621	8.4	233.3	248.6	250.8	74.6	91.8	88.5
2/8/2010	12:40:03 PM		1	1	2	1.14	1.49	1.36	8.2	233.5	249.6	252.6	73.3	97.9	88.8
2/8/2010	12:41:01 PM		1	1	3	1.15	1.42	1.976	8.2	233.4	248.9	250.2	69.7	100.9	88.9
2/8/2010	12:42:01 PM		1	1	4	1.14	1.45	2.619	8.3	233.1	249.3	253.5	67.2	102.4	88.8
2/8/2010	12:43:01 PM		1	1	5	1.14	1.48	3.271	8.4	233.1	249.3	252	65.6	104.1	89.3
2/8/2010	12:44:01 PM		1	1	6	1.13	1.49	3.928	8.6	233	249.1	250.7	63.8	104.8	89.4
2/8/2010	12:45:03 PM		1	1	7	1.14	1.47	4.601	8.5	232.9	249.2	252.5	62.2	105.5	89.6
2/8/2010	12:46:03 PM		1	1	8	1.14	1.46	5.25	8.4	232.8	249	249.6	61	105.9	89.9
2/8/2010	12:47:03 PM		1	1	9	1.14	1.49	5.907	8.6	232.7	249.3	253.7	59.8	106.4	90.1
2/8/2010	12:48:01 PM		1	1	10	1.15	1.49	6.539	8.6	232.3	249.5	248.8	58.9	106.7	90.2
2/8/2010	12:49:01 PM		1	1	11	1.14	1.49	7.195	8.6	232.2	249.7	255.6	58.4	106.7	90.4
2/8/2010	12:50:01 PM		1	1	12	1.15	1.49	7.854	8.6	232.2	249.6	250.1	58.1	106.9	90.6
2/8/2010	12:51:01 PM		1	1	13	1.14	1.51	8.516	8.7	232.2	249.4	251.9	58	107.1	90.8
2/8/2010	12:52:01 PM		1	1	14	1.14	1.51	9.177	8.7	232.1	249.9	253.2	58.1	107.2	91
2/8/2010	12:53:02 PM		1	1	15	1.17	1.49	9.835	8.6	231.9	249.2	248.9	58.1	107.4	91.2
2/8/2010	12:54:02 PM		1	1	16	1.15	1.51	10.496	8.7	232.1	249.6	255.4	58.2	107.4	91.4
2/8/2010	12:55:02 PM		1	1	17	1.15	1.5	11.156	8.7	232	249.8	250	58.3	107.4	91.5
2/8/2010	12:56:02 PM		1	1	18	1.14	1.5	11.815	8.7	232.1	249.6	252.2	58.3	107.5	91.7
2/8/2010	12:57:02 PM		1	1	19	1.13	1.53	12.482	8.8	232.2	249.6	250.9	58.3	107.5	91.8
2/8/2010	12:58:02 PM		1	2	20	1.13	1.64	13.173	9.3	232.1	249.2	251.4	58.3	107.8	91.9
2/8/2010	12:59:02 PM		1	2	21	1.13	1.53	13.839	9.5	232.2	249.7	251.8	58.2	107.8	92
2/8/2010	1:00:02 PM		1	2	22	1.12	1.4	14.476	9.7	232	248.8	250.4	57.9	107.5	92.2
2/8/2010	1:01:02 PM		1	2	23	1.13	1.4	15.11	9.7	231.9	249.3	253	58	107.3	92.2
2/8/2010	1:02:02 PM		1	2	24	1.13	1.39	15.745	9.7	231.9	248.8	248.4	58	107.1	92.3
2/8/2010	1:03:02 PM		1	2	25	1.12	1.4	16.382	9.7	231.9	249.2	253.5	58	107.1	92.3
2/8/2010	1:04:02 PM		1	2	26	1.12	1.39	17.016	9.7	232	249.5	250.2	58	107.1	92.5
2/8/2010	1:05:03 PM		1	2	27	1.12	1.4	17.653	9.7	231.9	249.3	252.4	57.9	107	92.5
2/8/2010	1:06:03 PM		1	2	28	1.12	1.4	18.288	9.7	232.1	249.4	254.5	57.9	106.9	92.6
2/8/2010	1:07:03 PM		1	2	29	1.12	1.4	18.922	9.7	231.9	249.2	249.6	57.9	106.7	92.4
2/8/2010	1:08:03 PM		1	2	30	1.11	1.39	19.557	9.7	231.7	249.6	252.9	57.7	106.4	92.1
2/8/2010	1:09:03 PM		1	2	31	1.11	1.39	20.19	9.7	232	249.6	249.3	57.9	106.8	92.5
2/8/2010	1:10:03 PM		1	2	32	1.1	1.39	20.823	9.7	232.1	249.7	253.7	57.9	106.9	92.7
2/8/2010	1:11:03 PM		1	2	33	1.11	1.39	21.457	9.7	232.1	249.8	249.1	57.7	106.8	92.6
2/8/2010	1:12:03 PM		1	2	34	1.11	1.39	22.092	9.7	232.1	249.7	253.2	58	106.9	92.8
2/8/2010	1:13:03 PM		1	2	35	1.13	1.39	22.725	9.7	232.1	250.1	251.6	58	106.8	92.8
2/8/2010	1:14:03 PM		1	2	36	1.13	1.39	23.358	9.7	231.9	247.8	249.8	57.9	106.5	92.6
2/8/2010	1:15:03 PM		1	2	37	1.11	1.39	23.991	9.7	231.9	248.8	254.7	58	106.6	92.7
2/8/2010	1:16:03 PM		1	2	38	1.09	1.39	24.625	9.7	231.9	249.3	249.5	58.1	106.4	92.8
2/8/2010	1:17:03 PM		1	2	39	1.12	1.51	25.285	10.2	232	250.3	252.8	58.1	106.2	92.7
2/8/2010	1:18:01 PM		1	3	40	1.15	1.53	25.93	10.4	232.2	250.2	251.4	58.1	106.2	92.7
2/8/2010	1:19:01 PM		1	3	41	1.2	1.57	26.607	10.5	232.3	248.8	250.9	58.2	106.2	92.7
2/8/2010	1:20:01 PM		1	3	42	1.16	1.57	27.283	10.6	232.4	248.9	252.2	58	106.2	92.6
2/8/2010	1:21:01 PM		1	3	43	1.17	1.54	27.955	10.4	232.4	248.8	250.2	57.7	106.1	92.6
2/8/2010	1:22:01 PM		1	3	44	1.17	1.58	28.634	10.6	232.4	249.8	253.3	57.7	105.9	92.5
2/8/2010	1:23:01 PM		1	3	45	1.15	1.54	29.303	10.5	232.4	250	249.4	57.6	105.8	92.5
2/8/2010	1:24:01 PM		1	3	46	1.16	1.54	29.973	10.4	232.4	250	254.1	57.5	105.7	92.5
2/8/2010	1:25:01 PM		1	3	47	1.17	1.59	30.656	10.6	232.3	249.6	250.4	57.5	105.7	92.5
2/8/2010	1:26:02 PM		1	3	48	1.19	1.75	31.372	11.5	232.4	248.5	251.8	57.5	106	92.5
2/8/2010	1:27:02 PM		1	3	49	1.16	1.76	32.091	11.6	232.8	249	252.8	57.2	106	92.5
2/8/2010	1:28:02 PM		1	3	50	1.1	1.77	32.809	11.5	233.6	249.1	249.9	57.2	106.1	92.6
2/8/2010	1:29:02 PM		1	3	51	1.13	1.78	33.53	11.5	234	249.9	253.8	57.2	106.1	92.6
2/8/2010	1:30:02 PM		1	3	52	1.1	1.76	34.248	11.5	234.3	249.9	249.4	57.2	106	92.6
2/8/2010	1:31:02 PM		1	3	53	1.13	1.75	34.967	11.5	234.2	250	253.3	57.1	105.8	92.5
2/8/2010	1:32:02 PM		1	3	54	1.15	1.76	35.686	11.5	234	249.3	249.4	57.3	105.6	92.5
2/8/2010	1:33:02 PM		1	3	55	1.15	1.76	36.405	11.5	233.8	248.6	253.7	57.3	105.4	92.4
2/8/2010	1:34:02 PM		1	3	56	1.16	1.76	37.123	11.5	233.8	249	252.9	57.4	105.3	92.4
2/8/2010	1:35:02 PM		1	3	57	1.16	1.76	37.841	11.5	233.6	249.5	249.1	57.4	105.1	92.3
2/8/2010	1:36:02 PM		1	3	58	1.15	1.76	38.56	11.5	233.6	250	255	57.5	104.9	92.3
2/8/2010	1:37:03 PM		1	3	59	1.16	1.75	39.277	11.5	233.3	250.4	249.8	57.5	104.8	92.1
2/8/2010	1:38:03 PM		1	4	60	1.16	1.76	39.995	11.5	233.3	249.3	253.5	57.6	104.9	92.2
2/8/2010	1:39:03 PM		1	4	61	1.14	1.75	40.714	11.5	233.3	249	253.2	57.6	104.9	92.2
2/8/2010	1:40:03 PM		1	4	62	1.15	1.75	41.433	11.5	233.2	248.3	249.4	57.6	104.7	92.1
2/8/2010	1:41:03 PM		1	4	63	1.16	1.76	42.149	11.5	233.2	249.6	253.6	57.7	104.6	92
2/8/2010	1:42:03 PM		1	4	64	1.13	1.76	42.867	11.5	233.1	250	249	57.8	104.5	92
2/8/2010	1:43:03 PM		1	4	65	1.26	1.75	43.585	11.5	233.9	250.1	254.1	57.9	104.4	92
2/8/2010	1:44:01 PM		1	4	66	1.26	1.78	44.284	11.6	233.9	249.1	251.8	57.9	104.3	91.9
2/8/2010	1:45:01 PM		1	4	67	1.26	1.82	45.013	11.8	234	248.5	250.3	57.8	104.6	92
2/8/2010	1:46:01 PM		1	4	68	1.25	1.82	45.743	11.8	234	249.3	254.6	57.7	104.7	92
2/8/2010	1:47:01 PM		1	4	69	1.25	1.83	46.472	11.8	233.8	250.1	249.2	57.6	104.7	91.9
2/8/2010	1:48:01 PM		1	4	70	1.25	1.83	47.202	11.8	233.8	250.1	253.4	58	104.7	91.9
2/8/2010	1:49:01 PM		1	4	71	1.24	1.81	47.929	11.8	233.9	249.5	251.4	58.1	104.6	92
2/8/2010	1:50:01 PM		1	4	72	1.26	1.79	48.656	11.8	233.7	248.2	250.6	58.1	104.4	91.8
2/8/2010	1:51:01 PM		1	4	73	1.27	1.81	49.384	11.8	233.6	249.1	253.7	58.2	104.3	91.8
2/8/2010	1:52:01 PM		1	4	74	1.26	1.81	50.113	11.8	233.7	249.4	249.1	58.5	104.3	91.8
2/8/2010	1:53:02 PM		1	4	75	1.26	1.81	50.842	11.8	233.6	250.3	254.4	58.5	104.2	91.7
2/8/2010	1:54:02 PM		1	4	76	1.26	1.79	51.571	11.8	233.4	250.2	250.3	58.4	104.1	91.5
2/8/2010	1:55:02 PM		1	4	77	1.25	1.79	52.301	11.8	233.8	248.8	252.1	58.6	104.6	91.9
2/8/2010	1:56:02 PM		1	4	78	1.25	1.81	53.032	11.8	233.6	248.8	252.8	58.4	104.6	91.8
2/8/2010	1:57:02 PM		1	4	79	1.25	1.83	53.765	11.8	233.7	249.4	249.3	58.5	104.6	91.9
2/8/2010	1:58:02 PM		1	5	80	1.3	1.83	54.499	11.8	233.7	250.3	254.7	58.4	104.8	91.9
2/8/2010	1:59:02 PM		1	5	81	1.29	1.82	55.231	11.8	233.6	250.3	249.6	58.4	104.7	91.8
2/8/2010	2:00:02 PM		1	5	82	1.28	1.76	55.949	11.5	233.5	249.2	253.1	58.5		

2/8/2010	2:03:02 PM	1	5	85	1.29	1.73	58.089	11.3	233.3	249.5	252.9	58.8	104.3	91.7
2/8/2010	2:04:02 PM	1	5	86	1.29	1.72	58.799	11.3	233.2	249.9	249.2	58.7	104.2	91.6
2/8/2010	2:05:02 PM	1	5	87	1.28	1.72	59.509	11.2	233.2	250.1	254.8	58.8	104.2	91.6
2/8/2010	2:06:02 PM	1	5	88	1.29	1.72	60.217	11.2	233.3	249.9	250.4	58.9	104.2	91.5
2/8/2010	2:07:01 PM	1	5	89	1.29	1.72	60.903	11.2	233.3	248.6	252.8	58.9	104.1	91.6
2/8/2010	2:08:03 PM	1	5	90	1.29	1.72	61.636	11.2	233.3	249	251.6	58.9	104.1	91.5
2/8/2010	2:09:03 PM	1	5	91	1.3	1.71	62.346	11.2	233.3	249.2	251.1	58.9	104.1	91.5
2/8/2010	2:10:03 PM	1	5	92	1.29	1.72	63.053	11.3	233.3	249.8	254.5	58.6	104.2	91.5
2/8/2010	2:11:03 PM	1	5	93	1.31	1.71	63.762	11.2	233.3	250.2	248.7	58.5	104.4	91.5
2/8/2010	2:12:03 PM	1	5	94	1.28	1.71	64.469	11.2	233.4	249.7	254.2	58.5	104.4	91.5
2/8/2010	2:13:01 PM	1	5	95	1.3	1.71	65.154	11.2	233.4	249.2	251.8	58.3	104.5	91.5
2/8/2010	2:14:01 PM	1	5	96	1.28	1.71	65.861	11.2	233.4	248	249.6	58	104.5	91.5
2/8/2010	2:15:01 PM	1	5	97	1.29	1.71	66.571	11.3	233.5	249.2	255	57.7	104.5	91.5
2/8/2010	2:16:01 PM	1	5	98	1.28	1.71	67.279	11.2	233.6	249.9	249.3	57.5	104.5	91.5
2/8/2010	2:17:01 PM	1	5	99	1.28	1.71	67.988	11.2	233.6	250.1	253.5	57.4	104.4	91.4
2/8/2010	2:18:03 PM	1	6	100	1.25	1.7	68.716	11.2	233.6	249.5	252	57.3	104.2	91.4
2/8/2010	2:19:03 PM	1	6	101	1.27	1.7	69.421	11.2	233.6	248.1	250.1	57.2	104.1	91.3
2/8/2010	2:20:01 PM	1	6	102	1.26	1.7	70.102	11.2	233.6	249.3	254.4	57.1	104.1	91.3
2/8/2010	2:21:02 PM	1	6	103	1.26	1.7	70.81	11.2	233.5	249.9	249.2	57	104.1	91.3
2/8/2010	2:22:02 PM	1	6	104	1.26	1.69	71.515	11.2	233.6	250.1	252.2	57	104.1	91.3
2/8/2010	2:23:02 PM	1	6	105	1.26	1.69	72.216	11.1	233.4	249.7	250.3	57	104.1	91.2
2/8/2010	2:24:02 PM	1	6	106	1.26	1.69	72.92	11.1	233.5	249.1	252.4	57	104.1	91.2
2/8/2010	2:25:02 PM	1	6	107	1.27	1.69	73.624	11.2	233.5	249	252	57	104	91.2
2/8/2010	2:26:02 PM	1	6	108	1.24	1.68	74.325	11.1	233.5	249.2	250	56.9	103.9	91.1
2/8/2010	2:27:02 PM	1	6	109	1.21	1.66	75.022	11	233.7	250.2	253.7	57	103.9	91.1
2/8/2010	2:28:02 PM	1	6	110	1.2	1.64	75.714	10.9	233.7	250.2	249.1	56.9	103.9	91.1
2/8/2010	2:29:02 PM	1	6	111	1.21	1.62	76.399	10.8	233.6	249.8	254.1	56.9	103.9	91
2/8/2010	2:30:02 PM	1	6	112	1.2	1.62	77.089	10.8	233.7	249.3	252.3	57	104	91.1
2/8/2010	2:31:03 PM	1	6	113	1.19	1.61	77.776	10.8	233.7	248.5	250.1	57	104.1	91.1
2/8/2010	2:32:01 PM	1	6	114	1.2	1.61	78.437	10.7	233.7	249.3	253.6	57.1	104	90.9
2/8/2010	2:33:01 PM	1	6	115	1.19	1.61	79.122	10.7	233.6	249.8	248.9	57	104.1	91
2/8/2010	2:34:01 PM	1	6	116	1.19	1.6	79.806	10.7	233.8	250.3	253.6	57	104.1	91
2/8/2010	2:35:03 PM	1	6	117	1.2	1.59	80.511	10.7	233.6	249.6	250.3	56.9	104	90.7
2/8/2010	2:36:03 PM	1	6	118	1.19	1.6	81.196	10.7	233.8	249	251.6	57.1	104.3	90.9
2/8/2010	2:37:03 PM	1	6	119	1.19	1.59	81.877	10.7	233.9	248.6	251.2	57.1	104.2	90.9
2/8/2010	2:38:03 PM	2	1	120	1.2	1.58	82.538	10.6	233.9	249	250.7	57.1	104.2	90.9
2/8/2010	2:47:00 PM	2	1	121	0.93	1.65	83.212	10.3	233.6	249.6	250.6	68	93	89.3
2/8/2010	2:48:00 PM	2	1	122	0.92	1.32	83.827	9.7	233.8	249.6	251.9	61.8	96.7	89.4
2/8/2010	2:49:00 PM	2	1	123	0.93	1.26	84.426	9.4	233.8	250.1	253.9	60.2	98.5	89.3
2/8/2010	2:50:00 PM	2	1	124	0.92	1.23	85.02	9.3	233.8	249.5	248.9	59.3	99.7	89.3
2/8/2010	2:51:01 PM	2	1	125	0.92	1.23	85.611	9.2	233.7	249.9	254.4	58.5	100.5	89.2
2/8/2010	2:52:01 PM	2	1	126	0.94	1.22	86.199	9.2	233.8	249.6	250.3	58.1	101.2	89.3
2/8/2010	2:53:01 PM	2	1	127	0.92	1.22	86.788	9.2	233.8	249.4	251.6	57.8	101.6	89.3
2/8/2010	2:54:01 PM	2	1	128	0.92	1.21	87.375	9.3	233.8	249.5	252.9	57.6	101.9	89.2
2/8/2010	2:55:01 PM	2	1	129	0.94	1.21	87.962	9.2	233.7	249.3	249	57.3	102.4	89.3
2/8/2010	2:56:01 PM	2	1	130	0.92	1.22	88.549	9.3	233.8	249.4	254.2	57	102.5	89.3
2/8/2010	2:57:01 PM	2	1	131	0.92	1.21	89.137	9.2	233.9	249.6	249.8	56.9	102.9	89.4
2/8/2010	2:58:01 PM	2	1	132	0.91	1.2	89.722	9.2	233.9	249.9	252.4	56.8	103.1	89.4
2/8/2010	2:59:01 PM	2	1	133	0.94	1.21	90.308	9.3	233.9	249.6	253.1	56.9	103.1	89.5
2/8/2010	3:00:01 PM	2	1	134	0.94	1.22	90.901	9.3	233.9	249.2	248.8	56.8	103.1	89.5
2/8/2010	3:01:01 PM	2	1	135	0.94	1.23	91.495	9.4	233.9	249.3	253.6	56.9	103.1	89.5
2/8/2010	3:02:01 PM	2	1	136	0.92	1.23	92.086	9.4	234	249.7	249.4	56.9	103.1	89.5
2/8/2010	3:03:01 PM	2	1	137	0.91	1.23	92.678	9.4	234	249.5	253.4	57	103.1	89.6
2/8/2010	3:04:01 PM	2	1	138	0.93	1.21	93.265	9.3	234.1	249.7	250.9	57	103.2	89.7
2/8/2010	3:05:02 PM	2	1	139	0.94	1.22	93.858	9.4	234.1	249.7	251.4	57	103.3	89.6
2/8/2010	3:06:02 PM	2	2	140	0.94	1.24	94.453	9.4	234	249.8	252.7	56.9	103.4	89.6
2/8/2010	3:07:02 PM	2	2	141	0.93	1.25	95.05	9.5	233.9	249.4	249.1	56.9	103.7	89.6
2/8/2010	3:08:00 PM	2	2	142	0.93	1.25	95.628	9.5	234.3	249.8	254.4	57.1	104.1	90
2/8/2010	3:09:00 PM	2	2	143	0.92	1.24	96.222	9.4	234	249.6	250.3	56.8	103.9	89.8
2/8/2010	3:10:00 PM	2	2	144	0.92	1.24	96.816	9.4	234.1	249.4	252.7	57.1	104.2	90
2/8/2010	3:11:00 PM	2	2	145	0.93	1.24	97.41	9.4	234.2	249.4	252	57	104.2	90.2
2/8/2010	3:12:00 PM	2	2	146	0.91	1.22	98.001	9.4	234.2	249.1	249.9	57	104	90.1
2/8/2010	3:13:00 PM	2	2	147	0.92	1.22	98.59	9.3	234.2	249.9	253.9	57	103.8	90.1
2/8/2010	3:14:00 PM	2	2	148	0.91	1.2	99.174	9.2	234.2	249.3	249	57.1	103.5	90
2/8/2010	3:15:00 PM	2	2	149	0.91	1.2	99.759	9.2	234.1	249.6	253.9	57.1	103.6	90.1
2/8/2010	3:16:00 PM	2	2	150	0.92	1.21	100.344	9.2	234.1	249.9	251.3	57.2	103.6	90.1
2/8/2010	3:17:01 PM	2	2	151	0.93	1.24	100.939	9.4	234.1	249.6	251	57.3	103.6	90.1
2/8/2010	3:18:01 PM	2	2	152	0.93	1.25	101.536	9.5	234	249.8	253.4	57.3	103.5	90.1
2/8/2010	3:19:01 PM	2	2	153	0.93	1.29	102.144	9.7	233.9	249.2	249.5	57.4	103.5	90
2/8/2010	3:20:01 PM	2	2	154	0.92	1.26	102.743	9.6	234	249.5	254.3	57.3	103.6	90
2/8/2010	3:21:01 PM	2	2	155	0.93	1.25	103.344	9.5	234	249.4	249.8	57.3	103.5	90
2/8/2010	3:22:01 PM	2	2	156	0.9	1.23	103.935	9.4	233.9	249.5	252.3	57.3	103.4	90
2/8/2010	3:23:01 PM	2	2	157	0.91	1.42	104.577	10.3	234	249.4	253	57.3	103.5	90
2/8/2010	3:24:01 PM	2	2	158	0.91	1.45	105.224	10.5	233.9	249.4	249.3	57.2	103.6	90
2/8/2010	3:25:01 PM	2	2	159	0.99	1.45	105.873	10.6	234	249.6	255.5	57.1	103.7	90
2/8/2010	3:26:01 PM	2	3	160	1.05	1.53	106.537	10.9	234.2	249.4	249.8	57	103.5	89.9
2/8/2010	3:27:01 PM	2	3	161	1.04	1.61	107.22	11.4	234.3	249.7	252.1	57	103.6	89.9
2/8/2010	3:28:01 PM	2	3	162	1.05	1.61	107.905	11.4	234.3	249.8	254.1	57	103.5	90
2/8/2010	3:29:01 PM	2	3	163	1.03	1.61	108.59	11.3	234.4	249.5	248.9	57.1	103.4	90
2/8/2010	3:30:01 PM	2	3	164	1.02	1.61	109.275	11.3	234.4	249.7	254.2	57.1	103.3	90
2/8/2010	3:31:01 PM	2	3	165	1.03	1.61	109.961	11.4	234.4	249.4	251.3	57.2	103.2	90
2/8/2010	3:32:01 PM	2	3	166	1.03	1.61	110.644	11.4	234.6	249.4	250.2	57.3	103.2	90
2/8/2010	3:33:02 PM	2	3	167	1.02	1.62	111.33	11.4	234.6	249.5	254.3	57.4	103.1	90
2/8/2010	3:34:00 PM	2	3	168	1.03	1.61	111.992	11.4	234.6	249.3	249.1	57.5	103.1	90.1
2/8/2010	3:35:00 PM	2	3	169	1.03	1.59	112.672	11.3	234.6	249.7	253.8	57.4	103	90.1
2/8/2010	3:36:00 PM	2	3	170	1.02	1.56								

2/8/2010	3:37:00 PM	2	3	171	1.03	1.57	114.021	11.1	234.8	249.5	251.9	57.4	102.9	90
2/8/2010	3:38:02 PM	2	3	172	1.02	1.56	114.716	11.1	234.9	249.9	254.2	57.5	102.9	90
2/8/2010	3:39:02 PM	2	3	173	1.02	1.52	115.383	10.9	234.9	249.6	248.9	57.5	102.9	90
2/8/2010	3:40:02 PM	2	3	174	1.03	1.46	116.03	10.5	234.8	249.9	253.9	57.6	102.7	90
2/8/2010	3:41:02 PM	2	3	175	1.01	1.43	116.671	10.4	234.9	249.7	251.5	57.7	102.8	90
2/8/2010	3:42:02 PM	2	3	176	1.02	1.41	117.308	10.3	235	249.3	249.7	57.8	102.8	89.9
2/8/2010	3:43:02 PM	2	3	177	1.02	1.41	117.946	10.3	235.1	249.3	254.5	57.8	102.8	89.9
2/8/2010	3:44:02 PM	2	3	178	1.02	1.4	118.58	10.2	235.3	249.5	249.6	57.9	103	90
2/8/2010	3:45:02 PM	2	3	179	1.07	1.39	119.214	10.2	235.1	249.3	253.8	57.9	103	89.9
2/8/2010	3:46:00 PM	2	4	180	1.08	1.39	119.825	10.2	235.3	249.7	252.4	57.9	103	89.9
2/8/2010	3:47:00 PM	2	4	181	1.1	1.41	120.461	10.3	235.2	249.4	249.5	57.8	103.1	89.9
2/8/2010	3:48:00 PM	2	4	182	1.09	1.43	121.102	10.3	235.3	249.7	254.1	57.7	103.1	89.9
2/8/2010	3:49:00 PM	2	4	183	1.1	1.46	121.751	10.6	235.3	249.6	249.2	57.6	103.1	89.9
2/8/2010	3:50:00 PM	2	4	184	1.09	1.46	122.401	10.6	235.2	249.6	252.5	57.6	103.1	89.8
2/8/2010	3:51:02 PM	2	4	185	1.09	1.46	123.073	10.6	235.2	249.8	253.1	57.5	103.1	89.8
2/8/2010	3:52:02 PM	2	4	186	1.08	1.46	123.722	10.6	235.2	249.1	249.1	57.6	103.2	89.9
2/8/2010	3:53:00 PM	2	4	187	1.18	1.47	124.353	10.6	235.5	249.5	255.9	57.6	103.2	89.9
2/8/2010	3:54:00 PM	2	4	188	1.19	1.5	125.014	10.8	235.5	249.6	251.8	57.5	103.2	89.9
2/8/2010	3:55:00 PM	2	4	189	1.19	1.53	125.68	10.9	235.4	249.5	250.6	57.5	103.2	89.9
2/8/2010	3:56:00 PM	2	4	190	1.19	1.55	126.351	11	235.5	248.9	253.6	57.6	103.3	89.9
2/8/2010	3:57:00 PM	2	4	191	1.2	1.57	127.025	11.1	235.5	249.5	248.8	57.5	103.3	89.9
2/8/2010	3:58:00 PM	2	4	192	1.19	1.63	127.715	11.5	235.5	249.5	254.2	57.6	103.4	90
2/8/2010	3:59:01 PM	2	4	193	1.18	1.62	128.401	11.4	235.5	249.8	250.9	57.5	103.3	90
2/8/2010	4:00:01 PM	2	4	194	1.19	1.61	129.084	11.3	235.4	249.1	250.8	57.6	103.1	89.9
2/8/2010	4:01:01 PM	2	4	195	1.18	1.6	129.768	11.3	235.3	249.7	254.4	57.7	103	90
2/8/2010	4:02:01 PM	2	4	196	1.19	1.6	130.45	11.3	235.2	249.3	248.9	57.7	103	89.9
2/8/2010	4:03:01 PM	2	4	197	1.19	1.61	131.133	11.3	235.2	249.1	254.1	57.7	102.9	89.9
2/8/2010	4:04:01 PM	2	4	198	1.17	1.6	131.818	11.3	235.1	249.8	253.3	58	102.8	89.9
2/8/2010	4:05:01 PM	2	4	199	1.21	1.6	132.501	11.3	235	249.2	249.3	58.1	102.7	89.9
2/8/2010	4:06:01 PM	2	5	200	1.23	1.61	133.184	11.3	235	249.6	254.8	58.2	102.7	89.9
2/8/2010	4:07:01 PM	2	5	201	1.22	1.6	133.869	11.3	234.9	249.5	249.9	58.2	102.6	89.8
2/8/2010	4:08:01 PM	2	5	202	1.21	1.6	134.554	11.3	234.9	249.5	253.3	58.2	102.7	89.9
2/8/2010	4:09:01 PM	2	5	203	1.22	1.61	135.236	11.3	234.9	249.2	253.2	58.2	102.7	89.9
2/8/2010	4:10:01 PM	2	5	204	1.19	1.6	135.917	11.3	234.9	249.1	249	58.3	102.6	89.8
2/8/2010	4:11:01 PM	2	5	205	1.21	1.61	136.601	11.3	234.8	249.6	254.5	58.3	102.6	89.9
2/8/2010	4:12:01 PM	2	5	206	1.2	1.65	137.294	11.6	234.7	249.6	249.7	58.3	102.6	89.9
2/8/2010	4:13:01 PM	2	5	207	1.21	1.64	137.984	11.5	234.7	249.5	252.7	58.3	102.6	89.9
2/8/2010	4:14:01 PM	2	5	208	1.2	1.63	138.672	11.4	234.7	249.8	252	58.3	102.5	89.8
2/8/2010	4:15:01 PM	2	5	209	1.2	1.62	139.358	11.4	234.8	249.2	250.4	58.5	102.5	89.8
2/8/2010	4:16:01 PM	2	5	210	1.21	1.64	140.049	11.4	234.8	249.8	253.6	58.5	102.5	89.8
2/8/2010	4:17:01 PM	2	5	211	1.21	1.66	140.744	11.6	234.8	249.3	248.9	58.5	102.6	89.8
2/8/2010	4:18:01 PM	2	5	212	1.19	1.65	141.437	11.5	235	249.4	253.8	58.5	102.6	89.8
2/8/2010	4:19:01 PM	2	5	213	1.21	1.64	142.127	11.5	235.1	249.4	252.7	58.6	102.6	89.8
2/8/2010	4:20:01 PM	2	5	214	1.2	1.65	142.819	11.6	235.1	249.4	249.4	58.6	102.6	89.8
2/8/2010	4:21:02 PM	2	5	215	1.21	1.65	143.509	11.5	235.3	249.4	255.1	58.6	102.6	89.9
2/8/2010	4:22:02 PM	2	5	216	1.2	1.65	144.202	11.5	235.4	249.6	249.9	58.6	102.6	89.8
2/8/2010	4:23:02 PM	2	5	217	1.2	1.63	144.89	11.4	235.6	249.6	251.7	58.7	102.6	89.8
2/8/2010	4:24:02 PM	2	5	218	1.19	1.63	145.576	11.4	235.7	249.7	254.1	58.7	102.5	89.8
2/8/2010	4:25:02 PM	2	5	219	1.18	1.61	146.259	11.3	235.8	249.6	248.6	58.8	102.5	89.8
2/8/2010	4:26:02 PM	2	6	220	1.09	1.54	146.926	11	235.8	249.3	254.8	58.9	102.4	89.8
2/8/2010	4:27:02 PM	2	6	221	1.1	1.51	147.585	10.8	235.8	249.4	252.8	58.9	102.3	89.8
2/8/2010	4:28:02 PM	2	6	222	1.09	1.48	148.239	10.6	236	249.1	248.9	59	102.3	89.8
2/8/2010	4:29:02 PM	2	6	223	1.11	1.47	148.891	10.6	236	249.6	256.5	59.1	102.4	89.7
2/8/2010	4:30:00 PM	2	6	224	1.12	1.48	149.521	10.6	236.1	249.6	251.9	59.2	102.4	89.7
2/8/2010	4:31:00 PM	2	6	225	1.09	1.47	150.17	10.6	236.1	249.5	250.3	59.3	102.4	89.7
2/8/2010	4:32:00 PM	2	6	226	1.11	1.47	150.823	10.6	236.2	249.9	254.6	59.2	102.5	89.7
2/8/2010	4:33:00 PM	2	6	227	1.1	1.46	151.472	10.6	236.3	249.6	249	59.2	102.5	89.6
2/8/2010	4:34:00 PM	2	6	228	1.11	1.46	152.12	10.5	236.3	249.5	254	59.4	102.5	89.7
2/8/2010	4:35:00 PM	2	6	229	1.11	1.46	152.769	10.6	236.3	249.5	252.8	59.4	102.5	89.6
2/8/2010	4:36:00 PM	2	6	230	1.1	1.46	153.416	10.5	236.4	248.8	249.1	59.4	102.6	89.6
2/8/2010	4:37:01 PM	2	6	231	1.11	1.46	154.064	10.5	236.3	249.3	255.9	59.3	102.5	89.6
2/8/2010	4:38:00 PM	2	6	232	1.11	1.46	154.712	10.6	236.4	249.4	251.1	59.3	102.6	89.6
2/8/2010	4:39:01 PM	2	6	233	1.11	1.46	155.362	10.6	236.4	249.5	250.8	59.3	102.7	89.6
2/8/2010	4:40:01 PM	2	6	234	1.11	1.46	156.011	10.6	236.5	249.7	255.3	59.4	102.7	89.6
2/8/2010	4:41:01 PM	2	6	235	1.11	1.46	156.66	10.6	236.4	249.5	249.2	59.5	102.6	89.6
2/8/2010	4:42:01 PM	2	6	236	1.11	1.46	157.31	10.6	236.3	250	252.9	59.5	102.5	89.6
2/8/2010	4:43:01 PM	2	6	237	1.1	1.46	157.959	10.6	236.3	249.6	250.8	59.6	102.5	89.6
2/8/2010	4:44:01 PM	2	6	238	1.1	1.46	158.607	10.6	236.4	249.2	251.1	59.6	102.5	89.5
2/8/2010	4:45:01 PM	2	6	239	1.1	1.46	159.253	10.5	236.3	249.4	253.4	59.7	102.5	89.5
2/8/2010	4:46:01 PM	3	1	240	1.1	1.45	159.888	10.5	236.2	249.4	249.3	59.7	102.5	89.5

Determination of Dioxin/Furan Emissions From Stationary Sources

Determination of Dioxin/Furan Emissions From Stationary Sources			
Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Description	Dioxin/Furan
Location	Stack	Run No.	2
Pbar (inHg)	29.45	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	61.3
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	7.07
Dry MW	29.9	Wet MW	29.7
Nozzle Diameter (in)	0.197	Press Stack (Ps)	-0.19
Avg O2 (%)	9.70	Avg CO2 (%)	9.40

[illegible]

Sample Gas Volume	151.319 dscf
Water Vapor	2.890 scf
Moisure Content	1.87 %
Avg. Stack Velocity	67.84 ft/sec
	4070.65 ft/min
Stack Flow	28774 wacfm
	21538 wscfm
	21134 dscfm

% Isokinetic **99.6 %**

EMSI



AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2/9/2010
Facility	Metro	Start/Stop Time	7:30 - 11:33
Unit	FBR 1	Test Method	EPA 23
Location	Stack	Run Number	3
Project #	902630	Description	Dioxin/Furan
Operator	NT NK	Carbon Trap ID	

RUN DATA

Tamb	22	°F	# Ports	2	Meter Box #	AB 3	ID#	232003
Pbar	29.54	In Hg	# Points	12	Nozzle Dia. (in)	0.197	ID#	224115
Filter #	Trap # 8		Time/Pt	20	Probe ID #	221018	Pitot ID #	
MF #			Port Order	B-A	del H @	1.889		
Pstack	-0.18	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	unit 1 run 3 M23		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.009	14	nt	7:05	Pre	O2	9.40	9.40	9.40	9.40
Post	0.01	12	nt	11:35	Post	CO2	9.70	9.70	9.70	9.70

≤ 0.02 cfm or 4 % of Sample Rate

Stable @ ≥ 3" 15 sec

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	End	Start	Diff	50ml Rinse	Y	N
					#1	396.5	362.7				261048
					#2	699.6	703.6				261003
					#3	691.1	691.5				261173
					#4	618.7	616.8				261115
					#5	867.9	838.9				261062
					#6						
					#7						
					#8	0.0	0.0				
					Total	3273.8	3213.5	60.3			

Post Field Meter Calibration Set Vacuum = 17" Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

Comments

Date	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out	
Average					240	1.13	1.51	157.45	8.1	234.8	249.3	251.3	60.7	105.6	90.4
2/9/2010	7:31:02 AM		1	1	1	0.93	1.88	0.737	8.4	233.4	249.8	250	76.2	86.4	79.9
2/9/2010	7:32:02 AM		1	1	2	0.94	1.14	1.298	5.8	233.3	249.3	252.7	75.6	92.8	79.9
2/9/2010	7:33:02 AM		1	1	3	0.93	1.21	1.873	6	233.3	249.7	250.3	74	96	80.1
2/9/2010	7:34:02 AM		1	1	4	0.95	1.21	2.452	6.1	233.4	249.1	252.6	73.1	98.5	80.4
2/9/2010	7:35:02 AM		1	1	5	0.95	1.24	3.036	6.1	233.3	248.9	250.9	72.9	100.3	80.7
2/9/2010	7:36:02 AM		1	1	6	0.92	1.21	3.615	6.1	233.4	249.3	252	70.9	101.8	81.1
2/9/2010	7:37:00 AM		1	1	7	0.95	1.24	4.18	6.2	233.3	249.1	249.9	69.5	102.8	81.5
2/9/2010	7:38:00 AM		1	1	8	0.95	1.26	4.77	6.3	233.5	249.2	253.4	69.1	103.7	81.9
2/9/2010	7:39:00 AM		1	1	9	0.94	1.26	5.361	6.3	233.2	249.6	250.1	69	104.5	82.3
2/9/2010	7:40:00 AM		1	1	10	0.92	1.23	5.941	6.2	233.6	249.9	251.6	68.9	105	82.7
2/9/2010	7:41:00 AM		1	1	11	0.92	1.29	6.536	6.3	233.6	249.6	250.5	68.1	105.5	83.1
2/9/2010	7:42:00 AM		1	1	12	0.94	1.45	7.177	7	233.5	249.6	252.6	67.4	106.2	83.5
2/9/2010	7:43:00 AM		1	1	13	0.94	1.46	7.818	7	233.4	248.7	250.5	67.2	106.8	84
2/9/2010	7:44:00 AM		1	1	14	0.93	1.47	8.459	7	233.5	248.9	251.6	67.1	107.2	84.4
2/9/2010	7:45:00 AM		1	1	15	0.92	1.47	9.103	7	233.6	248.8	251	67	107.5	84.8
2/9/2010	7:46:00 AM		1	1	16	0.91	1.46	9.743	7	233.7	248.9	249.4	66.8	107.7	85.2
2/9/2010	7:47:02 AM		1	1	17	0.94	1.39	10.388	6.8	233.7	249.6	253.1	66.5	107.9	85.6
2/9/2010	7:48:02 AM		1	1	18	0.94	1.28	10.985	6.3	233.7	249.7	249.4	66.3	107.9	86
2/9/2010	7:49:00 AM		1	1	19	0.97	1.28	11.564	6.4	233.9	249.7	253.6	66.1	108	86.4
2/9/2010	7:50:00 AM		1	2	20	0.98	1.29	12.164	6.4	234.1	249.2	250.3	65.9	108.2	86.7
2/9/2010	7:51:01 AM		1	2	21	0.99	1.3	12.768	6.4	234.1	248.3	251.9	65.7	108.3	87
2/9/2010	7:52:01 AM		1	2	22	0.99	1.29	13.369	6.4	234.1	248.9	250.6	65.3	108.4	87.3
2/9/2010	7:53:01 AM		1	2	23	0.99	1.32	13.978	6.5	233.9	248.9	252.3	65.1	108.6	87.6
2/9/2010	7:54:01 AM		1	2	24	1	1.33	14.589	6.5	233.9	249.2	250.5	64.9	108.8	88
2/9/2010	7:55:01 AM		1	2	25	1	1.34	15.204	6.6	233.9	249.1	251.8	64.7	109	88.2
2/9/2010	7:56:01 AM		1	2	26	0.97	1.31	15.81	6.5	233.9	249.9	251.1	64.5	109.1	88.6
2/9/2010	7:57:01 AM		1	2	27	0.98	1.26	16.405	6.5	234	249.5	251.3	64.3	109.2	88.9
2/9/2010	7:58:01 AM		1	2	28	0.98	1.27	17.003	6.9	233.8	249.5	252.3	64.1	109.2	89.2
2/9/2010	7:59:01 AM		1	2	29	0.97	1.3	17.608	7.1	234	248.4	250.4	63.9	109.3	89.4
2/9/2010	8:00:01 AM		1	2	30	0.97	1.29	18.212	7.2	233.9	248.4	250.4	63.6	109.4	89.7
2/9/2010	8:01:01 AM		1	2	31	1	1.31	18.819	7.2	233.7	248.6	253	63.4	109.4	90
2/9/2010	8:02:01 AM		1	2	32	0.98	1.31	19.428	7.3	233.8	249.2	251.9	63.5	109.5	90.2
2/9/2010	8:03:01 AM		1	2	33	0.99	1.32	20.041	7.3	233.7	249	251.2	63	109.6	90.5
2/9/2010	8:04:01 AM		1	2	34	1	1.33	20.656	7.4	233.6	249.6	250.9	62.4	109.7	90.7
2/9/2010	8:05:01 AM		1	2	35	0.98	1.33	21.269	7.3	233.7	249.4	251.5	62.2	109.8	91
2/9/2010	8:06:01 AM		1	2	36	0.99	1.32	21.88	7.3	233.7	249.6	250	62.1	109.9	91.3
2/9/2010	8:07:01 AM		1	2	37	0.99	1.31	22.489	7.3	233.7	249	252.6	61.8	110	91.5
2/9/2010	8:08:01 AM		1	2	38	0.98	1.31	23.101	7.3	233.6	248.8	250.1	61.5	110	91.7
2/9/2010	8:09:01 AM		1	2	39	1.05	1.34	23.719	7.4	234.1	248.9	253.2	61.4	110.1	91.9
2/9/2010	8:10:01 AM		1	3	40	1.14	1.43	24.358	7.7	234.7	248.7	249.9	61.2	110.3	92.1
2/9/2010	8:11:01 AM		1	3	41	1.12	1.47	25.01	7.9	234.7	249	251.8	60.8	110.5	92.3
2/9/2010	8:12:01 AM		1	3	42	1.14	1.49	25.662	7.9	234.9	249.3	250.1	60.5	110.6	92.5
2/9/2010	8:13:01 AM		1	3	43	1.14	1.5	26.318	8	234.8	249.7	253.3	60.3	110.7	92.7
2/9/2010	8:14:01 AM		1	3	44	1.1	1.5	26.977	8	234.7	249.2	250.1	60.1	110.8	93
2/9/2010	8:15:01 AM		1	3	45	1.1	1.5	27.632	8	234.7	249.7	253.5	60	110.8	93.1
2/9/2010	8:16:01 AM		1	3	46	1.11	1.49	28.287	8	234.7	248.4	249.3	60	110.8	93.4
2/9/2010	8:17:01 AM		1	3	47	1.12	1.48	28.941	8	234.6	249.1	252.5	59.9	110.9	93.6
2/9/2010	8:18:01 AM		1	3	48	1.09	1.48	29.595	8	234.7	247.9	249.2	60	110.9	93.8
2/9/2010	8:19:01 AM		1	3	49	1.12	1.49	30.25	8	234.6	249.1	253.7	59.9	111	94
2/9/2010	8:20:01 AM		1	3	50	1.13	1.48	30.905	8	234.4	249.4	249.6	59.9	111.1	94.2
2/9/2010	8:21:01 AM		1	3	51	1.12	1.49	31.56	8	234.3	249.4	252.8	59.8	111.1	94.3
2/9/2010	8:22:01 AM		1	3	52	1.11	1.49	32.215	8	234.4	249.4	249.4	59.8	111.2	94.5
2/9/2010	8:23:01 AM		1	3	53	1.12	1.49	32.872	8	234.5	249.1	253.9	59.9	111.2	94.7
2/9/2010	8:24:02 AM		1	3	54	1.12	1.49	33.529	8	234.7	248.8	250.8	59.9	111.3	94.8
2/9/2010	8:25:02 AM		1	3	55	1.11	1.49	34.185	8	234.8	247.9	251	59.9	111.5	95
2/9/2010	8:26:02 AM		1	3	56	1.12	1.5	34.84	8	234.9	249	252.8	59.8	111.5	95.1
2/9/2010	8:27:02 AM		1	3	57	1.11	1.5	35.498	8	234.8	249.2	251	59.8	111.6	95.3
2/9/2010	8:28:02 AM		1	3	58	1.13	1.5	36.155	8.1	234.8	249.7	253.6	59.8	111.7	95.4
2/9/2010	8:29:02 AM		1	3	59	1.13	1.5	36.814	8.1	234.8	249.6	249.3	59.8	111.7	95.6
2/9/2010	8:30:02 AM		1	4	60	1.13	1.51	37.474	8.1	234.9	249.8	251.7	59.8	111.8	95.7
2/9/2010	8:31:02 AM		1	4	61	1.12	1.51	38.134	8.1	235	248.7	250.4	59.8	111.8	95.8
2/9/2010	8:32:00 AM		1	4	62	1.12	1.52	38.776	8.1	235	248.5	253	59.7	111.9	95.9
2/9/2010	8:33:00 AM		1	4	63	1.15	1.52	39.44	8.1	234.9	248.6	250.1	59.7	111.9	96.2
2/9/2010	8:34:00 AM		1	4	64	1.17	1.52	40.103	8.2	235	249.3	253	59.7	112	96.3
2/9/2010	8:35:00 AM		1	4	65	1.26	1.59	40.782	8.4	235.4	249.5	249.9	59.7	112.1	96.4
2/9/2010	8:36:00 AM		1	4	66	1.26	1.63	41.471	8.5	235.4	249.9	252.3	59.5	112.1	96.5
2/9/2010	8:37:00 AM		1	4	67	1.26	1.65	42.165	8.6	235.5	248.9	250.1	59.6	112.2	96.7
2/9/2010	8:38:00 AM		1	4	68	1.25	1.65	42.857	8.6	235.4	249	253.7	59.4	112.2	96.8
2/9/2010	8:39:00 AM		1	4	69	1.25	1.65	43.551	8.6	235.5	248.1	250.2	59.5	112.2	96.9
2/9/2010	8:40:00 AM		1	4	70	1.24	1.65	44.243	8.6	235.5	249.4	250.7	59.6	112.2	97
2/9/2010	8:41:00 AM		1	4	71	1.25	1.64	44.934	8.6	235.4	249.5	252	59.6	112.1	97.1
2/9/2010	8:42:00 AM		1	4	72	1.25	1.65	45.628	8.6	235.3	250	251.9	59.6	112.2	97.2
2/9/2010	8:43:00 AM		1	4	73	1.26	1.66	46.325	8.7	235.3	248.4	250	59.5	112.2	97.3
2/9/2010	8:44:00 AM		1	4	74	1.25	1.67	47.022	8.7	235.3	248.4	253.1	59.5	112.2	97.4
2/9/2010	8:45:02 AM		1	4	75	1.26	1.68	47.745	8.8	235.3	248.9	250	59.4	112.2	97.5
2/9/2010	8:46:02 AM		1	4	76	1.25	1.68	48.447	8.8	235.2	249.8	251.1	59.4	112.3	97.7
2/9/2010	8:47:02 AM		1	4	77	1.25	1.69	49.148	8.8	235.2	249.5	250.6	59.4	112.2	97.7
2/9/2010	8:48:00 AM		1	4	78	1.26	1.69	49.828	8.8	235.2	249.3	251.7	59.4	112.3	97.8
2/9/2010	8:49:00 AM		1	4	79	1.25	1.69	50.532	8.8	235.1	247.8	250.6	59.5	112.3	97.9
2/9/2010	8:50:00 AM		1	5	80	1.27	1.68	51.234	8.8	235.1	249.1	251.7	59.6	112.3	98
2/9/2010	8:51:00 AM		1	5	81	1.25	1.69	51.938	8.8	235.2	249.6	250.8	59.6	112.3	98.1
2/9/2010	8:52:01 AM		1	5	82	1.24	1.7	52.643	8.8	235.3	250	252.6	59.6	112.3	98.1
2/9/2010	8:53:01 AM														

2/9/2010	8:55:01 AM	1	5	85	1.25	1.69	54.754	8.8	235.4	248.2	249.8	59.7	112.4	98.4
2/9/2010	8:56:01 AM	1	5	86	1.24	1.69	55.458	8.8	235.3	249	252.8	59.7	112.4	98.5
2/9/2010	8:57:01 AM	1	5	87	1.26	1.69	56.162	8.8	235.2	249.9	250.4	59.7	112.5	98.5
2/9/2010	8:58:01 AM	1	5	88	1.24	1.68	56.867	8.8	235.4	250	252.2	59.7	112.5	98.6
2/9/2010	8:59:01 AM	1	5	89	1.25	1.68	57.568	8.8	235.3	249.3	249.7	59.8	112.6	98.7
2/9/2010	9:00:01 AM	1	5	90	1.25	1.69	58.27	8.8	235.3	248.8	254.5	59.8	112.5	98.8
2/9/2010	9:01:01 AM	1	5	91	1.24	1.68	58.974	8.8	235.4	248.7	249.3	59.9	112.6	98.9
2/9/2010	9:02:01 AM	1	5	92	1.24	1.69	59.678	8.8	235.4	249.5	253.1	59.9	112.6	99
2/9/2010	9:03:01 AM	1	5	93	1.23	1.68	60.38	8.8	235.4	250	249.6	59.8	112.6	99
2/9/2010	9:04:01 AM	1	5	94	1.26	1.69	61.083	8.8	235.4	249.8	253.1	59.9	112.7	99.1
2/9/2010	9:05:02 AM	1	5	95	1.24	1.68	61.786	8.8	235.4	249	249.8	60	112.7	99.1
2/9/2010	9:06:02 AM	1	5	96	1.24	1.68	62.49	8.8	235.1	248.6	253.5	59.8	112.4	98.9
2/9/2010	9:07:02 AM	1	5	97	1.27	1.68	63.193	8.8	233.4	248.9	249.3	58.6	109.6	96.8
2/9/2010	9:08:02 AM	1	5	98	1.23	1.68	63.895	8.8	233.4	249.9	253.2	58.6	107.9	96.5
2/9/2010	9:09:00 AM	1	5	99	1.22	1.68	64.575	8.8	233.2	250.3	249.7	58.7	106.8	96.4
2/9/2010	9:10:00 AM	1	6	100	1.22	1.67	65.274	8.8	233.2	249.1	252.8	58.9	106.2	96.3
2/9/2010	9:11:00 AM	1	6	101	1.21	1.67	65.972	8.7	233.2	248.4	249.1	58.8	105.7	95.9
2/9/2010	9:12:00 AM	1	6	102	1.21	1.66	66.67	8.7	233.3	249.1	253.5	58.8	105.6	95.7
2/9/2010	9:13:00 AM	1	6	103	1.19	1.65	67.364	8.7	233.5	249.4	250.5	58.9	105.4	95.4
2/9/2010	9:14:00 AM	1	6	104	1.22	1.62	68.049	8.5	233.6	249.9	252.1	58.9	105.3	95.1
2/9/2010	9:15:00 AM	1	6	105	1.21	1.62	68.735	8.5	233.8	250.2	251.5	59	105.2	94.9
2/9/2010	9:16:00 AM	1	6	106	1.2	1.62	69.424	8.5	234	249.2	251.4	59	105.1	94.6
2/9/2010	9:17:00 AM	1	6	107	1.19	1.62	70.109	8.5	234.3	248.9	253	59	105.2	94.4
2/9/2010	9:18:00 AM	1	6	108	1.21	1.62	70.794	8.5	234.4	248.8	249.5	59	105.2	94.1
2/9/2010	9:19:01 AM	1	6	109	1.19	1.62	71.48	8.5	234.7	249.8	253.4	59	105.1	93.8
2/9/2010	9:20:01 AM	1	6	110	1.22	1.61	72.164	8.5	234.6	250.2	249.3	58.9	105	93.4
2/9/2010	9:21:01 AM	1	6	111	1.22	1.61	72.847	8.4	234.7	250	253.8	58.9	104.8	93.1
2/9/2010	9:22:01 AM	1	6	112	1.22	1.6	73.529	8.4	234.8	249.5	249	58.9	104.7	92.8
2/9/2010	9:23:01 AM	1	6	113	1.21	1.6	74.209	8.4	234.8	249.3	253.3	58.9	104.8	92.7
2/9/2010	9:24:01 AM	1	6	114	1.2	1.6	74.889	8.4	234.9	249.1	249.7	58.9	104.8	92.5
2/9/2010	9:25:01 AM	1	6	115	1.2	1.6	75.571	8.4	235	249.2	252.7	58.8	104.7	92.3
2/9/2010	9:26:01 AM	1	6	116	1.21	1.59	76.252	8.4	234.9	249	249.5	58.7	104.6	92
2/9/2010	9:27:01 AM	1	6	117	1.21	1.6	76.932	8.4	234.9	250.2	252.7	58.7	104.5	91.8
2/9/2010	9:28:01 AM	1	6	118	1.21	1.59	77.611	8.4	235	250.1	249.7	58.8	104.6	91.7
2/9/2010	9:29:01 AM	1	6	119	1.21	1.59	78.292	8.4	235	249.7	252.8	58.8	104.6	91.6
2/9/2010	9:30:01 AM	2	1	120	1.22	1.59	78.959	8.4	235.1	248.8	250	58.9	104.5	91.4
2/9/2010	9:34:01 AM	2	1	121	0.95	1.66	79.637	8.1	234.2	249.5	249.5	64.9	96.5	90.6
2/9/2010	9:35:01 AM	2	1	122	0.95	1.36	80.259	7.7	234.6	249.7	253.3	61.4	99.6	90.1
2/9/2010	9:36:01 AM	2	1	123	0.95	1.3	80.867	7.4	234.7	249.8	249.3	60.6	100.8	89.9
2/9/2010	9:37:01 AM	2	1	124	0.97	1.28	81.47	7.3	234.7	249.7	253.3	60.2	101.6	89.7
2/9/2010	9:38:01 AM	2	1	125	0.95	1.27	82.071	7.3	234.7	249.7	249.6	60	102.1	89.6
2/9/2010	9:39:02 AM	2	1	126	0.96	1.26	82.67	7.3	234.5	249.5	252.8	60.1	102.2	89.4
2/9/2010	9:40:02 AM	2	1	127	0.97	1.28	83.274	7.4	234.4	249.6	252	60	102.4	89.3
2/9/2010	9:41:02 AM	2	1	128	0.95	1.27	83.876	7.4	234.4	248.8	250.9	59.8	102.7	89.3
2/9/2010	9:42:02 AM	2	1	129	0.95	1.27	84.478	7.4	234.4	249.4	250.6	59.7	102.8	89.2
2/9/2010	9:43:02 AM	2	1	130	0.95	1.26	85.075	7.3	234.3	249	251.4	59.6	102.8	89.1
2/9/2010	9:44:02 AM	2	1	131	0.96	1.25	85.67	7.3	234.3	249.1	249.5	59.6	102.8	89.1
2/9/2010	9:45:02 AM	2	1	132	0.96	1.28	86.271	7.4	234.2	249.4	252.4	59.6	102.9	89
2/9/2010	9:46:02 AM	2	1	133	0.95	1.27	86.871	7.4	234.2	249.2	249.9	59.6	103	88.9
2/9/2010	9:47:00 AM	2	1	134	0.96	1.27	87.453	7.4	234.2	249.5	254.6	59.7	103	89
2/9/2010	9:48:00 AM	2	1	135	0.95	1.27	88.053	7.4	234.1	249.6	249.4	59.6	103	88.8
2/9/2010	9:49:00 AM	2	1	136	0.96	1.28	88.655	7.4	234.2	249.6	253.4	59.7	103.1	88.9
2/9/2010	9:50:00 AM	2	1	137	0.96	1.28	89.259	7.4	234.1	249.6	249	59.7	103.1	88.8
2/9/2010	9:51:02 AM	2	1	138	0.96	1.29	89.883	7.5	233.9	249.7	253.3	59.6	103.1	88.8
2/9/2010	9:52:02 AM	2	1	139	0.96	1.28	90.487	7.4	233.9	249.6	249.1	59.6	103	88.7
2/9/2010	9:53:02 AM	2	2	140	0.96	1.27	91.091	7.4	233.7	249.4	253.4	59.7	103.1	88.7
2/9/2010	9:54:02 AM	2	2	141	0.96	1.26	91.687	7.3	233.7	249.2	250	59.6	103	88.7
2/9/2010	9:55:00 AM	2	2	142	0.94	1.26	92.267	7.3	233.6	249.4	252.7	59.7	103	88.6
2/9/2010	9:56:00 AM	2	2	143	0.95	1.26	92.862	7.3	233.6	249.1	249.5	59.6	103	88.6
2/9/2010	9:57:00 AM	2	2	144	0.95	1.26	93.461	7.4	233.7	249.4	253.1	59.6	103.1	88.6
2/9/2010	9:58:01 AM	2	2	145	0.94	1.25	94.059	7.3	233.8	249.1	248.9	59.7	103	88.5
2/9/2010	9:59:00 AM	2	2	146	0.95	1.26	94.658	7.4	233.8	249.6	252.8	59.7	103.1	88.6
2/9/2010	10:00:00 AM	2	2	147	0.94	1.26	95.255	7.4	234	249	249.2	59.7	103.1	88.6
2/9/2010	10:01:00 AM	2	2	148	0.95	1.27	95.855	7.4	233.9	249.3	253.6	59.7	103.1	88.5
2/9/2010	10:02:00 AM	2	2	149	0.94	1.26	96.452	7.3	234	249.5	249.7	59.8	103.1	88.5
2/9/2010	10:03:00 AM	2	2	150	0.94	1.26	97.048	7.3	234.1	249.3	252.8	59.8	103	88.4
2/9/2010	10:04:01 AM	2	2	151	0.95	1.25	97.644	7.3	234.2	249.3	250.4	59.8	103	88.4
2/9/2010	10:05:01 AM	2	2	152	0.93	1.25	98.236	7.3	234.3	249.2	252.2	59.8	102.9	88.4
2/9/2010	10:06:01 AM	2	2	153	0.95	1.24	98.828	7.2	234.2	249.2	251.1	59.8	102.9	88.3
2/9/2010	10:07:01 AM	2	2	154	0.94	1.25	99.421	7.3	234.2	249.2	252	59.9	102.9	88.3
2/9/2010	10:08:01 AM	2	2	155	0.93	1.24	100.012	7.3	234.2	249.4	250.7	59.9	102.8	88.3
2/9/2010	10:09:01 AM	2	2	156	0.93	1.23	100.6	7.2	234.3	249.4	251	59.9	102.9	88.3
2/9/2010	10:10:01 AM	2	2	157	0.95	1.23	101.191	7.2	234.3	249	249.7	60	102.9	88.3
2/9/2010	10:11:01 AM	2	2	158	0.94	1.25	101.786	7.3	234.3	249.3	252.7	60	102.9	88.3
2/9/2010	10:12:01 AM	2	2	159	1.04	1.27	102.386	7.3	234.5	249.4	249.5	60.1	103.1	88.4
2/9/2010	10:13:01 AM	2	3	160	1.14	1.43	103.025	8	234.9	249.7	254.1	59.8	103.3	88.3
2/9/2010	10:14:01 AM	2	3	161	1.15	1.46	103.669	8.1	235	249.8	249.6	59.5	103.6	88.4
2/9/2010	10:15:01 AM	2	3	162	1.15	1.5	104.325	8.2	234.9	249.5	253.2	59.4	103.7	88.4
2/9/2010	10:16:01 AM	2	3	163	1.16	1.51	104.983	8.3	235	249.7	250	59.4	103.9	88.5
2/9/2010	10:17:01 AM	2	3	164	1.13	1.53	105.644	8.4	234.9	249	253.8	59.4	103.8	88.5
2/9/2010	10:18:01 AM	2	3	165	1.11	1.51	106.301	8.3	234.9	249.3	251.2	59.4	103.8	88.5
2/9/2010	10:19:01 AM	2	3	166	1.12	1.49	106.953	8.2	234.8	249.1	250.8	59.5	103.6	88.4
2/9/2010	10:20:01 AM	2	3	167	1.11	1.46	107.599	8.1	234.9	248.4	249.6	59.7	103.6	88.5
2/9/2010	10:21:01 AM	2	3	168	1.13	1.45	108.243	8.1	235	249.4	253	59.8	103.6	88.6
2/9/2010	10:22:01 AM	2	3	169	1.1	1.47	108.891	8.2	235	249.2	249.2	59.8	103.7	88.6
2/9/2010	10:23:01 AM	2	3	170	1.11									

2/9/2010	10:24:01 AM	2	3	171	1.11	1.47	110.189	8.2	235.1	249.6	249.6	59.9	103.9	88.7
2/9/2010	10:25:01 AM	2	3	172	1.11	1.47	110.839	8.2	235	249.7	253.4	59.9	104	88.8
2/9/2010	10:26:01 AM	2	3	173	1.1	1.47	111.488	8.2	235	249.8	249.4	59.9	104	88.8
2/9/2010	10:27:01 AM	2	3	174	1.12	1.48	112.139	8.2	234.9	249.7	252.8	59.9	103.7	88.7
2/9/2010	10:28:01 AM	2	3	175	1.12	1.48	112.79	8.2	234.9	249.5	249.3	60	103.7	88.8
2/9/2010	10:29:01 AM	2	3	176	1.09	1.48	113.443	8.2	235	249.6	253.8	60	103.7	88.7
2/9/2010	10:30:01 AM	2	3	177	1.1	1.49	114.096	8.2	234.9	249.3	249.5	60	103.7	88.7
2/9/2010	10:31:01 AM	2	3	178	1.09	1.47	114.746	8.2	234.9	249.4	253.4	60	103.8	88.8
2/9/2010	10:32:01 AM	2	3	179	1.11	1.45	115.39	8.1	234.9	249.3	249.5	60.1	103.9	88.8
2/9/2010	10:33:01 AM	2	4	180	1.22	1.55	116.06	8.5	234.8	249.4	253.8	60	103.9	88.8
2/9/2010	10:34:01 AM	2	4	181	1.21	1.6	116.737	8.7	234.8	249.3	251	59.9	104.1	88.9
2/9/2010	10:35:01 AM	2	4	182	1.2	1.59	117.415	8.7	234.8	248.7	251.7	59.9	104	88.8
2/9/2010	10:36:01 AM	2	4	183	1.24	1.61	118.095	8.7	234.8	249.3	251	59.9	103.9	88.8
2/9/2010	10:37:01 AM	2	4	184	1.27	1.65	118.785	8.9	234.9	249.2	251.5	59.1	103.8	88.8
2/9/2010	10:38:01 AM	2	4	185	1.29	1.65	119.474	8.9	234.8	249.4	252.5	58.9	103.7	88.8
2/9/2010	10:39:01 AM	2	4	186	1.27	1.65	120.166	8.9	234.9	249.3	251.4	58.8	103.6	88.8
2/9/2010	10:40:01 AM	2	4	187	1.29	1.66	120.857	8.9	234.8	249.5	251.5	58.9	103.5	88.7
2/9/2010	10:41:01 AM	2	4	188	1.29	1.66	121.548	8.9	234.8	249.3	250.7	58.9	103.4	88.7
2/9/2010	10:42:01 AM	2	4	189	1.28	1.66	122.242	8.9	234.8	249.7	252.8	59	103.3	88.6
2/9/2010	10:43:01 AM	2	4	190	1.3	1.67	122.936	8.9	234.9	249.8	249.3	59.1	103.3	88.7
2/9/2010	10:44:01 AM	2	4	191	1.3	1.68	123.631	9	234.8	249.8	253.4	59	103.2	88.6
2/9/2010	10:45:01 AM	2	4	192	1.3	1.68	124.327	9	234.9	249.5	249.2	59	103.2	88.6
2/9/2010	10:46:01 AM	2	4	193	1.28	1.69	125.028	9	235.1	249.8	253.3	59.1	103.2	88.5
2/9/2010	10:47:01 AM	2	4	194	1.29	1.69	125.726	9	235.2	249.4	249.3	59.2	103.2	88.5
2/9/2010	10:48:01 AM	2	4	195	1.28	1.69	126.426	9.1	235.2	249.7	253.7	59.2	103.1	88.4
2/9/2010	10:49:01 AM	2	4	196	1.29	1.68	127.125	9.1	235.3	249.6	249.6	59.3	103.1	88.4
2/9/2010	10:50:01 AM	2	4	197	1.28	1.69	127.822	9	235.3	249.5	252.7	59.3	103	88.3
2/9/2010	10:51:01 AM	2	4	198	1.28	1.69	128.52	9	235.5	249.3	249.4	59.4	103	88.3
2/9/2010	10:52:01 AM	2	4	199	1.28	1.69	129.219	9	235.3	249.2	253.4	59.5	102.9	88.3
2/9/2010	10:53:01 AM	2	5	200	1.3	1.69	129.916	9	235.5	249	249.3	59.5	102.7	88.2
2/9/2010	10:54:01 AM	2	5	201	1.29	1.69	130.615	9	235.7	249	252.9	59.4	102.6	88.2
2/9/2010	10:55:01 AM	2	5	202	1.28	1.69	131.312	9	235.8	248.9	249.9	59.4	102.5	88
2/9/2010	10:56:01 AM	2	5	203	1.29	1.7	132.013	9	235.9	249.7	253.1	59.5	102.4	88
2/9/2010	10:57:01 AM	2	5	204	1.27	1.7	132.714	9	236.1	249.4	250.2	59.3	102.4	88
2/9/2010	10:58:01 AM	2	5	205	1.27	1.7	133.411	9	236.2	249.8	253	59.1	102.4	88
2/9/2010	10:59:01 AM	2	5	206	1.28	1.7	134.112	9.1	236.3	249.5	249.6	59.1	102.4	87.9
2/9/2010	11:00:01 AM	2	5	207	1.29	1.69	134.81	9	236.2	249.8	252.8	59.1	102.4	87.9
2/9/2010	11:01:02 AM	2	5	208	1.28	1.69	135.509	9	236.2	249.6	249.4	59.3	102.3	87.8
2/9/2010	11:02:02 AM	2	5	209	1.27	1.69	136.209	9	236.2	249.8	253	59.3	102.3	87.8
2/9/2010	11:03:02 AM	2	5	210	1.29	1.69	136.908	9	236.2	249.5	249	59.1	102.3	87.8
2/9/2010	11:04:02 AM	2	5	211	1.29	1.69	137.609	9	236.1	250.1	254.2	59.2	102.3	87.7
2/9/2010	11:05:02 AM	2	5	212	1.29	1.69	138.307	9	236.1	249.9	249.7	59.1	102.3	87.7
2/9/2010	11:06:02 AM	2	5	213	1.27	1.69	139.004	9	236.2	249.7	253.5	59.1	102.3	87.7
2/9/2010	11:07:02 AM	2	5	214	1.29	1.69	139.704	9	236.1	249.6	249.4	59	102.3	87.6
2/9/2010	11:08:02 AM	2	5	215	1.27	1.69	140.403	9	236.1	249.7	252.5	59	102.2	87.6
2/9/2010	11:09:02 AM	2	5	216	1.3	1.69	141.1	9	236	249.1	249.5	59	102.2	87.5
2/9/2010	11:10:02 AM	2	5	217	1.28	1.69	141.8	9	236	249.3	252.7	59.1	102	87.4
2/9/2010	11:11:00 AM	2	5	218	1.29	1.69	142.473	9	236.1	248.6	249	59.3	102	87.5
2/9/2010	11:12:00 AM	2	5	219	1.26	1.68	143.17	9	236	249.1	252.8	59.3	101.9	87.4
2/9/2010	11:13:00 AM	2	6	220	1.22	1.66	143.862	8.9	236.1	249.5	249.4	59.3	101.8	87.3
2/9/2010	11:14:00 AM	2	6	221	1.24	1.65	144.55	8.8	236.2	249.7	253	59.3	101.8	87.3
2/9/2010	11:15:00 AM	2	6	222	1.23	1.63	145.234	8.8	236.1	249.7	250.4	59.4	101.7	87.2
2/9/2010	11:16:00 AM	2	6	223	1.23	1.63	145.919	8.8	236.3	249.9	252.7	59.5	101.7	87.2
2/9/2010	11:17:00 AM	2	6	224	1.23	1.63	146.602	8.8	236.4	249.7	250.5	59.4	101.7	87.2
2/9/2010	11:18:00 AM	2	6	225	1.24	1.62	147.285	8.8	236.5	249.4	252.2	59.5	101.7	87.2
2/9/2010	11:19:00 AM	2	6	226	1.22	1.63	147.968	8.8	236.6	249.2	249.7	59.5	101.7	87.1
2/9/2010	11:20:00 AM	2	6	227	1.24	1.62	148.651	8.7	236.5	249.1	253.3	59.5	101.7	87.1
2/9/2010	11:21:00 AM	2	6	228	1.23	1.62	149.333	8.7	236.3	249.2	250	59.6	101.6	87
2/9/2010	11:22:00 AM	2	6	229	1.22	1.61	150.015	8.7	235.3	248.1	251.7	58.8	100.4	85.8
2/9/2010	11:23:00 AM	2	6	230	1.24	1.61	150.694	8.7	234.8	249.5	249	59.3	98.8	85.1
2/9/2010	11:24:01 AM	2	6	231	1.23	1.61	151.374	8.7	235.8	249.6	253.8	60.1	98.8	86
2/9/2010	11:25:01 AM	2	6	232	1.23	1.61	152.052	8.7	235.3	249.9	250.3	59.5	98	85.2
2/9/2010	11:26:01 AM	2	6	233	1.23	1.59	152.727	8.7	235.9	249.8	252.6	60	98.5	85.6
2/9/2010	11:27:01 AM	2	6	234	1.22	1.59	153.404	8.6	236.1	249.7	249.7	59.8	98.7	85.7
2/9/2010	11:28:01 AM	2	6	235	1.23	1.59	154.078	8.7	236.1	249.9	253.4	59.7	99	85.6
2/9/2010	11:29:01 AM	2	6	236	1.22	1.59	154.753	8.6	236.3	249.4	249.5	59.6	99.1	85.5
2/9/2010	11:30:01 AM	2	6	237	1.24	1.6	155.429	8.7	236.2	249.6	253.2	59.5	99.3	85.4
2/9/2010	11:31:01 AM	2	6	238	1.23	1.6	156.106	8.7	236.2	249.5	247.9	59.6	99.4	85.4
2/9/2010	11:32:01 AM	2	6	239	1.22	1.59	156.783	8.7	236.1	248.4	247.9	59.6	99.3	85.3
2/9/2010	11:33:01 AM	2	6	240	1.24	1.6	157.45	8.7	236.1	246.6	254.5	59.7	99.5	85.3

Determination of Dioxin/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Description	Dioxin/Furan
Location	Stack	Run No.	3
Pbar (inHg)	29.54	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	60.3
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	7.07
Dry MW	29.9	Wet MW	29.7
Nozzle Diameter (in)	0.197	Press Stack (Ps)	-0.18
Avg O2 (%)	9.40	Avg CO2 (%)	9.70

[illegible]

Sample Gas Volume	149.275 dscf
Water Vapor	2.843 scf
Moisure Content	1.87 %
Avg. Stack Velocity	67.82 ft/sec
	4069.11 ft/min
Stack Flow	28763 wacfm
	21572 wscfm
	21168 dscfm

% Isokinetic **98.1 %**

EMSI

EPA Method OTM 027

Determination of Particulate Matter Less Than 2.5 Microns

Test Information						Start Time
Client:	Met Council	Date:	2/8/2010	Time:	7:50 - 11:56	7:50
Facility:	Metro	Location:	Stack	Job #:	902630	11:56
Unit:	FBR 1	Test #:	1			

Preliminary Measurements			
Barometric Press. =	30.15	% CO2 =	8.6
Stack Pressure, Pg =	0.1	% O2 =	11.0
Ave. Stack Temp., Ts =	232	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	90	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	80	Delta H @ =	2.020
Moisture Content, % =	3.00	Total Run Time =	240
Average Delta P =	1.14	Number Of Sample Points =	12
Point #1 Delta P =	1.28	Nozzle Number:	225081
		Nozzle Diameter:	0.153
Cyclone Flow Rate, Qs = 0.52181 CFM			
Minimum Delta P, ^Pmin, = 0.616661 "H2O			
Maximum Delta P, ^Pmax, = 1.795041 "H2O			
PM 2.5 Delta H Setpoint = 0.56842 "H2O			

Test Data					
Barometric Press. =	29.45	inHg	Water Condensate		
Stack Pressure, Pg =	-0.19	inH2O	Start	End	Total
% CO2 =	9.2	%	1	362.6	374.2
% O2 =	10.0	%	2	622	624
Meter Factor (Y)	1.000	dimensionless	3	709.2	712.9
Stack Diameter	36.00	inches	4	872.3	894.8
			Total	2566.1	2605.9
					39.8

Port/Point	Time	Delta P	ER	Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Filter Temp
							0.000					
A1	0.0	1.28		229	21.2	0.57	8.706	5.0	58	100	90	58
A2	21.2	1.36		231	21.8	0.57	17.302	6.0	58	108	94	58
A3	43.0	1.32		232	21.5	0.57	26.055	6.0	56	108	95	58
A4	64.6	1.08		232	19.5	0.57	35.056	6.0	55	112	100	62
A5	84.0	0.93		232	18.1	0.57	41.811	6.0	54	112	101	68
A6	102.1	0.82		232	17.0	0.57	48.748	6.0	54	105	98	68
B1	119.1	1.24		232	20.9	0.57	56.924	6.0	54	103	95	72
B2	139.9	1.35		232	21.8	0.57	65.944	6.0	54	104	95	71
B3	161.7	1.32		232	21.5	0.57	76.802	6.0	54	104	95	69
B4	183.2	1.20		232	20.5	0.57	83.358	6.0	54	104	96	67
B5	203.7	1.00		232	18.7	0.57	91.225	6.0	55	104	96	69
B6	222.4	0.83		230	17.1	0.57	98.436	6.0	59	104	96	72
Final	239.5	--	--	--	--	--	--	--	--	--	--	--
Avg/Total	239.5	1.14		232	20	0.57	98.436	5.9	55	106	96	

Test Results			
Absolute Pressure Stack (Ps)	29.44	inHg	Stack Flow
Vol Meter (Vm(std))	91.355	dscf	Stack Flow
Sample Rate (Qs)	0.518	acfm	Stack Flow
Volume Water Vapor (Vw(std))	1.873	scf	Moisture Gain
Molecular Weight Dry (Md)	29.87	lb/lb-mole	
Molecular Weight Wet (Mw)	29.63	lb/lb-mole	
Viscosity of Gas	215.86	micropoise	
Moisture Content Gas	2.01	%	
Stack Velocity	68.13	ft/sec	
Area Nozzle	0.000128	ft2	
Stack Area	7.07	ft2	

Acceptability Criteria

EPA Method OTM 027

Determination of Particulate Matter Less Than 2.5 Microns

Test Information						Start Time
Client:	Met Council	Date:	2/8/2010	Time:	12:38 - 16:46	12:38
Facility:	Metro	Location:	Stack	Job #:	902630	16:46
Unit:	FBR 1	Test #:	2			

Preliminary Measurements			
Barometric Press. =	29.45	% CO2 =	10.8
Stack Pressure, Pg =	-0.19	% O2 =	8.5
Ave. Stack Temp., Ts =	232	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	106	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	96	Delta H@ =	2.020
Moisture Content, % =	3.00	Total Run Time =	240
Average Delta P =	1.14	Number Of Sample Points =	12
Point #1 Delta P =	1.25	Nozzle Number:	225069
		Nozzle Diameter:	0.154
Cyclone Flow Rate, Qs = 0.52135 CFM			
Minimum Delta P, ^Pmin, = 0.589094 "H2O			
Maximum Delta P, ^Pmax, = 1.721102 "H2O			
PM 2.5 Delta H Setpoint = 0.57543 "H2O			

Test Data					
Barometric Press. =	29.45	inHg	Water Condensate		
Stack Pressure, Pg =	-0.19	inH2O	Start	End	Total
% CO2 =	9.4	%	1	359.3	374.8
% O2 =	9.7	%	2	607.7	610.2
Meter Factor (Y)	1.000	dimensionless	3	707.6	712.3
Stack Diameter	36.00	inches	4	840.8	861.7
			Total	2515.4	2559
					43.6

Port/Point	Time	Delta P	ER	Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Filter Temp
							0.000					
B1	0.0	1.25		232	20.9	0.58	8.825	5.0	63	97	94	80
B2	20.9	1.33		232	21.6	0.58	17.911	5.0	54	102	94	72
B3	42.5	1.34		232	21.6	0.58	27.163	5.0	54	100	94	72
B4	64.1	1.21		232	20.6	0.58	35.657	5.0	54	97	92	70
B5	84.7	1.01		232	18.8	0.58	43.358	5.0	56	97	92	73
B6	103.5	0.86		230	17.3	0.58	50.592	5.0	57	97	92	72
A1	120.8	1.27		228	21.1	0.58	59.059	5.0	59	97	91	71
A2	141.9	1.38		231	22.0	0.58	68.204	5.0	57	97	90	71
A3	163.8	1.34		232	21.6	0.58	77.326	5.0	56	96	90	68
A4	185.5	1.02		232	18.9	0.58	85.157	5.0	54	96	90	68
A5	204.4	0.98		232	18.5	0.58	92.962	5.0	52	95	90	52
A6	222.9	0.81		232	16.8	0.58	99.982	5.0	68	95	90	68
Final	239.7	--	--	--	--	--	--	--	--	--	--	--
Avg/Total	239.7	1.15		231	20	0.58	99.982	5.0	57	97	92	

Test Results			
Absolute Pressure Stack (Ps)	29.44	inHg	Stack Flow
Vol Meter (Vm(std))	93.865	dscf	Stack Flow
Sample Rate (Qs)	0.533	acfm	Stack Flow
Volume Water Vapor (Vw(std))	2.052	scf	Moisture Gain
Molecular Weight Dry (Md)	29.89	lb/lb-mole	
Molecular Weight Wet (Mw)	29.64	lb/lb-mole	
Viscosity of Gas	215.55	micropoise	
Moisture Content Gas	2.14	%	
Stack Velocity	68.30	ft/sec	
Area Nozzle	0.000129	ft2	
Stack Area	7.07	ft2	

Acceptability Criteria

EPA Method OTM 027

Determination of Particulate Matter Less Than 2.5 Microns

Test Information						Start Time
Client:	Met Council	Date:	2/9/2010	Time:	7:30 - 11:32	7:30
Facility:	Metro	Location:	Stack	Job #:	902630	11:32
Unit:	FBR 1	Test #:	3			

Preliminary Measurements			
Barometric Press. =	30.24	% CO2 =	9.4
Stack Pressure, Pg =	-0.19	% O2 =	9.7
Ave. Stack Temp., Ts =	231	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	97	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	92	Delta H @ =	2.020
Moisture Content, % =	2.00	Total Run Time =	249
Average Delta P =	1.15	Number Of Sample Points =	12
Point #1 Delta P =	1.2	Nozzle Number:	225081
		Nozzle Diameter:	0.153
Cyclone Flow Rate, Qs = 0.51975 CFM			
Minimum Delta P, ^Pmin, = 0.617228 "H2O			
Maximum Delta P, ^Pmax, = 1.798705 "H2O			
PM 2.5 Delta H Setpoint = 0.59141 "H2O			

Test Data					
Barometric Press. =	29.54	inHg	Water Condensate		
Stack Pressure, Pg =	-0.18	inH2O	Start	End	Total
% CO2 =	9.7	%	1	362.3	381.2
% O2 =	9.4	%	2	622	625.4
Meter Factor (Y)	1.000	dimensionless	3	707.5	708.1
Stack Diameter	36.00	inches	4	972.4	992.2
			Total	2664.2	2706.9
					42.7

Port/Point	Time	Delta P	ER	Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Filter Temp
A1	0.0	1.20		230	21.2	0.59	0.000					
A2	21.2	1.31		232	22.1	0.59	8.971	5.0	67	86	80	80
A3	43.3	1.28		233	21.9	0.59	18.107	5.0	60	101	86	69
A4	65.2	1.02		233	19.5	0.59	27.391	5.0	54	104	90	67
A5	84.8	0.94		233	18.8	0.59	35.750	5.0	53	105	93	67
A6	103.5	0.83		233	17.6	0.59	43.390	5.0	53	106	95	67
B1	121.2	1.19		233	21.1	0.59	50.760	5.0	52	95	92	68
B2	142.3	1.26		234	21.7	0.59	59.399	5.0	54	91	87	69
B3	164.0	1.24		234	21.5	0.59	68.882	5.0	50	92	85	67
B4	185.5	1.03		234	21.5	0.59	76.876	5.0	50	92	86	67
B5	205.2	0.87		238	19.6	0.59	85.762	5.0	50	93	86	68
B6	223.2	0.81		231	18.0	0.59	93.295	5.0	51	90	85	69
Final	240.6	--		232	17.4	0.59	100.532	5.0	51	89	83	66
Avg/Total	240.6	1.074		233	20	0.59	100.532	5.0	54	95	87	

Test Results			
Absolute Pressure Stack (Ps)	29.53 inHg	Stack Flow	28,068 wacfm
Vol Meter (Vm(std))	95.195 dscf	Stack Flow	21,104 wscfm
Sample Rate (Qs)	0.537 acfm	Stack Flow	20,668 dscfm
Volume Water Vapor (Vw(std))	2.010 scf	Moisture Gain	42.7 mg
Molecular Weight Dry (Md)	29.93 lb/lb-mole		
Molecular Weight Wet (Mw)	29.68 lb/lb-mole		
Viscosity of Gas	215.81 micropoise		
Moisture Content Gas	2.07 %		
Stack Velocity	66.18 ft/sec		
Area Nozzle	0.000128 ft2		
Stack Area	7.07 ft2		

Acceptability Criteria

**MET Council
Metro
FBR Unit 2**

Date	2/10/2010		2/10/2010		2/10/2010	
Time	7:37 - 8:37		8:50 - 9:50		10:02 - 11:02	
Analyzer Value	Run 1		Run 2		Run 3	
NOx	10.6		11.0		10.9	
CO	1.4		1.2		1.1	
SO2	0.0		0.0		0.0	
O2	9.4		9.4		9.5	
CO2	9.5		9.6		9.5	
Calibration Err	Pre		Pre		Pre	
NOx Zero	0.00		0.00		0.00	
NOx Mid	49.00		49.00		49.00	
NOx High	101.00		101.00		101.00	
CO Zero	0.00		0.00		0.00	
CO Mid	51.00		51.00		51.00	
CO High	101.60		101.60		101.60	
SO2 Zero	0.31		0.31		0.31	
SO2 Mid	50.00		50.00		50.00	
SO2 High	100.95		100.95		100.95	
O2 Zero	0.00		0.00		0.00	
O2 Mid	10.00		10.00		10.00	
O2 High	19.92		19.92		19.92	
CO2 Zero	0.00		0.00		0.00	
CO2 Mid	10.00		10.00		10.00	
CO2 High	19.56		19.56		19.56	
System Bias	Pre	Post	Pre	Post	Pre	Post
NOx Zero	0.00	0.00	0.00	0.00	0.00	0.00
NOx Span	49.00	50.00	50.00	49.80	49.80	49.50
CO Zero	0.00	0.00	0.00	0.00	0.00	0.00
CO Span	51.00	51.00	51.00	51.00	51.00	51.00
SO2 Zero	0.72	0.40	0.40	0.07	0.07	0.20
SO2 Span	49.36	47.60	47.60	47.50	47.50	47.50
O2 Zero	0.00	0.00	0.00	0.00	0.00	0.00
O2 Span	10.38	10.00	10.00	10.00	10.00	10.00
CO2 Zero	0.00	0.20	0.20	0.20	0.20	0.22
CO2 Span	9.68	10.00	10.00	10.00	10.00	10.00
Run Results	Run 1		Run 2		Run 3	
NOx	10.8		11.1		11.0	
CO	1.4		1.2		1.1	
SO2	0.0		0.0		0.0	
O2	9.3		9.5		9.6	
CO2	9.7		9.7		9.6	
Nox @ 7% O2	12.9		13.5		13.6	
CO @ 7% O2	1.7		1.5		1.3	
SO2 @ 7% O2	0.0		0.0		0.0	
Cal Results	Run 1		Run 2		Run 3	
NOx CE Zero	0.0		0.0		0.0	
NOx CE Mid	-1.3		-1.3		-1.3	
NOx CE High	-0.6		-0.6		-0.6	
NOx SB Zero	0.0	0.0	0.0	0.0	0.0	0.0
NOx SB Span	0.0	1.0	1.0	0.8	0.8	0.5
NOx Zero Drift	0.0		0.0		0.0	
NOx Span Drift	1.0		-0.2		-0.3	
CO CE Zero	0.0		0.0		0.0	
CO CE Mid	0.3		0.3		0.3	
CO CE High	0.6		0.6		0.6	
CO SB Zero	0.0	0.0	0.0	0.0	0.0	0.0
CO SB Span	0.0	0.0	0.0	0.0	0.0	0.0
CO Zero Drift	0.0		0.0		0.0	
CO Span Drift	0.0		0.0		0.0	
SO2 CE Zero	0.3		0.3		0.3	
SO2 CE Mid	-0.5		-0.5		-0.5	
SO2 CE High	0.0		0.0		0.0	
SO2 SB Zero	0.4	0.1	0.1	-0.2	-0.2	-0.1
SO2 SB Span	-0.6	-2.4	-2.4	-2.5	-2.5	-2.5
SO2 Zero Drift	-0.3		-0.3		0.1	
SO2 Span Drift	-1.7		-0.1		0.0	
O2 CE Zero	0.0		0.0		0.0	
O2 CE Mid	-0.5		-0.5		-0.5	
O2 CE High	0.0		0.0		0.0	
O2 SB Zero	0.0	0.0	0.0	0.0	0.0	0.0
O2 SB Span	1.9	0.0	0.0	0.0	0.0	0.0
O2 Zero Drift	0.0		0.0		0.0	
O2 Span Drift	-1.9		0.0		0.0	
CO2 CE Zero	0.0		0.0		0.0	
CO2 CE Mid	-0.4		-0.4		-0.4	
CO2 CE High	-0.8		-0.8		-0.8	
CO2 SB Zero	0.0	1.0	1.0	1.0	1.0	1.1
CO2 SB Span	-1.6	0.0	0.0	0.0	0.0	0.0
CO2 Zero Drift	1.0		0.0		0.1	
CO2 Span Drift	1.6		0.0		0.0	
Analyzer	Zero	Span	Mid	High	Range	SB
NOx	0.00	50.30	50.30	101.60	101.60	Mid
CO	0.00	50.70	50.70	101.00	101.00	Mid
SO2	0.00	50.50	50.50	101.00	101.00	Mid
O2	0.00	10.10	10.10	19.92	19.92	Mid
CO2	0.00	10.08	10.08	19.71	19.71	Mid

Emission Report

MET Council

St. Paul

Unit: 2

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/10/10	02/10/10	07:37:02	07:37:57	1	9.6	9.3	9.6	1.0	0.1
02/10/10	02/10/10	07:38:00	07:38:57	1	9.6	9.2	10.2	1.6	0.1
02/10/10	02/10/10	07:39:00	07:39:57	1	9.7	9.2	9.9	1.4	0.2
02/10/10	02/10/10	07:40:00	07:40:58	1	9.9	9.0	9.6	1.0	0.1
02/10/10	02/10/10	07:41:01	07:41:58	1	9.9	9.1	9.4	1.0	0.1
02/10/10	02/10/10	07:42:01	07:42:59	1	9.7	9.2	10.2	1.0	0.1
02/10/10	02/10/10	07:43:02	07:43:59	1	9.7	9.2	10.1	1.0	0.0
02/10/10	02/10/10	07:44:02	07:44:57	1	9.8	9.1	10.7	1.0	0.0
02/10/10	02/10/10	07:45:00	07:45:57	1	9.8	9.2	10.0	1.0	0.0
02/10/10	02/10/10	07:46:00	07:46:58	1	9.5	9.4	9.7	1.0	0.1
02/10/10	02/10/10	07:47:01	07:47:58	1	9.4	9.4	10.3	1.5	0.0
02/10/10	02/10/10	07:48:01	07:48:59	1	9.3	9.6	10.6	1.1	0.0
02/10/10	02/10/10	07:49:02	07:49:59	1	8.9	9.7	10.7	1.8	0.0
02/10/10	02/10/10	07:50:02	07:50:57	1	9.1	9.5	10.6	1.9	0.0
02/10/10	02/10/10	07:51:00	07:51:57	1	9.4	9.5	11.3	1.1	0.0
02/10/10	02/10/10	07:52:00	07:52:57	1	9.2	9.6	11.9	1.3	0.0
02/10/10	02/10/10	07:53:00	07:53:58	1	9.2	9.6	11.0	1.7	0.0
02/10/10	02/10/10	07:54:01	07:54:58	1	9.2	9.6	10.8	2.0	0.0
02/10/10	02/10/10	07:55:01	07:55:59	1	9.2	9.6	11.1	1.8	0.0
02/10/10	02/10/10	07:56:02	07:56:59	1	9.2	9.6	10.7	1.8	0.0
02/10/10	02/10/10	07:57:02	07:57:57	1	9.2	9.6	10.9	2.0	0.0
02/10/10	02/10/10	07:58:00	07:58:57	1	9.4	9.4	10.6	1.3	0.0
02/10/10	02/10/10	07:59:00	07:59:58	1	9.3	9.6	10.6	1.5	0.0
02/10/10	02/10/10	08:00:01	08:00:58	1	9.2	9.6	10.7	2.0	0.0
02/10/10	02/10/10	08:01:01	08:01:59	1	9.1	9.7	10.9	1.7	0.0
02/10/10	02/10/10	08:02:02	08:02:59	1	9.3	9.6	10.9	1.9	0.0
02/10/10	02/10/10	08:03:02	08:03:57	1	9.3	9.5	11.3	1.7	0.0
02/10/10	02/10/10	08:04:00	08:04:57	1	9.4	9.5	11.4	1.0	0.0
02/10/10	02/10/10	08:05:00	08:05:58	1	9.3	9.6	10.5	1.2	0.0
02/10/10	02/10/10	08:06:01	08:06:58	1	9.5	9.4	9.8	1.0	0.0
02/10/10	02/10/10	08:07:01	08:07:59	1	9.7	9.3	9.6	1.0	0.0

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/10/10	02/10/10	08:08:02	08:08:59	1	9.6	9.4	10.9	1.2	0.0
02/10/10	02/10/10	08:09:02	08:09:57	1	9.4	9.4	11.2	1.0	0.0
02/10/10	02/10/10	08:10:00	08:10:57	1	9.6	9.4	10.8	1.0	0.0
02/10/10	02/10/10	08:11:00	08:11:57	1	9.5	9.4	10.4	1.0	0.0
02/10/10	02/10/10	08:12:01	08:12:58	1	9.4	9.6	10.0	1.3	0.0
02/10/10	02/10/10	08:13:01	08:13:58	1	9.6	9.4	10.3	1.3	0.0
02/10/10	02/10/10	08:14:01	08:14:59	1	9.4	9.5	11.0	1.0	0.0
02/10/10	02/10/10	08:15:02	08:15:59	1	9.4	9.5	10.5	1.6	0.0
02/10/10	02/10/10	08:16:03	08:16:57	1	9.5	9.4	10.4	1.7	0.0
02/10/10	02/10/10	08:17:00	08:17:57	1	9.5	9.5	10.4	1.0	0.0
02/10/10	02/10/10	08:18:01	08:18:58	1	9.3	9.5	11.5	2.0	0.0
02/10/10	02/10/10	08:19:01	08:19:59	1	9.4	9.5	10.3	1.3	0.0
02/10/10	02/10/10	08:20:02	08:20:59	1	9.6	9.4	10.5	1.0	0.0
02/10/10	02/10/10	08:21:02	08:21:59	1	9.6	9.4	10.5	1.2	0.0
02/10/10	02/10/10	08:22:02	08:22:57	1	9.4	9.6	11.3	1.1	0.0
02/10/10	02/10/10	08:23:00	08:23:57	1	9.3	9.6	10.3	1.9	0.0
02/10/10	02/10/10	08:24:00	08:24:58	1	9.4	9.5	10.3	1.0	0.0
02/10/10	02/10/10	08:25:01	08:25:58	1	9.2	9.7	10.2	1.5	0.0
02/10/10	02/10/10	08:26:01	08:26:59	1	9.0	9.7	10.6	2.0	0.0
02/10/10	02/10/10	08:27:02	08:27:59	1	9.3	9.6	9.8	1.5	0.0
02/10/10	02/10/10	08:28:02	08:28:57	1	9.4	9.6	9.9	2.0	0.0
02/10/10	02/10/10	08:29:00	08:29:57	1	9.3	9.7	10.6	1.7	0.0
02/10/10	02/10/10	08:30:00	08:30:58	1	9.3	9.7	12.0	2.0	0.0
02/10/10	02/10/10	08:31:01	08:31:58	1	9.4	9.5	10.9	1.5	0.0
02/10/10	02/10/10	08:32:01	08:32:59	1	9.5	9.5	10.2	2.0	0.0
02/10/10	02/10/10	08:33:02	08:33:59	1	9.4	9.6	10.5	2.0	0.0
02/10/10	02/10/10	08:34:02	08:34:57	1	9.4	9.6	11.0	1.3	0.0
02/10/10	02/10/10	08:35:00	08:35:57	1	9.5	9.5	10.6	2.0	0.0
02/10/10	02/10/10	08:36:00	08:36:58	1	9.7	9.3	11.1	1.2	0.0
Average					9.4	9.5	10.6	1.4	0.0
Minimum Value					8.9	9.0	9.4	1.0	0.0
Maximum Value					9.9	9.7	12.0	2.0	0.2

Emission Report

MET Council

St. Paul

Unit: 2

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/10/10	02/10/10	08:50:01	08:50:59	2	9.6	9.4	10.8	0.2	0.3
02/10/10	02/10/10	08:51:02	08:51:59	2	9.5	9.6	10.8	0.6	0.0
02/10/10	02/10/10	08:52:02	08:52:57	2	9.4	9.6	11.2	1.3	0.0
02/10/10	02/10/10	08:53:00	08:53:57	2	9.5	9.6	11.7	2.0	0.0
02/10/10	02/10/10	08:54:00	08:54:57	2	9.4	9.6	11.2	2.0	0.0
02/10/10	02/10/10	08:55:00	08:55:58	2	9.4	9.6	11.2	1.7	0.0
02/10/10	02/10/10	08:56:01	08:56:58	2	9.1	9.7	11.8	2.0	0.0
02/10/10	02/10/10	08:57:01	08:57:59	2	9.2	9.8	11.2	2.0	0.0
02/10/10	02/10/10	08:58:02	08:58:59	2	9.3	9.6	10.6	2.2	0.0
02/10/10	02/10/10	08:59:02	08:59:57	2	9.1	9.8	11.4	1.9	0.0
02/10/10	02/10/10	09:00:00	09:00:57	2	9.1	9.8	11.3	1.9	0.0
02/10/10	02/10/10	09:01:00	09:01:57	2	9.2	9.7	10.4	1.8	0.0
02/10/10	02/10/10	09:02:01	09:02:58	2	9.3	9.7	11.1	1.9	0.0
02/10/10	02/10/10	09:03:01	09:03:58	2	9.3	9.6	11.1	1.7	0.0
02/10/10	02/10/10	09:04:01	09:04:59	2	9.4	9.6	11.1	1.8	0.0
02/10/10	02/10/10	09:05:02	09:05:59	2	9.5	9.6	10.6	0.7	0.0
02/10/10	02/10/10	09:06:02	09:06:57	2	9.4	9.5	11.2	1.5	0.0
02/10/10	02/10/10	09:07:00	09:07:57	2	9.4	9.6	10.8	0.3	0.0
02/10/10	02/10/10	09:08:00	09:08:58	2	9.5	9.5	10.8	0.5	0.0
02/10/10	02/10/10	09:09:01	09:09:58	2	9.5	9.5	10.5	1.0	0.0
02/10/10	02/10/10	09:10:01	09:10:59	2	9.5	9.5	10.4	0.6	0.0
02/10/10	02/10/10	09:11:02	09:11:59	2	9.5	9.5	11.2	0.4	0.0
02/10/10	02/10/10	09:12:02	09:12:59	2	9.5	9.5	10.7	0.4	0.0
02/10/10	02/10/10	09:13:02	09:13:57	2	9.4	9.6	11.5	1.9	0.0
02/10/10	02/10/10	09:14:00	09:14:57	2	9.4	9.6	10.6	1.7	0.0
02/10/10	02/10/10	09:15:00	09:15:58	2	9.1	9.7	11.4	2.0	0.0
02/10/10	02/10/10	09:16:01	09:16:58	2	9.4	9.6	11.4	1.8	0.0
02/10/10	02/10/10	09:17:01	09:17:59	2	9.5	9.5	10.2	1.4	0.0
02/10/10	02/10/10	09:18:02	09:18:59	2	9.4	9.6	10.4	0.1	0.0
02/10/10	02/10/10	09:19:02	09:19:57	2	9.3	9.6	10.5	0.8	0.0
02/10/10	02/10/10	09:20:00	09:20:57	2	9.4	9.6	10.5	1.5	0.0

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/10/10	02/10/10	09:21:00	09:21:57	2	9.5	9.6	11.2	0.3	0.0
02/10/10	02/10/10	09:22:01	09:22:58	2	9.6	9.5	11.3	1.6	0.0
02/10/10	02/10/10	09:23:01	09:23:58	2	9.4	9.6	11.0	0.1	0.0
02/10/10	02/10/10	09:24:01	09:24:59	2	9.2	9.7	11.4	1.3	0.0
02/10/10	02/10/10	09:25:02	09:25:59	2	9.4	9.6	11.3	0.8	0.0
02/10/10	02/10/10	09:26:02	09:26:57	2	9.0	9.7	10.6	1.9	0.0
02/10/10	02/10/10	09:27:00	09:27:57	2	9.4	9.6	11.1	0.4	0.0
02/10/10	02/10/10	09:28:00	09:28:58	2	9.4	9.6	10.9	0.7	0.0
02/10/10	02/10/10	09:29:01	09:29:58	2	9.4	9.6	11.2	0.9	0.0
02/10/10	02/10/10	09:30:01	09:30:58	2	9.4	9.6	11.1	0.7	0.0
02/10/10	02/10/10	09:31:01	09:31:59	2	9.0	9.9	11.0	1.8	0.0
02/10/10	02/10/10	09:32:02	09:32:59	2	9.1	9.8	12.6	1.9	0.0
02/10/10	02/10/10	09:33:02	09:33:57	2	9.2	9.7	11.6	1.7	0.0
02/10/10	02/10/10	09:34:00	09:34:57	2	9.3	9.6	11.5	1.9	0.0
02/10/10	02/10/10	09:35:00	09:35:58	2	9.4	9.6	11.5	1.2	0.0
02/10/10	02/10/10	09:36:01	09:36:58	2	9.4	9.6	11.1	1.7	0.0
02/10/10	02/10/10	09:37:01	09:37:59	2	9.4	9.6	11.2	1.1	0.0
02/10/10	02/10/10	09:38:02	09:38:59	2	9.4	9.6	10.6	0.5	0.0
02/10/10	02/10/10	09:39:02	09:39:57	2	9.5	9.4	10.4	0.7	0.0
02/10/10	02/10/10	09:40:00	09:40:57	2	9.5	9.6	10.6	0.6	0.0
02/10/10	02/10/10	09:41:00	09:41:58	2	9.4	9.6	11.5	1.4	0.0
02/10/10	02/10/10	09:42:01	09:42:58	2	9.3	9.6	11.1	0.3	0.0
02/10/10	02/10/10	09:43:01	09:43:59	2	9.4	9.6	10.4	0.5	0.0
02/10/10	02/10/10	09:44:02	09:44:59	2	9.4	9.6	10.1	1.1	0.0
02/10/10	02/10/10	09:45:02	09:45:57	2	9.2	9.8	10.6	1.1	0.0
02/10/10	02/10/10	09:46:00	09:46:57	2	9.3	9.7	10.9	1.4	0.0
02/10/10	02/10/10	09:47:00	09:47:58	2	9.2	9.8	11.2	1.1	0.0
02/10/10	02/10/10	09:48:01	09:48:58	2	9.3	9.6	11.0	1.6	0.0
02/10/10	02/10/10	09:49:01	09:49:59	2	9.4	9.6	10.9	1.3	0.0
Average					9.4	9.6	11.0	1.2	0.0
Minimum Value					9.0	9.4	10.1	0.1	0.0
Maximum Value					9.6	9.9	12.6	2.2	0.3

Emission Report

MET Council

St. Paul

Unit: 2

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/10/10	02/10/10	10:02:02	10:02:57	3	9.5	9.5	11.0	1.5	0.0
02/10/10	02/10/10	10:03:00	10:03:57	3	9.5	9.5	11.3	0.6	0.0
02/10/10	02/10/10	10:04:00	10:04:57	3	9.6	9.4	10.9	1.3	0.0
02/10/10	02/10/10	10:05:00	10:05:58	3	9.5	9.5	11.4	0.0	0.0
02/10/10	02/10/10	10:06:01	10:06:58	3	9.5	9.5	10.8	0.2	0.0
02/10/10	02/10/10	10:07:01	10:07:59	3	9.5	9.6	10.8	0.2	0.0
02/10/10	02/10/10	10:08:02	10:08:59	3	9.3	9.6	10.9	1.9	0.0
02/10/10	02/10/10	10:09:02	10:09:57	3	9.5	9.4	10.7	1.7	0.0
02/10/10	02/10/10	10:10:00	10:10:57	3	9.6	9.5	11.3	0.1	0.0
02/10/10	02/10/10	10:11:00	10:11:58	3	9.4	9.6	11.1	1.2	0.0
02/10/10	02/10/10	10:12:01	10:12:58	3	9.6	9.5	10.5	1.4	0.0
02/10/10	02/10/10	10:13:01	10:13:59	3	9.6	9.5	10.4	1.0	0.0
02/10/10	02/10/10	10:14:02	10:14:59	3	9.5	9.5	11.3	0.1	0.0
02/10/10	02/10/10	10:15:02	10:15:59	3	9.6	9.4	10.1	1.3	0.0
02/10/10	02/10/10	10:16:02	10:16:57	3	9.4	9.5	11.0	0.2	0.0
02/10/10	02/10/10	10:17:00	10:17:57	3	9.6	9.4	10.9	0.2	0.0
02/10/10	02/10/10	10:18:00	10:18:58	3	9.6	9.4	11.0	0.2	0.0
02/10/10	02/10/10	10:19:01	10:19:58	3	9.4	9.5	11.5	0.7	0.0
02/10/10	02/10/10	10:20:01	10:20:59	3	9.6	9.4	11.1	0.4	0.0
02/10/10	02/10/10	10:21:02	10:21:59	3	9.6	9.4	11.8	0.4	0.0
02/10/10	02/10/10	10:22:02	10:22:57	3	9.7	9.4	10.6	0.2	0.0
02/10/10	02/10/10	10:23:00	10:23:57	3	9.6	9.4	10.8	1.1	0.0
02/10/10	02/10/10	10:24:00	10:24:58	3	9.6	9.5	10.3	0.3	0.0
02/10/10	02/10/10	10:25:01	10:25:58	3	9.6	9.5	10.8	1.5	0.0
02/10/10	02/10/10	10:26:01	10:26:58	3	9.5	9.5	10.8	1.0	0.0
02/10/10	02/10/10	10:27:01	10:27:59	3	9.6	9.4	10.6	1.2	0.0
02/10/10	02/10/10	10:28:02	10:28:59	3	9.6	9.4	11.0	0.8	0.0
02/10/10	02/10/10	10:29:02	10:29:57	3	9.6	9.5	10.1	1.2	0.0
02/10/10	02/10/10	10:30:00	10:30:57	3	9.5	9.6	10.5	2.0	0.0
02/10/10	02/10/10	10:31:00	10:31:58	3	9.5	9.5	10.2	1.7	0.0
02/10/10	02/10/10	10:32:01	10:32:58	3	9.6	9.5	10.8	0.5	0.0

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/10/10	02/10/10	10:33:01	10:33:59	3	9.6	9.4	10.7	0.8	0.0
02/10/10	02/10/10	10:34:02	10:34:56	3	9.5	9.5	10.4	0.7	0.0
02/10/10	02/10/10	10:35:00	10:35:57	3	9.4	9.6	10.8	1.5	0.0
02/10/10	02/10/10	10:36:00	10:36:58	3	9.4	9.6	10.6	1.7	0.0
02/10/10	02/10/10	10:37:01	10:37:58	3	9.4	9.6	11.0	2.0	0.0
02/10/10	02/10/10	10:38:01	10:38:59	3	9.4	9.6	10.4	2.3	0.0
02/10/10	02/10/10	10:39:02	10:39:59	3	9.4	9.6	10.7	1.4	0.0
02/10/10	02/10/10	10:40:02	10:40:57	3	9.4	9.7	10.4	1.1	0.0
02/10/10	02/10/10	10:41:00	10:41:57	3	9.2	9.7	11.3	1.7	0.0
02/10/10	02/10/10	10:42:00	10:42:58	3	9.4	9.6	11.4	0.7	0.0
02/10/10	02/10/10	10:43:01	10:43:58	3	9.4	9.5	11.4	1.1	0.0
02/10/10	02/10/10	10:44:01	10:44:59	3	9.6	9.4	10.0	1.5	0.0
02/10/10	02/10/10	10:45:02	10:45:59	3	9.8	9.4	10.4	1.0	0.0
02/10/10	02/10/10	10:46:02	10:46:57	3	9.6	9.4	11.6	0.8	0.0
02/10/10	02/10/10	10:47:00	10:47:57	3	9.5	9.6	10.8	0.7	0.0
02/10/10	02/10/10	10:48:00	10:48:57	3	9.7	9.4	10.1	1.5	0.0
02/10/10	02/10/10	10:49:00	10:49:58	3	9.6	9.5	10.7	0.5	0.0
02/10/10	02/10/10	10:50:01	10:50:58	3	9.7	9.4	10.7	1.5	0.0
02/10/10	02/10/10	10:51:01	10:51:59	3	9.5	9.6	10.4	1.3	0.0
02/10/10	02/10/10	10:52:02	10:52:59	3	9.3	9.7	11.2	1.0	0.0
02/10/10	02/10/10	10:53:02	10:53:57	3	9.1	9.8	11.6	1.7	0.0
02/10/10	02/10/10	10:54:00	10:54:57	3	9.3	9.6	11.7	1.5	0.0
02/10/10	02/10/10	10:55:00	10:55:58	3	9.4	9.6	11.0	2.0	0.0
02/10/10	02/10/10	10:56:01	10:56:58	3	9.4	9.6	10.3	2.0	0.0
02/10/10	02/10/10	10:57:01	10:57:59	3	9.4	9.6	11.6	2.0	0.0
02/10/10	02/10/10	10:58:02	10:58:59	3	9.4	9.7	10.9	1.0	0.0
02/10/10	02/10/10	10:59:02	10:59:59	3	9.3	9.6	11.2	2.0	0.0
02/10/10	02/10/10	11:00:03	11:00:57	3	9.4	9.6	11.1	2.0	0.0
02/10/10	02/10/10	11:01:00	11:01:57	3	9.5	9.5	11.4	0.9	0.0
Average					9.5	9.5	10.9	1.1	0.0
Minimum Value					9.1	9.4	10.0	0.0	0.0
Maximum Value					9.8	9.8	11.8	2.3	0.0



AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2/9/2010
Facility	Metro	Start/Stop Time	12:25 - 16:27
Unit	FBR 2	Test Method	EPA 23
Location	Stack	Run Number	1
Project #	902630	Description	Dioxin/Furan
Operator	nt nk	Carbon Trap ID	

RUN DATA

Tamb	22	°F	# Ports	2	Meter Box #	AB 3	ID#	2320003
Pbar	29.54	In Hg	# Points	12	Nozzle Dia. (in)	0.197	ID#	224115
Filter #	Trap # 7		Time/Pt	20	Probe ID #	221018	Pitot ID #	
MF #			Port Order	b-a	del H @	1.889		
Pstack	-0.29	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	Unit 2 run 1 M23		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.006	12	nt	12:08	Pre	O2	9.60	9.60	9.60	9.60
Post	0.004	13	nt	16:30	ok	CO2	9.70	9.70	9.70	9.70

≤ 0.02 cfm or 4 % of Sample Rate Stable @ ≥ 3" 15 sec

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)			50ml Rinse	Y	N
						End	Start	Diff	ID #		
					#1	396.9	362.3		263051		
					#2	694.8	700.3		261011		
					#3	688.7	690.6		261096		
					#4	615.4	612.3		261030		
					#5	951.2	919.1		261042		
					#6						
					#7						
					#8	0.0	0.0				
					Total	3347.0	3284.6	62.4			

Post Field Meter Calibration				Set Vacuum = 17"		Collect 5 cf per run			
Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time	
Enter on Run 3 Sheet									

TC Field Calibration	
Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

Comments

Date	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out	
Average					240	1.13	1.48	155.757	8.9	230.0	249.0	251.6	56.4	98.2	83.8
2/9/2010	12:26:01 PM		1	1	1	1.12	1.69	0.698	8.4	229.8	249.4	252.2	76.6	84.8	80.9
2/9/2010	12:27:01 PM		1	1	2	1.13	1.56	1.364	8.4	229.8	249	250	72.8	90.6	81.2
2/9/2010	12:28:01 PM		1	1	3	1.11	1.49	2.013	8	229.9	249.5	252.6	70.6	93.5	81.3
2/9/2010	12:29:01 PM		1	1	4	1.11	1.47	2.657	7.9	230.1	249.3	248.3	68.2	95.2	81.6
2/9/2010	12:30:01 PM		1	1	5	1.12	1.47	3.301	7.8	230	249.8	256	65.8	96.5	81.7
2/9/2010	12:31:01 PM		1	1	6	1.12	1.45	3.942	7.8	229.9	249.8	251.3	63.5	97.2	81.8
2/9/2010	12:32:01 PM		1	1	7	1.12	1.44	4.58	7.8	230	249.6	250	61.6	97.8	82
2/9/2010	12:33:01 PM		1	1	8	1.12	1.43	5.215	7.8	229.9	249.5	252.9	59.9	98.2	82.2
2/9/2010	12:34:01 PM		1	1	9	1.12	1.43	5.851	7.9	229.9	249	249.6	58.6	98.5	82.4
2/9/2010	12:35:01 PM		1	1	10	1.12	1.44	6.49	7.9	229.9	249.5	254.4	57.4	98.9	82.6
2/9/2010	12:36:01 PM		1	1	11	1.12	1.43	7.127	7.9	230.1	249.1	248.9	56.5	99.2	82.8
2/9/2010	12:37:01 PM		1	1	12	1.11	1.44	7.764	7.9	229.9	249.4	254.5	55.8	99.2	82.8
2/9/2010	12:38:01 PM		1	1	13	1.13	1.44	8.401	7.9	229.8	249.4	251.7	55.3	99.2	82.9
2/9/2010	12:39:01 PM		1	1	14	1.13	1.44	9.041	8	229.7	248.6	250.4	55	99.2	83
2/9/2010	12:40:01 PM		1	1	15	1.11	1.46	9.683	8	229.8	249.5	253.1	54.9	99.2	83.1
2/9/2010	12:41:01 PM		1	1	16	1.12	1.46	10.327	8	229.9	248.4	248.1	54.7	99.5	83.4
2/9/2010	12:42:01 PM		1	1	17	1.11	1.46	10.972	8	229.8	249.3	254.8	54.6	99.6	83.6
2/9/2010	12:43:01 PM		1	1	18	1.12	1.46	11.617	8.1	229.9	249.1	251.8	54.5	99.5	83.6
2/9/2010	12:44:01 PM		1	1	19	1.12	1.48	12.268	8.2	229.8	248.8	250.9	54.5	99.5	83.7
2/9/2010	12:45:01 PM		1	2	20	1.12	1.5	12.92	8.2	229.8	249.5	254.6	54.5	99.4	83.7
2/9/2010	12:46:01 PM		1	2	21	1.12	1.49	13.573	8.2	229.9	249	248.7	54.6	99.5	83.9
2/9/2010	12:47:01 PM		1	2	22	1.12	1.49	14.224	8.2	229.9	249.2	253.4	54.6	99.6	84
2/9/2010	12:48:01 PM		1	2	23	1.11	1.48	14.872	8.2	229.8	249.3	249.1	54.7	99.5	83.9
2/9/2010	12:49:01 PM		1	2	24	1.11	1.45	15.514	8.2	229.8	249.4	252.2	54.8	99.5	84.1
2/9/2010	12:50:01 PM		1	2	25	1.11	1.45	16.153	8.2	229.8	249.4	251.7	54.7	99.5	84.1
2/9/2010	12:51:01 PM		1	2	26	1.11	1.44	16.791	8.2	229.7	249.2	250.8	54.7	99.4	84.1
2/9/2010	12:52:01 PM		1	2	27	1.11	1.43	17.429	8.3	229.6	249.3	254.2	54.7	99.3	84.1
2/9/2010	12:53:01 PM		1	2	28	1.11	1.46	18.074	8.4	229.6	249.1	248.9	54.7	99.3	84.1
2/9/2010	12:54:01 PM		1	2	29	1.11	1.47	18.718	8.5	229.5	249.4	254.3	54.6	99.4	84.2
2/9/2010	12:55:01 PM		1	2	30	1.11	1.46	19.364	8.5	229.5	249.5	249.2	54.6	99.3	84.3
2/9/2010	12:56:01 PM		1	2	31	1.11	1.46	20.008	8.5	229.3	249.6	252.7	54.5	99.1	84.1
2/9/2010	12:57:01 PM		1	2	32	1.11	1.46	20.652	8.5	229.3	249.4	252.8	54.6	99	84.1
2/9/2010	12:58:01 PM		1	2	33	1.12	1.47	21.3	8.5	229.4	248.6	249.7	54.7	99	84.2
2/9/2010	12:59:01 PM		1	2	34	1.11	1.48	21.95	8.6	229.4	249.2	253.2	54.6	99.1	84.2
2/9/2010	1:00:01 PM		1	2	35	1.11	1.48	22.6	8.6	229.4	248.9	248.3	54.7	99	84.2
2/9/2010	1:01:01 PM		1	2	36	1.11	1.48	23.251	8.6	229.5	248.7	254.2	54.8	99	84.2
2/9/2010	1:02:01 PM		1	2	37	1.1	1.49	23.901	8.6	229.6	249.2	252.4	55	99	84.2
2/9/2010	1:03:01 PM		1	2	38	1.11	1.48	24.549	8.6	229.7	248.2	248.8	55	99	84.2
2/9/2010	1:04:01 PM		1	2	39	1.15	1.5	25.202	8.6	230.3	249.3	255.2	55.1	99.1	84.3
2/9/2010	1:05:01 PM		1	3	40	1.18	1.51	25.856	8.7	230.7	249.3	249.6	54.8	99.1	84.3
2/9/2010	1:06:01 PM		1	3	41	1.17	1.5	26.511	8.7	230.7	249.1	252.7	54.8	99.1	84.3
2/9/2010	1:07:01 PM		1	3	42	1.15	1.51	27.164	8.7	230.9	249.4	253.6	54.8	99.2	84.3
2/9/2010	1:08:01 PM		1	3	43	1.15	1.5	27.818	8.7	230.9	249.1	248.9	54.7	99.1	84.3
2/9/2010	1:09:01 PM		1	3	44	1.15	1.5	28.473	8.7	231	249.6	255.2	54.7	99.2	84.4
2/9/2010	1:10:01 PM		1	3	45	1.15	1.5	29.127	8.7	231	249.3	250	54.7	99.3	84.4
2/9/2010	1:11:01 PM		1	3	46	1.16	1.5	29.783	8.7	230.8	249.4	251.7	54.5	99.2	84.3
2/9/2010	1:12:01 PM		1	3	47	1.15	1.51	30.44	8.8	230.8	249.6	252.8	54.5	99.1	84.3
2/9/2010	1:13:01 PM		1	3	48	1.15	1.5	31.095	8.8	230.9	248.9	249.5	54.7	99.3	84.5
2/9/2010	1:14:01 PM		1	3	49	1.16	1.51	31.752	8.8	232.5	249.5	253.6	54.8	99.4	84.5
2/9/2010	1:15:01 PM		1	3	50	1.17	1.51	32.408	8.8	230.6	249.1	248.7	54.8	99.3	84.4
2/9/2010	1:16:01 PM		1	3	51	1.16	1.5	33.063	8.7	230.6	248.8	253	54.9	99.1	84.3
2/9/2010	1:17:01 PM		1	3	52	1.16	1.51	33.719	8.8	230.8	249.2	250.3	55.1	99.2	84.5
2/9/2010	1:18:01 PM		1	3	53	1.16	1.51	34.376	8.8	231.2	248.2	251.5	55.2	99.4	84.6
2/9/2010	1:19:01 PM		1	3	54	1.16	1.52	35.036	8.8	231.6	249	253.7	55.2	99.4	84.5
2/9/2010	1:20:01 PM		1	3	55	1.16	1.51	35.694	8.8	231.9	248.6	248.9	55.3	99.5	84.6
2/9/2010	1:21:01 PM		1	3	56	1.16	1.52	36.352	8.8	231.8	249.2	254.1	55.3	99.5	84.7
2/9/2010	1:22:01 PM		1	3	57	1.15	1.51	37.009	8.8	231.7	248.9	249.7	55.1	99.7	84.7
2/9/2010	1:23:01 PM		1	3	58	1.17	1.51	37.667	8.8	231.6	249	253.3	55.1	99.7	84.8
2/9/2010	1:24:01 PM		1	3	59	1.14	1.52	38.326	8.9	231.5	249.3	251.6	55.1	99.8	84.8
2/9/2010	1:25:01 PM		1	4	60	1.12	1.5	38.98	8.8	230.7	249.1	249.6	55.3	99.6	84.8
2/9/2010	1:26:01 PM		1	4	61	1.13	1.5	39.636	8.8	231.5	249.5	254.8	55.4	99.7	84.9
2/9/2010	1:27:01 PM		1	4	62	1.12	1.5	40.291	8.8	231.1	249.4	249.2	55.3	99.6	84.8
2/9/2010	1:28:01 PM		1	4	63	1.12	1.5	40.947	8.8	231.1	249.3	254.7	55.5	99.7	84.9
2/9/2010	1:29:01 PM		1	4	64	1.11	1.5	41.602	8.8	231.1	249.5	250.2	55.3	99.9	85
2/9/2010	1:30:01 PM		1	4	65	1.13	1.5	42.257	8.8	231	249.5	252.3	55.2	99.9	85
2/9/2010	1:31:01 PM		1	4	66	1.12	1.5	42.913	8.8	231	249.4	252.6	55.3	100	85.1
2/9/2010	1:32:01 PM		1	4	67	1.13	1.49	43.566	8.8	231	249.1	250.1	55.5	100.1	85.2
2/9/2010	1:33:01 PM		1	4	68	1.12	1.5	44.22	8.8	231	249.4	254.5	55.3	100.2	85.2
2/9/2010	1:34:01 PM		1	4	69	1.12	1.5	44.874	8.8	231	248.9	248.5	55.4	100.3	85.3
2/9/2010	1:35:01 PM		1	4	70	1.12	1.5	45.529	8.8	230.9	249.3	253.7	55.4	100.5	85.4
2/9/2010	1:36:01 PM		1	4	71	1.11	1.49	46.183	8.8	230.6	249.5	250.3	55.2	100.3	85.3
2/9/2010	1:37:01 PM		1	4	72	1.12	1.49	46.836	8.8	230.5	249	252.2	55.5	100.2	85.2
2/9/2010	1:38:01 PM		1	4	73	1.12	1.49	47.491	8.8	230.3	249.2	253	55.5	100.4	85.4
2/9/2010	1:39:01 PM		1	4	74	1.13	1.48	48.143	8.8	230.3	248.3	248.7	55.7	100.4	85.5
2/9/2010	1:40:01 PM		1	4	75	1.11	1.49	48.794	8.8	230.3	248.7	253.9	55.8	100.4	85.4
2/9/2010	1:41:01 PM		1	4	76	1.12	1.49	49.447	8.8	230.3	249	249.7	55.8	100.5	85.6
2/9/2010	1:42:00 PM		1	4	77	1.11	1.49	50.079	8.8	230.1	249	252.6	55.6	100.4	85.5
2/9/2010	1:43:00 PM		1	4	78	1.11	1.5	50.733	8.8	230.1	249.6	251.6	55.7	100.4	85.6
2/9/2010	1:44:02 PM		1	4	79	1.12	1.49	51.407	8.8	230	249	251.4	55.6	100.4	85.6
2/9/2010	1:45:02 PM		1	5	80	1.1	1.49	52.062	8.8	229.2	249.3	252.4	55.4	100.2	85.5
2/9/2010	1:46:02 PM		1	5	81	1.09	1.48	52.712	8.8	229.2	249.1	248.7	55.4	100.2	85.6
2/9/2010	1:47:00 PM		1	5	82	1.1	1.49	53.343	8.8	229.1	249.4	256.1	55.3	100.1	85.6
2/9/2010	1:48:00 PM		1	5	83	1.09	1.47	53.992	8.7						

2/9/2010	1:50:02 PM	1	5	85	1.1	1.44	55.298	8.6	228.8	248.7	252.7	55	100.1	85.6
2/9/2010	1:51:02 PM	1	5	86	1.1	1.44	55.939	8.6	228.9	247.8	248.5	55	100.2	85.7
2/9/2010	1:52:02 PM	1	5	87	1.1	1.45	56.581	8.6	228.9	248.7	255.1	55	100.4	85.8
2/9/2010	1:53:00 PM	1	5	88	1.1	1.45	57.203	8.6	228.8	249.1	250.9	54.8	100.2	85.6
2/9/2010	1:54:00 PM	1	5	89	1.1	1.44	57.845	8.6	228.7	249.3	250.7	54.7	100	85.5
2/9/2010	1:55:02 PM	1	5	90	1.1	1.44	58.508	8.6	228.7	249.3	252.9	54.6	99.8	85.4
2/9/2010	1:56:00 PM	1	5	91	1.1	1.44	59.128	8.5	228.7	249.4	248.6	54.6	99.7	85.5
2/9/2010	1:57:00 PM	1	5	92	1.1	1.47	59.776	8.6	228.5	249	254.2	54.4	99.5	85.3
2/9/2010	1:58:00 PM	1	5	93	1.1	1.47	60.425	8.7	228.6	249.1	249.9	54.6	99.5	85.3
2/9/2010	1:59:00 PM	1	5	94	1.09	1.47	61.073	8.7	228.7	248.3	252.5	54.6	99.5	85.3
2/9/2010	2:00:02 PM	1	5	95	1.09	1.47	61.744	8.7	228.6	248.9	253.7	54.6	99.4	85.2
2/9/2010	2:01:02 PM	1	5	96	1.1	1.47	62.393	8.7	228.6	248.5	248.8	54.6	99.3	85.1
2/9/2010	2:02:00 PM	1	5	97	1.1	1.47	63.019	8.7	228.7	248.9	254	54.8	99.2	85.1
2/9/2010	2:03:00 PM	1	5	98	1.08	1.46	63.666	8.6	228.6	249.3	249.8	54.7	99.1	85.1
2/9/2010	2:04:00 PM	1	5	99	1.1	1.47	64.312	8.6	228.7	249.4	250.8	54.6	99.2	85.1
2/9/2010	2:05:00 PM	1	6	100	1.06	1.46	64.957	8.6	228.5	249.7	252.3	54.5	99.3	85.1
2/9/2010	2:06:02 PM	1	6	101	1.07	1.43	65.615	8.5	228.5	248.6	248.1	54.5	99.2	85
2/9/2010	2:07:00 PM	1	6	102	1.07	1.43	66.233	8.5	228.5	249	253.5	54.5	99.3	85.1
2/9/2010	2:08:00 PM	1	6	103	1.07	1.43	66.873	8.5	228.3	248.9	249.5	54.4	99.3	85
2/9/2010	2:09:02 PM	1	6	104	1.08	1.41	67.529	8.4	228.4	248.5	252.2	54.4	99.3	85
2/9/2010	2:10:00 PM	1	6	105	1.07	1.42	68.144	8.5	228.4	248.9	253.8	54.4	99.3	85
2/9/2010	2:11:00 PM	1	6	106	1.07	1.43	68.782	8.5	228.4	248.9	248.7	54.4	99.4	85
2/9/2010	2:12:00 PM	1	6	107	1.06	1.45	69.425	8.6	228.6	249.5	255	54.4	99.4	85
2/9/2010	2:13:02 PM	1	6	108	1.07	1.44	70.088	8.6	228.7	249.5	250	54.5	99.4	85
2/9/2010	2:14:00 PM	1	6	109	1.07	1.42	70.702	8.5	228.6	249.6	252.2	54.4	99.4	85
2/9/2010	2:15:00 PM	1	6	110	1.06	1.41	71.335	8.4	228.6	248.8	251.7	54.4	99.3	84.9
2/9/2010	2:16:00 PM	1	6	111	1.06	1.42	71.971	8.5	228.8	247.9	250.1	54.6	99.4	84.9
2/9/2010	2:17:00 PM	1	6	112	1.06	1.42	72.607	8.5	228.6	248.7	253.2	54.5	99.3	84.9
2/9/2010	2:18:00 PM	1	6	113	1.06	1.42	73.243	8.5	228.7	248.9	248.9	54.6	99.3	84.8
2/9/2010	2:19:02 PM	1	6	114	1.07	1.4	73.896	8.4	228.9	249.2	253.7	54.6	99.3	84.9
2/9/2010	2:20:00 PM	1	6	115	1.06	1.4	74.507	8.4	228.9	249.4	249.4	54.6	99.4	84.9
2/9/2010	2:21:00 PM	1	6	116	1.06	1.41	75.14	8.4	228.7	249.4	251.8	54.6	99.1	84.7
2/9/2010	2:22:02 PM	1	6	117	1.06	1.42	75.797	8.5	228.7	249.8	254.6	54.9	99	84.7
2/9/2010	2:23:00 PM	1	6	118	1.06	1.42	76.414	8.5	228.8	249.1	248.5	55.1	99.1	84.8
2/9/2010	2:24:00 PM	1	6	119	1.05	1.43	77.053	8.6	228.6	249	254.3	54.8	99.1	84.7
2/9/2010	2:25:00 PM	2	1	120	1.07	1.44	77.695	8.6	228.7	248.9	251.4	54.7	99.2	84.7
2/9/2010	2:28:00 PM	2	1	121	1.17	1.45	78.345	8.4	230	249.5	250.5	59.4	92.7	84.6
2/9/2010	2:29:00 PM	2	1	122	1.16	1.38	78.97	8.6	235.4	246.9	252.6	56.3	95.9	84.5
2/9/2010	2:30:00 PM	2	1	123	1.17	1.38	79.597	8.6	230.2	248.9	248.2	55.7	97.1	84.4
2/9/2010	2:31:00 PM	2	1	124	1.16	1.38	80.223	8.7	230.1	249.4	254.8	55.2	97.7	84.3
2/9/2010	2:32:00 PM	2	1	125	1.16	1.38	80.848	8.7	230.1	247.7	250	55.5	97.9	84.3
2/9/2010	2:33:00 PM	2	1	126	1.17	1.38	81.474	8.7	230.2	249.6	252.3	56.1	98.2	84.3
2/9/2010	2:34:00 PM	2	1	127	1.16	1.38	82.101	8.7	230.4	249.8	253.1	55.9	98.5	84.4
2/9/2010	2:35:00 PM	2	1	128	1.15	1.38	82.726	8.6	230.3	247.2	248.4	55	98.6	84.3
2/9/2010	2:36:00 PM	2	1	129	1.17	1.38	83.353	8.7	230.3	250.3	253.4	54.7	98.6	84.3
2/9/2010	2:37:00 PM	2	1	130	1.17	1.38	83.98	8.7	230.3	249	249	54.6	98.6	84.3
2/9/2010	2:38:00 PM	2	1	131	1.17	1.39	84.607	8.7	230.2	248.1	253.7	54.5	98.6	84.3
2/9/2010	2:39:00 PM	2	1	132	1.16	1.38	85.234	8.7	230.3	250	251.9	54.5	98.7	84.3
2/9/2010	2:40:00 PM	2	1	133	1.17	1.39	85.863	8.7	230.4	249.8	250.2	54.5	98.8	84.4
2/9/2010	2:41:00 PM	2	1	134	1.16	1.38	86.487	8.7	230.4	248	253.8	54.4	98.9	84.4
2/9/2010	2:42:00 PM	2	1	135	1.17	1.38	87.115	8.6	230.5	249.1	248.4	54.4	99.1	84.5
2/9/2010	2:43:00 PM	2	1	136	1.17	1.39	87.741	8.7	230.5	249.9	253	54.5	99.1	84.5
2/9/2010	2:44:00 PM	2	1	137	1.17	1.38	88.367	8.6	230.4	247.8	249.4	54.4	99	84.4
2/9/2010	2:45:00 PM	2	1	138	1.17	1.39	88.993	8.7	230.4	249.4	252.5	54.5	99	84.4
2/9/2010	2:46:00 PM	2	1	139	1.16	1.43	89.629	8.8	230.3	250.6	252.9	54.5	98.8	84.3
2/9/2010	2:47:00 PM	2	2	140	1.16	1.48	90.28	9.2	230.4	247.1	249.6	54.8	98.7	84.3
2/9/2010	2:48:00 PM	2	2	141	1.16	1.5	90.932	9.2	230.4	249.9	252.7	54.8	98.8	84.3
2/9/2010	2:49:00 PM	2	2	142	1.16	1.49	91.585	9.2	230.3	250	248.1	55.1	98.5	84.2
2/9/2010	2:50:00 PM	2	2	143	1.16	1.49	92.238	9.2	230.5	248.2	255.1	55.5	98.4	84.2
2/9/2010	2:51:00 PM	2	2	144	1.16	1.49	92.889	9.2	230.6	248.6	251.2	55.5	98.5	84.3
2/9/2010	2:52:00 PM	2	2	145	1.16	1.5	93.543	9.2	230.5	250.1	250	55.6	98.5	84.2
2/9/2010	2:53:00 PM	2	2	146	1.16	1.5	94.197	9.2	230.6	249.4	255.8	55.5	98.4	84.2
2/9/2010	2:54:00 PM	2	2	147	1.16	1.5	94.851	9.2	230.5	248.1	249.5	55.5	98.2	84.1
2/9/2010	2:55:00 PM	2	2	148	1.15	1.49	95.503	9.2	230.7	250.1	252.7	55.7	98.2	84.2
2/9/2010	2:56:00 PM	2	2	149	1.15	1.49	96.157	9.2	230.7	248.5	250.2	55.8	98.2	84.2
2/9/2010	2:57:00 PM	2	2	150	1.16	1.49	96.807	9.2	230.6	248	251.8	55.9	98.1	84.1
2/9/2010	2:58:00 PM	2	2	151	1.16	1.49	97.46	9.2	230.5	250.3	252.5	56.1	98	84.1
2/9/2010	2:59:00 PM	2	2	152	1.16	1.49	98.112	9.2	230.4	248.9	248.1	56	97.9	84
2/9/2010	3:00:00 PM	2	2	153	1.16	1.49	98.765	9.2	230.3	248.1	255.1	56.1	97.8	83.9
2/9/2010	3:01:00 PM	2	2	154	1.15	1.5	99.419	9.2	230.3	249.5	251.5	56.3	97.7	83.9
2/9/2010	3:02:00 PM	2	2	155	1.15	1.5	100.073	9.3	230.5	249.7	250.8	56.4	97.8	83.9
2/9/2010	3:03:00 PM	2	2	156	1.16	1.49	100.727	9.3	230.3	248.1	251.8	56.4	97.6	83.8
2/9/2010	3:04:02 PM	2	2	157	1.16	1.5	101.401	9.3	230.3	249.1	249.5	56.5	97.5	83.7
2/9/2010	3:05:02 PM	2	2	158	1.14	1.5	102.055	9.3	230.5	250.2	254	56.7	97.5	83.7
2/9/2010	3:06:00 PM	2	2	159	1.18	1.5	102.687	9.3	230.6	247.5	248.8	56.7	97.5	83.7
2/9/2010	3:07:00 PM	2	3	160	1.2	1.51	103.342	9.3	230.4	249.8	253.8	56.9	97.4	83.6
2/9/2010	3:08:00 PM	2	3	161	1.21	1.55	104.007	9.5	230.3	249.8	252.4	57	97.3	83.5
2/9/2010	3:09:00 PM	2	3	162	1.2	1.54	104.67	9.5	230.3	246.9	250.6	57.2	97.3	83.4
2/9/2010	3:10:02 PM	2	3	163	1.2	1.56	105.359	9.6	230.2	250.2	253.9	57.4	97.2	83.4
2/9/2010	3:11:00 PM	2	3	164	1.21	1.56	106.004	9.6	230.2	248.1	248.4	57.6	97.2	83.3
2/9/2010	3:12:00 PM	2	3	165	1.2	1.56	106.673	9.7	230	248.8	253.6	57.7	97	83.2
2/9/2010	3:13:00 PM	2	3	166	1.2	1.55	107.341	9.6	229.9	250.5	249.2	57.7	97	83.2
2/9/2010	3:14:02 PM	2	3	167	1.2	1.55	108.03	9.6	229.8	247.7	253.5	57.6	97	83.1
2/9/2010	3:15:02 PM	2	3	168	1.2	1.55	108.697	9.6	229.8	248.5	249.9	57.9	97	83.1
2/9/2010	3:16:00 PM	2	3	169	1.2	1.55	109.343	9.6	229.7	248.8	251.3	58.1	96.9	83
2/9/2010	3:17:02 PM	2	3	170	1.2	1.55	110.033	9.6	229.8	248.5	252.8	58.3	97	83.1

2/9/2010	3:18:00 PM	2	3	171	1.2	1.55	110.679	9.6	229.7	250.3	248.8	58.3	96.9	83
2/9/2010	3:19:02 PM	2	3	172	1.2	1.56	111.369	9.7	229.7	249.1	255	58.5	96.9	83
2/9/2010	3:20:00 PM	2	3	173	1.2	1.56	112.014	9.6	229.8	247.8	249.8	58.7	97	83
2/9/2010	3:21:00 PM	2	3	174	1.2	1.55	112.682	9.6	229.7	250	250.3	58.6	96.9	82.9
2/9/2010	3:22:02 PM	2	3	175	1.2	1.57	113.373	9.7	229.8	249	252.9	58.8	96.9	82.9
2/9/2010	3:23:00 PM	2	3	176	1.2	1.58	114.026	9.8	229.7	247.2	249.1	58.9	96.9	82.9
2/9/2010	3:24:00 PM	2	3	177	1.2	1.59	114.701	9.8	229.7	250.4	252.5	58.8	96.9	82.9
2/9/2010	3:25:02 PM	2	3	178	1.2	1.58	115.397	9.8	229.7	248.4	248.8	58.9	96.9	82.8
2/9/2010	3:26:00 PM	2	3	179	1.2	1.59	116.05	9.8	229.7	248.5	254.4	58.9	96.8	82.8
2/9/2010	3:27:02 PM	2	4	180	1.2	1.59	116.746	9.8	229.7	250.4	249.9	58.7	96.8	82.8
2/9/2010	3:28:00 PM	2	4	181	1.13	1.56	117.394	9.7	229.6	247.6	252	58.6	96.9	82.9
2/9/2010	3:29:02 PM	2	4	182	1.13	1.53	118.078	9.5	229.4	249	252.4	58.7	96.8	82.8
2/9/2010	3:30:00 PM	2	4	183	1.14	1.53	118.717	9.5	229.4	249.9	249.1	58.5	96.8	82.8
2/9/2010	3:31:00 PM	2	4	184	1.13	1.53	119.378	9.5	229.5	248.2	253.4	58.5	96.9	82.9
2/9/2010	3:32:00 PM	2	4	185	1.14	1.53	120.04	9.5	229.4	248.7	248.7	58.2	96.8	82.8
2/9/2010	3:33:02 PM	2	4	186	1.13	1.53	120.724	9.5	229.3	249.8	254.9	57.9	96.7	82.7
2/9/2010	3:34:02 PM	2	4	187	1.14	1.51	121.38	9.4	229.3	247.6	250.8	57.9	96.6	82.7
2/9/2010	3:35:00 PM	2	4	188	1.13	1.51	122.016	9.4	229.3	249.5	250.3	57.8	96.6	82.7
2/9/2010	3:36:00 PM	2	4	189	1.12	1.51	122.674	9.4	229.3	249.6	253.8	57.8	96.6	82.7
2/9/2010	3:37:00 PM	2	4	190	1.13	1.5	123.33	9.4	229.4	247.5	248.4	57.8	96.7	82.7
2/9/2010	3:38:00 PM	2	4	191	1.13	1.5	123.985	9.4	229.4	250.2	253.7	57.8	96.8	82.8
2/9/2010	3:39:00 PM	2	4	192	1.13	1.5	124.64	9.4	229.3	248	252.1	57.6	96.8	82.7
2/9/2010	3:40:02 PM	2	4	193	1.14	1.5	125.315	9.4	229.4	248.2	249.9	57.6	96.8	82.7
2/9/2010	3:41:02 PM	2	4	194	1.13	1.5	125.97	9.4	229.3	249.9	254	57.5	96.7	82.6
2/9/2010	3:42:00 PM	2	4	195	1.13	1.5	126.602	9.4	229.3	246.9	248.2	57.6	96.7	82.7
2/9/2010	3:43:00 PM	2	4	196	1.13	1.5	127.258	9.4	229.3	250.6	254.6	57.6	96.6	82.6
2/9/2010	3:44:02 PM	2	4	197	1.13	1.5	127.935	9.4	229.4	248.3	251.2	57.6	96.8	82.7
2/9/2010	3:45:00 PM	2	4	198	1.14	1.5	128.568	9.4	229.2	248	250.2	57.5	96.7	82.5
2/9/2010	3:46:02 PM	2	4	199	1.12	1.5	129.246	9.4	229.3	250.2	254.1	57.6	96.7	82.6
2/9/2010	3:47:00 PM	2	5	200	1.1	1.5	129.879	9.4	229.1	247.7	248.4	57.5	96.6	82.6
2/9/2010	3:48:00 PM	2	5	201	1.1	1.49	130.533	9.4	229.1	248.9	253.2	57.4	96.6	82.5
2/9/2010	3:49:00 PM	2	5	202	1.1	1.49	131.186	9.4	229.1	250.2	253.5	57.5	96.7	82.6
2/9/2010	3:50:02 PM	2	5	203	1.11	1.49	131.858	9.3	229.1	247.6	248.5	57.7	96.6	82.6
2/9/2010	3:51:00 PM	2	5	204	1.11	1.49	132.49	9.3	229	249.3	254.2	57.7	96.6	82.6
2/9/2010	3:52:00 PM	2	5	205	1.1	1.48	133.141	9.3	229	250	249.5	57.8	96.6	82.5
2/9/2010	3:53:00 PM	2	5	206	1.11	1.49	133.792	9.3	229	247.3	253.3	57.7	96.6	82.5
2/9/2010	3:54:02 PM	2	5	207	1.11	1.48	134.463	9.3	229.1	249.9	253.3	57.7	96.6	82.5
2/9/2010	3:55:00 PM	2	5	208	1.11	1.48	135.091	9.3	229.1	248.5	247.8	57.7	96.5	82.4
2/9/2010	3:56:02 PM	2	5	209	1.11	1.48	135.76	9.3	229.2	248.5	254.5	57.8	96.5	82.5
2/9/2010	3:57:02 PM	2	5	210	1.1	1.48	136.409	9.2	229.3	250.4	249.8	57.9	96.6	82.5
2/9/2010	3:58:00 PM	2	5	211	1.1	1.48	137.036	9.2	229.3	248.1	251.9	57.8	96.5	82.5
2/9/2010	3:59:00 PM	2	5	212	1.11	1.47	137.684	9.3	229.4	248.4	252.2	58	96.6	82.5
2/9/2010	4:00:00 PM	2	5	213	1.1	1.47	138.331	9.2	229.4	250.1	248.5	58	96.7	82.5
2/9/2010	4:01:02 PM	2	5	214	1.11	1.47	139	9.2	229.4	248.5	254	57.8	96.8	82.5
2/9/2010	4:02:00 PM	2	5	215	1.11	1.47	139.624	9.2	229.3	248	249.1	57.6	96.7	82.4
2/9/2010	4:03:00 PM	2	5	216	1.11	1.47	140.268	9.2	229.2	249.9	251.9	57.7	96.6	82.5
2/9/2010	4:04:02 PM	2	5	217	1.12	1.46	140.93	9.2	229.2	247.7	252.7	57.7	96.6	82.5
2/9/2010	4:05:02 PM	2	5	218	1.1	1.46	141.573	9.2	229.3	249.5	249.4	57.8	96.5	82.5
2/9/2010	4:06:00 PM	2	5	219	1.12	1.47	142.195	9.2	229.3	250.3	253.7	57.9	96.7	82.5
2/9/2010	4:07:02 PM	2	6	220	1.13	1.46	142.86	9.2	229.2	248	248.5	57.6	96.7	82.5
2/9/2010	4:08:00 PM	2	6	221	1.13	1.47	143.482	9.3	229.3	248.7	253.4	57.4	96.7	82.5
2/9/2010	4:09:00 PM	2	6	222	1.14	1.47	144.126	9.2	229.2	250.5	251.3	57.1	96.6	82.5
2/9/2010	4:10:00 PM	2	6	223	1.14	1.48	144.772	9.3	229.3	247.6	251	57.1	96.6	82.5
2/9/2010	4:11:02 PM	2	6	224	1.13	1.48	145.441	9.3	229.1	248.8	253.3	57	96.6	82.4
2/9/2010	4:12:02 PM	2	6	225	1.13	1.48	146.089	9.3	229.2	250.2	248.4	56.9	96.6	82.5
2/9/2010	4:13:00 PM	2	6	226	1.13	1.48	146.715	9.3	251.3	248.1	255.9	56.8	96.7	82.5
2/9/2010	4:14:00 PM	2	6	227	1.13	1.47	147.359	9.3	229.2	248.4	251	56.6	96.5	82.4
2/9/2010	4:15:00 PM	2	6	228	1.12	1.47	148.003	9.2	229.2	249.6	251.5	56.5	96.5	82.2
2/9/2010	4:16:00 PM	2	6	229	1.12	1.47	148.648	9.3	229.2	249.3	253.4	56.5	96.5	82.3
2/9/2010	4:17:02 PM	2	6	230	1.12	1.47	149.314	9.3	229.3	247.2	249.5	56.5	96.4	82.2
2/9/2010	4:18:00 PM	2	6	231	1.13	1.47	149.934	9.3	229.3	250.4	254.2	56.6	96.4	82.2
2/9/2010	4:19:02 PM	2	6	232	1.14	1.46	150.6	9.3	229.3	248.5	248.8	56.5	96.4	82.1
2/9/2010	4:20:00 PM	2	6	233	1.13	1.47	151.222	9.3	229.5	247.7	253.4	56.6	96.5	82.2
2/9/2010	4:21:00 PM	2	6	234	1.13	1.47	151.869	9.3	229.6	250.3	250.7	56.5	96.5	82.2
2/9/2010	4:22:00 PM	2	6	235	1.12	1.48	152.515	9.3	229.5	247.1	251.4	56.4	96.5	82.1
2/9/2010	4:23:00 PM	2	6	236	1.13	1.48	153.163	9.3	229.6	249.6	251.1	56.6	96.5	82.1
2/9/2010	4:24:00 PM	2	6	237	1.12	1.48	153.81	9.3	229.4	249.7	248.8	56.5	96.4	82
2/9/2010	4:25:00 PM	2	6	238	1.14	1.48	154.458	9.3	229.5	247.7	255.7	56.4	96.4	82
2/9/2010	4:26:00 PM	2	6	239	1.12	1.48	155.108	9.4	229.4	249.1	249.6	56.3	96.4	82
2/9/2010	4:27:00 PM	2	6	240	1.14	1.48	155.757	9.4	246.2	247.9	252.6	56.2	96.4	82

EPA REFERENCE METHOD 23

Determination of Dioxin/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Description	Dioxin/Furan
Location	Stack	Run No.	1
Pbar (inHg)	29.54	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	62.4
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	7.07
Dry MW	29.9	Wet MW	29.7
Nozzle Diameter (in)	0.197	Press Stack (Ps)	-0.29
Avg O2 (%)	9.60	Avg CO2 (%)	9.70

Traverse Point		Time (min)	Delta P (in.H2O)	Delta H (inH2O)	Meter Reading (acf)	Vacuum (in. Hg)	Stack Temp (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Impinger Temp (°F)	Meter In Temp (°F)	Meter Out Temp (°F)
Port	Point											
			See Automated Box 1-Minute Data Sheet									
Averages		240	1.13	1.48	155.757	8.9	230	249	252	56	98	84

Sample Gas Volume 149.533 dscf
 Water Vapor 2.942 scf
 Moisture Content 1.93 %
 Avg. Stack Velocity 67.71 ft/sec
 4062.77 ft/min
 Stack Flow 28718 wacfm
 21682 wscfm
 21264 dscfm

% Isokinetic 97.8 %

EMSI



AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2/10/2010
Facility	Metro	Start/Stop Time	7:36 - 11:38
Unit	FBR 2	Test Method	EPA 23
Location	Stack	Run Number	2
Project #	902630	Description	Dioxin/Furan
Operator	nt nk	Carbon Trap ID	

RUN DATA

Tamb	8	°F	# Ports	2	Meter Box #	AB 3	ID#	2320003
Pbar	29.54	In Hg	# Points	12	Nozzle Dia. (in)	0.197	ID#	
Filter #	Trap # 6		Time/Pt	20	Probe ID #	221018	Pitot ID #	
MF #			Port Order	b-a	del H @	1.889		
Pstack	-0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	Unit 2 Run 2 M23		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.013	13	nt	7:00	Pre	O2	9.50	9.50	9.50	9.50
Post	0.01	14	nt	11:40	ok	CO2	9.50	9.50	9.50	9.50
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)			50ml Rinse	Y N
						End	Start	Diff	ID #	
					#1	389.5	362.1		261048	
					#2	698.2	699.5		261003	
					#3	690.3	691.0		261173	
					#4	617.5	616.3		261115	
					#5	915.8	883.3		261062	
					#6					
					#7					
					#8	0.0	0.0			
					Total	3311.3	3252.2	59.1		

Post Field Meter Calibration			Set Vacuum = 17"			Collect 5 cf per run		
Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
Enter on Run 3 Sheet								

TC Field Calibration	
Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

Comments

Date	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out	
Average					240	1.18	1.57	160.434	10.5	229.6	249.1	251.2	58.2	101.1	88.2
2/10/2010	7:37:01 AM		1	1	1	1.14	1.78	0.695	8.7	226.2	249.2	250.9	77.3	81.2	75.2
2/10/2010	7:38:01 AM		1	1	2	1.11	1.43	1.322	7.9	226.3	249	249.9	72.8	88.2	75
2/10/2010	7:39:01 AM		1	1	3	1.11	1.46	1.954	7.9	226.5	249.7	253.8	70.5	91.4	75.2
2/10/2010	7:40:01 AM		1	1	4	1.12	1.44	2.583	7.9	226.5	249	248.8	68.8	93.6	75.5
2/10/2010	7:41:01 AM		1	1	5	1.12	1.45	3.217	7.9	226.6	249.2	252.9	67.2	95.2	75.9
2/10/2010	7:42:01 AM		1	1	6	1.11	1.46	3.851	7.9	226.6	249.2	250.8	65.7	96.4	76.3
2/10/2010	7:43:01 AM		1	1	7	1.12	1.46	4.484	7.9	226.7	249.3	250.5	64.4	97.3	76.6
2/10/2010	7:44:01 AM		1	1	8	1.13	1.5	5.126	8	226.8	249.6	253.8	63.1	98.1	77
2/10/2010	7:45:01 AM		1	1	9	1.11	1.57	5.785	8.3	226.8	249.4	248.5	61.6	98.8	77.4
2/10/2010	7:46:01 AM		1	1	10	1.12	1.59	6.448	8.4	226.9	249.4	253.9	61.4	99.4	77.8
2/10/2010	7:47:01 AM		1	1	11	1.12	1.62	7.12	8.6	227	249.4	251.1	61.2	99.9	78.2
2/10/2010	7:48:01 AM		1	1	12	1.11	1.61	7.789	8.6	227	249.5	249.7	61.1	100.2	78.6
2/10/2010	7:49:01 AM		1	1	13	1.1	1.61	8.458	8.7	227.1	249.4	254.3	61	100.4	79
2/10/2010	7:50:01 AM		1	1	14	1.11	1.6	9.127	8.7	227.2	249.3	249.4	61.1	100.7	79.4
2/10/2010	7:51:01 AM		1	1	15	1.12	1.6	9.793	8.7	227.3	249.3	253.1	61.1	100.9	79.7
2/10/2010	7:52:01 AM		1	1	16	1.11	1.59	10.457	8.7	227.4	249.5	248.6	61.1	101.1	80.1
2/10/2010	7:53:01 AM		1	1	17	1.12	1.6	11.124	8.7	227.5	249.4	252.8	61.2	101.4	80.4
2/10/2010	7:54:01 AM		1	1	18	1.12	1.5	11.768	8.4	227.6	249.5	249.3	60.8	101.5	80.8
2/10/2010	7:55:01 AM		1	1	19	1.12	1.46	12.403	8.2	227.7	249.4	253.7	60.3	101.5	81.2
2/10/2010	7:56:01 AM		1	2	20	1.11	1.48	13.043	8.2	227.8	249.5	249.7	60.2	101.7	81.5
2/10/2010	7:57:01 AM		1	2	21	1.11	1.47	13.682	8.2	227.8	249.2	252.1	60.1	101.8	81.8
2/10/2010	7:58:01 AM		1	2	22	1.1	1.46	14.318	8.2	227.8	249.4	249.8	60	102	82.1
2/10/2010	7:59:01 AM		1	2	23	1.09	1.46	14.955	8.2	227.7	249.1	252.1	59.9	102.1	82.3
2/10/2010	8:00:01 AM		1	2	24	1.1	1.45	15.587	8.1	227.8	249.3	250.4	59.9	102.3	82.6
2/10/2010	8:01:01 AM		1	2	25	1.1	1.48	16.229	8.2	227.9	249.3	252.3	59.7	102.5	82.9
2/10/2010	8:02:01 AM		1	2	26	1.1	1.47	16.87	8.2	227.9	249.1	249.6	59.6	102.6	83.1
2/10/2010	8:03:01 AM		1	2	27	1.1	1.47	17.512	8.2	228	248.6	252.9	59.4	102.7	83.5
2/10/2010	8:04:01 AM		1	2	28	1.1	1.44	18.148	8.1	227.8	249.4	251.2	59.1	102.8	83.8
2/10/2010	8:05:01 AM		1	2	29	1.11	1.47	18.787	8.2	227.9	248.9	250.9	59	103	84
2/10/2010	8:06:01 AM		1	2	30	1.1	1.47	19.428	8.2	227.9	249.5	252.4	58.8	103.1	84.2
2/10/2010	8:07:01 AM		1	2	31	1.11	1.44	20.062	8.3	227.8	248.3	248.9	58.7	103.2	84.5
2/10/2010	8:08:01 AM		1	2	32	1.1	1.41	20.689	9.8	227.7	249	253	58.6	103.2	84.7
2/10/2010	8:09:01 AM		1	2	33	1.1	1.44	21.323	9.9	227.8	248.6	248.4	58.5	103.2	84.9
2/10/2010	8:10:01 AM		1	2	34	1.1	1.45	21.96	10	227.7	249.2	253.5	58.5	103.1	85.1
2/10/2010	8:11:01 AM		1	2	35	1.1	1.45	22.598	9.9	227.7	249.3	250.2	58.4	103.1	85.3
2/10/2010	8:12:01 AM		1	2	36	1.09	1.44	23.234	9.9	227.7	248.9	251.3	58.4	103	85.5
2/10/2010	8:13:01 AM		1	2	37	1.1	1.46	23.874	9.9	227.7	249.3	252.6	58.6	103	85.7
2/10/2010	8:14:01 AM		1	2	38	1.09	1.46	24.514	9.9	227.8	248.9	249.4	58.6	103	86
2/10/2010	8:15:01 AM		1	2	39	1.15	1.5	25.165	10.1	228.1	249.6	253.9	58.4	103	86.2
2/10/2010	8:16:01 AM		1	3	40	1.22	1.59	25.836	10.5	229.6	248.5	249.4	58.6	103.1	86.3
2/10/2010	8:17:01 AM		1	3	41	1.22	1.61	26.512	10.6	229.8	249.3	252.7	58.8	102.9	86.5
2/10/2010	8:18:01 AM		1	3	42	1.22	1.61	27.189	10.7	229.9	249.3	249	58.9	101.9	86.6
2/10/2010	8:19:01 AM		1	3	43	1.21	1.62	27.867	10.7	229.9	249.5	254	59	100.7	86.7
2/10/2010	8:20:01 AM		1	3	44	1.22	1.62	28.545	10.7	229.7	249.3	249.2	59	99.3	86.8
2/10/2010	8:21:01 AM		1	3	45	1.22	1.62	29.224	10.7	229.8	249.4	252.1	59.2	98	86.8
2/10/2010	8:22:01 AM		1	3	46	1.22	1.62	29.901	10.7	229.7	249.5	250.5	59.1	97.1	86.8
2/10/2010	8:23:01 AM		1	3	47	1.2	1.62	30.579	10.7	229.8	249.4	251.3	59	96.5	86.7
2/10/2010	8:24:01 AM		1	3	48	1.21	1.62	31.257	10.7	229.7	249.6	250.9	59.1	96.4	86.7
2/10/2010	8:25:01 AM		1	3	49	1.21	1.62	31.934	10.6	229.7	248.9	250.1	59	96.4	86.7
2/10/2010	8:26:01 AM		1	3	50	1.2	1.62	32.611	10.7	229.8	249.3	253.2	59.3	96.5	86.6
2/10/2010	8:27:01 AM		1	3	51	1.21	1.61	33.289	10.6	229.7	248.1	249	59.3	96.7	86.6
2/10/2010	8:28:01 AM		1	3	52	1.21	1.62	33.968	10.7	229.8	249	253	59.1	97	86.6
2/10/2010	8:29:01 AM		1	3	53	1.21	1.62	34.643	10.6	229.8	248.9	248.6	58.8	97.2	86.6
2/10/2010	8:30:01 AM		1	3	54	1.21	1.61	35.321	10.6	229.9	249.2	253.8	58.4	97.5	86.6
2/10/2010	8:31:01 AM		1	3	55	1.21	1.61	35.997	10.6	229.9	249	249.1	57.9	97.8	86.6
2/10/2010	8:32:01 AM		1	3	56	1.2	1.59	36.671	10.6	230	249.1	253	57.6	98.1	86.6
2/10/2010	8:33:01 AM		1	3	57	1.21	1.59	37.343	10.5	230	249.1	251.5	57.4	98.4	86.6
2/10/2010	8:34:01 AM		1	3	58	1.21	1.59	38.013	10.5	230	248.7	249.3	57.2	98.7	86.7
2/10/2010	8:35:01 AM		1	3	59	1.21	1.59	38.686	10.5	230	249.4	253	57.1	99	86.7
2/10/2010	8:36:01 AM		1	4	60	1.21	1.59	39.358	10.6	229.9	249.3	249.6	57.1	99.2	86.7
2/10/2010	8:37:01 AM		1	4	61	1.22	1.59	40.029	10.6	229.9	249.4	251.1	57.1	99.5	86.8
2/10/2010	8:38:01 AM		1	4	62	1.19	1.58	40.699	10.5	229.8	249	250.1	56.9	99.7	86.8
2/10/2010	8:39:01 AM		1	4	63	1.16	1.57	41.367	10.4	229.9	249.1	253.6	57	100	86.9
2/10/2010	8:40:01 AM		1	4	64	1.16	1.57	42.033	10.4	229.9	249	249.4	56.9	100.2	86.9
2/10/2010	8:41:01 AM		1	4	65	1.16	1.56	42.701	10.4	229.9	249.4	253.9	57	100.4	87
2/10/2010	8:42:01 AM		1	4	66	1.16	1.55	43.361	10.4	229.9	249.2	249.1	57	100.6	87.1
2/10/2010	8:43:01 AM		1	4	67	1.15	1.55	44.024	10.4	229.9	249.4	252.7	57	100.9	87.2
2/10/2010	8:44:01 AM		1	4	68	1.16	1.55	44.689	10.4	229.9	249.5	249.6	57.1	101.1	87.2
2/10/2010	8:45:01 AM		1	4	69	1.16	1.55	45.352	10.4	229.9	249.7	252.8	57.2	101.3	87.3
2/10/2010	8:46:01 AM		1	4	70	1.16	1.54	46.015	10.4	229.9	249.2	250.8	57.2	101.4	87.4
2/10/2010	8:47:01 AM		1	4	71	1.15	1.54	46.678	10.4	229.8	248.9	250.4	57.3	101.5	87.5
2/10/2010	8:48:01 AM		1	4	72	1.15	1.55	47.342	10.4	229.8	249.3	251.8	57.3	101.6	87.6
2/10/2010	8:49:01 AM		1	4	73	1.15	1.54	48.005	10.4	229.7	248.8	249.1	57.4	101.7	87.7
2/10/2010	8:50:01 AM		1	4	74	1.15	1.54	48.666	10.4	229.8	249.4	254.2	57.5	101.8	87.8
2/10/2010	8:51:02 AM		1	4	75	1.16	1.54	49.331	10.4	229.8	248.7	248.3	57.6	101.8	87.8
2/10/2010	8:52:02 AM		1	4	76	1.15	1.54	49.993	10.4	229.9	249.1	252.7	57.6	101.9	87.9
2/10/2010	8:53:02 AM		1	4	77	1.15	1.54	50.656	10.4	230	249.1	249.2	57.7	101.9	88
2/10/2010	8:54:02 AM		1	4	78	1.14	1.54	51.317	10.4	230	249.6	252.9	57.9	101.9	88.1
2/10/2010	8:55:02 AM		1	4	79	1.15	1.54	51.979	10.4	229.9	249.2	250.5	58	102	88.2
2/10/2010	8:56:02 AM		1	5	80	1.15	1.55	52.642	10.4	229.5	248.5	252	58	102	88.3
2/10/2010	8:57:02 AM		1	5	81	1.13	1.52	53.299	10.3	229.5	249.3	252.2	57.7	102	88.3
2/10/2010	8:58:02 AM		1	5	82	1.15	1.52	53.957	10.3	229.7	248.8	250.2	57.		

2/10/2010	9:01:00 AM	1	5	85	1.13	1.52	55.91	10.3	229.8	249.2	253.8	56.9	102.1	88.8
2/10/2010	9:02:00 AM	1	5	86	1.12	1.5	56.563	10.2	229.7	249	249.7	56.7	102.1	88.8
2/10/2010	9:03:00 AM	1	5	87	1.13	1.49	57.213	10.1	229.8	249.5	252.8	56.3	102	88.9
2/10/2010	9:04:00 AM	1	5	88	1.13	1.47	57.861	10.1	229.8	249.2	250.5	56.1	102.1	88.9
2/10/2010	9:05:00 AM	1	5	89	1.13	1.51	58.517	10.2	229.8	249	252.1	56	102.1	89
2/10/2010	9:06:00 AM	1	5	90	1.14	1.51	59.174	10.3	229.8	249.4	251.4	55.8	102.2	89.1
2/10/2010	9:07:00 AM	1	5	91	1.13	1.53	59.834	10.3	229.7	249	250.7	55.8	102.2	89.1
2/10/2010	9:08:00 AM	1	5	92	1.13	1.53	60.493	10.4	229.7	249.6	252.2	55.7	102.1	89.2
2/10/2010	9:09:00 AM	1	5	93	1.13	1.52	61.15	10.3	229.7	248.4	249.8	55.6	102.1	89.3
2/10/2010	9:10:00 AM	1	5	94	1.14	1.52	61.807	10.3	229.7	249.3	252.8	55.7	102	89.3
2/10/2010	9:11:00 AM	1	5	95	1.14	1.53	62.468	10.4	229.6	249.1	249.6	55.7	102	89.4
2/10/2010	9:12:00 AM	1	5	96	1.14	1.54	63.132	10.4	229.5	249.6	252.4	55.8	102	89.4
2/10/2010	9:13:00 AM	1	5	97	1.12	1.52	63.79	10.3	229.6	249	249.1	55.8	102	89.4
2/10/2010	9:14:00 AM	1	5	98	1.15	1.52	64.45	10.3	229.7	249.1	251.5	56	101.9	89.5
2/10/2010	9:15:00 AM	1	5	99	1.1	1.5	65.106	10.3	229.3	249	250.4	56.1	101.9	89.5
2/10/2010	9:16:00 AM	1	6	100	1.09	1.44	65.744	10	229.1	249.4	252.4	56.3	101.9	89.6
2/10/2010	9:17:00 AM	1	6	101	1.08	1.44	66.385	10	229	249.1	250.3	56.3	101.8	89.6
2/10/2010	9:18:00 AM	1	6	102	1.08	1.41	67.018	9.8	229.1	249.4	252.9	56.6	101.9	89.7
2/10/2010	9:19:00 AM	1	6	103	1.08	1.41	67.652	9.8	229.1	249	249.2	56.7	101.8	89.7
2/10/2010	9:20:00 AM	1	6	104	1.08	1.44	68.292	10	229	249.3	253.5	56.8	101.8	89.7
2/10/2010	9:21:02 AM	1	6	105	1.08	1.45	68.955	10	229	249.2	249	57	101.9	89.8
2/10/2010	9:22:02 AM	1	6	106	1.08	1.48	69.603	10.1	229.1	249.3	253.3	57.1	101.9	89.8
2/10/2010	9:23:02 AM	1	6	107	1.1	1.45	70.244	10	229.2	249.2	249.5	57.3	101.9	89.8
2/10/2010	9:24:02 AM	1	6	108	1.08	1.48	70.895	10.2	229.2	249.4	252.3	57.5	101.8	89.8
2/10/2010	9:25:02 AM	1	6	109	1.09	1.44	71.535	10	229.2	249.3	250.7	57.5	101.8	89.9
2/10/2010	9:26:02 AM	1	6	110	1.07	1.43	72.172	9.9	229.1	249.2	251.9	57.6	101.8	89.9
2/10/2010	9:27:02 AM	1	6	111	1.07	1.4	72.803	9.8	229	249.6	252	57.7	101.8	89.9
2/10/2010	9:28:02 AM	1	6	112	1.08	1.44	73.443	9.9	229	249.2	249.7	57.8	101.8	89.9
2/10/2010	9:29:00 AM	1	6	113	1.09	1.49	74.073	10.2	229.2	249.4	251.8	58	101.8	90
2/10/2010	9:30:02 AM	1	6	114	1.1	1.48	74.744	10.2	229.1	249.3	250.6	58	101.9	90
2/10/2010	9:31:02 AM	1	6	115	1.08	1.45	75.387	10.1	229.2	249.2	252.9	58.2	101.9	90.1
2/10/2010	9:32:02 AM	1	6	116	1.07	1.42	76.021	9.9	229.1	249	249.5	58.3	101.9	90.1
2/10/2010	9:33:02 AM	1	6	117	1.07	1.4	76.651	9.8	229.2	249.4	252.7	58.4	101.8	90.1
2/10/2010	9:34:00 AM	1	6	118	1.07	1.39	77.258	9.7	229.1	249.3	248.9	58.6	101.8	90.1
2/10/2010	9:35:00 AM	1	6	119	1.07	1.4	77.888	9.8	229.3	249.4	252.9	58.7	101.8	90.1
2/10/2010	9:36:02 AM	2	1	120	1.09	1.42	78.526	9.9	229.5	249.1	249.2	58.6	101.8	90.1
2/10/2010	9:39:00 AM	2	1	121	1.27	1.86	79.239	10.5	230.3	247.5	252.2	60	97.7	90.4
2/10/2010	9:40:00 AM	2	1	122	1.28	1.65	79.925	11.4	230.5	248.7	252.9	57.3	99.7	90
2/10/2010	9:41:00 AM	2	1	123	1.27	1.66	80.614	11.3	230.6	249.2	250.1	56.7	100.3	89.9
2/10/2010	9:42:00 AM	2	1	124	1.27	1.67	81.303	11.3	230.7	250	252.3	56.4	100.5	89.9
2/10/2010	9:43:00 AM	2	1	125	1.28	1.7	82	11.5	230.7	248.9	249.4	56.1	100.7	89.9
2/10/2010	9:44:00 AM	2	1	126	1.29	1.7	82.698	11.6	230.7	248.6	252.5	56.1	100.7	89.9
2/10/2010	9:45:00 AM	2	1	127	1.28	1.69	83.396	11.6	230.7	248.2	249.3	56.1	100.8	90
2/10/2010	9:46:00 AM	2	1	128	1.29	1.7	84.094	11.6	230.7	249.6	252.6	56.2	100.7	90
2/10/2010	9:47:00 AM	2	1	129	1.28	1.71	84.794	11.7	230.8	249.4	248.3	56.2	100.7	90
2/10/2010	9:48:00 AM	2	1	130	1.28	1.7	85.493	11.8	230.8	249.5	253.7	56.3	100.7	90
2/10/2010	9:49:00 AM	2	1	131	1.29	1.7	86.191	11.8	230.8	248.3	249	56.6	100.6	90
2/10/2010	9:50:00 AM	2	1	132	1.28	1.69	86.889	11.7	230.8	248.2	252.9	56.9	100.6	90.1
2/10/2010	9:51:00 AM	2	1	133	1.29	1.7	87.588	11.7	230.7	248.9	249.5	57.1	100.6	90.1
2/10/2010	9:52:01 AM	2	1	134	1.29	1.7	88.289	11.7	230.6	250.1	252.6	57.4	100.6	90.1
2/10/2010	9:53:01 AM	2	1	135	1.29	1.7	88.99	11.7	230.5	249.4	249.6	57.5	100.5	90.1
2/10/2010	9:54:01 AM	2	1	136	1.29	1.7	89.688	11.7	230.5	247.9	252.4	57.8	100.5	90.1
2/10/2010	9:55:01 AM	2	1	137	1.29	1.7	90.388	11.7	230.5	248.5	250.8	57.8	100.5	90.1
2/10/2010	9:56:01 AM	2	1	138	1.29	1.7	91.089	11.7	230.4	248.9	249.9	58	100.4	90.2
2/10/2010	9:57:01 AM	2	1	139	1.29	1.71	91.791	11.7	230.3	250.1	252.9	58.6	100.4	90.2
2/10/2010	9:58:01 AM	2	2	140	1.3	1.71	92.493	11.7	230.4	249.3	249	59.5	100.4	90.2
2/10/2010	9:59:01 AM	2	2	141	1.29	1.71	93.196	11.7	230.4	248.6	253.7	59.7	100.4	90.1
2/10/2010	10:00:01 AM	2	2	142	1.29	1.71	93.895	11.7	230.3	247.8	248.8	59.9	100.4	90.1
2/10/2010	10:01:01 AM	2	2	143	1.28	1.71	94.598	11.7	230.3	249.2	252.7	60	100.4	90.1
2/10/2010	10:02:01 AM	2	2	144	1.27	1.71	95.299	11.7	230.4	249.9	249.9	60.1	100.5	90.1
2/10/2010	10:03:01 AM	2	2	145	1.27	1.7	95.998	11.7	230.4	248.7	252.8	60.2	100.5	90.1
2/10/2010	10:04:01 AM	2	2	146	1.28	1.68	96.693	11.6	230.5	248.5	252.4	60.2	100.6	90.1
2/10/2010	10:05:01 AM	2	2	147	1.28	1.68	97.389	11.6	230.4	248.3	249.6	60.1	100.7	90.2
2/10/2010	10:06:01 AM	2	2	148	1.28	1.68	98.085	11.6	230.4	249.8	254.3	60	100.7	90.2
2/10/2010	10:07:01 AM	2	2	149	1.28	1.69	98.784	11.6	230.4	249.6	248.6	59.9	100.8	90.2
2/10/2010	10:08:01 AM	2	2	150	1.28	1.72	99.486	11.7	230.4	248.8	253.9	60	100.8	90.2
2/10/2010	10:09:01 AM	2	2	151	1.29	1.71	100.187	11.7	230.3	247.9	249.9	60	100.8	90.2
2/10/2010	10:10:01 AM	2	2	152	1.29	1.71	100.89	11.7	230.3	248.7	251.7	59.9	100.8	90.2
2/10/2010	10:11:01 AM	2	2	153	1.28	1.71	101.592	11.7	230.3	249.5	250.3	59.9	100.8	90.2
2/10/2010	10:12:01 AM	2	2	154	1.28	1.71	102.294	11.7	230.4	247.8	250.8	59.9	100.8	90.2
2/10/2010	10:13:01 AM	2	2	155	1.28	1.71	102.994	11.7	230.2	248.3	252.1	60	100.5	90.2
2/10/2010	10:14:01 AM	2	2	156	1.29	1.72	103.697	11.7	230.2	249	249.5	60	99.9	90.2
2/10/2010	10:15:01 AM	2	2	157	1.29	1.71	104.398	11.7	230.1	250	252.5	59.8	99.6	90.2
2/10/2010	10:16:01 AM	2	2	158	1.29	1.72	105.101	11.7	230	249.1	249.7	59.5	99.5	90.2
2/10/2010	10:17:01 AM	2	2	159	1.34	1.75	105.811	11.8	230	249	252.4	58.9	99.4	90.1
2/10/2010	10:18:01 AM	2	3	160	1.35	1.77	106.527	12	230.1	247.7	248.2	58.7	99.4	90.1
2/10/2010	10:19:01 AM	2	3	161	1.33	1.77	107.241	12	230	249.5	253.9	58.4	99.5	90.1
2/10/2010	10:20:01 AM	2	3	162	1.34	1.78	107.956	12	230	249.9	249.7	58.1	99.6	90.1
2/10/2010	10:21:01 AM	2	3	163	1.34	1.77	108.672	11.9	230	247.9	252.6	57.7	99.6	90.1
2/10/2010	10:22:01 AM	2	3	164	1.35	1.77	109.386	11.9	230	247.9	249.4	57.4	99.7	90
2/10/2010	10:23:01 AM	2	3	165	1.34	1.78	110.103	11.9	229.9	249.3	252.5	57.1	99.8	90
2/10/2010	10:24:01 AM	2	3	166	1.35	1.78	110.818	12	229.9	250	250.2	57	99.9	90
2/10/2010	10:25:01 AM	2	3	167	1.35	1.78	111.534	11.9	230	248.7	252.6	56.9	99.9	90
2/10/2010	10:26:01 AM	2	3	168	1.34	1.77	112.249	11.9	230	248	250.7	56.7	100	90
2/10/2010	10:27:01 AM	2	3	169	1.33	1.78	112.965	11.9	230.1</					

2/10/2010	10:29:01 AM	2	3	171	1.35	1.77	114.397	11.9	230.1	249.8	251.3	56.6	100.3	90
2/10/2010	10:30:01 AM	2	3	172	1.35	1.78	115.113	12	230.2	248.7	251.5	56.7	100.4	90
2/10/2010	10:31:01 AM	2	3	173	1.34	1.78	115.828	11.9	230.3	247.7	250.2	56.7	100.4	90
2/10/2010	10:32:01 AM	2	3	174	1.35	1.78	116.544	11.9	230.2	249.3	252	56.6	100.5	90
2/10/2010	10:33:01 AM	2	3	175	1.35	1.77	117.26	11.9	230.2	249.5	249	56.6	100.6	90
2/10/2010	10:34:01 AM	2	3	176	1.34	1.78	117.975	11.9	230.2	249	253.4	56.6	100.6	90
2/10/2010	10:35:01 AM	2	3	177	1.35	1.78	118.692	11.9	230.3	247.8	249.2	56.7	100.7	90
2/10/2010	10:36:01 AM	2	3	178	1.35	1.78	119.408	11.9	230.3	249.1	252.5	56.7	100.8	90
2/10/2010	10:37:01 AM	2	3	179	1.36	1.78	120.125	11.9	230.4	249.8	249.8	57	100.9	90.1
2/10/2010	10:38:01 AM	2	4	180	1.38	1.78	120.841	11.9	230.4	249.8	253.7	57	101	90.2
2/10/2010	10:39:01 AM	2	4	181	1.37	1.78	121.556	11.9	230.5	247.7	248.8	57.1	101	90.1
2/10/2010	10:40:01 AM	2	4	182	1.27	1.75	122.265	11.8	230.5	248.7	253.3	57.1	101	90.2
2/10/2010	10:41:01 AM	2	4	183	1.16	1.58	122.935	11	230.3	249.5	249.3	57.1	101	90.1
2/10/2010	10:42:01 AM	2	4	184	1.16	1.56	123.605	10.8	230.2	249.8	252.4	57.2	101.1	90.2
2/10/2010	10:43:01 AM	2	4	185	1.16	1.55	124.271	10.8	230.2	249.5	249.9	57.2	101.4	90.2
2/10/2010	10:44:01 AM	2	4	186	1.16	1.55	124.937	10.8	230.3	247.4	251.7	57.1	101.5	90.2
2/10/2010	10:45:01 AM	2	4	187	1.16	1.55	125.603	10.8	230.2	248.7	249.8	57	101.7	90.2
2/10/2010	10:46:01 AM	2	4	188	1.17	1.55	126.269	10.8	230.1	249.9	251.7	56.9	101.9	90.3
2/10/2010	10:47:01 AM	2	4	189	1.17	1.55	126.938	10.8	230.2	249.3	250.5	57	102	90.3
2/10/2010	10:48:01 AM	2	4	190	1.16	1.56	127.604	10.8	230.1	248.1	252.4	56.9	102.1	90.3
2/10/2010	10:49:01 AM	2	4	191	1.17	1.54	128.27	10.8	230	248.5	250.3	56.9	102.3	90.4
2/10/2010	10:50:01 AM	2	4	192	1.16	1.54	128.935	10.7	230.1	248.9	252.1	57	102.3	90.4
2/10/2010	10:51:01 AM	2	4	193	1.16	1.55	129.599	10.7	230	249.7	252.5	56.9	102.5	90.5
2/10/2010	10:52:01 AM	2	4	194	1.17	1.55	130.264	10.7	230.1	248.6	249.6	57	102.5	90.4
2/10/2010	10:53:01 AM	2	4	195	1.15	1.54	130.929	10.8	230.2	248.2	252.4	57	102.6	90.5
2/10/2010	10:54:01 AM	2	4	196	1.16	1.54	131.593	10.7	230.2	248.6	249.3	57.1	102.7	90.5
2/10/2010	10:55:01 AM	2	4	197	1.16	1.55	132.259	10.8	230.4	249.7	253.4	57.1	102.8	90.5
2/10/2010	10:56:01 AM	2	4	198	1.17	1.54	132.923	10.7	230.4	249.3	249	57.2	102.9	90.6
2/10/2010	10:57:01 AM	2	4	199	1.16	1.54	133.586	10.7	230.3	248.9	253.7	57.3	102.9	90.6
2/10/2010	10:58:01 AM	2	5	200	1.2	1.55	134.251	10.8	230.4	247.9	249	57.4	102.9	90.6
2/10/2010	10:59:01 AM	2	5	201	1.19	1.58	134.923	10.9	230.4	248.7	252.7	57.4	103.1	90.7
2/10/2010	11:00:01 AM	2	5	202	1.18	1.57	135.594	10.9	230.4	249.4	251.5	57.5	103.1	90.8
2/10/2010	11:01:01 AM	2	5	203	1.19	1.57	136.264	10.9	230.4	249.2	249.8	57.5	103.1	90.8
2/10/2010	11:02:01 AM	2	5	204	1.18	1.57	136.937	10.9	230.3	249.8	253.1	57.6	103.2	90.9
2/10/2010	11:03:01 AM	2	5	205	1.17	1.57	137.606	10.9	230.4	248.3	248.8	57.7	103.2	90.9
2/10/2010	11:04:01 AM	2	5	206	1.18	1.58	138.278	10.9	230.4	248.7	254.3	57.7	103.2	91
2/10/2010	11:05:02 AM	2	5	207	1.16	1.56	138.949	10.9	230.3	248.4	248.8	57.8	103.3	91.1
2/10/2010	11:06:01 AM	2	5	208	1.13	1.54	139.614	10.8	230.4	249.5	253.7	58	103.3	91.1
2/10/2010	11:07:02 AM	2	5	209	1.12	1.52	140.273	10.7	230.3	249.6	249.9	58	103.4	91.2
2/10/2010	11:08:02 AM	2	5	210	1.12	1.52	140.933	10.7	230.3	248.6	252	58.2	103.4	91.2
2/10/2010	11:09:02 AM	2	5	211	1.11	1.51	141.588	10.6	230.1	248.4	250.6	58.2	103.4	91.2
2/10/2010	11:10:00 AM	2	5	212	1.13	1.5	142.222	10.6	230	248.8	251.4	58.2	103.5	91.3
2/10/2010	11:11:00 AM	2	5	213	1.12	1.5	142.877	10.6	230	249.4	250.9	58.2	103.5	91.3
2/10/2010	11:12:02 AM	2	5	214	1.12	1.5	143.554	10.6	230	249.7	250.6	58.3	103.6	91.3
2/10/2010	11:13:02 AM	2	5	215	1.12	1.51	144.211	10.6	230.1	249.9	253.6	58.3	103.7	91.4
2/10/2010	11:14:02 AM	2	5	216	1.12	1.5	144.867	10.6	230	248.7	248.6	58.4	103.8	91.4
2/10/2010	11:15:02 AM	2	5	217	1.11	1.5	145.521	10.6	230	248.3	253.4	58.3	103.8	91.4
2/10/2010	11:16:02 AM	2	5	218	1.12	1.5	146.176	10.6	229.9	248.5	249.1	58.2	103.8	91.5
2/10/2010	11:17:02 AM	2	5	219	1.13	1.5	146.833	10.6	229.9	249.8	253	58.1	103.8	91.5
2/10/2010	11:18:02 AM	2	6	220	1.11	1.49	147.486	10.6	230	249.9	250.5	58.1	103.7	91.5
2/10/2010	11:19:02 AM	2	6	221	1.1	1.47	148.135	10.5	230	248.5	251.3	58	103.6	91.6
2/10/2010	11:20:02 AM	2	6	222	1.1	1.46	148.781	10.4	229.9	248.4	253.3	57.7	103.6	91.6
2/10/2010	11:21:02 AM	2	6	223	1.12	1.46	149.425	10.4	229.9	248.3	248.7	57.6	103.6	91.6
2/10/2010	11:22:02 AM	2	6	224	1.11	1.46	150.075	10.4	229.9	249.5	254.5	57.3	103.6	91.7
2/10/2010	11:23:02 AM	2	6	225	1.1	1.46	150.724	10.4	229.8	249.9	249.3	57.1	103.7	91.7
2/10/2010	11:24:02 AM	2	6	226	1.13	1.46	151.371	10.4	229.9	249.7	252.9	57	103.8	91.7
2/10/2010	11:25:02 AM	2	6	227	1.08	1.47	152.021	10.5	230	248.3	249.2	56.9	103.8	91.7
2/10/2010	11:26:02 AM	2	6	228	1.09	1.45	152.663	10.3	230.2	248.1	253	56.9	103.7	91.7
2/10/2010	11:27:02 AM	2	6	229	1.11	1.47	153.311	10.5	230.2	249.1	251.1	56.8	103.8	91.8
2/10/2010	11:28:02 AM	2	6	230	1.1	1.48	153.963	10.5	230.2	249	251.6	56.7	103.8	91.8
2/10/2010	11:29:02 AM	2	6	231	1.09	1.48	154.615	10.5	230.2	249.7	250.5	56.5	103.8	91.8
2/10/2010	11:30:00 AM	2	6	232	1.1	1.48	155.245	10.5	230.1	249.8	251.1	56.5	103.7	91.8
2/10/2010	11:31:00 AM	2	6	233	1.09	1.48	155.896	10.5	230	249	251.8	56.5	103.8	91.9
2/10/2010	11:32:00 AM	2	6	234	1.11	1.47	156.546	10.5	230.1	248.1	249.7	56.5	103.8	91.9
2/10/2010	11:33:00 AM	2	6	235	1.09	1.46	157.192	10.4	230.1	248.8	252.6	56.6	103.7	91.9
2/10/2010	11:34:00 AM	2	6	236	1.11	1.46	157.838	10.4	230	248.9	249.5	56.6	103.7	91.9
2/10/2010	11:35:00 AM	2	6	237	1.11	1.46	158.486	10.4	230	249.4	253	56.6	103.7	91.9
2/10/2010	11:36:00 AM	2	6	238	1.11	1.45	159.129	10.4	230	249.3	248.9	56.6	103.6	91.9
2/10/2010	11:37:00 AM	2	6	239	1.1	1.48	159.781	10.5	229.9	249.6	253.3	56.6	103.7	92
2/10/2010	11:38:00 AM	2	6	240	1.1	1.48	160.434	10.5	229.9	249.2	248.9	56.6	103.8	92

EPA REFERENCE METHOD 23

Determination of Dioxin/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/10/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Description	Dioxin/Furan
Location	Stack	Run No.	2
Pbar (inHg)	29.54	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	59.1
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	7.07
Dry MW	29.9	Wet MW	29.7
Nozzle Diameter (in)	0.197	Press Stack (Ps)	-0.19
Avg O2 (%)	9.50	Avg CO2 (%)	9.50

[illegible]

Sample Gas Volume	153.029 dscf
Water Vapor	2.787 scf
Moisure Content	1.79 %
Avg. Stack Velocity	69.12 ft/sec
	4147.09 ft/min
Stack Flow	29314 wacfm
	22150 wscfm
	21754 dscfm

% Isokinetic **97.9 %**

EMSI

902630 Metro
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AUTOMATED BOX STACK TEST DATA SHEET

Client	Met Council	Test Date	2/10/2010
Facility	Metro	Start/Stop Time	12:25 - 16:30
Unit	FBR 2	Test Method	EPA 23
Location	Stack	Run Number	3
Project #	902630	Description	Dioxin/Furan
Operator	nt nk	Carbon Trap ID	

RUN DATA

Tamb	11	°F	# Ports	2	Meter Box #	AB 3	ID#	2320003
Pbar	29.54	In Hg	# Points	12	Nozzle Dia. (in)	0.197	ID#	
Filter #	Trap 6		Time/Pt	20	Probe ID #	221018	Pitot ID #	
MF #			Port Order	A-B	del H @	1.889		
Pstack	-0.19	In H2O	Pitot Coef	0.84	Meter Factor	1.011		
Sample Time	240	min	Test #	1	Data File Name	unit 2 run 3 m23		

Leak Chk	CFM	Vac	Init	Time	Pitot Leak Check	Run	1	2	3	Average
Pre	0.012	14	nt	12:06	Pre	O2	9.80	9.80	9.80	9.80
Post	0.004	14	nt	16:30	ok	CO2	9.30	9.30	9.30	9.30
≤ 0.02 cfm or 4 % of Sample Rate					Stable @ ≥ 3" 15 sec					

DATA CORRECTIONS / RECORD

End Vol	Start Vol	Diff	Omit	Description	Impinger	MATERIAL WEIGHT (g)			50ml Rinse	Y	N
						End	Start	Diff	ID #		
					#1	397.7	361.9		263051		
					#2	692.8	694.7		261011		
					#3	687.1	688.7		261096		
					#4	614.5	612.2		261030		
					#5	960.1	932.1		261042		
					#6						
					#7						
					#8	0.0	0.0				
					Total	3352.2	3289.6	62.6			

Post Field Meter Calibration Set Vacuum = 17" Collect 5 cf per run

Delta H	Vm I	Vm F	Tm I	Tm F	ID	Amb	Vacuum	Time
1.14	0.000	5.935	70	73	55	74	17	10.5
1.14	0.000	5.959	73	75	55	72	17	10.5
1.15	0.000	5.985	75	76	55	73	17	10.5

TC Field Calibration

Ref °F	Probe TC °F

≤ 1.5 % (Absolute Temp)

Comments

Date	Time	Port	Point	Time	Delta P	Delta H	Meter Vol	Vac	Stack	Probe	Filter	Dryer	Meter In	Meter Out	
Average					240	1.12	1.51	158.041	7.5	230.0	249.0	251.1	55.8	107.0	93.7
2/10/2010	12:26:01 PM		1	1	1	1.06	1.97	0.747	7.8	228.7	248.9	253.3	72.8	91.9	88.6
2/10/2010	12:27:01 PM		1	1	2	1.06	1.42	1.378	6.2	228.7	249	248.5	70.6	96.2	87.8
2/10/2010	12:28:01 PM		1	1	3	1.05	1.41	2.006	6.2	228.6	249.4	253.3	69.3	98.4	87.7
2/10/2010	12:29:01 PM		1	1	4	1.05	1.4	2.634	6.2	228.7	249.1	248.5	67.8	100.1	87.8
2/10/2010	12:30:01 PM		1	1	5	1.07	1.4	3.261	6.2	228.6	249.3	254	66.1	101.3	87.9
2/10/2010	12:31:01 PM		1	1	6	1.05	1.43	3.897	6.2	228.6	249.6	249.3	64.1	102.3	88
2/10/2010	12:32:01 PM		1	1	7	1.06	1.4	4.524	6.2	228.6	249.4	252.8	62.2	103	88.1
2/10/2010	12:33:01 PM		1	1	8	1.07	1.4	5.152	6.1	228.6	249.4	249.8	60.6	103.6	88.2
2/10/2010	12:34:01 PM		1	1	9	1.06	1.4	5.78	6.1	228.7	249.5	251.6	59.1	104.1	88.3
2/10/2010	12:35:01 PM		1	1	10	1.05	1.41	6.408	6.1	228.8	249.1	249.4	58	104.4	88.5
2/10/2010	12:36:01 PM		1	1	11	1.05	1.43	7.046	6.2	228.8	249.2	253.1	57	104.8	88.8
2/10/2010	12:37:01 PM		1	1	12	1.05	1.44	7.684	6.3	228.8	249.3	249.8	56	105	88.9
2/10/2010	12:38:01 PM		1	1	13	1.05	1.4	8.312	6.1	228.8	249.1	252.4	55.5	105.2	89
2/10/2010	12:39:01 PM		1	1	14	1.06	1.4	8.94	6.2	228.7	249.3	251	55.1	105.5	89.2
2/10/2010	12:40:01 PM		1	1	15	1.06	1.39	9.569	6.2	228.6	248.9	250.1	54.9	105.6	89.3
2/10/2010	12:41:01 PM		1	1	16	1.06	1.4	10.199	6.2	228.5	249.6	253.4	54.9	105.7	89.4
2/10/2010	12:42:01 PM		1	1	17	1.05	1.4	10.83	6.2	228.6	248.3	248.6	54.9	105.9	89.6
2/10/2010	12:43:01 PM		1	1	18	1.05	1.43	11.467	6.3	228.5	248.7	252.6	54.8	106	89.7
2/10/2010	12:44:01 PM		1	1	19	1.05	1.36	12.088	6.8	228.5	249.1	248.4	54.9	106.1	89.9
2/10/2010	12:45:01 PM		1	2	20	1.04	1.42	12.723	7.2	228.6	249.3	253	55	106.1	90
2/10/2010	12:46:01 PM		1	2	21	1.04	1.4	13.35	7.1	228.6	248.9	249.5	54.9	106.2	90.2
2/10/2010	12:47:01 PM		1	2	22	1.05	1.39	13.98	7.1	228.6	249.1	252.9	54.9	106.2	90.3
2/10/2010	12:48:01 PM		1	2	23	1.05	1.45	14.621	7.3	228.6	249	250.9	54.8	106.3	90.4
2/10/2010	12:49:01 PM		1	2	24	1.05	1.44	15.262	7.3	228.5	248.8	250.6	54.7	106.5	90.5
2/10/2010	12:50:01 PM		1	2	25	1.04	1.42	15.897	7.2	228.5	248.8	252.1	54.7	106.5	90.6
2/10/2010	12:51:01 PM		1	2	26	1.06	1.41	16.533	7.2	228.5	248.9	249.6	54.7	106.6	90.8
2/10/2010	12:52:01 PM		1	2	27	1.06	1.44	17.174	7.3	228.5	249.1	252.4	54.7	106.5	90.9
2/10/2010	12:53:01 PM		1	2	28	1.04	1.44	17.814	7.3	228.5	249.3	249.1	54.6	106.6	91.1
2/10/2010	12:54:01 PM		1	2	29	1.04	1.41	18.446	7.2	228.5	249.1	254.1	54.6	106.6	91.2
2/10/2010	12:55:01 PM		1	2	30	1.05	1.39	19.076	7.1	228.5	249.3	249.4	54.6	106.7	91.3
2/10/2010	12:56:01 PM		1	2	31	1.06	1.39	19.708	7.1	228.5	249.5	253.1	54.6	106.7	91.4
2/10/2010	12:57:01 PM		1	2	32	1.05	1.39	20.339	7.1	228.4	249.5	250.2	54.6	106.7	91.5
2/10/2010	12:58:01 PM		1	2	33	1.05	1.43	20.975	7.2	228.3	249.3	251.9	54.5	106.7	91.6
2/10/2010	12:59:01 PM		1	2	34	1.05	1.42	21.612	7.2	228.3	249.4	251.6	54.6	106.8	91.7
2/10/2010	1:00:01 PM		1	2	35	1.05	1.42	22.248	7.2	228.2	248.5	249.9	54.6	106.8	91.8
2/10/2010	1:01:01 PM		1	2	36	1.05	1.43	22.886	7.3	228.2	249.3	252.9	54.5	106.9	91.9
2/10/2010	1:02:01 PM		1	2	37	1.04	1.43	23.523	7.2	228.2	248.5	248.7	54.6	106.9	91.9
2/10/2010	1:03:01 PM		1	2	38	1.05	1.43	24.162	7.3	228.2	249.2	253.3	54.6	107	92
2/10/2010	1:04:01 PM		1	2	39	1.1	1.44	24.806	7.3	228.9	249.2	249.2	54.7	107	92.1
2/10/2010	1:05:01 PM		1	3	40	1.15	1.5	25.461	7.5	229.5	248.8	252.2	54.6	107.1	92.2
2/10/2010	1:06:01 PM		1	3	41	1.12	1.5	26.116	7.5	229.6	249	250	54.6	107.2	92.3
2/10/2010	1:07:01 PM		1	3	42	1.12	1.5	26.774	7.5	229.7	247.8	251	54.8	107.2	92.4
2/10/2010	1:08:01 PM		1	3	43	1.11	1.51	27.431	7.5	229.7	249.1	252.1	55	107.2	92.4
2/10/2010	1:09:01 PM		1	3	44	1.12	1.51	28.09	7.5	229.6	248.8	250	55	107.3	92.5
2/10/2010	1:10:01 PM		1	3	45	1.11	1.51	28.747	7.5	229.6	249.4	253.8	55	107.4	92.6
2/10/2010	1:11:01 PM		1	3	46	1.12	1.5	29.404	7.5	229.5	249.4	248.6	54.9	107.3	92.7
2/10/2010	1:12:01 PM		1	3	47	1.11	1.52	30.063	7.5	229.6	249.4	253.6	54.9	107.3	92.7
2/10/2010	1:13:01 PM		1	3	48	1.11	1.51	30.722	7.5	229.6	249.5	249.6	54.7	107.4	92.9
2/10/2010	1:14:01 PM		1	3	49	1.12	1.51	31.38	7.5	229.7	248.3	252.5	54.7	107.4	92.9
2/10/2010	1:15:01 PM		1	3	50	1.12	1.51	32.039	7.5	229.8	248.7	250.7	54.7	107.5	93
2/10/2010	1:16:01 PM		1	3	51	1.12	1.52	32.699	7.5	229.8	248.5	250.8	54.7	107.5	93.1
2/10/2010	1:17:01 PM		1	3	52	1.12	1.52	33.36	7.5	229.9	249.2	252.5	54.7	107.5	93.1
2/10/2010	1:18:01 PM		1	3	53	1.11	1.51	34.018	7.5	230	249	249.1	54.6	107.6	93.2
2/10/2010	1:19:01 PM		1	3	54	1.12	1.51	34.677	7.5	230	249.5	253.3	54.6	107.6	93.2
2/10/2010	1:20:01 PM		1	3	55	1.11	1.51	35.336	7.5	230.1	249.5	249	54.6	107.6	93.2
2/10/2010	1:21:01 PM		1	3	56	1.12	1.52	35.996	7.5	230.1	249.2	252.9	54.6	107.6	93.4
2/10/2010	1:22:01 PM		1	3	57	1.1	1.52	36.657	7.5	230.4	249.1	249.4	54.7	107.6	93.4
2/10/2010	1:23:01 PM		1	3	58	1.1	1.5	37.313	7.4	230.4	249	253.1	54.5	107.6	93.5
2/10/2010	1:24:01 PM		1	3	59	1.11	1.5	37.97	7.5	230.3	248.5	250.2	54.4	107.6	93.5
2/10/2010	1:25:01 PM		1	4	60	1.12	1.49	38.625	7.5	230.3	248.1	251.1	54.4	107.6	93.7
2/10/2010	1:26:01 PM		1	4	61	1.12	1.49	39.282	7.5	230.2	248.7	251.4	54.4	107.6	93.7
2/10/2010	1:27:01 PM		1	4	62	1.11	1.49	39.938	7.5	230.3	249	249.6	54.4	107.6	93.7
2/10/2010	1:28:01 PM		1	4	63	1.11	1.5	40.594	7.4	230.3	249.6	254.2	54.5	107.6	93.8
2/10/2010	1:29:01 PM		1	4	64	1.1	1.48	41.247	7.4	230.3	249	248.8	54.4	107.6	93.8
2/10/2010	1:30:01 PM		1	4	65	1.1	1.49	41.901	7.4	230.4	249.5	253.3	54.5	107.7	93.9
2/10/2010	1:31:01 PM		1	4	66	1.1	1.49	42.554	7.4	230.7	249.5	250.2	54.4	107.7	93.9
2/10/2010	1:32:01 PM		1	4	67	1.1	1.48	43.206	7.4	231.1	247.9	251.7	54.3	107.7	93.9
2/10/2010	1:33:01 PM		1	4	68	1.11	1.47	43.858	7.5	231.2	248.6	251.9	54.2	107.7	94
2/10/2010	1:34:01 PM		1	4	69	1.11	1.48	44.509	7.5	231	248.7	249.4	54.1	107.7	94
2/10/2010	1:35:01 PM		1	4	70	1.12	1.48	45.162	7.5	230.8	249.3	253.2	54	107.7	94.1
2/10/2010	1:36:01 PM		1	4	71	1.11	1.47	45.814	7.5	230.6	249.2	248.9	54	107.7	94.1
2/10/2010	1:37:01 PM		1	4	72	1.11	1.48	46.467	7.5	230.5	249.4	253.2	54.1	107.7	94.1
2/10/2010	1:38:01 PM		1	4	73	1.11	1.48	47.12	7.5	230.4	249.3	251	54.1	107.8	94.2
2/10/2010	1:39:01 PM		1	4	74	1.11	1.49	47.774	7.5	230.3	248.3	251.3	54.2	107.8	94.2
2/10/2010	1:40:01 PM		1	4	75	1.11	1.48	48.426	7.5	230.2	248.6	250.5	54.2	107.8	94.2
2/10/2010	1:41:01 PM		1	4	76	1.12	1.49	49.08	7.5	230.2	248.6	250.7	54.3	107.8	94.2
2/10/2010	1:42:01 PM		1	4	77	1.1	1.48	49.736	7.5	230.1	249.3	251.6	54.4	107.8	94.4
2/10/2010	1:43:01 PM		1	4	78	1.12	1.48	50.389	7.4	230.1	249.1	249.3	54.4	107.8	94.4
2/10/2010	1:44:01 PM		1	4	79	1.1	1.49	51.043	7.5	229.6	249.7	253.9	54.4	107.8	94.4
2/10/2010	1:45:01 PM		1	5	80	1.09	1.47	51.695	7.4	229.2	249.4	249	54.4	107.8	94.4
2/10/2010	1:46:01 PM		1	5	81	1.09	1.48	52.349	7.5	229.3	249.6	253.4	54.5	107.8	94.4

2/10/2010	1:50:01 PM	1	5	85	1.1	1.46	54.961	7.4	229	248.6	251.5	54.4	107.9	94.6
2/10/2010	1:51:01 PM	1	5	86	1.08	1.47	55.613	7.4	229	248.8	251.9	54.4	107.8	94.6
2/10/2010	1:52:01 PM	1	5	87	1.07	1.45	56.261	7.4	229.2	248.8	250.1	54.4	107.8	94.6
2/10/2010	1:53:01 PM	1	5	88	1.1	1.46	56.907	7.4	229.3	249.7	253	54.4	107.8	94.6
2/10/2010	1:54:01 PM	1	5	89	1.08	1.46	57.555	7.4	229.2	249.3	249	54.3	107.7	94.6
2/10/2010	1:55:01 PM	1	5	90	1.1	1.46	58.203	7.4	229.2	249.6	253.3	54.3	107.7	94.6
2/10/2010	1:56:01 PM	1	5	91	1.09	1.48	58.854	7.4	229.3	249.2	249	54.3	107.8	94.7
2/10/2010	1:57:01 PM	1	5	92	1.08	1.48	59.507	7.4	229.1	248.9	253.4	54.2	107.8	94.7
2/10/2010	1:58:01 PM	1	5	93	1.09	1.47	60.16	7.4	229.2	248.7	250.7	54.2	107.8	94.7
2/10/2010	1:59:01 PM	1	5	94	1.09	1.48	60.812	7.5	229.1	248.4	251.5	54.2	107.8	94.7
2/10/2010	2:00:01 PM	1	5	95	1.09	1.47	61.463	7.4	229.1	249.3	251.8	54.1	107.8	94.7
2/10/2010	2:01:01 PM	1	5	96	1.08	1.46	62.109	7.4	229.1	248.6	249.5	54.2	107.7	94.7
2/10/2010	2:02:01 PM	1	5	97	1.11	1.47	62.763	7.4	229.1	249.3	253.3	53.9	107.7	94.7
2/10/2010	2:03:01 PM	1	5	98	1.08	1.47	63.414	7.4	229.1	249.3	248.7	53.9	107.9	94.8
2/10/2010	2:04:01 PM	1	5	99	1.08	1.47	64.065	7.4	229.1	249.9	254	53.9	107.9	94.8
2/10/2010	2:05:01 PM	1	6	100	1.09	1.46	64.715	7.4	228.8	249.6	249.8	54.2	107.9	94.8
2/10/2010	2:06:01 PM	1	6	101	1.11	1.48	65.37	7.4	228.9	248.5	252	54.1	107.9	94.8
2/10/2010	2:07:01 PM	1	6	102	1.1	1.48	66.023	7.4	228.9	248.7	252.8	54.1	107.9	94.8
2/10/2010	2:08:01 PM	1	6	103	1.1	1.49	66.679	7.5	228.9	248.3	249.3	54.2	107.9	94.8
2/10/2010	2:09:01 PM	1	6	104	1.1	1.5	67.339	7.5	228.8	248.9	254.1	54.2	107.9	94.8
2/10/2010	2:10:01 PM	1	6	105	1.09	1.49	67.995	7.5	228.7	249.2	248.8	54.2	108	94.8
2/10/2010	2:11:01 PM	1	6	106	1.09	1.49	68.652	7.5	228.7	249.6	252.6	54.3	108	94.9
2/10/2010	2:12:01 PM	1	6	107	1.09	1.46	69.302	7.4	228.5	249.4	251.3	54.3	108	94.9
2/10/2010	2:13:01 PM	1	6	108	1.09	1.45	69.95	7.4	228.7	248.1	250.5	54.5	108	94.9
2/10/2010	2:14:01 PM	1	6	109	1.1	1.47	70.6	7.4	228.7	248.9	251.8	54.5	108	94.9
2/10/2010	2:15:01 PM	1	6	110	1.09	1.47	71.252	7.4	228.7	248.6	249.9	54.5	108	94.9
2/10/2010	2:16:01 PM	1	6	111	1.1	1.49	71.907	7.5	228.8	249.4	252.8	54.5	108	95
2/10/2010	2:17:01 PM	1	6	112	1.09	1.49	72.563	7.5	228.9	249.4	248.8	54.6	107.7	94.9
2/10/2010	2:18:01 PM	1	6	113	1.11	1.49	73.219	7.5	228.9	249.6	254.9	54.6	107.5	94.9
2/10/2010	2:19:01 PM	1	6	114	1.1	1.49	73.873	7.5	228.8	249.5	250.1	54.8	107.4	95
2/10/2010	2:20:01 PM	1	6	115	1.09	1.47	74.526	7.5	228.9	249.3	251.6	54.9	107.4	95
2/10/2010	2:21:01 PM	1	6	116	1.09	1.46	75.173	7.4	228.9	249.1	252	55.1	107.4	95
2/10/2010	2:22:01 PM	1	6	117	1.09	1.46	75.823	7.4	228.8	247.8	249.2	55.2	107.5	95
2/10/2010	2:23:01 PM	1	6	118	1.09	1.47	76.474	7.4	228.9	249.1	252.6	55.3	107.5	95
2/10/2010	2:24:01 PM	1	6	119	1.08	1.48	77.129	7.5	228.9	249	249.4	55.4	107.6	95
2/10/2010	2:25:01 PM	2	1	120	1.08	1.49	77.772	7.5	228.9	249.7	251.4	55.5	107.6	95
2/10/2010	2:29:01 PM	2	1	121	1.16	1.61	78.446	7.5	229.4	249	253	60.9	101.9	95.2
2/10/2010	2:30:01 PM	2	1	122	1.16	1.5	79.105	7.6	229.7	249.2	250	57.6	104.6	94.6
2/10/2010	2:31:01 PM	2	1	123	1.15	1.5	79.762	7.7	229.8	248.4	252.9	56.9	105.6	94.5
2/10/2010	2:32:01 PM	2	1	124	1.15	1.5	80.42	7.7	229.8	249.4	251.7	56.5	106.3	94.5
2/10/2010	2:33:01 PM	2	1	125	1.15	1.5	81.078	7.7	229.8	247.8	249.6	56.3	106.7	94.5
2/10/2010	2:34:01 PM	2	1	126	1.15	1.51	81.739	7.7	229.7	249	253	56.1	107	94.5
2/10/2010	2:35:01 PM	2	1	127	1.15	1.51	82.4	7.7	229.8	248.7	249	55.9	107.3	94.6
2/10/2010	2:36:01 PM	2	1	128	1.15	1.52	83.062	7.7	229.7	249.1	253.2	55.7	107.4	94.6
2/10/2010	2:37:01 PM	2	1	129	1.15	1.52	83.725	7.8	229.7	248.8	249.3	55.4	107.5	94.6
2/10/2010	2:38:01 PM	2	1	130	1.16	1.53	84.391	7.8	229.6	249.4	252.6	55.1	107.1	94.6
2/10/2010	2:39:01 PM	2	1	131	1.15	1.53	85.057	7.8	229.6	249.2	249.9	55.1	106.5	94.6
2/10/2010	2:40:01 PM	2	1	132	1.16	1.53	85.722	7.8	229.6	249.5	251.4	55.1	105.7	94.6
2/10/2010	2:41:01 PM	2	1	133	1.14	1.53	86.388	7.8	229.5	249.3	253.3	55.1	105	94.5
2/10/2010	2:42:01 PM	2	1	134	1.15	1.53	87.052	7.8	229.5	248.6	249.2	55.2	104.2	94.4
2/10/2010	2:43:01 PM	2	1	135	1.15	1.53	87.717	7.8	229.4	248.8	252.4	55.3	103.5	94.4
2/10/2010	2:44:01 PM	2	1	136	1.15	1.53	88.382	7.9	229.4	248.7	248.7	55.5	103	94.3
2/10/2010	2:45:01 PM	2	1	137	1.15	1.53	89.049	7.8	229.4	249.5	253.3	55.7	102.8	94.2
2/10/2010	2:46:01 PM	2	1	138	1.16	1.53	89.715	7.8	229.4	248.8	249.3	55.8	102.9	94.1
2/10/2010	2:47:01 PM	2	1	139	1.16	1.53	90.38	7.8	229.4	248.5	252.2	55.9	103	94
2/10/2010	2:48:01 PM	2	2	140	1.15	1.54	91.047	7.8	229.5	248.9	250.6	56	103.2	93.9
2/10/2010	2:49:01 PM	2	2	141	1.14	1.53	91.713	7.8	229.6	248.3	250.6	55.9	103.4	93.9
2/10/2010	2:50:01 PM	2	2	142	1.14	1.54	92.378	7.8	229.6	248.8	252.2	55.9	103.7	93.8
2/10/2010	2:51:01 PM	2	2	143	1.14	1.53	93.043	7.8	229.7	248.4	249.1	55.8	103.9	93.7
2/10/2010	2:52:01 PM	2	2	144	1.13	1.54	93.709	7.8	229.8	249	252.5	55.8	104.2	93.7
2/10/2010	2:53:01 PM	2	2	145	1.13	1.54	94.374	7.8	229.9	249	248.9	55.7	104.3	93.5
2/10/2010	2:54:01 PM	2	2	146	1.13	1.53	95.041	7.8	230	249.2	254.5	55.8	104.6	93.6
2/10/2010	2:55:01 PM	2	2	147	1.13	1.53	95.705	7.8	230.1	249.2	249.2	55.9	104.7	93.4
2/10/2010	2:56:01 PM	2	2	148	1.13	1.53	96.369	7.8	230.1	249	251.3	55.8	104.9	93.5
2/10/2010	2:57:01 PM	2	2	149	1.13	1.53	97.036	7.8	230.1	248.8	251.9	55.9	105.1	93.4
2/10/2010	2:58:01 PM	2	2	150	1.13	1.53	97.699	7.7	230.2	248	249.5	55.9	105.2	93.4
2/10/2010	2:59:01 PM	2	2	151	1.12	1.53	98.363	7.8	230.3	249	253	56	105.4	93.4
2/10/2010	3:00:01 PM	2	2	152	1.13	1.53	99.027	7.8	230.5	248.3	248.8	56	105.6	93.4
2/10/2010	3:01:01 PM	2	2	153	1.12	1.53	99.69	7.7	230.5	248.8	253	55.9	105.7	93.4
2/10/2010	3:02:01 PM	2	2	154	1.14	1.52	100.352	7.7	230.4	248.7	248.7	55.9	105.9	93.4
2/10/2010	3:03:01 PM	2	2	155	1.11	1.53	101.016	7.7	230.4	249.2	252.9	55.9	106	93.4
2/10/2010	3:04:01 PM	2	2	156	1.13	1.52	101.678	7.7	230.3	249.4	249.8	55.8	106.2	93.5
2/10/2010	3:05:01 PM	2	2	157	1.14	1.52	102.342	7.7	230.3	248.4	251.8	55.7	106.3	93.5
2/10/2010	3:06:01 PM	2	2	158	1.12	1.53	103.005	7.8	230.4	248.8	252.4	55.8	106.4	93.5
2/10/2010	3:07:01 PM	2	2	159	1.24	1.57	103.679	7.9	230.6	248.1	249.5	55.7	106.5	93.5
2/10/2010	3:08:01 PM	2	3	160	1.29	1.69	104.381	8.3	230.7	248.8	252	55.7	106.7	93.6
2/10/2010	3:09:01 PM	2	3	161	1.26	1.7	105.083	8.4	230.9	248.5	249.4	55.8	106.8	93.6
2/10/2010	3:10:01 PM	2	3	162	1.25	1.7	105.787	8.4	230.9	248.7	253.4	55.8	106.8	93.5
2/10/2010	3:11:01 PM	2	3	163	1.25	1.7	106.491	8.4	230.9	248.7	248.3	55.9	106.9	93.7
2/10/2010	3:12:01 PM	2	3	164	1.26	1.7	107.195	8.4	230.9	249.3	252.4	55.8	106.9	93.7
2/10/2010	3:13:01 PM	2	3	165	1.25	1.7	107.899	8.4	231	249.1	248.6	56	106.9	93.7
2/10/2010	3:14:01 PM	2	3	166	1.26	1.71	108.604	8.4	231	249.1	253.8	56	107	93.8
2/10/2010	3:15:01 PM	2	3	167	1.26	1.71	109.309	8.4	230.9	249.1	249.7	55.9	107.1	93.9
2/10/2010	3:16:01 PM	2	3	168	1.26	1.7	110.013	8.4	231	248.5	251.7	56	107.1	93.9
2/10/2010	3:17:01 PM	2	3	169	1.25	1.7	110.717	8.4	231	248.7	251	55.9	107.2	93.9
2														

2/10/2010	3:19:01 PM	2	3	171	1.25	1.71	112.127	8.4	231.2	248.8	253.7	56	107.3	94
2/10/2010	3:20:01 PM	2	3	172	1.27	1.71	112.833	8.4	231.2	248.5	248.6	56	107.4	94.1
2/10/2010	3:21:02 PM	2	3	173	1.27	1.71	113.54	8.4	231.2	249	253.6	55.9	107.5	94.1
2/10/2010	3:22:02 PM	2	3	174	1.25	1.71	114.246	8.4	231.5	249	249.2	56	107.5	94.1
2/10/2010	3:23:02 PM	2	3	175	1.25	1.71	114.952	8.4	231.6	249.5	252.4	56	107.6	94.2
2/10/2010	3:24:02 PM	2	3	176	1.25	1.72	115.658	8.5	231.6	249.1	250.9	56	107.7	94.2
2/10/2010	3:25:02 PM	2	3	177	1.24	1.71	116.366	8.5	231.8	248.4	250.5	56	107.7	94.2
2/10/2010	3:26:02 PM	2	3	178	1.24	1.7	117.067	8.4	232	248.6	252.6	55.9	107.8	94.3
2/10/2010	3:27:02 PM	2	3	179	1.24	1.69	117.768	8.3	232.1	247.7	248.9	56	107.8	94.4
2/10/2010	3:28:02 PM	2	4	180	1.23	1.69	118.469	8.3	232.1	249.6	253.4	56.1	107.8	94.4
2/10/2010	3:29:02 PM	2	4	181	1.19	1.62	119.154	8.1	232.1	249.2	248.8	56.2	107.9	94.4
2/10/2010	3:30:02 PM	2	4	182	1.12	1.56	119.825	7.9	232.1	249.1	252.8	56	107.8	94.4
2/10/2010	3:31:02 PM	2	4	183	1.12	1.54	120.491	7.8	232.1	249	249.6	55.8	107.9	94.5
2/10/2010	3:32:02 PM	2	4	184	1.12	1.54	121.158	7.8	232.2	248.3	251.4	55.6	107.9	94.5
2/10/2010	3:33:02 PM	2	4	185	1.12	1.53	121.824	7.8	232.1	249.1	249.6	55.6	108	94.6
2/10/2010	3:34:02 PM	2	4	186	1.12	1.53	122.489	7.7	232.1	248.8	251.4	55.7	108	94.6
2/10/2010	3:35:02 PM	2	4	187	1.12	1.53	123.154	7.8	232	249.2	250.3	55.5	108.1	94.7
2/10/2010	3:36:02 PM	2	4	188	1.13	1.52	123.818	7.7	231.9	248.3	249.7	55.5	108.1	94.7
2/10/2010	3:37:02 PM	2	4	189	1.12	1.53	124.483	7.8	231.7	248.9	252.3	55.4	108.1	94.7
2/10/2010	3:38:02 PM	2	4	190	1.12	1.54	125.149	7.8	231.7	248.5	249.9	55.3	108.1	94.8
2/10/2010	3:39:02 PM	2	4	191	1.12	1.53	125.815	7.8	231.6	249.2	252.3	55.2	108.1	94.8
2/10/2010	3:40:02 PM	2	4	192	1.12	1.52	126.48	7.7	231.6	247.8	248.4	55.2	108.2	94.8
2/10/2010	3:41:02 PM	2	4	193	1.13	1.53	127.146	7.8	231.4	249	252.8	55.2	108.2	94.8
2/10/2010	3:42:02 PM	2	4	194	1.12	1.53	127.812	7.8	231.5	248.3	249	55.2	108.3	94.9
2/10/2010	3:43:02 PM	2	4	195	1.13	1.54	128.479	7.8	231.4	249.4	252.8	55.2	108.3	94.9
2/10/2010	3:44:02 PM	2	4	196	1.12	1.53	129.144	7.7	231.3	248.5	248.7	55.2	108.3	95
2/10/2010	3:45:02 PM	2	4	197	1.12	1.53	129.808	7.7	231.3	248.7	252.2	55.2	108.4	95
2/10/2010	3:46:02 PM	2	4	198	1.12	1.53	130.475	7.8	231.3	248.6	252.5	55.2	108.4	95
2/10/2010	3:47:02 PM	2	4	199	1.12	1.53	131.14	7.8	231.3	248.5	249.4	55.4	108.4	95
2/10/2010	3:48:02 PM	2	5	200	1.12	1.54	131.807	7.8	231.3	249.3	253.2	55.6	108.5	95.1
2/10/2010	3:49:02 PM	2	5	201	1.13	1.53	132.472	7.7	231.2	248	248.7	55.7	108.5	95.1
2/10/2010	3:50:02 PM	2	5	202	1.13	1.53	133.138	7.8	231	249	252.4	55.8	108.5	95.2
2/10/2010	3:51:02 PM	2	5	203	1.14	1.53	133.805	7.7	230.9	248.6	248.8	56	108.5	95.2
2/10/2010	3:52:02 PM	2	5	204	1.14	1.54	134.473	7.8	230.8	249.3	253.4	56	108.6	95.2
2/10/2010	3:53:02 PM	2	5	205	1.13	1.53	135.138	7.7	230.9	248.9	249.4	56.1	108.6	95.2
2/10/2010	3:54:02 PM	2	5	206	1.13	1.54	135.804	7.8	230.8	248.8	251.9	56	108.7	95.3
2/10/2010	3:55:02 PM	2	5	207	1.12	1.53	136.47	7.8	230.9	249.1	249.7	56.1	108.7	95.3
2/10/2010	3:56:02 PM	2	5	208	1.12	1.53	137.136	7.8	230.9	248.9	251.9	56.1	108.8	95.3
2/10/2010	3:57:02 PM	2	5	209	1.12	1.52	137.8	7.7	230.8	249.2	252.4	56.1	108.9	95.4
2/10/2010	3:58:02 PM	2	5	210	1.13	1.52	138.461	7.7	230.9	247.8	248.8	56.2	108.8	95.4
2/10/2010	3:59:02 PM	2	5	211	1.11	1.52	139.125	7.7	230.9	249.1	253.1	56.2	108.9	95.5
2/10/2010	4:00:02 PM	2	5	212	1.12	1.51	139.784	7.7	231	248.7	248.5	56.3	108.9	95.5
2/10/2010	4:01:02 PM	2	5	213	1.12	1.51	140.446	7.7	230.9	249.2	253.3	56.3	109	95.6
2/10/2010	4:02:02 PM	2	5	214	1.12	1.5	141.107	7.7	230.9	249.1	250.4	56.4	109	95.6
2/10/2010	4:03:02 PM	2	5	215	1.11	1.51	141.768	7.7	231	248.5	251.1	56.4	109	95.6
2/10/2010	4:04:02 PM	2	5	216	1.11	1.51	142.429	7.7	231.1	249.1	252.1	56.6	109.1	95.6
2/10/2010	4:05:02 PM	2	5	217	1.11	1.5	143.088	7.7	231.2	248.5	249.2	56.8	109	95.6
2/10/2010	4:06:02 PM	2	5	218	1.11	1.51	143.749	7.7	231	249.3	253.1	56.8	109.1	95.7
2/10/2010	4:07:02 PM	2	5	219	1.11	1.49	144.406	7.6	231	248.9	248.8	56.9	109.1	95.7
2/10/2010	4:08:02 PM	2	6	220	1.09	1.49	145.062	7.6	231	249.6	254.1	57	109.1	95.8
2/10/2010	4:09:02 PM	2	6	221	1.1	1.48	145.714	7.6	231	249	249.6	56.9	109.2	95.8
2/10/2010	4:10:02 PM	2	6	222	1.07	1.46	146.366	7.5	231.1	249.1	251.8	57	109.2	95.8
2/10/2010	4:11:02 PM	2	6	223	1.09	1.46	147.017	7.6	231	249.3	251.6	57	109.3	95.9
2/10/2010	4:12:02 PM	2	6	224	1.09	1.46	147.666	7.5	231.1	249.1	250.4	57.1	109.3	95.9
2/10/2010	4:13:02 PM	2	6	225	1.1	1.46	148.316	7.5	231.2	249	251.7	57.1	109.3	95.9
2/10/2010	4:14:02 PM	2	6	226	1.08	1.46	148.964	7.5	231.1	249	249.4	57.2	109.3	96
2/10/2010	4:15:02 PM	2	6	227	1.1	1.47	149.615	7.5	231.1	249.2	253.6	57.2	109.3	96
2/10/2010	4:16:02 PM	2	6	228	1.1	1.46	150.264	7.5	231.2	248.8	248.7	57.3	109.3	96
2/10/2010	4:17:02 PM	2	6	229	1.09	1.48	150.917	7.6	231.2	249.1	253.2	57.4	109.3	96
2/10/2010	4:18:02 PM	2	6	230	1.11	1.47	151.571	7.6	231.2	249.1	249.6	57.5	109.4	96.1
2/10/2010	4:19:02 PM	2	6	231	1.09	1.48	152.224	7.6	231.2	249.3	252.1	57.5	109.4	96.2
2/10/2010	4:20:02 PM	2	6	232	1.08	1.45	152.871	7.5	231.2	249.7	251.8	57.5	109.3	96.2
2/10/2010	4:21:02 PM	2	6	233	1.1	1.45	153.517	7.5	231.1	248.6	249.5	57.5	109.4	96.2
2/10/2010	4:22:02 PM	2	6	234	1.1	1.45	154.165	7.5	230.9	249.5	254.3	57.5	109.4	96.3
2/10/2010	4:23:02 PM	2	6	235	1.08	1.46	154.812	7.5	230.9	249.2	248.7	57.5	109.4	96.3
2/10/2010	4:24:02 PM	2	6	236	1.08	1.46	155.461	7.5	231	248.7	251.9	57.6	109.4	96.3
2/10/2010	4:25:02 PM	2	6	237	1.09	1.46	156.109	7.5	230.9	249.1	250.9	57.6	109.4	96.3
2/10/2010	4:26:02 PM	2	6	238	1.09	1.47	156.758	7.5	231	248.7	251.2	57.6	109.5	96.3
2/10/2010	4:27:02 PM	2	6	239	1.1	1.47	157.411	7.6	230.8	249.2	250.9	57.7	109.5	96.4
2/10/2010	4:28:02 PM	2	6	240	1.08	1.46	158.041	7.5	230.9	249	250.5	57.8	109.5	96.4

Determination of Dioxin/Furan Emissions From Stationary Sources

Determination of Dioxin/Furan Emissions From Stationary Sources			
Client	Met Council	Date	2/10/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Description	Dioxin/Furan
Location	Stack	Run No.	3
Pbar (inHg)	29.54	Ref Temp°F	68
Ref Pres (in.Hg)	29.92	H2O Cond. (mL)	62.6
Meter Factor (Y)	1.011	Delta H@	1.889
Pitot Coeff. (Cp)	0.84	Stack Area (ft2)	7.07
Dry MW	29.9	Wet MW	29.6
Nozzle Diameter (in)	0.197	Press Stack (Ps)	-0.19
Avg O2 (%)	9.80	Avg CO2 (%)	9.30

Traverse Point		Time (min)	Delta P (in.H ₂ O)	Delta H (inH ₂ O)	Meter Reading (acf)	Vacuum (in. Hg)	Stack Temp (°F)	Probe Temp. (°F)	Filter Temp. (°F)	Impinger Temp (°F)	Meter In Temp (°F)	Meter Out Temp (°F)
Port	Point											
		See Automated Box 1-Minute Data Sheet										
Averages		0	1.12	1.51	158.041	7.5	230	249	251	56	107	94

Sample Gas Volume	149.191 dscf
Water Vapor	2.952 scf
Moisure Content	1.94 %
Avg. Stack Velocity	67.36 ft/sec
	4041.39 ft/min
Stack Flow	28567 wacfm
	21572 wscfm
	21153 dscfm

% Isokinetic **98.1 %**

EMSI

EPA Method OTM 027

Determination of Particulate Matter Less Than 2.5 Microns

Test Information					Start Time
Client:	Met Council	Date:	2/9/2010	Time:	12:25 - 16:27
Facility:	Metro	Location:	Stack	Job #:	902630
Unit:	FBI 2	Test #:	1		16:27

Preliminary Measurements

Barometric Press. =	30.24	% CO2 =	9.7
Stack Pressure, Pg =	0.1	% O2 =	9.4
Ave. Stack Temp., Ts =	229	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	90	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	80	Delta H@ =	2.020
Moisture Content, % =	2.00	Total Run Time =	241
Average Delta P =	1.10	Number Of Sample Points =	12
Point #1 Delta P =	1.1	Nozzle Number:	225069
		Nozzle Diameter:	0.154

Cyclone Flow Rate, Qs =	0.51683 CFM
Minimum Delta P, ^Pmin, =	0.595129 "H2O
Maximum Delta P, ^Pmax, =	1.744933 "H2O
PM 2.5 Delta H Setpoint =	0.57803 "H2O

Test Data

Barometric Press. =	29.54	inHg	Water Condensate		
Stack Pressure, Pg =	-0.29	inH2O	Start	End	Total
% CO2 =	9.7	%	1	359.5	379.4
% O2 =	9.6	%	2	608.8	611.4
Meter Factor (Y)	1.000	dimensionless	3	709.4	710.2
Stack Diameter	36.00	inches	4	897.3	915.2
			Total	2575	2616.2
					41.2

Port/Point	Time	Delta P	ER	Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Filter Temp
							0.000					
A1	0.0	1.10		229	20.1	0.58	9.174	5.0	59	84	81	78
A2	20.1	1.12		229	20.3	0.58	16.725	5.0	50	90	82	67
A3	40.3	1.13		229	20.4	0.58	25.841	5.0	53	89	82	67
A4	60.7	1.13		229	20.4	0.58	33.501	5.0	53	90	83	67
A5	81.1	1.00		230	19.1	0.58	41.136	5.0	53	91	83	70
A6	100.2	0.91		229	18.3	0.58	48.980	5.0	53	90	83	67
B1	118.5	1.11		227	20.2	0.58	56.656	5.0	53	90	83	67
B2	138.6	1.20		228	21.0	0.58	65.487	5.0	50	89	83	66
B3	159.6	1.15		229	20.5	0.58	73.480	5.0	51	89	81	66
B4	180.2	1.07		230	19.8	0.58	81.869	5.0	52	88	80	67
B5	200.0	1.14		229	20.4	0.58	90.260	5.0	53	88	80	65
B6	220.4	1.15		229	20.5	0.58	98.557	5.0	54	88	80	66
Final	240.9	--	--	--	--	--	--	--	--	--	--	--
Avg/Total	240.9	1.100		229	20	0.58	98.557	5.0	53	89	82	

Test Results

Absolute Pressure Stack (Ps)	29.52 inHg	Stack Flow	28,312 wacfm
Vol Meter (Vm(std))	94.356 dscf	Stack Flow	21,408 wscfm
Sample Rate (Qs)	0.529 acfm	Stack Flow	20,977 dscfm
Volume Water Vapor (Vw(std))	1.939 scf	Moisture Gain	41.2 mg
Molecular Weight Dry (Md)	29.94 lb/lb-mole		
Molecular Weight Wet (Mw)	29.70 lb/lb-mole		
Viscosity of Gas	215.02 micropoise		
Moisture Content Gas	2.01 %		
Stack Velocity	66.76 ft/sec		
Area Nozzle	0.000129 ft2		
Stack Area	7.07 ft2		

Acceptability Criteria

# Points outside delta P min/max ranges	0
% Isokinetic (I)	102.07 80<= I <=120
Z Value Acceptance Criteria	1.0389 0.99 <= Z <= 1.01
Z Value Acceptance Criteria 2nd Iteration	1.0000 0.99 <= Z <= 1.01
Acceptable Test Run	Yes Yes/No

EMSI

EPA Method OTM 027

Determination of Particulate Matter Less Than 2.5 Microns

Test Information						Start Time
Client:	Met Council	Date:	2/10/2010	Time:	7:36 - 11:40	7:36
Facility:	Metro	Location:	Stack	Job #:	902630	11:40
Unit:	FBI 2	Test #:	2			

Preliminary Measurements

Barometric Press. =	29.54	% CO2 =	9.7
Stack Pressure, Pg =	-0.29	% O2 =	9.6
Ave. Stack Temp., Ts =	229	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	89	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	82	Delta H@ =	2.020
Moisture Content, % =	2.00	Total Run Time =	241
Average Delta P =	1.10	Number Of Sample Points =	12
Point #1 Delta P =	1.12	Nozzle Number:	225081
		Nozzle Diameter:	0.153

Cyclone Flow Rate, Qs =	0.52222 CFM
Minimum Delta P, ^Pmin, =	0.612572 "H2O
Maximum Delta P, ^Pmax, =	1.781344 "H2O
PM 2.5 Delta H Setpoint =	0.57753 "H2O

Test Data

Barometric Press. =	29.54	inHg	Water Condensate		
Stack Pressure, Pg =	-0.19	inH2O	Start	End	Total
% CO2 =	9.5	%	1	362.7	383.2
% O2 =	9.5	%	2	622.2	624.6
Meter Factor (Y)	1.000	dimensionless	3	705.8	704.5
Stack Diameter	36.00	inches	4	859	877.1
			Total	2549.7	2589.4
					39.7

Port/Point	Time	Delta P	ER	Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Filter Temp
							0.000					
A1	0.0	1.12		224	20.3	0.58	8.502	5.0	66	87	75	72
A2	20.3	1.13		226	20.4	0.58	16.774	5.0	58	95	80	62
A3	40.6	1.15		226	20.5	0.58	25.260	5.0	55	97	84	62
A4	61.2	1.16		226	20.6	0.58	33.748	5.0	52	95	85	59
A5	81.8	1.05		226	19.6	0.58	41.558	5.0	51	99	87	60
A6	101.4	0.96		226	18.8	0.58	49.319	5.0	50	100	89	58
B1	120.2	1.09		225	20.0	0.58	58.088	5.0	54	97	90	60
B2	140.2	1.16		226	20.6	0.58	66.094	5.0	50	100	90	58
B3	160.8	1.19		227	20.9	0.58	74.780	5.0	49	100	91	58
B4	181.7	1.18		227	20.8	0.58	83.435	5.0	49	101	91	58
B5	202.5	1.09		226	20.0	0.58	92.028	5.0	48	102	92	58
B6	222.5	1.00		226	19.2	0.58	99.599	5.0	48	103	93	58
Final	241.7	--	--	--	--	--	--	--	--	--	--	--
Avg/Total	241.7	1.106		226	20	0.58	99.599	5.0	53	98	87	

Test Results

Absolute Pressure Stack (Ps)	29.53 inHg	Stack Flow	28,337 wacfm
Vol Meter (Vm(std))	94.088 dscf	Stack Flow	21,526 wscfm
Sample Rate (Qs)	0.523 acfm	Stack Flow	21,107 dscfm
Volume Water Vapor (Vw(std))	1.869 scf	Moisture Gain	39.7 mg
Molecular Weight Dry (Md)	29.90 lb/lb-mole		
Molecular Weight Wet (Mw)	29.67 lb/lb-mole		
Viscosity of Gas	214.32 micropoise		
Moisture Content Gas	1.95 %		
Stack Velocity	66.81 ft/sec		
Area Nozzle	0.000128 ft2		
Stack Area	7.07 ft2		

Acceptability Criteria

# Points outside delta P min/max ranges	0
% Isokinetic (I)	102.18 80<= I <=120
Z Value Acceptance Criteria	1.0387 0.99 <= Z <= 1.01
Z Value Acceptance Criteria 2nd Iteration	1.0000 0.99 <= Z <= 1.01
Acceptable Test Run	Yes Yes/No

EMSI

EPA Method OTM 027

Determination of Particulate Matter Less Than 2.5 Microns

Test Information						Start Time
Client:	Met Council	Date:	2/10/2010	Time:	12:25 - 16:28	12:25
Facility:	Metro	Location:	Stack	Job #:	902630	16:28
Unit:	FBI 2	Test #:	3			

Preliminary Measurements

Barometric Press. =	29.54	% CO2 =	9.5
Stack Pressure, Pg =	-0.19	% O2 =	9.5
Ave. Stack Temp., Ts =	226	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	98	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	87	Delta H@ =	2.020
Moisture Content, % =	2.00	Total Run Time =	241
Average Delta P =	1.11	Number Of Sample Points =	12
Point #1 Delta P =	1.1	Nozzle Number:	225069
		Nozzle Diameter:	0.154

Cyclone Flow Rate, Qs =	0.51966 CFM
Minimum Delta P, ^Pmin, =	0.590461 "H2O
Maximum Delta P, ^Pmax, =	1.727067 "H2O
PM 2.5 Delta H Setpoint =	0.58234 "H2O

Test Data

Barometric Press. =	29.54	inHg	Water Condensate		
Stack Pressure, Pg =	-0.19	inH2O	Start	End	Total
% CO2 =	9.3	%	1	359.7	380.3
% O2 =	9.8	%	2	608.6	611.3
Meter Factor (Y)	1.000	dimensionless	3	706.4	706.6
Stack Diameter	36.00	inches	4	860.0	879.0
			Total	2534.7	2577.2
					42.5

Port/Point	Time	Delta P	ER	Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Filter Temp
							0.000					
B1	0.0	1.10		226	20.0	0.59	8.614	5.0	59	95	90	72
B2	20.0	1.17		226	20.7	0.59	17.411	5.0	50	102	91	63
B3	40.7	1.18		226	20.7	0.59	26.205	5.0	50	103	92	62
B4	61.4	1.18		226	20.7	0.59	34.394	5.0	50	103	93	61
B5	82.2	1.10		226	20.0	0.59	43.383	5.0	50	104	94	61
B6	102.2	1.00		226	19.1	0.59	51.429	5.0	49	104	94	58
A1	121.3	1.12		226	20.2	0.59	59.892	5.0	52	102	94	63
A2	141.5	1.12		226	20.2	0.59	68.512	5.0	50	101	94	60
A3	161.8	1.14		227	20.4	0.59	76.937	5.0	50	103	93	59
A4	182.1	1.17		227	20.7	0.59	85.352	5.0	50	104	94	60
A5	202.8	1.16		227	20.6	0.59	94.227	5.0	49	104	94	57
A6	223.4	1.04		227	19.5	0.59	101.983	5.0	50	105	95	60
Final	242.9	--	--	--	--	--	--	--	--	--	--	--
Avg/Total	242.9	1.123		226	20	0.59	101.983	5.0	51	103	93	

Test Results

Absolute Pressure Stack (Ps)	29.53 inHg	Stack Flow	28,580 wacfm
Vol Meter (Vm(std))	95.442 dscf	Stack Flow	21,697 wscfm
Sample Rate (Qs)	0.529 acfm	Stack Flow	21,251 dscfm
Volume Water Vapor (Vw(std))	2.000 scf	Moisture Gain	42.5 mg
Molecular Weight Dry (Md)	29.88 lb/lb-mole		
Molecular Weight Wet (Mw)	29.64 lb/lb-mole		
Viscosity of Gas	214.50 micropoise		
Moisture Content Gas	2.05 %		
Stack Velocity	67.39 ft/sec		
Area Nozzle	0.000129 ft2		
Stack Area	7.07 ft2		

Acceptability Criteria

# Points outside delta P min/max ranges	0
% Isokinetic (I)	101.11 80<= I <=120
Z Value Acceptance Criteria	1.0388 0.99 <= Z <= 1.01
Z Value Acceptance Criteria 2nd Iteration	1.0000 0.99 <= Z <= 1.01
Acceptable Test Run	Yes Yes/No

EMSI

**MET Council
Metro
FBR Unit 3**

Date	2/11/2010		2/11/2010		2/11/2010	
Time	8:08 - 9:08		9:35 - 10:35		12:02 - 13:02	
Analyzer Value	Run 1		Run 2		Run 3	
NOx	12.9		12.7		31.2	
CO	3.0		0.2		0.1	
SO2	0.3		0.1		0.0	
O2	8.9		10.0		9.2	
CO2	9.7		8.9		9.7	
Calibration Err	Pre		Pre		Pre	
NOx Zero	0.00		0.00		0.00	
NOx Mid	50.50		50.50		50.50	
NOx High	102.00		102.00		102.00	
CO Zero	0.00		0.00		0.00	
CO Mid	52.00		52.00		52.00	
CO High	102.00		102.00		102.00	
SO2 Zero	0.40		0.40		0.40	
SO2 Mid	49.80		49.80		49.80	
SO2 High	99.73		99.73		99.73	
O2 Zero	0.00		0.00		0.00	
O2 Mid	10.00		10.00		10.00	
O2 High	19.85		19.85		19.85	
CO2 Zero	0.00		0.00		0.00	
CO2 Mid	10.00		10.00		10.00	
CO2 High	19.40		19.40		19.40	
System Bias	Pre	Post	Pre	Post	Pre	Post
NOx Zero	0.00	0.30	0.30	0.50	0.50	1.50
NOx Span	49.70	50.50	50.50	50.30	50.30	52.17
CO Zero	0.00	0.00	0.00	0.00	0.00	0.00
CO Span	51.80	51.60	51.60	51.67	51.67	52.00
SO2 Zero	0.48	0.44	0.44	0.50	0.50	0.08
SO2 Span	48.12	47.88	47.88	47.08	47.08	47.70
O2 Zero	0.00	0.00	0.00	0.00	0.00	0.00
O2 Span	9.92	9.96	9.96	9.92	9.92	9.80
CO2 Zero	0.10	0.20	0.20	0.30	0.30	0.40
CO2 Span	10.00	10.00	10.00	10.00	10.00	10.04
Run Results	Run 1		Run 2		Run 3	
NOx	12.8		12.4		30.2	
CO	2.9		0.2		0.1	
SO2	0.0		0.0		0.0	
O2	9.0		10.2		9.4	
CO2	9.8		8.9		9.7	
Nox @ 7% O2	15.1		16.0		36.6	
CO @ 7% O2	3.4		0.3		0.1	
SO2 @ 7% O2	0.0		0.0		0.0	
Cal Results	Run 1		Run 2		Run 3	
NOx CE Zero	0.0		0.0		0.0	
NOx CE Mid	0.2		0.2		0.2	
NOx CE High	0.4		0.4		0.4	
NOx SB Zero	0.0	0.3	0.3	0.5	0.5	1.5
NOx SB Span	-0.8	0.0	0.0	-0.2	-0.2	1.6
NOx Zero Drift	0.3		0.2		1.0	
NOx Span Drift	0.8		-0.2		1.8	
CO CE Zero	0.0		0.0		0.0	
CO CE Mid	1.3		1.3		1.3	
CO CE High	1.0		1.0		1.0	
CO SB Zero	0.0	0.0	0.0	0.0	0.0	0.0
CO SB Span	-0.2	-0.4	-0.4	-0.3	-0.3	0.0
CO Zero Drift	0.0		0.0		0.0	
CO Span Drift	-0.2		0.1		0.3	
SO2 CE Zero	0.4		0.4		0.4	
SO2 CE Mid	-0.7		-0.7		-0.7	
SO2 CE High	-1.3		-1.3		-1.3	
SO2 SB Zero	0.1	0.0	0.0	0.1	0.1	-0.3
SO2 SB Span	-1.7	-1.9	-1.9	-2.7	-2.7	-2.1
SO2 Zero Drift	0.0		0.1		-0.4	
SO2 Span Drift	-0.2		-0.8		0.6	
O2 CE Zero	0.0		0.0		0.0	
O2 CE Mid	-0.5		-0.5		-0.5	
O2 CE High	-0.4		-0.4		-0.4	
O2 SB Zero	0.0	0.0	0.0	0.0	0.0	0.0
O2 SB Span	-0.4	-0.2	-0.2	-0.4	-0.4	-1.0
O2 Zero Drift	0.0		0.0		0.0	
O2 Span Drift	0.2		-0.2		-0.6	
CO2 CE Zero	0.0		0.0		0.0	
CO2 CE Mid	-0.4		-0.4		-0.4	
CO2 CE High	-1.6		-1.6		-1.6	
CO2 SB Zero	0.5	1.0	1.0	1.5	1.5	2.0
CO2 SB Span	0.0	0.0	0.0	0.0	0.0	0.2
CO2 Zero Drift	0.5		0.5		0.5	
CO2 Span Drift	0.0		0.0		0.2	
Analyzer	Zero	Span	Mid	High	Range	SB
NOx	0.00	50.30	50.30	101.60	101.60	Mid
CO	0.00	50.70	50.70	101.00	101.00	Mid
SO2	0.00	50.50	50.50	101.00	101.00	Mid
O2	0.00	10.10	10.10	19.92	19.92	Mid
CO2	0.00	10.08	10.08	19.71	19.71	Mid

Emission Report

MET Council

St. Paul

Unit: 3

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/11/10	02/11/10	08:08:01	08:08:59	1	10.1	8.8	9.8	1.0	0.5
02/11/10	02/11/10	08:09:02	08:09:57	1	10.1	8.9	10.7	1.0	0.5
02/11/10	02/11/10	08:10:00	08:10:58	1	10.0	8.9	10.3	1.0	0.6
02/11/10	02/11/10	08:11:01	08:11:59	1	9.9	9.0	10.7	1.2	0.6
02/11/10	02/11/10	08:12:02	08:12:57	1	9.8	9.1	10.7	0.9	0.5
02/11/10	02/11/10	08:13:00	08:13:58	1	9.8	9.0	11.5	1.0	0.6
02/11/10	02/11/10	08:14:01	08:14:59	1	9.9	9.0	10.8	1.0	0.6
02/11/10	02/11/10	08:15:02	08:15:57	1	9.7	9.1	11.2	0.9	0.5
02/11/10	02/11/10	08:16:00	08:16:58	1	9.8	9.1	9.8	1.0	0.5
02/11/10	02/11/10	08:17:01	08:17:58	1	9.9	9.0	10.3	1.0	0.4
02/11/10	02/11/10	08:18:02	08:18:57	1	9.7	9.2	12.0	1.0	0.4
02/11/10	02/11/10	08:19:00	08:19:58	1	9.7	9.2	12.3	1.0	0.4
02/11/10	02/11/10	08:20:01	08:20:59	1	9.7	9.2	12.4	1.0	0.4
02/11/10	02/11/10	08:21:02	08:21:56	1	9.5	9.3	10.8	1.0	0.5
02/11/10	02/11/10	08:22:00	08:22:57	1	9.2	9.5	11.0	1.0	0.5
02/11/10	02/11/10	08:23:01	08:23:59	1	9.3	9.4	10.8	1.0	0.4
02/11/10	02/11/10	08:24:02	08:24:56	1	9.5	9.2	11.3	1.0	0.3
02/11/10	02/11/10	08:25:00	08:25:57	1	9.7	9.2	11.4	1.0	0.4
02/11/10	02/11/10	08:26:01	08:26:59	1	9.4	9.4	11.4	1.0	0.3
02/11/10	02/11/10	08:27:02	08:27:57	1	9.5	9.3	11.4	1.0	0.4
02/11/10	02/11/10	08:28:00	08:28:58	1	9.6	9.2	10.6	1.0	0.3
02/11/10	02/11/10	08:29:01	08:29:59	1	9.6	9.2	10.9	1.2	0.3
02/11/10	02/11/10	08:30:02	08:30:57	1	9.3	9.4	11.1	1.0	0.3
02/11/10	02/11/10	08:31:00	08:31:58	1	9.5	9.3	11.6	1.0	0.3
02/11/10	02/11/10	08:32:01	08:32:59	1	9.5	9.3	12.2	1.0	0.2
02/11/10	02/11/10	08:33:02	08:33:57	1	9.6	9.3	11.6	1.0	0.3
02/11/10	02/11/10	08:34:00	08:34:57	1	9.4	9.3	12.0	1.0	0.4
02/11/10	02/11/10	08:35:00	08:35:58	1	9.5	9.3	12.9	1.0	0.2
02/11/10	02/11/10	08:36:01	08:36:59	1	9.4	9.4	12.2	1.7	0.4
02/11/10	02/11/10	08:37:02	08:37:57	1	9.3	9.4	11.4	1.0	0.3
02/11/10	02/11/10	08:38:00	08:38:58	1	9.4	9.4	11.5	1.0	0.1

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/11/10	02/11/10	08:39:01	08:39:59	1	9.3	9.5	11.9	1.0	0.2
02/11/10	02/11/10	08:40:02	08:40:56	1	8.9	9.8	13.5	1.7	0.2
02/11/10	02/11/10	08:41:00	08:41:57	1	8.4	10.2	13.0	2.2	0.3
02/11/10	02/11/10	08:42:00	08:42:58	1	7.9	10.2	14.8	3.7	0.2
02/11/10	02/11/10	08:43:01	08:43:59	1	8.8	9.8	11.9	2.2	0.2
02/11/10	02/11/10	08:44:02	08:44:57	1	8.8	9.9	12.1	2.2	0.3
02/11/10	02/11/10	08:45:00	08:45:58	1	7.5	10.8	14.6	3.7	0.3
02/11/10	02/11/10	08:46:01	08:46:59	1	7.3	10.6	17.4	10.4	0.2
02/11/10	02/11/10	08:47:02	08:47:57	1	8.5	10.0	12.7	5.8	0.3
02/11/10	02/11/10	08:48:00	08:48:58	1	8.2	10.2	13.4	3.1	0.3
02/11/10	02/11/10	08:49:01	08:49:59	1	8.6	10.0	12.5	2.2	0.3
02/11/10	02/11/10	08:50:02	08:50:57	1	8.8	9.9	12.1	2.5	0.3
02/11/10	02/11/10	08:51:00	08:51:58	1	8.6	10.1	12.4	2.1	0.3
02/11/10	02/11/10	08:52:01	08:52:59	1	7.9	10.6	13.1	2.7	0.4
02/11/10	02/11/10	08:53:02	08:53:57	1	7.1	11.2	12.9	6.4	0.3
02/11/10	02/11/10	08:54:00	08:54:58	1	6.5	11.1	18.7	13.5	0.2
02/11/10	02/11/10	08:55:01	08:55:59	1	7.9	10.5	14.4	9.4	0.4
02/11/10	02/11/10	08:56:03	08:56:58	1	7.8	10.4	15.2	8.0	0.3
02/11/10	02/11/10	08:57:01	08:57:59	1	7.3	10.9	16.6	5.2	0.3
02/11/10	02/11/10	08:58:02	08:58:57	1	6.7	11.1	18.2	9.2	0.3
02/11/10	02/11/10	08:59:00	08:59:58	1	7.6	10.6	16.0	8.7	0.3
02/11/10	02/11/10	09:00:01	09:00:59	1	7.7	10.6	15.4	6.1	0.4
02/11/10	02/11/10	09:01:02	09:01:57	1	8.0	10.3	14.7	4.0	0.3
02/11/10	02/11/10	09:02:00	09:02:59	1	8.3	10.2	14.2	3.5	0.2
02/11/10	02/11/10	09:03:02	09:03:57	1	6.4	11.2	22.9	13.1	0.3
02/11/10	02/11/10	09:04:00	09:04:58	1	8.0	10.1	17.7	8.7	0.2
02/11/10	02/11/10	09:05:01	09:05:59	1	9.0	9.6	14.8	6.0	0.2
02/11/10	02/11/10	09:06:02	09:06:57	1	9.2	9.4	14.1	2.1	0.1
02/11/10	02/11/10	09:07:00	09:07:58	1	9.2	9.4	13.9	1.2	0.2
Average					8.9	9.7	12.9	3.0	0.3
Minimum Value					6.4	8.8	9.8	0.9	0.1
Maximum Value					10.1	11.2	22.9	13.5	0.6

Emission Report

MET Councle

St. Paul

Unit: 3

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/11/10	02/11/10	09:35:01	09:35:59	2	10.8	8.4	12.5	0.1	0.3
02/11/10	02/11/10	09:36:02	09:36:57	2	10.8	8.4	12.9	0.1	0.3
02/11/10	02/11/10	09:37:00	09:37:58	2	10.7	8.4	11.9	0.1	0.1
02/11/10	02/11/10	09:38:01	09:38:59	2	10.9	8.2	11.7	0.1	0.0
02/11/10	02/11/10	09:39:02	09:39:57	2	10.8	8.3	12.1	0.0	0.2
02/11/10	02/11/10	09:40:00	09:40:58	2	10.7	8.5	12.5	0.0	0.2
02/11/10	02/11/10	09:41:01	09:41:59	2	10.6	8.5	15.1	0.1	0.2
02/11/10	02/11/10	09:42:02	09:42:57	2	10.4	8.6	12.9	0.0	0.1
02/11/10	02/11/10	09:43:00	09:43:58	2	10.4	8.6	12.5	0.0	0.1
02/11/10	02/11/10	09:44:01	09:44:59	2	10.4	8.6	11.1	0.0	0.1
02/11/10	02/11/10	09:45:02	09:45:57	2	10.3	8.7	11.9	0.1	0.2
02/11/10	02/11/10	09:46:00	09:46:58	2	10.4	8.7	11.6	0.0	0.2
02/11/10	02/11/10	09:47:01	09:47:59	2	10.3	8.8	11.7	0.0	0.1
02/11/10	02/11/10	09:48:02	09:48:57	2	10.4	8.7	11.4	0.0	0.1
02/11/10	02/11/10	09:49:00	09:49:58	2	10.2	8.8	11.5	0.0	0.2
02/11/10	02/11/10	09:50:01	09:50:59	2	10.2	8.9	11.8	0.0	0.1
02/11/10	02/11/10	09:51:02	09:51:57	2	9.1	9.4	12.8	0.5	0.1
02/11/10	02/11/10	09:52:00	09:52:59	2	9.9	8.9	11.3	0.9	0.1
02/11/10	02/11/10	09:53:02	09:53:57	2	10.1	8.8	12.0	0.1	0.1
02/11/10	02/11/10	09:54:00	09:54:58	2	10.2	8.8	12.8	0.0	0.0
02/11/10	02/11/10	09:55:01	09:55:59	2	10.3	8.8	11.3	0.0	0.0
02/11/10	02/11/10	09:56:02	09:56:57	2	10.1	8.8	11.1	0.0	0.1
02/11/10	02/11/10	09:57:00	09:57:57	2	10.2	8.8	13.1	0.0	0.0
02/11/10	02/11/10	09:58:00	09:58:58	2	10.2	8.9	11.8	0.1	0.1
02/11/10	02/11/10	09:59:01	09:59:59	2	9.3	9.4	11.9	0.0	0.0
02/11/10	02/11/10	10:00:02	10:00:57	2	9.9	9.0	11.4	0.0	0.0
02/11/10	02/11/10	10:01:00	10:01:58	2	10.3	8.8	11.6	0.0	0.0
02/11/10	02/11/10	10:02:01	10:02:59	2	10.3	8.7	11.8	0.0	0.2
02/11/10	02/11/10	10:03:02	10:03:57	2	10.4	8.6	11.8	0.0	0.1
02/11/10	02/11/10	10:04:00	10:04:58	2	10.4	8.7	11.3	0.0	0.0
02/11/10	02/11/10	10:05:01	10:05:59	2	10.4	8.7	12.4	0.0	0.0

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/11/10	02/11/10	10:06:02	10:06:57	2	10.0	8.9	12.3	0.0	0.0
02/11/10	02/11/10	10:07:00	10:07:58	2	9.9	9.1	12.3	0.0	0.2
02/11/10	02/11/10	10:08:01	10:08:59	2	9.6	9.1	14.3	1.6	0.1
02/11/10	02/11/10	10:09:02	10:09:57	2	10.0	9.0	14.5	0.3	0.0
02/11/10	02/11/10	10:10:00	10:10:58	2	9.7	9.2	11.1	0.1	0.1
02/11/10	02/11/10	10:11:01	10:11:59	2	9.9	9.1	12.1	0.0	0.2
02/11/10	02/11/10	10:12:02	10:12:57	2	9.9	9.1	12.3	0.0	0.1
02/11/10	02/11/10	10:13:00	10:13:58	2	10.0	9.0	13.7	0.1	0.1
02/11/10	02/11/10	10:14:01	10:14:59	2	10.0	9.0	12.0	0.1	0.0
02/11/10	02/11/10	10:15:03	10:15:58	2	9.7	9.2	11.8	0.5	0.0
02/11/10	02/11/10	10:16:01	10:16:59	2	10.0	9.0	10.5	0.0	0.1
02/11/10	02/11/10	10:17:02	10:17:57	2	10.0	9.0	12.3	0.0	0.0
02/11/10	02/11/10	10:18:00	10:18:58	2	10.0	9.0	11.5	0.0	0.0
02/11/10	02/11/10	10:19:01	10:19:59	2	10.1	9.0	13.5	0.1	0.0
02/11/10	02/11/10	10:20:02	10:20:57	2	10.2	8.8	14.3	0.0	0.1
02/11/10	02/11/10	10:21:00	10:21:58	2	10.2	8.9	13.2	0.0	0.1
02/11/10	02/11/10	10:22:01	10:22:59	2	10.2	8.8	11.9	0.0	0.0
02/11/10	02/11/10	10:23:02	10:23:57	2	9.3	9.7	11.6	0.0	0.0
02/11/10	02/11/10	10:24:01	10:24:59	2	7.5	10.2	26.0	4.3	0.0
02/11/10	02/11/10	10:25:02	10:25:57	2	9.2	9.4	13.9	2.8	0.0
02/11/10	02/11/10	10:26:00	10:26:58	2	9.9	9.1	13.6	0.0	0.0
02/11/10	02/11/10	10:27:01	10:27:59	2	9.9	9.1	13.5	0.0	0.1
02/11/10	02/11/10	10:28:02	10:28:57	2	9.9	9.1	14.6	0.0	0.0
02/11/10	02/11/10	10:29:00	10:29:58	2	9.8	9.2	14.4	0.0	0.1
02/11/10	02/11/10	10:30:01	10:30:59	2	9.9	9.1	13.2	0.0	0.1
02/11/10	02/11/10	10:31:02	10:31:57	2	9.8	9.2	12.9	0.0	0.0
02/11/10	02/11/10	10:32:00	10:32:58	2	9.7	9.2	12.9	0.0	0.1
02/11/10	02/11/10	10:33:01	10:33:59	2	9.8	9.2	14.0	0.1	0.1
02/11/10	02/11/10	10:34:02	10:34:57	2	9.6	9.3	11.8	0.1	0.1
Average					10.0	8.9	12.7	0.2	0.1
Minimum Value					7.5	8.2	10.5	0.0	0.0
Maximum Value					10.9	10.2	26.0	4.3	0.3

Emission Report

MET Councle

St. Paul

Unit: 3

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/11/10	02/11/10	12:02:01	12:02:59	3	9.1	9.7	25.2	0.1	0.6
02/11/10	02/11/10	12:03:02	12:03:57	3	9.0	9.8	25.1	0.0	0.6
02/11/10	02/11/10	12:04:00	12:04:58	3	9.1	9.6	28.4	0.0	0.5
02/11/10	02/11/10	12:05:01	12:05:59	3	9.1	9.7	30.5	0.0	0.3
02/11/10	02/11/10	12:06:02	12:06:57	3	9.1	9.7	27.4	0.0	0.2
02/11/10	02/11/10	12:07:00	12:07:58	3	9.1	9.6	30.0	0.0	0.1
02/11/10	02/11/10	12:08:02	12:08:57	3	9.1	9.7	31.4	0.0	0.0
02/11/10	02/11/10	12:09:00	12:09:58	3	9.1	9.6	39.1	0.0	0.1
02/11/10	02/11/10	12:10:01	12:10:59	3	9.3	9.5	35.9	0.0	0.2
02/11/10	02/11/10	12:11:02	12:11:57	3	9.3	9.5	32.1	0.0	0.1
02/11/10	02/11/10	12:12:00	12:12:58	3	9.3	9.5	39.4	0.0	0.1
02/11/10	02/11/10	12:13:01	12:13:59	3	9.2	9.5	39.8	0.0	0.0
02/11/10	02/11/10	12:14:02	12:14:57	3	9.4	9.4	38.8	0.0	0.1
02/11/10	02/11/10	12:15:00	12:15:58	3	9.3	9.5	33.7	0.0	0.1
02/11/10	02/11/10	12:16:01	12:16:59	3	9.1	9.7	38.4	0.0	0.0
02/11/10	02/11/10	12:17:03	12:17:58	3	9.0	9.7	33.3	0.0	0.0
02/11/10	02/11/10	12:18:01	12:18:59	3	9.0	9.8	27.6	0.0	0.0
02/11/10	02/11/10	12:19:02	12:19:57	3	8.9	9.9	35.0	0.3	0.0
02/11/10	02/11/10	12:20:00	12:20:58	3	8.9	9.8	32.7	0.0	0.0
02/11/10	02/11/10	12:21:01	12:21:59	3	9.0	9.8	33.6	0.5	0.0
02/11/10	02/11/10	12:22:02	12:22:57	3	9.0	9.8	36.7	0.4	0.0
02/11/10	02/11/10	12:23:00	12:23:58	3	8.8	10.0	36.1	1.1	0.0
02/11/10	02/11/10	12:24:01	12:24:59	3	9.0	9.8	34.5	1.1	0.0
02/11/10	02/11/10	12:25:03	12:25:58	3	9.4	9.6	36.3	0.0	0.0
02/11/10	02/11/10	12:26:01	12:26:59	3	9.5	9.5	35.1	0.5	0.0
02/11/10	02/11/10	12:27:02	12:27:57	3	9.2	9.8	35.3	0.2	0.0
02/11/10	02/11/10	12:28:00	12:28:58	3	9.2	9.8	36.8	0.8	0.0
02/11/10	02/11/10	12:29:01	12:29:59	3	9.2	9.8	32.9	0.8	0.0
02/11/10	02/11/10	12:30:02	12:30:57	3	9.2	9.8	31.3	0.7	0.0
02/11/10	02/11/10	12:31:00	12:31:58	3	9.3	9.7	30.0	0.1	0.0
02/11/10	02/11/10	12:32:01	12:32:59	3	9.3	9.7	24.9	0.0	0.0

Start Date	End Date	Start	Stop	Test	O2 %	CO2 %	NOx ppm	CO ppm	SO2 ppm
02/11/10	02/11/10	12:33:02	12:33:58	3	9.2	9.7	25.8	0.0	0.0
02/11/10	02/11/10	12:34:01	12:34:59	3	9.2	9.8	34.6	0.2	0.0
02/11/10	02/11/10	12:35:02	12:35:57	3	9.3	9.6	32.3	0.9	0.0
02/11/10	02/11/10	12:36:00	12:36:58	3	9.4	9.6	28.8	0.0	0.0
02/11/10	02/11/10	12:37:01	12:37:59	3	9.4	9.6	31.0	0.0	0.0
02/11/10	02/11/10	12:38:02	12:38:57	3	9.4	9.6	31.4	0.0	0.0
02/11/10	02/11/10	12:39:00	12:39:58	3	9.4	9.6	26.8	0.0	0.0
02/11/10	02/11/10	12:40:01	12:40:56	3	9.5	9.5	32.3	0.0	0.0
02/11/10	02/11/10	12:41:00	12:41:58	3	9.5	9.5	33.2	0.1	0.0
02/11/10	02/11/10	12:42:01	12:42:59	3	9.4	9.7	28.3	0.0	0.0
02/11/10	02/11/10	12:43:02	12:43:57	3	9.2	9.7	32.6	0.2	0.0
02/11/10	02/11/10	12:44:00	12:44:58	3	9.3	9.7	24.3	0.0	0.0
02/11/10	02/11/10	12:45:01	12:45:59	3	9.4	9.6	27.8	0.0	0.0
02/11/10	02/11/10	12:46:02	12:46:57	3	9.4	9.6	32.3	0.0	0.0
02/11/10	02/11/10	12:47:00	12:47:58	3	9.3	9.7	30.9	0.0	0.0
02/11/10	02/11/10	12:48:01	12:48:59	3	9.1	9.8	24.3	0.0	0.0
02/11/10	02/11/10	12:49:02	12:49:57	3	9.2	9.8	26.6	0.0	0.0
02/11/10	02/11/10	12:50:00	12:50:58	3	9.2	9.8	32.1	0.0	0.0
02/11/10	02/11/10	12:51:01	12:51:59	3	9.2	9.8	29.5	0.0	0.0
02/11/10	02/11/10	12:52:03	12:52:58	3	9.1	9.8	28.5	0.0	0.0
02/11/10	02/11/10	12:53:01	12:53:59	3	9.0	10.0	25.4	0.0	0.0
02/11/10	02/11/10	12:54:02	12:54:57	3	8.9	10.1	28.6	0.0	0.0
02/11/10	02/11/10	12:55:00	12:55:58	3	8.9	10.0	28.7	0.4	0.0
02/11/10	02/11/10	12:56:01	12:56:59	3	8.9	10.0	29.6	0.0	0.0
02/11/10	02/11/10	12:57:02	12:57:57	3	8.8	10.0	26.2	0.0	0.0
02/11/10	02/11/10	12:58:00	12:58:58	3	8.9	10.0	29.9	0.2	0.0
02/11/10	02/11/10	12:59:01	12:59:59	3	9.1	9.8	28.6	0.6	0.0
02/11/10	02/11/10	13:00:02	13:00:57	3	9.2	9.7	25.8	0.0	0.0
02/11/10	02/11/10	13:01:00	13:01:58	3	9.3	9.7	28.5	0.0	0.0
Average					9.2	9.7	31.2	0.1	0.0
Minimum Value					8.8	9.4	24.3	0.0	0.0
Maximum Value					9.5	10.1	39.8	1.1	0.6

EPA Method OTM 027

Determination of Particulate Matter Less Than 2.5 Microns

Test Information						Start Time
Client:	Met Council	Date:	2/11/2010	Time:	7:32 - 11:34	7:32
Facility:	Metro	Location:	Stack	Job #:	902630	11:34
Unit:	FBI 3	Test #:	1			

Preliminary Measurements

Barometric Press. =	30.24	% CO2 =	9.0
Stack Pressure, Pg =	0.1	% O2 =	10.0
Ave. Stack Temp., Ts =	231	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	90	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	80	Delta H@ =	2.020
Moisture Content, % =	2.00	Total Run Time =	241
Average Delta P =	0.89	Number Of Sample Points =	12
Point #1 Delta P =	0.87	Nozzle Number:	225081
		Nozzle Diameter:	0.153

Cyclone Flow Rate, Qs =	0.52003 CFM
Minimum Delta P, ^Pmin, =	0.617650 "H2O
Maximum Delta P, ^Pmax, =	1.799847 "H2O
PM 2.5 Delta H Setpoint =	0.58011 "H2O

Test Data

Barometric Press. =	29.48	inHg	Water Condensate		
Stack Pressure, Pg =	-0.19	inH2O	Start	End	Total
% CO2 =	9.1	%	1	362.4	380.3
% O2 =	9.7	%	2	622.4	624.5
Meter Factor (Y)	1.000	dimensionless	3	701.3	700.9
Stack Diameter	36.00	inches	4	877.2	894.8
			Total	2563.3	2600.5
					37.2

Port/Point	Time	Delta P	ER	Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Filter Temp
							0.000					
A1	0.0	0.87		228	19.9	0.59	9.039	5.0	60	85	69	68
A2	19.9	0.95		231	20.8	0.59	16.641	5.0	53	91	75	61
A3	40.7	0.96		232	20.9	0.59	25.221	5.0	50	93	79	59
A4	61.6	0.92		232	20.5	0.59	33.616	5.0	51	94	82	59
A5	82.1	0.84		231	19.6	0.59	41.380	5.0	51	97	85	59
A6	101.7	0.75		230	18.5	0.59	48.960	5.0	51	97	87	60
B1	120.2	0.81		231	19.2	0.59	56.959	5.0	57	95	87	63
B2	139.4	0.91		233	20.4	0.59	65.649	5.0	53	98	88	61
B3	159.7	0.95		233	20.8	0.59	73.754	5.0	53	98	88	63
B4	180.6	0.96		233	20.9	0.59	82.623	5.0	53	99	89	62
B5	201.5	0.87		233	19.9	0.59	90.652	5.0	54	99	89	63
B6	221.4	0.84		233	19.6	0.59	98.718	5.0	54	100	90	62
Final	240.9	--	--	--	--	--	--	--	--	--	--	--
Avg/Total	240.9	0.885		232	20	0.59	98.718	5.0	53	96	84	

Test Results

Absolute Pressure Stack (Ps)	29.47 inHg	Stack Flow	25,498 wacfm
Vol Meter (Vm(std))	93.554 dscf	Stack Flow	19,169 wscfm
Sample Rate (Qs)	0.526 acfm	Stack Flow	18,817 dscfm
Volume Water Vapor (Vw(std))	1.751 scf	Moisture Gain	37.2 mg
Molecular Weight Dry (Md)	29.84 lb/lb-mole		
Molecular Weight Wet (Mw)	29.63 lb/lb-mole		
Viscosity of Gas	215.88 micropoise		
Moisture Content Gas	1.84 %		
Stack Velocity	60.12 ft/sec		
Area Nozzle	0.000128 ft2		
Stack Area	7.07 ft2		

Acceptability Criteria

# Points outside delta P min/max ranges	0
% Isokinetic (I)	114.30 80<= I <=120
Z Value Acceptance Criteria	1.0393 0.99 <= Z <= 1.01
Z Value Acceptance Criteria 2nd Iteration	1.0000 0.99 <= Z <= 1.01
Acceptable Test Run	Yes Yes/No

EMSI

EPA Method OTM 027

Determination of Particulate Matter Less Than 2.5 Microns

Test Information						Start Time
Client:	Met Council	Date:	2/11/2010	Time:	12:00 - 16:04	12:00
Facility:	Metro	Location:	Stack	Job #:	902630	16:04
Unit:	FBI 3	Test #:	2			

Preliminary Measurements

Barometric Press. =	29.48	% CO2 =	9.1
Stack Pressure, Pg =	-0.19	% O2 =	9.7
Ave. Stack Temp., Ts =	232	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	96	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	84	Delta H@ =	2.020
Moisture Content, % =	2.00	Total Run Time =	241
Average Delta P =	0.88	Number Of Sample Points =	12
Point #1 Delta P =	0.9	Nozzle Number:	225069
		Nozzle Diameter:	0.154

Cyclone Flow Rate, Qs =	0.52583 CFM
Minimum Delta P, ΔPmin, =	0.597844 "H2O
Maximum Delta P, ΔPmax, =	1.746196 "H2O
PM 2.5 Delta H Setpoint =	0.58063 "H2O

Test Data

Barometric Press. =	29.48	inHg	Water Condensate		
Stack Pressure, Pg =	-0.19	inH2O	Start	End	Total
% CO2 =	9.9	%	1	359	377.6
% O2 =	9.0	%	2	608.5	610.9
Meter Factor (Y)	1.000	dimensionless	3	704.4	701.5
Stack Diameter	36.00	inches	4	836.7	858.5
			Total	2508.6	2548.5
					39.9

Port/Point	Time	Delta P	ER	Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Filter Temp
							0.000					
A1	0.0	0.90		228	20.3	0.59	8.501	5.0	53	100	89	68
A2	20.3	0.98		230	21.1	0.59	17.185	5.0	53	100	89	68
A3	41.4	0.97		231	21.0	0.59	25.950	5.0	53	102	91	69
A4	62.4	0.91		232	20.4	0.59	34.096	5.0	53	103	92	66
A5	82.8	0.81		231	19.2	0.59	42.506	5.0	53	103	92	65
A6	102.0	0.84		230	19.6	0.59	50.697	5.0	54	103	93	64
B1	121.6	0.86		231	19.8	0.59	60.333	5.0	54	103	94	65
B2	141.4	0.89		233	20.1	0.59	67.448	5.0	55	105	94	64
B3	161.5	0.92		233	20.5	0.59	75.666	5.0	57	105	95	65
B4	182.0	0.95		234	20.8	0.59	84.564	5.0	55	106	95	65
B5	202.8	0.84		233	19.6	0.59	92.890	5.0	54	106	96	65
B6	222.4	0.86		233	19.8	0.59	101.052	5.0	54	106	96	65
Final	242.2	--	--	--	--	--	--	--	--	--	--	--
Avg/Total	242.2	0.893		232	20	0.59	101.052	5.0	54	104	93	

Test Results

Absolute Pressure Stack (Ps)	29.47 inHg	Stack Flow	25,586 wacfm
Vol Meter (Vm(std))	94.309 dscf	Stack Flow	19,238 wscfm
Sample Rate (Qs)	0.528 acfm	Stack Flow	18,862 dscfm
Volume Water Vapor (Vw(std))	1.878 scf	Moisture Gain	39.9 mg
Molecular Weight Dry (Md)	29.94 lb/lb-mole		
Molecular Weight Wet (Mw)	29.71 lb/lb-mole		
Viscosity of Gas	215.35 micropoise		
Moisture Content Gas	1.95 %		
Stack Velocity	60.33 ft/sec		
Area Nozzle	0.000129 ft2		
Stack Area	7.07 ft2		

Acceptability Criteria

# Points outside delta P min/max ranges	0
% Isokinetic (I)	112.87 80<= I <=120
Z Value Acceptance Criteria	1.0391 0.99 <= Z <= 1.01
Z Value Acceptance Criteria 2nd Iteration	1.0000 0.99 <= Z <= 1.01
Acceptable Test Run	Yes Yes/No

EMSI

EPA Method OTM 027

Determination of Particulate Matter Less Than 2.5 Microns

Test Information						Start Time
Client:	Met Council	Date:	2/12/2010	Time:	8:10 - 12:13	8:10
Facility:	Metro	Location:	Stack	Job #:	902630	12:13
Unit:	FBI 3	Test #:	3			

Preliminary Measurements

Barometric Press. =	29.48	% CO2 =	9.9
Stack Pressure, Pg =	-0.19	% O2 =	9.0
Ave. Stack Temp., Ts =	232	M2 Pitot Correction, Cp =	0.84
Inlet Meter Temp. =	90	M201A Pitot Correction =	0.84
Outlet Meter Temp. =	85	Delta H@ =	2.020
Moisture Content, % =	2.00	Total Run Time =	241
Average Delta P =	0.92	Number Of Sample Points =	12
Point #1 Delta P =	0.9	Nozzle Number:	225081
		Nozzle Diameter:	0.154

Cyclone Flow Rate, Qs =	0.52405 CFM
Minimum Delta P, ^Pmin, =	0.595675 "H2O
Maximum Delta P, ^Pmax, =	1.740550 "H2O
PM 2.5 Delta H Setpoint =	0.57985 "H2O

Test Data

Barometric Press. =	29.41	inHg	Water Condensate			
Stack Pressure, Pg =	-0.15	inH2O	Start	End	Total	
% CO2 =	9.6	%	1	362.2	379.6	17.4
% O2 =	9.3	%	2	623.2	625	1.8
Meter Factor (Y)	1.000	dimensionless	3	698.8	699.1	0.3
Stack Diameter	36.00	inches	4	892.8	911.2	18.4
			Total	2577	2614.9	37.9

Port/Point	Time	Delta P	ER	Stack Temp.	Dwell Time	Delta H	Meter ACF	Vacuum	Imp Temp	Meter Inlet	Meter Outlet	Filter Temp
							0.000					
A1	0.0	0.90		228	19.9	0.58	8.349	5.0	62	70	60	69
A2	19.9	1.01		229	21.0	0.58	16.527	5.0	55	84	67	63
A3	40.9	1.00		230	20.9	0.58	25.025	5.0	55	86	72	64
A4	61.8	0.92		231	20.1	0.58	32.440	5.0	55	89	76	63
A5	81.9	0.79		231	18.6	0.58	40.104	5.0	54	90	79	63
A6	100.5	0.80		232	18.7	0.58	47.963	5.0	54	92	81	63
B1	119.3	0.90		231	19.9	0.58	55.946	5.0	54	91	82	57
B2	139.1	0.95		232	20.4	0.58	64.247	5.0	54	93	83	63
B3	159.5	1.00		232	20.9	0.58	72.840	5.0	55	94	84	66
B4	180.5	0.98		232	20.7	0.58	80.858	5.0	55	95	85	64
B5	201.2	0.93		232	20.2	0.58	89.041	5.0	55	97	86	66
B6	221.4	0.93		232	20.2	0.58	97.798	5.0	55	96	87	63
Final	241.6	--	--	--	--	--	--	--	--	--	--	--
Avg/Total	241.6	0.925		231	20	0.58	97.798	5.0	55	90	79	

Test Results

Absolute Pressure Stack (Ps)	29.40 inHg	Stack Flow	26,058 wacfm
Vol Meter (Vm(std))	93.418 dscf	Stack Flow	19,564 wscfm
Sample Rate (Qs)	0.525 acfm	Stack Flow	19,198 dscfm
Volume Water Vapor (Vw(std))	1.784 scf	Moisture Gain	37.9 mg
Molecular Weight Dry (Md)	29.91 lb/lb-mole		
Molecular Weight Wet (Mw)	29.68 lb/lb-mole		
Viscosity of Gas	215.46 micropoise		
Moisture Content Gas	1.87 %		
Stack Velocity	61.44 ft/sec		
Area Nozzle	0.000129 ft2		
Stack Area	7.07 ft2		

Acceptability Criteria

# Points outside delta P min/max ranges	0
% Isokinetic (I)	110.13 80<= I <=120
Z Value Acceptance Criteria	1.0392 0.99 <= Z <= 1.01
Z Value Acceptance Criteria 2nd Iteration	1.0000 0.99 <= Z <= 1.01
Acceptable Test Run	Yes Yes/No

EMSI

EPA Method 23 Example Calculation

Run 1 FBR 1 Test Method

Sample Volume (dscf)

153.529

A	Convert F to R	460
B	Reference Temperature (F)	68
C	Reference Pressure (inHg)	29.92
D	Meter Volume (ft3)	163.35
E	Meter Factor (Yd)	1.011
F	Barometric Pressure (inHg)	29.45
G	Avg Delta H (inH2O)	1.60
H	Convert inH2O to inHg	13.6
I	Avg Meter In Temp (F)	109
J	Avg Meter Out Temp (F)	94
Formula	$((A + B) / C) * D * E * ((F + G / H) / ((I + J) / 2) + A)$	

Water Vapor (scf)

2.862

A	Water Condensed (ml)	60.7
B	Constant	0.04715
Formula	$A * B$	

Moisture Content (%)

1.83

A	Water Vapor (scf)	2.862
B	Sample Volume (dscm)	153.529
Formula	$(A / (A + B)) * 100$	

Absolute Stack Pressure (in. Hg)

29.44

A	Barometric Pressure (in. Hg)	29.5
B	Stack Pressure (in. H2O)	-0.19
C	Conversion inH2O to inHg	13.6
Formula	$A + (B / C)$	

Stack MW Dry (lbs/lbs*mole)

29.87

A	MW Fraction CO2	0.44
B	Average CO2 (%)	9.2
C	MW O2	0.32
D	Average O2 (%)	10.0
E	MW Fraction N2 / CO	0.28
F	Average N2 (%)	80.8
G	Average CO (ppm)	0.0
H	Conversion (ppm to %)	10000
Formula	$(A * B) + (C * D) + (E + F) + ((E * (G / H))$	

Stack MW Wet (lb/lb mole)

29.65

A	Stack MW dry (lb/lb mole)	29.87
B	Constant A	1
C	Moisture Content (%)	1.83
D	Percent Conversion	100
E	MW H2O (lb/lb mole)	18
Formula	$A * (B - (C / D) + (E * (C / D)))$	

Avg. Stack Velocity (ft/sec)

70.51

A	EPA Constant	85.49
B	Pitot Coef.	0.84
C	Avg. SQRT Delta P	1.10
D	Avg. Temp (R)	692
E	Abs. Stack Pres. (in Hg)	29.436
F	Stack MW Wet (lb/lb mole)	29.65
Formula	$A * B * C * \text{SQRT}(D / (E * F))$	

Nozzle Area (ft2)

0.000211670

A	Nozzle Size	0.197
B	Constant A	12
C	Constant B	2
D	Pi (Microsoft Function @Pi)	3.141592654
Formula	$((A / 12) / 2) ^ 2 * D$	

% Isokinetic

97.0

A	Percent Conversion	100.00
B	Avg. Stack Temp. (F)	232
C	Temp Conv to Rankin	460
D	Constant C	0.002669
E	H2O Cond (ml)	60.70

	F Meter Volume (acf)	163.35
	G Meter Factor	1.011
	H Meter Inlet Temp (F)	109
	I Meter Outlet Temp (F)	94
	J Divide by 2	2
	K Barometric Press. (in. Hg)	29.45
	L Avg. Delta H (inH2O)	1.60
	M Conv inHg to inH2O	13.6
	N 60 minutes per hour conv	60
	O Test Length (min)	240
	P Avg. Stack Vel. (ft/sec)	70.51
	Q Abs. Stack Press. (in. Hg)	29.436
	R Nozzle Area (ft2)	0.000211670
	Formula $A * (B + C) * (D * E + F * G / (((H + I) / J) + C) * (K + L / M)) / (N * O * P * Q * R)$	
Stack Area (ft2)	A Stack Diameter (inches)	36.0
7.07	B Constant A	12
	C Constant B	2
	D Pi (Microsoft Function @Pi)	3.141592654
	Formula $((A / 12) / 2)^2 * D$	
Stack Volumetric Flow (wacfm)	A Stack Area (ft2)	7.07
29,906	B Stack Flow Velocity (ft/sec)	70.51
	C Conversion sec to min	60
	Formula $((A / 12) / 2)^2 * D$	
Stack Volumetric Flow (wscfm)	A Stack Flow (wacfm)	29906
22,439	B Convert F to R	460
	C Reference Temp (F)	68
	D Avg. Temp (R)	692
	E Abs. Stack Press. (in. Hg)	29.436
	F Reference Pres (inHg)	29.92
	Formula $(A * ((B + C) / D)) * (E / F)$	
Stack Volumetric Flow (dscfm)	A Stack Flow (wscfm)	22439
22,028	B Moisture Content (%)	1.83
	C Percent Conversion	100
	Formula $A * (1 - (B / C))$	
Total PCDD/PCDF (ng)	A OCDD (ng)	0.40
1.14	B OCDF (ng)	0.40
	C Total TCDD (ng)	0.04
	D Total PeCDD (ng)	0.04
	E Total HxCDD (ng)	0.05
	F Total HpCDD (ng)	0.04
	G Total TCDF (ng)	0.04
	H Total PeCDF (ng)	0.04
	I Total HxCDF (ng)	0.05
	J Total HpCDF (ng)	0.04
	Formula $A + B + C + D + E + F + G + H + I + J$	
Total PCDD/PCDF (ng/dscf)	A Total PCDD/PCDF (ng)	1.14
0.007	B Sample Gas Volume (dscf)	153.529
	Formula A / B	
Total PCDD/PCDF (ng/dscm)	A Total PCDD/PCDF (ng/dscf)	0.007
0.262	B Conversion ft3 to m3	35.31467
	Formula $A * B$	
Total PCDD/PCDF (ng/dscm @ 7% O2)	A Total PCDD/PCDF (ng/dscm)	0.262
0.334	B Oxygen Correction Value (%)	7.0
	C Ambient Oxygen Conc (%)	20.9
	D Stack Oxygen (%)	10.0
	Formula $A * ((C - B) / (C - D))$	

Appendix C

Process Operations Data

Fluidized Bed Incinerator : **INC#1 Metro**

RUN # 1		Fuel	Feed	Feed	Fuel	Temp	Temp	Volt	Flow	Temp	Flow	Flow	Pressure	Pressure	Off-Gas	Off-Gas	Off Gas	TEMP	Scrubber pH
		Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Natural Gas	Reactor Temp	FBR Off-Gas	Secondary Voltage	Carbon Injection Rate	Carbon Injection Temp	Steam Production	Venturi Water flow	Venturi Ring Jet	Baghouse dP	FBR Flue Oxygen	FBR Flue Opacity	FBR Flue gas, aft scrub temp	Scrub water inlet temp	WSCR_Absobtion_Ph
		SMBMCAL0951	Grab sample	Calculated	SMB_01206FT	SMBMCAL0160	SMB_01009TT	SMB_07120ET	SMB_04125FT	SMB_04110TT	SMB_03323FT	SMB_06121FT	SMB_06123PT	SMB_RA022PT	SMB_01020AT	SMB_08200AT	SMB_6125TT	SMBC1929OTT	MetSMBD0611AT
		(wtph)	(%)	(dlph)	(scfh)	(deg.F)	(DegF)	(kilovolts)	(lb/hr)	(DegF)	(lb/hr)	(gpm)	(inW.C.)	(inW.C.)	(%)	(%)	(deg.F)	(deg.F)	(pH)
2/8/10 7:50	#	13.7	27.5	3.8	333	1409	1525	33.1	3.7	359	21,153	205	25.0	5.2	6.5	0.6	60	57	6.0
2/8/10 8:20	#	13.6	27.5	3.7	401	1410	1525	32.1	3.7	359	21,046	204	25.0	5.6	6.5	0.6	60	57	6.0
2/8/10 8:50	#	14.1	27.5	3.9	1027	1409	1525	33.2	2.9	359	21,058	204	25.0	5.3	6.6	0.6	60	57	5.9
2/8/10 9:20	#	14.1	27.5	3.9	367	1411	1525	33.4	5.3	358	20,980	204	25.0	5.3	6.6	0.6	60	57	5.9
2/8/10 9:50	#	13.6	27.5	3.7	296	1409	1525	33.8	4.2	358	20,961	204	24.9	5.7	6.7	0.6	60	57	5.9
2/8/10 10:20	#	13.1	27.5	3.6	0	1410	1525	34.7	4.1	358	21,310	246	24.7	5.0	5.4	0.6	60	57	5.9
2/8/10 10:50	#	13.8	27.5	3.8	357	1409	1525	34.6	4.6	364	22,404	262	25.3	5.3	4.2	0.6	61	57	6.0
2/8/10 11:20	#	13.1	27.5	3.6	272	1413	1525	33.2	4.0	362	22,538	203	25.0	5.5	5.6	0.6	62	58	6.0
2/8/10 11:50	#	13.0	27.5	3.6	188	1408	1525	32.9	4.8	361	22,180	207	24.9	5.5	5.8	0.6	61	58	6.0
Run Average =	#	13.6	27.5	3.7	360	1410	1525	33.5	4.1	360	21,515	215	25.0	5.4	6.0	0.6	61	57	6.0

Values reported are 30 minute average values.

SMB: Fluidized Bed Incinerator **INC#1** **Metro**

RUN # 2	Fuel	Feed	Feed	Fuel	Temp	Temp	Volt	Flow	Temp	Flow	Flow	Pressure	Pressure	Off-Gas	Off-Gas	Off Gas	TEMP	Scrubber pH
	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Natural Gas	Reactor Temp	FBR Off-Gas	Secondary Voltage	Carbon Injection Rate	Carbon Injection Temp	Steam Production	Venturi Water flow	Venturi RingJet	Baghouse dP	FBR Flue Oxygen	FBR Flue Opacity	FBR Flue gas, aft scrub temp	Scrub water inlet temp	WSCR_Absorption_Ph
	SMBMCAL0951	Grab sample	Calculated	SMB_01206FT	SMBMCAL0160	SMB_01009TT	SMB_07120ET	SMB_04125FT	SMB_04110TT	SMB_03323FT	SMB_06121FT	SMB_06123PT	SMB_RA022PT	SMB_01020AT	SMB_06200AT	SMB_6125TT	SMBC1929OTT	MetSMBD0611A
	(wtph)	(%)	(dtpH)	(scfh)	(deg.F)	(DegF)	(kilovolts)	(lb/hr)	(DegF)	(lb/hr)	(gpm)	(inW.C.)	(inW.C.)	(%)	(%)	(deg.F)	(deg.F)	(pH)
2/8/10 12:38	14.1	28.6	4.0	312	1410	1525	33.2	3.7	359	21,309	221	25.0	5.8	5.9	0.6	61	58	6.1
2/8/10 13:08	14.3	28.6	4.1	3324	1405	1527	33.0	3.4	360	21,726	225	25.0	5.0	5.5	0.6	61	58	6.1
2/8/10 13:38	14.3	28.6	4.1	314	1413	1525	33.7	3.3	359	21,264	228	25.0	5.3	5.9	0.6	61	58	6.1
2/8/10 14:08	14.2	28.6	4.1	514	1414	1525	33.4	3.5	359	21,180	232	24.9	5.6	5.7	0.6	61	58	6.0
2/8/10 14:38	14.3	28.6	4.1	1060	1416	1525	35.3	5.2	359	20,911	251	25.0	5.8	5.6	0.6	60	58	6.0
2/8/10 15:08	14.2	28.6	4.1	225	1414	1525	34.7	3.5	359	20,971	251	25.0	5.2	5.6	0.6	60	58	6.0
2/8/10 15:38	14.5	28.6	4.1	589	1416	1525	35.8	3.9	360	21,231	254	25.0	5.1	5.3	0.6	60	58	6.0
2/8/10 16:08	12.8	28.6	3.7	252	1414	1525	35.6	4.1	360	21,384	254	25.0	5.5	5.3	0.6	60	58	6.0
2/8/10 16:38	13.5	28.6	3.9	11	1417	1525	35.2	4.6	359	21,157	254	25.0	5.7	5.4	0.5	61	58	6.0
Run Average =	14.0	28.6	4.0	733	1413	1525	34.4	3.9	359	21,237	241	25.0	5.5	5.6	0.6	61	58	6.0

SMB: Fluidized Bed Incinerator **INC#1** **Metro**

RUN # 3	Fuel	Feed	Feed	Fuel	Temp	Temp	Volt	Flow	Temp	Flow	Flow	Pressure	Pressure	Off-Gas	Off-Gas	Off Gas	TEMP	Scrubber pH
	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Natural Gas	Reactor Temp	FBR Off-Gas	Secondary Voltage	Carbon Injection Rate	Carbon Injection Temp	Steam Production	Venturi Water flow	Venturi RingJet	Baghouse dP	FBR Flue Oxygen	FRB Flue Opacity	FRB Flue gas, aft scrub temp	Scrub water inlet temp	WSCR_Absorbio n_Ph
	SMBMCAL0951	Grab sample	Calculated	SMB_01206FT	SMBMCAL0160	SMB_01009TT	SMB_07120ET	SMB_04125FT	SMB_04110TT	SMB_03323FT	SMB_06121FT	SMB_06123PT	SMB_RA022PT	SMB_01020AT	SMB_08200AT	SMB_6125TT	SMB01929OTT	MetSMBD0611A
	(wtph)	(%)	(dtpH)	(scfh)	(deg.F)	(DegF)	(kilovolts)	(lb/hr)	(DegF)	(lb/hr)	(gpm)	(inW.C.)	(inW.C.)	(%)	(%)	(deg.F)	(deg.F)	(pH)
2/9/10 7:30	13.0	27.7	3.6	0	1415	1525	32.3	4.0	361	22,179	229	25.0	5.7	5.0	0.5	60	57	6.0
2/9/10 8:00	12.8	27.7	3.6	204	1414	1525	33.6	3.3	361	21,915	230	25.0	5.6	5.1	0.6	60	57	6.0
2/9/10 8:30	13.2	27.7	3.7	655	1414	1525	32.9	3.8	361	21,983	230	25.0	5.9	5.0	0.6	61	57	6.0
2/9/10 9:00	13.4	27.7	3.7	201	1415	1525	33.0	5.7	361	22,005	228	25.0	6.3	5.0	0.6	61	57	6.0
2/9/10 9:30	12.7	27.7	3.5	410	1415	1525	32.4	4.6	360	21,737	228	25.0	6.5	5.3	0.6	61	57	6.0
2/9/10 10:00	13.0	27.7	3.6	506	1414	1525	33.2	4.4	361	21,927	228	25.0	6.4	5.1	0.5	60	57	6.0
2/9/10 10:30	13.0	27.7	3.6	912	1414	1525	33.1	4.1	361	22,048	229	25.0	5.5	5.0	0.6	61	57	6.0
2/9/10 11:00	14.0	27.7	3.9	41	1416	1525	32.8	3.6	363	22,661	227	25.0	6.0	4.6	0.6	61	57	6.0
2/9/10 11:30	14.0	27.7	3.9	808	1414	1525	33.4	4.0	359	21,624	228	25.0	6.1	5.3	0.5	61	57	6.0
Run Average =	13.2	27.7	3.7	415	1415	1525	33.0	4.2	361	22,009	229	25.0	6.0	5.0	0.5	61	57	6.0

Values reported are 30 minute average values.

Fluidized Bed Incinerator :

INC#2 Metro

RUN # 1	Fuel	Feed	Feed	Fuel		Temp	Temp	Volt	Flow	Temp	Flow	Flow	Pressure	Pressure	Off-Gas	Off-Gas	Off Gas	TEMP	Scrubber pH
	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Natural	Gas	Reactor Temp	FBR Off-Gas	Secondary Voltage	Carbon Injection Rate	Carbon Injection Temp	Steam Production	Venturi Water flow	Venturi RingJet	Baghouse dP	FBR Flue Oxygen	FRB Flue Opacity	FRB Flue gas, aft scrub temp	Scrub water inlet temp	WSCR_Absobtion_P h
	SMBMCAL0951	Grab sample	Calculated	SMB_01206FT		SMBMCAL0160	SMB_01009TT	SMB_07120ET	SMB_04125FT	SMB_04110TT	SMB_03323FT	SMB_06121FT	SMB_06123PT	SMB_RA022PT	SMB_01020AT	SMB_08200AT	SMB_6125TT	SMBC1929OTT	MetSMBD0611AT
	(wtph)	(%)	(dlph)	(scdh)		(deg.F)	(DegF)	(kilovolts)	(lb/hr)	(DegF)	(lb/hr)	(gpm)	(inW.C.)	(inW.C.)	(%)	(%)	(deg.F)	(deg.F)	(pH)
2/9/10 12:25	13.3	26.1	3.5	0		1413	1525	33.4	5.6	349	24,159	230	25.0	5.9	4.1	0.4	60	57	6.0
2/9/10 12:55	13.2	26.1	3.5	0		1410	1525	32.5	5.4	348	24,094	230	25.0	6.2	4.1	0.4	60	57	6.0
2/9/10 13:25	13.1	26.1	3.4	101		1410	1525	33.8	5.8	347	23,779	230	25.0	6.4	4.3	0.4	60	57	6.0
2/9/10 13:55	13.1	26.1	3.4	1		1411	1525	34.1	5.8	348	23,607	229	25.0	5.9	4.4	0.4	60	57	6.0
2/9/10 14:25	13.2	26.1	3.4	0		1412	1525	33.6	5.8	348	23,894	231	25.0	5.6	4.2	0.4	60	57	6.0
2/9/10 14:55	13.0	26.1	3.4	0		1413	1525	34.1	5.7	348	23,777	230	25.0	5.9	4.4	0.3	60	57	6.0
2/9/10 15:25	12.8	26.1	3.3	0		1416	1525	34.3	5.7	348	23,366	229	25.0	6.1	4.6	0.3	60	57	6.0
2/9/10 15:55	12.9	26.1	3.4	0		1420	1525	33.9	5.6	348	23,579	229	24.9	6.3	4.4	0.3	59	57	6.0
2/9/10 16:25	13.0	26.1	3.4	0		1422	1525	34.0	5.6	348	23,699	229	24.9	5.4	4.4	0.3	60	57	6.0
Run Average =	13.1	26.1	3.4	11		1414	1525	33.7	5.7	348	23,773	230	25.0	6.0	4.3	0.3	60	57	6.0

Values reported are 30 minute average values.

SMB: Fluidized Bed Incinerator INC#2

RUN # 2	Fuel	Feed	Feed	Fuel	Temp	Temp	Volt	Flow	Temp	Flow	Flow	Pressure	Pressure	Off-Gas	Off-Gas	Off Gas	TEMP	Scrubber pH
	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Natural Gas	Reactor Temp	FBR Off-Gas	Secondary Voltage	Carbon Injection Rate	Carbon Injection Temp	Steam Production	Venturi Water flow	Venturi RingJet	Baghouse dP	FBR Flue Oxygen	FBR Flue Opacity	FBR Flue gas, alt scrub temp	Scrub water inlet temp	WSCR_Absobtion_Ph
	SMBMCAL0951	Grab sample	Calculated	SMB_01206FT	SMBMCAL0160	SMB_01009TT	SMB_07120ET	SMB_04125FT	SMB_04110TT	SMB_03323FT	SMB_06121FT	SMB_06123PT	SMB_RA022PT	SMB_01020AT	SMB_08200AT	SMB_6125TT	SMBC1929OTT	MetSMBD0611AT
	(wtph)	(%)	(dtph)	(scfh)	(deg.F)	(DegF)	(kilovolts)	(lb/hr)	(DegF)	(lb/hr)	(gpm)	(inW.C.)	(inW.C.)	(%)	(%)	(deg.F)	(deg.F)	(pH)
2/10/10 7:36	13.3	27.2	3.6	254	1410	1525	36.9	5.5	349	23,938	200	25.0	6.0	4.5	0.4	59	57	6.0
2/10/10 8:06	13.3	27.2	3.6	153	1410	1525	36.4	5.8	349	24,227	202	25.0	6.0	4.4	0.4	60	57	6.0
2/10/10 8:36	13.3	27.2	3.6	475	1410	1525	37.5	5.4	349	24,211	205	25.0	6.0	4.3	0.4	59	57	6.0
2/10/10 9:06	13.2	27.2	3.6	0	1411	1525	35.9	5.7	349	24,166	208	25.0	6.0	4.3	0.3	60	57	6.0
2/10/10 10:06	13.2	27.2	3.6	142	1410	1525	36.7	5.6	349	24,006	204	25.0	6.0	4.4	0.3	59	57	6.0
2/10/10 10:36	13.2	27.2	3.6	527	1409	1525	36.4	5.4	349	24,212	201	25.0	6.0	4.3	0.4	60	57	6.0
2/10/10 11:06	13.2	27.2	3.6	922	1411	1525	37.0	5.6	349	24,149	203	25.0	6.0	4.4	0.4	60	57	6.0
2/10/10 11:36	13.1	27.2	3.6	159	1410	1525	36.9	5.5	349	23,879	208	25.0	6.0	4.6	0.4	59	57	6.0
Run Average =	13.2	27.2	3.6	332	1410	1525	36.8	5.6	349	24,110	203	25.0	6.0	4.4	0.4	59	57	6.0

Values reported are 30 minute average values.

SMB: Fluidized Bed Incinerator : INC#2

RUN # 3	Fuel	Feed	Feed	Fuel	Temp	Temp	Volt	Flow	Temp	Flow	Flow	Pressure	Pressure	Off-Gas	Off-Gas	Off Gas	TEMP	Scrubber pH
	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Natural Gas	Reactor Temp	FBR Off-Gas	Secondary Voltage	Carbon Injection Rate	Carbon Injection Temp	Steam Production	Venturi Water flow	Venturi RingJet	Baghouse dP	FBR Flue Oxygen	FRB Flue Opacity	FRB Flue gas, aft scrub temp	Scrub water inlet temp	WSCR_Absobtion_Ph
	SMBMCAL0951	Grab sample	Calculated	SMB_01206FT	SMBMCAL0160	SMB_01009TT	SMB_07120ET	SMB_04125FT	SMB_04110TT	SMB_03323FT	SMB_06121FT	SMB_06123PT	SMB_RA022PT	SMB_01020AT	SMB_08200AT	SMB_6125TT	SMBC1929OTT	MetSMBD0611AT
	(wtph)	(%)	(dtph)	(scfh)	(deg.F)	(DegF)	(kilovolts)	(lb/hr)	(DegF)	(lb/hr)	(gpm)	(inW.C.)	(inW.C.)	(%)	(%)	(deg.F)	(deg.F)	(pH)
2/10/10 12:25	13.0	25.3	3.3	1104	1421	1525	36.1	5.5	348	23,907	210	25.0	5.8	4.4	0.3	60	57	6.0
2/10/10 12:55	13.0	25.3	3.3	612	1420	1525	36.0	5.3	348	23,756	207	24.9	6.0	4.6	0.3	60	57	6.0
2/10/10 13:25	12.9	25.3	3.3	1288	1420	1525	35.1	5.3	348	23,748	209	25.0	6.3	4.5	0.3	60	57	6.0
2/10/10 13:55	12.9	25.3	3.3	778	1419	1525	35.5	5.4	348	23,682	210	25.0	6.5	4.6	0.2	60	57	6.0
2/10/10 14:25	13.0	25.3	3.3	257	1410	1525	36.7	5.6	348	23,605	210	25.0	6.7	4.7	0.3	60	57	6.0
2/10/10 14:55	13.1	25.3	3.3	1091	1409	1525	36.3	5.4	348	23,876	212	25.0	6.9	4.4	0.4	61	57	6.0
2/10/10 15:25	13.2	25.3	3.3	2482	1419	1525	36.4	5.5	348	24,189	216	25.1	7.0	4.1	0.4	61	57	6.0
2/10/10 15:55	13.2	25.3	3.3	1531	1420	1525	35.0	5.7	348	24,207	212	25.0	5.7	4.2	0.4	60	57	6.0
2/10/10 16:25	12.4	25.3	3.1	1074	1420	1525	35.2	5.6	348	23,686	220	24.9	5.9	4.3	0.4	60	57	6.0
Run Average =	13.0	25.3	3.3	1135	1418	1525	35.8	5.5	348	23,851	212	25.0	6.3	4.4	0.3	60	57	6.0

Values reported are 30 minute average values.

Fluidized Bed Incinerator :

INC#3

RUN # 1	Fuel	Feed	Feed	Fuel	Temp	Temp	Volt	Flow	Temp	Flow	Flow	Pressure	Pressure	Off-Gas	Off-Gas	Off Gas	TEMP	Scrubber pH
	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Natural Gas	Reactor Temp	FBR Off-Gas	Secondary Voltage	Carbon Injection Rate	Carbon Injection Temp	Steam Production	Venturi Water flow	Venturi RingJet	Baghouse dP	FBR Flue Oxygen	FRB Flue Opacity	FRB Flue gas, aft scrub temp	Scrub water inlet temp	WSCR_Absobtion_P h
	SMBMCAL0951	Grab sample	Calculated	SMB_01206FT	SMBMCAL0160	SMB_01009TT	SMB_07120ET	SMB_04125FT	SMB_04110TT	SMB_03323FT	SMB_06121FT	SMB_06123PT	SMB_RA022PT	SMB_01020AT	SMB_08200AT	SMB_6125TT	SMBC1929OTT	MetSMBD0611AT
	(wtph)	(%)	(dlph)	(scdh)	(deg.F)	(DegF)	(kilovolts)	(lb/hr)	(DegF)	(lb/hr)	(gpm)	(inW.C.)	(inW.C.)	(%)	(%)	(deg.F)	(deg.F)	(pH)
2/11/10 7:32	12.3	27.6	3.4	4183	1419	1525	28.7	6.0	359	19,251	262	25.1	4.9	5.0	1.9	60	56	5.3
2/11/10 8:02	12.4	27.6	3.4	3130	1420	1525	28.4	7.7	357	18,886	261	25.0	5.0	5.3	1.9	60	56	5.3
2/11/10 8:32	12.9	27.6	3.6	7637	1416	1526	28.1	6.6	362	20,460	260	25.0	5.1	4.2	1.9	61	57	5.4
2/11/10 9:02	12.0	27.6	3.3	4561	1423	1524	27.9	8.0	356	18,455	265	25.0	4.9	5.5	2.0	61	57	5.4
2/11/10 9:32	11.8	27.6	3.3	1805	1422	1524	28.2	8.3	355	18,316	266	25.0	5.1	5.8	2.0	60	57	5.5
2/11/10 10:02	12.1	27.6	3.3	2273	1422	1525	27.9	8.9	355	18,671	267	25.0	5.2	5.4	1.9	60	57	5.5
2/11/10 10:32	12.0	27.6	3.3	135	1432	1525	27.9	8.2	356	18,774	270	25.0	4.6	5.3	1.8	60	57	5.5
2/11/10 11:02	12.3	27.6	3.4	5	1437	1525	27.9	7.4	356	18,919	270	25.0	5.1	5.1	1.8	60	57	5.5
2/11/10 11:32	12.2	27.6	3.4	0	1445	1525	27.7	7.5	357	19,283	271	25.0	5.3	4.8	1.9	60	57	
Run Average =	12.2	27.6	3.4	2637	1426	1525	28.1	7.6	357	19,002	266	25.0	5.0	5.1	1.9	60	57	5.4

Values reported are 30 minute average values.

SMB: Fluidized Bed Incinerator INC#3

RUN # 2	Fuel	Feed	Feed	Fuel	Temp	Temp	Volt	Flow	Temp	Flow	Flow	Pressure	Pressure	Off-Gas	Off-Gas	Off Gas	TEMP	Scrubber pH
	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Natural Gas	Reactor Temp	FBR Off-Gas	Secondary Voltage	Carbon Injection Rate	Carbon Injection Temp	Steam Production	Venturi Water flow	Venturi RingJet	Baghouse dP	FBR Flue Oxygen	FBR Flue Opacity	FBR Flue gas, aft scrub temp	Scrub water inlet temp	WSCR_Absobtion_Ph
	SMBMCAL0951	Grab sample	Calculated	SMB_01206FT	SMBMCAL0160	SMB_01009TT	SMB_07120ET	SMB_04125FT	SMB_04110TT	SMB_03323FT	SMB_06121FT	SMB_06123PT	SMB_RA022PT	SMB_01020AT	SMB_08200AT	SMB_6125TT	SMBC1929OTT	MetSMBD0611AT
	(wtph)	(%)	(dtph)	(scfh)	(deg.F)	(DegF)	(kilovolts)	(lb/hr)	(DegF)	(lb/hr)	(gpm)	(inW.C.)	(inW.C.)	(%)	(%)	(deg.F)	(deg.F)	(pH)
2/11/10 12:00	12.4	27.3	3.4	0	1459	1525	28.1	7.6	358	20,058	262	25.0	4.9	4.8	1.9	61	57	5.5
2/11/10 12:30	12.6	27.3	3.4	0	1442	1525	27.7	7.1	357	19,629	271	25.0	5.0	4.9	1.8	61	57	5.5
2/11/10 13:00	12.8	27.3	3.5	0	1432	1525	27.1	9.4	358	19,843	274	25.0	5.1	4.7	1.8	61	57	5.5
2/11/10 13:30	12.7	27.3	3.5	0	1426	1525	28.1	7.9	358	19,762	276	25.0	5.6	4.7	1.8	61	57	5.5
2/11/10 14:00	12.7	27.3	3.5	0	1428	1525	28.3	7.3	357	19,668	274	25.0	5.2	4.7	1.8	61	57	5.5
2/11/10 14:30	12.7	27.3	3.5	0	1450	1525	27.5	5.6	359	20,249	277	25.0	5.5	4.1	1.8	61	57	5.5
2/11/10 15:00	12.5	27.3	3.4	0	1468	1525	27.3	6.8	359	20,053	277	25.0	5.6	4.4	1.7	61	57	5.5
2/11/10 15:30	12.5	27.3	3.4	0	1457	1525	28.1	7.4	358	19,909	273	25.1	5.2	4.8	1.7	61	57	5.5
2/11/10 16:00	12.6	27.3	3.4	0	1444	1525	27.7	9.2	357	19,584	274	25.0	3.9	5.0	1.7	61	57	5.5
Run Average =	12.6	27.3	3.4	0	1445	1525	27.8	7.6	358	19,862	273	25.0	5.1	4.7	1.8	61	57	5.5

Values reported are 30 minute average values.

SMB: Fluidized Bed Incinerator : INC#3

RUN # 3	Fuel	Feed	Feed	Fuel	Temp	Temp	Volt	Flow	Temp	Flow	Flow	Pressure	Pressure	Off-Gas	Off-Gas	Off Gas	TEMP	Scrubber pH
	Wet Sludge feed	Sludge Solids content	Dry Sludge feed	Natural Gas	Reactor Temp	FBR Off-Gas	Secondary Voltage	Carbon Injection Rate	Carbon Injection Temp	Steam Production	Venturi Water flow	Venturi RingJet	Baghouse dP	FBR Flue Oxygen	FRB Flue Opacity	FRB Flue gas, aft scrub temp	Scrub water inlet temp	WSCR_Absobtion_Ph
	SMBMCAL0951	Grab sample	Calculated	SMB_01206FT	SMBMCAL0160	SMB_01009TT	SMB_07120ET	SMB_04125FT	SMB_04110TT	SMB_03323FT	SMB_06121FT	SMB_06123PT	SMB_RA022PT	SMB_01020AT	SMB_08200AT	SMB_6125TT	SMBC1929OTT	MeISMBD0611AT
	(wtph)	(%)	(dtpH)	(scfh)	(deg.F)	(DegF)	(kilovolts)	(lb/hr)	(DegF)	(lb/hr)	(gpm)	(inW.C.)	(inW.C.)	(%)	(%)	(deg.F)	(deg.F)	(pH)
2/12/10 8:10	12.6	27.5	3.5	0	1445	1525	27.5	7.1	357	20,015	265	25.0	5.7	4.7	1.9	60	56	5.5
2/12/10 8:40	12.6	27.5	3.4	0	1449	1525	27.9	7.4	357	20,061	267	25.0	5.3	4.6	1.9	60	56	5.5
2/12/10 9:10	12.7	27.5	3.5	0	1451	1525	28.0	7.2	357	20,062	268	25.0	5.1	4.6	1.9	60	56	5.5
2/12/10 9:40	12.7	27.5	3.5	0	1455	1524	27.5	7.0	358	20,121	269	25.0	5.5	4.6	1.9	60	56	5.5
2/12/10 10:10	12.6	27.5	3.5	0	1454	1525	28.2	6.7	358	20,319	260	25.1	5.6	4.7	1.9	60	57	5.5
2/12/10 10:40	12.6	27.5	3.5	0	1463	1525	27.1	8.8	359	20,858	222	25.1	5.2	5.3	1.9	61	57	5.5
2/12/10 11:10	12.6	27.5	3.5	0	1463	1525	27.2	8.0	358	20,680	220	25.0	5.5	5.5	1.9	61	57	5.5
2/12/10 11:40	12.6	27.5	3.4	0	1463	1525	27.5	7.2	358	20,627	222	25.0	5.6	5.5	1.9	61	57	5.5
2/12/10 12:10	12.4	27.5	3.4	0	1457	1525	27.6	9.6	357	20,165	231	25.0	5.2	5.5	1.9	61	57	5.5
2/12/10 12:40	12.3	27.5	3.4	4	1421	1524	38.8	4.0	349	15,744	373	24.8	3.9	6.9	0.6	58	57	
Run Average =	12.6	27.5	3.4	0	1452	1525	28.7	7.3	357	19,865	260	25.0	5.3	5.2	1.7	60	57	5.5

Values reported are 30 minute average values.

Brian Durkop

From: Jax, Jeffrey [jeffrey.jax@metc.state.mn.us]
Sent: Thursday, March 11, 2010 8:23 AM
To: 'Brian Durkop'
Subject: FW: Inc. Scrubber solids

Dave Quast provide this Metro value for Solids and Calculated value for Seneca.

-----Original Message-----

From: Quast, David
Sent: Wednesday, March 10, 2010 1:16 PM
To: Jax, Jeffrey
Subject: Inc. Scrubber solids

Metro Plant:

Total Flow = 1050 gpm/scrubber
Total dissolved solids scrubber water in = 900 mg/l Total solids scrubber water out = 925 mg/l Total suspended solids scrubber water out = 25 mg/l

Seneca Plant:

Total Flow = 670 gpm/scrubber
Total dissolved solids scrubber water in = 900 mg/l Total solids scrubber water out = 1000 mg/l Total suspended solids scrubber water out = 100 mg/l

_____ Information from ESET NOD32 Antivirus, version of virus signature database 4934
(20100311) _____

The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

CF03 — gpm — BNO3
 CF07 — 200 gpm — 58%
 58% Primary

Mark Carlson 612-490-1659 - Eagle Mountain - Nate - Adam - Nate - Brian

(AUTOMATED -

Date 2/9/2010 - 2/10/2010		Operator Steve Robbins		Engineer Quat Davern		FBR 2	
Time →		Run 1 2-9		Run 2 2-10		Run 3 2-10-10	
FLOWS		1225	1345	1400	1628	0736	1225
Sludge Feed w/iph		13.2	13.2	13.2	13.0	13.3	13.0
Bed Lance Fuel CFH		0	0	0	0	0	0
Inlet Air (FAB) scfm		13,950	14,000	14,000	14,000	14,350	14,200
Quench water gpm		3.5	3.3	3.4	3.1	3.0	3.1
Ammonia Gph		0	0	0	0	0	0
Waste Heat PPH		34,100	23,900	23,900	23,800	24,200	23,800
Carbon PPH		5.5	5.7	5.7	5.7	5.8	5.4
TEMPERATURES		Using more lance fuel		1520-1535			
Windbox °F		846	845	845	845	829	837
Bed selected 3 °F		1410	1410	1411	1413	1410	1410
Freeboard °F		1568	1567	1568	1568	1565	1566
Exit °F		1524	1523	1525	1525	1525	1525
BH inlet °F		349	342	348	348	349	348
BH outlet °F		321	321	321	321	321	321
Scrubber water to WSCR °F		57	57	57	57	57	57
Scrubber quench °F		158	158	158	158	158	158
Scrubber outlet °F		60	60	60	60	60	60
Stack °F		229	229	229	228	229	228
PRESSURES		cleaning BH2 every 110 min.					
Windbox in. w.c.		85	84	85	86	86	86
Bed in. w.c.		158	158	158	158	158	158
Freeboard in. w.c.		5.4	5.3	5.3	5.4	6.4	6.3
BH dPI in. w.c.		6.1	6.1	6.0	5.9	5.9	6.4
Ring Jet dPI in. w.c.		25.0	25.0	25.0	25.0	25.0	25.0
SCRUBBER WATER							
Quench gpm		197	197	198	197	196	195
Packed tower cooling gpm		622	622	623	622	616	614
Absorber Flow gpm		656	656	656	656	657	657
Ring Jet flow gpm		231	230	230	230	200	203
CEMS/COMS							
Exit O2 %		4.1	4.3	4.3	4.4	4.4	4.5
Opacity %		0.4	0.4	0.4	0.3	0.4	0.3
O2 Dry %		9.5	9.6	9.6	9.7	9.5	9.7
CO %		11.3	11.4	11.2	10.9	11.7	11.5
NOX ppm		10.0	10.0	10.2	10.5	9.8	9.7
WESP Sec. V/KV		331	334	33.5	33.6	36.1	35.2
WSCR pH		6.0	6.0	6.0	6.0	6.0	6.0
Draft in w.c.		-2.9	-2.9	-3.0	-3.0	-2.0	-2.0
ID AMPS		109	109	109	109	109	109
TD %		69.4	69.4	69.4	69.4	69.4	69.4

58% primary Blend
 CF04 — 175gpm → BN04
 CF08 — 175gpm → 65%
 P854 — 13.0wtph
 FBR Stack Test Form
 Nate-Adam-Nate
 Eagle Mountain- Mark Carlson 612-490-1659

Date	Time	Operator	John Brinkert	Engineer	Quast/Davern	FBR	3
Run 1	2-11-10	Run 2	2-11-10	Run 3	2-12-10		
0732	0910	1040	1135	1200	1330	1500	1604
12.5	12.5	12.0	12.0	12.5	12.7	12.7	12.5
5000	4950	1860	965	0	0	0	0
13600	13600	13600	13540	13500	13400	13400	13400
4.1	3.3	2.6	3.2	4.3	5.1	5.7	5.6
0	0	0	0	0	0	0	0
19600	19500	18500	19000	19700	20000	20000	20000
6.9	7.3	8.3	7.7	7.3	8.2	6.5	7.0
TEMPERATURES							
Windbox °F	821	818	822	807	835	838	835
Bed selected °F	1419	1421	1422	1416	1424	1438	1402
Freeboard °F	1521	1566	1565	1591	1589	1591	1596
Exit °F	1524	1524	1525	1525	1525	1525	1525
BH inlet °F	359	358	354	356	356	357	357
BH outlet °F	331	330	330	331	331	331	332
Scrubber water to WSCR °F	56	57	57	57	57	57	57
Scrubber quench °F	162	160	159	161	161	162	162
Scrubber outlet °F	161	160	160	161	161	162	162
Stack °F	233	231	230	232	232	233	233
PRESSURES							
Windbox in. w.c.	96	95	96	96	96	96	96
Bed in. w.c.	75	74	74	75	75	75	75
Freeboard in. w.c.	7.8	7.0	7.3	7.3	7.5	7.5	7.5
BH dP in. w.c.	5.1	5.1	5.2	4.9	5.1	5.2	5.2
Ring Jet dP in. w.c.	25.0	25.0	25.0	25.0	25.0	25.0	25.0
WHBOU DRAFT IN WC	-1.1	-1.1	-1.0	-1.0	-1.0	-1.0	-1.0
SCRUBBER WATER	172	173	174	174	171	172	173
Packed tower cooling gpm	619	623	624	625	613	617	622
Absorber Flow gpm	651	651	651	651	651	651	651
Ring jet flow gpm	279	263	267	267	273	275	275
PH WSCR	5.4	5.5	5.5	5.5	5.5	5.5	5.5
CEMS/COMS	4.7	4.8	5.5	4.9	4.9	4.3	4.6
Exit O2 %	2.9	2.0	2.0	1.8	1.9	1.8	1.9
Opacity %	9.6	8.9	9.9	9.8	9.6	9.1	9.4
O2 Dry %	19.1	17.5	13.2	11.9	10.4	10.5	9.3
CO %	26.3	17.8	14.0	15.8	23.7	23.0	34.5
NOx ppm	28.3	28.2	28.0	28.0	27.9	27.7	27.8
WESP Sec. V/KV	67.4	69.5	69.4	59.4	69.0	69.0	69.5
Current ID FAN AMPS	15.4	16.1	16.2	16.2	16.2	16.2	16.2
Damper ID FAN %							

PM 2.5 CO NOx SOx

10:30 Incr. FAB damper 47 → 51%
 samples from all 8 runs to Mark Carlson 2-12
 Drier cake led to 40°F rise in bed temps + FB temps.
 Glenn Giefer visited site (10:00 AM) with Jeff Jax.
 2/12/10 - Glenn G. asked why we saw NOx increase. I mentioned 20°F temp increase due to drier cake.
 1030 incr. air flow by 800 cfm (FAN)



2869 Sandstone Dr. Hatfield Pa. 19440

(tel)215-822-8995 (fax)215-822-1293

Certificate of Analytical Results

Date: 16-Mar-10

CLIENT: Maxxam Analytical Services
6740 Campobello Road
Mississauga, Ontario L5N 2L8
Lab Order: R10030004
Project: B022951

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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FE4527-01R \ 1-DIOXIN/PM2.

Lab ID: R10030004-01A

Date Sampled: 02/12/2010

Date Received: 03/01/2010

Matrix: SOLID

PERCENT MOISTURE

Moisture, Total	73.9	%	D 2216	01-Mar-10	VJO
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ASH, COAL

Ash	4.48	17.2	%	D3174	03-Mar-10	VJO
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CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	11.0	42.1	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.72	6.59	%			
Hydrogen (Incl. H in Moisture)	9.99		%			
Nitrogen	1.10	4.21	%			
Oxygen (Excl. O in Moisture)	7.62	29.2	%			
Oxygen (Incl. O in Moisture)	73.2		%			

FIXED CARBON, COAL

Fixed Carbon	2.60	9.96	%	D3172	03-Mar-10	VJO
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HEATING VALUE, COAL

Heating Value	2160	8,280	Btu/lb	D5865	05-Mar-10	VJO
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SULFUR

Sulfur	0.210	0.80	%	D4239	02-Mar-10	VJO
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VOLATILE MATTER, COAL

Volatile Matter	19.0	72.8	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

(tel)215-822-8995 (fax)215-822-1293

Certificate of Analytical Results

Date: 16-Mar-10

CLIENT: Maxxam Analytical Services
6740 Campobello Road
Mississauga, Ontario L5N 2L8
Lab Order: R10030004
Project: B022951

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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FE4528-01R \ 2-DIOXIN/PM2.

Lab ID: R10030004-02A

Date Sampled: 02/12/2010

Date Received: 03/01/2010

Matrix: SOLID

PERCENT MOISTURE

Moisture, Total	75.2	%	D 2216	01-Mar-10	VJO
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ASH, COAL

Ash	4.44	17.9	%	D3174	03-Mar-10	VJO
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CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	10.4	41.9	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.62	6.53	%			
Hydrogen (Incl. H in Moisture)	10.0		%			
Nitrogen	0.97	3.91	%			
Oxygen (Excl. O in Moisture)	7.13	28.8	%			
Oxygen (Incl. O in Moisture)	73.9		%			

FIXED CARBON, COAL

Fixed Carbon	2.46	9.92	%	D3172	03-Mar-10	VJO
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HEATING VALUE, COAL

Heating Value	1950	7,860	Btu/lb	D5865	05-Mar-10	VJO
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SULFUR

Sulfur	0.210	0.85	%	D4239	02-Mar-10	VJO
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VOLATILE MATTER, COAL

Volatile Matter	17.9	72.2	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

(tel)215-822-8995 (fax)215-822-1293

Certificate of Analytical Results

Date: 16-Mar-10

CLIENT: Maxxam Analytical Services
6740 Campobello Road
Mississauga, Ontario L5N 2L8
Lab Order: R10030004
Project: B022951

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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FE4529-01R \ 3-DIOXIN/PM2.

Lab ID: R10030004-03A

Date Sampled: 02/12/2010

Date Received: 03/01/2010

Matrix: SOLID

PERCENT MOISTURE

Moisture, Total	74.6	%	D 2216	01-Mar-10	VJO
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ASH, COAL

Ash	4.24	16.7	%	D3174	03-Mar-10	VJO
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CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	11.8	46.5	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.70	6.69	%			
Hydrogen (Incl. H in Moisture)	10.0		%			
Nitrogen	1.07	4.21	%			
Oxygen (Excl. O in Moisture)	7.43	29.3	%			
Oxygen (Incl. O in Moisture)	73.7		%			

FIXED CARBON, COAL

Fixed Carbon	2.59	10.2	%	D3172	03-Mar-10	VJO
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HEATING VALUE, COAL

Heating Value	2080	8,190	Btu/lb	D5865	05-Mar-10	VJO
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SULFUR

Sulfur	0.210	0.83	%	D4239	02-Mar-10	VJO
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VOLATILE MATTER, COAL

Volatile Matter	18.6	73.2	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

(tel)215-822-8995 (fax)215-822-1293

Certificate of Analytical Results

Date: 16-Mar-10

CLIENT: Maxxam Analytical Services
6740 Campobello Road
Mississauga, Ontario L5N 2L8
Lab Order: R10030004
Project: B022951

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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FE4530-01R \ 4-DIOXIN/PM2.

Lab ID: R10030004-04A

Date Sampled: 02/12/2010

Date Received: 03/01/2010

Matrix: SOLID

PERCENT MOISTURE

Moisture, Total	75.2	%	D 2216	01-Mar-10	VJO
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ASH, COAL

Ash	3.87	15.6	%	D3174	03-Mar-10	VJO
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CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	11.0	44.4	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.68	6.77	%			
Hydrogen (Incl. H in Moisture)	10.1		%			
Nitrogen	1.17	4.72	%			
Oxygen (Excl. O in Moisture)	6.67	26.9	%			
Oxygen (Incl. O in Moisture)	73.4		%			

FIXED CARBON, COAL

Fixed Carbon	2.55	10.3	%	D3172	03-Mar-10	VJO
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HEATING VALUE, COAL

Heating Value	2130	8,590	Btu/lb	D5865	05-Mar-10	VJO
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SULFUR

Sulfur	0.210	0.85	%	D4239	02-Mar-10	VJO
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VOLATILE MATTER, COAL

Volatile Matter	18.4	74.2	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

(tel)215-822-8995 (fax)215-822-1293

Certificate of Analytical Results

Date: 16-Mar-10

CLIENT: Maxxam Analytical Services
6740 Campobello Road
Mississauga, Ontario L5N 2L8
Lab Order: R10030004
Project: B022951

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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FE4531-01R \ 5-DIOXIN/PM2.

Lab ID: R10030004-05A

Date Sampled: 02/12/2010

Date Received: 03/01/2010

Matrix: SOLID

PERCENT MOISTURE

Moisture, Total	75.1	%	D 2216	01-Mar-10	VJO
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ASH, COAL

Ash	4.21	16.9	%	D3174	03-Mar-10	VJO
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CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	11.0	44.2	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.68	6.75	%			
Hydrogen (Incl. H in Moisture)	10.1		%			
Nitrogen	1.17	4.70	%			
Oxygen (Excl. O in Moisture)	6.67	26.8	%			
Oxygen (Incl. O in Moisture)	73.4		%			

FIXED CARBON, COAL

Fixed Carbon	2.82	11.3	%	D3172	03-Mar-10	VJO
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HEATING VALUE, COAL

Heating Value	1990	7,990	Btu/lb	D5865	05-Mar-10	VJO
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SULFUR

Sulfur	0.210	0.84	%	D4239	02-Mar-10	VJO
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VOLATILE MATTER, COAL

Volatile Matter	18.2	73.1	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

(tel)215-822-8995 (fax)215-822-1293

Certificate of Analytical Results

Date: 16-Mar-10

CLIENT: Maxxam Analytical Services
6740 Campobello Road
Mississauga, Ontario L5N 2L8
Lab Order: R10030004
Project: B022951

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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FE4532-01R \ 6-DIOXIN/PM2.

Lab ID: R10030004-06A

Date Sampled: 02/12/2010

Date Received: 03/01/2010

Matrix: SOLID

PERCENT MOISTURE

Moisture, Total	75.6	%	D 2216	01-Mar-10	VJO
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ASH, COAL

Ash	4.15	17.0	%	D3174	03-Mar-10	VJO
-----	------	------	---	-------	-----------	-----

CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	10.8	44.3	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.70	6.97	%			
Hydrogen (Incl. H in Moisture)	10.2		%			
Nitrogen	1.18	4.84	%			
Oxygen (Excl. O in Moisture)	6.34	26.0	%			
Oxygen (Incl. O in Moisture)	73.5		%			

FIXED CARBON, COAL

Fixed Carbon	2.56	10.5	%	D3172	03-Mar-10	VJO
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HEATING VALUE, COAL

Heating Value	1920	7,870	Btu/lb	D5865	05-Mar-10	VJO
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SULFUR

Sulfur	0.200	0.82	%	D4239	02-Mar-10	VJO
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VOLATILE MATTER, COAL

Volatile Matter	17.6	72.1	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

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Certificate of Analytical Results

Date: 16-Mar-10

CLIENT: Maxxam Analytical Services
6740 Campobello Road
Mississauga, Ontario L5N 2L8
Lab Order: R10030004
Project: B022951

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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FE4533-01R \ 7-PM2.5

Lab ID: R10030004-07A

Date Sampled: 02/12/2010

Date Received: 03/01/2010

Matrix: SOLID

PERCENT MOISTURE

Moisture, Total	74.3	%	D 2216	01-Mar-10	VJO
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ASH, COAL

Ash	4.42	17.2	%	D3174	03-Mar-10	VJO
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CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	10.5	40.9	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.65	6.42	%			
Hydrogen (Incl. H in Moisture)	9.96		%			
Nitrogen	1.15	4.47	%			
Oxygen (Excl. O in Moisture)	7.79	30.3	%			
Oxygen (Incl. O in Moisture)	73.8		%			

FIXED CARBON, COAL

Fixed Carbon	2.34	9.11	%	D3172	03-Mar-10	VJO
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HEATING VALUE, COAL

Heating Value	2040	7,940	Btu/lb	D5865	05-Mar-10	VJO
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SULFUR

Sulfur	0.200	0.78	%	D4239	02-Mar-10	VJO
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VOLATILE MATTER, COAL

Volatile Matter	18.9	73.5	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

(tel)215-822-8995 (fax)215-822-1293

Certificate of Analytical Results

Date: 16-Mar-10

CLIENT: Maxxam Analytical Services
6740 Campobello Road
Mississauga, Ontario L5N 2L8
Lab Order: R10030004
Project: B022951

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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FE4534-01R \ 8-PM2.5

Lab ID: R10030004-08A

Date Sampled: 02/12/2010

Date Received: 03/01/2010

Matrix: SOLID

PERCENT MOISTURE

Moisture, Total	74.5	%	D 2216	01-Mar-10	VJO
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ASH, COAL

Ash	4.44	17.4	%	D3174	03-Mar-10	VJO
-----	------	------	---	-------	-----------	-----

CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	11.1	43.5	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.71	6.71	%			
Hydrogen (Incl. H in Moisture)	10.0		%			
Nitrogen	1.16	4.55	%			
Oxygen (Excl. O in Moisture)	6.87	26.9	%			
Oxygen (Incl. O in Moisture)	73.0		%			

FIXED CARBON, COAL

Fixed Carbon	2.70	10.6	%	D3172	03-Mar-10	VJO
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HEATING VALUE, COAL

Heating Value	2140	8,390	Btu/lb	D5865	05-Mar-10	VJO
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SULFUR

Sulfur	0.200	0.78	%	D4239	02-Mar-10	VJO
--------	-------	------	---	-------	-----------	-----

VOLATILE MATTER, COAL

Volatile Matter	18.4	72.2	%	D3175	03-Mar-10	VJO
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< Indicates less than the limit of quantitation

H - Hold Time exceedance



2869 Sandstone Dr. Hatfield Pa. 19440

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Certificate of Analytical Results

Date: 16-Mar-10

CLIENT: Maxxam Analytical Services
6740 Campobello Road
Mississauga, Ontario L5N 2L8
Lab Order: R10030004
Project: B022951

Analyses	As Received Basis	Dry Basis	Units	Method	Date	Analyst
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FE4535-01R \ 9-PM2.5

Lab ID: R10030004-09A

Date Sampled: 02/12/2010

Date Received: 03/01/2010

Matrix: SOLID

PERCENT MOISTURE

Moisture, Total	72.5	%	D 2216	01-Mar-10	VJO
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ASH, COAL

Ash	4.92	17.9	%	D3174	03-Mar-10	VJO
-----	------	------	---	-------	-----------	-----

CARBON, HYDROGEN, NITROGEN, OXYGEN (COAL)

Carbon	12.1	44.0	%	D5291/537	05-Mar-10	VJO
Hydrogen (Excl. H in Moisture)	1.90	6.91	%			
Hydrogen (Incl. H in Moisture)	10.0		%			
Nitrogen	1.22	4.44	%			
Oxygen (Excl. O in Moisture)	7.11	25.9	%			
Oxygen (Incl. O in Moisture)	71.5		%			

FIXED CARBON, COAL

Fixed Carbon	2.20	8.00	%	D3172	03-Mar-10	VJO
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HEATING VALUE, COAL

Heating Value	2210	8,040	Btu/lb	D5865	05-Mar-10	VJO
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SULFUR

Sulfur	0.210	0.76	%	D4239	02-Mar-10	VJO
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VOLATILE MATTER, COAL

Volatile Matter	20.4	74.2	%	D3175	03-Mar-10	VJO
-----------------	------	------	---	-------	-----------	-----

< Indicates less than the limit of quantitation

H - Hold Time exceedance

Appendix D
Laboratory Results

EPA Reference Method 23
Determination of Dioxins/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack	Version	ST604-04

AVERAGE TEST 1-3

Element	Detection Status	ng/dscm					
		ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	TEF
2378-TCDD	BDL	0.040	0.000	0.009	7.49E-07	0.012	1
12378-PeCDD	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.5
123478-HxCDD	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.1
123678-HxCDD	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.1
123789-HxCDD	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.1
1234678-HpCDD	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.01
OCDD	BDL	0.400	0.002	0.093	7.49E-06	0.116	0.001
2378-TCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.1
12378-PeCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.05
23478-PeCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.5
123478-HxCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.1
123678-HxCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.1
234678-HxCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.1
123789-HxCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.1
1234678-HpCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.01
1234789-HpCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	0.01
OCDF	BDL	0.400	0.002	0.093	7.49E-06	0.116	0.001
Total TCDD	BDL	0.040	0.000	0.009	7.49E-07	0.012	
Total PeCDD	BDL	0.040	0.000	0.009	7.49E-07	0.012	
Total HxCDD	DLL	0.043	0.000	0.010	8.00E-07	0.012	
Total HpCDD	DLL	0.041	0.000	0.009	7.62E-07	0.012	
Total TCDF	DLL	0.043	0.000	0.010	8.11E-07	0.013	
Total PeCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	
Total HxCDF	DLL	0.043	0.000	0.010	8.00E-07	0.012	
Total HpCDF	BDL	0.040	0.000	0.009	7.49E-07	0.012	
Total PCDD/PCDF	DLL	0.406	0.000	0.094	7.70E-06	0.119	
Total TEQ	DLL	0.116	0.001	0.03	2.17E-06	0.03	

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EPA Reference Method 23
Determination of Dioxins/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack	Version	ST604-04

TEST 1 **Time** **7:50 - 11:53** **Date** **2/8/2010**

Stack Volumetric Flow 22028 DSCFM F-Factor NA

Sample Gas Volume 153.529 DSCF Heat Input NA mmBtu/hr

Oxygen 10.0 %

Element	Status	Detection		ng/dscm			
		ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	TEF
2378-TCDD	BDL	0.040	0.000	0.009	7.59E-07	0.012	1
12378-PeCDD	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.5
123478-HxCDD	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.1
123678-HxCDD	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.1
123789-HxCDD	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.1
1234678-HpCDD	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.01
OCDD	BDL	0.400	0.003	0.092	7.59E-06	0.117	0.001
2378-TCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.1
12378-PeCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.05
23478-PeCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.5
123478-HxCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.1
123678-HxCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.1
234678-HxCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.1
123789-HxCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.1
1234678-HpCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.01
1234789-HpCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	0.01
OCDF	BDL	0.400	0.003	0.092	7.59E-06	0.117	0.001
Total TCDD	BDL	0.040	0.000	0.009	7.59E-07	0.012	
Total PeCDD	BDL	0.040	0.000	0.009	7.59E-07	0.012	
Total HxCDD	ADL	0.048	0.000	0.011	9.11E-07	0.014	
Total HpCDD	ADL	0.042	0.000	0.010	7.97E-07	0.012	
Total TCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	
Total PeCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	
Total HxCDF	ADL	0.048	0.000	0.011	9.11E-07	0.014	
Total HpCDF	BDL	0.040	0.000	0.009	7.59E-07	0.012	
Total PCDD/PCDF	DLL	1.138	0.007	0.262	2.16E-05	0.334	
Total TEQ	DLL	0.116	0.001	0.03	2.20E-06	0.03	

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EPA Reference Method 23
Determination of Dioxins/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack	Version	ST604-04

TEST 2	Time	12:38 - 16:46	Date	2/8/2010
Stack Volumetric Flow	21134 DSCFM	F-Factor	NA	
Sample Gas Volume	151.319 DSCF	Heat Input	NA	mmBtu/hr
Oxygen	9.7 %			

Element	Status	Detection		ng/dscm			
		ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	TEF
2378-TCDD	BDL	0.040	0.000	0.009	7.39E-07	0.012	1
12378-PeCDD	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.5
123478-HxCDD	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.1
123678-HxCDD	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.1
123789-HxCDD	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.1
1234678-HpCDD	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.01
OCDD	BDL	0.400	0.003	0.093	7.39E-06	0.116	0.001
2378-TCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.1
12378-PeCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.05
23478-PeCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.5
123478-HxCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.1
123678-HxCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.1
234678-HxCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.1
123789-HxCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.1
1234678-HpCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.01
1234789-HpCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	0.01
OCDF	BDL	0.400	0.003	0.093	7.39E-06	0.116	0.001
Total TCDD	BDL	0.040	0.000	0.009	7.39E-07	0.012	
Total PeCDD	BDL	0.040	0.000	0.009	7.39E-07	0.012	
Total HxCDD	BDL	0.040	0.000	0.009	7.39E-07	0.012	
Total HpCDD	BDL	0.040	0.000	0.009	7.39E-07	0.012	
Total TCDF	ADL	0.050	0.000	0.012	9.24E-07	0.014	
Total PeCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	
Total HxCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	
Total HpCDF	BDL	0.040	0.000	0.009	7.39E-07	0.012	
Total PCDD/PCDF	DLL	1.130	0.007	0.264	2.09E-05	0.327	
Total TEQ	DLL	0.116	0.001	0.03	2.14E-06	0.03	

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EPA Reference Method 23
Determination of Dioxins/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack	Version	ST604-04

TEST 3	Time	7:30 - 11:33	Date	2/9/2010
Stack Volumetric Flow	21168	DSCFM	F-Factor	NA
Sample Gas Volume	149.275	DSCF	Heat Input	NA mmBtu/hr
Oxygen	9.4	%		

Element	Status	Detection		ng/dscm			
		ng	ng/dscf	ng/dscm	lbs/hr	@7% O ₂	TEF
2378-TCDD	BDL	0.040	0.000	0.009	7.50E-07	0.011	1
12378-PeCDD	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.5
123478-HxCDD	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.1
123678-HxCDD	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.1
123789-HxCDD	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.1
1234678-HpCDD	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.01
OCDD	BDL	0.400	0.003	0.095	7.50E-06	0.114	0.001
2378-TCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.1
12378-PeCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.05
23478-PeCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.5
123478-HxCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.1
123678-HxCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.1
234678-HxCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.1
123789-HxCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.1
1234678-HpCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.01
1234789-HpCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	0.01
OCDF	BDL	0.400	0.003	0.095	7.50E-06	0.114	0.001
Total TCDD	BDL	0.040	0.000	0.009	7.50E-07	0.011	
Total PeCDD	BDL	0.040	0.000	0.009	7.50E-07	0.011	
Total HxCDD	BDL	0.040	0.000	0.009	7.50E-07	0.011	
Total HpCDD	BDL	0.040	0.000	0.009	7.50E-07	0.011	
Total TCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	
Total PeCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	
Total HxCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	
Total HpCDF	BDL	0.040	0.000	0.009	7.50E-07	0.011	
Total PCDD/PCDF	BDL	1.120	0.008	0.265	2.10E-05	0.320	
Total TEQ	BDL	0.116	0.001	0.03	2.18E-06	0.03	

BDL = Below Detection Limit - All fractions below detection limit

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EPA REFERENCE METHOD 23
Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack		

AVERAGE TEST 1-3

Element	Detection Status					
		ng	ng/dscf	ng/dscm	lbs/hr	ng/dscm @7%O2
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0013	0.0466	3.747E-09	0.0579
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0013	0.0466	3.747E-09	0.0579
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0013	0.0466	3.747E-09	0.0579
2,3',4,4',5-PentaCB (#118)	BDL	0.20	0.0013	0.0466	3.747E-09	0.0579
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0013	0.0466	3.747E-09	0.0579
2,3,3',4,4'-PentaCB (#105)	BDL	0.20	0.0013	0.0466	3.747E-09	0.0579
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0013	0.0466	3.747E-09	0.0579
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0013	0.0466	3.747E-09	0.0579
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0026	0.0933	7.495E-09	0.1158
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0013	0.0466	3.747E-09	0.0579
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0013	0.0466	3.747E-09	0.0579

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EMSI

EPA REFERENCE METHOD 23
Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack	Version	ST604-04

TEST 1	Time	7:50 - 11:53	Date	2/8/2010
Stack Volumetric Flow	22,028	dscfm	Oxygen	10.00 %
Sample Gas Volume	153,529	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection		ng/dscm			
	Status	ng	ng/dscf	ng/dscm	lbs/hr	@7%O ₂
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0013	0.0460	3.796E-09	0.0586
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0013	0.0460	3.796E-09	0.0586
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0013	0.0460	3.796E-09	0.0586
2,3',4,4',5-PentaCB (#118)	BDL	0.20	0.0013	0.0460	3.796E-09	0.0586
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0013	0.0460	3.796E-09	0.0586
2,3,3',4,4'-PentaCB (#105)	BDL	0.20	0.0013	0.0460	3.796E-09	0.0586
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0013	0.0460	3.796E-09	0.0586
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0013	0.0460	3.796E-09	0.0586
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0026	0.0919	7.592E-09	0.1172
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0013	0.0460	3.796E-09	0.0586
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0013	0.0460	3.796E-09	0.0586

BDL = Below Detection Limit - All fractions below detection limit
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EMSI

EPA REFERENCE METHOD 23

Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack		

TEST 2	Time	12:38 - 16:46	Date	2/8/2010
Stack Volumetric Flow	21,134	dscfm	Oxygen	9.70 %
Sample Gas Volume	151.319	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection Status	ng	ng/dscf	ng/dscm	lbs/hr	ng/dscm @7%O2
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0013	0.0466	3.695E-09	0.0579
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0013	0.0466	3.695E-09	0.0579
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0013	0.0466	3.695E-09	0.0579
2,3',4,4',5-PentaCB (#118)	BDL	0.20	0.0013	0.0466	3.695E-09	0.0579
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0013	0.0466	3.695E-09	0.0579
2,3,3',4,4'-PentaCB (#105)	BDL	0.20	0.0013	0.0466	3.695E-09	0.0579
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0013	0.0466	3.695E-09	0.0579
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0013	0.0466	3.695E-09	0.0579
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0026	0.0933	7.390E-09	0.1158
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0013	0.0466	3.695E-09	0.0579
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0013	0.0466	3.695E-09	0.0579

BDL = Below Detection Limit - All fractions below detection limit

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EMSI

EPA REFERENCE METHOD 23

Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack		

TEST 3	Time	7:30 - 11:33	Date	2/9/2010
Stack Volumetric Flow	21,168	dscfm	Oxygen	9.40 %
Sample Gas Volume	149.275	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection Status	ng	ng/dscf	ng/dscm	lbs/hr	ng/dscm @7%O2
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0013	0.0473	3.752E-09	0.0571
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0013	0.0473	3.752E-09	0.0571
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0013	0.0473	3.752E-09	0.0571
2,3',4,4',5-PentaCB (#118)	BDL	0.20	0.0013	0.0473	3.752E-09	0.0571
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0013	0.0473	3.752E-09	0.0571
2,3,3',4,4'-PentaCB (#105)	BDL	0.20	0.0013	0.0473	3.752E-09	0.0571
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0013	0.0473	3.752E-09	0.0571
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0013	0.0473	3.752E-09	0.0571
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0027	0.0946	7.503E-09	0.1143
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0013	0.0473	3.752E-09	0.0571
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0013	0.0473	3.752E-09	0.0571

BDL = Below Detection Limit - All fractions below detection limit

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ADL = Above Detection Limit - All fractions above detection limit

EMSI

EPA REFERENCE METHOD 23

Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack		

AVERAGE TEST 1-3

	Detection		ug/dscm			
Element	Status	ug	ug/dscf	ug/dscm	lbs/hr	@7%O2
Naphthalene	ADL	0.54400	0.0036	0.1269	1.020E-05	0.1574
2-Methylnaphthalene	ADL	0.10540	0.0007	0.0245	1.975E-06	0.0306
2-Chloronaphthalene	DLL	0.00021	0.0000	0.0000	3.941E-09	0.0001
Acenaphthylene	ADL	0.01303	0.0001	0.0030	2.431E-07	0.0038
Acenaphthene	ADL	0.00659	0.0000	0.0015	1.234E-07	0.0019
Fluorene	ADL	0.01981	0.0001	0.0046	3.699E-07	0.0057
Phenanthrene	ADL	0.10907	0.0007	0.0254	2.041E-06	0.0316
Anthracene	ADL	0.00987	0.0001	0.0023	1.849E-07	0.0029
Fluoranthene	ADL	0.06767	0.0004	0.0157	1.266E-06	0.0196
Pyrene	ADL	0.03987	0.0003	0.0093	7.458E-07	0.0116
Benzo(a)anthracene	ADL	0.00501	0.0000	0.0012	9.369E-08	0.0015
Chrysene	ADL	0.02303	0.0002	0.0054	4.306E-07	0.0067
Benzo(b)fluoranthene	ADL	0.00516	0.0000	0.0012	9.659E-08	0.0015
Benzo(k)fluoranthene	ADL	0.00188	0.0000	0.0004	3.515E-08	0.0005
Benzo(e)pyrene	ADL	0.01303	0.0001	0.0030	2.438E-07	0.0038
Benzo(a)pyrene	ADL	0.00298	0.0000	0.0007	5.578E-08	0.0009
Perylene	BDL	0.00026	0.0000	0.0001	4.872E-09	0.0001
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	5.621E-09	0.0001
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	8.619E-09	0.0001
Benzo(g,h,i)perylene	ADL	0.02063	0.0001	0.0048	3.860E-07	0.0060

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ADL = Above Detection Limit - All fractions above detection limit

NOTE: Multiple Compounds Detected in the Blank

EMSI

EPA REFERENCE METHOD 23

Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack	Version	ST604-04

TEST 1	Time	7:50 - 11:53	Date	2/8/2010
Stack Volumetric Flow	22,028	dscfm	Oxygen	10.00 %
Sample Gas Volume	153.529	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection		ug/dscm				
	Status	ug	ug/dscf	ug/dscm	lbs/hr	@7%O2	ng
Naphthalene	ADL	0.54000	0.0035	0.1241	1.025E-05	0.1583	540.00
2-Methylnaphthalene	ADL	0.11900	0.0008	0.0274	2.258E-06	0.0349	119.00
2-Chloronaphthalene	ADL	0.00028	0.0000	0.0001	5.314E-09	0.0001	0.28
Acenaphthylene	ADL	0.01100	0.0001	0.0025	2.088E-07	0.0032	11.00
Acenaphthene	ADL	0.00696	0.0000	0.0016	1.321E-07	0.0020	6.96
Fluorene	ADL	0.01850	0.0001	0.0043	3.511E-07	0.0054	18.50
Phenanthrene	ADL	0.12300	0.0008	0.0283	2.334E-06	0.0361	123.00
Anthracene	ADL	0.01080	0.0001	0.0025	2.050E-07	0.0032	10.80
Fluoranthene	ADL	0.07800	0.0005	0.0179	1.480E-06	0.0229	78.00
Pyrene	ADL	0.04120	0.0003	0.0095	7.819E-07	0.0121	41.20
Benzo(a)anthracene	ADL	0.00528	0.0000	0.0012	1.002E-07	0.0015	5.28
Chrysene	ADL	0.02280	0.0001	0.0052	4.327E-07	0.0067	22.80
Benzo(b)fluoranthene	ADL	0.00628	0.0000	0.0014	1.192E-07	0.0018	6.28
Benzo(k)fluoranthene	ADL	0.00084	0.0000	0.0002	1.594E-08	0.0002	0.84
Benzo(e)pyrene	ADL	0.01050	0.0001	0.0024	1.993E-07	0.0031	10.50
Benzo(a)pyrene	ADL	0.00232	0.0000	0.0005	4.403E-08	0.0007	2.32
Perylene	BDL	0.00026	0.0000	0.0001	4.935E-09	0.0001	0.26
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	5.694E-09	0.0001	0.30
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	8.730E-09	0.0001	0.46
Benzo(g,h,i)perylene	ADL	0.01500	0.0001	0.0034	2.847E-07	0.0044	15.00

BDL = Below Detection Limit - All fractions below detection limit

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ADL = Above Detection Limit - All fractions above detection limit

NOTE: Multiple Compounds Detected in the Blank

EMSI

EPA REFERENCE METHOD 23

Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack		

TEST 2	Time	12:38 - 16:46	Date	2/8/2010
Stack Volumetric Flow	21,134	dscfm	Oxygen	9.70 %
Sample Gas Volume	151.319	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

	Detection					ug/dscm	
Element	Status	ug	ug/dscf	ug/dscm	lbs/hr	@7%O2	ng
Naphthalene	ADL	0.52000	0.0034	0.1213	9.607E-06	0.1505	520.00
2-Methylnaphthalene	ADL	0.11800	0.0008	0.0275	2.180E-06	0.0342	118.00
2-Chloronaphthalene	ADL	0.00020	0.0000	0.0000	3.695E-09	0.0001	0.20
Acenaphthylene	ADL	0.02220	0.0001	0.0052	4.101E-07	0.0064	22.20
Acenaphthene	ADL	0.00716	0.0000	0.0017	1.323E-07	0.0021	7.16
Fluorene	ADL	0.03350	0.0002	0.0078	6.189E-07	0.0097	33.50
Phenanthrene	ADL	0.14500	0.0010	0.0338	2.679E-06	0.0420	145.00
Anthracene	ADL	0.01210	0.0001	0.0028	2.235E-07	0.0035	12.10
Fluoranthene	ADL	0.09440	0.0006	0.0220	1.744E-06	0.0273	94.40
Pyrene	ADL	0.05400	0.0004	0.0126	9.976E-07	0.0156	54.00
Benzo(a)anthracene	ADL	0.00720	0.0000	0.0017	1.330E-07	0.0021	7.20
Chrysene	ADL	0.03370	0.0002	0.0079	6.226E-07	0.0098	33.70
Benzo(b)fluoranthene	ADL	0.00700	0.0000	0.0016	1.293E-07	0.0020	7.00
Benzo(k)fluoranthene	ADL	0.00124	0.0000	0.0003	2.291E-08	0.0004	1.24
Benzo(e)pyrene	ADL	0.01590	0.0001	0.0037	2.937E-07	0.0046	15.90
Benzo(a)pyrene	ADL	0.00307	0.0000	0.0007	5.672E-08	0.0009	3.07
Perylene	BDL	0.00026	0.0000	0.0001	4.803E-09	0.0001	0.26
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	5.542E-09	0.0001	0.30
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	8.498E-09	0.0001	0.46
Benzo(g,h,i)perylene	ADL	0.02270	0.0002	0.0053	4.194E-07	0.0066	22.70

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NOTE: Multiple Compounds Detected in the Blank

EMSI

EPA REFERENCE METHOD 23
Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack		

TEST 3	Time	7:30 - 11:33	Date	2/9/2010
Stack Volumetric Flow	21,168	dscfm	Oxygen	9.40 %
Sample Gas Volume	149.275	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection		ug/dscm				
	Status	ug	ug/dscf	ug/dscm	lbs/hr	@7%O2	ng
Naphthalene	ADL	0.57200	0.0038	0.1352	1.073E-05	0.1634	572.00
2-Methylnaphthalene	ADL	0.07920	0.0005	0.0187	1.486E-06	0.0226	79.20
2-Chloronaphthalene	BDL	0.00015	0.0000	0.0000	2.814E-09	0.0000	0.15
Acenaphthylene	ADL	0.00588	0.0000	0.0014	1.103E-07	0.0017	5.88
Acenaphthene	ADL	0.00564	0.0000	0.0013	1.058E-07	0.0016	5.64
Fluorene	ADL	0.00744	0.0000	0.0018	1.396E-07	0.0021	7.44
Phenanthrene	ADL	0.05920	0.0004	0.0140	1.110E-06	0.0169	59.20
Anthracene	ADL	0.00672	0.0000	0.0016	1.261E-07	0.0019	6.72
Fluoranthene	ADL	0.03060	0.0002	0.0072	5.740E-07	0.0087	30.60
Pyrene	ADL	0.02440	0.0002	0.0058	4.577E-07	0.0070	24.40
Benzo(a)anthracene	ADL	0.00255	0.0000	0.0006	4.783E-08	0.0007	2.55
Chrysene	ADL	0.01260	0.0001	0.0030	2.364E-07	0.0036	12.60
Benzo(b)fluoranthene	ADL	0.00220	0.0000	0.0005	4.127E-08	0.0006	2.20
Benzo(k)fluoranthene	ADL	0.00355	0.0000	0.0008	6.659E-08	0.0010	3.55
Benzo(e)pyrene	ADL	0.01270	0.0001	0.0030	2.382E-07	0.0036	12.70
Benzo(a)pyrene	ADL	0.00355	0.0000	0.0008	6.659E-08	0.0010	3.55
Perylene	BDL	0.00026	0.0000	0.0001	4.877E-09	0.0001	0.26
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	5.627E-09	0.0001	0.30
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	8.629E-09	0.0001	0.46
Benzo(g,h,i)perylene	ADL	0.02420	0.0002	0.0057	4.539E-07	0.0069	24.20

BDL = Below Detection Limit - All fractions below detection limit

DDL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

NOTE: Multiple Compounds Detected in the Blank

EMSI

EPA Method OTM 027
Determination of Particulate Matter Less Than 2.5 Microns
Total Emissions

Client	Met Council	Analyst	MC
Facility	Metro	Job Number	902630
Unit	FBR 1	Description	Compliance
Location	Stack		

<i>TEST 1</i>	<i>Time</i>	<i>7:50 - 11:56</i>	<i>Date</i>	<i>2/8/2010</i>
Filterable Net Gain	BDL	1.0 mg	10.00	% Oxygen
Condensable Net Gain	ADL	2.7 mg	NA	F-factor
Sample Gas Volume		91.355 dscf		
Stack Volumetric Flow		21269 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.041	mg/dscf
Particulate Emission Rate			0.115	lbs/hr
Particulate Concentration			0.001	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			3.75	mg

<i>Test 2</i>	<i>Time</i>	<i>12:38 - 16:46</i>	<i>Date</i>	<i>2/8/2010</i>
Filterable Net Gain	DLL	1.4 mg	9.70	% Oxygen
Condensable Net Gain	BDL	0.9 mg	NA	F-factor
Sample Gas Volume		93.865 dscf		
Stack Volumetric Flow		21297 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.024	mg/dscf
Particulate Emission Rate			0.069	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.000	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			2.30	mg

<i>Test 3</i>	<i>Time</i>	<i>7:30 - 11:32</i>	<i>Date</i>	<i>2/9/2010</i>
Filterable Net Gain	BDL	1.0 mg	9.40	% Oxygen
Condensable Net Gain	ADL	2.4 mg	NA	F-factor
Sample Gas Volume		95.195 dscf		
Stack Volumetric Flow		20668 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.036	mg/dscf
Particulate Emission Rate			0.099	lbs/hr
Particulate Concentration			0.001	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			3.45	mg

Results Average Test 1-3				
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.0339	mg/dscf
Particulate Emission Rate			0.0945	lbs/hr
Particulate Concentration			0.0005	gr/dscf
Particulate Concentration			0.0007	gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Less Than 2.5 Microns
Filterable Emissions

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Metro</u>	Job Number	<u>902630</u>
Unit	<u>FBR 1</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

<i>TEST 1</i>	<i>Time</i>	<i>7:50 - 11:56</i>	<i>Date</i>	<i>2/8/2010</i>
Filter Net Gain	BDL	<u>0.5</u> mg	<u>10.00</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>91.355</u> dscf		
Stack Volumetric Flow		<u>21269</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.011</u>	mg/dscf
Particulate Emission Rate			<u>0.031</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 2</i>	<i>Time</i>	<i>12:38 - 16:46</i>	<i>Date</i>	<i>2/8/2010</i>
Filter Net Gain	BDL	<u>0.5</u> mg	<u>9.70</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>0.9</u> mg	NA	F-factor
Sample Gas Volume		<u>93.865</u> dscf		
Stack Volumetric Flow		<u>21297</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.015</u>	mg/dscf
Particulate Emission Rate			<u>0.042</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 3</i>	<i>Time</i>	<i>7:30 - 11:32</i>	<i>Date</i>	<i>2/9/2010</i>
Filter Net Gain	BDL	<u>0.5</u> mg	<u>9.40</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>95.195</u> dscf		
Stack Volumetric Flow		<u>20668</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.011</u>	mg/dscf
Particulate Emission Rate			<u>0.029</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

RESULTS AVERAGE TESTS 1-3

Particulate Concentration	NA	lbs/mmBtu
Particulate Concentration	<u>0.012</u>	mg/dscf
Particulate Emission Rate	<u>0.034</u>	lbs/hr
Particulate Concentration	<u>0.000</u>	gr/dscf
Particulate Concentration	<u>0.000</u>	gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Less Than 2.5 Microns
Organic Condensable Emissions

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Metro</u>	Job Number	<u>902630</u>
Unit	<u>FBR 1</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

TEST 1	Time	7:50 - 11:56	Date	2/8/2010
Organic Net Gain (Solvent)	ADL	<u>1.2</u> mg	<u>10.00</u>	% Oxygen
Sample Gas Volume		<u>91.355</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>21269</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0131</u>	mg/dscf
Particulate Emission Rate			<u>0.0370</u>	lbs/hr
Particulate Concentration			<u>0.00020</u>	gr/dscf
Particulate Concentration			<u>0.00026</u>	gr/dscf @7% Oxygen

TEST 2	Time	12:38 - 16:46	Date	2/8/2010
Organic Net Gain (Solvent)	BDL	<u>0.5</u> mg	<u>9.70</u>	% Oxygen
Sample Gas Volume		<u>93.865</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>21297</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0053</u>	mg/dscf
Particulate Emission Rate			<u>0.0150</u>	lbs/hr
Particulate Concentration			<u>0.00008</u>	gr/dscf
Particulate Concentration			<u>0.00010</u>	gr/dscf @7% Oxygen

TEST 3	Time	7:30 - 11:32	Date	2/9/2010
Organic Net Gain (Solvent)	ADL	<u>0.9</u> mg	<u>9.40</u>	% Oxygen
Sample Gas Volume		<u>95.195</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>20668</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0095</u>	mg/dscf
Particulate Emission Rate			<u>0.0258</u>	lbs/hr
Particulate Concentration			<u>0.00015</u>	gr/dscf
Particulate Concentration			<u>0.00018</u>	gr/dscf @7% Oxygen

Results Average Test 1-3

Particulate Concentration	<u>NA</u>	lbs/mmBtu
Particulate Concentration	<u>0.0093</u>	mg/dscf
Particulate Emission Rate	<u>0.0259</u>	lbs/hr
Particulate Concentration	<u>0.00014</u>	gr/dscf
Particulate Concentration	<u>0.00018</u>	gr/dscf @7% Oxygen

**Determination of Particulate Matter Less Than 2.5 Microns
Aqueous Condensable Emissions**

Client	Met Council	Analyst	MC
Facility	Metro	Job Number	902,630
Unit	FBR 1	Description	Compliance
Location	Stack		

<i>Test 1</i>	<i>Time</i>	<i>7:50 - 11:56</i>	<i>Date</i>	<i>2/8/2010</i>
Dried Sample Net Gain		1.6 mg	10.00	% Oxygen
Aqueous Net Gain (H2O)	ADL	1.5 mg	0.100	Normality of NH ₄ OH
Sample Gas Volume		91.355 dscf	0.03	Volume of Titrant (ml)
Stack Volumetric Flow		21269 dscfm	0.05	Mass of NH ₄ Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.017	mg/dscf
Particulate Emission Rate			0.048	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.000	gr/dscf @7% Oxygen

<i>Test 2</i>	<i>Time</i>	<i>12:38 - 16:46</i>	<i>Date</i>	<i>2/8/2010</i>
Dried Sample Net Gain		0.5 mg	9.70	% Oxygen
Aqueous Net Gain (H2O)	BDL	0.4 mg	0.100	Normality of NH ₄ OH
Sample Gas Volume		93.865 dscf	0.06	Volume of Titrant (ml)
Stack Volumetric Flow		21297 dscfm	0.10	Mass of NH ₄ Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.004	mg/dscf
Particulate Emission Rate			0.012	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.000	gr/dscf @7% Oxygen

<i>Test 3</i>	<i>Time</i>	<i>7:30 - 11:32</i>	<i>Date</i>	<i>2/9/2010</i>
Dried Sample Net Gain		1.6 mg	9.40	% Oxygen
Aqueous Net Gain (H2O)	ADL	1.5 mg	0.100	Normality of NH ₄ OH
Sample Gas Volume		95.195 dscf	0.03	Volume of Titrant (ml)
Stack Volumetric Flow		21269 dscfm	0.05	Mass of NH ₄ Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.016	mg/dscf
Particulate Emission Rate			0.046	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.000	gr/dscf @7% Oxygen

Results Average Test 1-3				
Particulate Concentration		NA		lbs/mmBtu
Particulate Concentration			0.012	mg/dscf
Particulate Emission Rate			0.035	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.000	gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Greater Than 2.5 Microns
Filterable Emissions

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Metro</u>	Job Number	<u>902630</u>
Unit	<u>FBR 1</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

<i>TEST 1</i>	<i>Time</i>	<i>7:50 - 11:56</i>	<i>Date</i>	<i>2/8/2010</i>
Filter Net Gain		<u> </u> mg	<u>10.00</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>91.355</u> dscf		
Stack Volumetric Flow		<u>21269</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.005</u>	mg/dscf
Particulate Emission Rate			<u>0.015</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 2</i>	<i>Time</i>	<i>12:38 - 16:46</i>	<i>Date</i>	<i>2/8/2010</i>
Filter Net Gain		<u> </u> mg	<u>9.70</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>93.865</u> dscf		
Stack Volumetric Flow		<u>21297</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.005</u>	mg/dscf
Particulate Emission Rate			<u>0.015</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 3</i>	<i>Time</i>	<i>7:30 - 11:32</i>	<i>Date</i>	<i>2/9/2010</i>
Filter Net Gain		<u> </u> mg	<u>9.40</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>95.195</u> dscf		
Stack Volumetric Flow		<u>20668</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.005</u>	mg/dscf
Particulate Emission Rate			<u>0.014</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

RESULTS AVERAGE TESTS 1-3

Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.005</u>	mg/dscf
Particulate Emission Rate			<u>0.015</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

EPA Reference Method 23
Determination of Dioxins/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack	Version	ST604-04

AVERAGE TEST 1-3

Element	Detection Status	ng/dscm					
		ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	TEF
2378-TCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	1
12378-PeCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.5
123478-HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
123678-HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
123789-HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
1234678-HpCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.01
OCDD	BDL	0.400	0.002	0.094	7.52E-06	0.116	0.001
2378-TCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
12378-PeCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.05
23478-PeCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.5
123478-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
123678-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
234678-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
123789-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
1234678-HpCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.01
1234789-HpCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.01
OCDF	BDL	0.400	0.002	0.094	7.52E-06	0.116	0.001
Total TCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total PeCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total HpCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total TCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total PeCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total HpCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total PCDD/PCDF	BDL	0.400	0.000	0.094	7.52E-06	0.116	
Total TEQ	BDL	0.116	0.001	0.03	2.18E-06	0.03	

BDL = Below Detection Limit - All fractions below detection limit

DL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EPA Reference Method 23
Determination of Dioxins/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack	Version	ST604-04

TEST 1	Time	12:25 - 16:27	Date	2/9/2010
Stack Volumetric Flow	21264	DSCFM	F-Factor	NA
Sample Gas Volume	149.533	DSCF	Heat Input	NA mmBtu/hr
Oxygen	9.6	%		

Element	Status	Detection		ng/dscm			
		ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	TEF
2378-TCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	1
12378-PeCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.5
123478-HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
123678-HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
123789-HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
1234678-HpCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.01
OCDD	BDL	0.400	0.003	0.094	7.52E-06	0.116	0.001
2378-TCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
12378-PeCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.05
23478-PeCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.5
123478-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
123678-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
234678-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
123789-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.1
1234678-HpCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.01
1234789-HpCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	0.01
OCDF	BDL	0.400	0.003	0.094	7.52E-06	0.116	0.001
Total TCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total PeCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total HpCDD	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total TCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total PeCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total HpCDF	BDL	0.040	0.000	0.009	7.52E-07	0.012	
Total PCDD/PCDF	BDL	1.120	0.007	0.265	2.11E-05	0.325	
Total TEQ	BDL	0.116	0.001	0.03	2.18E-06	0.03	

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EPA Reference Method 23
Determination of Dioxins/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack	Version	ST604-04

TEST 2	Time	Test Method	Date	1/0/1900
Stack Volumetric Flow	21754	DSCFM	F-Factor	NA
Sample Gas Volume	153.029	DSCF	Heat Input	NA mmBtu/hr
Oxygen	9.5	%		

Element	Status	Detection		ng/dscm			TEF
		ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	
2378-TCDD	BDL	0.040	0.000	0.009	7.52E-07	0.011	1
12378-PeCDD	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.5
123478-HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.1
123678-HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.1
123789-HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.1
1234678-HpCDD	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.01
OCDD	BDL	0.400	0.003	0.092	7.52E-06	0.113	0.001
2378-TCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.1
12378-PeCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.05
23478-PeCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.5
123478-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.1
123678-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.1
234678-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.1
123789-HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.1
1234678-HpCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.01
1234789-HpCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	0.01
OCDF	BDL	0.400	0.003	0.092	7.52E-06	0.113	0.001
Total TCDD	BDL	0.040	0.000	0.009	7.52E-07	0.011	
Total PeCDD	BDL	0.040	0.000	0.009	7.52E-07	0.011	
Total HxCDD	BDL	0.040	0.000	0.009	7.52E-07	0.011	
Total HpCDD	BDL	0.040	0.000	0.009	7.52E-07	0.011	
Total TCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	
Total PeCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	
Total HxCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	
Total HpCDF	BDL	0.040	0.000	0.009	7.52E-07	0.011	
Total PCDD/PCDF	BDL	1.120	0.007	0.258	2.11E-05	0.315	
Total TEQ	BDL	0.116	0.001	0.03	2.18E-06	0.03	

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EPA Reference Method 23
Determination of Dioxins/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack	Version	ST604-04

TEST 3	Time	Test Method	Date	1/0/1900
Stack Volumetric Flow	21153	DSCFM	F-Factor	NA
Sample Gas Volume	149.191	DSCF	Heat Input	NA mmBtu/hr
Oxygen	9.8	%		

Element	Status	Detection		ng/dscm			
		ng	ng/dscf	ng/dscm	lbs/hr	@7% O2	TEF
2378-TCDD	BDL	0.040	0.000	0.009	7.50E-07	0.012	1
12378-PeCDD	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.5
123478-HxCDD	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.1
123678-HxCDD	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.1
123789-HxCDD	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.1
1234678-HpCDD	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.01
OCDD	BDL	0.400	0.003	0.095	7.50E-06	0.119	0.001
2378-TCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.1
12378-PeCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.05
23478-PeCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.5
123478-HxCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.1
123678-HxCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.1
234678-HxCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.1
123789-HxCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.1
1234678-HpCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.01
1234789-HpCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	0.01
OCDF	BDL	0.400	0.003	0.095	7.50E-06	0.119	0.001
Total TCDD	BDL	0.040	0.000	0.009	7.50E-07	0.012	
Total PeCDD	BDL	0.040	0.000	0.009	7.50E-07	0.012	
Total HxCDD	BDL	0.040	0.000	0.009	7.50E-07	0.012	
Total HpCDD	BDL	0.040	0.000	0.009	7.50E-07	0.012	
Total TCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	
Total PeCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	
Total HxCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	
Total HpCDF	BDL	0.040	0.000	0.009	7.50E-07	0.012	
Total PCDD/PCDF	BDL	1.120	0.008	0.265	2.10E-05	0.332	
Total TEQ	BDL	0.116	0.001	0.03	2.18E-06	0.03	

BDL = Below Detection Limit - All fractions below detection limit

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ADL = Above Detection Limit - All fractions above detection limit

EPA REFERENCE METHOD 23
Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack		

AVERAGE TEST 1-3

Element	Detection Status					
		ng	ng/dscf	ng/dscm	lbs/hr	ng/dscm @7%O2
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0013	0.0469	3.758E-09	0.0578
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0013	0.0469	3.758E-09	0.0578
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0013	0.0469	3.758E-09	0.0578
2,3',4,4',5-PentaCB (#118)	BDL	0.20	0.0013	0.0469	3.758E-09	0.0578
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0013	0.0469	3.758E-09	0.0578
2,3,3',4,4'-PentaCB (#105)	BDL	0.20	0.0013	0.0469	3.758E-09	0.0578
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0013	0.0469	3.758E-09	0.0578
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0013	0.0469	3.758E-09	0.0578
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0027	0.0937	7.516E-09	0.1157
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0013	0.0469	3.758E-09	0.0578
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0013	0.0469	3.758E-09	0.0578

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EMSI

EPA REFERENCE METHOD 23
Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack	Version	ST604-04

TEST 1	Time	12:25 - 16:27	Date	2/9/2010
Stack Volumetric Flow	21,264	dscfm	Oxygen	9.60 %
Sample Gas Volume	149,533	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection		ng/dscm			
	Status	ng	ng/dscf	ng/dscm	lbs/hr	@7%O2
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0013	0.0472	3.762E-09	0.0581
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0013	0.0472	3.762E-09	0.0581
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0013	0.0472	3.762E-09	0.0581
2,3',4,4',5-PentaCB (#118)	BDL	0.20	0.0013	0.0472	3.762E-09	0.0581
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0013	0.0472	3.762E-09	0.0581
2,3,3',4,4'-PentaCB (#105)	BDL	0.20	0.0013	0.0472	3.762E-09	0.0581
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0013	0.0472	3.762E-09	0.0581
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0013	0.0472	3.762E-09	0.0581
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0027	0.0944	7.524E-09	0.1161
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0013	0.0472	3.762E-09	0.0581
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0013	0.0472	3.762E-09	0.0581

BDL = Below Detection Limit - All fractions below detection limit
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ADL = Above Detection Limit - All fractions above detection limit

EMSI

EPA REFERENCE METHOD 23

Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

Client	Met Council	Date	2/10/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack		

TEST 2	Time	7:36 - 11:38	Date	2/10/2010
Stack Volumetric Flow	21,754	dscfm	Oxygen	9.50 %
Sample Gas Volume	153.029	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection Status	ng	ng/dscf	ng/dscm	lbs/hr	ng/dscm @7%O2
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0013	0.0461	3.761E-09	0.0562
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0013	0.0461	3.761E-09	0.0562
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0013	0.0461	3.761E-09	0.0562
2,3',4,4',5-PentaCB (#118)	BDL	0.20	0.0013	0.0461	3.761E-09	0.0562
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0013	0.0461	3.761E-09	0.0562
2,3,3',4,4'-PentaCB (#105)	BDL	0.20	0.0013	0.0461	3.761E-09	0.0562
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0013	0.0461	3.761E-09	0.0562
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0013	0.0461	3.761E-09	0.0562
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0026	0.0922	7.522E-09	0.1125
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0013	0.0461	3.761E-09	0.0562
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0013	0.0461	3.761E-09	0.0562

BDL = Below Detection Limit - All fractions below detection limit

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EMSI

EPA REFERENCE METHOD 23

Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

Client	Met Council	Date	2/10/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack		

TEST 3	Time	12:25 - 16:30	Date	2/10/2010
Stack Volumetric Flow	21,153	dscfm	Oxygen	9.80 %
Sample Gas Volume	149,191	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection Status	ng	ng/dscf	ng/dscm	lbs/hr	ng/dscm @7% O2
3,4',4,5'-TetraCB (#81)	BDL	0.20	0.0013	0.0473	3.751E-09	0.0592
3,3',4,4'-TetraCB (#77)	BDL	0.20	0.0013	0.0473	3.751E-09	0.0592
2',3,4,4',5-PentaCB (#123)	BDL	0.20	0.0013	0.0473	3.751E-09	0.0592
2,3',4,4',5-PentaCB (#118)	BDL	0.20	0.0013	0.0473	3.751E-09	0.0592
2,3,4,4',5-PentaCB (#114)	BDL	0.20	0.0013	0.0473	3.751E-09	0.0592
2,3,3',4,4'-PentaCB (#105)	BDL	0.20	0.0013	0.0473	3.751E-09	0.0592
3,3',4,4',5-PentaCB (#126)	BDL	0.20	0.0013	0.0473	3.751E-09	0.0592
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20	0.0013	0.0473	3.751E-09	0.0592
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40	0.0027	0.0946	7.502E-09	0.1185
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20	0.0013	0.0473	3.751E-09	0.0592
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20	0.0013	0.0473	3.751E-09	0.0592

BDL = Below Detection Limit - All fractions below detection limit

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ADL = Above Detection Limit - All fractions above detection limit

EMSI

EPA REFERENCE METHOD 23
Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack		

AVERAGE TEST 1-3

Element	Detection						ug/dscm
	Status	ug	ug/dscf	ug/dscm	lbs/hr	@7%O2	
Naphthalene	ADL	0.55333	0.0037	0.1297	1.040E-05	0.1600	
2-Methylnaphthalene	ADL	0.08733	0.0006	0.0205	1.641E-06	0.0252	
2-Chloronaphthalene	ADL	0.00028	0.0000	0.0001	5.325E-09	0.0001	
Acenaphthylene	ADL	0.00608	0.0000	0.0014	1.143E-07	0.0018	
Acenaphthene	ADL	0.00644	0.0000	0.0015	1.210E-07	0.0019	
Fluorene	ADL	0.00851	0.0001	0.0020	1.600E-07	0.0025	
Phenanthrene	ADL	0.05533	0.0004	0.0130	1.040E-06	0.0160	
Anthracene	ADL	0.00326	0.0000	0.0008	6.131E-08	0.0009	
Fluoranthene	ADL	0.03423	0.0002	0.0080	6.433E-07	0.0099	
Pyrene	ADL	0.02887	0.0002	0.0068	5.424E-07	0.0084	
Benzo(a)anthracene	ADL	0.00419	0.0000	0.0010	7.872E-08	0.0012	
Chrysene	ADL	0.01833	0.0001	0.0043	3.445E-07	0.0053	
Benzo(b)fluoranthene	ADL	0.00323	0.0000	0.0008	6.062E-08	0.0009	
Benzo(k)fluoranthene	ADL	0.00204	0.0000	0.0005	3.833E-08	0.0006	
Benzo(e)pyrene	ADL	0.00864	0.0001	0.0020	1.623E-07	0.0025	
Benzo(a)pyrene	DLL	0.00108	0.0000	0.0003	2.025E-08	0.0003	
Perylene	BDL	0.00026	0.0000	0.0001	4.885E-09	0.0001	
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	5.637E-09	0.0001	
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	8.643E-09	0.0001	
Benzo(g,h,i)perylene	ADL	0.02063	0.0001	0.0048	3.877E-07	0.0060	

BDL = Below Detection Limit - All fractions below detection limit

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EMSI

EPA REFERENCE METHOD 23

Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

Client	Met Council	Date	2/9/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack	Version	ST604-04

TEST 1	Time	12:25 - 16:27	Date	2/9/2010
Stack Volumetric Flow	21,264	dscfm	Oxygen	9.60 %
Sample Gas Volume	149.533	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection Status	ug	ug/dscf	ug/dscm	lbs/hr	ug/dscm @7%O2	ng
Naphthalene	ADL	0.54400	0.0036	0.1284	1.023E-05	0.1579	544.00
2-Methylnaphthalene	ADL	0.09400	0.0006	0.0222	1.768E-06	0.0273	94.00
2-Chloronaphthalene	ADL	0.00038	0.0000	0.0001	7.148E-09	0.0001	0.38
Acenaphthylene	ADL	0.00712	0.0000	0.0017	1.339E-07	0.0021	7.12
Acenaphthene	ADL	0.00736	0.0000	0.0017	1.384E-07	0.0021	7.36
Fluorene	ADL	0.01070	0.0001	0.0025	2.013E-07	0.0031	10.70
Phenanthrene	ADL	0.05960	0.0004	0.0141	1.121E-06	0.0173	59.60
Anthracene	ADL	0.00330	0.0000	0.0008	6.207E-08	0.0010	3.30
Fluoranthene	ADL	0.04160	0.0003	0.0098	7.825E-07	0.0121	41.60
Pyrene	ADL	0.03510	0.0002	0.0083	6.602E-07	0.0102	35.10
Benzo(a)anthracene	ADL	0.00504	0.0000	0.0012	9.480E-08	0.0015	5.04
Chrysene	ADL	0.02370	0.0002	0.0056	4.458E-07	0.0069	23.70
Benzo(b)fluoranthene	ADL	0.00412	0.0000	0.0010	7.750E-08	0.0012	4.12
Benzo(k)fluoranthene	ADL	0.00217	0.0000	0.0005	4.082E-08	0.0006	2.17
Benzo(e)pyrene	ADL	0.00956	0.0001	0.0023	1.798E-07	0.0028	9.56
Benzo(a)pyrene	ADL	0.00261	0.0000	0.0006	4.909E-08	0.0008	2.61
Perylene	BDL	0.00026	0.0000	0.0001	4.891E-09	0.0001	0.26
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	5.643E-09	0.0001	0.30
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	8.653E-09	0.0001	0.46
Benzo(g,h,i)perylene	ADL	0.02380	0.0002	0.0056	4.477E-07	0.0069	23.80

BDL = Below Detection Limit - All fractions below detection limit

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EMSI

EPA REFERENCE METHOD 23

Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

Client	Met Council	Date	2/10/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack		

TEST 2	Time	7:36 - 11:38	Date	2/10/2010
Stack Volumetric Flow	21,754	dscfm	Oxygen	9.50 %
Sample Gas Volume	153.029	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Detection		ug/dscm				
	Status	ug	ug/dscf	ug/dscm	lbs/hr	@7%O2	ng
Naphthalene	ADL	0.56800	0.0037	0.1310	1.068E-05	0.1597	568.00
2-Methylnaphthalene	ADL	0.09120	0.0006	0.0210	1.715E-06	0.0256	91.20
2-Chloronaphthalene	ADL	0.00023	0.0000	0.0001	4.325E-09	0.0001	0.23
Acenaphthylene	ADL	0.00592	0.0000	0.0014	1.113E-07	0.0017	5.92
Acenaphthene	ADL	0.00720	0.0000	0.0017	1.354E-07	0.0020	7.20
Fluorene	ADL	0.00680	0.0000	0.0016	1.279E-07	0.0019	6.80
Phenanthrene	ADL	0.05880	0.0004	0.0136	1.106E-06	0.0165	58.80
Anthracene	ADL	0.00282	0.0000	0.0007	5.303E-08	0.0008	2.82
Fluoranthene	ADL	0.03050	0.0002	0.0070	5.735E-07	0.0086	30.50
Pyrene	ADL	0.02400	0.0002	0.0055	4.513E-07	0.0067	24.00
Benzo(a)anthracene	ADL	0.00273	0.0000	0.0006	5.134E-08	0.0008	2.73
Chrysene	ADL	0.01160	0.0001	0.0027	2.181E-07	0.0033	11.60
Benzo(b)fluoranthene	ADL	0.00197	0.0000	0.0005	3.704E-08	0.0006	1.97
Benzo(k)fluoranthene	ADL	0.00195	0.0000	0.0004	3.667E-08	0.0005	1.95
Benzo(e)pyrene	ADL	0.00736	0.0000	0.0017	1.384E-07	0.0021	7.36
Benzo(a)pyrene	BDL	0.00031	0.0000	0.0001	5.829E-09	0.0001	0.31
Perylene	BDL	0.00026	0.0000	0.0001	4.889E-09	0.0001	0.26
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	5.641E-09	0.0001	0.30
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	8.650E-09	0.0001	0.46
Benzo(g,h,i)perylene	ADL	0.01460	0.0001	0.0034	2.745E-07	0.0041	14.60

BDL = Below Detection Limit - All fractions below detection limit

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EMSI

EPA REFERENCE METHOD 23
Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

Client	Met Council	Date	2/10/2010
Facility	Metro	Job Number	902630
Unit	FBR 2	Operator	nt nk
Location	Stack		

TEST 3	Time	12:25 - 16:30	Date	2/10/2010
Stack Volumetric Flow	21,153	dscfm	Oxygen	9.80 %
Sample Gas Volume	149.191	dscf	F-Factor	NA
			Heat Input	NA mmBtu/hr

Element	Status	Detection		ug/dscm			
		ug	ug/dscf	ug/dscm	lbs/hr	@7%O2	ng
Naphthalene	ADL	0.54800	0.0037	0.1296	1.028E-05	0.1623	548.00
2-Methylnaphthalene	ADL	0.07680	0.0005	0.0182	1.440E-06	0.0227	76.80
2-Chloronaphthalene	ADL	0.00024	0.0000	0.0001	4.501E-09	0.0001	0.24
Acenaphthylene	ADL	0.00520	0.0000	0.0012	9.753E-08	0.0015	5.20
Acenaphthene	ADL	0.00476	0.0000	0.0011	8.928E-08	0.0014	4.76
Fluorene	ADL	0.00804	0.0001	0.0019	1.508E-07	0.0024	8.04
Phenanthrene	ADL	0.04760	0.0003	0.0113	8.928E-07	0.0141	47.60
Anthracene	ADL	0.00367	0.0000	0.0009	6.883E-08	0.0011	3.67
Fluoranthene	ADL	0.03060	0.0002	0.0072	5.739E-07	0.0091	30.60
Pyrene	ADL	0.02750	0.0002	0.0065	5.158E-07	0.0081	27.50
Benzo(a)anthracene	ADL	0.00480	0.0000	0.0011	9.003E-08	0.0014	4.80
Chrysene	ADL	0.01970	0.0001	0.0047	3.695E-07	0.0058	19.70
Benzo(b)fluoranthene	ADL	0.00359	0.0000	0.0008	6.733E-08	0.0011	3.59
Benzo(k)fluoranthene	ADL	0.00200	0.0000	0.0005	3.751E-08	0.0006	2.00
Benzo(e)pyrene	ADL	0.00900	0.0001	0.0021	1.688E-07	0.0027	9.00
Benzo(a)pyrene	BDL	0.00031	0.0000	0.0001	5.814E-09	0.0001	0.31
Perylene	BDL	0.00026	0.0000	0.0001	4.876E-09	0.0001	0.26
Indeno (1,2,3 -cd) pyrene	BDL	0.00030	0.0000	0.0001	5.627E-09	0.0001	0.30
Dibenz(a,h)anthracene	BDL	0.00046	0.0000	0.0001	8.627E-09	0.0001	0.46
Benzo(g,h,i)perylene	ADL	0.02350	0.0002	0.0056	4.407E-07	0.0070	23.50

BDL = Below Detection Limit - All fractions below detection limit

DDL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EMSI

EPA Method OTM 027
Determination of Particulate Matter Less Than 2.5 Microns
Total Emissions

Client	Met Council	Analyst	MC
Facility	Metro	Job Number	902630
Unit	FBI 2	Description	Compliance
Location	Stack		

<i>TEST 1</i>	<i>Time</i>	<i>12:25 - 16:27</i>	<i>Date</i>	<i>2/9/2010</i>
Filterable Net Gain	BDL	1.0 mg	9.60	% Oxygen
Condensable Net Gain	ADL	1.6 mg	NA	F-factor
Sample Gas Volume		94.356 dscf		
Stack Volumetric Flow		20977 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.028	mg/dscf
Particulate Emission Rate			0.078	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			2.65	mg

<i>Test 2</i>	<i>Time</i>	<i>7:36 - 11:40</i>	<i>Date</i>	<i>2/10/2010</i>
Filterable Net Gain	BDL	1.0 mg	9.50	% Oxygen
Condensable Net Gain	DLL	2.0 mg	NA	F-factor
Sample Gas Volume		94.088 dscf		
Stack Volumetric Flow		21107 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.032	mg/dscf
Particulate Emission Rate			0.090	lbs/hr
Particulate Concentration			0.001	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			3.05	mg

<i>Test 3</i>	<i>Time</i>	<i>12:25 - 16:28</i>	<i>Date</i>	<i>2/10/2010</i>
Filterable Net Gain	DLL	1.5 mg	9.80	% Oxygen
Condensable Net Gain	ADL	3.0 mg	NA	F-factor
Sample Gas Volume		95.442 dscf		
Stack Volumetric Flow		21251 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.048	mg/dscf
Particulate Emission Rate			0.134	lbs/hr
Particulate Concentration			0.001	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			4.55	mg

Results Average Test 1-3				
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.0360	mg/dscf
Particulate Emission Rate			0.1008	lbs/hr
Particulate Concentration			0.0006	gr/dscf
Particulate Concentration			0.0007	gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Less Than 2.5 Microns
Filterable Emissions

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Metro</u>	Job Number	<u>902630</u>
Unit	<u>FBI 2</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

<i>TEST 1</i>	<i>Time</i>	<i>12:25 - 16:27</i>	<i>Date</i>	<i>2/9/2010</i>
Filter Net Gain	BDL	<u>0.5</u> mg	<u>9.60</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>94.356</u> dscf		
Stack Volumetric Flow		<u>20977</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.011</u>	mg/dscf
Particulate Emission Rate			<u>0.029</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 2</i>	<i>Time</i>	<i>7:36 - 11:40</i>	<i>Date</i>	<i>2/10/2010</i>
Filter Net Gain	BDL	<u>0.5</u> mg	<u>9.50</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>94.088</u> dscf		
Stack Volumetric Flow		<u>21107</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.011</u>	mg/dscf
Particulate Emission Rate			<u>0.030</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 3</i>	<i>Time</i>	<i>12:25 - 16:28</i>	<i>Date</i>	<i>2/10/2010</i>
Filter Net Gain	BDL	<u>0.5</u> mg	<u>9.80</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>1.0</u> mg	NA	F-factor
Sample Gas Volume		<u>95.442</u> dscf		
Stack Volumetric Flow		<u>21251</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.016</u>	mg/dscf
Particulate Emission Rate			<u>0.044</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

RESULTS AVERAGE TESTS 1-3

Particulate Concentration	NA	lbs/mmBtu
Particulate Concentration	<u>0.012</u>	mg/dscf
Particulate Emission Rate	<u>0.034</u>	lbs/hr
Particulate Concentration	<u>0.000</u>	gr/dscf
Particulate Concentration	<u>0.000</u>	gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Less Than 2.5 Microns
Organic Condensable Emissions

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Metro</u>	Job Number	<u>902630</u>
Unit	<u>FBI 2</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

TEST 1	Time	12:25 - 16:27	Date	2/9/2010
Organic Net Gain (Solvent)	ADL	<u>0.8</u> mg	<u>9.60</u>	% Oxygen
Sample Gas Volume		<u>94.356</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>20977</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0085</u>	mg/dscf
Particulate Emission Rate			<u>0.0235</u>	lbs/hr
Particulate Concentration			<u>0.00013</u>	gr/dscf
Particulate Concentration			<u>0.00016</u>	gr/dscf @7% Oxygen

TEST 2	Time	7:36 - 11:40	Date	2/10/2010
Organic Net Gain (Solvent)	BDL	<u>0.5</u> mg	<u>9.50</u>	% Oxygen
Sample Gas Volume		<u>94.088</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>21107</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0053</u>	mg/dscf
Particulate Emission Rate			<u>0.0148</u>	lbs/hr
Particulate Concentration			<u>0.00008</u>	gr/dscf
Particulate Concentration			<u>0.00010</u>	gr/dscf @7% Oxygen

TEST 3	Time	12:25 - 16:28	Date	2/10/2010
Organic Net Gain (Solvent)	ADL	<u>1.8</u> mg	<u>9.80</u>	% Oxygen
Sample Gas Volume		<u>95.442</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>21251</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0189</u>	mg/dscf
Particulate Emission Rate			<u>0.0530</u>	lbs/hr
Particulate Concentration			<u>0.00029</u>	gr/dscf
Particulate Concentration			<u>0.00036</u>	gr/dscf @7% Oxygen

Results Average Test 1-3				
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0109</u>	mg/dscf
Particulate Emission Rate			<u>0.0305</u>	lbs/hr
Particulate Concentration			<u>0.00017</u>	gr/dscf
Particulate Concentration			<u>0.00021</u>	gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Less Than 2.5 Microns
Aqueous Condensable Emissions

Client	Met Council	Analyst	MC
Facility	Metro	Job Number	902,630
Unit	FBI 2	Description	Compliance
Location	Stack		

<i>Test 1</i>	<i>Time</i>	<i>12:25 - 16:27</i>	<i>Date</i>	<i>2/9/2010</i>
Dried Sample Net Gain		0.9 mg		9.60 % Oxygen
Aqueous Net Gain (H2O)	ADL	0.8 mg		0.100 Normality of NH ₄ OH
Sample Gas Volume		94.356 dscf		0.03 Volume of Titrant (ml)
Stack Volumetric Flow		20977 dscfm		0.05 Mass of NH ₄ Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration				0.009 mg/dscf
Particulate Emission Rate				0.025 lbs/hr
Particulate Concentration				0.000 gr/dscf
Particulate Concentration				0.000 gr/dscf @7% Oxygen

<i>Test 2</i>	<i>Time</i>	<i>7:36 - 11:40</i>	<i>Date</i>	<i>2/10/2010</i>
Dried Sample Net Gain		1.6 mg		9.50 % Oxygen
Aqueous Net Gain (H2O)	ADL	1.5 mg		0.100 Normality of NH ₄ OH
Sample Gas Volume		94.088 dscf		0.03 Volume of Titrant (ml)
Stack Volumetric Flow		21107 dscfm		0.05 Mass of NH ₄ Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration				0.016 mg/dscf
Particulate Emission Rate				0.046 lbs/hr
Particulate Concentration				0.000 gr/dscf
Particulate Concentration				0.000 gr/dscf @7% Oxygen

<i>Test 3</i>	<i>Time</i>	<i>12:25 - 16:28</i>	<i>Date</i>	<i>2/10/2010</i>
Dried Sample Net Gain		1.3 mg		9.80 % Oxygen
Aqueous Net Gain (H2O)	ADL	1.2 mg		0.100 Normality of NH ₄ OH
Sample Gas Volume		95.442 dscf		0.03 Volume of Titrant (ml)
Stack Volumetric Flow		20977 dscfm		0.05 Mass of NH ₄ Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration				0.013 mg/dscf
Particulate Emission Rate				0.036 lbs/hr
Particulate Concentration				0.000 gr/dscf
Particulate Concentration				0.000 gr/dscf @7% Oxygen

Results Average Test 1-3				
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration				0.013 mg/dscf
Particulate Emission Rate				0.036 lbs/hr
Particulate Concentration				0.000 gr/dscf
Particulate Concentration				0.000 gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Greater Than 2.5 Microns
Filterable Emissions

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Metro</u>	Job Number	<u>902630</u>
Unit	<u>FBI 2</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

<i>TEST 1</i>	<i>Time</i>	<i>12:25 - 16:27</i>	<i>Date</i>	<i>2/9/2010</i>
Filter Net Gain		<u> </u> mg	<u>9.60</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>94.356</u> dscf		
Stack Volumetric Flow		<u>20977</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.005</u>	mg/dscf
Particulate Emission Rate			<u>0.015</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 2</i>	<i>Time</i>	<i>7:36 - 11:40</i>	<i>Date</i>	<i>2/10/2010</i>
Filter Net Gain		<u> </u> mg	<u>9.50</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>1.8</u> mg	NA	F-factor
Sample Gas Volume		<u>94.088</u> dscf		
Stack Volumetric Flow		<u>21107</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.019</u>	mg/dscf
Particulate Emission Rate			<u>0.053</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 3</i>	<i>Time</i>	<i>12:25 - 16:28</i>	<i>Date</i>	<i>2/10/2010</i>
Filter Net Gain		<u> </u> mg	<u>9.80</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>2.5</u> mg	NA	F-factor
Sample Gas Volume		<u>95.442</u> dscf		
Stack Volumetric Flow		<u>21251</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.026</u>	mg/dscf
Particulate Emission Rate			<u>0.074</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.001</u>	gr/dscf @7% Oxygen

RESULTS AVERAGE TESTS 1-3

Particulate Concentration	NA	lbs/mmBtu
Particulate Concentration	<u>0.0169</u>	mg/dscf
Particulate Emission Rate	<u>0.0472</u>	lbs/hr
Particulate Concentration	<u>0.0003</u>	gr/dscf
Particulate Concentration	<u>0.0003</u>	gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Less Than 2.5 Microns
Total Emissions

Client	Met Council	Analyst	MC
Facility	Metro	Job Number	902630
Unit	FBI 3	Description	Compliance
Location	Stack		

<i>TEST 1</i>	<i>Time</i>	<i>7:32 - 11:34</i>	<i>Date</i>	<i>2/11/2010</i>
Filterable Net Gain	BDL	1.0 mg	9.70	% Oxygen
Condensable Net Gain	DLL	2.3 mg	NA	F-factor
Sample Gas Volume		93.554 dscf		
Stack Volumetric Flow		18817 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.035	mg/dscf
Particulate Emission Rate			0.088	lbs/hr
Particulate Concentration			0.001	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			3.30	mg

<i>Test 2</i>	<i>Time</i>	<i>12:00 - 16:04</i>	<i>Date</i>	<i>2/11/2010</i>
Filterable Net Gain	BDL	1.0 mg	9.00	% Oxygen
Condensable Net Gain	DLL	1.9 mg	NA	F-factor
Sample Gas Volume		94.309 dscf		
Stack Volumetric Flow		18862 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.031	mg/dscf
Particulate Emission Rate			0.078	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			2.95	mg

<i>Test 3</i>	<i>Time</i>	<i>8:10 - 12:13</i>	<i>Date</i>	<i>2/12/2010</i>
Filterable Net Gain	DLL	1.3 mg	9.30	% Oxygen
Condensable Net Gain	ADL	2.0 mg	NA	F-factor
Sample Gas Volume		93.418 dscf		
Stack Volumetric Flow		19198 dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.036	mg/dscf
Particulate Emission Rate			0.091	lbs/hr
Particulate Concentration			0.001	gr/dscf
Particulate Concentration			0.001	gr/dscf @7% Oxygen
Total Particulate Gain (mg)			3.35	mg

Results Average Test 1-3				
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.0341	mg/dscf
Particulate Emission Rate			0.0856	lbs/hr
Particulate Concentration			0.0005	gr/dscf
Particulate Concentration			0.0006	gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Less Than 2.5 Microns
Filterable Emissions

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Metro</u>	Job Number	<u>902630</u>
Unit	<u>FBI 3</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

<i>TEST 1</i>	<i>Time</i>	<i>7:32 - 11:34</i>	<i>Date</i>	<i>2/11/2010</i>
Filter Net Gain	BDL	<u>0.5</u> mg	<u>9.70</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>93.554</u> dscf		
Stack Volumetric Flow		<u>18817</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.011</u>	mg/dscf
Particulate Emission Rate			<u>0.027</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 2</i>	<i>Time</i>	<i>12:00 - 16:04</i>	<i>Date</i>	<i>2/11/2010</i>
Filter Net Gain	BDL	<u>0.5</u> mg	<u>9.00</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>94.309</u> dscf		
Stack Volumetric Flow		<u>18862</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.011</u>	mg/dscf
Particulate Emission Rate			<u>0.026</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 3</i>	<i>Time</i>	<i>8:10 - 12:13</i>	<i>Date</i>	<i>2/12/2010</i>
Filter Net Gain	BDL	<u>0.5</u> mg	<u>9.30</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>0.8</u> mg	NA	F-factor
Sample Gas Volume		<u>93.418</u> dscf		
Stack Volumetric Flow		<u>19198</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.014</u>	mg/dscf
Particulate Emission Rate			<u>0.035</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

RESULTS AVERAGE TESTS 1-3

Particulate Concentration	NA	lbs/mmBtu
Particulate Concentration	<u>0.012</u>	mg/dscf
Particulate Emission Rate	<u>0.029</u>	lbs/hr
Particulate Concentration	<u>0.000</u>	gr/dscf
Particulate Concentration	<u>0.000</u>	gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Less Than 2.5 Microns
Organic Condensable Emissions

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Metro</u>	Job Number	<u>902630</u>
Unit	<u>FBI 3</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

TEST 1	Time	7:32 - 11:34	Date	2/11/2010
Organic Net Gain (Solvent)	BDL	<u>0.5</u> mg	<u>9.70</u>	% Oxygen
Sample Gas Volume		<u>93.554</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>18817</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0053</u>	mg/dscf
Particulate Emission Rate			<u>0.0133</u>	lbs/hr
Particulate Concentration			<u>0.00008</u>	gr/dscf
Particulate Concentration			<u>0.00010</u>	gr/dscf @7% Oxygen

TEST 2	Time	12:00 - 16:04	Date	2/11/2010
Organic Net Gain (Solvent)	ADL	<u>1.5</u> mg	<u>9.00</u>	% Oxygen
Sample Gas Volume		<u>94.309</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>18862</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0159</u>	mg/dscf
Particulate Emission Rate			<u>0.0397</u>	lbs/hr
Particulate Concentration			<u>0.00025</u>	gr/dscf
Particulate Concentration			<u>0.00029</u>	gr/dscf @7% Oxygen

TEST 3	Time	8:10 - 12:13	Date	2/12/2010
Organic Net Gain (Solvent)	ADL	<u>1.1</u> mg	<u>9.30</u>	% Oxygen
Sample Gas Volume		<u>93.418</u> dscf	<u>NA</u>	F-factor
Stack Volumetric Flow		<u>19198</u> dscfm		
Particulate Concentration			<u>NA</u>	lbs/mmBtu
Particulate Concentration			<u>0.0118</u>	mg/dscf
Particulate Emission Rate			<u>0.0299</u>	lbs/hr
Particulate Concentration			<u>0.00018</u>	gr/dscf
Particulate Concentration			<u>0.00022</u>	gr/dscf @7% Oxygen

Results Average Test 1-3

Particulate Concentration	<u>NA</u>	lbs/mmBtu
Particulate Concentration	<u>0.0110</u>	mg/dscf
Particulate Emission Rate	<u>0.0276</u>	lbs/hr
Particulate Concentration	<u>0.00017</u>	gr/dscf
Particulate Concentration	<u>0.00020</u>	gr/dscf @7% Oxygen

**Determination of Particulate Matter Less Than 2.5 Microns
Aqueous Condensable Emissions**

Client	Met Council	Analyst	MC
Facility	Metro	Job Number	902,630
Unit	FBI 3	Description	Compliance
Location	Stack		

<i>Test 1</i>	<i>Time</i>	<i>7:32 - 11:34</i>	<i>Date</i>	<i>2/11/2010</i>
Dried Sample Net Gain		1.9 mg	9.70	% Oxygen
Aqueous Net Gain (H2O)	ADL	1.8 mg	0.100	Normality of NH ₄ OH
Sample Gas Volume		93,554 dscf	0.06	Volume of Titrant (ml)
Stack Volumetric Flow		18817 dscfm	0.10	Mass of NH ₄ Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.019	mg/dscf
Particulate Emission Rate			0.048	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.000	gr/dscf @7% Oxygen

<i>Test 2</i>	<i>Time</i>	<i>12:00 - 16:04</i>	<i>Date</i>	<i>2/11/2010</i>
Dried Sample Net Gain		0.5 mg	9.00	% Oxygen
Aqueous Net Gain (H2O)	BDL	0.4 mg	0.100	Normality of NH ₄ OH
Sample Gas Volume		94,309 dscf	0.03	Volume of Titrant (ml)
Stack Volumetric Flow		18862 dscfm	0.05	Mass of NH ₄ Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.005	mg/dscf
Particulate Emission Rate			0.012	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.000	gr/dscf @7% Oxygen

<i>Test 3</i>	<i>Time</i>	<i>8:10 - 12:13</i>	<i>Date</i>	<i>2/12/2010</i>
Dried Sample Net Gain		1.0 mg	9.30	% Oxygen
Aqueous Net Gain (H2O)	ADL	0.9 mg	0.100	Normality of NH ₄ OH
Sample Gas Volume		93,418 dscf	0.03	Volume of Titrant (ml)
Stack Volumetric Flow		18817 dscfm	0.05	Mass of NH ₄ Added (mg)
			NA	F-factor
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			0.010	mg/dscf
Particulate Emission Rate			0.025	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.000	gr/dscf @7% Oxygen

Results Average Test 1-3				
Particulate Concentration		NA		lbs/mmBtu
Particulate Concentration			0.011	mg/dscf
Particulate Emission Rate			0.028	lbs/hr
Particulate Concentration			0.000	gr/dscf
Particulate Concentration			0.000	gr/dscf @7% Oxygen

EPA Method OTM 027
Determination of Particulate Matter Greater Than 2.5 Microns
Filterable Emissions

Client	<u>Met Council</u>	Analyst	<u>MC</u>
Facility	<u>Metro</u>	Job Number	<u>902630</u>
Unit	<u>FBI 3</u>	Description	<u>Compliance</u>
Location	<u>Stack</u>		

<i>TEST 1</i>	<i>Time</i>	<i>7:32 - 11:34</i>	<i>Date</i>	<i>2/11/2010</i>
Filter Net Gain		<u> </u> mg	<u>9.70</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>0.8</u> mg	NA	F-factor
Sample Gas Volume		<u>93.554</u> dscf		
Stack Volumetric Flow		<u>18817</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.009</u>	mg/dscf
Particulate Emission Rate			<u>0.021</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 2</i>	<i>Time</i>	<i>12:00 - 16:04</i>	<i>Date</i>	<i>2/11/2010</i>
Filter Net Gain		<u> </u> mg	<u>9.00</u>	% Oxygen
Probe Rinse Net Gain	ADL	<u>1.1</u> mg	NA	F-factor
Sample Gas Volume		<u>94.309</u> dscf		
Stack Volumetric Flow		<u>18862</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.012</u>	mg/dscf
Particulate Emission Rate			<u>0.029</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

<i>TEST 3</i>	<i>Time</i>	<i>8:10 - 12:13</i>	<i>Date</i>	<i>2/12/2010</i>
Filter Net Gain		<u> </u> mg	<u>9.30</u>	% Oxygen
Probe Rinse Net Gain	BDL	<u>0.5</u> mg	NA	F-factor
Sample Gas Volume		<u>93.418</u> dscf		
Stack Volumetric Flow		<u>19198</u> dscfm		
Particulate Concentration			NA	lbs/mmBtu
Particulate Concentration			<u>0.005</u>	mg/dscf
Particulate Emission Rate			<u>0.014</u>	lbs/hr
Particulate Concentration			<u>0.000</u>	gr/dscf
Particulate Concentration			<u>0.000</u>	gr/dscf @7% Oxygen

RESULTS AVERAGE TESTS 1-3

Particulate Concentration	NA	lbs/mmBtu
Particulate Concentration	<u>0.0085</u>	mg/dscf
Particulate Emission Rate	<u>0.0213</u>	lbs/hr
Particulate Concentration	<u>0.0001</u>	gr/dscf
Particulate Concentration	<u>0.0002</u>	gr/dscf @7% Oxygen

EPA Reference Method 23
Determination of Dioxins/Furan Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack	Version	ST604-04

Train Blank

Element	Detection		TEF
	Status	ng	
2378-TCDD	BDL	0.040	1
12378-PeCDD	BDL	0.040	0.5
123478-HxCDD	BDL	0.040	0.1
123678-HxCDD	BDL	0.040	0.1
123789-HxCDD	BDL	0.040	0.1
1234678-HpCDD	BDL	0.040	0.01
OCDD	BDL	0.400	0.001
2378-TCDF	BDL	0.040	0.1
12378-PeCDF	BDL	0.040	0.05
23478-PeCDF	BDL	0.040	0.5
123478-HxCDF	BDL	0.040	0.1
123678-HxCDF	BDL	0.040	0.1
234678-HxCDF	BDL	0.040	0.1
123789-HxCDF	BDL	0.040	0.1
1234678-HpCDF	BDL	0.040	0.01
1234789-HpCDF	BDL	0.040	0.01
OCDF	BDL	0.400	0.001
Total TCDD	BDL	0.040	
Total PeCDD	BDL	0.040	
Total HxCDD	BDL	0.040	
Total HpCDD	BDL	0.040	
Total TCDF	BDL	0.040	
Total PeCDF	BDL	0.040	
Total HxCDF	BDL	0.040	
Total HpCDF	BDL	0.040	

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EMSI

EPA Reference Method 23
Determination of Dioxins/Furan Emissions From Stationary Sources

Client	Met Council	Date	2-16-10
Facility	Seneca	Job Number	902630
Unit	Unit 1	Operator	BD
Location	Stack	Version	ST604-04

Reagent Blank

Element	Detection		TEF
	Status	ng	
2378-TCDD	BDL	0.040	1
12378-PeCDD	BDL	0.040	0.5
123478-HxCDD	BDL	0.040	0.1
123678-HxCDD	BDL	0.040	0.1
123789-HxCDD	BDL	0.040	0.1
1234678-HpCDD	BDL	0.040	0.01
OCDD	BDL	0.400	0.001
2378-TCDF	BDL	0.040	0.1
12378-PeCDF	BDL	0.040	0.05
23478-PeCDF	BDL	0.040	0.5
123478-HxCDF	BDL	0.040	0.1
123678-HxCDF	BDL	0.040	0.1
234678-HxCDF	BDL	0.040	0.1
123789-HxCDF	BDL	0.040	0.1
1234678-HpCDF	BDL	0.040	0.01
1234789-HpCDF	BDL	0.040	0.01
OCDF	BDL	0.040	0.001
Total TCDD	BDL	0.040	
Total PeCDD	BDL	0.040	
Total HxCDD	BDL	0.040	
Total HpCDD	BDL	0.400	
Total TCDF	BDL	0.040	
Total PeCDF	BDL	0.040	
Total HxCDF	BDL	0.040	
Total HpCDF	BDL	0.040	

BDL = Below Detection Limit - All fractions below detection limit

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ADL = Above Detection Limit - All fractions above detection limit

EMSI

EPA REFERENCE METHOD 23
Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	FBR 1	Operator	NT NK
Location	Stack		

Train Blank

Element	Detection	
	Status	ng
3,4',4,5'-TetraCB (#81)	BDL	0.20
3,3',4,4'-TetraCB (#77)	BDL	0.20
2',3,4,4',5-PentaCB (#123)	BDL	0.20
2,3',4,4',5-PentaCB (#118)	BDL	0.20
2,3,4,4',5-PentaCB (#114)	BDL	0.20
2,3,3',4,4'-PentaCB (#105)	BDL	0.20
3,3',4,4',5-PentaCB (#126)	BDL	0.20
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EMSI

EPA REFERENCE METHOD 23
Determination of Polychlorinated Biphenyl Emissions From Stationary Sources

Client	Met Council	Date	2-16-10
Facility	Seneca	Job Number	902630
Unit	Unit 1	Operator	BD
Location	Stack		

Reagent Blank

Element	Detection	
	Status	ng
3,4',4,5'-TetraCB (#81)	BDL	0.20
3,3',4,4'-TetraCB (#77)	BDL	0.20
2',3,4,4',5-PentaCB (#123)	BDL	0.20
2,3',4,4',5-PentaCB (#118)	BDL	0.20
2,3,4,4',5-PentaCB (#114)	BDL	0.20
2,3,3',4,4'-PentaCB (#105)	BDL	0.20
3,3',4,4',5-PentaCB (#126)	BDL	0.20
2,3',4,4',5,5'-HexaCB (#167)	BDL	0.20
2,3,3,4,4,5-HexaCB (#156/#157)	BDL	0.40
3,3',4,4',5,5'-HexaCB (#169)	BDL	0.20
2,3,3',4,4',5,5'-HeptaCB (#189)	BDL	0.20

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

EMSI

EPA REFERENCE METHOD 23
Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

Client	Met Council	Date	2/8/2010
Facility	Metro	Job Number	902630
Unit	1	Operator	
Location	Stack		

Train Blank

Element	Detection		
	Status	ug	ng
Naphthalene	ADL	0.42800	428.00
2-Methylnaphthalene	ADL	0.02850	28.50
2-Chloronaphthalene	ADL	0.00017	0.17
Acenaphthylene	ADL	0.00225	2.25
Acenaphthene	ADL	0.00146	1.46
Fluorene	ADL	0.00306	3.06
Phenanthrene	ADL	0.02050	20.50
Anthracene	ADL	0.00224	2.24
Fluoranthene	ADL	0.01350	13.50
Pyrene	ADL	0.01130	11.30
Benzo(a)anthracene	ADL	0.00142	1.42
Chrysene	ADL	0.00428	4.28
Benzo(b)fluoranthene	ADL	0.00310	3.10
Benzo(k)fluoranthene	ADL	0.00064	0.64
Benzo(e)pyrene	ADL	0.00584	5.84
Benzo(a)pyrene	ADL	0.00156	1.56
Perylene	BDL	0.00026	0.26
Indeno (1,2,3 -cd) pyrene	ADL	0.00276	2.76
Dibenz(a,h)anthracene	BDL	0.00046	0.46
Benzo(g,h,i)perylene	ADL	0.01200	12.00

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

NOTE: Multiple Compounds Detected in the Blank

EMSI

EPA REFERENCE METHOD 23

Determination of Polyaromatic Hydrocarbon Emissions From Stationary Sources

Client	Met Council	Date	2-16-10
Facility		Job Number	902630
Unit	1	Operator	
Location	Stack		

Reagent Blank

Element	Detection		
	Status	ug	ng
Naphthalene	ADL	0.28200	282.00
2-Methylnaphthalene	ADL	0.01310	13.10
2-Chloronaphthalene	BDL	0.00015	0.15
Acenaphthylene	ADL	0.00286	2.86
Acenaphthene	ADL	0.00069	0.69
Fluorene	ADL	0.00119	1.19
Phenanthrene	ADL	0.01050	10.50
Anthracene	ADL	0.00106	1.06
Fluoranthene	ADL	0.00680	6.80
Pyrene	ADL	0.00076	0.76
Benzo(a)anthracene	BDL	0.00017	0.17
Chrysene	ADL	0.00131	1.31
Benzo(b)fluoranthene	ADL	0.00082	0.82
Benzo(k)fluoranthene	ADL	0.00056	0.56
Benzo(e)pyrene	ADL	0.00228	2.28
Benzo(a)pyrene	ADL	0.00130	1.30
Perylene	BDL	0.00026	0.26
Indeno (1,2,3 -cd) pyrene	ADL	0.00180	1.80
Dibenz(a,h)anthracene	BDL	0.00046	0.46
Benzo(g,h,i)perylene	ADL	0.00512	5.12

BDL = Below Detection Limit - All fractions below detection limit

DLL = Detection Limit Limited - Some fractions below detection limit

ADL = Above Detection Limit - All fractions above detection limit

NOTE: Multiple Compounds Detected in the Blank

EMSI

Your Project #: 902630
Site: MET COUNCIL- METRO PLANT

Attention: Mark Carlson

Eagle Mountain
8905 Autumn Oaks Dr.
Rockford, MN
USA 55373

Report Date: 2010/03/10

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B022953

Received: 2010/02/25, 12:10

Sample Matrix: Impinger Solution

Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Dioxins/Furans in Air (Method 23) ¶	7	2010/02/26	2010/03/02	BRL SOP-00404	EPA1613Bmod(M23/23A)
PAHs in Air (CARB429)	7	2010/02/26	2010/03/04	BRL SOP-00201	CARB429mod(CARB429)
PCBs by HRMS (1668A)	7	2010/02/26	2010/03/02	BRL SOP-00408	EPA 1668Amod(M0010)

(1) This test was performed in Maxxam Mississauga under Maxxam Burlington SCC Accreditation

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

CLAYTON JOHNSON, Project Manager
Email: Clayton.Johnson@maxxamanalytics.com
Phone# (905) 817-5769

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CALA have approved this reporting process and electronic report format.

Total cover pages: 1

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4540						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Polyaromatic Hydrocarbons								
Naphthalene	ng	428	1.1	22				2087844
2-Methylnaphthalene	ng	28.5	0.45	3.1				2087844
2-Chloronaphthalene	ng	0.17	0.064	0.15				2087844
Acenaphthylene	ng	2.25	0.26	0.32				2087844
Acenaphthene	ng	1.46	0.25	0.40				2087844
Fluorene	ng	3.06	0.57	0.49				2087844
Phenanthrene	ng	20.5	0.39	0.67				2087844
Anthracene	ng	2.24	0.46	0.31				2087844
Fluoranthene	ng	13.5	0.19	0.65				2087844
Pyrene	ng	11.3	0.16	0.52				2087844
Benzo(a)anthracene	ng	1.42	0.11	0.17				2087844
Chrysene	ng	4.28	0.11	0.33				2087844
Benzo(b)fluoranthene	ng	3.10	0.25	0.59				2087844
Benzo(k)fluoranthene	ng	0.64	0.34	0.35				2087844
Benzo(e)pyrene	ng	5.84	0.53	0.43				2087844
Benzo(a)pyrene	ng	1.56	0.69	0.31				2087844
Perylene	ng	<0.26	0.51	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	2.76	2.3	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	1.6	0.46				2087844
Benzo(g,h,i)perylene	ng	12.0	2.0	0.23				2087844
PCBs								
2-MonoCB-(1)	ng	<0.20	0.011	0.20				2087846
3-MonoCB-(2)	ng	<0.20	0.012	0.20				2087846
4-MonoCB-(3)	ng	<0.20	0.013	0.20				2087846
2,2'-DiCB-(4)	ng	<0.20	0.066	0.20				2087846
2,3-DiCB-(5)	ng	<0.20	0.12	0.20				2087846
2,3'-DiCB-(6)	ng	<0.20	0.11	0.20				2087846
2,4-DiCB-(7)	ng	<0.20	0.11	0.20				2087846

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4540						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,4'-DiCB-(8)	ng	<0.20	0.11	0.20				2087846
2,5-DiCB-(9)	ng	<0.20	0.11	0.20				2087846
2,6-DiCB-(10)	ng	<0.20	0.054	0.20				2087846
3,3'-DiCB-(11)	ng	0.30	0.11	0.20				2087846
DiCB-(12)+(13)	ng	<0.40	0.12	0.40				2087846
3,5-DiCB-(14)	ng	<0.20	0.11	0.20				2087846
4,4'-DiCB-(15)	ng	<0.20	0.13	0.20				2087846
22'3-TriCB-(16)	ng	<0.20	0.023	0.20				2087846
22'4-TriCB-(17)	ng	<0.20	0.019	0.20				2087846
TriCB-(18)+(30)	ng	<0.40	0.030	0.40				2087846
22'6-TriCB-(19)	ng	<0.20	0.018	0.20				2087846
TriCB-(20) + (28)	ng	<0.40	0.010	0.40				2087846
TriCB-(21)+(33)	ng	<0.40	0.0096	0.40				2087846
234'-TriCB-(22)	ng	<0.20	0.022	0.20				2087846
235-TriCB-(23)	ng	<0.20	0.010	0.20				2087846
236-TriCB-(24)	ng	<0.20	0.014	0.20				2087846
23'4-TriCB-(25)	ng	<0.20	0.0091	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.012	0.40				2087846
23'6-TriCB-(27)	ng	<0.20	0.013	0.20				2087846
24'5-TriCB-(31)	ng	<0.20	0.049	0.20				2087846
24'6-TriCB-(32)	ng	<0.20	0.012	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.0099	0.20				2087846
33'4-TriCB-(35)	ng	<0.20	0.010	0.20				2087846
33'5-TriCB-(36)	ng	<0.20	0.0085	0.20				2087846
344'-TriCB-(37)	ng	<0.20	0.011	0.20				2087846
345-TriCB-(38)	ng	<0.20	0.010	0.20				2087846
34'5-TriCB-(39)	ng	<0.20	0.0097	0.20				2087846
TetraCB-(40)+(41)+(71)	ng	<0.60	0.0086	0.60				2087846
22'34'-TetraCB-(42)	ng	<0.20	0.0092	0.20				2087846
22'35-TetraCB-(43)	ng	<0.20	0.011	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4540						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
TetraCB-(44)+(47)+(65)	ng	<0.60	0.0080	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40	0.0039	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20	0.010	0.20				2087846
22'45'-TetraCB-(48)	ng	<0.20	0.0085	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	<0.40	0.048	0.40				2087846
TetraCB-(50)+(53)	ng	<0.40	0.011	0.40				2087846
22'55'-TetraCB-(52)	ng	<0.20	0.24	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.0082	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.012	0.20				2087846
233'4'-Tetra CB(56)	ng	<0.20	0.013	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.011	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.011	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60	0.0067	0.60				2087846
2344'-TetraCB -(60)	ng	<0.20	0.012	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	<0.80	0.062	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20	0.011	0.20				2087846
234'6'-TetraCB-(64)	ng	<0.20	0.0064	0.20				2087846
23'44'-TetraCB-(66)	ng	<0.20	0.019	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20	0.010	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20	0.010	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.011	0.20				2087846
23'5'6-TetraCB-(73)	ng	<0.20	0.0067	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.011	0.20	0.000100	0.00000110		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.012	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.010	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.010	0.20				2087846
344'5'-TetraCB-(81)	ng	<0.20	0.011	0.20	0.000300	0.00000330		2087846
22'33'4-PentaCB-(82)	ng	<0.20	0.012	0.20				2087846
PentaCB-(83)+(99)	ng	<0.40	0.023	0.40				2087846
22'33'6-PentaCB-(84)	ng	<0.20	0.012	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4540						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
PentaCB-(85)+(116)+(117)	ng	<0.60	0.0087	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	<1.2	0.041	1.2				2087846
PentaCB-(88)+(91)	ng	<0.40	0.0082	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.011	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	<0.60	0.0092	0.60				2087846
22'355'-PentaCB-(92)	ng	<0.20	0.010	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.010	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.011	0.20				2087846
22'35'6-PentaCB-(95)	ng	<0.20	0.0098	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20	0.0038	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.0092	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.0045	0.20				2087846
233'44'-PentaCB-(105)	ng	<0.20	0.0079	0.20	0.0000300	0.000000237		2087846
233'45-PentaCB-(106)	ng	<0.20	0.0080	0.20				2087846
233'4'5-PentaCB-(107)	ng	<0.20	0.0081	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40	0.0084	0.40				2087846
PentaCB-(110)+(115)	ng	<0.40	0.0085	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.0080	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.0078	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.0077	0.20	0.0000300	0.000000231		2087846
23'44'5-PentaCB-(118)	ng	<0.20	0.0076	0.20	0.0000300	0.000000228		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.0076	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.0080	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20	0.0088	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.0078	0.20	0.0000300	0.000000234		2087846
33'44'5-PentaCB-(126)	ng	<0.20	0.0076	0.20	0.100	0.000760		2087846
33'455'-PentaCB-(127)	ng	<0.20	0.0082	0.20				2087846
HexaCB-(128)+(166)	ng	<0.40	0.017	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	<0.60	0.018	0.60				2087846
22'33'45'-HexaCB-(130)	ng	<0.20	0.021	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

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Maxxam ID		FE4540						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'33'46'-HexaCB-(131)	ng	<0.20	0.021	0.20				2087846
22'33'46'-HexaCB-(132)	ng	<0.20	0.021	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20	0.019	0.20				2087846
HexaCB-(134)+(143)	ng	<0.40	0.021	0.40				2087846
HexaCB-(135)+(151)	ng	<0.40	0.027	0.40				2087846
22'33'66'-HexaCB-(136)	ng	<0.20	0.0039	0.20				2087846
22'344'5'-HexaCB-(137)	ng	<0.20	0.022	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.018	0.40				2087846
22'3455'-HexaCB-(141)	ng	<0.20	0.019	0.20				2087846
22'3456'-HexaCB-(142)	ng	<0.20	0.021	0.20				2087846
22'345'6'-HexaCB-(144)	ng	<0.20	0.0051	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0042	0.20				2087846
22'34'55'-HexaCB-(146)	ng	<0.20	0.018	0.20				2087846
HexaCB-(147)+(149)	ng	<0.40	0.051	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.0052	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20	0.0039	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0038	0.20				2087846
HexaCB-(153)+(168)	ng	<0.40	0.016	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.0046	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20	0.0051	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40	0.0054	0.40	0.0000300	0.000000162		2087846
233'44'6'-HexaCB-(158)	ng	<0.20	0.014	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.0054	0.20				2087846
233'456'-HexaCB-(160)	ng	<0.20	0.016	0.20				2087846
233'45'6'-HexaCB-(161)	ng	<0.20	0.015	0.20				2087846
233'4'55'-HexaCB-(162)	ng	<0.20	0.0056	0.20				2087846
233'4'5'6'-HexaCB-(164)	ng	<0.20	0.014	0.20				2087846
233'55'6'-HexaCB-(165)	ng	<0.20	0.016	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20	0.0048	0.20	0.0000300	0.000000144		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.0050	0.20	0.0300	0.000150		2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

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Maxxam ID		FE4540						
Sampling Date		2010/02/08				TOXIC EQUIVALENCY	# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'33'44'5-HeptaCB-(170)	ng	<0.20	0.0085	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.0079	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.0083	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	<0.20	0.011	0.20				2087846
22'33'45'6-HeptaCB-(175)	ng	<0.20	0.0048	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.0037	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	<0.20	0.0079	0.20				2087846
22'33'55'6-HeptaCB-(178)	ng	<0.20	0.0050	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	<0.20	0.0052	0.20				2087846
HeptaCB-(180)+(193)	ng	<0.40	0.028	0.40				2087846
22'344'56-HeptaCB-(181)	ng	<0.20	0.0077	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.0049	0.20				2087846
22'344'5'6-HeptaCB-(183)	ng	<0.20	0.0069	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20	0.0037	0.20				2087846
22'3455'6-HeptaCB-(185)	ng	<0.20	0.0082	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.0039	0.20				2087846
22'34'55'6-HeptaCB-(187)	ng	<0.20	0.014	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.0050	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.0089	0.20	0.0000300	0.000000267		2087846
233'44'56-HeptaCB-(190)	ng	<0.20	0.0065	0.20				2087846
233'44'5'6-HeptaCB-(191)	ng	<0.20	0.0063	0.20				2087846
233'455'6-HeptaCB-(192)	ng	<0.20	0.0068	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20	0.0081	0.20				2087846
22'33'44'56-OctaCB-(195)	ng	<0.20	0.0054	0.20				2087846
22'33'44'56'-OctaCB-(196)	ng	<0.20	0.0051	0.20				2087846
22'33'44'66-OctaCB-(197)	ng	<0.20	0.0040	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40	0.0052	0.40				2087846
22'33'4566'-OctaCB-(200)	ng	<0.20	0.0036	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.0038	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20	0.0046	0.20				2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4540						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'344'55'6-OctaCB-(203)	ng	<0.20	0.0049	0.20				2087846
22'344'566'-OctaCB-(204)	ng	<0.20	0.0038	0.20				2087846
233'44'55'6-OctaCB-(205)	ng	<0.20	0.0035	0.20				2087846
22'33'44'55'6-NonaCB-(206)	ng	<0.20	0.0071	0.20				2087846
22'33'44'566'-NonaCB-(207)	ng	<0.20	0.0067	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.0075	0.20				2087846
DecaCB-(209)	ng	<0.20	0.0036	0.20				2087846
Monochlorobiphenyl	ng	<N/A	0.012	N/A				2087846
Dichlorobiphenyl	ng	0.30	0.13	N/A				2087846
Trichlorobiphenyl	ng	0.119	0.023	N/A				2087846
Tetrachlorobiphenyl	ng	0.140	0.012	N/A				2087846
Pentachlorobiphenyl	ng	0.339	0.012	N/A				2087846
Hexachlorobiphenyl	ng	0.148	0.022	N/A				2087846
Heptachlorobiphenyl	ng	<N/A	0.0089	N/A				2087846
Octachlorobiphenyl	ng	<N/A	0.0054	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.0075	N/A				2087846
Decachlorobiphenyl	ng	0.0046	0.0036	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.000916		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	58						2087844
Acenaphthylene-2H8	%	63						2087844
Benz(a)anthracene-2H12	%	80						2087844
Benzo(a)pyrene-2H12	%	87						2087844
Benzo(b)fluoranthene-2H12	%	118						2087844
Benzo(g,h,i)perylene-2H12	%	57						2087844
Benzo(k)fluoranthene-2H12	%	103						2087844
Chrysene-2H12	%	77						2087844
Dibenzo(a,h)anthracene-2H14	%	56						2087844
Fluoranthene-2H10	%	86						2087844
Fluorene-2H10	%	77						2087844
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

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Maxxam ID		FE4540						
Sampling Date		2010/02/08				TOXIC EQUIVALENCY	# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Indeno(1,2,3-c,d)pyrene-2H12	%	54						2087844
Naphthalene-2H8	%	54						2087844
Perylene-2H12	%	99						2087844
Phenanthrene-2H10	%	74						2087844
Terphenyl-2H14	%	132						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	93						2087846
C13-2,44'-TriCB-(28)	%	64						2087846
C13-2,4'5'-TriCB-(31) (FS)	%	53						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	122						2087846
C13-22'33'44'5-HeptaCB-(170)	%	104						2087846
C13-22'33'455'66'-NonaCB-(208)	%	119						2087846
C13-22'33'55'66'-OctaCB-(202)	%	123						2087846
C13-22'33'55'6-HeptaCB-(178)	%	141 (1)						2087846
C13-22'344'55'-HeptaCB-(180)	%	109						2087846
C13-22'34'566'-HeptaCB-(188)	%	118						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	101						2087846
C13-22'44'66'-HexaCB-(155)	%	124						2087846
C13-22'466'-PentaCB-(104)	%	96						2087846
C13-22'66'-TetraCB-(54)	%	73						2087846
C13-22'6-TriCB-(19)	%	60						2087846
C13-22'-DiCB-(4)	%	51						2087846
C13-233'44'55'6-OctaCB-(205)	%	104						2087846
C13-233'44'55'-HeptaCB-(189)	%	97						2087846
C13-233'44'-PentaCB-(105)	%	84						2087846
C13-233'55'-PentaCB-(111)	%	110						2087846
C13-23'44'55'-HexaCB-(167)	%	91						2087846
C13-2344'5-PentaCB-(114)	%	82						2087846
C13-23'44'5-PentaCB-(118)	%	83						2087846
C13-2'344'5-PentaCB-(123)	%	82						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-2-MonoCB-(1)	%	33						2087846
C13-33'44'55'-HexaCB-(169)	%	85						2087846
C13-33'44'5'-PentaCB-(126)	%	85						2087846
C13-33'44'-TetraCB-(77)	%	77						2087846
C13-344'5'-TetraCB-(81)	%	79						2087846
C13-344'-TriCB-(37)	%	69						2087846
C13-44'-DiCB-(15)	%	56						2087846
C13-4-MonoCB-(3)	%	39						2087846
C13-DecaCB-(209)	%	147 (1)						2087846
C13-HexaCB-(156)+(157)	%	90						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam ID		FE4541						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Polyaromatic Hydrocarbons								
Naphthalene	ng	540	2.4	22				2087844
2-Methylnaphthalene	ng	119	4.4	3.1				2087844
2-Chloronaphthalene	ng	0.28	0.044	0.15				2087844
Acenaphthylene	ng	11.0	0.62	0.32				2087844
Acenaphthene	ng	6.96	0.62	0.40				2087844
Fluorene	ng	18.5	1.2	0.49				2087844
Phenanthrene	ng	123	0.54	0.67				2087844
Anthracene	ng	10.8	0.64	0.31				2087844
Fluoranthene	ng	78.0	0.30	0.65				2087844
Pyrene	ng	41.2	0.25	0.52				2087844
Benzo(a)anthracene	ng	5.28	0.18	0.17				2087844
Chrysene	ng	22.8	0.20	0.33				2087844
Benzo(b)fluoranthene	ng	6.28	0.42	0.59				2087844
Benzo(k)fluoranthene	ng	0.84	0.57	0.35				2087844
Benzo(e)pyrene	ng	10.5	0.92	0.43				2087844
Benzo(a)pyrene	ng	2.32	1.2	0.31				2087844
Perylene	ng	<0.26	1.1	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	<0.30	3.9	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	2.8	0.46				2087844
Benzo(g,h,i)perylene	ng	15.0	3.5	0.23				2087844
PCBs								
2-MonoCB-(1)	ng	<0.20	0.011	0.20				2087846
3-MonoCB-(2)	ng	<0.20 (1)	0.047	0.20				2087846
4-MonoCB-(3)	ng	<0.20	0.011	0.20				2087846
2,2'-DiCB-(4)	ng	0.64	0.048	0.20				2087846
2,3-DiCB-(5)	ng	<0.20	0.035	0.20				2087846
2,3'-DiCB-(6)	ng	<0.20	0.032	0.20				2087846

RDL = Reportable Detection Limit
EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4541						
Sampling Date		2010/02/08				TOXIC EQUIVALENCY	# of	
	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

2,4-DiCB-(7)	ng	0.25	0.032	0.20				2087846
2,4'-DiCB-(8)	ng	0.32	0.030	0.20				2087846
2,5-DiCB-(9)	ng	<0.20 (1)	0.041	0.20				2087846
2,6-DiCB-(10)	ng	<0.20	0.040	0.20				2087846
3,3'-DiCB-(11)	ng	1.70	0.033	0.20				2087846
DiCB-(12)+(13)	ng	<0.40 (1)	0.066	0.40				2087846
3,5-DiCB-(14)	ng	<0.20	0.031	0.20				2087846
4,4'-DiCB-(15)	ng	0.28	0.036	0.20				2087846
22'3-TriCB-(16)	ng	0.39	0.020	0.20				2087846
22'4-TriCB-(17)	ng	0.36	0.017	0.20				2087846
TriCB-(18)+(30)	ng	0.97	0.014	0.40				2087846
22'6-TriCB-(19)	ng	<0.20	0.016	0.20				2087846
TriCB-(20) + (28)	ng	0.68	0.015	0.40				2087846
TriCB-(21)+(33)	ng	<0.40	0.015	0.40				2087846
234'-TriCB-(22)	ng	0.24	0.016	0.20				2087846
235-TriCB-(23)	ng	<0.20	0.017	0.20				2087846
236-TriCB-(24)	ng	<0.20	0.013	0.20				2087846
23'4-TriCB-(25)	ng	<0.20	0.014	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.016	0.40				2087846
23'6-TriCB-(27)	ng	<0.20 (1)	0.054	0.20				2087846
24'5-TriCB-(31)	ng	0.66	0.015	0.20				2087846
24'6-TriCB-(32)	ng	0.21	0.011	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.015	0.20				2087846
33'4-TriCB-(35)	ng	<0.20	0.016	0.20				2087846
33'5-TriCB-(36)	ng	<0.20	0.013	0.20				2087846
344'-TriCB-(37)	ng	<0.20	0.016	0.20				2087846
345-TriCB-(38)	ng	<0.20	0.016	0.20				2087846
34'5-TriCB-(39)	ng	<0.20	0.015	0.20				2087846
TetraCB-(40)+(41)+(71)	ng	<0.60	0.035	0.60				2087846

EDL = Estimated Detection Limit

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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4541						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'34'-TetraCB-(42)	ng	<0.20	0.039	0.20				2087846
22'35'-TetraCB-(43)	ng	<0.20	0.047	0.20				2087846
TetraCB-(44)+(47)+(65)	ng	<0.60	0.033	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40	0.036	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20	0.041	0.20				2087846
22'45'-TetraCB-(48)	ng	<0.20	0.036	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	<0.40	0.031	0.40				2087846
TetraCB-(50)+(53)	ng	<0.40	0.035	0.40				2087846
22'55'-TetraCB-(52)	ng	0.87	0.035	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.011	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.022	0.20				2087846
233'4'-Tetra CB(56)	ng	<0.20	0.022	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.021	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.022	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60	0.027	0.60				2087846
2344'-TetraCB -(60)	ng	<0.20	0.022	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	<0.80	0.021	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20	0.020	0.20				2087846
234'6'-TetraCB-(64)	ng	<0.20	0.027	0.20				2087846
23'44'-TetraCB-(66)	ng	<0.20	0.020	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20	0.019	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20	0.019	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.020	0.20				2087846
23'5'6'-TetraCB-(73)	ng	<0.20	0.025	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.020	0.20	0.000100	0.00000200		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.021	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.018	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.019	0.20				2087846
344'5'-TetraCB-(81)	ng	<0.20	0.020	0.20	0.000300	0.00000600		2087846
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RESULTS OF ANALYSES OF IMPINGER SOLUTION

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Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'33'4-PentaCB-(82)	ng	<0.20	0.018	0.20				2087846
PentaCB-(83)+(99)	ng	<0.40 (1)	0.11	0.40				2087846
22'33'6-PentaCB-(84)	ng	<0.20	0.019	0.20				2087846
PentaCB-(85)+(116)+(117)	ng	<0.60	0.013	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	<1.2	0.015	1.2				2087846
PentaCB-(88)+(91)	ng	<0.40 (1)	0.029	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.017	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	<0.60	0.015	0.60				2087846
22'355'-PentaCB-(92)	ng	<0.20	0.017	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.016	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.018	0.20				2087846
22'35'6-PentaCB-(95)	ng	0.23	0.015	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20	0.0050	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.015	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.0062	0.20				2087846
233'44'-PentaCB-(105)	ng	<0.20 (1)	0.029	0.20	0.0000300	0.000000870		2087846
233'45-PentaCB-(106)	ng	<0.20	0.013	0.20				2087846
233'4'5-PentaCB-(107)	ng	<0.20	0.013	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40	0.013	0.40				2087846
PentaCB-(110)+(115)	ng	<0.40	0.014	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.013	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.013	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.012	0.20	0.0000300	0.000000360		2087846
23'44'5-PentaCB-(118)	ng	<0.20	0.012	0.20	0.0000300	0.000000360		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.012	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.013	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20	0.014	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.012	0.20	0.0000300	0.000000360		2087846
33'44'5-PentaCB-(126)	ng	<0.20	0.012	0.20	0.100	0.00120		2087846

EDL = Estimated Detection Limit

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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

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Eagle Mountain
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RESULTS OF ANALYSES OF IMPINGER SOLUTION

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Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'455'-PentaCB-(127)	ng	<0.20	0.013	0.20				2087846
HexaCB-(128)+(166)	ng	<0.40	0.022	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	<0.60	0.023	0.60				2087846
22'33'45'-HexaCB-(130)	ng	<0.20	0.027	0.20				2087846
22'33'46'-HexaCB-(131)	ng	<0.20	0.027	0.20				2087846
22'33'46'-HexaCB-(132)	ng	<0.20 (1)	0.034	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20	0.025	0.20				2087846
HexaCB-(134)+(143)	ng	<0.40	0.030	0.40				2087846
HexaCB-(135)+(151)	ng	<0.40	0.0091	0.40				2087846
22'33'66'-HexaCB-(136)	ng	<0.20	0.0069	0.20				2087846
22'344'5'-HexaCB-(137)	ng	<0.20	0.027	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.024	0.40				2087846
22'3455'-HexaCB-(141)	ng	<0.20	0.025	0.20				2087846
22'3456'-HexaCB-(142)	ng	<0.20	0.026	0.20				2087846
22'345'6'-HexaCB-(144)	ng	<0.20	0.0089	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0072	0.20				2087846
22'34'55'-HexaCB-(146)	ng	<0.20	0.022	0.20				2087846
HexaCB-(147)+(149)	ng	<0.40	0.030	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.0089	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20	0.0070	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0067	0.20				2087846
HexaCB-(153)+(168)	ng	<0.40	0.020	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.0080	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20	0.0088	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40	0.015	0.40	0.0000300	0.000000450		2087846
233'44'6'-HexaCB-(158)	ng	<0.20	0.018	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.017	0.20				2087846
233'456'-HexaCB-(160)	ng	<0.20	0.021	0.20				2087846
233'45'6'-HexaCB-(161)	ng	<0.20	0.019	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds (1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

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Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
233'4'55'-HexaCB-(162)	ng	<0.20	0.017	0.20				2087846
233'4'5'6'-HexaCB-(164)	ng	<0.20	0.018	0.20				2087846
233'5'5'6'-HexaCB-(165)	ng	<0.20	0.021	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20	0.015	0.20	0.0000300	0.000000450		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.015	0.20	0.0300	0.000450		2087846
22'33'44'5'-HeptaCB-(170)	ng	<0.20	0.034	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.042	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.042	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	<0.20	0.041	0.20				2087846
22'33'45'6'-HeptaCB-(175)	ng	<0.20	0.010	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.0080	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	<0.20	0.041	0.20				2087846
22'33'55'6'-HeptaCB-(178)	ng	<0.20	0.010	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	<0.20	0.0077	0.20				2087846
HeptaCB-(180)+(193)	ng	<0.40	0.031	0.40				2087846
22'344'56'-HeptaCB-(181)	ng	<0.20	0.041	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.010	0.20				2087846
22'344'5'6'-HeptaCB-(183)	ng	<0.20	0.036	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20	0.0077	0.20				2087846
22'3455'6'-HeptaCB-(185)	ng	<0.20	0.043	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.0083	0.20				2087846
22'34'55'6'-HeptaCB-(187)	ng	<0.20	0.0098	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.011	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.019	0.20	0.0000300	0.000000570		2087846
233'44'56'-HeptaCB-(190)	ng	<0.20	0.033	0.20				2087846
233'44'5'6'-HeptaCB-(191)	ng	<0.20	0.032	0.20				2087846
233'455'6'-HeptaCB-(192)	ng	<0.20	0.035	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20	0.032	0.20				2087846
22'33'44'56'-OctaCB-(195)	ng	<0.20	0.035	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

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	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'33'44'56'-OctaCB-(196)	ng	<0.20	0.030	0.20				2087846
22'33'44'66'-OctaCB-(197)	ng	<0.20	0.023	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40	0.030	0.40				2087846
22'33'4566'-OctaCB-(200)	ng	<0.20	0.022	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.022	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20	0.028	0.20				2087846
22'344'55'6'-OctaCB-(203)	ng	<0.20	0.028	0.20				2087846
22'344'566'-OctaCB-(204)	ng	<0.20	0.022	0.20				2087846
233'44'55'6'-OctaCB-(205)	ng	<0.20	0.022	0.20				2087846
22'33'44'55'6'-NonaCB-(206)	ng	<0.20	0.024	0.20				2087846
22'33'44'566'-NonaCB-(207)	ng	<0.20	0.023	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.026	0.20				2087846
DecaCB-(209)	ng	<0.20	0.024	0.20				2087846
Monochlorobiphenyl	ng	0.115	0.012	N/A				2087846
Dichlorobiphenyl	ng	3.26	0.048	N/A				2087846
Trichlorobiphenyl	ng	4.24	0.020	N/A				2087846
Tetrachlorobiphenyl	ng	2.85	0.047	N/A				2087846
Pentachlorobiphenyl	ng	0.938	0.019	N/A				2087846
Hexachlorobiphenyl	ng	0.495	0.030	N/A				2087846
Heptachlorobiphenyl	ng	0.112	0.043	N/A				2087846
Octachlorobiphenyl	ng	<N/A	0.035	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.026	N/A				2087846
Decachlorobiphenyl	ng	<N/A	0.024	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.00166		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	79						2087844
Acenaphthylene-2H8	%	85						2087844
Benz(a)anthracene-2H12	%	91						2087844
Benzo(a)pyrene-2H12	%	93						2087844

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	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Benzo(b)fluoranthene-2H12	%	139						2087844
Benzo(g,h,i)perylene-2H12	%	59						2087844
Benzo(k)fluoranthene-2H12	%	114						2087844
Chrysene-2H12	%	89						2087844
Dibenzo(a,h)anthracene-2H14	%	50						2087844
Fluoranthene-2H10	%	99						2087844
Fluorene-2H10	%	80						2087844
Indeno(1,2,3-c,d)pyrene-2H12	%	56						2087844
Naphthalene-2H8	%	76						2087844
Perylene-2H12	%	89						2087844
Phenanthrene-2H10	%	105						2087844
Terphenyl-2H14	%	94						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	98						2087846
C13-2,44'-TriCB-(28)	%	78						2087846
C13-2,4'5'-TriCB-(31) (FS)	%	67						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	119						2087846
C13-22'33'44'5'-HeptaCB-(170)	%	107						2087846
C13-22'33'455'66'-NonaCB-(208)	%	115						2087846
C13-22'33'55'66'-OctaCB-(202)	%	120						2087846
C13-22'33'55'6-HeptaCB-(178)	%	143 (1)						2087846
C13-22'344'55'-HeptaCB-(180)	%	109						2087846
C13-22'34'566'-HeptaCB-(188)	%	122						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	100						2087846
C13-22'44'66'-HexaCB-(155)	%	129						2087846
C13-22'466'-PentaCB-(104)	%	109						2087846
C13-22'66'-TetraCB-(54)	%	102						2087846
C13-22'6-TriCB-(19)	%	96						2087846
C13-22'-DiCB-(4)	%	97						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B022953
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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4541						
Sampling Date		2010/02/08				TOXIC EQUIVALENCY	# of	
	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-233'44'55'-OctaCB-(205)	%	102						2087846
C13-233'44'55'-HeptaCB-(189)	%	97						2087846
C13-233'44'-PentaCB-(105)	%	84						2087846
C13-233'55'-PentaCB-(111)	%	116						2087846
C13-23'44'55'-HexaCB-(167)	%	93						2087846
C13-2344'5-PentaCB-(114)	%	80						2087846
C13-23'44'5-PentaCB-(118)	%	82						2087846
C13-2'344'5-PentaCB-(123)	%	81						2087846
C13-2-MonoCB-(1)	%	73						2087846
C13-33'44'55'-HexaCB-(169)	%	83						2087846
C13-33'44'5-PentaCB-(126)	%	84						2087846
C13-33'44'-TetraCB-(77)	%	87						2087846
C13-344'5-TetraCB-(81)	%	87						2087846
C13-344'-TriCB-(37)	%	77						2087846
C13-44'-DiCB-(15)	%	80						2087846
C13-4-MonoCB-(3)	%	76						2087846
C13-DecaCB-(209)	%	136						2087846
C13-HexaCB-(156)+(157)	%	91						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Maxxam Job #: B022953
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Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4542						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Polyaromatic Hydrocarbons								
Naphthalene	ng	520	3.3	22				2087844
2-Methylnaphthalene	ng	118	2.8	3.1				2087844
2-Chloronaphthalene	ng	0.20	0.040	0.15				2087844
Acenaphthylene	ng	22.2	0.14	0.32				2087844
Acenaphthene	ng	7.16	0.69	0.40				2087844
Fluorene	ng	33.5	2.5	0.49				2087844
Phenanthrene	ng	145	0.92	0.67				2087844
Anthracene	ng	12.1	1.1	0.31				2087844
Fluoranthene	ng	94.4	0.30	0.65				2087844
Pyrene	ng	54.0	0.26	0.52				2087844
Benzo(a)anthracene	ng	7.20	0.28	0.17				2087844
Chrysene	ng	33.7	0.32	0.33				2087844
Benzo(b)fluoranthene	ng	7.00	0.59	0.59				2087844
Benzo(k)fluoranthene	ng	1.24	0.79	0.35				2087844
Benzo(e)pyrene	ng	15.9	1.2	0.43				2087844
Benzo(a)pyrene	ng	3.07	1.6	0.31				2087844
Perylene	ng	<0.26	1.4	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	<0.30	4.9	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	3.6	0.46				2087844
Benzo(g,h,i)perylene	ng	22.7	4.3	0.23				2087844
PCBs								
2-MonoCB-(1)	ng	<0.20 (1)	0.033	0.20				2087846
3-MonoCB-(2)	ng	<0.20	0.019	0.20				2087846
4-MonoCB-(3)	ng	<0.20	0.017	0.20				2087846
2,2'-DiCB-(4)	ng	0.65	0.051	0.20				2087846
2,3-DiCB-(5)	ng	<0.20	0.042	0.20				2087846
2,3'-DiCB-(6)	ng	<0.20 (1)	0.054	0.20				2087846

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Eagle Mountain
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Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4542						
Sampling Date		2010/02/08				TOXIC EQUIVALENCY	# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

2,4-DiCB-(7)	ng	0.24	0.038	0.20				2087846
2,4'-DiCB-(8)	ng	<0.20 (1)	0.23	0.20				2087846
2,5-DiCB-(9)	ng	<0.20	0.038	0.20				2087846
2,6-DiCB-(10)	ng	<0.20	0.042	0.20				2087846
3,3'-DiCB-(11)	ng	1.32	0.039	0.20				2087846
DiCB-(12)+(13)	ng	<0.40	0.040	0.40				2087846
3,5-DiCB-(14)	ng	<0.20	0.038	0.20				2087846
4,4'-DiCB-(15)	ng	0.26	0.043	0.20				2087846
22'3-TriCB-(16)	ng	<0.20 (1)	0.33	0.20				2087846
22'4-TriCB-(17)	ng	0.35	0.016	0.20				2087846
TriCB-(18)+(30)	ng	0.94	0.014	0.40				2087846
22'6-TriCB-(19)	ng	<0.20	0.016	0.20				2087846
TriCB-(20) + (28)	ng	0.66	0.012	0.40				2087846
TriCB-(21)+(33)	ng	<0.40	0.011	0.40				2087846
234'-TriCB-(22)	ng	0.24	0.012	0.20				2087846
235-TriCB-(23)	ng	<0.20	0.013	0.20				2087846
236-TriCB-(24)	ng	<0.20	0.013	0.20				2087846
23'4-TriCB-(25)	ng	<0.20	0.010	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.012	0.40				2087846
23'6-TriCB-(27)	ng	<0.20	0.012	0.20				2087846
24'5-TriCB-(31)	ng	0.66	0.011	0.20				2087846
24'6-TriCB-(32)	ng	0.22	0.011	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.011	0.20				2087846
33'4-TriCB-(35)	ng	<0.20 (1)	0.031	0.20				2087846
33'5-TriCB-(36)	ng	<0.20	0.010	0.20				2087846
344'-TriCB-(37)	ng	<0.20	0.012	0.20				2087846
345-TriCB-(38)	ng	<0.20	0.012	0.20				2087846
34'5-TriCB-(39)	ng	<0.20	0.012	0.20				2087846
TetraCB-(40)+(41)+(71)	ng	<0.60	0.012	0.60				2087846

EDL = Estimated Detection Limit

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TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4542						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'34'-TetraCB-(42)	ng	<0.20	0.013	0.20				2087846
22'35'-TetraCB-(43)	ng	<0.20	0.015	0.20				2087846
TetraCB-(44)+(47)+(65)	ng	<0.60	0.011	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40	0.012	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20	0.013	0.20				2087846
22'45'-TetraCB-(48)	ng	<0.20 (1)	0.073	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	<0.40	0.010	0.40				2087846
TetraCB-(50)+(53)	ng	<0.40	0.011	0.40				2087846
22'55'-TetraCB-(52)	ng	0.84	0.012	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.011	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.023	0.20				2087846
233'4'-Tetra CB(56)	ng	<0.20	0.023	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.022	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.023	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60	0.0089	0.60				2087846
2344'-TetraCB -(60)	ng	<0.20	0.023	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	<0.80	0.022	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20	0.021	0.20				2087846
234'6'-TetraCB-(64)	ng	<0.20	0.0087	0.20				2087846
23'44'-TetraCB-(66)	ng	<0.20	0.021	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20	0.020	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20	0.020	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.021	0.20				2087846
23'5'6'-TetraCB-(73)	ng	<0.20	0.0080	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.021	0.20	0.000100	0.00000210		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.022	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.019	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.020	0.20				2087846
344'5'-TetraCB-(81)	ng	<0.20	0.021	0.20	0.000300	0.00000630		2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds (1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

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Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4542						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'33'4-PentaCB-(82)	ng	<0.20	0.026	0.20				2087846
PentaCB-(83)+(99)	ng	<0.40	0.024	0.40				2087846
22'33'6-PentaCB-(84)	ng	<0.20 (1)	0.053	0.20				2087846
PentaCB-(85)+(116)+(117)	ng	<0.60	0.019	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	<1.2	0.020	1.2				2087846
PentaCB-(88)+(91)	ng	<0.40	0.023	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.024	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	<0.60	0.021	0.60				2087846
22'355'-PentaCB-(92)	ng	<0.20	0.024	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.023	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.025	0.20				2087846
22'35'6-PentaCB-(95)	ng	0.24	0.022	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20	0.0067	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.021	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.0083	0.20				2087846
233'44'-PentaCB-(105)	ng	<0.20	0.015	0.20	0.0000300	0.000000450		2087846
233'45-PentaCB-(106)	ng	<0.20	0.015	0.20				2087846
233'4'5-PentaCB-(107)	ng	<0.20	0.015	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40	0.016	0.40				2087846
PentaCB-(110)+(115)	ng	<0.40	0.019	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.018	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.018	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.015	0.20	0.0000300	0.000000450		2087846
23'44'5-PentaCB-(118)	ng	<0.20	0.014	0.20	0.0000300	0.000000420		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.017	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.018	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20	0.017	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.015	0.20	0.0000300	0.000000450		2087846
33'44'5-PentaCB-(126)	ng	<0.20	0.015	0.20	0.100	0.00150		2087846

EDL = Estimated Detection Limit

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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Eagle Mountain
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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4542						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

33'455'-PentaCB-(127)	ng	<0.20	0.016	0.20				2087846
HexaCB-(128)+(166)	ng	<0.40	0.023	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	<0.60	0.024	0.60				2087846
22'33'45'-HexaCB-(130)	ng	<0.20	0.028	0.20				2087846
22'33'46'-HexaCB-(131)	ng	<0.20	0.029	0.20				2087846
22'33'46'-HexaCB-(132)	ng	<0.20 (1)	0.060	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20	0.026	0.20				2087846
HexaCB-(134)+(143)	ng	<0.40	0.031	0.40				2087846
HexaCB-(135)+(151)	ng	<0.40 (1)	0.062	0.40				2087846
22'33'66'-HexaCB-(136)	ng	<0.20	0.0081	0.20				2087846
22'344'5'-HexaCB-(137)	ng	<0.20	0.028	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.025	0.40				2087846
22'3455'-HexaCB-(141)	ng	<0.20	0.026	0.20				2087846
22'3456'-HexaCB-(142)	ng	<0.20	0.027	0.20				2087846
22'345'6'-HexaCB-(144)	ng	<0.20	0.010	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0084	0.20				2087846
22'34'55'-HexaCB-(146)	ng	<0.20 (1)	0.027	0.20				2087846
HexaCB-(147)+(149)	ng	<0.40	0.032	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.010	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20	0.0082	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0078	0.20				2087846
HexaCB-(153)+(168)	ng	<0.40	0.021	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.0094	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20	0.010	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40 (1)	0.018	0.40	0.0000300	0.000000540		2087846
233'44'6'-HexaCB-(158)	ng	<0.20	0.019	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.018	0.20				2087846
233'456'-HexaCB-(160)	ng	<0.20	0.022	0.20				2087846
233'45'6'-HexaCB-(161)	ng	<0.20	0.020	0.20				2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Maxxam ID		FE4542						
Sampling Date		2010/02/08				TOXIC EQUIVALENCY	# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

233'4'55'-HexaCB-(162)	ng	<0.20	0.018	0.20				2087846
233'4'5'6'-HexaCB-(164)	ng	<0.20	0.019	0.20				2087846
233'5'5'6'-HexaCB-(165)	ng	<0.20	0.022	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20	0.015	0.20	0.0000300	0.000000450		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.016	0.20	0.0300	0.000480		2087846
22'33'44'5'-HeptaCB-(170)	ng	<0.20	0.029	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.035	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.036	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	<0.20	0.034	0.20				2087846
22'33'45'6'-HeptaCB-(175)	ng	<0.20	0.014	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.011	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	<0.20	0.035	0.20				2087846
22'33'55'6'-HeptaCB-(178)	ng	<0.20	0.014	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	<0.20	0.010	0.20				2087846
HeptaCB-(180)+(193)	ng	<0.40	0.026	0.40				2087846
22'344'56'-HeptaCB-(181)	ng	<0.20	0.034	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.014	0.20				2087846
22'344'5'6'-HeptaCB-(183)	ng	<0.20	0.031	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20	0.010	0.20				2087846
22'3455'6'-HeptaCB-(185)	ng	<0.20	0.036	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.011	0.20				2087846
22'34'55'6'-HeptaCB-(187)	ng	<0.20 (1)	0.041	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.014	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.027	0.20	0.0000300	0.000000810		2087846
233'44'56'-HeptaCB-(190)	ng	<0.20	0.028	0.20				2087846
233'44'5'6'-HeptaCB-(191)	ng	<0.20	0.027	0.20				2087846
233'455'6'-HeptaCB-(192)	ng	<0.20	0.030	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20	0.024	0.20				2087846
22'33'44'56'-OctaCB-(195)	ng	<0.20	0.026	0.20				2087846

EDL = Estimated Detection Limit

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TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4542						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'33'44'56'-OctaCB-(196)	ng	<0.20	0.024	0.20				2087846
22'33'44'66'-OctaCB-(197)	ng	<0.20	0.019	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40	0.024	0.40				2087846
22'33'4566'-OctaCB-(200)	ng	<0.20	0.017	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.018	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20	0.022	0.20				2087846
22'344'55'6'-OctaCB-(203)	ng	<0.20	0.023	0.20				2087846
22'344'566'-OctaCB-(204)	ng	<0.20	0.018	0.20				2087846
233'44'55'6'-OctaCB-(205)	ng	<0.20	0.017	0.20				2087846
22'33'44'55'6'-NonaCB-(206)	ng	<0.20	0.030	0.20				2087846
22'33'44'566'-NonaCB-(207)	ng	<0.20	0.028	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.032	0.20				2087846
DecaCB-(209)	ng	<0.20	0.0099	0.20				2087846
Monochlorobiphenyl	ng	0.135	0.019	N/A				2087846
Dichlorobiphenyl	ng	2.47	0.051	N/A				2087846
Trichlorobiphenyl	ng	3.75	0.019	N/A				2087846
Tetrachlorobiphenyl	ng	2.83	0.023	N/A				2087846
Pentachlorobiphenyl	ng	1.19	0.027	N/A				2087846
Hexachlorobiphenyl	ng	0.526	0.032	N/A				2087846
Heptachlorobiphenyl	ng	0.084	0.036	N/A				2087846
Octachlorobiphenyl	ng	<N/A	0.026	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.032	N/A				2087846
Decachlorobiphenyl	ng	0.0126	0.0099	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.00199		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	67						2087844
Acenaphthylene-2H8	%	77						2087844
Benz(a)anthracene-2H12	%	51						2087844
Benzo(a)pyrene-2H12	%	87						2087844
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

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Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4542						
Sampling Date		2010/02/08				TOXIC EQUIVALENCY	# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Benzo(b)fluoranthene-2H12	%	123						2087844
Benzo(g,h,i)perylene-2H12	%	51						2087844
Benzo(k)fluoranthene-2H12	%	107						2087844
Chrysene-2H12	%	48 (1)						2087844
Dibenzo(a,h)anthracene-2H14	%	53						2087844
Fluoranthene-2H10	%	101						2087844
Fluorene-2H10	%	76						2087844
Indeno(1,2,3-c,d)pyrene-2H12	%	65						2087844
Naphthalene-2H8	%	59						2087844
Perylene-2H12	%	88						2087844
Phenanthrene-2H10	%	115						2087844
Terphenyl-2H14	%	76						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	93						2087846
C13-2,44'-TriCB-(28)	%	73						2087846
C13-2,4'5'-TriCB-(31) (FS)	%	62						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	116						2087846
C13-22'33'44'5'-HeptaCB-(170)	%	105						2087846
C13-22'33'455'66'-NonaCB-(208)	%	112						2087846
C13-22'33'55'66'-OctaCB-(202)	%	121						2087846
C13-22'33'55'6-HeptaCB-(178)	%	140 (1)						2087846
C13-22'344'55'-HeptaCB-(180)	%	107						2087846
C13-22'34'566'-HeptaCB-(188)	%	116						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	97						2087846
C13-22'44'66'-HexaCB-(155)	%	125						2087846
C13-22'466'-PentaCB-(104)	%	103						2087846
C13-22'66'-TetraCB-(54)	%	91						2087846
C13-22'6-TriCB-(19)	%	80						2087846
C13-22'-DiCB-(4)	%	72						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4542						
Sampling Date		2010/02/08				TOXIC EQUIVALENCY	# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-233'44'55'-OctaCB-(205)	%	100						2087846
C13-233'44'55'-HeptaCB-(189)	%	94						2087846
C13-233'44'-PentaCB-(105)	%	78						2087846
C13-233'55'-PentaCB-(111)	%	114						2087846
C13-23'44'55'-HexaCB-(167)	%	88						2087846
C13-2344'5-PentaCB-(114)	%	77						2087846
C13-23'44'5-PentaCB-(118)	%	78						2087846
C13-2'344'5-PentaCB-(123)	%	77						2087846
C13-2-MonoCB-(1)	%	52						2087846
C13-33'44'55'-HexaCB-(169)	%	90						2087846
C13-33'44'5-PentaCB-(126)	%	82						2087846
C13-33'44'-TetraCB-(77)	%	88						2087846
C13-344'5-TetraCB-(81)	%	87						2087846
C13-344'-TriCB-(37)	%	75						2087846
C13-44'-DiCB-(15)	%	72						2087846
C13-4-MonoCB-(3)	%	56						2087846
C13-DecaCB-(209)	%	134						2087846
C13-HexaCB-(156)+(157)	%	89						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

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Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4543						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Polyaromatic Hydrocarbons								
Naphthalene	ng	572	2.7	22				2087844
2-Methylnaphthalene	ng	79.2	1.3	3.1				2087844
2-Chloronaphthalene	ng	<0.15	0.036	0.15				2087844
Acenaphthylene	ng	5.88	0.34	0.32				2087844
Acenaphthene	ng	5.64	0.55	0.40				2087844
Fluorene	ng	7.44	1.2	0.49				2087844
Phenanthrene	ng	59.2	1.3	0.67				2087844
Anthracene	ng	6.72	1.6	0.31				2087844
Fluoranthene	ng	30.6	0.24	0.65				2087844
Pyrene	ng	24.4	0.20	0.52				2087844
Benzo(a)anthracene	ng	2.55	0.19	0.17				2087844
Chrysene	ng	12.6	0.22	0.33				2087844
Benzo(b)fluoranthene	ng	2.20	0.51	0.59				2087844
Benzo(k)fluoranthene	ng	3.55	0.73	0.35				2087844
Benzo(e)pyrene	ng	12.7	1.3	0.43				2087844
Benzo(a)pyrene	ng	3.55	1.7	0.31				2087844
Perylene	ng	<0.26	1.4	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	<0.30	5.4	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	4.8	0.46				2087844
Benzo(g,h,i)perylene	ng	24.2	4.9	0.23				2087844
PCBs								
2-MonoCB-(1)	ng	<0.20	0.018	0.20				2087846
3-MonoCB-(2)	ng	<0.20 (1)	0.041	0.20				2087846
4-MonoCB-(3)	ng	<0.20 (1)	0.051	0.20				2087846
2,2'-DiCB-(4)	ng	0.60	0.046	0.20				2087846
2,3-DiCB-(5)	ng	<0.20	0.065	0.20				2087846
2,3'-DiCB-(6)	ng	<0.20	0.059	0.20				2087846

RDL = Reportable Detection Limit
EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Eagle Mountain
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Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4543						
Sampling Date		2010/02/09				TOXIC EQUIVALENCY	# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

2,4-DiCB-(7)	ng	<0.20 (1)	0.22	0.20				2087846
2,4'-DiCB-(8)	ng	0.21	0.056	0.20				2087846
2,5-DiCB-(9)	ng	<0.20	0.059	0.20				2087846
2,6-DiCB-(10)	ng	<0.20	0.038	0.20				2087846
3,3'-DiCB-(11)	ng	0.95	0.061	0.20				2087846
DiCB-(12)+(13)	ng	<0.40	0.062	0.40				2087846
3,5-DiCB-(14)	ng	<0.20	0.059	0.20				2087846
4,4'-DiCB-(15)	ng	<0.20 (1)	0.23	0.20				2087846
22'3-TriCB-(16)	ng	0.42	0.020	0.20				2087846
22'4-TriCB-(17)	ng	0.37	0.017	0.20				2087846
TriCB-(18)+(30)	ng	0.96	0.014	0.40				2087846
22'6-TriCB-(19)	ng	<0.20 (1)	0.14	0.20				2087846
TriCB-(20) + (28)	ng	0.67	0.014	0.40				2087846
TriCB-(21)+(33)	ng	<0.40	0.014	0.40				2087846
234'-TriCB-(22)	ng	0.23	0.015	0.20				2087846
235-TriCB-(23)	ng	<0.20	0.016	0.20				2087846
236-TriCB-(24)	ng	<0.20	0.013	0.20				2087846
23'4-TriCB-(25)	ng	<0.20 (1)	0.048	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.014	0.40				2087846
23'6-TriCB-(27)	ng	<0.20	0.012	0.20				2087846
24'5-TriCB-(31)	ng	0.68	0.013	0.20				2087846
24'6-TriCB-(32)	ng	0.21	0.012	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.014	0.20				2087846
33'4-TriCB-(35)	ng	<0.20	0.014	0.20				2087846
33'5-TriCB-(36)	ng	<0.20	0.012	0.20				2087846
344'-TriCB-(37)	ng	<0.20	0.015	0.20				2087846
345-TriCB-(38)	ng	<0.20	0.015	0.20				2087846
34'5-TriCB-(39)	ng	<0.20	0.014	0.20				2087846
TetraCB-(40)+(41)+(71)	ng	<0.60	0.025	0.60				2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4543						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'34'-TetraCB-(42)	ng	<0.20	0.028	0.20				2087846
22'35'-TetraCB-(43)	ng	<0.20	0.034	0.20				2087846
TetraCB-(44)+(47)+(65)	ng	<0.60	0.023	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40	0.025	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20	0.029	0.20				2087846
22'45'-TetraCB-(48)	ng	<0.20	0.026	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	<0.40	0.022	0.40				2087846
TetraCB-(50)+(53)	ng	<0.40	0.025	0.40				2087846
22'55'-TetraCB-(52)	ng	1.02	0.025	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.014	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.022	0.20				2087846
233'4'-Tetra CB(56)	ng	<0.20 (1)	0.055	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.020	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.021	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60	0.020	0.60				2087846
2344'-TetraCB -(60)	ng	<0.20	0.021	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	<0.80	0.020	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20	0.019	0.20				2087846
234'6'-TetraCB-(64)	ng	<0.20	0.019	0.20				2087846
23'44'-TetraCB-(66)	ng	<0.20	0.020	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20	0.018	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20	0.019	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.020	0.20				2087846
23'5'6'-TetraCB-(73)	ng	<0.20	0.018	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.019	0.20	0.000100	0.00000190		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.021	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.018	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.019	0.20				2087846
344'5'-TetraCB-(81)	ng	<0.20	0.019	0.20	0.000300	0.00000570		2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds (1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4543						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'33'4-PentaCB-(82)	ng	<0.20	0.031	0.20				2087846
PentaCB-(83)+(99)	ng	<0.40	0.029	0.40				2087846
22'33'6-PentaCB-(84)	ng	<0.20	0.032	0.20				2087846
PentaCB-(85)+(116)+(117)	ng	<0.60	0.023	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	<1.2	0.025	1.2				2087846
PentaCB-(88)+(91)	ng	<0.40	0.028	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.029	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	<0.60	0.025	0.60				2087846
22'355'-PentaCB-(92)	ng	<0.20 (1)	0.042	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.028	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.030	0.20				2087846
22'35'6-PentaCB-(95)	ng	0.29	0.027	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20	0.0061	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.026	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.0076	0.20				2087846
233'44'-PentaCB-(105)	ng	<0.20	0.011	0.20	0.0000300	0.000000330		2087846
233'45-PentaCB-(106)	ng	<0.20	0.011	0.20				2087846
233'4'5-PentaCB-(107)	ng	<0.20	0.011	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40	0.012	0.40				2087846
PentaCB-(110)+(115)	ng	<0.40	0.023	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.022	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.022	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.011	0.20	0.0000300	0.000000330		2087846
23'44'5-PentaCB-(118)	ng	<0.20	0.011	0.20	0.0000300	0.000000330		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.020	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.021	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20	0.013	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.011	0.20	0.0000300	0.000000330		2087846
33'44'5-PentaCB-(126)	ng	<0.20	0.011	0.20	0.100	0.00110		2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4543						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

33'455'-PentaCB-(127)	ng	<0.20	0.011	0.20				2087846
HexaCB-(128)+(166)	ng	<0.40	0.019	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	<0.60	0.020	0.60				2087846
22'33'45'-HexaCB-(130)	ng	<0.20	0.024	0.20				2087846
22'33'46'-HexaCB-(131)	ng	<0.20	0.024	0.20				2087846
22'33'46'-HexaCB-(132)	ng	<0.20 (1)	0.041	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20	0.022	0.20				2087846
HexaCB-(134)+(143)	ng	<0.40	0.026	0.40				2087846
HexaCB-(135)+(151)	ng	<0.40	0.0093	0.40				2087846
22'33'66'-HexaCB-(136)	ng	<0.20 (1)	0.019	0.20				2087846
22'344'5'-HexaCB-(137)	ng	<0.20	0.024	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.021	0.40				2087846
22'3455'-HexaCB-(141)	ng	<0.20	0.022	0.20				2087846
22'3456'-HexaCB-(142)	ng	<0.20	0.023	0.20				2087846
22'345'6'-HexaCB-(144)	ng	<0.20	0.0091	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0074	0.20				2087846
22'34'55'-HexaCB-(146)	ng	<0.20	0.020	0.20				2087846
HexaCB-(147)+(149)	ng	<0.40	0.027	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.0091	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20	0.0072	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0068	0.20				2087846
HexaCB-(153)+(168)	ng	<0.40	0.018	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.0082	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20	0.0090	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40	0.014	0.40	0.0000300	0.000000420		2087846
233'44'6'-HexaCB-(158)	ng	<0.20	0.016	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.016	0.20				2087846
233'456'-HexaCB-(160)	ng	<0.20	0.018	0.20				2087846
233'45'6'-HexaCB-(161)	ng	<0.20	0.017	0.20				2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4543						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

233'4'55'-HexaCB-(162)	ng	<0.20	0.016	0.20				2087846
233'4'5'6'-HexaCB-(164)	ng	<0.20	0.016	0.20				2087846
233'5'5'6'-HexaCB-(165)	ng	<0.20	0.018	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20	0.014	0.20	0.0000300	0.000000420		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.014	0.20	0.0300	0.000420		2087846
22'33'44'5'-HeptaCB-(170)	ng	<0.20	0.024	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.029	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.029	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	<0.20	0.028	0.20				2087846
22'33'45'6'-HeptaCB-(175)	ng	<0.20	0.013	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.010	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	<0.20	0.029	0.20				2087846
22'33'55'6'-HeptaCB-(178)	ng	<0.20	0.014	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	<0.20	0.010	0.20				2087846
HeptaCB-(180)+(193)	ng	<0.40	0.022	0.40				2087846
22'344'56'-HeptaCB-(181)	ng	<0.20	0.028	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.014	0.20				2087846
22'344'5'6'-HeptaCB-(183)	ng	<0.20	0.025	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20	0.010	0.20				2087846
22'3455'6'-HeptaCB-(185)	ng	<0.20	0.030	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.011	0.20				2087846
22'34'55'6'-HeptaCB-(187)	ng	<0.20	0.013	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.014	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.024	0.20	0.0000300	0.000000720		2087846
233'44'56'-HeptaCB-(190)	ng	<0.20	0.023	0.20				2087846
233'44'5'6'-HeptaCB-(191)	ng	<0.20	0.022	0.20				2087846
233'455'6'-HeptaCB-(192)	ng	<0.20	0.024	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20	0.024	0.20				2087846
22'33'44'56'-OctaCB-(195)	ng	<0.20	0.025	0.20				2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

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Eagle Mountain
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Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4543						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'33'44'56'-OctaCB-(196)	ng	<0.20	0.017	0.20				2087846
22'33'44'66'-OctaCB-(197)	ng	<0.20	0.013	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40	0.017	0.40				2087846
22'33'4566'-OctaCB-(200)	ng	<0.20	0.012	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.013	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20	0.016	0.20				2087846
22'344'55'6'-OctaCB-(203)	ng	<0.20	0.016	0.20				2087846
22'344'566'-OctaCB-(204)	ng	<0.20	0.013	0.20				2087846
233'44'55'6'-OctaCB-(205)	ng	<0.20	0.016	0.20				2087846
22'33'44'55'6'-NonaCB-(206)	ng	<0.20	0.022	0.20				2087846
22'33'44'566'-NonaCB-(207)	ng	<0.20	0.020	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.023	0.20				2087846
DecaCB-(209)	ng	<0.20	0.011	0.20				2087846
Monochlorobiphenyl	ng	0.034	0.020	N/A				2087846
Dichlorobiphenyl	ng	1.76	0.067	N/A				2087846
Trichlorobiphenyl	ng	4.03	0.020	N/A				2087846
Tetrachlorobiphenyl	ng	3.01	0.034	N/A				2087846
Pentachlorobiphenyl	ng	1.17	0.032	N/A				2087846
Hexachlorobiphenyl	ng	0.465	0.027	N/A				2087846
Heptachlorobiphenyl	ng	0.094	0.030	N/A				2087846
Octachlorobiphenyl	ng	<N/A	0.025	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.023	N/A				2087846
Decachlorobiphenyl	ng	<N/A	0.011	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.00153		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	73						2087844
Acenaphthylene-2H8	%	77						2087844
Benz(a)anthracene-2H12	%	58						2087844
Benzo(a)pyrene-2H12	%	87						2087844
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

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Eagle Mountain
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Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4543						
Sampling Date		2010/02/09				TOXIC EQUIVALENCY	# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Benzo(b)fluoranthene-2H12	%	138						2087844
Benzo(g,h,i)perylene-2H12	%	49 (1)						2087844
Benzo(k)fluoranthene-2H12	%	127						2087844
Chrysene-2H12	%	56						2087844
Dibenzo(a,h)anthracene-2H14	%	47 (1)						2087844
Fluoranthene-2H10	%	105						2087844
Fluorene-2H10	%	74						2087844
Indeno(1,2,3-c,d)pyrene-2H12	%	59						2087844
Naphthalene-2H8	%	66						2087844
Perylene-2H12	%	91						2087844
Phenanthrene-2H10	%	126						2087844
Terphenyl-2H14	%	67						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	100						2087846
C13-2,44'-TriCB-(28)	%	76						2087846
C13-2,4'5'-TriCB-(31) (FS)	%	62						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	127						2087846
C13-22'33'44'5-HeptaCB-(170)	%	112						2087846
C13-22'33'455'66'-NonaCB-(208)	%	122						2087846
C13-22'33'55'66'-OctaCB-(202)	%	126						2087846
C13-22'33'55'6-HeptaCB-(178)	%	152 (1)						2087846
C13-22'344'55'-HeptaCB-(180)	%	111						2087846
C13-22'34'566'-HeptaCB-(188)	%	126						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	102						2087846
C13-22'44'66'-HexaCB-(155)	%	133						2087846
C13-22'466'-PentaCB-(104)	%	110						2087846
C13-22'66'-TetraCB-(54)	%	96						2087846
C13-22'6-TriCB-(19)	%	83						2087846
C13-22'-DiCB-(4)	%	80						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Eagle Mountain
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Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4543						
Sampling Date		2010/02/09				TOXIC EQUIVALENCY	# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-233'44'55'-OctaCB-(205)	%	106						2087846
C13-233'44'55'-HeptaCB-(189)	%	100						2087846
C13-233'44'-PentaCB-(105)	%	84						2087846
C13-233'55'-PentaCB-(111)	%	117						2087846
C13-23'44'55'-HexaCB-(167)	%	93						2087846
C13-2344'5'-PentaCB-(114)	%	83						2087846
C13-23'44'5'-PentaCB-(118)	%	83						2087846
C13-2'344'5'-PentaCB-(123)	%	82						2087846
C13-2-MonoCB-(1)	%	57						2087846
C13-33'44'55'-HexaCB-(169)	%	94						2087846
C13-33'44'5'-PentaCB-(126)	%	83						2087846
C13-33'44'-TetraCB-(77)	%	90						2087846
C13-344'5'-TetraCB-(81)	%	90						2087846
C13-344'-TriCB-(37)	%	76						2087846
C13-44'-DiCB-(15)	%	73						2087846
C13-4-MonoCB-(3)	%	62						2087846
C13-DecaCB-(209)	%	145 (1)						2087846
C13-HexaCB-(156)+(157)	%	92						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Eagle Mountain
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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4544						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Polyaromatic Hydrocarbons								
Naphthalene	ng	544	3.6	22				2087844
2-Methylnaphthalene	ng	94.0	2.3	3.1				2087844
2-Chloronaphthalene	ng	0.38	0.11	0.15				2087844
Acenaphthylene	ng	7.12	0.77	0.32				2087844
Acenaphthene	ng	7.36	0.49	0.40				2087844
Fluorene	ng	10.7	1.4	0.49				2087844
Phenanthrene	ng	59.6	1.6	0.67				2087844
Anthracene	ng	3.30	1.9	0.31				2087844
Fluoranthene	ng	41.6	0.36	0.65				2087844
Pyrene	ng	35.1	0.30	0.52				2087844
Benzo(a)anthracene	ng	5.04	0.21	0.17				2087844
Chrysene	ng	23.7	0.24	0.33				2087844
Benzo(b)fluoranthene	ng	4.12	0.46	0.59				2087844
Benzo(k)fluoranthene	ng	2.17	0.62	0.35				2087844
Benzo(e)pyrene	ng	9.56	0.99	0.43				2087844
Benzo(a)pyrene	ng	2.61	1.3	0.31				2087844
Perylene	ng	<0.26	1.1	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	<0.30	4.8	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	3.4	0.46				2087844
Benzo(g,h,i)perylene	ng	23.8	4.4	0.23				2087844
PCBs								
2-MonoCB-(1)	ng	<0.20	0.013	0.20				2087846
3-MonoCB-(2)	ng	<0.20	0.014	0.20				2087846
4-MonoCB-(3)	ng	<0.20 (1)	0.035	0.20				2087846
2,2'-DiCB-(4)	ng	0.65	0.032	0.20				2087846
2,3-DiCB-(5)	ng	<0.20	0.044	0.20				2087846
2,3'-DiCB-(6)	ng	<0.20	0.040	0.20				2087846

RDL = Reportable Detection Limit
EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Eagle Mountain
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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4544						
Sampling Date		2010/02/09				TOXIC EQUIVALENCY	# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

2,4-DiCB-(7)	ng	<0.20 (1)	0.15	0.20				2087846
2,4'-DiCB-(8)	ng	<0.20	0.038	0.20				2087846
2,5-DiCB-(9)	ng	<0.20	0.040	0.20				2087846
2,6-DiCB-(10)	ng	<0.20	0.026	0.20				2087846
3,3'-DiCB-(11)	ng	0.79	0.041	0.20				2087846
DiCB-(12)+(13)	ng	<0.40	0.042	0.40				2087846
3,5-DiCB-(14)	ng	<0.20	0.040	0.20				2087846
4,4'-DiCB-(15)	ng	0.23	0.045	0.20				2087846
22'3-TriCB-(16)	ng	0.37	0.015	0.20				2087846
22'4-TriCB-(17)	ng	0.35	0.013	0.20				2087846
TriCB-(18)+(30)	ng	1.02	0.011	0.40				2087846
22'6-TriCB-(19)	ng	<0.20	0.013	0.20				2087846
TriCB-(20) + (28)	ng	0.59	0.017	0.40				2087846
TriCB-(21)+(33)	ng	<0.40	0.017	0.40				2087846
234'-TriCB-(22)	ng	0.21	0.018	0.20				2087846
235-TriCB-(23)	ng	<0.20	0.019	0.20				2087846
236-TriCB-(24)	ng	<0.20	0.010	0.20				2087846
23'4-TriCB-(25)	ng	<0.20	0.015	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.017	0.40				2087846
23'6-TriCB-(27)	ng	<0.20 (1)	0.042	0.20				2087846
24'5-TriCB-(31)	ng	0.59	0.016	0.20				2087846
24'6-TriCB-(32)	ng	0.21	0.0088	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.016	0.20				2087846
33'4-TriCB-(35)	ng	<0.20 (1)	0.023	0.20				2087846
33'5-TriCB-(36)	ng	<0.20	0.014	0.20				2087846
344'-TriCB-(37)	ng	<0.20 (1)	0.060	0.20				2087846
345-TriCB-(38)	ng	<0.20	0.017	0.20				2087846
34'5-TriCB-(39)	ng	<0.20	0.017	0.20				2087846
TetraCB-(40)+(41)+(71)	ng	<0.60	0.016	0.60				2087846

EDL = Estimated Detection Limit

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(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Maxxam ID		FE4544						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'34'-TetraCB-(42)	ng	<0.20	0.018	0.20				2087846
22'35'-TetraCB-(43)	ng	<0.20	0.021	0.20				2087846
TetraCB-(44)+(47)+(65)	ng	<0.60	0.015	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40 (1)	0.11	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20	0.019	0.20				2087846
22'45'-TetraCB-(48)	ng	<0.20 (1)	0.067	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	<0.40	0.014	0.40				2087846
TetraCB-(50)+(53)	ng	<0.40	0.016	0.40				2087846
22'55'-TetraCB-(52)	ng	0.84	0.016	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.0096	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.013	0.20				2087846
233'4'-Tetra CB(56)	ng	<0.20	0.013	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.012	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.013	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60 (1)	0.021	0.60				2087846
2344'-TetraCB -(60)	ng	<0.20	0.013	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	<0.80	0.012	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20	0.012	0.20				2087846
234'6'-TetraCB-(64)	ng	<0.20	0.012	0.20				2087846
23'44'-TetraCB-(66)	ng	<0.20	0.012	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20	0.011	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20 (1)	0.012	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.012	0.20				2087846
23'5'6'-TetraCB-(73)	ng	<0.20	0.011	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.012	0.20	0.000100	0.00000120		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.013	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.011	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.011	0.20				2087846
344'5'-TetraCB-(81)	ng	<0.20	0.012	0.20	0.000300	0.00000360		2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4544						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'33'4-PentaCB-(82)	ng	<0.20	0.037	0.20				2087846
PentaCB-(83)+(99)	ng	<0.40	0.034	0.40				2087846
22'33'6-PentaCB-(84)	ng	<0.20 (1)	0.045	0.20				2087846
PentaCB-(85)+(116)+(117)	ng	<0.60	0.027	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	<1.2	0.030	1.2				2087846
PentaCB-(88)+(91)	ng	<0.40	0.033	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.035	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	<0.60	0.030	0.60				2087846
22'355'-PentaCB-(92)	ng	<0.20	0.034	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.034	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.036	0.20				2087846
22'35'6-PentaCB-(95)	ng	0.22	0.032	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20	0.0099	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.030	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.012	0.20				2087846
233'44'-PentaCB-(105)	ng	<0.20 (1)	0.026	0.20	0.0000300	0.000000780		2087846
233'45-PentaCB-(106)	ng	<0.20	0.015	0.20				2087846
233'4'5-PentaCB-(107)	ng	<0.20	0.015	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40	0.016	0.40				2087846
PentaCB-(110)+(115)	ng	<0.40	0.028	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.026	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.026	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.014	0.20	0.0000300	0.000000420		2087846
23'44'5-PentaCB-(118)	ng	<0.20	0.014	0.20	0.0000300	0.000000420		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.024	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.026	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20	0.017	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.015	0.20	0.0000300	0.000000450		2087846
33'44'5-PentaCB-(126)	ng	<0.20	0.014	0.20	0.100	0.00140		2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds (1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4544						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'455'-PentaCB-(127)	ng	<0.20	0.015	0.20				2087846
HexaCB-(128)+(166)	ng	<0.40	0.023	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	<0.60	0.024	0.60				2087846
22'33'45'-HexaCB-(130)	ng	<0.20	0.028	0.20				2087846
22'33'46'-HexaCB-(131)	ng	<0.20	0.028	0.20				2087846
22'33'46'-HexaCB-(132)	ng	<0.20 (1)	0.046	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20	0.026	0.20				2087846
HexaCB-(134)+(143)	ng	<0.40	0.031	0.40				2087846
HexaCB-(135)+(151)	ng	<0.40	0.0082	0.40				2087846
22'33'66'-HexaCB-(136)	ng	<0.20	0.0062	0.20				2087846
22'344'5'-HexaCB-(137)	ng	<0.20	0.028	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.025	0.40				2087846
22'3455'-HexaCB-(141)	ng	<0.20	0.026	0.20				2087846
22'3456'-HexaCB-(142)	ng	<0.20	0.027	0.20				2087846
22'345'6'-HexaCB-(144)	ng	<0.20	0.0081	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0065	0.20				2087846
22'34'55'-HexaCB-(146)	ng	<0.20	0.023	0.20				2087846
HexaCB-(147)+(149)	ng	<0.40	0.031	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.0080	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20	0.0064	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0060	0.20				2087846
HexaCB-(153)+(168)	ng	<0.40	0.021	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.0073	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20	0.0080	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40	0.017	0.40	0.0000300	0.000000510		2087846
233'44'6'-HexaCB-(158)	ng	<0.20	0.018	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.019	0.20				2087846
233'456'-HexaCB-(160)	ng	<0.20	0.021	0.20				2087846
233'45'6'-HexaCB-(161)	ng	<0.20	0.019	0.20				2087846
<p>EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds (1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.</p>								

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Eagle Mountain
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Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4544						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

233'4'55'-HexaCB-(162)	ng	<0.20	0.019	0.20				2087846
233'4'5'6'-HexaCB-(164)	ng	<0.20	0.019	0.20				2087846
233'55'6'-HexaCB-(165)	ng	<0.20	0.022	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20	0.017	0.20	0.0000300	0.000000510		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.017	0.20	0.0300	0.000510		2087846
22'33'44'5'-HeptaCB-(170)	ng	<0.20	0.036	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.045	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.045	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	<0.20	0.044	0.20				2087846
22'33'45'6'-HeptaCB-(175)	ng	<0.20	0.0090	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.0071	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	<0.20	0.045	0.20				2087846
22'33'55'6'-HeptaCB-(178)	ng	<0.20	0.0093	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	<0.20 (1)	0.014	0.20				2087846
HeptaCB-(180)+(193)	ng	<0.40	0.033	0.40				2087846
22'344'56'-HeptaCB-(181)	ng	<0.20	0.044	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.0091	0.20				2087846
22'344'5'6'-HeptaCB-(183)	ng	<0.20	0.039	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20	0.0068	0.20				2087846
22'3455'6'-HeptaCB-(185)	ng	<0.20	0.046	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.0074	0.20				2087846
22'34'55'6'-HeptaCB-(187)	ng	<0.20 (1)	0.030	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.0095	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.034	0.20	0.0000300	0.00000102		2087846
233'44'56'-HeptaCB-(190)	ng	<0.20	0.035	0.20				2087846
233'44'5'6'-HeptaCB-(191)	ng	<0.20	0.035	0.20				2087846
233'455'6'-HeptaCB-(192)	ng	<0.20	0.038	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20	0.031	0.20				2087846
22'33'44'56'-OctaCB-(195)	ng	<0.20	0.034	0.20				2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4544						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'33'44'56'-OctaCB-(196)	ng	<0.20	0.021	0.20				2087846
22'33'44'66'-OctaCB-(197)	ng	<0.20	0.016	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40	0.021	0.40				2087846
22'33'4566'-OctaCB-(200)	ng	<0.20	0.015	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.016	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20	0.019	0.20				2087846
22'344'55'6'-OctaCB-(203)	ng	<0.20	0.020	0.20				2087846
22'344'566'-OctaCB-(204)	ng	<0.20	0.016	0.20				2087846
233'44'55'6'-OctaCB-(205)	ng	<0.20	0.022	0.20				2087846
22'33'44'55'6'-NonaCB-(206)	ng	<0.20	0.029	0.20				2087846
22'33'44'566'-NonaCB-(207)	ng	<0.20	0.028	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.031	0.20				2087846
DecaCB-(209)	ng	<0.20	0.017	0.20				2087846
Monochlorobiphenyl	ng	0.080	0.014	N/A				2087846
Dichlorobiphenyl	ng	1.87	0.045	N/A				2087846
Trichlorobiphenyl	ng	3.80	0.019	N/A				2087846
Tetrachlorobiphenyl	ng	2.40	0.021	N/A				2087846
Pentachlorobiphenyl	ng	0.928	0.038	N/A				2087846
Hexachlorobiphenyl	ng	0.493	0.031	N/A				2087846
Heptachlorobiphenyl	ng	0.056	0.046	N/A				2087846
Octachlorobiphenyl	ng	<N/A	0.034	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.031	N/A				2087846
Decachlorobiphenyl	ng	<N/A	0.017	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.00192		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	68						2087844
Acenaphthylene-2H8	%	72						2087844
Benz(a)anthracene-2H12	%	56						2087844
Benzo(a)pyrene-2H12	%	84						2087844

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

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Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4544						
Sampling Date		2010/02/09				TOXIC EQUIVALENCY	# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Benzo(b)fluoranthene-2H12	%	119						2087844
Benzo(g,h,i)perylene-2H12	%	55						2087844
Benzo(k)fluoranthene-2H12	%	100						2087844
Chrysene-2H12	%	54						2087844
Dibenzo(a,h)anthracene-2H14	%	53						2087844
Fluoranthene-2H10	%	89						2087844
Fluorene-2H10	%	83						2087844
Indeno(1,2,3-c,d)pyrene-2H12	%	55						2087844
Naphthalene-2H8	%	72						2087844
Perylene-2H12	%	86						2087844
Phenanthrene-2H10	%	101						2087844
Terphenyl-2H14	%	78						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	92						2087846
C13-2,44'-TriCB-(28)	%	75						2087846
C13-2,4'5-TriCB-(31) (FS)	%	62						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	113						2087846
C13-22'33'44'5-HeptaCB-(170)	%	102						2087846
C13-22'33'455'66'-NonaCB-(208)	%	113						2087846
C13-22'33'55'66'-OctaCB-(202)	%	118						2087846
C13-22'33'55'6-HeptaCB-(178)	%	145 (1)						2087846
C13-22'344'55'-HeptaCB-(180)	%	103						2087846
C13-22'34'566'-HeptaCB-(188)	%	116						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	95						2087846
C13-22'44'66'-HexaCB-(155)	%	122						2087846
C13-22'466'-PentaCB-(104)	%	103						2087846
C13-22'66'-TetraCB-(54)	%	97						2087846
C13-22'6-TriCB-(19)	%	91						2087846
C13-22'-DiCB-(4)	%	93						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4544						
Sampling Date		2010/02/09				TOXIC EQUIVALENCY	# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-233'44'55'-OctaCB-(205)	%	99						2087846
C13-233'44'55'-HeptaCB-(189)	%	93						2087846
C13-233'44'-PentaCB-(105)	%	77						2087846
C13-233'55'-PentaCB-(111)	%	114						2087846
C13-23'44'55'-HexaCB-(167)	%	86						2087846
C13-2344'5-PentaCB-(114)	%	73						2087846
C13-23'44'5-PentaCB-(118)	%	75						2087846
C13-2'344'5-PentaCB-(123)	%	75						2087846
C13-2-MonoCB-(1)	%	67						2087846
C13-33'44'55'-HexaCB-(169)	%	86						2087846
C13-33'44'5-PentaCB-(126)	%	79						2087846
C13-33'44'-TetraCB-(77)	%	82						2087846
C13-344'5-TetraCB-(81)	%	84						2087846
C13-344'-TriCB-(37)	%	71						2087846
C13-44'-DiCB-(15)	%	75						2087846
C13-4-MonoCB-(3)	%	72						2087846
C13-DecaCB-(209)	%	135						2087846
C13-HexaCB-(156)+(157)	%	86						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4545						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Polyaromatic Hydrocarbons								
Naphthalene	ng	568	4.1	22				2087844
2-Methylnaphthalene	ng	91.2	1.4	3.1				2087844
2-Chloronaphthalene	ng	0.23	0.044	0.15				2087844
Acenaphthylene	ng	5.92	0.28	0.32				2087844
Acenaphthene	ng	7.20	0.60	0.40				2087844
Fluorene	ng	6.80	1.1	0.49				2087844
Phenanthrene	ng	58.8	2.0	0.67				2087844
Anthracene	ng	2.82	2.4	0.31				2087844
Fluoranthene	ng	30.5	0.24	0.65				2087844
Pyrene	ng	24.0	0.20	0.52				2087844
Benzo(a)anthracene	ng	2.73	0.16	0.17				2087844
Chrysene	ng	11.6	0.18	0.33				2087844
Benzo(b)fluoranthene	ng	1.97	0.42	0.59				2087844
Benzo(k)fluoranthene	ng	1.95	0.57	0.35				2087844
Benzo(e)pyrene	ng	7.36	0.97	0.43				2087844
Benzo(a)pyrene	ng	<0.31	1.3	0.31				2087844
Perylene	ng	<0.26	1.0	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	<0.30	3.9	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	2.8	0.46				2087844
Benzo(g,h,i)perylene	ng	14.6	3.6	0.23				2087844
PCBs								
2-MonoCB-(1)	ng	<0.20 (1)	0.028	0.20				2087846
3-MonoCB-(2)	ng	<0.20	0.015	0.20				2087846
4-MonoCB-(3)	ng	<0.20	0.014	0.20				2087846
2,2'-DiCB-(4)	ng	0.62	0.039	0.20				2087846
2,3-DiCB-(5)	ng	<0.20	0.045	0.20				2087846
2,3'-DiCB-(6)	ng	<0.20	0.041	0.20				2087846

RDL = Reportable Detection Limit
EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4545						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

2,4-DiCB-(7)	ng	<0.20	0.041	0.20				2087846
2,4'-DiCB-(8)	ng	0.21	0.039	0.20				2087846
2,5-DiCB-(9)	ng	<0.20	0.041	0.20				2087846
2,6-DiCB-(10)	ng	<0.20	0.032	0.20				2087846
3,3'-DiCB-(11)	ng	0.68	0.042	0.20				2087846
DiCB-(12)+(13)	ng	<0.40	0.043	0.40				2087846
3,5-DiCB-(14)	ng	<0.20	0.041	0.20				2087846
4,4'-DiCB-(15)	ng	0.22	0.047	0.20				2087846
22'3-TriCB-(16)	ng	0.43	0.022	0.20				2087846
22'4-TriCB-(17)	ng	0.40	0.018	0.20				2087846
TriCB-(18)+(30)	ng	1.02	0.015	0.40				2087846
22'6-TriCB-(19)	ng	<0.20 (1)	0.15	0.20				2087846
TriCB-(20) + (28)	ng	0.64	0.020	0.40				2087846
TriCB-(21)+(33)	ng	<0.40	0.020	0.40				2087846
234'-TriCB-(22)	ng	0.23	0.021	0.20				2087846
235-TriCB-(23)	ng	<0.20	0.022	0.20				2087846
236-TriCB-(24)	ng	<0.20	0.014	0.20				2087846
23'4-TriCB-(25)	ng	<0.20	0.018	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.020	0.40				2087846
23'6-TriCB-(27)	ng	<0.20	0.013	0.20				2087846
24'5-TriCB-(31)	ng	0.64	0.019	0.20				2087846
24'6-TriCB-(32)	ng	0.22	0.012	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.020	0.20				2087846
33'4-TriCB-(35)	ng	<0.20	0.020	0.20				2087846
33'5-TriCB-(36)	ng	<0.20	0.017	0.20				2087846
344'-TriCB-(37)	ng	<0.20	0.021	0.20				2087846
345-TriCB-(38)	ng	<0.20	0.021	0.20				2087846
34'5-TriCB-(39)	ng	<0.20	0.020	0.20				2087846
TetraCB-(40)+(41)+(71)	ng	<0.60	0.026	0.60				2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
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Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4545						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'34'-TetraCB-(42)	ng	<0.20	0.028	0.20				2087846
22'35'-TetraCB-(43)	ng	<0.20	0.034	0.20				2087846
TetraCB-(44)+(47)+(65)	ng	<0.60	0.024	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40	0.026	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20	0.030	0.20				2087846
22'45'-TetraCB-(48)	ng	<0.20	0.026	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	<0.40	0.023	0.40				2087846
TetraCB-(50)+(53)	ng	<0.40	0.025	0.40				2087846
22'55'-TetraCB-(52)	ng	0.89	0.026	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.010	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.021	0.20				2087846
233'4'-Tetra CB(56)	ng	<0.20	0.020	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.019	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.020	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60 (1)	0.022	0.60				2087846
2344'-TetraCB -(60)	ng	<0.20 (1)	0.023	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	<0.80	0.019	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20	0.018	0.20				2087846
234'6'-TetraCB-(64)	ng	<0.20	0.019	0.20				2087846
23'44'-TetraCB-(66)	ng	<0.20	0.019	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20	0.017	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20	0.018	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.018	0.20				2087846
23'5'6'-TetraCB-(73)	ng	<0.20	0.018	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.018	0.20	0.000100	0.00000180		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.020	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.017	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.018	0.20				2087846
344'5'-TetraCB-(81)	ng	<0.20	0.018	0.20	0.000300	0.00000540		2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds (1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

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Maxxam ID		FE4545						
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	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'33'4-PentaCB-(82)	ng	<0.20	0.022	0.20				2087846
PentaCB-(83)+(99)	ng	<0.40	0.020	0.40				2087846
22'33'6-PentaCB-(84)	ng	<0.20	0.023	0.20				2087846
PentaCB-(85)+(116)+(117)	ng	<0.60	0.016	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	<1.2	0.018	1.2				2087846
PentaCB-(88)+(91)	ng	<0.40	0.020	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.021	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	<0.60	0.018	0.60				2087846
22'355'-PentaCB-(92)	ng	<0.20 (1)	0.031	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.020	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.021	0.20				2087846
22'35'6-PentaCB-(95)	ng	0.22	0.019	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20	0.0049	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.018	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.0061	0.20				2087846
233'44'-PentaCB-(105)	ng	<0.20 (1)	0.021	0.20	0.0000300	0.000000630		2087846
233'45-PentaCB-(106)	ng	<0.20	0.012	0.20				2087846
233'4'5-PentaCB-(107)	ng	<0.20	0.012	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40	0.013	0.40				2087846
PentaCB-(110)+(115)	ng	<0.40	0.017	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.015	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.015	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.012	0.20	0.0000300	0.000000360		2087846
23'44'5-PentaCB-(118)	ng	<0.20	0.012	0.20	0.0000300	0.000000360		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.015	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.015	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20	0.014	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.012	0.20	0.0000300	0.000000360		2087846
33'44'5-PentaCB-(126)	ng	<0.20	0.012	0.20	0.100	0.00120		2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds (1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

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Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'455'-PentaCB-(127)	ng	<0.20	0.012	0.20				2087846
HexaCB-(128)+(166)	ng	<0.40	0.017	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	<0.60	0.018	0.60				2087846
22'33'45'-HexaCB-(130)	ng	<0.20	0.021	0.20				2087846
22'33'46'-HexaCB-(131)	ng	<0.20	0.022	0.20				2087846
22'33'46'-HexaCB-(132)	ng	<0.20	0.022	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20	0.020	0.20				2087846
HexaCB-(134)+(143)	ng	<0.40	0.023	0.40				2087846
HexaCB-(135)+(151)	ng	<0.40	0.0081	0.40				2087846
22'33'66'-HexaCB-(136)	ng	<0.20	0.0061	0.20				2087846
22'344'5'-HexaCB-(137)	ng	<0.20	0.021	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.019	0.40				2087846
22'3455'-HexaCB-(141)	ng	<0.20	0.019	0.20				2087846
22'3456'-HexaCB-(142)	ng	<0.20	0.021	0.20				2087846
22'345'6'-HexaCB-(144)	ng	<0.20	0.0080	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0064	0.20				2087846
22'34'55'-HexaCB-(146)	ng	<0.20	0.018	0.20				2087846
HexaCB-(147)+(149)	ng	<0.40	0.024	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.0079	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20	0.0063	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0059	0.20				2087846
HexaCB-(153)+(168)	ng	<0.40	0.016	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.0072	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20	0.0079	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40	0.0095	0.40	0.0000300	0.000000285		2087846
233'44'6'-HexaCB-(158)	ng	<0.20	0.014	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.011	0.20				2087846
233'456'-HexaCB-(160)	ng	<0.20	0.016	0.20				2087846
233'45'6'-HexaCB-(161)	ng	<0.20	0.015	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

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Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
233'4'55'-HexaCB-(162)	ng	<0.20	0.011	0.20				2087846
233'4'5'6'-HexaCB-(164)	ng	<0.20	0.015	0.20				2087846
233'55'6'-HexaCB-(165)	ng	<0.20	0.017	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20	0.0093	0.20	0.0000300	0.000000279		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.0096	0.20	0.0300	0.000288		2087846
22'33'44'5'-HeptaCB-(170)	ng	<0.20	0.015	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.019	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.019	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	<0.20	0.019	0.20				2087846
22'33'45'6'-HeptaCB-(175)	ng	<0.20	0.011	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.0083	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	<0.20	0.019	0.20				2087846
22'33'55'6'-HeptaCB-(178)	ng	<0.20	0.011	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	<0.20 (1)	0.012	0.20				2087846
HeptaCB-(180)+(193)	ng	<0.40 (1)	0.044	0.40				2087846
22'344'56'-HeptaCB-(181)	ng	<0.20	0.019	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.011	0.20				2087846
22'344'5'6'-HeptaCB-(183)	ng	<0.20	0.016	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20	0.0080	0.20				2087846
22'3455'6'-HeptaCB-(185)	ng	<0.20	0.020	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.0086	0.20				2087846
22'34'55'6'-HeptaCB-(187)	ng	<0.20	0.010	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.011	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.029	0.20	0.0000300	0.000000870		2087846
233'44'56'-HeptaCB-(190)	ng	<0.20	0.015	0.20				2087846
233'44'5'6'-HeptaCB-(191)	ng	<0.20	0.015	0.20				2087846
233'455'6'-HeptaCB-(192)	ng	<0.20	0.016	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20	0.026	0.20				2087846
22'33'44'56'-OctaCB-(195)	ng	<0.20	0.028	0.20				2087846
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds (1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.								

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	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'33'44'56'-OctaCB-(196)	ng	<0.20	0.017	0.20				2087846
22'33'44'66'-OctaCB-(197)	ng	<0.20	0.013	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40	0.017	0.40				2087846
22'33'45'66'-OctaCB-(200)	ng	<0.20	0.012	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.013	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20	0.016	0.20				2087846
22'344'55'6'-OctaCB-(203)	ng	<0.20	0.016	0.20				2087846
22'344'56'6'-OctaCB-(204)	ng	<0.20	0.013	0.20				2087846
233'44'55'6'-OctaCB-(205)	ng	<0.20	0.018	0.20				2087846
22'33'44'55'6'-NonaCB-(206)	ng	<0.20	0.027	0.20				2087846
22'33'44'56'6'-NonaCB-(207)	ng	<0.20	0.025	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.028	0.20				2087846
DecaCB-(209)	ng	<0.20	0.016	0.20				2087846
Monochlorobiphenyl	ng	0.086	0.015	N/A				2087846
Dichlorobiphenyl	ng	1.88	0.047	N/A				2087846
Trichlorobiphenyl	ng	4.07	0.022	N/A				2087846
Tetrachlorobiphenyl	ng	2.73	0.034	N/A				2087846
Pentachlorobiphenyl	ng	0.927	0.023	N/A				2087846
Hexachlorobiphenyl	ng	0.460	0.024	N/A				2087846
Heptachlorobiphenyl	ng	0.051	0.029	N/A				2087846
Octachlorobiphenyl	ng	<N/A	0.028	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.028	N/A				2087846
Decachlorobiphenyl	ng	<N/A	0.016	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.00150		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	68						2087844
Acenaphthylene-2H8	%	79						2087844
Benz(a)anthracene-2H12	%	63						2087844
Benzo(a)pyrene-2H12	%	85						2087844
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

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	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Benzo(b)fluoranthene-2H12	%	141						2087844
Benzo(g,h,i)perylene-2H12	%	54						2087844
Benzo(k)fluoranthene-2H12	%	124						2087844
Chrysene-2H12	%	57						2087844
Dibenzo(a,h)anthracene-2H14	%	52						2087844
Fluoranthene-2H10	%	99						2087844
Fluorene-2H10	%	75						2087844
Indeno(1,2,3-c,d)pyrene-2H12	%	59						2087844
Naphthalene-2H8	%	63						2087844
Perylene-2H12	%	94						2087844
Phenanthrene-2H10	%	106						2087844
Terphenyl-2H14	%	83						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	98						2087846
C13-2,44'-TriCB-(28)	%	74						2087846
C13-2,4'5'-TriCB-(31) (FS)	%	65						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	126						2087846
C13-22'33'44'5-HeptaCB-(170)	%	113						2087846
C13-22'33'455'66'-NonaCB-(208)	%	123						2087846
C13-22'33'55'66'-OctaCB-(202)	%	131						2087846
C13-22'33'55'6-HeptaCB-(178)	%	141						2087846
C13-22'344'55'-HeptaCB-(180)	%	111						2087846
C13-22'34'566'-HeptaCB-(188)	%	124						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	103						2087846
C13-22'44'66'-HexaCB-(155)	%	134						2087846
C13-22'466'-PentaCB-(104)	%	111						2087846
C13-22'66'-TetraCB-(54)	%	98						2087846
C13-22'6-TriCB-(19)	%	86						2087846
C13-22'-DiCB-(4)	%	83						2087846
C13-233'44'55'6-OctaCB-(205)	%	106						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
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	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-233'44'55'-HeptaCB-(189)	%	98						2087846
C13-233'44'-PentaCB-(105)	%	82						2087846
C13-233'55'-PentaCB-(111)	%	110						2087846
C13-23'44'55'-HexaCB-(167)	%	91						2087846
C13-2344'5'-PentaCB-(114)	%	76						2087846
C13-23'44'5'-PentaCB-(118)	%	76						2087846
C13-2'344'5'-PentaCB-(123)	%	78						2087846
C13-2-MonoCB-(1)	%	57						2087846
C13-33'44'55'-HexaCB-(169)	%	88						2087846
C13-33'44'5'-PentaCB-(126)	%	80						2087846
C13-33'44'-TetraCB-(77)	%	87						2087846
C13-344'5'-TetraCB-(81)	%	88						2087846
C13-344'-TriCB-(37)	%	77						2087846
C13-44'-DiCB-(15)	%	76						2087846
C13-4-MonoCB-(3)	%	66						2087846
C13-DecaCB-(209)	%	145 (1)						2087846
C13-HexaCB-(156)+(157)	%	91						2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4546						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Polyaromatic Hydrocarbons								
Naphthalene	ng	548	1.9	22				2087844
2-Methylnaphthalene	ng	76.8	2.0	3.1				2087844
2-Chloronaphthalene	ng	0.24	0.036	0.15				2087844
Acenaphthylene	ng	5.20	0.31	0.32				2087844
Acenaphthene	ng	4.76	0.40	0.40				2087844
Fluorene	ng	8.04	1.3	0.49				2087844
Phenanthrene	ng	47.6	2.0	0.67				2087844
Anthracene	ng	3.67	2.4	0.31				2087844
Fluoranthene	ng	30.6	0.32	0.65				2087844
Pyrene	ng	27.5	0.27	0.52				2087844
Benzo(a)anthracene	ng	4.80	0.19	0.17				2087844
Chrysene	ng	19.7	0.20	0.33				2087844
Benzo(b)fluoranthene	ng	3.59	0.43	0.59				2087844
Benzo(k)fluoranthene	ng	2.00	0.61	0.35				2087844
Benzo(e)pyrene	ng	9.00	0.96	0.43				2087844
Benzo(a)pyrene	ng	<0.31	1.2	0.31				2087844
Perylene	ng	<0.26	1.0	0.26				2087844
Indeno(1,2,3-cd)pyrene	ng	<0.30	3.5	0.30				2087844
Dibenz(a,h)anthracene	ng	<0.46	2.7	0.46				2087844
Benzo(g,h,i)perylene	ng	23.5	3.2	0.23				2087844
PCBs								
2-MonoCB-(1)	ng	<0.20	0.021	0.20				2087846
3-MonoCB-(2)	ng	<0.20	0.024	0.20				2087846
4-MonoCB-(3)	ng	<0.20 (1)	0.036	0.20				2087846
2,2'-DiCB-(4)	ng	0.65	0.031	0.20				2087846
2,3-DiCB-(5)	ng	<0.20	0.033	0.20				2087846
2,3'-DiCB-(6)	ng	<0.20	0.030	0.20				2087846

RDL = Reportable Detection Limit
EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4546						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

2,4-DiCB-(7)	ng	<0.20	0.030	0.20				2087846
2,4'-DiCB-(8)	ng	<0.20	0.029	0.20				2087846
2,5-DiCB-(9)	ng	<0.20	0.030	0.20				2087846
2,6-DiCB-(10)	ng	<0.20	0.026	0.20				2087846
3,3'-DiCB-(11)	ng	0.68	0.031	0.20				2087846
DiCB-(12)+(13)	ng	<0.40	0.032	0.40				2087846
3,5-DiCB-(14)	ng	<0.20	0.030	0.20				2087846
4,4'-DiCB-(15)	ng	0.22	0.034	0.20				2087846
22'3-TriCB-(16)	ng	0.38	0.015	0.20				2087846
22'4-TriCB-(17)	ng	0.38	0.013	0.20				2087846
TriCB-(18)+(30)	ng	1.03	0.011	0.40				2087846
22'6-TriCB-(19)	ng	<0.20 (1)	0.14	0.20				2087846
TriCB-(20) + (28)	ng	0.63	0.017	0.40				2087846
TriCB-(21)+(33)	ng	<0.40	0.017	0.40				2087846
234'-TriCB-(22)	ng	0.21	0.018	0.20				2087846
235-TriCB-(23)	ng	<0.20	0.019	0.20				2087846
236-TriCB-(24)	ng	<0.20	0.0099	0.20				2087846
23'4-TriCB-(25)	ng	<0.20	0.016	0.20				2087846
TriCB-(26)+(29)	ng	<0.40	0.017	0.40				2087846
23'6-TriCB-(27)	ng	<0.20	0.0091	0.20				2087846
24'5-TriCB-(31)	ng	0.61	0.016	0.20				2087846
24'6-TriCB-(32)	ng	0.21	0.0087	0.20				2087846
23'5'-TriCB-(34)	ng	<0.20	0.017	0.20				2087846
33'4-TriCB-(35)	ng	<0.20 (1)	0.028	0.20				2087846
33'5-TriCB-(36)	ng	<0.20	0.015	0.20				2087846
344'-TriCB-(37)	ng	<0.20	0.018	0.20				2087846
345-TriCB-(38)	ng	<0.20	0.018	0.20				2087846
34'5-TriCB-(39)	ng	<0.20	0.017	0.20				2087846
TetraCB-(40)+(41)+(71)	ng	<0.60	0.015	0.60				2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

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RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4546						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'34'-TetraCB-(42)	ng	<0.20	0.017	0.20				2087846
22'35'-TetraCB-(43)	ng	<0.20	0.020	0.20				2087846
TetraCB-(44)+(47)+(65)	ng	<0.60	0.014	0.60				2087846
TetraCB-(45)+(51)	ng	<0.40	0.015	0.40				2087846
22'36'-TetraCB-(46)	ng	<0.20 (1)	0.035	0.20				2087846
22'45'-TetraCB-(48)	ng	<0.20	0.015	0.20				2087846
TetraCB-(49)+TetraCB-(69)	ng	<0.40	0.013	0.40				2087846
TetraCB-(50)+(53)	ng	<0.40 (1)	0.079	0.40				2087846
22'55'-TetraCB-(52)	ng	1.06	0.015	0.20				2087846
22'66'-TetraCB-(54)	ng	<0.20	0.012	0.20				2087846
233'4'-TetraCB-(55)	ng	<0.20	0.021	0.20				2087846
233'4'-Tetra CB(56)	ng	<0.20	0.021	0.20				2087846
233'5'-TetraCB-(57)	ng	<0.20	0.020	0.20				2087846
233'5'-TetraCB-(58)	ng	<0.20	0.020	0.20				2087846
TetraCB-(59)+(62)+(75)	ng	<0.60	0.012	0.60				2087846
2344'-TetraCB -(60)	ng	<0.20	0.021	0.20				2087846
TetraCB-(61)+(70)+(74)+(76)	ng	<0.80	0.020	0.80				2087846
234'5'-TetraCB-(63)	ng	<0.20	0.018	0.20				2087846
234'6'-TetraCB-(64)	ng	<0.20	0.011	0.20				2087846
23'44'-TetraCB-(66)	ng	<0.20	0.019	0.20				2087846
23'45'-TetraCB-(67)	ng	<0.20	0.018	0.20				2087846
23'45'-TetraCB-(68)	ng	<0.20	0.018	0.20				2087846
23'55'-TetraCB-(72)	ng	<0.20	0.019	0.20				2087846
23'5'6'-TetraCB-(73)	ng	<0.20	0.011	0.20				2087846
33'44'-TetraCB-(77)	ng	<0.20	0.018	0.20	0.000100	0.00000180		2087846
33'45'-TetraCB-(78)	ng	<0.20	0.020	0.20				2087846
33'45'-TetraCB(79)	ng	<0.20	0.017	0.20				2087846
33'55'-TetraCB-(80)	ng	<0.20	0.018	0.20				2087846
344'5'-TetraCB-(81)	ng	<0.20	0.018	0.20	0.000300	0.00000540		2087846

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

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Maxxam ID		FE4546						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

22'33'4-PentaCB-(82)	ng	<0.20	0.021	0.20				2087846
PentaCB-(83)+(99)	ng	<0.40	0.019	0.40				2087846
22'33'6-PentaCB-(84)	ng	<0.20 (1)	0.083	0.20				2087846
PentaCB-(85)+(116)+(117)	ng	<0.60	0.015	0.60				2087846
PentaCB-(86)(87)(97)(109)(119)(125)	ng	<1.2 (1)	0.21	1.2				2087846
PentaCB-(88)+(91)	ng	<0.40	0.019	0.40				2087846
22'346'-PentaCB-(89)	ng	<0.20	0.020	0.20				2087846
PentaCB-(90)+(101)+(113)	ng	<0.60	0.017	0.60				2087846
22'355'-PentaCB-(92)	ng	<0.20 (1)	0.067	0.20				2087846
PentaCB-(93)+(98)+(100)+(102)	ng	<0.80	0.019	0.80				2087846
22'356'-PentaCB-(94)	ng	<0.20	0.020	0.20				2087846
22'35'6-PentaCB-(95)	ng	0.37	0.018	0.20				2087846
22'366'-PentaCB-(96)	ng	<0.20	0.0083	0.20				2087846
22'45'6-PentaCB-(103)	ng	<0.20	0.017	0.20				2087846
22'466'-PentaCB-(104)	ng	<0.20	0.010	0.20				2087846
233'44'-PentaCB-(105)	ng	<0.20	0.021	0.20	0.0000300	0.000000630		2087846
233'45-PentaCB-(106)	ng	<0.20	0.021	0.20				2087846
233'4'5-PentaCB-(107)	ng	<0.20	0.021	0.20				2087846
PentaCB-(108)+(124)	ng	<0.40	0.022	0.40				2087846
PentaCB-(110)+(115)	ng	<0.40	0.016	0.40				2087846
233'55'-PentaCB-(111)	ng	<0.20	0.014	0.20				2087846
233'56-PentaCB-(112)	ng	<0.20	0.014	0.20				2087846
2344'5-PentaCB-(114)	ng	<0.20	0.021	0.20	0.0000300	0.000000630		2087846
23'44'5-PentaCB-(118)	ng	<0.20	0.020	0.20	0.0000300	0.000000600		2087846
23'455'-PentaCB-(120)	ng	<0.20	0.014	0.20				2087846
23'45'6-PentaCB-(121)	ng	<0.20	0.014	0.20				2087846
233'4'5'-PentaCB-(122)	ng	<0.20	0.024	0.20				2087846
23'44'5'-PentaCB-(123)	ng	<0.20	0.021	0.20	0.0000300	0.000000630		2087846
33'44'5-PentaCB-(126)	ng	<0.20	0.020	0.20	0.100	0.00200		2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
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Maxxam ID		FE4546						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

33'455'-PentaCB-(127)	ng	<0.20	0.022	0.20				2087846
HexaCB-(128)+(166)	ng	<0.40	0.024	0.40				2087846
HexaCB-(129)+(138)+(163)	ng	<0.60	0.025	0.60				2087846
22'33'45'-HexaCB-(130)	ng	<0.20	0.030	0.20				2087846
22'33'46'-HexaCB-(131)	ng	<0.20	0.030	0.20				2087846
22'33'46'-HexaCB-(132)	ng	<0.20 (1)	0.095	0.20				2087846
22'33'55'-HexaCB-(133)	ng	<0.20	0.027	0.20				2087846
HexaCB-(134)+(143)	ng	<0.40	0.032	0.40				2087846
HexaCB-(135)+(151)	ng	<0.40	0.0083	0.40				2087846
22'33'66'-HexaCB-(136)	ng	<0.20	0.0063	0.20				2087846
22'344'5'-HexaCB-(137)	ng	<0.20	0.030	0.20				2087846
HexaCB-(139)+(140)	ng	<0.40	0.026	0.40				2087846
22'3455'-HexaCB-(141)	ng	<0.20	0.027	0.20				2087846
22'3456'-HexaCB-(142)	ng	<0.20	0.029	0.20				2087846
22'345'6'-HexaCB-(144)	ng	<0.20 (1)	0.017	0.20				2087846
22'3466'-HexaCB-(145)	ng	<0.20	0.0066	0.20				2087846
22'34'55'-HexaCB-(146)	ng	<0.20 (1)	0.033	0.20				2087846
HexaCB-(147)+(149)	ng	<0.40	0.033	0.40				2087846
22'34'56'-HexaCB-(148)	ng	<0.20	0.0082	0.20				2087846
22'34'66'-HexaCB-(150)	ng	<0.20	0.0065	0.20				2087846
22'3566'-HexaCB-(152)	ng	<0.20	0.0061	0.20				2087846
HexaCB-(153)+(168)	ng	<0.40	0.022	0.40				2087846
22'44'56'-HexaCB-(154)	ng	<0.20	0.0074	0.20				2087846
22'44'66'-HexaCB-(155)	ng	<0.20	0.0081	0.20				2087846
HexaCB-(156)+(157)	ng	<0.40	0.019	0.40	0.0000300	0.000000570		2087846
233'44'6'-HexaCB-(158)	ng	<0.20	0.020	0.20				2087846
233'455'-HexaCB-(159)	ng	<0.20	0.022	0.20				2087846
233'456'-HexaCB-(160)	ng	<0.20	0.023	0.20				2087846
233'45'6'-HexaCB-(161)	ng	<0.20	0.021	0.20				2087846

EDL = Estimated Detection Limit
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	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

233'4'55'-HexaCB-(162)	ng	<0.20	0.022	0.20				2087846
233'4'5'6'-HexaCB-(164)	ng	<0.20	0.020	0.20				2087846
233'5'5'6'-HexaCB-(165)	ng	<0.20	0.023	0.20				2087846
23'44'55'-HexaCB-(167)	ng	<0.20	0.019	0.20	0.0000300	0.000000570		2087846
33'44'55'-HexaCB-(169)	ng	<0.20	0.019	0.20	0.0300	0.000570		2087846
22'33'44'5'-HeptaCB-(170)	ng	<0.20	0.030	0.20				2087846
HeptaCB-(171)+(173)	ng	<0.40	0.037	0.40				2087846
22'33'455'-HeptaCB-(172)	ng	<0.20	0.037	0.20				2087846
22'33'456'-HeptaCB-(174)	ng	<0.20	0.036	0.20				2087846
22'33'45'6'-HeptaCB-(175)	ng	<0.20	0.012	0.20				2087846
22'33'466'-HeptaCB-(176)	ng	<0.20	0.0093	0.20				2087846
22'33'45'6'-HeptaCB-(177)	ng	<0.20	0.036	0.20				2087846
22'33'55'6'-HeptaCB-(178)	ng	<0.20	0.012	0.20				2087846
22'33'566'-HeptaCB-(179)	ng	<0.20	0.0091	0.20				2087846
HeptaCB-(180)+(193)	ng	<0.40	0.027	0.40				2087846
22'344'56'-HeptaCB-(181)	ng	<0.20	0.036	0.20				2087846
22'344'56'-HeptaCB-(182)	ng	<0.20	0.012	0.20				2087846
22'344'5'6'-HeptaCB-(183)	ng	<0.20	0.032	0.20				2087846
22'344'66'-HeptaCB-(184)	ng	<0.20	0.0090	0.20				2087846
22'3455'6'-HeptaCB-(185)	ng	<0.20	0.038	0.20				2087846
22'34566'-HeptaCB-(186)	ng	<0.20	0.0097	0.20				2087846
22'34'55'6'-HeptaCB-(187)	ng	<0.20	0.011	0.20				2087846
22'34'566'-HeptaCB-(188)	ng	<0.20	0.013	0.20				2087846
233'44'55'-HeptaCB-(189)	ng	<0.20	0.023	0.20	0.0000300	0.000000690		2087846
233'44'56'-HeptaCB-(190)	ng	<0.20	0.029	0.20				2087846
233'44'5'6'-HeptaCB-(191)	ng	<0.20	0.028	0.20				2087846
233'455'6'-HeptaCB-(192)	ng	<0.20	0.031	0.20				2087846
22'33'44'55'-OctaCB-(194)	ng	<0.20	0.032	0.20				2087846
22'33'44'56'-OctaCB-(195)	ng	<0.20	0.035	0.20				2087846

EDL = Estimated Detection Limit
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Maxxam ID		FE4546						
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	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
22'33'44'56'-OctaCB-(196)	ng	<0.20	0.026	0.20				2087846
22'33'44'66'-OctaCB-(197)	ng	<0.20	0.020	0.20				2087846
OctaCB-(198)+(199)	ng	<0.40	0.026	0.40				2087846
22'33'4566'-OctaCB-(200)	ng	<0.20	0.019	0.20				2087846
22'33'45'66'-OctaCB-(201)	ng	<0.20	0.019	0.20				2087846
22'33'55'66'-OctaCB-(202)	ng	<0.20	0.024	0.20				2087846
22'344'55'6'-OctaCB-(203)	ng	<0.20	0.025	0.20				2087846
22'344'566'-OctaCB-(204)	ng	<0.20	0.019	0.20				2087846
233'44'55'6'-OctaCB-(205)	ng	<0.20	0.022	0.20				2087846
22'33'44'55'6'-NonaCB-(206)	ng	<0.20	0.024	0.20				2087846
22'33'44'566'-NonaCB-(207)	ng	<0.20	0.022	0.20				2087846
22'33'455'66'-NonaCB-(208)	ng	<0.20	0.025	0.20				2087846
DecaCB-(209)	ng	<0.20	0.015	0.20				2087846
Monochlorobiphenyl	ng	0.033	0.024	N/A				2087846
Dichlorobiphenyl	ng	1.83	0.034	N/A				2087846
Trichlorobiphenyl	ng	3.89	0.019	N/A				2087846
Tetrachlorobiphenyl	ng	3.13	0.021	N/A				2087846
Pentachlorobiphenyl	ng	1.61	0.024	N/A				2087846
Hexachlorobiphenyl	ng	1.10	0.033	N/A				2087846
Heptachlorobiphenyl	ng	0.336	0.038	N/A				2087846
Octachlorobiphenyl	ng	<N/A	0.035	N/A				2087846
Nonachlorobiphenyl	ng	<N/A	0.025	N/A				2087846
Decachlorobiphenyl	ng	<N/A	0.015	N/A				2087846
TOTAL TOXIC EQUIVALENCY	ng					0.00258		
Surrogate Recovery (%)								
2-Methylnaphthalene-2H10	%	87						2087844
Acenaphthylene-2H8	%	88						2087844
Benz(a)anthracene-2H12	%	56						2087844
Benzo(a)pyrene-2H12	%	87						2087844
EDL = Estimated Detection Limit QC Batch = Quality Control Batch TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested. WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								

Maxxam Job #: B022953
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Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4546						
Sampling Date		2010/02/10				TOXIC EQUIVALENCY	# of	
	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Benzo(b)fluoranthene-2H12	%	133						2087844
Benzo(g,h,i)perylene-2H12	%	58						2087844
Benzo(k)fluoranthene-2H12	%	109						2087844
Chrysene-2H12	%	57						2087844
Dibenzo(a,h)anthracene-2H14	%	60						2087844
Fluoranthene-2H10	%	100						2087844
Fluorene-2H10	%	84						2087844
Indeno(1,2,3-c,d)pyrene-2H12	%	69						2087844
Naphthalene-2H8	%	91						2087844
Perylene-2H12	%	89						2087844
Phenanthrene-2H10	%	119						2087844
Terphenyl-2H14	%	74						2087844
C13-2,2',3,5',6-PentaCB(95) (FS)	%	91						2087846
C13-2,44'-TriCB-(28)	%	72						2087846
C13-2,4'5-TriCB-(31) (FS)	%	60						2087846
C13-22'33'44'55'6-NonaCB-(206)	%	116						2087846
C13-22'33'44'5-HeptaCB-(170)	%	102						2087846
C13-22'33'455'66'-NonaCB-(208)	%	113						2087846
C13-22'33'55'66'-OctaCB-(202)	%	122						2087846
C13-22'33'55'6-HeptaCB-(178)	%	141 (1)						2087846
C13-22'344'55'-HeptaCB-(180)	%	108						2087846
C13-22'34'566'-HeptaCB-(188)	%	114						2087846
C13-22'44'55'HexaCB-(153) (FS)	%	95						2087846
C13-22'44'66'-HexaCB-(155)	%	122						2087846
C13-22'466'-PentaCB-(104)	%	102						2087846
C13-22'66'-TetraCB-(54)	%	93						2087846
C13-22'6-TriCB-(19)	%	83						2087846
C13-22'-DiCB-(4)	%	84						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B022953
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Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

RESULTS OF ANALYSES OF IMPINGER SOLUTION

Maxxam ID		FE4546						
Sampling Date		2010/02/10				TOXIC EQUIVALENCY	# of	
	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

C13-233'44'55'-OctaCB-(205)	%	99						2087846
C13-233'44'55'-HeptaCB-(189)	%	90						2087846
C13-233'44'-PentaCB-(105)	%	76						2087846
C13-233'55'-PentaCB-(111)	%	110						2087846
C13-23'44'55'-HexaCB-(167)	%	84						2087846
C13-2344'5-PentaCB-(114)	%	73						2087846
C13-23'44'5-PentaCB-(118)	%	74						2087846
C13-2'344'5-PentaCB-(123)	%	75						2087846
C13-2-MonoCB-(1)	%	61						2087846
C13-33'44'55'-HexaCB-(169)	%	85						2087846
C13-33'44'5-PentaCB-(126)	%	78						2087846
C13-33'44'-TetraCB-(77)	%	81						2087846
C13-344'5-TetraCB-(81)	%	81						2087846
C13-344'-TriCB-(37)	%	71						2087846
C13-44'-DiCB-(15)	%	69						2087846
C13-4-MonoCB-(3)	%	64						2087846
C13-DecaCB-(209)	%	135						2087846
C13-HexaCB-(156)+(157)	%	83						2087846

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4540						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40 (1)	4.4	40	1.00	4.40		2089890
1,2,3,7,8-Penta CDD	pg	<40	2.2	40	1.00	2.20		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40	2.2	40	0.100	0.220		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.5	40	0.0100	0.0250		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.2	400	0.000300	0.00126		2089890
Total Tetra CDD	pg	<40 (1)	4.4	40				2089890
Total Penta CDD	pg	<40	2.2	40				2089890
Total Hexa CDD	pg	<40	2.0	40				2089890
Total Hepta CDD	pg	<40	2.5	40				2089890
2,3,7,8-Tetra CDF **	pg	<40	2.2	40	0.100	0.220		2089890
1,2,3,7,8-Penta CDF	pg	<40 (1)	3.0	40	0.0300	0.0900		2089890
2,3,4,7,8-Penta CDF	pg	<40	2.3	40	0.300	0.690		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40	1.8	40	0.100	0.180		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	11	40	0.0100	0.110		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40 (1)	6.8	40	0.0100	0.0680		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.4	400	0.000300	0.00132		2089890
Total Tetra CDF	pg	<40	2.2	40				2089890
Total Penta CDF	pg	<40	2.4	40				2089890
Total Hexa CDF	pg	<40	2.1	40				2089890
Total Hepta CDF	pg	<40 (1)	12	40				2089890
Toxic Equivalency	pg	15.0	2.2	N/A				2089890
TOTAL TOXIC EQUIVALENCY	pg					9.28		

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4540						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TRAIN BLANK-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	102						2089890
C13-1234678 HeptaCDF **	%	105						2089890
C13-123478 HexaCDD	%	92						2089890
C13-123478 HexaCDF	%	103						2089890
C13-1234789 HeptaCDF	%	111						2089890
C13-123678 HexaCDD	%	112						2089890
C13-123678 HexaCDF	%	97						2089890
C13-12378 PentaCDD	%	115						2089890
C13-12378 PentaCDF	%	99						2089890
C13-123789 HexaCDF	%	106						2089890
C13-23478 PentaCDF	%	143 (1)						2089890
C13-2378 TetraCDD	%	68						2089890
C13-2378 TetraCDF	%	70						2089890
C13-Octachlorodibenzo-p-Dioxin	%	112						2089890
C137-2378 TetraCDD	%	105						2089890

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) Recovery exceeds method acceptance criteria 70-130%

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4541						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40 (1)	2.8	40	1.00	2.80		2089890
1,2,3,7,8-Penta CDD	pg	<40 (1)	3.2	40	1.00	3.20		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40	2.2	40	0.100	0.220		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.1	40	0.0100	0.0210		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.7	400	0.000300	0.00141		2089890
Total Tetra CDD	pg	<40 (1)	3.4	40				2089890
Total Penta CDD	pg	<40 (1)	4.4	40				2089890
Total Hexa CDD	pg	48	2.2	40				2089890
Total Hepta CDD	pg	42	2.1	40				2089890
2,3,7,8-Tetra CDF **	pg	<40	2.2	40	0.100	0.220		2089890
1,2,3,7,8-Penta CDF	pg	<40 (1)	3.8	40	0.0300	0.114		2089890
2,3,4,7,8-Penta CDF	pg	<40	2.2	40	0.300	0.660		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40	2.0	40	0.100	0.200		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40	2.6	40	0.100	0.260		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.6	40	0.100	0.260		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	18	40	0.0100	0.180		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40	2.3	40	0.0100	0.0230		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.4	400	0.000300	0.00132		2089890
Total Tetra CDF	pg	<40	2.2	40				2089890
Total Penta CDF	pg	<40	2.2	40				2089890
Total Hexa CDF	pg	48	2.4	40				2089890
Total Hepta CDF	pg	<40	2.1	40				2089890
Toxic Equivalency	pg	16.8	2.2	N/A				2089890

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4541						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

TOTAL TOXIC EQUIVALENCY	pg					8.83		
Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	95						2089890
C13-1234678 HeptaCDF **	%	95						2089890
C13-123478 HexaCDD	%	98						2089890
C13-123478 HexaCDF	%	103						2089890
C13-1234789 HeptaCDF	%	107						2089890
C13-123678 HexaCDD	%	103						2089890
C13-123678 HexaCDF	%	90						2089890
C13-12378 PentaCDD	%	103						2089890
C13-12378 PentaCDF	%	87						2089890
C13-123789 HexaCDF	%	100						2089890
C13-23478 PentaCDF	%	140 (1)						2089890
C13-2378 TetraCDD	%	55						2089890
C13-2378 TetraCDF	%	55						2089890
C13-Octachlorodibenzo-p-Dioxin	%	104						2089890
C137-2378 TetraCDD	%	106						2089890

EDL = Estimated Detection Limit
QC Batch = Quality Control Batch
* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
(1) Recovery exceeds method acceptance criteria 70-130%

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4542						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40 (1)	3.0	40	1.00	3.00		2089890
1,2,3,7,8-Penta CDD	pg	<40	2.4	40	1.00	2.40		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40	1.9	40	0.100	0.190		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.2	40	0.0100	0.0220		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.2	400	0.000300	0.00126		2089890
Total Tetra CDD	pg	<40	2.2	40				2089890
Total Penta CDD	pg	<40	2.4	40				2089890
Total Hexa CDD	pg	<40	2.0	40				2089890
Total Hepta CDD	pg	<40	2.2	40				2089890
2,3,7,8-Tetra CDF **	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,7,8-Penta CDF	pg	<40 (1)	4.2	40	0.0300	0.126		2089890
2,3,4,7,8-Penta CDF	pg	<40	2.4	40	0.300	0.720		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40 (1)	5.4	40	0.100	0.540		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	12	40	0.0100	0.120		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40 (1)	7.4	40	0.0100	0.0740		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.0	400	0.000300	0.00120		2089890
Total Tetra CDF	pg	50	2.1	40				2089890
Total Penta CDF	pg	<40	2.5	40				2089890
Total Hexa CDF	pg	<40	2.1	40				2089890
Total Hepta CDF	pg	<40 (1)	14	40				2089890
Toxic Equivalency	pg	12.5	2.1	N/A				2089890

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4542						
Sampling Date		2010/02/08			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

TOTAL TOXIC EQUIVALENCY	pg					8.48		
Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	99						2089890
C13-1234678 HeptaCDF **	%	102						2089890
C13-123478 HexaCDD	%	107						2089890
C13-123478 HexaCDF	%	100						2089890
C13-1234789 HeptaCDF	%	117						2089890
C13-123678 HexaCDD	%	97						2089890
C13-123678 HexaCDF	%	96						2089890
C13-12378 PentaCDD	%	95						2089890
C13-12378 PentaCDF	%	82						2089890
C13-123789 HexaCDF	%	101						2089890
C13-23478 PentaCDF	%	140 (1)						2089890
C13-2378 TetraCDD	%	59						2089890
C13-2378 TetraCDF	%	54						2089890
C13-Octachlorodibenzo-p-Dioxin	%	114						2089890
C137-2378 TetraCDD	%	110						2089890

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) Recovery exceeds method acceptance criteria 70-130%

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4543						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40 (1)	2.5	40	1.00	2.50		2089890
1,2,3,7,8-Penta CDD	pg	<40	2.4	40	1.00	2.40		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40 (1)	2.8	40	0.100	0.280		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40	2.0	40	0.100	0.200		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.1	40	0.0100	0.0210		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.3	400	0.000300	0.00129		2089890
Total Tetra CDD	pg	<40 (1)	3.0	40				2089890
Total Penta CDD	pg	<40	2.4	40				2089890
Total Hexa CDD	pg	<40	2.1	40				2089890
Total Hepta CDD	pg	<40	2.1	40				2089890
2,3,7,8-Tetra CDF **	pg	<40	2.4	40	0.100	0.240		2089890
1,2,3,7,8-Penta CDF	pg	<40	2.6	40	0.0300	0.0780		2089890
2,3,4,7,8-Penta CDF	pg	<40	2.4	40	0.300	0.720		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40	1.8	40	0.100	0.180		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40	2.4	40	0.100	0.240		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	9.9	40	0.0100	0.0990		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40 (1)	4.7	40	0.0100	0.0470		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.1	400	0.000300	0.00123		2089890
Total Tetra CDF	pg	<40	2.4	40				2089890
Total Penta CDF	pg	<40	2.5	40				2089890
Total Hexa CDF	pg	<40	2.1	40				2089890
Total Hepta CDF	pg	<40 (1)	11	40				2089890
Toxic Equivalency	pg	10.1	2.4	N/A				2089890

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4543						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 1-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

TOTAL TOXIC EQUIVALENCY	pg					7.66		
Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	103						2089890
C13-1234678 HeptaCDF **	%	104						2089890
C13-123478 HexaCDD	%	100						2089890
C13-123478 HexaCDF	%	104						2089890
C13-1234789 HeptaCDF	%	106						2089890
C13-123678 HexaCDD	%	103						2089890
C13-123678 HexaCDF	%	91						2089890
C13-12378 PentaCDD	%	105						2089890
C13-12378 PentaCDF	%	97						2089890
C13-123789 HexaCDF	%	103						2089890
C13-23478 PentaCDF	%	130						2089890
C13-2378 TetraCDD	%	51						2089890
C13-2378 TetraCDF	%	53						2089890
C13-Octachlorodibenzo-p-Dioxin	%	115						2089890
C137-2378 TetraCDD	%	109						2089890

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4544						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40	2.8	40	1.00	2.80		2089890
1,2,3,7,8-Penta CDD	pg	<40	2.2	40	1.00	2.20		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40 (1)	2.6	40	0.100	0.260		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40	2.2	40	0.100	0.220		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.1	40	0.0100	0.0210		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.6	400	0.000300	0.00138		2089890
Total Tetra CDD	pg	<40	2.8	40				2089890
Total Penta CDD	pg	<40	2.2	40				2089890
Total Hexa CDD	pg	<40	2.2	40				2089890
Total Hepta CDD	pg	<40	2.1	40				2089890
2,3,7,8-Tetra CDF **	pg	<40	3.1	40	0.100	0.310		2089890
1,2,3,7,8-Penta CDF	pg	<40	2.5	40	0.0300	0.0750		2089890
2,3,4,7,8-Penta CDF	pg	<40 (1)	7.1	40	0.300	2.13		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.6	40	0.100	0.260		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40	2.3	40	0.100	0.230		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40	2.9	40	0.100	0.290		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.9	40	0.100	0.290		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	10	40	0.0100	0.100		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40 (1)	5.4	40	0.0100	0.0540		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.4	400	0.000300	0.00132		2089890
Total Tetra CDF	pg	<40	3.1	40				2089890
Total Penta CDF	pg	<40 (1)	7.1	40				2089890
Total Hexa CDF	pg	<40	2.6	40				2089890
Total Hepta CDF	pg	<40 (1)	11	40				2089890
Toxic Equivalency	pg	5.5	3.1	N/A				2089890

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4544						
Sampling Date		2010/02/09			TOXIC EQUIVALENCY		# of	
	Units	TEST 1-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

TOTAL TOXIC EQUIVALENCY	pg					9.45		
Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	90						2089890
C13-1234678 HeptaCDF **	%	97						2089890
C13-123478 HexaCDD	%	99						2089890
C13-123478 HexaCDF	%	102						2089890
C13-1234789 HeptaCDF	%	106						2089890
C13-123678 HexaCDD	%	103						2089890
C13-123678 HexaCDF	%	92						2089890
C13-12378 PentaCDD	%	70						2089890
C13-12378 PentaCDF	%	67						2089890
C13-123789 HexaCDF	%	96						2089890
C13-23478 PentaCDF	%	130						2089890
C13-2378 TetraCDD	%	41						2089890
C13-2378 TetraCDF	%	40						2089890
C13-Octachlorodibenzo-p-Dioxin	%	89						2089890
C137-2378 TetraCDD	%	106						2089890

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4545						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40	2.3	40	1.00	2.30		2089890
1,2,3,7,8-Penta CDD	pg	<40 (1)	2.4	40	1.00	2.40		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40	2.2	40	0.100	0.220		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40 (1)	3.4	40	0.100	0.340		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.2	40	0.0100	0.0220		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.3	400	0.000300	0.00129		2089890
Total Tetra CDD	pg	<40 (1)	2.7	40				2089890
Total Penta CDD	pg	<40 (1)	3.5	40				2089890
Total Hexa CDD	pg	<40	2.1	40				2089890
Total Hepta CDD	pg	<40	2.2	40				2089890
2,3,7,8-Tetra CDF **	pg	<40	2.6	40	0.100	0.260		2089890
1,2,3,7,8-Penta CDF	pg	<40	2.7	40	0.0300	0.0810		2089890
2,3,4,7,8-Penta CDF	pg	<40	2.5	40	0.300	0.750		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.5	40	0.100	0.250		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40	2.2	40	0.100	0.220		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40 (1)	4.8	40	0.100	0.480		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.8	40	0.100	0.280		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	7.2	40	0.0100	0.0720		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40 (1)	6.2	40	0.0100	0.0620		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.2	400	0.000300	0.00126		2089890
Total Tetra CDF	pg	<40	2.6	40				2089890
Total Penta CDF	pg	<40	2.6	40				2089890
Total Hexa CDF	pg	<40	2.6	40				2089890
Total Hepta CDF	pg	<40 (1)	8.0	40				2089890
Toxic Equivalency	pg	6.5	2.6	N/A				2089890

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Report Date: 2010/03/10

Eagle Mountain
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Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4545						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 2-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

TOTAL TOXIC EQUIVALENCY	pg					7.95		
Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	95						2089890
C13-1234678 HeptaCDF **	%	98						2089890
C13-123478 HexaCDD	%	95						2089890
C13-123478 HexaCDF	%	97						2089890
C13-1234789 HeptaCDF	%	109						2089890
C13-123678 HexaCDD	%	105						2089890
C13-123678 HexaCDF	%	95						2089890
C13-12378 PentaCDD	%	67						2089890
C13-12378 PentaCDF	%	67						2089890
C13-123789 HexaCDF	%	101						2089890
C13-23478 PentaCDF	%	120						2089890
C13-2378 TetraCDD	%	54						2089890
C13-2378 TetraCDF	%	53						2089890
C13-Octachlorodibenzo-p-Dioxin	%	99						2089890
C137-2378 TetraCDD	%	102						2089890

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
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Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4546						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

Dioxins & Furans								
2,3,7,8-Tetra CDD *	pg	<40 (1)	2.6	40	1.00	2.60		2089890
1,2,3,7,8-Penta CDD	pg	<40	2.1	40	1.00	2.10		2089890
1,2,3,4,7,8-Hexa CDD	pg	<40	2.3	40	0.100	0.230		2089890
1,2,3,6,7,8-Hexa CDD	pg	<40 (1)	2.6	40	0.100	0.260		2089890
1,2,3,7,8,9-Hexa CDD	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,4,6,7,8-Hepta CDD	pg	<40	2.3	40	0.0100	0.0230		2089890
1,2,3,4,6,7,8,9-Octa CDD	pg	<400	4.4	400	0.000300	0.00132		2089890
Total Tetra CDD	pg	<40 (1)	2.8	40				2089890
Total Penta CDD	pg	<40	2.1	40				2089890
Total Hexa CDD	pg	<40	2.2	40				2089890
Total Hepta CDD	pg	<40	2.3	40				2089890
2,3,7,8-Tetra CDF **	pg	<40	2.1	40	0.100	0.210		2089890
1,2,3,7,8-Penta CDF	pg	<40	2.4	40	0.0300	0.0720		2089890
2,3,4,7,8-Penta CDF	pg	<40	2.3	40	0.300	0.690		2089890
1,2,3,4,7,8-Hexa CDF	pg	<40	2.2	40	0.100	0.220		2089890
1,2,3,6,7,8-Hexa CDF	pg	<40 (1)	3.4	40	0.100	0.340		2089890
2,3,4,6,7,8-Hexa CDF	pg	<40	2.5	40	0.100	0.250		2089890
1,2,3,7,8,9-Hexa CDF	pg	<40	2.4	40	0.100	0.240		2089890
1,2,3,4,6,7,8-Hepta CDF	pg	<40 (1)	7.4	40	0.0100	0.0740		2089890
1,2,3,4,7,8,9-Hepta CDF	pg	<40 (1)	3.9	40	0.0100	0.0390		2089890
1,2,3,4,6,7,8,9-Octa CDF	pg	<400	4.2	400	0.000300	0.00126		2089890
Total Tetra CDF	pg	<40	2.1	40				2089890
Total Penta CDF	pg	<40	2.3	40				2089890
Total Hexa CDF	pg	<40	2.2	40				2089890
Total Hepta CDF	pg	<40 (1)	8.2	40				2089890
Toxic Equivalency	pg	7.4	2.1	N/A				2089890

RDL = Reportable Detection Limit

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

DIOXINS AND FURANS BY HRMS (IMPINGER SOLUTION)

Maxxam ID		FE4546						
Sampling Date		2010/02/10			TOXIC EQUIVALENCY		# of	
	Units	TEST 3-METRO 2-M23	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch

TOTAL TOXIC EQUIVALENCY	pg					7.56		
Surrogate Recovery (%)								
C13-1234678 HeptaCDD *	%	96						2089890
C13-1234678 HeptaCDF **	%	99						2089890
C13-123478 HexaCDD	%	99						2089890
C13-123478 HexaCDF	%	109						2089890
C13-1234789 HeptaCDF	%	108						2089890
C13-123678 HexaCDD	%	102						2089890
C13-123678 HexaCDF	%	93						2089890
C13-12378 PentaCDD	%	110						2089890
C13-12378 PentaCDF	%	87						2089890
C13-123789 HexaCDF	%	96						2089890
C13-23478 PentaCDF	%	142 (1)						2089890
C13-2378 TetraCDD	%	47						2089890
C13-2378 TetraCDF	%	44						2089890
C13-Octachlorodibenzo-p-Dioxin	%	109						2089890
C137-2378 TetraCDD	%	106						2089890

EDL = Estimated Detection Limit

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

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(1) Recovery exceeds method acceptance criteria 70-130%

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

Test Summary

Maxxam ID FE4540
Sample ID TRAIN BLANK-M23
Matrix Impinger Solution

Collected 2010/02/08
Shipped
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/02	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/02	BY

Maxxam ID FE4541
Sample ID TEST 1-METRO 1-M23
Matrix Impinger Solution

Collected 2010/02/08
Shipped
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/02	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/02	BY

Maxxam ID FE4542
Sample ID TEST 2-METRO 1-M23
Matrix Impinger Solution

Collected 2010/02/08
Shipped
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/02	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/02	BY

Maxxam ID FE4543
Sample ID TEST 3-METRO 1-M23
Matrix Impinger Solution

Collected 2010/02/09
Shipped
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/02	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/02	BY

Maxxam ID FE4544
Sample ID TEST 1-METRO 2-M23
Matrix Impinger Solution

Collected 2010/02/09
Shipped
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/02	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/02	BY

Maxxam Job #: B022953
Report Date: 2010/03/10

Eagle Mountain
Client Project #: 902630
Project name: MET COUNCIL- METRO PLANT

Test Summary

Maxxam ID FE4545
Sample ID TEST 2-METRO 2-M23
Matrix Impinger Solution

Collected 2010/02/10
Shipped
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/02	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/02	BY

Maxxam ID FE4546
Sample ID TEST 3-METRO 2-M23
Matrix Impinger Solution

Collected 2010/02/10
Shipped
Received 2010/02/25

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	2089890	2010/02/26	2010/03/02	OBC
PAHs in Air (CARB429)	HRMS/MS	2087844	2010/02/26	2010/03/04	EM
PCBs by HRMS (1668A)	HRMS/MS	2087846	2010/02/26	2010/03/02	BY

Maxxam Job #: B022953
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Eagle Mountain
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GENERAL COMMENTS

Benzo[b]fluoranthene is actually present as benzo[b/j]fluoranthene as these two congeners co-elute.

Some of the surrogate recoveries are outside of standard recovery ranges due to interferences from the matrix.

Results relate only to the items tested.

Eagle Mountain
Attention: Mark Carlson
Client Project #: 902630
P.O. #:
Project name: MET COUNCIL- METRO PLANT

Quality Assurance Report

Maxxam Job Number: GB022953

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2087844 EM	Spiked Blank	2-Methylnaphthalene-2H10	2010/03/04		70	%	50 - 150
		Acenaphthylene-2H8	2010/03/04		72	%	50 - 150
		Benz(a)anthracene-2H12	2010/03/04		91	%	50 - 150
		Benzo(a)pyrene-2H12	2010/03/04		92	%	50 - 150
		Benzo(b)fluoranthene-2H12	2010/03/04		105	%	50 - 150
		Benzo(g,h,i)perylene-2H12	2010/03/04		84	%	50 - 150
		Benzo(k)fluoranthene-2H12	2010/03/04		89	%	50 - 150
		Chrysene-2H12	2010/03/04		88	%	50 - 150
		Dibenzo(a,h)anthracene-2H14	2010/03/04		93	%	50 - 150
		Fluoranthene-2H10	2010/03/04		93	%	50 - 150
		Indeno(1,2,3-c,d)pyrene-2H12	2010/03/04		94	%	50 - 150
		Naphthalene-2H8	2010/03/04		67	%	50 - 150
		Perylene-2H12	2010/03/04		101	%	50 - 150
		Phenanthrene-2H10	2010/03/04		95	%	50 - 150
		Naphthalene	2010/03/04		148 (1)	%	60 - 140
	RPD	Naphthalene	2010/03/04	4.0		%	50
	Spiked Blank	2-Methylnaphthalene	2010/03/04		101	%	60 - 140
	RPD	2-Methylnaphthalene	2010/03/04	6.7		%	50
	Spiked Blank	2-Chloronaphthalene	2010/03/04		111	%	N/A
	RPD	2-Chloronaphthalene	2010/03/04	4.6		%	50
	Spiked Blank	Acenaphthylene	2010/03/04		99	%	60 - 140
	RPD	Acenaphthylene	2010/03/04	2.0		%	50
	Spiked Blank	Acenaphthene	2010/03/04		101	%	60 - 140
	RPD	Acenaphthene	2010/03/04	2.0		%	50
	Spiked Blank	Fluorene	2010/03/04		78	%	60 - 140
	RPD	Fluorene	2010/03/04	5.0		%	50
	Spiked Blank	Phenanthrene	2010/03/04		84	%	60 - 140
	RPD	Phenanthrene	2010/03/04	2.4		%	50
	Spiked Blank	Anthracene	2010/03/04		82	%	60 - 140
	RPD	Anthracene	2010/03/04	3.6		%	50
	Spiked Blank	Fluoranthene	2010/03/04		91	%	60 - 140
	RPD	Fluoranthene	2010/03/04	1.1		%	50
	Spiked Blank	Pyrene	2010/03/04		82	%	60 - 140
	RPD	Pyrene	2010/03/04	1.2		%	50
	Spiked Blank	Benzo(a)anthracene	2010/03/04		79	%	60 - 140
	RPD	Benzo(a)anthracene	2010/03/04	11.9		%	50
	Spiked Blank	Chrysene	2010/03/04		91	%	60 - 140
	RPD	Chrysene	2010/03/04	0		%	50
	Spiked Blank	Benzo(b)fluoranthene	2010/03/04		84	%	60 - 140
	RPD	Benzo(b)fluoranthene	2010/03/04	3.5		%	50
	Spiked Blank	Benzo(k)fluoranthene	2010/03/04		90	%	60 - 140
	RPD	Benzo(k)fluoranthene	2010/03/04	4.5		%	50
	Spiked Blank	Benzo(e)pyrene	2010/03/04		100	%	60 - 140
	RPD	Benzo(e)pyrene	2010/03/04	7.7		%	50
	Spiked Blank	Benzo(a)pyrene	2010/03/04		108	%	60 - 140
	RPD	Benzo(a)pyrene	2010/03/04	4.7		%	50
	Spiked Blank	Perylene	2010/03/04		87	%	60 - 140
	RPD	Perylene	2010/03/04	1.1		%	50
	Spiked Blank	Indeno(1,2,3-cd)pyrene	2010/03/04		90	%	60 - 140
	RPD	Indeno(1,2,3-cd)pyrene	2010/03/04	11.8		%	50
	Spiked Blank	Dibenz(a,h)anthracene	2010/03/04		80	%	60 - 140
	RPD	Dibenz(a,h)anthracene	2010/03/04	16.1		%	50
	Spiked Blank	Benzo(g,h,i)perylene	2010/03/04		91	%	60 - 140
	RPD	Benzo(g,h,i)perylene	2010/03/04	2.2		%	50
	Method Blank	2-Methylnaphthalene-2H10	2010/03/04		92	%	50 - 150

Eagle Mountain
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Client Project #: 902630
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Project name: MET COUNCIL- METRO PLANT

Quality Assurance Report (Continued)

Maxxam Job Number: GB022953

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2087844 EM	Method Blank	Acenaphthylene-2H8	2010/03/04		87	%	50 - 150
		Benz(a)anthracene-2H12	2010/03/04		97	%	50 - 150
		Benzo(a)pyrene-2H12	2010/03/04		88	%	50 - 150
		Benzo(b)fluoranthene-2H12	2010/03/04		112	%	50 - 150
		Benzo(g,h,i)perylene-2H12	2010/03/04		51	%	50 - 150
		Benzo(k)fluoranthene-2H12	2010/03/04		95	%	50 - 150
		Chrysene-2H12	2010/03/04		92	%	50 - 150
		Dibenzo(a,h)anthracene-2H14	2010/03/04		51	%	50 - 150
		Fluoranthene-2H10	2010/03/04		101	%	50 - 150
		Indeno(1,2,3-c,d)pyrene-2H12	2010/03/04		64	%	50 - 150
		Naphthalene-2H8	2010/03/04		92	%	50 - 150
		Perylene-2H12	2010/03/04		90	%	50 - 150
		Phenanthrene-2H10	2010/03/04		115	%	50 - 150
		Naphthalene	2010/03/04	92, EDL=0.38		ng	
		2-Methylnaphthalene	2010/03/04	5.0, EDL=0.24		ng	
		2-Chloronaphthalene	2010/03/04	ND, EDL=0.064		ng	
		Acenaphthylene	2010/03/04	0.46, EDL=0.12		ng	
		Acenaphthene	2010/03/04	ND, EDL=0.16		ng	
		Fluorene	2010/03/04	ND, EDL=0.25		ng	
		Phenanthrene	2010/03/04	1.85, EDL=0.20		ng	
		Anthracene	2010/03/04	0.63, EDL=0.24		ng	
		Fluoranthene	2010/03/04	2.14, EDL=0.12		ng	
		Pyrene	2010/03/04	3.30, EDL=0.10		ng	
		Benzo(a)anthracene	2010/03/04	0.31, EDL=0.10		ng	
		Chrysene	2010/03/04	0.61, EDL=0.12		ng	
		Benzo(b)fluoranthene	2010/03/04	1.00, EDL=0.18		ng	
		Benzo(k)fluoranthene	2010/03/04	0.63, EDL=0.24		ng	
		Benzo(e)pyrene	2010/03/04	3.30, EDL=0.34		ng	
		Benzo(a)pyrene	2010/03/04	ND, EDL=1.4		ng	
		Perylene	2010/03/04	ND, EDL=0.86		ng	
		Indeno(1,2,3-cd)pyrene	2010/03/04	2.66, EDL=1.7		ng	
		Dibenz(a,h)anthracene	2010/03/04	1.77, EDL=1.2		ng	
		Benzo(g,h,i)perylene	2010/03/04	8.20, EDL=1.6		ng	
2087846 BY	Spiked Blank	C13-2,44'-TriCB-(28)	2010/03/02		62	%	40 - 125
		C13-22'33'44'55'6'-NonaCB-(206)	2010/03/02		118	%	30 - 140
		C13-22'33'44'5'-HeptaCB-(170)	2010/03/02		103	%	30 - 140
		C13-22'33'455'66'-NonaCB-(208)	2010/03/02		113	%	30 - 140
		C13-22'33'55'66'-OctaCB-(202)	2010/03/02		117	%	30 - 140
		C13-22'33'55'6'-HeptaCB-(178)	2010/03/02		143 (1)	%	40 - 125
		C13-22'344'55'-HeptaCB-(180)	2010/03/02		106	%	30 - 140
		C13-22'34'566'-HeptaCB-(188)	2010/03/02		113	%	30 - 140
		C13-22'44'66'-HexaCB-(155)	2010/03/02		114	%	30 - 140
		C13-22'466'-PentaCB-(104)	2010/03/02		92	%	30 - 140
		C13-22'66'-TetraCB-(54)	2010/03/02		81	%	30 - 140
		C13-22'6'-TriCB-(19)	2010/03/02		73	%	30 - 140
		C13-22'-DiCB-(4)	2010/03/02		72	%	30 - 140
		C13-233'44'55'6'-OctaCB-(205)	2010/03/02		102	%	30 - 140
		C13-233'44'55'-HeptaCB-(189)	2010/03/02		96	%	30 - 140
		C13-233'44'-PentaCB-(105)	2010/03/02		83	%	30 - 140
		C13-233'55'-PentaCB-(111)	2010/03/02		108	%	40 - 125
		C13-23'44'55'-HexaCB-(167)	2010/03/02		92	%	30 - 140
		C13-2344'5'-PentaCB-(114)	2010/03/02		79	%	30 - 140
		C13-23'44'5'-PentaCB-(118)	2010/03/02		80	%	30 - 140
		C13-2'344'5'-PentaCB-(123)	2010/03/02		79	%	30 - 140
		C13-2-MonoCB-(1)	2010/03/02		54	%	15 - 140

Eagle Mountain
Attention: Mark Carlson
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Quality Assurance Report (Continued)

Maxxam Job Number: GB022953

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2087846 BY	Spiked Blank	C13-33'44'55'-HexaCB-(169)	2010/03/02		92	%	30 - 140
		C13-33'44'5'-PentaCB-(126)	2010/03/02		86	%	30 - 140
		C13-33'44'-TetraCB-(77)	2010/03/02		78	%	30 - 140
		C13-344'5'-TetraCB-(81)	2010/03/02		77	%	30 - 140
		C13-344'-TriCB-(37)	2010/03/02		63	%	30 - 140
		C13-44'-DiCB-(15)	2010/03/02		59	%	30 - 140
		C13-4-MonoCB-(3)	2010/03/02		56	%	15 - 140
		C13-DecaCB-(209)	2010/03/02		136	%	30 - 140
		C13-HexaCB-(156)+(157)	2010/03/02		91	%	30 - 140
	RPD	2-MonoCB-(1)	2010/03/02		99	%	50 - 150
		2-MonoCB-(1)	2010/03/02	0		%	30
	Spiked Blank	4-MonoCB-(3)	2010/03/02		97	%	50 - 150
	RPD	4-MonoCB-(3)	2010/03/02	0		%	30
	Spiked Blank	22'-DiCB-(4)	2010/03/02		102	%	50 - 150
	RPD	22'-DiCB-(4)	2010/03/02	1.9		%	30
	Spiked Blank	4,4'-DiCB-(15)	2010/03/02		109	%	50 - 150
	RPD	4,4'-DiCB-(15)	2010/03/02	1.9		%	30
	Spiked Blank	22'6'-TriCB-(19)	2010/03/02		98	%	50 - 150
	RPD	22'6'-TriCB-(19)	2010/03/02	3.0		%	30
	Spiked Blank	235-TriCB-(23)	2010/03/02		104	%	50 - 150
	RPD	235-TriCB-(23)	2010/03/02	1		%	30
	Spiked Blank	23'5'-TriCB-(34)	2010/03/02		98	%	50 - 150
	RPD	23'5'-TriCB-(34)	2010/03/02	4.0		%	30
	Spiked Blank	344'-TriCB-(37)	2010/03/02		108	%	50 - 150
	RPD	344'-TriCB-(37)	2010/03/02	0.9		%	30
	Spiked Blank	22'66'-TetraCB-(54)	2010/03/02		103	%	50 - 150
	RPD	22'66'-TetraCB-(54)	2010/03/02	3.8		%	30
	Spiked Blank	33'44'-TetraCB-(77)	2010/03/02		110	%	50 - 150
	RPD	33'44'-TetraCB-(77)	2010/03/02	1.8		%	30
	Spiked Blank	344'5'-TetraCB-(81)	2010/03/02		109	%	50 - 150
	RPD	344'5'-TetraCB-(81)	2010/03/02	0.9		%	30
	Spiked Blank	22'466'-PentaCB-(104)	2010/03/02		101	%	50 - 150
	RPD	22'466'-PentaCB-(104)	2010/03/02	0		%	30
	Spiked Blank	233'44'-PentaCB-(105)	2010/03/02		107	%	50 - 150
	RPD	233'44'-PentaCB-(105)	2010/03/02	0.9		%	30
	Spiked Blank	2344'5'-PentaCB-(114)	2010/03/02		106	%	50 - 150
	RPD	2344'5'-PentaCB-(114)	2010/03/02	2.8		%	30
	Spiked Blank	23'44'5'-PentaCB-(118)	2010/03/02		104	%	50 - 150
	RPD	23'44'5'-PentaCB-(118)	2010/03/02	4.7		%	30
	Spiked Blank	23'44'5'-PentaCB-(123)	2010/03/02		108	%	50 - 150
	RPD	23'44'5'-PentaCB-(123)	2010/03/02	1.9		%	30
	Spiked Blank	33'44'5'-PentaCB-(126)	2010/03/02		107	%	50 - 150
	RPD	33'44'5'-PentaCB-(126)	2010/03/02	1.9		%	30
	Spiked Blank	22'44'66'-HexaCB-(155)	2010/03/02		103	%	50 - 150
	RPD	22'44'66'-HexaCB-(155)	2010/03/02	1		%	30
	Spiked Blank	HexaCB-(156)+(157)	2010/03/02		107	%	50 - 150
	RPD	HexaCB-(156)+(157)	2010/03/02	0		%	30
	Spiked Blank	23'44'55'-HexaCB-(167)	2010/03/02		107	%	50 - 150
	RPD	23'44'55'-HexaCB-(167)	2010/03/02	2.8		%	30
	Spiked Blank	33'44'55'-HexaCB-(169)	2010/03/02		105	%	50 - 150
	RPD	33'44'55'-HexaCB-(169)	2010/03/02	1.9		%	30
	Spiked Blank	22'33'44'5'-HeptaCB-(170)	2010/03/02		103	%	50 - 150
	RPD	22'33'44'5'-HeptaCB-(170)	2010/03/02	1		%	30
	Spiked Blank	HeptaCB-(180)+(193)	2010/03/02		94	%	50 - 150
	RPD	HeptaCB-(180)+(193)	2010/03/02	3.1		%	30

Eagle Mountain
Attention: Mark Carlson
Client Project #: 902630
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Quality Assurance Report (Continued)

Maxxam Job Number: GB022953

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2087846 BY	Spiked Blank	22'344'56'-HeptaCB-(182)	2010/03/02		108	%	50 - 150
	RPD	22'344'56'-HeptaCB-(182)	2010/03/02	0.9		%	30
	Spiked Blank	22'34'55'6'-HeptaCB-(187)	2010/03/02		110	%	50 - 150
	RPD	22'34'55'6'-HeptaCB-(187)	2010/03/02	1.8		%	30
	Spiked Blank	22'34'566'-HeptaCB-(188)	2010/03/02		104	%	50 - 150
	RPD	22'34'566'-HeptaCB-(188)	2010/03/02	1		%	30
	Spiked Blank	233'44'55'-HeptaCB-(189)	2010/03/02		107	%	50 - 150
	RPD	233'44'55'-HeptaCB-(189)	2010/03/02	1.9		%	30
	Spiked Blank	22'33'55'66'-OctaCB-(202)	2010/03/02		102	%	50 - 150
	RPD	22'33'55'66'-OctaCB-(202)	2010/03/02	2.9		%	30
	Spiked Blank	233'44'55'6'-OctaCB-(205)	2010/03/02		107	%	50 - 150
	RPD	233'44'55'6'-OctaCB-(205)	2010/03/02	1.9		%	30
	Spiked Blank	22'33'44'55'6'-NonaCB-(206)	2010/03/02		101	%	50 - 150
	RPD	22'33'44'55'6'-NonaCB-(206)	2010/03/02	1		%	30
	Spiked Blank	22'33'455'66'-NonaCB-(208)	2010/03/02		104	%	50 - 150
	RPD	22'33'455'66'-NonaCB-(208)	2010/03/02	1		%	30
	Spiked Blank	DecaCB-(209)	2010/03/02		104	%	50 - 150
	RPD	DecaCB-(209)	2010/03/02	1		%	30
	Method Blank	C13-2,44'-TriCB-(28)	2010/03/02		68	%	40 - 125
		C13-22'33'44'55'6'-NonaCB-(206)	2010/03/02		122	%	30 - 140
		C13-22'33'44'5'-HeptaCB-(170)	2010/03/02		107	%	30 - 140
		C13-22'33'455'66'-NonaCB-(208)	2010/03/02		121	%	30 - 140
		C13-22'33'55'66'-OctaCB-(202)	2010/03/02		128	%	30 - 140
		C13-22'33'55'6'-HeptaCB-(178)	2010/03/02		133 (1)	%	40 - 125
		C13-22'344'55'-HeptaCB-(180)	2010/03/02		108	%	30 - 140
		C13-22'34'566'-HeptaCB-(188)	2010/03/02		120	%	30 - 140
		C13-22'44'66'-HexaCB-(155)	2010/03/02		128	%	30 - 140
		C13-22'466'-PentaCB-(104)	2010/03/02		105	%	30 - 140
		C13-22'66'-TetraCB-(54)	2010/03/02		92	%	30 - 140
		C13-22'6'-TriCB-(19)	2010/03/02		90	%	30 - 140
		C13-22'-DiCB-(4)	2010/03/02		93	%	30 - 140
		C13-233'44'55'6'-OctaCB-(205)	2010/03/02		101	%	30 - 140
		C13-233'44'55'-HeptaCB-(189)	2010/03/02		98	%	30 - 140
		C13-233'44'-PentaCB-(105)	2010/03/02		84	%	30 - 140
		C13-233'55'-PentaCB-(111)	2010/03/02		107	%	40 - 125
		C13-23'44'55'-HexaCB-(167)	2010/03/02		89	%	30 - 140
		C13-2344'5'-PentaCB-(114)	2010/03/02		80	%	30 - 140
		C13-23'44'5'-PentaCB-(118)	2010/03/02		82	%	30 - 140
		C13-2'344'5'-PentaCB-(123)	2010/03/02		82	%	30 - 140
		C13-2-MonoCB-(1)	2010/03/02		74	%	15 - 140
		C13-33'44'55'-HexaCB-(169)	2010/03/02		86	%	30 - 140
		C13-33'44'5'-PentaCB-(126)	2010/03/02		82	%	30 - 140
		C13-33'44'-TetraCB-(77)	2010/03/02		77	%	30 - 140
		C13-344'5'-TetraCB-(81)	2010/03/02		76	%	30 - 140
		C13-344'-TriCB-(37)	2010/03/02		68	%	30 - 140
		C13-44'-DiCB-(15)	2010/03/02		74	%	30 - 140
		C13-4-MonoCB-(3)	2010/03/02		73	%	15 - 140
		C13-DecaCB-(209)	2010/03/02		143 (1)	%	30 - 140
		C13-HexaCB-(156)+(157)	2010/03/02		89	%	30 - 140
		2-MonoCB-(1)	2010/03/02	ND, EDL=0.0062		ng	
		3-MonoCB-(2)	2010/03/02	ND, EDL=0.0069		ng	
		4-MonoCB-(3)	2010/03/02	ND, EDL=0.0062		ng	
		22'-DiCB-(4)	2010/03/02	ND, EDL=0.036		ng	
		2,3-DiCB-(5)	2010/03/02	ND, EDL=0.078		ng	
		2,3'-DiCB-(6)	2010/03/02	ND, EDL=0.073		ng	

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2087846 BY	Method Blank	2,4-DiCB-(7)	2010/03/02	ND, EDL=0.073		ng	
		2,4'-DiCB-(8)	2010/03/02	ND, EDL=0.070		ng	
		2,5-DiCB-(9)	2010/03/02	ND, EDL=0.073		ng	
		2,6-DiCB-(10)	2010/03/02	ND, EDL=0.029		ng	
		3,3'-DiCB-(11)	2010/03/02	ND, EDL=0.074		ng	
		DiCB-(12)+(13)	2010/03/02	ND, EDL=0.076		ng	
		3,5-DiCB-(14)	2010/03/02	ND, EDL=0.073		ng	
		4,4'-DiCB-(15)	2010/03/02	ND, EDL=0.085		ng	
		22'3-TriCB-(16)	2010/03/02	ND, EDL=0.024		ng	
		22'4-TriCB-(17)	2010/03/02	ND, EDL=0.019		ng	
		TriCB-(18)+(30)	2010/03/02	ND, EDL=0.016		ng	
		22'6-TriCB-(19)	2010/03/02	ND, EDL=0.019		ng	
		TriCB-(20) + (28)	2010/03/02	ND, EDL=0.0085		ng	
		TriCB-(21)+(33)	2010/03/02	ND, EDL=0.0082		ng	
		234'-TriCB-(22)	2010/03/02	ND, EDL=0.0089		ng	
		235-TriCB-(23)	2010/03/02	ND, EDL=0.0089		ng	
		236-TriCB-(24)	2010/03/02	ND, EDL=0.015		ng	
		23'4-TriCB-(25)	2010/03/02	ND, EDL=0.0077		ng	
		TriCB-(26)+(29)	2010/03/02	ND, EDL=0.0082		ng	
		23'6-TriCB-(27)	2010/03/02	ND, EDL=0.014		ng	
		24'5-TriCB-(31)	2010/03/02	ND, EDL=0.0080		ng	
		24'6-TriCB-(32)	2010/03/02	ND, EDL=0.013		ng	
		23'5'-TriCB-(34)	2010/03/02	ND, EDL=0.0084		ng	
		33'4-TriCB-(35)	2010/03/02	ND, EDL=0.0085		ng	
		33'5-TriCB-(36)	2010/03/02	ND, EDL=0.0073		ng	
		344'-TriCB-(37)	2010/03/02	ND, EDL=0.0091		ng	
		345-TriCB-(38)	2010/03/02	ND, EDL=0.0085		ng	
		34'5-TriCB-(39)	2010/03/02	ND, EDL=0.0083		ng	
		TetraCB-(40)+(41)+(71)	2010/03/02	ND, EDL=0.018		ng	
		22'34'-TetraCB-(42)	2010/03/02	ND, EDL=0.019		ng	
		22'35-TetraCB-(43)	2010/03/02	ND, EDL=0.022		ng	
		TetraCB-(44)+(47)+(65)	2010/03/02	ND, EDL=0.016		ng	
		TetraCB-(45)+(51)	2010/03/02	ND, EDL=0.018		ng	
		22'36'-TetraCB-(46)	2010/03/02	ND, EDL=0.020		ng	
		22'45-TetraCB-(48)	2010/03/02	ND, EDL=0.017		ng	
		TetraCB-(49)+TetraCB-(69)	2010/03/02	ND, EDL=0.015		ng	
		TetraCB-(50)+(53)	2010/03/02	ND, EDL=0.017		ng	
		22'55'-TetraCB-(52)	2010/03/02	ND, EDL=0.022		ng	
		22'66'-TetraCB-(54)	2010/03/02	ND, EDL=0.0086		ng	
		233'4-TetraCB-(55)	2010/03/02	ND, EDL=0.0058		ng	
		233'4'-Tetra CB(56)	2010/03/02	ND, EDL=0.0058		ng	
		233'5-TetraCB-(57)	2010/03/02	ND, EDL=0.0056		ng	
		233'5'-TetraCB-(58)	2010/03/02	ND, EDL=0.0055		ng	
		TetraCB-(59)+(62)+(75)	2010/03/02	ND, EDL=0.014		ng	
		2344'-TetraCB -(60)	2010/03/02	ND, EDL=0.0059		ng	
		TetraCB-(61)+(70)+(74)+(76)	2010/03/02	ND, EDL=0.0056		ng	
		234'5-TetraCB-(63)	2010/03/02	ND, EDL=0.0053		ng	
		234'6-TetraCB-(64)	2010/03/02	ND, EDL=0.013		ng	
		23'44'-TetraCB-(66)	2010/03/02	ND, EDL=0.0054		ng	
		23'45-TetraCB-(67)	2010/03/02	ND, EDL=0.0052		ng	
		23'45'-TetraCB-(68)	2010/03/02	ND, EDL=0.0051		ng	
		23'55'-TetraCB-(72)	2010/03/02	ND, EDL=0.0052		ng	
		23'5'6-TetraCB-(73)	2010/03/02	ND, EDL=0.014		ng	
		33'44'-TetraCB-(77)	2010/03/02	ND, EDL=0.0055		ng	
		33'45-TetraCB-(78)	2010/03/02	ND, EDL=0.0057		ng	

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2087846 BY	Method Blank	33'45'-TetraCB-(79)	2010/03/02	ND, EDL=0.0049		ng	
		33'55'-TetraCB-(80)	2010/03/02	ND, EDL=0.0050		ng	
		344'5'-TetraCB-(81)	2010/03/02	ND, EDL=0.0055		ng	
		22'33'4'-PentaCB-(82)	2010/03/02	ND, EDL=0.0099		ng	
		PentaCB-(83)+(99)	2010/03/02	ND, EDL=0.0092		ng	
		22'33'6'-PentaCB-(84)	2010/03/02	ND, EDL=0.010		ng	
		PentaCB-(85)+(116)+(117)	2010/03/02	ND, EDL=0.0074		ng	
		PentaCB-(86)(87)(97)(109)(119)(125)	2010/03/02	ND, EDL=0.0079		ng	
		PentaCB-(88)+(91)	2010/03/02	ND, EDL=0.0090		ng	
		22'346'-PentaCB-(89)	2010/03/02	ND, EDL=0.0093		ng	
		PentaCB-(90)+(101)+(113)	2010/03/02	ND, EDL=0.0079		ng	
		22'355'-PentaCB-(92)	2010/03/02	ND, EDL=0.0088		ng	
		PentaCB-(93)+(98)+(100)+(102)	2010/03/02	ND, EDL=0.0089		ng	
		22'356'-PentaCB-(94)	2010/03/02	ND, EDL=0.0097		ng	
		22'35'6'-PentaCB-(95)	2010/03/02	ND, EDL=0.0084		ng	
		22'366'-PentaCB-(96)	2010/03/02	ND, EDL=0.0038		ng	
		22'45'6'-PentaCB-(103)	2010/03/02	ND, EDL=0.0079		ng	
		22'466'-PentaCB-(104)	2010/03/02	ND, EDL=0.0045		ng	
		233'44'-PentaCB-(105)	2010/03/02	ND, EDL=0.0089		ng	
		233'45'-PentaCB-(106)	2010/03/02	ND, EDL=0.0091		ng	
		233'4'5'-PentaCB-(107)	2010/03/02	ND, EDL=0.0092		ng	
		PentaCB-(108)+(124)	2010/03/02	ND, EDL=0.0095		ng	
		PentaCB-(110)+(115)	2010/03/02	ND, EDL=0.021		ng	
		233'55'-PentaCB-(111)	2010/03/02	ND, EDL=0.0068		ng	
		233'56'-PentaCB-(112)	2010/03/02	ND, EDL=0.0067		ng	
		2344'5'-PentaCB-(114)	2010/03/02	ND, EDL=0.0087		ng	
		23'44'5'-PentaCB-(118)	2010/03/02	ND, EDL=0.0086		ng	
		23'455'-PentaCB-(120)	2010/03/02	ND, EDL=0.0065		ng	
		23'45'6'-PentaCB-(121)	2010/03/02	ND, EDL=0.0068		ng	
		233'4'5'-PentaCB-(122)	2010/03/02	ND, EDL=0.010		ng	
		23'44'5'-PentaCB-(123)	2010/03/02	ND, EDL=0.0089		ng	
		33'44'5'-PentaCB-(126)	2010/03/02	ND, EDL=0.0086		ng	
		33'455'-PentaCB-(127)	2010/03/02	ND, EDL=0.0093		ng	
		HexaCB-(128)+(166)	2010/03/02	ND, EDL=0.013		ng	
		HexaCB-(129)+(138)+(163)	2010/03/02	ND, EDL=0.065		ng	
		22'33'45'-HexaCB-(130)	2010/03/02	ND, EDL=0.016		ng	
		22'33'46'-HexaCB-(131)	2010/03/02	ND, EDL=0.015		ng	
		22'33'46'-HexaCB-(132)	2010/03/02	ND, EDL=0.012		ng	
		22'33'55'-HexaCB-(133)	2010/03/02	ND, EDL=0.014		ng	
		HexaCB-(134)+(143)	2010/03/02	ND, EDL=0.016		ng	
		HexaCB-(135)+(151)	2010/03/02	ND, EDL=0.018		ng	
		22'33'66'-HexaCB-(136)	2010/03/02	ND, EDL=0.0069		ng	
		22'344'5'-HexaCB-(137)	2010/03/02	ND, EDL=0.016		ng	
		HexaCB-(139)+(140)	2010/03/02	ND, EDL=0.014		ng	
		22'3455'-HexaCB-(141)	2010/03/02	ND, EDL=0.014		ng	
		22'3456'-HexaCB-(142)	2010/03/02	ND, EDL=0.015		ng	
		22'345'6'-HexaCB-(144)	2010/03/02	ND, EDL=0.0064		ng	
		22'3466'-HexaCB-(145)	2010/03/02	ND, EDL=0.0052		ng	
		22'34'55'-HexaCB-(146)	2010/03/02	ND, EDL=0.013		ng	
		HexaCB-(147)+(149)	2010/03/02	ND, EDL=0.015		ng	
		22'34'56'-HexaCB-(148)	2010/03/02	ND, EDL=0.0064		ng	
		22'34'66'-HexaCB-(150)	2010/03/02	ND, EDL=0.0049		ng	
		22'3566'-HexaCB-(152)	2010/03/02	ND, EDL=0.0047		ng	
		HexaCB-(153)+(168)	2010/03/02	ND, EDL=0.048		ng	
		22'44'56'-HexaCB-(154)	2010/03/02	ND, EDL=0.0057		ng	

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2087846 BY	Method Blank	22'44'66'-HexaCB-(155)	2010/03/02	ND, EDL=0.0063		ng	
		HexaCB-(156)+(157)	2010/03/02	ND, EDL=0.0089		ng	
		233'44'6'-HexaCB-(158)	2010/03/02	ND, EDL=0.010		ng	
		233'455'-HexaCB-(159)	2010/03/02	ND, EDL=0.0054		ng	
		233'456'-HexaCB-(160)	2010/03/02	ND, EDL=0.012		ng	
		233'45'6'-HexaCB-(161)	2010/03/02	ND, EDL=0.011		ng	
		233'4'55'-HexaCB-(162)	2010/03/02	ND, EDL=0.0055		ng	
		233'4'5'6'-HexaCB-(164)	2010/03/02	ND, EDL=0.010		ng	
		233'55'6'-HexaCB-(165)	2010/03/02	ND, EDL=0.012		ng	
		23'44'55'-HexaCB-(167)	2010/03/02	ND, EDL=0.0048		ng	
		33'44'55'-HexaCB-(169)	2010/03/02	ND, EDL=0.0049		ng	
		22'33'44'5'-HeptaCB-(170)	2010/03/02	ND, EDL=0.017		ng	
		HeptaCB-(171)+(173)	2010/03/02	ND, EDL=0.021		ng	
		22'33'455'-HeptaCB-(172)	2010/03/02	ND, EDL=0.022		ng	
		22'33'456'-HeptaCB-(174)	2010/03/02	ND, EDL=0.020		ng	
		22'33'45'6'-HeptaCB-(175)	2010/03/02	ND, EDL=0.0041		ng	
		22'33'466'-HeptaCB-(176)	2010/03/02	ND, EDL=0.0032		ng	
		22'33'45'6'-HeptaCB-(177)	2010/03/02	ND, EDL=0.021		ng	
		22'33'55'6'-HeptaCB-(178)	2010/03/02	ND, EDL=0.0043		ng	
		22'33'566'-HeptaCB-(179)	2010/03/02	ND, EDL=0.0067		ng	
		HeptaCB-(180)+(193)	2010/03/02	ND, EDL=0.023		ng	
		22'344'56'-HeptaCB-(181)	2010/03/02	ND, EDL=0.020		ng	
		22'344'56'-HeptaCB-(182)	2010/03/02	ND, EDL=0.0042		ng	
		22'344'5'6'-HeptaCB-(183)	2010/03/02	ND, EDL=0.018		ng	
		22'344'66'-HeptaCB-(184)	2010/03/02	ND, EDL=0.0031		ng	
		22'3455'6'-HeptaCB-(185)	2010/03/02	ND, EDL=0.021		ng	
		22'34566'-HeptaCB-(186)	2010/03/02	ND, EDL=0.0033		ng	
		22'34'55'6'-HeptaCB-(187)	2010/03/02	ND, EDL=0.012		ng	
		22'34'566'-HeptaCB-(188)	2010/03/02	ND, EDL=0.0043		ng	
		233'44'55'-HeptaCB-(189)	2010/03/02	ND, EDL=0.0073		ng	
		233'44'56'-HeptaCB-(190)	2010/03/02	ND, EDL=0.017		ng	
		233'44'5'6'-HeptaCB-(191)	2010/03/02	ND, EDL=0.016		ng	
		233'455'6'-HeptaCB-(192)	2010/03/02	ND, EDL=0.018		ng	
		22'33'44'55'-OctaCB-(194)	2010/03/02	ND, EDL=0.0067		ng	
		22'33'44'56'-OctaCB-(195)	2010/03/02	ND, EDL=0.0070		ng	
		22'33'44'56'-OctaCB-(196)	2010/03/02	ND, EDL=0.0069		ng	
		22'33'44'66'-OctaCB-(197)	2010/03/02	ND, EDL=0.0054		ng	
		OctaCB-(198)+(199)	2010/03/02	ND, EDL=0.0070		ng	
		22'33'4566'-OctaCB-(200)	2010/03/02	ND, EDL=0.0048		ng	
		22'33'45'66'-OctaCB-(201)	2010/03/02	ND, EDL=0.0051		ng	
		22'33'55'66'-OctaCB-(202)	2010/03/02	ND, EDL=0.0063		ng	
		22'344'55'6'-OctaCB-(203)	2010/03/02	ND, EDL=0.0066		ng	
		22'344'566'-OctaCB-(204)	2010/03/02	ND, EDL=0.0051		ng	
		233'44'55'6'-OctaCB-(205)	2010/03/02	ND, EDL=0.0046		ng	
		22'33'44'55'6'-NonaCB-(206)	2010/03/02	ND, EDL=0.0083		ng	
		22'33'44'566'-NonaCB-(207)	2010/03/02	ND, EDL=0.0078		ng	
		22'33'455'66'-NonaCB-(208)	2010/03/02	ND, EDL=0.0087		ng	
		DecaCB-(209)	2010/03/02	ND, EDL=0.0045		ng	
		Monochlorobiphenyl	2010/03/02	ND, EDL=0.0069		ng	
		Dichlorobiphenyl	2010/03/02	ND, EDL=0.085		ng	
		Trichlorobiphenyl	2010/03/02	ND, EDL=0.024		ng	
		Tetrachlorobiphenyl	2010/03/02	0.026, EDL=0.022		ng	
		Pentachlorobiphenyl	2010/03/02	0.120, EDL=0.010		ng	
		Hexachlorobiphenyl	2010/03/02	0.040, EDL=0.016		ng	
		Heptachlorobiphenyl	2010/03/02	ND, EDL=0.022		ng	

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2087846 BY	Method Blank	Octachlorobiphenyl	2010/03/02	ND, EDL=0.0070		ng	
		Nonachlorobiphenyl	2010/03/02	ND, EDL=0.0087		ng	
		Decachlorobiphenyl	2010/03/02	ND, EDL=0.0045		ng	
2089890 OBC	Spiked Blank	C13-1234678 HeptaCDD	2010/03/02		105	%	25 - 130
		C13-1234678 HeptaCDF	2010/03/02		106	%	25 - 130
		C13-123678 HexaCDD	2010/03/02		97	%	40 - 130
		C13-123678 HexaCDF	2010/03/02		84	%	40 - 130
		C13-12378 PentaCDD	2010/03/02		85	%	40 - 130
		C13-12378 PentaCDF	2010/03/02		92	%	40 - 130
		C13-123789 HexaCDF	2010/03/02		95	%	40 - 130
		C13-2378 TetraCDD	2010/03/02		49	%	40 - 130
		C13-2378 TetraCDF	2010/03/02		54	%	40 - 130
		C13-Octachlorodibenzo-p-Dioxin	2010/03/02		116	%	25 - 130
		2,3,7,8-Tetra CDD	2010/03/02		106	%	80 - 140
	RPD	2,3,7,8-Tetra CDD	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,7,8-Penta CDD	2010/03/02		114	%	80 - 140
	RPD	1,2,3,7,8-Penta CDD	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,4,7,8-Hexa CDD	2010/03/02		94	%	80 - 140
	RPD	1,2,3,4,7,8-Hexa CDD	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,6,7,8-Hexa CDD	2010/03/02		97	%	80 - 140
	RPD	1,2,3,6,7,8-Hexa CDD	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,7,8,9-Hexa CDD	2010/03/02		99	%	80 - 140
	RPD	1,2,3,7,8,9-Hexa CDD	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,4,6,7,8-Hepta CDD	2010/03/02		89	%	80 - 140
	RPD	1,2,3,4,6,7,8-Hepta CDD	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,4,6,7,8,9-Octa CDD	2010/03/02		100	%	80 - 140
	RPD	1,2,3,4,6,7,8,9-Octa CDD	2010/03/02	NC		%	20
	Spiked Blank	2,3,7,8-Tetra CDF	2010/03/02		117	%	80 - 140
	RPD	2,3,7,8-Tetra CDF	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,7,8-Penta CDF	2010/03/02		114	%	80 - 140
	RPD	1,2,3,7,8-Penta CDF	2010/03/02	NC		%	20
	Spiked Blank	2,3,4,7,8-Penta CDF	2010/03/02		112	%	80 - 140
	RPD	2,3,4,7,8-Penta CDF	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,4,7,8-Hexa CDF	2010/03/02		106	%	80 - 140
	RPD	1,2,3,4,7,8-Hexa CDF	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,6,7,8-Hexa CDF	2010/03/02		110	%	80 - 140
	RPD	1,2,3,6,7,8-Hexa CDF	2010/03/02	NC		%	20
	Spiked Blank	2,3,4,6,7,8-Hexa CDF	2010/03/02		125	%	80 - 140
	RPD	2,3,4,6,7,8-Hexa CDF	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,7,8,9-Hexa CDF	2010/03/02		121	%	80 - 140
	RPD	1,2,3,7,8,9-Hexa CDF	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,4,6,7,8-Hepta CDF	2010/03/02		95	%	80 - 140
	RPD	1,2,3,4,6,7,8-Hepta CDF	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,4,7,8,9-Hepta CDF	2010/03/02		99	%	80 - 140
	RPD	1,2,3,4,7,8,9-Hepta CDF	2010/03/02	NC		%	20
	Spiked Blank	1,2,3,4,6,7,8,9-Octa CDF	2010/03/02		110	%	80 - 140
	RPD	1,2,3,4,6,7,8,9-Octa CDF	2010/03/02	NC		%	20
	Method Blank	C13-1234678 HeptaCDD	2010/03/02		116	%	25 - 130
		C13-1234678 HeptaCDF	2010/03/02		110	%	25 - 130
		C13-123678 HexaCDD	2010/03/02		101	%	40 - 130
		C13-123678 HexaCDF	2010/03/02		92	%	40 - 130
		C13-12378 PentaCDD	2010/03/02		92	%	40 - 130
		C13-12378 PentaCDF	2010/03/02		97	%	40 - 130
		C13-123789 HexaCDF	2010/03/02		98	%	40 - 130
		C13-2378 TetraCDD	2010/03/02		68	%	40 - 130

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Maxxam Job Number: GB022953

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	%Recovery	Units	QC Limits
2089890 OBC	Method Blank	C13-2378 TetraCDF	2010/03/02		79	%	40 - 130
		C13-Octachlorodibenzo-p-Dioxin	2010/03/02		111	%	25 - 130
		2,3,7,8-Tetra CDD	2010/03/02	ND, EDL=2.3		pg	
		1,2,3,7,8-Penta CDD	2010/03/02	ND, EDL=2.4		pg	
		1,2,3,4,7,8-Hexa CDD	2010/03/02	ND, EDL=2.2		pg	
		1,2,3,6,7,8-Hexa CDD	2010/03/02	ND, EDL=2.0		pg	
		1,2,3,7,8,9-Hexa CDD	2010/03/02	ND, EDL=1.9		pg	
		1,2,3,4,6,7,8-Hepta CDD	2010/03/02	ND, EDL=2.2		pg	
		1,2,3,4,6,7,8,9-Octa CDD	2010/03/02	ND, EDL=4.2		pg	
		Total Tetra CDD	2010/03/02	ND, EDL=2.3		pg	
		Total Penta CDD	2010/03/02	ND, EDL=2.4		pg	
		Total Hexa CDD	2010/03/02	ND, EDL=2.0		pg	
		Total Hepta CDD	2010/03/02	ND, EDL=2.2		pg	
		2,3,7,8-Tetra CDF	2010/03/02	ND, EDL=2.2		pg	
		1,2,3,7,8-Penta CDF	2010/03/02	ND, EDL=5.6 (2)		pg	
		2,3,4,7,8-Penta CDF	2010/03/02	ND, EDL=2.1		pg	
		1,2,3,4,7,8-Hexa CDF	2010/03/02	ND, EDL=2.3		pg	
		1,2,3,6,7,8-Hexa CDF	2010/03/02	ND, EDL=2.0		pg	
		2,3,4,6,7,8-Hexa CDF	2010/03/02	ND, EDL=2.6		pg	
		1,2,3,7,8,9-Hexa CDF	2010/03/02	ND, EDL=2.5		pg	
		1,2,3,4,6,7,8-Hepta CDF	2010/03/02	ND, EDL=10 (2)		pg	
		1,2,3,4,7,8,9-Hepta CDF	2010/03/02	ND, EDL=2.3		pg	
		1,2,3,4,6,7,8,9-Octa CDF	2010/03/02	ND, EDL=4.1		pg	
		Total Tetra CDF	2010/03/02	ND, EDL=2.2		pg	
		Total Penta CDF	2010/03/02	ND, EDL=2.1		pg	
		Total Hexa CDF	2010/03/02	53, EDL=2.3		pg	
		Total Hepta CDF	2010/03/02	ND, EDL=2.1		pg	
		Toxic Equivalency	2010/03/02	22.8, EDL=2.2		pg	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

CHAIN OF CUSTODY DOCUMENT

Page: 2 of 2

Client: Met Council

Test Date: February 8-10, 2010

Project #: 902630

Location: Metro Plant

SAMPLED BY:	RECOVERED BY:		DATE	TIME
Monte Trant	Mark Carlson			
RELINQUISHED BY:	RECEIVED BY:	FOR	DATE	TIME
Mark Carlson				
RELINQUISHED BY:	RECEIVED BY:	FOR	DATE	TIME
	Mark Carlson	Mark Carlson	10/2/25	12:10

ANALYSIS REQUESTED

[illegible]

COMMENTS: Please Return all Hazardous Shipping Containers to EMSI

902630 Metro
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CHAIN OF CUSTODY DOCUMENT

Page: 1 of 2

Client: Met Council

Test Date: February 8-10, 2010

Project #: 902630

Location: Metro Plant

SAMPLED BY:	RECOVERED BY:		DATE	TIME
Nate Trant	Mark Carlson		2-8-10	10
RELINQUISHED BY:	RECEIVED BY:	FOR	DATE	TIME
Mark Carlson				
RELINQUISHED BY:	RECEIVED BY:	FOR	DATE	TIME
	Maxxam		10/02/25	12:10

ANALYSIS REQUESTED

SAMPLE ID	SAMPLE DESCRIPTION	TEST NO.	DATE/TIME SAMPLED	PCDD/PCDF	PCB's	PAH's							SAMPLE COND.
1	Filter	1	2-8-10	X	X	X							Metro 1
2	Trap	1	2-8-10	X	X	X							Metro 1
3	Acetone, Meth Chloride	1	2-8-10	X	X	X							Metro 1
4	Toluene	1	2-8-10	X	X	X							Metro 1
5	Filter	2	2-8-10	X	X	X							Metro 1
6	Trap	2	2-8-10	X	X	X							Metro 1
7	Acetone, Meth Chloride	2	2-8-10	X	X	X							Metro 1
8	Toluene	2	2-8-10	X	X	X							Metro 1
9	Filter	3	2-9-10	X	X	X							Metro 1
10	Trap	3	2-9-10	X	X	X							Metro 1
11	Acetone, Meth Chloride	3	2-9-10	X	X	X							Metro 1
12	Toluene	3	2-9-10	X	X	X							Metro 1
13	Filter	1	2-9-10	X	X	X							Metro 2
14	Trap	1	2-9-10	X	X	X							Metro 2
15	Acetone, Meth Chloride	1	2-9-10	X	X	X							Metro 2
16	Toluene	1	2-9-10	X	X	X							Metro 2
17	Filter	2	2-10-10	X	X	X							Metro 2
18	Trap	2	2-10-10	X	X	X							Metro 2

COMMENTS: Please Return all Hazardous Shipping Containers to EMSI

902630 Metro
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SAMPLE RECEIPT LOG

Lab Name: <u>Maxxam Analytics Inc., Mississauga Laboratory</u>	
Received by (Name): <u>M. Ficht</u>	
Received by (Signature): <u>[Signature]</u>	Date: <u>10/02/25</u> Time: <u>12:10</u>

Client Name: <u>Eagle Mountain</u>	
Number of Package: <u>11</u>	Number of Boxes: <u>11</u> or Coolers: <u>3</u>
Waybill #: <u>Driver pickup</u>	

REMARKS:	Condition of Sample(s) Shipment - Comments
Sample Reception Documentation	
Samples Packed in Coolers? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Cooler Contains ice? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Custody seal(s) on cooler? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/>	
Chain of Custody (CoC) present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Cooler Temperature measured? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Containers intact? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Correct containers used? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
CoC agrees with samples? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Samples rec'd after hold time? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Project Mgr contacted via SIF? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Project Manager Documentation	
Client contacted if discrepancies in shipment are observed? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Client acceptance of deficiencies (if observed at sample receipt) Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Cooler temperatures upon receipt	
Cooler ID: <u>C1</u> Temp: <u>15°C 19°C 15°C</u>	
Cooler ID: <u>C2</u> Temp: <u>4°C 4°C 4°C</u>	
Cooler ID: <u>C3</u> Temp: <u>15°C 19°C 17°C</u>	

Unpacked & package checked By: [Signature]
 Package checked By: [Signature]
 Relinquished by: [Signature]

Date: 10/02/25
 Date: [Signature]
 Date: [Signature]



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 1 (EU035)
Test Date: February 8, 2010

Method: EPA OTM 02728
Run #: 1
Analyst: MC

Filter ID#: m58	Initial Weight (g)	Date	9/17/09	9/18/09		0.1126	Total:
		Time	17:40	15:11			
		RH (%)	45	47			
		Weight	0.1125	0.1127			
	Final Weight (g)	Date	2/14/10	2/14/10		0.1126	Total:
		Time	10:55	20:50			
		RH (%)	31	32			
		Weight	0.1125	0.1126			

ND 0.5 mg

Sample Volume (ml) 20							
Acetone ID#: 30	Initial Weight (g)	Date	1/29/10	1/29/10		49.0775	Total:
		Time	10:14	17:17			
		RH (%)	26	26			
		Weight	49.0775	49.0775			
	Final Weight (g)	Date	2/13/10	2/14/10	2/14/10	49.0773	Total:
		Time	18:57	8:58	20:27		
		RH (%)	33	32	32		
		Weight	49.0781	49.0773	49.0772		

ND 0.5 mg

Sample Volume (ml) 265							
Organic ID#: 2	Initial Weight (g)	Date	1/29/10	1/30/10		88.9435	Total:
		Time	10:55	10:41			
		RH (%)	26	26			
		Weight	88.9435	88.9435			
	Final Weight (g)	Date	2/13/10	2/14/10		88.9447	Total:
		Time	18:42	9:55			
		RH (%)	33	31			
		Weight	88.9447	88.9447			

1.2 mg

Sample Volume (ml) 284.8							
Aqueous ID#: 1	Initial Weight (g)	Date	1/29/10	1/30/10		88.7246	Total:
		Time	10:21	10:58			
		RH (%)	26	26			
		Weight	88.7247	88.7244			
	Final Weight (g)	Date	2/13/10	2/14/10		88.7262	Total:
		Time	18:16	9:17			
		RH (%)	33	32			
		Weight	88.7259	88.7264			

1.6 mg

Lab Note:

Purge Conducted

Titration Correction

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 1 (EU035)
Test Date: February 8, 2010

Method: EPA OTM 02728
Run #: 2
Analyst: MC

Filter ID#: m59	Initial Weight (g)	Date	9/17/09	9/18/09		0.1123	
		Time	17:42	15:10			
		RH (%)	45	47			
		Weight	0.1123	0.1123			
	Final Weight (g)	Date	2/14/10	2/14/10		0.1122	Total: ND 0.5 mg
		Time	10:56	20:49			
		RH (%)	31	32			
		Weight	0.1122	0.1121			

		Sample Volume (ml)		30			
Acetone ID#: 29	Initial Weight (g)	Date	1/29/10	1/29/10		63.0237	Total:

		Sample Volume (ml)		275			
Organic ID#: <							

		Sample Volume (ml)		292.9				
Aqueous ID#:	Initial Weight (g)	Date	1/29/10	1/30/10		85.8541	Total:	
		Time	10:20	11:01				
		RH (%)	26	26				
		Weight	85.8542	85.8540				
11								
	Final Weight (g)	Date	2/13/10	2/14/10		85.8540		ND 0.5 mg
		Time	18:39	9:28				
		RH (%)	33	31				
		Weight	85.8537	85.8542				

Lab Note: Purge Conducted Titration Correction ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 1 (EU035)
Test Date: February 9, 2010

Method: EPA OTM 02728
Run #: 3
Analyst: MC

Filter ID#: m60	Initial Weight (g)	Date	9/17/09	9/18/09		0.1122	
		Time	17:44	15:10			
		RH (%)	45	47			
		Weight	0.1122	0.1122			
	Final Weight (g)	Date	2/14/10	2/14/10		0.1121	Total: ND 0.5 mg
		Time	10:58	20:48			
		RH (%)	31	32			
		Weight	0.1120	0.1121			

Sample Volume (ml)								
Acetone ID#: 28	Initial Weight (g)	Date	1/29/10	1/29/10	1/30/10	60.6959		
		Time	10:12	17:06	10:14			
		RH (%)	26	26	26			
		Weight	60.6939	60.6958	60.6959			
	Final Weight (g)	Date	2/13/10	2/14/10		60.6954		
		Time	18:52	9:04				
		RH (%)	33	32				
		Weight	60.6956	60.6951				
						Total:	ND 0.5	mg

		Sample Volume (ml)					
Organic ID#:	Initial Weight (g)	Date	1/29/10	1/30/10		88.3077	
		Time	10:23	11:17			
		RH (%)	26	26			
		Weight	88.3078	88.3075			
3	Final Weight (g)	Date	2/13/10	2/14/10		88.3086	Total: 0.9 mg
Time		19:01	10:44				
RH (%)		33	31				
Weight		88.3086	88.3086				

Sample Volume (ml)							
Aqueous ID#: 6	Initial Weight (g)	Date	1/29/10	1/30/10		86.4814	
		Time	10:24	10:55			
		RH (%)	26	26			
		Weight	86.4812	86.4816			
	Final Weight (g)	Date	2/13/10	2/14/10	2/14/10	86.4830	Total: 1.6 mg
		Time	18:15	9:23	20:41		
		RH (%)	33	32	32		
		Weight	86.4839	86.4827	86.4832		

Lab Note: Purge Conducted Titration Correction ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 1 (EU035)
Test Date: February 8, 2010

Method: EPA OTM 02728
Run #: 1
Analyst: MC

Filter ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

		Sample Volume (ml)				30	
Acetone ID#:	Initial Weight (g)	Date	1/12/10	1/13/10		105.6795	
		Time	9:39	10:02			
		RH (%)	28	29			
		Weight	105.6792	105.6797			
E1							
	Final Weight (g)	Date	2/13/10	2/14/10		105.6796	Total: ND 0.5 mg
		Time	18:35	9:08			
		RH (%)	33	32			
		Weight	105.6796	105.6796			

105.6795
105.6796 ND 0.5 mg

		Sample Volume (ml)				
Organic ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
Time						
RH (%)						
Weight						
						mg

mg

		Sample Volume (ml)				
Aqueous ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
Time						
RH (%)						
Weight						
						mg

mg

Lab Note:

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 1 (EU035)
Test Date: February 8, 2010

Method: EPA OTM 02728
Run #: 2
Analyst: MC

Filter ID#:	Initial Weight (g)	Date					
		Time					
		RH (%)					
		Weight					
	Final Weight (g)	Date					Total:
		Time					
		RH (%)					
		Weight					

mg

		Sample Volume (ml)		30			
Acetone ID#:	Initial Weight (g)	Date	1/12/10	1/13/10		114.6699	
		Time	8:44	11:07			
		RH (%)	28	27			
		Weight	114.6699	114.6698			
E3	Final Weight (g)	Date	2/13/10	2/14/10		102.6699	Total:
		Time	18:45	9:19			
		RH (%)	33	32			
		Weight	102.6700	102.6698			

ND 0.5 mg

		Sample Volume (ml)					
Organic ID#:	Initial Weight (g)	Date					
		Time					
		RH (%)					
		Weight					
	Final Weight (g)	Date					Total:
		Time					
		RH (%)					
		Weight					

mg

		Sample Volume (ml)					
Aqueous ID#:	Initial Weight (g)	Date					
		Time					
		RH (%)					
		Weight					
	Final Weight (g)	Date					Total:
		Time					
		RH (%)					
		Weight					

mg

Lab Note:

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 1 (EU035)
Test Date: February 9, 2010

Method: EPA OTM 02728
Run #: 3
Analyst: MC

Filter ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

Sample Volume (ml) 30

Acetone ID#:	Initial Weight (g)	Date	1/12/10	1/13/10		
		Time	8:37	11:30		
		RH (%)	28	27		
		Weight	115.8410	115.8415		
A2	Final Weight (g)	Date	2/13/10	2/14/10		Total:
		Time	18:49	9:41		
		RH (%)	33	31		
		Weight	115.8420	115.8415		

115.8413
115.8418 **ND 0.5** mg

Sample Volume (ml)

Organic ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

Sample Volume (ml)

Aqueous ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

Lab Note:

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 2 (EU036)
Test Date: February 9, 2010

Method: EPA OTM 02728
Run #: 1
Analyst: MC

Filter ID#: m61	Initial Weight (g)	Date	9/17/09	9/18/09		0.1118	Total:
		Time	17:45	15:09			
		RH (%)	45	47			
		Weight	0.1118	0.1117			
	Final Weight (g)	Date	2/14/10	2/14/10		0.1119	Total:
		Time	11:00	20:47			
		RH (%)	31	32			
		Weight	0.1117	0.1120			

ND 0.5 mg

Sample Volume (ml) 30							
Acetone ID#: 27	Initial Weight (g)	Date	1/29/10	1/29/10		63.2031	Total:
		Time	9:37	17:11			
		RH (%)	27	26			
		Weight	63.2028	63.2033			
	Final Weight (g)	Date	2/13/10	2/14/10	2/14/10	63.2036	Total:
		Time	18:52	9:01	20:32		
		RH (%)	33	32	32		
		Weight	63.2043	63.2036	63.2035		

ND 0.5 mg

Sample Volume (ml) 275							
Organic ID#: 42	Initial Weight (g)	Date	1/29/10	1/29/10		102.0777	Total:
		Time	11:02	17:23			
		RH (%)	26	26			
		Weight	102.0776	102.0778			
	Final Weight (g)	Date	2/13/10	2/14/10		102.0785	Total:
		Time	18:29	9:33			
		RH (%)	33	31			
		Weight	102.0787	102.0783			

0.8 mg

Sample Volume (ml) 362.3							
Aqueous ID#: 23	Initial Weight (g)	Date	1/29/10	1/30/10		87.8846	Total:
		Time	9:10	12:04			
		RH (%)	27	27			
		Weight	87.8848	87.8844			
	Final Weight (g)	Date	2/13/10	2/14/10		87.8855	Total:
		Time	18:24	9:16			
		RH (%)	33	32			
		Weight	87.8855	87.8855			

0.9 mg

Lab Note: Purge Conducted Titration Correction ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 2 (EU036)
Test Date: February 10, 2010

Method: EPA OTM 02728
Run #: 2
Analyst: MC

Filter ID#: m62	Initial Weight (g)	Date	9/17/09	9/18/09		0.1129	
		Time	17:46	15:08			
		RH (%)	44	47			
		Weight	0.1128	0.1129			
	Final Weight (g)	Date	2/14/10	2/14/10		0.1130	Total:
		Time	11:01	20:46			
		RH (%)	31	32			
		Weight	0.1131	0.1129			

ND 0.5 mg

Sample Volume (ml)

Acetone ID#: 26	Initial Weight (g)	Date	1/29/10	1/29/10		61.2208	
		Time	10:13	17:19			
		RH (%)	26	26			
		Weight	61.2206	61.2209			
	Final Weight (g)	Date	2/13/10	2/14/10		61.2210	Total:
		Time	18:25	9:00			
		RH (%)	33	32			
		Weight	61.2210	61.2209			

ND 0.5 mg

Sample Volume (ml) 275

Organic ID#: 88	Initial Weight (g)	Date	1/29/10	1/29/10		118.1237	
		Time	11:00	17:25			
		RH (%)	26	26			
		Weight	118.1236	118.1237			
	Final Weight (g)	Date	2/13/10	2/14/10	2/14/10	118.1240	Total:
		Time	18:40	9:58	20:03		
		RH (%)	33	31	32		
		Weight	118.1247	118.1240	118.1240		

ND 0.5 mg

Sample Volume (ml) 388.2

Aqueous ID#: 34	Initial Weight (g)	Date	1/29/10	1/29/10		101.5727	
		Time	10:58	17:20			
		RH (%)	26	26			
		Weight	101.5729	101.5725			
	Final Weight (g)	Date	2/13/10	2/14/10	2/14/10	101.5743	Total:
		Time	18:22	9:22	20:36		
		RH (%)	33	32	32		
		Weight	101.5747	101.5741	101.5744		

1.6 mg

Lab Note: Purge Conducted Titration Correction ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 2 (EU036)
Test Date: February 10, 2010

Method: EPA OTM 02728
Run #: 3
Analyst: MC

Filter ID#: m63	Initial Weight (g)	Date	9/17/09	9/18/09		0.1122	
		Time	17:47	15:07			
		RH (%)	44	47			
		Weight	0.1121	0.1122			
	Final Weight (g)	Date	2/14/10	2/14/10		0.1121	Total: ND 0.5 mg
		Time	11:03	20:45			
		RH (%)	31	32			
		Weight	0.1121	0.1120			

Sample Volume (ml)						
Acetone ID#: 25	Initial Weight (g)	Date	1/29/10	1/29/10		60.1936
		Time	9:35	17:05		
		RH (%)	27	27		
		Weight	60.1937	60.1935		
	Final Weight (g)	Date	2/13/10	2/14/10		60.1946
		Time	18:55	8:56		
		RH (%)	33	32		
		Weight	60.1947	60.1944		
						Total: 1.0 mg

<div>Organic ID#:</div> <div>7</div>	Initial Weight (g)	Date	1/29/10	1/30/10		96.3594	Total: 1.8 mg
		Time	10:35	11:02			
		RH (%)	26	26			
		Weight	96.3593	96.3595			
	Final Weight (g)	Date	2/13/10	2/14/10		96.3612	
		Time	18:17	9:13			
		RH (%)	33	32			
		Weight	96.3611	96.3612			

		Sample Volume (ml)			396.4		
Aqueous ID#: 84	Initial Weight (g)	Date	1/29/10	1/29/10	1/30/10	105.8190	
		Time	10:59	17:21	10:42		
		RH (%)	26	26	26		
		Weight	105.8219	105.8189	105.8191		
	Final Weight (g)	Date	2/14/10	2/14/10		105.8203	Total: 1.3 mg
		Time	9:34	20:22			
		RH (%)	31	32			
		Weight	105.8203	105.8203			

Lab Note: Purge Conducted Titration Correction ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 2 (EU036)
Test Date: February 9, 2010

Method: EPA OTM 02728
Run #: 1
Analyst: MC

Filter ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

		Sample Volume (ml)				30	
Acetone ID#:	Initial Weight (g)	Date	1/12/10	1/13/10		115.9657	
		Time	9:40	9:58			
		RH (%)	28	29			
		Weight	115.9655	115.9659			
A8		Date	2/13/10	2/14/10		115.9659	Total: ND 0.5 mg
Time		18:56	10:00				
RH (%)		33	31				
Weight		115.9659	115.9659				

115.9657
115.9659 ND 0.5 mg

		Sample Volume (ml)				
Organic ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
Time						
RH (%)						
Weight						
						mg

mg

		Sample Volume (ml)				
Aqueous ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
Time						
RH (%)						
Weight						
						mg

mg

Lab Note:

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 2 (EU036)
Test Date: February 10, 2010

Method: EPA OTM 02728
Run #: 2
Analyst: MC

Filter ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

Sample Volume (ml) 30							
Acetone ID#: 920074	Initial Weight (g)	Date	1/29/10	1/30/10	1/31/10	67.4629	
		Time	10:17	10:40	11:55		
		RH (%)	26	26	25		
		Weight	67.4636	67.4627	67.4630		
	Final Weight (g)	Date	2/13/10	2/14/10		67.4647	Total: 1.8 mg
Time		18:19	8:51				
RH (%)		33	33				
Weight		67.4646	67.4647				

67.4629 67.4647 **1.8 mg**

		Sample Volume (ml)				
Organic ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
Time						
RH (%)						
Weight						
						mg

mg

Sample Volume (ml)						
Aqueous ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				
						mg

mg

Lab Note:

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 2 (EU036)
Test Date: February 10, 2010

Method: EPA OTM 02728
Run #: 3
Analyst: MC

Filter ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

		Sample Volume (ml)				30	
Acetone ID#:	Initial Weight (g)	Date	1/29/10	1/30/10		66.0599	
		Time	10:15	10:39			
		RH (%)	26	26			
		Weight	66.0599	66.0599			
5							
	Final Weight (g)	Date	2/13/10	2/14/10	2/14/10	66.0624	Total:
		Time	18:26	9:46	20:27		
		RH (%)	33	31	33		
		Weight	66.0632	66.0622	66.0626		
							2.5 mg

2.5 mg

		Sample Volume (ml)				
Organic ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
Time						
RH (%)						
Weight						
						mg

mg

Sample Volume (ml)						
Aqueous ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				
						mg

mg

Lab Note:

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 3 (EU037)
Test Date: February 11, 2010

Method: EPA OTM 02728
Run #: 1
Analyst: MC

Filter ID#: m64	Initial Weight (g)	Date	9/17/09	9/18/09		0.1126	Total:
		Time	17:48	15:06			
		RH (%)	44	47			
		Weight	0.1124	0.1127			
	Final Weight (g)	Date	2/14/10	2/14/10		0.1119	Total:
		Time	11:05	20:44			
		RH (%)	31	32			
		Weight	0.1119	0.1118			

ND 0.5 mg

Sample Volume (ml)

Acetone ID#: A11	Initial Weight (g)	Date	1/29/10	1/29/10		76.5824	Total:
		Time	9:36	17:20			
		RH (%)	27	26			
		Weight	76.5825	76.5823			
	Final Weight (g)	Date	2/13/10	2/14/10		76.5826	Total:
		Time	18:28	10:13			
		RH (%)	33	31			
		Weight	76.5828	76.5824			

ND 0.5 mg

Sample Volume (ml)

Organic ID#: 8	Initial Weight (g)	Date	1/29/10	1/30/10		87.3001	Total:
		Time	10:26	10:53			
		RH (%)	26	26			
		Weight	87.2998	87.3003			
	Final Weight (g)	Date	2/13/10	2/14/10		87.3005	Total:
		Time	18:37	9:30			
		RH (%)	33	31			
		Weight	87.3006	87.3003			

ND 0.5 mg

Sample Volume (ml)

Aqueous ID#: 13	Initial Weight (g)	Date	1/29/10	1/30/10		89.5186	Total:
		Time	10:40	11:01			
		RH (%)	26	26			
		Weight	89.5186	89.5186			
	Final Weight (g)	Date	2/14/10	2/14/10		89.5205	Total:
		Time	9:37	20:15			
		RH (%)	31	32			
		Weight	89.5202	89.5207			

1.9 mg

Lab Note:

Purge Conducted

Titration Correction

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 3 (EU037)
Test Date: February 11, 2010

Method: EPA OTM 02728
Run #: 2
Analyst: MC

Filter ID#: m65	Initial Weight (g)	Date	9/17/09	9/18/09		0.1132	
		Time	17:49	15:05			
		RH (%)	44	47			
		Weight	0.1131	0.1133			
	Final Weight (g)	Date	2/14/10	2/14/10		0.1128	Total: ND 0.5 mg
		Time	11:07	20:43			
		RH (%)	31	32			
		Weight	0.1129	0.1127			

Sample Volume (ml)							
Acetone ID#: 878	Initial Weight (g)	Date	1/29/10	1/29/10		70.1708	
		Time	9:38	17:22			
		RH (%)	27	26			
		Weight	70.1706	70.1709			
	Final Weight (g)	Date	2/13/10	2/14/10		70.1711	Total: ND 0.5 mg
		Time	18:27	9:44			
		RH (%)	33	31			
		Weight	70.1709	70.1712			

		Sample Volume (ml)					
Organic ID#:	Initial Weight (g)	Date	1/12/10	1/13/10		114.1384	Total: 1.5 mg
		Time	9:45	9:49			
		RH (%)	28	30			
		Weight	114.1381	114.1386			
E10	Final Weight (g)	Date	2/13/10	2/14/10		114.1399	
Time		19:05	10:32				
RH (%)		33	31				
Weight		114.1400	114.1397				

Sample Volume (ml)							
Aqueous ID#: 14	Initial Weight (g)	Date	1/29/10	1/30/10		98.8637	
		Time	10:49	11:27			
		RH (%)	26	25			
		Weight	98.8636	98.8637			
	Final Weight (g)	Date	2/14/10	2/14/10		98.8637	Total: ND 0.5 mg
		Time	9:38	20:09			
		RH (%)	31	32			
		Weight	98.8637	98.8636			

Lab Note: Purge Conducted Titration Correction ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 3 (EU037)
Test Date: February 11, 2010

Method: EPA OTM 02728
Run #: 3
Analyst: MC

Filter ID#: m66	Initial Weight (g)	Date	9/17/09	9/18/09		0.1121	
		Time	17:49	15:04			
		RH (%)	44	47			
		Weight	0.1120	0.1122			
	Final Weight (g)	Date	2/14/10	2/14/10		0.1120	Total: ND 0.5 mg
		Time	11:08	20:42			
		RH (%)	31	32			
		Weight	0.1120	0.1119			

Sample Volume (ml)							
Acetone ID#: E4	Initial Weight (g)	Date	1/12/10	1/13/10		113.0940	
		Time	8:39	11:14			
		RH (%)	28	27			
		Weight	113.0941	113.0938			
	Final Weight (g)	Date	2/13/10	2/14/10		113.0948	Total: 0.8 mg
		Time	19:03	10:10			
		RH (%)	33	31			
		Weight	113.0950	113.0946			

		Sample Volume (ml)					
Organic ID#:	Initial Weight (g)	Date	1/29/10	1/30/10		87.6487	
		Time	10:44	11:19			
		RH (%)	26	26			
		Weight	87.6486	87.6487			
19	Final Weight (g)	Date	2/13/10	2/14/10		87.6498	Total: 1.1 mg
Time		19:02	10:38				
RH (%)		33	31				
Weight		87.6499	87.6497				

Sample Volume (ml)							
Aqueous ID#: 16	Initial Weight (g)	Date	1/29/10	1/30/10		88.5581	
		Time	10:18	11:26			
		RH (%)	26	26			
		Weight	88.5578	88.5583			
	Final Weight (g)	Date	2/14/10	2/14/10		88.5591	Total: 1.0 mg
		Time	9:40	20:06			
		RH (%)	31	32			
		Weight	88.5592	88.5589			

Lab Note: Purge Conducted Titration Correction ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 3 (EU037)
Test Date: February 11, 2010

Method: EPA OTM 02728
Run #: 1
Analyst: MC

Filter ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

		Sample Volume (ml)				30	
Acetone ID#:	Initial Weight (g)	Date	1/29/10	1/29/10		69.4358	
		Time	9:35	17:04			
		RH (%)	27	27			
		Weight	69.4359	69.4357			
983							
	Final Weight (g)	Date	2/13/10	2/14/10		69.4366	Total:
		Time	18:18	8:53			
		RH (%)	33	32			
		Weight	69.4366	69.4365			
							0.8 mg

0.8 mg

		Sample Volume (ml)				
Organic ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
Time						
RH (%)						
Weight						
						mg

mg

		Sample Volume (ml)				
Aqueous ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
Time						
RH (%)						
Weight						
						mg

mg

Lab Note:

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 3 (EU037)
Test Date: February 11, 2010

Method: EPA OTM 02728
Run #: 2
Analyst: MC

Filter ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

Sample Volume (ml) 30					
Acetone ID#:	Initial Weight (g)	Date	1/12/10	1/13/10	
		Time	8:46	11:36	
		RH (%)	28	27	
		Weight	112.2314	112.2318	
E5	Final Weight (g)	Date	2/13/10	2/14/10	Total:
		Time	19:07	10:07	
		RH (%)	33	31	
		Weight	112.2328	112.2325	

112.2316

112.2327

1.1 mg

Sample Volume (ml)					
Organic ID#:	Initial Weight (g)	Date			
		Time			
		RH (%)			
		Weight			
	Final Weight (g)	Date			Total:
		Time			
		RH (%)			
		Weight			

mg

Sample Volume (ml)					
Aqueous ID#:	Initial Weight (g)	Date			
		Time			
		RH (%)			
		Weight			
	Final Weight (g)	Date			Total:
		Time			
		RH (%)			
		Weight			

mg

Lab Note:

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: FBI 3 (EU037)
Test Date: February 11, 2010

Method: EPA OTM 02728
Run #: 3
Analyst: MC

Filter ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

Sample Volume (ml) 30

Acetone ID#:	Initial Weight (g)	Date	1/12/10	1/13/10		
		Time	9:46	9:45		
		RH (%)	28	29		
		Weight	109.0894	109.0898		
A10	Final Weight (g)	Date	2/13/10	2/14/10		Total:
		Time	18:20	9:10		
		RH (%)	33	32		
		Weight	109.0902	109.0900		

109.0896
109.0901 **ND 0.5** mg

Sample Volume (ml)

Organic ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

Sample Volume (ml)

Aqueous ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

Lab Note:

ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: Reagent Blank
Test Date: February 9, 2010

Method: EPA OTM 02728
Run #: 1
Analyst: MC

Filter ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				

mg

		Sample Volume (ml)		150			
Acetone ID#:	Initial Weight (g)	Date	1/29/10	1/30/10		85.6255	
		Time	10:37	11:09			
		RH (%)	26	26			
		Weight	85.6252	85.6257			
9							
	Final Weight (g)	Date	2/13/10	2/14/10		85.6259	Total:
		Time	18:44	9:48			
		RH (%)	33	31			
		Weight	85.6261	85.6257			
							ND 0.5 mg

ND 0.5 mg

		Sample Volume (ml)		150			
Organic ID#:	Initial Weight (g)	Date	1/29/10	1/30/10		100.9018	
		Time	10:34	11:16			
		RH (%)	26	26			
		Weight	100.9017	100.9018			
15	Final Weight (g)	Date	2/13/10	2/14/10		100.9020	Total:
Time		18:46	10:20				
RH (%)		33	31				
Weight		100.9018	100.9021				
							ND 0.5 mg

ND 0.5 mg

		Sample Volume (ml)		150			
Aqueous ID#:	Initial Weight (g)	Date	1/29/10	1/30/10		85.9579	
		Time	10:17	11:17			
		RH (%)	26	26			
		Weight	85.9580	85.9578			
21							
	Final Weight (g)	Date	2/13/10	2/14/10		85.9565	Total:
		Time	18:33	9:31			
		RH (%)	33	31			
		Weight	85.9566	85.9563			
							ND 0.5 mg

ND 0.5 mg

Lab Note: Purge Conducted Titration Correction ND=Non Detect



PARTICULATE WEIGHT ANALYSIS

Client: Met Council
Facility: Metro
Project #: 902630
Unit: Train Blank
Test Date: February 9, 2010

Method: EPA OTM 02728
Run #: 2
Analyst: MC

Filter ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
		Time				
		RH (%)				
		Weight				
						mg

		Sample Volume (ml)				
Acetone ID#:	Initial Weight (g)	Date				
		Time				
		RH (%)				
		Weight				
	Final Weight (g)	Date				Total:
Time						
RH (%)						
Weight						
						mg

Sample Volume (ml)						
Organic ID#:	Initial Weight (g)	Date	1/29/10	1/30/10		100.9018
		Time	10:34	11:16		
		RH (%)	26	26		
		Weight	100.9017	100.9018		
15	Final Weight (g)	Date	2/13/10	2/14/10		100.9020
Time		18:46	10:20			
RH (%)		33	31			
Weight		100.9018	100.9021			
						Total: ND 0.5 mg

Sample Volume (ml)								
Aqueous ID#:	Initial Weight (g)	Date	1/29/10	1/30/10		87.5426		
		Time	10:27	11:15				
		RH (%)	26	26				
		Weight	87.5423	87.5428				
17								
	Final Weight (g)	Date	2/13/10	2/14/10		87.5421	Total:	
		Time	18:21	9:26				
		RH (%)	33	32				
		Weight	87.5420	87.5422				
							ND 0.5	mg

Lab Note: Purge Conducted Titration Correction ND=Non Detect

Appendix E

Equipment Calibrations

APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	AB 3
Console Serial Number	2320003
DGM Model Number	
DGM Serial Number	

Calibration Conditions			
Date	Time	1-25-10	11:00
Barometric Pressure		29.3	in Hg
Theoretical Critical Vacuum ¹		13.8	in Hg
Calibration Technician		NT	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K ₁	17.647	oR/in Hg

¹For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

²The Critical Orifice Coefficient, K', must be entered in English units, (ft³•oR^{1/2})/(in.Hg•min).

Calibration Data										
Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(θ)	(P _m)	(V _{mi})	(V _{mf})	(t _{mi})	(t _{mf})		K'	(t _{amb})	(t _{amb})	
min	in H ₂ O	cubic feet	cubic feet	°F	°F		see above ²	°F	°F	in Hg
19.5	0.3	0.000	5.821	68	69	UN40	0.2318	65	65	17
12.5	0.6	0.000	5.441	69	70	UN48	0.3365	65	65	17
12.5	1.0	0.000	6.973	70	71	UN55	0.4319	65	65	17
7.5	2.0	0.000	5.741	71	71	UN63	0.5939	65	66	17
5.5	3.3	0.000	5.598	71	71	UN73	0.7868	66	66	17

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
(V _{m(std)})	(Q _{m(std)})	(V _{cr(std)})	(Q _{cr(std)})	(Y)	(ΔY)	(Q _{m(std)(corr)})	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H ₂ O	
5.692	0.292	5.772	0.296	1.014	0.003	0.296	1.949	0.060
5.314	0.425	5.371	0.430	1.011	-0.001	0.430	1.909	0.020
6.805	0.544	6.894	0.552	1.013	0.002	0.552	1.865	-0.024
5.610	0.748	5.685	0.758	1.013	0.002	0.758	1.895	0.006
5.489	0.998	5.521	1.004	1.006	-0.006	1.004	1.828	-0.061
				1.011	Y Average		1.889	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

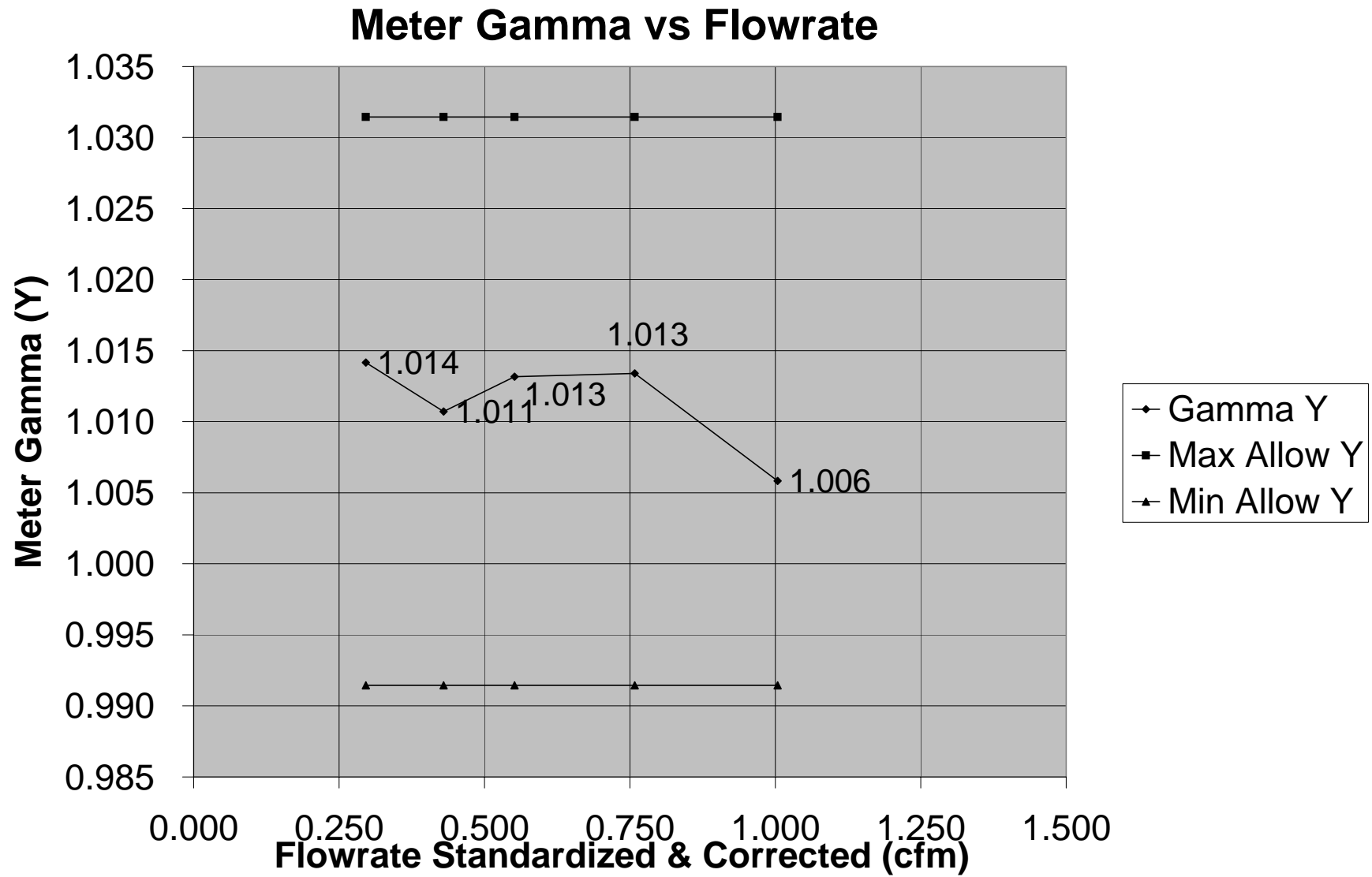
I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature _____

Date _____

#VALUE!

Calibration Technician: NT

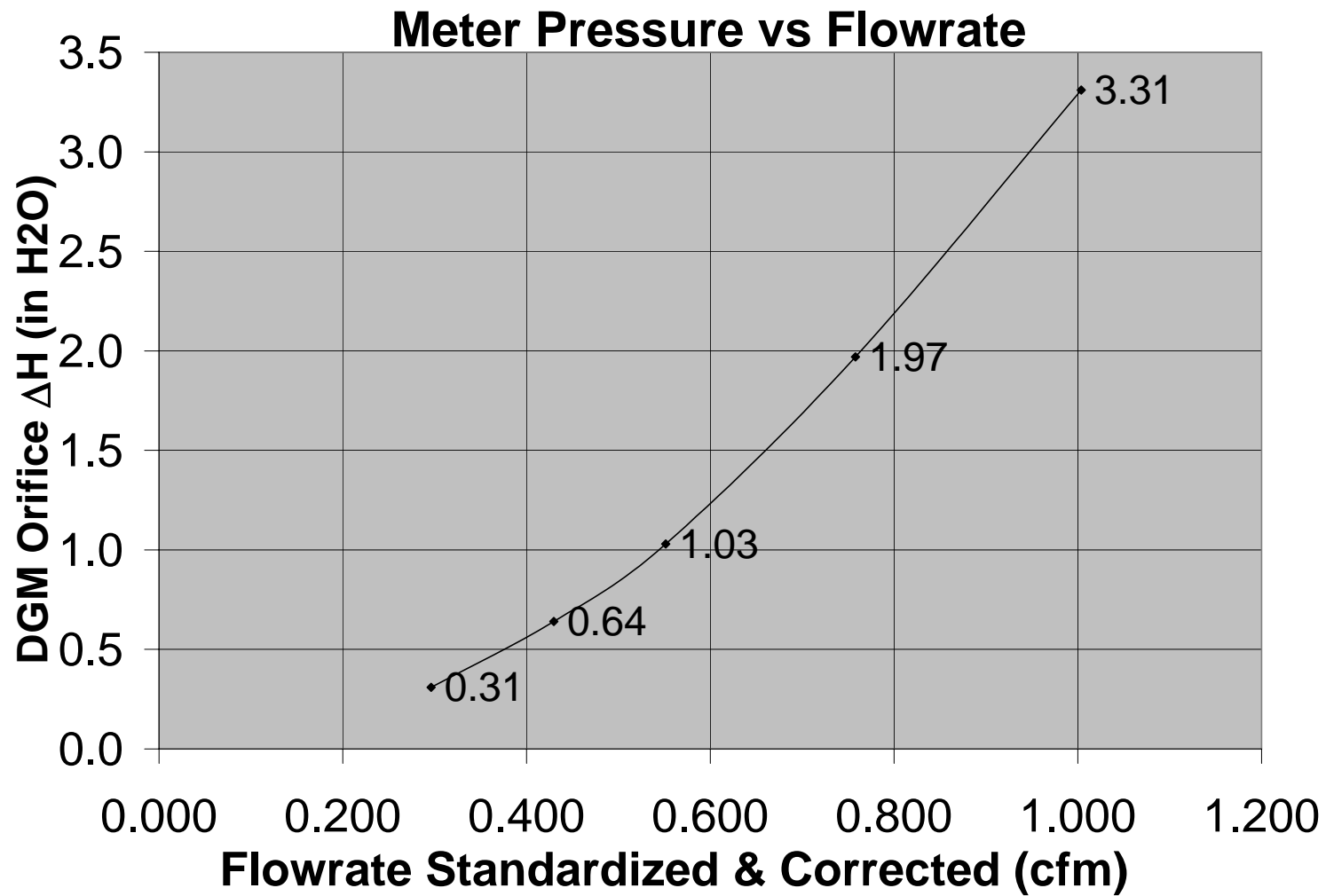


Console Serial: 2320003

Console Model: AB 3

#VALUE!

Calibration Technician:



Console Serial: 2320003

Console Model: A

APEX INSTRUMENTS METHOD 5 POST-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
3-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	AB 3
Console Serial Number	
DGM Model Number	
DGM Serial Number	

Calibration Conditions			
Date	Time	11-Feb-10	0:00
Barometric Pressure		29.5	in Hg
Theoretical Critical Vacuum ¹		13.9	in Hg
Calibration Technician		nt nk	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K ₁	17.647	oR/in Hg

¹For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

²The Critical Orifice Coefficient, K', must be entered in English units, (ft³*°R^{1/2})/(in.Hg*min).

Calibration Data										
Run Time		Metering Console				Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient see list on right	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(θ)	(P _m)	(V _{mi})	(V _{mf})	(t _{mi})	(t _{mf})		K'	(t _{amb})	(t _{amb})	
min	in H ₂ O	cubic feet	cubic feet	°F	°F		see above ²	°F	°F	in Hg
10.5	1.1	0.000	5.935	70	73	55	0.4411	74	72	17
10.5	1.1	0.000	5.959	73	75	55	0.4411	72	73	17
10.5	1.2	0.000	5.985	75	76	55	0.4411	73	73	17

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
				Value	Variation	Std & Corr	0.75 SCFM	Variation
(V _{m(std)})	(Q _{m(std)})	(V _{cr(std)})	(Q _{cr(std)})	(Y)	(ΔY)	(Q _{m(std)(corr)})	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H ₂ O	
5.838	0.556	5.926	0.564	1.015	0.000	0.564	1.987	0.003
5.834	0.556	5.929	0.565	1.016	0.001	0.565	1.976	-0.008
5.843	0.556	5.926	0.564	1.014	-0.001	0.564	1.990	0.005
Pretest Gamma	1.011	% Deviation	0.4	1.015	Y Average		1.984	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature _____ Nate Traut

Date _____ 2/11/2010

APEX INSTRUMENTS METHOD 5 PRE-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
5-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	EMSI-AB 1
Console Serial Number	2320001
DGM Master Factor	
DGM Serial Number	

Calibration Conditions			
Date	Time	08-Jan-10	12:10
Barometric Pressure		29.1	in Hg
Theoretical Critical Vacuum ¹		13.7	in Hg
Calibration Technician		NT	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K ₁	17.647	oR/in Hg

¹For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

²The Critical Orifice Coefficient, K', must be entered in English units, (ft³*°R^{1/2})/(in.Hg*min).

Calibration Data										
Run Time	Metering Console					Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(θ)	(P _m)	(V _{mi})	(V _{mf})	(t _{mi})	(t _{mf})		K'	(t _{amb})	(t _{amb})	
min	in H ₂ O	cubic feet	cubic feet	°F	°F		see above ²	°F	°F	in Hg
25.0	0.4	0.000	7.564	66	67	UN-40	0.2318	65	65	17
14.0	0.7	0.000	6.141	67	68	UN-48	0.3365	65	65	17
11.0	1.1	0.000	6.170	68	69	UN-55	0.4319	65	69	17
8.5	2.0	0.000	6.548	69	71	UN-63	0.5939	69	69	17
6.0	3.4	0.000	6.128	71	72	UN-73	0.7868	69	70	17

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
(V _{m(std)})	(Q _{m(std)})	(V _{cr(std)})	(Q _{cr(std)})	Value	Variation	Std & Corr	0.75 SCFM	Variation
(Y)	(ΔY)	(Q _{m(std)(corr)})	(ΔH@)	(ΔΔH@)				
cubic feet	cfm	cubic feet	cfm			cfm	in H ₂ O	
7.384	0.295	7.360	0.294	0.997	-0.003	0.294	2.221	0.201
5.989	0.428	5.983	0.427	0.999	-0.001	0.427	2.047	0.028
6.012	0.547	6.022	0.547	1.002	0.002	0.547	1.982	-0.038
6.377	0.750	6.387	0.751	1.002	0.002	0.751	1.971	-0.048
5.971	0.995	5.970	0.995	1.000	0.000	0.995	1.877	-0.142
				1.000	Y Average		2.020	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

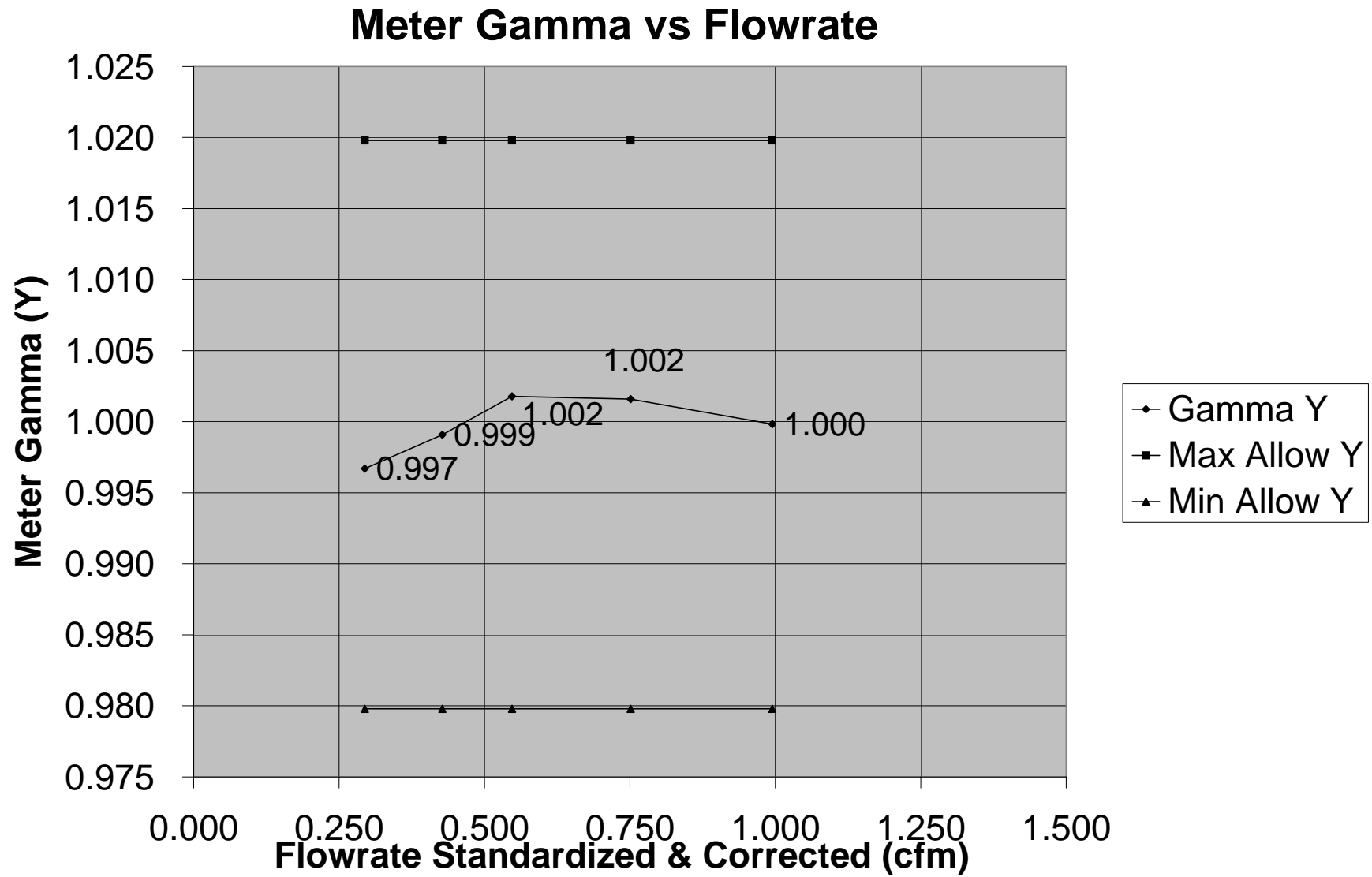
I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature _____

Date _____

Calibration Date: 1-8-2010

Calibration Technician: NT

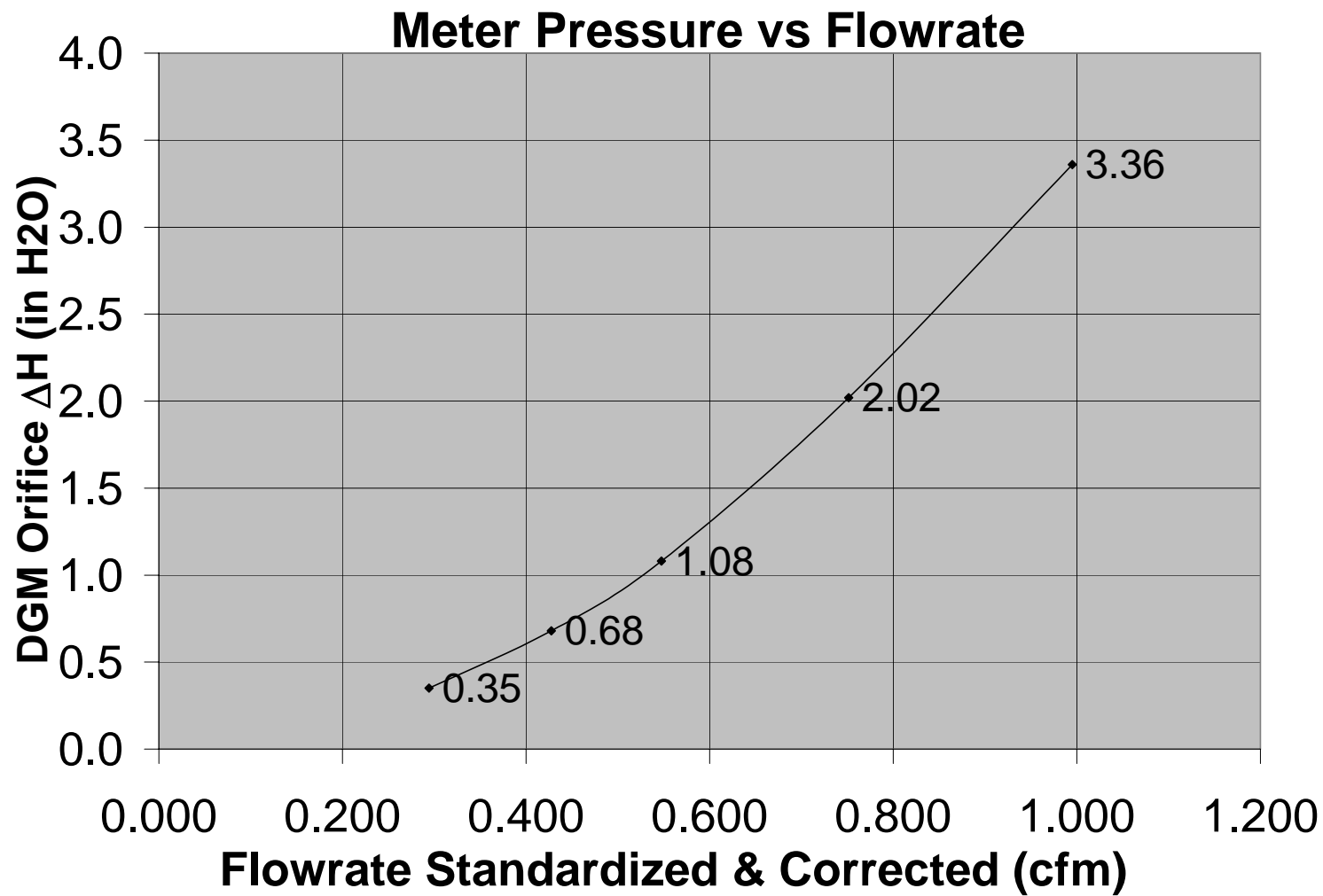


Console Serial: 2320001

Console Model: EMSI-AB

Calibration Date: 1-8-2010

Calibration Technician: NT



Console Serial: 2320001

Console Model: EMSI-AB 1

APEX INSTRUMENTS METHOD 5 POST-TEST CONSOLE CALIBRATION
USING CALIBRATED CRITICAL ORIFICES
3-POINT ENGLISH UNITS

Meter Console Information	
Console Model Number	AB 1
Console Serial Number	232001
DGM Model Number	
DGM Serial Number	

Calibration Conditions			
Date	Time	12-Feb-10	13:30
Barometric Pressure		30.1	in Hg
Theoretical Critical Vacuum ¹		14.2	in Hg
Calibration Technician		NT	

Factors/Conversions		
Std Temp	528	°R
Std Press	29.92	in Hg
K ₁	17.647	oR/in Hg

¹For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

²The Critical Orifice Coefficient, K', must be entered in English units, (ft³*°R^{1/2})/(in.Hg*min).

Calibration Data										
Run Time		Metering Console				Critical Orifice				
Elapsed	DGM Orifice ΔH	Volume Initial	Volume Final	Outlet Temp Initial	Outlet Temp Final	Serial Number	Coefficient see list on right	Amb Temp Initial	Amb Temp Final	Actual Vacuum
(θ)	(P _m)	(V _{mi})	(V _{mf})	(t _{mi})	(t _{mf})		K'	(t _{amb})	(t _{amb})	
min	in H ₂ O	cubic feet	cubic feet	°F	°F		see above ²	°F	°F	in Hg
12.0	0.7	0.000	5.427	87	87	48	0.3449	77	77	17
12.5	0.7	0.000	5.668	87	87	48	0.3449	77	76	17
12.0	0.7	0.000	5.431	87	87	48	0.3449	76	77	17

Results								
Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	ΔH @	
(V _{m(std)})	(Q _{m(std)})	(V _{cr(std)})	(Q _{cr(std)})	Value	Variation	Std & Corr	0.75 SCFM	Variation
(V _{m(std)})	(Q _{m(std)})	(V _{cr(std)})	(Q _{cr(std)})	(Y)	(ΔY)	(Q _{m(std)(corr)})	(ΔH@)	(ΔΔH@)
cubic feet	cfm	cubic feet	cfm			cfm	in H ₂ O	
5.281	0.440	5.378	0.448	1.018	0.001	0.448	1.858	0.001
5.515	0.441	5.604	0.448	1.016	-0.001	0.448	1.856	-0.001
5.284	0.440	5.380	0.448	1.018	0.001	0.448	1.856	-0.001
Pretest Gamma	1.000	% Deviation	1.8	1.018	Y Average		1.857	ΔH@ Average

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR Title 40, Part 60, Appendix A-3, Method 5, 16.2.3

Signature _____

Date _____

Temperature Sensor Calibration

Equipment ID #	Reference point Temp.*F	Reference TC Temp. *F	TC Temp. *F	Acceptable if $\leq 1.5\%$	
				% Difference	
235004 Hot Box	Ice Bath	NA		#VALUE!	Date
	Ambient	NA		#VALUE!	1-11-10
	Oven Temp. 1	244	250	0.85	Tech.
	Oven Temp. 2	292	300	1.05	NT

Temperature Sensor Calibration

Equipment ID #	Reference point Temp.*F	Reference TC Temp. *F	TC Temp. *F	Acceptable if $\leq 1.5\%$	
				% Difference	
221015 M5 Probe	Ice Bath	33	35	0.40	Date
	Ambient	59	58	0.19	1-11-10
	Oven Temp. 1	247	250	0.42	Tech.
	Oven Temp. 2	393	400	0.81	NT

Temperature Sensor Calibration

Equipment ID #	Reference point Temp.*F	Reference TC Temp. *F	TC Temp. *F	Acceptable if $\leq 1.5\%$	
				% Difference	
221018 M5 Probe	Ice Bath	35	36	0.20	Date
	Ambient	66	67	0.19	1-11-10
	Oven Temp. 1	250	251	0.14	Tech.
	Oven Temp. 2	400	408	0.92	NT

Each nozzle must be calibrated prior to field use. Each nozzle shall be given a permanent unique ID number at the time of first service. The following ID naming conventions shall be used:

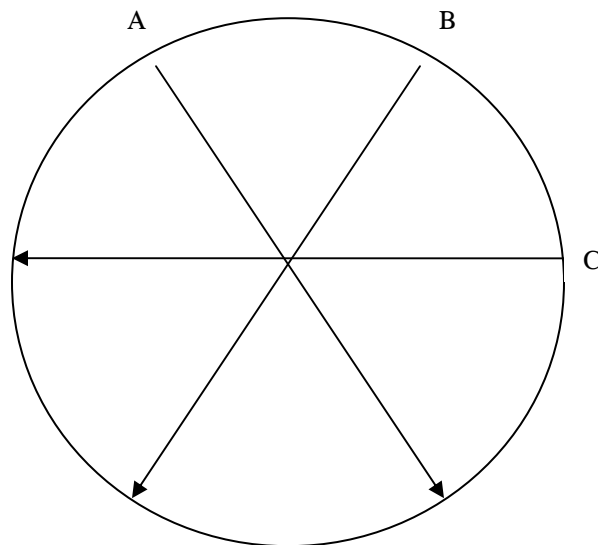
Nozzle Naming Convention

Glass Nozzles	224001 to 224999
Metal Nozzles	225001 to 225999

Note: Use first number available in sequential order from records

The nozzles shall be inspected for chips, cracks, corrosion and dents prior to service and prior to each field use. Any nozzle with notable damage shall be taken out of service and repaired and recalibrated before returning to service.

Conduct the nozzle calibration by using a micrometer to take three separate inside diameter measurements as outlined in the following diagram. Maintain a calibration log in a three ring binder and by electronically scanning each calibration page and adding it to the calibration folder. Copies of the folder should be made available in a file box located in each trailer.

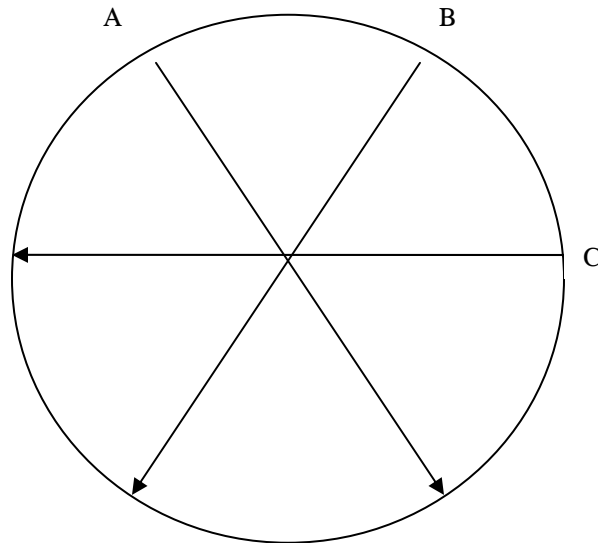


Calibration Example

Readings		Acceptance Criteria:	
Measurement A	0.125	Highest Measurement	0.125
Measurement B	0.123	Lowest Measurement	0.123
Measurement C	0.125	Difference	0.002
Average	0.124	Acceptable ≤ 0.004	Yes

Instructions:

Make three inside diameter measurements with a NIST traceable micrometer at dimensions A, B, and C. Record the results and click the calculate button. Record the Nozzle ID number, mark free of damage, record name and date of calibration.



Nozzle ID Number

225069

☒ Glass ☒ Metal

☐ Out of Service

☒ Nozzle Edge Free of Damage

NIST Master: 421002

Dimension A: .154 inches

Dimension B: .154 inches

Dimension C: .154 inches

Location: MN Metal Nozzle Box

Find

Save

Next #

Calculate

Clear

Historical Data Path

F:\EEQP\Historical Data\Nozzle.ini

Acceptance Criteria:

Average 0.154 inches

Maximum Diameter 0.154 inches

Minimum Diameter 0.154 inches

Difference 0 inches

Acceptable ≤ 0.004 Passed

Date:

2010-01-28

Technician:

Randy Resch

Comment:

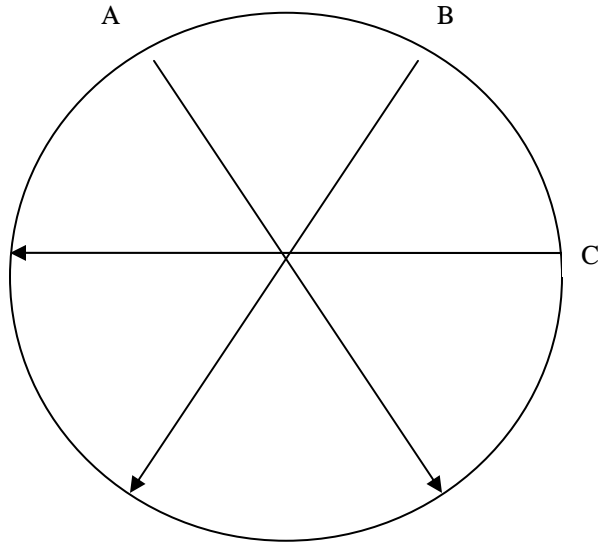
EMSI Source Testing Department

o Isokinetic Nozzle Calibration Form

Form
ST300-02

Instructions:

Make three inside diameter measurements with a NIST traceable micrometer at dimensions A, B, and C. Record the results and click the calculate button. Record the Nozzle ID number, mark free of damage, record name and date of calibration.



Nozzle ID Number

224115

☒ Glass ☒ Metal

☐ Out of Service

☒ Nozzle Edge Free of Damage

NIST Master: 421002

Dimension A: 0.197 inches

Dimension B: 0.197 inches

Dimension C: 0.197 inches

Location: MN Glass Nozzle Box

Find

Save

Next #

Calculate

Clear

Historical Data Path

F:\EEQP\Historical Data\Nozzle.ini

Acceptance Criteria:

Average 0.197 inches

Date:

Maximum Diameter 0.197 inches

2/4/2010

Minimum Diameter 0.197 inches

Technician:

Difference 0 inches

Mark Carlson

Acceptable ≤ 0.004 Passed

Comment: Out of stack nozzle

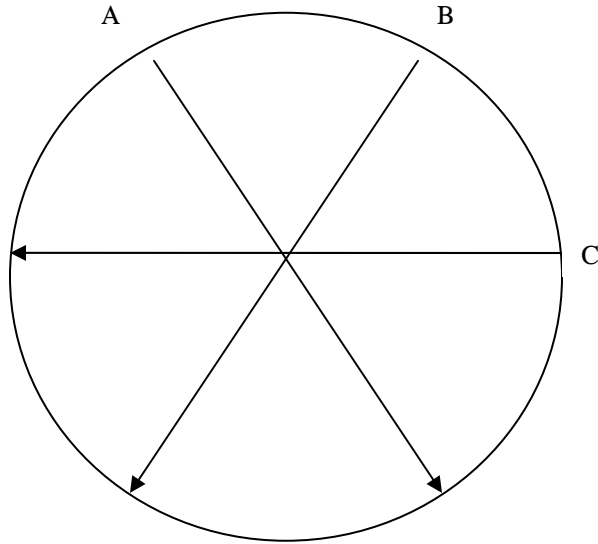
EMSI Source Testing Department

o Isokinetic Nozzle Calibration Form

Form
ST300-02

Instructions:

Make three inside diameter measurements with a NIST traceable micrometer at dimensions A, B, and C. Record the results and click the calculate button. Record the Nozzle ID number, mark free of damage, record name and date of calibration.



Nozzle ID Number

225081

☒ Glass ☒ Metal

☐ Out of Service

☒ Nozzle Edge Free of Damage

NIST Master: 421002

Dimension A: 0.153 inches

Dimension B: 0.153 inches

Dimension C: 0.153 inches

Location: MN Metal Nozzle Box

Find

Save

Next #

Calculate

Clear

Historical Data Path

F:\EEQP\Historical Data\Nozzle.ini

Acceptance Criteria:

Average 0.153 inches

Date:

Maximum Diameter 0.153 inches

2010-02-02

Minimum Diameter 0.153 inches

Technician:

Difference 0 inches

Nate Traut

Acceptable ≤ 0.004 Passed

Comment:

EMSI Source Testing Department

o Probe Calibration Procedure (Caliper)

Form
ST305-01

Probe ID Number	<input type="text" value="221015"/>	Pitot ID Number	<input type="text" value="222013"/>
NIST Master	<input type="text" value="421002"/>	Technician	<input type="text" value="Nathan Traut"/>
<input checked="" type="checkbox"/> MN	<input checked="" type="checkbox"/> PA	<input type="checkbox"/> Out of Service	Date
			<input type="text" value="2009-09-08"/>
<input type="button" value="Calculate"/> <input type="button" value="Save"/>		<input type="button" value="Clear"/> <input type="button" value="Next"/> <input type="button" value="Find"/>	

	<input type="text" value="0.375"/> D_t <input type="text" value="0.50"/> D_n <input type="text" value="0.874"/> a
	<input type="text" value="0.480"/> P_a <input type="text" value="0.480"/> P_b <input type="text" value="0.840"/> b
	<input type="text"/> c <input type="text"/> d <input type="text"/> e
OR	OR
	<input type="text" value="7.832"/> c <input type="text" value="2.790"/> f

EPA Method 2 Specifications	$c \geq 3"$ Pass	$D_t = \frac{3}{16}" \text{ to } \frac{3}{8}"$ Pass
$a \geq \frac{3}{4}"$ Pass	$D_n = \frac{1}{2}"$ Pass	$d \geq 3"$ NA
$e \geq \frac{3}{4}"$ NA	$b \geq 0"$ Pass	$f \geq 2"$ Pass
		$1.05 D_t < P < 1.50 D_t$ Pass
		$P_a = P_b$ Pass

Note: All measurements are in inches.

Historical Data

EMSI Source Testing Department

o Probe Calibration Procedure (Caliper)

Form
ST305-01

Probe ID Number	<input type="text" value="221018"/>	Pitot ID Number	<input type="text" value="222024"/>
NIST Master	<input type="text" value="421002"/>	Technician	<input type="text" value="Nathan Traut"/>
<input checked="" type="checkbox"/> MN <input checked="" type="checkbox"/> PA <input type="checkbox"/> Out of Service		Date	<input type="text" value="2009-09-08"/>
<input type="button" value="Calculate"/>	<input type="button" value="Save"/>	<input type="button" value="Clear"/>	<input type="button" value="Next"/>
<input type="button" value="Find"/>			

	<input type="text" value="0.375"/> D_t <input type="text" value="0.508"/> D_n <input type="text" value="0.825"/> a
	<input type="text" value="0.483"/> P_a <input type="text" value="0.483"/> P_b <input type="text" value="0.830"/> b
	<input type="text"/> c <input type="text"/> d <input type="text"/> e
OR	OR
	<input type="text" value="7.788"/> c <input type="text" value="2.797"/> f

EPA Method 2 Specifications

$c \geq 3"$ Pass	$D_t = \frac{3}{16}" \text{ to } \frac{3}{8}"$ Pass
$a \geq \frac{3}{4}"$ Pass	$1.05 D_t < P < 1.50 D_t$ Pass
$e \geq \frac{3}{4}"$ NA	$P_a = P_b$ Pass

Note: All measurements are in inches.

Historical Data

EMSI Source Testing Department

o Pitot Calibration Procedure (Caliper)

Form
ST304-01

Probe ID Number:	221015	Pitot ID Number:	222013
NIST Master:	421002	Technician:	Nathan Traut
Location:	Minnesota	Date:	9-8-09
		Status:	Pass
Calculate	Save	Clear	Next
		Find	

Historical Data: F:\ASTM Compliance\ Historical Data\ Pitot\ini

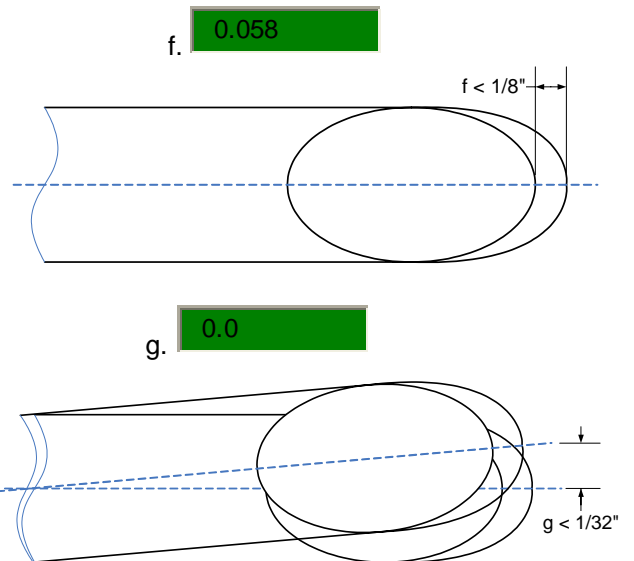
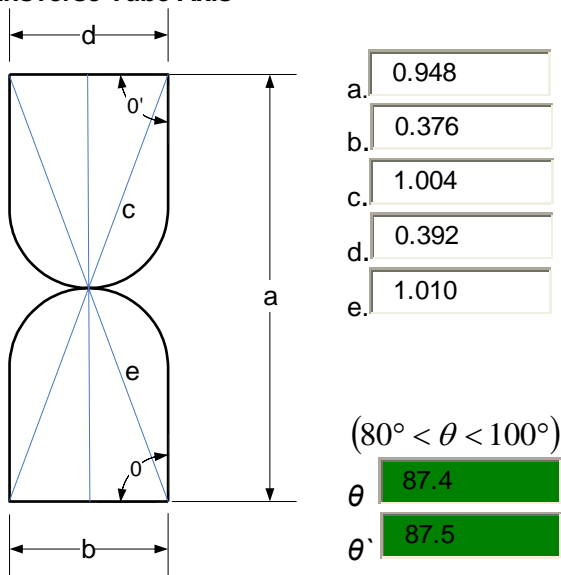
Note: All measurements are in inches.

Equation 1*: $\frac{a^2 + b^2 - c^2}{2ab} = \cos \theta$

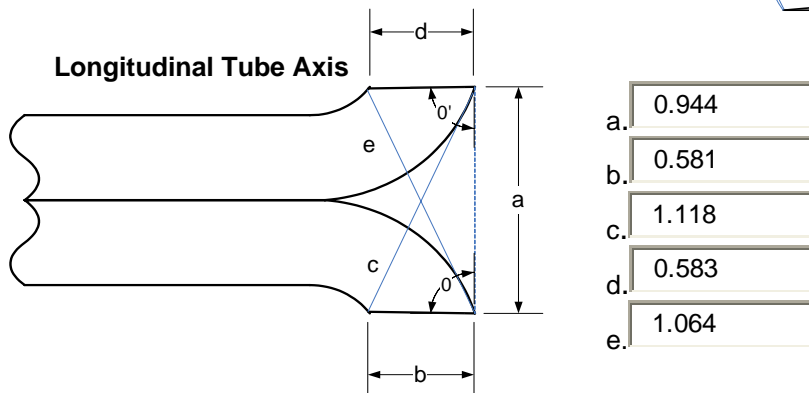
Equation 2*: $\frac{a^2 + d^2 - e^2}{2ad} = \cos \theta'$

*Equations 1 & 2 are used for both the Transverse and Longitudinal calculations.

Transverse Tube Axis



Longitudinal Tube Axis



theta 91.1 (85° < theta < 95°)

theta' 84.8 (85° < theta < 95°)

Comments:

EMSI Source Testing Department

o Pitot Calibration Procedure (Caliper)

Form
ST304-01

Probe ID Number:	<input type="text"/>	Pitot ID Number:	<input type="text" value="222024"/>
NIST Master:	<input type="text" value="421002"/>	Technician:	<input type="text" value="Nate Traut"/>
Location:	<input type="text" value="Minnesota"/>	Date:	<input type="text" value="8-20-2009"/>
		Status:	<input type="text" value="Pass"/>

Historical Data:

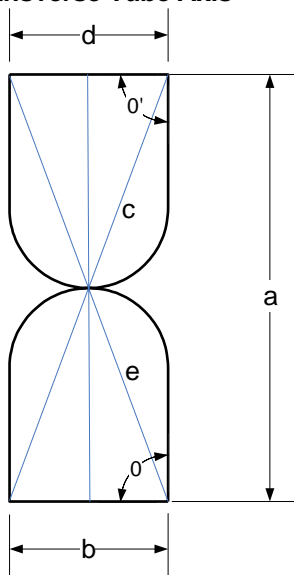
Note: All measurements are in inches.

Equation 1*: $\frac{a^2 + b^2 - c^2}{2ab} = \cos \theta$

Equation 2*: $\frac{a^2 + d^2 - e^2}{2ad} = \cos \theta'$

*Equations 1 & 2 are used for both the Transverse and Longitudinal calculations.

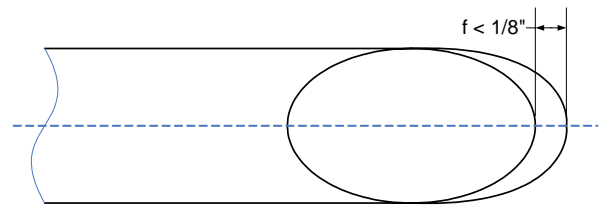
Transverse Tube Axis



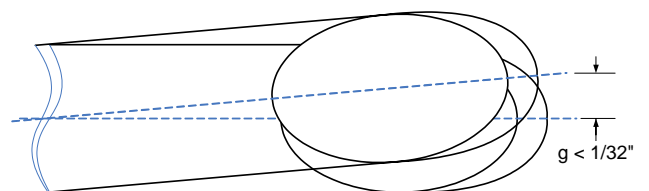
- a.
- b.
- c.
- d.
- e.

(80° < θ < 100°)
 θ
 θ'

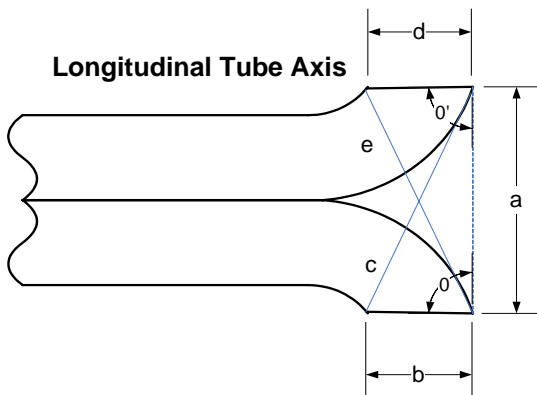
f.



g.



Longitudinal Tube Axis



- a.
- b.
- c.
- d.
- e.

θ (85° < θ < 95°)
 θ' (85° < θ < 95°)

Comments:

Calibration Report

MET Councle

St. Paul

Unit: 1

Channel	Test #	Start Time	Stop Time	Z/M/H	Local/Sys Bias	Actual Value	Cylinder Value	Span
O2	1	08:43:46	08:43:59	Zero	Local	0.00	0.00	19.92
O2	1	08:50:23	08:50:36	Mid	Local	9.94	10.10	19.92
O2	1	08:48:22	08:48:35	High	Local	19.86	19.92	19.92
O2	1	08:57:41	08:57:53	Zero	Pre SB	0.00	0.00	19.92
O2	1	08:55:09	08:55:21	Mid	Pre SB	10.18	10.10	19.92
O2	1	11:07:26	11:07:38	Zero	Post SB	0.00	0.00	19.92
O2	1	11:04:57	11:05:10	Mid	Post SB	9.88	10.10	19.92
O2	2	13:32:28	13:32:40	Zero	Post SB	0.00	0.00	19.92
O2	2	13:36:07	13:36:19	Mid	Post SB	9.92	10.10	19.92
O2	3	14:46:31	14:46:41	Zero	Post SB	0.00	0.00	19.92
O2	3	14:50:12	14:50:25	Mid	Post SB	9.90	10.10	19.92
CO2	1	08:43:46	08:43:59	Zero	Local	0.10	0.00	19.71
CO2	1	08:50:23	08:50:36	Mid	Local	10.20	10.08	19.71
CO2	1	08:48:22	08:48:35	High	Local	19.80	19.71	19.71
CO2	1	08:57:41	08:57:53	Zero	Pre SB	0.20	0.00	19.71
CO2	1	08:55:06	08:55:18	Mid	Pre SB	9.94	10.08	19.71
CO2	1	11:08:09	11:08:21	Zero	Post SB	0.20	0.00	19.71
CO2	1	11:04:48	11:05:01	Mid	Post SB	10.20	10.08	19.71
CO2	2	13:32:40	13:32:49	Zero	Post SB	0.22	0.00	19.71
CO2	2	13:36:10	13:36:19	Mid	Post SB	10.20	10.08	19.71
CO2	3	14:47:37	14:47:49	Zero	Post SB	0.30	0.00	19.71
CO2	3	14:50:12	14:50:25	Mid	Post SB	10.20	10.08	19.71
NOx	1	08:48:57	08:49:06	Zero	Local	0.00	0.00	101.6
NOx	1	08:46:49	08:47:02	Mid	Local	50.50	50.30	101.6
NOx	1	08:43:46	08:43:59	High	Local	103.30	101.60	101.6
NOx	1	08:54:25	08:54:38	Zero	Pre SB	0.00	0.00	101.6
NOx	1	08:58:43	08:58:55	Mid	Pre SB	53.50	50.30	101.6
NOx	1	11:05:13	11:05:25	Zero	Post SB	0.00	0.00	101.6
NOx	1	11:08:46	11:08:58	Mid	Post SB	49.00	50.30	101.6
NOx	2	12:03:21	12:03:24	Zero	Local	0.00	0.00	101.6
NOx	2	12:05:09	12:05:19	Mid	Local	50.38	50.30	101.6
NOx	2	12:06:26	12:06:33	High	Local	102.50	101.60	101.6
NOx	2	12:13:17	12:13:29	Zero	Pre SB	0.00	0.00	101.6
NOx	2	12:08:48	12:09:22	Mid	Pre SB	49.50	50.30	101.6
NOx	2	13:36:31	13:36:44	Zero	Post SB	0.00	0.00	101.6
NOx	2	13:32:46	13:32:58	Mid	Post SB	49.00	50.30	101.6
NOx	3	14:50:49	14:51:02	Zero	Post SB	0.00	0.00	101.6
NOx	3	14:47:49	14:47:58	Mid	Post SB	49.00	50.30	101.6
CO	1	08:48:53	08:49:06	Zero	Local	0.00	0.00	101
CO	1	08:45:41	08:45:54	Mid	Local	52.00	50.70	101
CO	1	08:43:46	08:43:56	High	Local	102.00	101.00	101
CO	1	08:54:25	08:54:38	Zero	Pre SB	0.00	0.00	101
CO	1	08:58:43	08:58:55	Mid	Pre SB	52.00	50.70	101
CO	1	11:05:07	11:05:19	Zero	Post SB	0.00	0.00	101
CO	1	11:08:31	11:08:40	Mid	Post SB	51.25	50.70	101
CO	2	13:36:13	13:36:25	Zero	Post SB	0.00	0.00	101
CO	2	13:32:52	13:33:01	Mid	Post SB	51.25	50.70	101
CO	3	14:50:28	14:50:40	Zero	Post SB	0.00	0.00	101
CO	3	14:46:47	14:46:59	Mid	Post SB	51.00	50.70	101
SO2	1	08:48:50	08:49:00	Zero	Local	0.95	0.00	101
SO2	1	08:45:41	08:45:54	Mid	Local	50.40	50.50	101
SO2	1	08:43:43	08:43:56	High	Local	100.28	101.00	101
SO2	1	08:55:18	08:55:30	Zero	Pre SB	0.80	0.00	101

Channel	Test #	Start Time	Stop Time	Z/M/H	Local/Sys Bias	Actual Value	Cylinder Value	Span
SO2	1	08:58:43	08:58:55	Mid	Pre SB	48.56	50.50	101
SO2	1	11:05:13	11:05:25	Zero	Post SB	0.24	0.00	101
SO2	1	11:08:46	11:09:05	Mid	Post SB	47.80	50.50	101
SO2	2	13:37:52	13:37:55	Zero	Post SB	0.20	0.00	101
SO2	2	13:33:48	13:34:00	Mid	Post SB	47.44	50.50	101
SO2	3	14:52:26	14:52:35	Zero	Post SB	0.25	0.00	101
SO2	3	14:48:26	14:48:39	Mid	Post SB	47.96	50.50	101

Calibration Report

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St. Paul

Unit: 2

Channel	Test #	Start Time	Stop Time	Z/M/H	Local/Sys Bias	Actual Value	Cylinder Value	Span
O2	1	07:08:46	07:08:58	Zero	Local	0.00	0.00	19.92
O2	1	07:07:02	07:07:09	Mid	Local	10.00	10.10	19.92
O2	1	07:05:41	07:05:53	High	Local	19.92	19.92	19.92
O2	1	07:15:16	07:15:28	Zero	Pre SB	0.00	0.00	19.92
O2	1	07:13:27	07:14:18	Mid	Pre SB	10.38	10.10	19.92
O2	1	08:44:31	08:44:43	Zero	Post SB	0.00	0.00	19.92
O2	1	08:42:03	08:42:15	Mid	Post SB	10.00	10.10	19.92
O2	2	09:54:32	09:54:44	Zero	Post SB	0.00	0.00	19.92
O2	2	09:52:43	09:52:55	Mid	Post SB	10.00	10.10	19.92
O2	3	11:05:47	11:05:59	Zero	Post SB	0.00	0.00	19.92
O2	3	11:03:49	11:04:01	Mid	Post SB	10.00	10.10	19.92
CO2	1	07:08:46	07:08:58	Zero	Local	0.00	0.00	19.71
CO2	1	07:07:05	07:07:09	Mid	Local	10.00	10.08	19.71
CO2	1	07:05:41	07:05:53	High	Local	19.56	19.71	19.71
CO2	1	07:15:25	07:15:37	Zero	Pre SB	0.00	0.00	19.71
CO2	1	07:13:30	07:14:18	Mid	Pre SB	9.68	10.08	19.71
CO2	1	08:44:46	08:44:58	Zero	Post SB	0.20	0.00	19.71
CO2	1	08:42:03	08:42:15	Mid	Post SB	10.00	10.08	19.71
CO2	2	09:55:41	09:55:53	Zero	Post SB	0.20	0.00	19.71
CO2	2	09:52:43	09:52:55	Mid	Post SB	10.00	10.08	19.71
CO2	3	11:06:17	11:06:29	Zero	Post SB	0.22	0.00	19.71
CO2	3	11:03:52	11:04:04	Mid	Post SB	10.00	10.08	19.71
NOx	1	07:05:35	07:05:47	Zero	Local	0.00	0.00	101.6
NOx	1	07:08:58	07:09:10	Mid	Local	49.00	50.30	101.6
NOx	1	07:10:28	07:10:31	High	Local	101.00	101.60	101.6
NOx	1	07:12:54	07:13:06	Zero	Pre SB	0.00	0.00	101.6
NOx	1	07:15:58	07:16:07	Mid	Pre SB	49.00	50.30	101.6
NOx	1	08:42:15	08:42:27	Zero	Post SB	0.00	0.00	101.6
NOx	1	08:44:34	08:44:46	Mid	Post SB	50.00	50.30	101.6
NOx	2	09:52:49	09:53:01	Zero	Post SB	0.00	0.00	101.6
NOx	2	09:54:59	09:55:11	Mid	Post SB	49.80	50.30	101.6
NOx	3	11:04:04	11:04:16	Zero	Post SB	0.00	0.00	101.6
NOx	3	11:06:05	11:06:17	Mid	Post SB	49.50	50.30	101.6
CO	1	07:05:35	07:05:47	Zero	Local	0.00	0.00	101
CO	1	07:08:49	07:09:01	Mid	Local	51.00	50.70	101
CO	1	07:10:22	07:10:34	High	Local	101.60	101.00	101
CO	1	07:12:57	07:13:09	Zero	Pre SB	0.00	0.00	101
CO	1	07:15:34	07:15:46	Mid	Pre SB	51.00	50.70	101
CO	1	08:42:06	08:42:18	Zero	Post SB	0.00	0.00	101
CO	1	08:44:37	08:44:49	Mid	Post SB	51.00	50.70	101
CO	2	09:52:43	09:52:55	Zero	Post SB	0.00	0.00	101
CO	2	09:54:50	09:54:59	Mid	Post SB	51.00	50.70	101
CO	3	11:03:55	11:04:07	Zero	Post SB	0.00	0.00	101
CO	3	11:05:56	11:06:08	Mid	Post SB	51.00	50.70	101
SO2	1	07:05:38	07:06:53	Zero	Local	0.31	0.00	101
SO2	1	07:08:55	07:09:07	Mid	Local	50.00	50.50	101
SO2	1	07:10:25	07:10:34	High	Local	100.95	101.00	101
SO2	1	07:13:24	07:13:36	Zero	Pre SB	0.72	0.00	101
SO2	1	07:15:46	07:15:58	Mid	Pre SB	49.36	50.50	101
SO2	1	08:42:18	08:42:30	Zero	Post SB	0.40	0.00	101
SO2	1	08:46:05	08:46:29	Mid	Post SB	47.60	50.50	101
SO2	2	09:53:10	09:53:22	Zero	Post SB	0.07	0.00	101
SO2	2	09:57:39	09:57:42	Mid	Post SB	47.50	50.50	101

Channel	Test #	Start Time	Stop Time	Z/M/H	Local/Sys Bias	Actual Value	Cylinder Value	Span
SO2	3	11:04:13	11:04:13	Zero	Post SB	0.20	0.00	101
SO2	3	11:10:49	11:11:04	Mid	Post SB	47.50	50.50	101

Calibration Report

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St. Paul

Unit: 3

Channel	Test #	Start Time	Stop Time	Z/M/H	Local/Sys Bias	Actual Value	Cylinder Value	Span
O2	1	06:46:50	06:47:02	Zero	Local	0.00	0.00	19.92
O2	1	06:45:37	06:45:43	Mid	Local	10.00	10.10	19.92
O2	1	06:44:32	06:44:42	High	Local	19.85	19.92	19.92
O2	1	07:49:37	07:49:50	Zero	Pre SB	0.00	0.00	19.92
O2	1	07:59:53	08:00:06	Mid	Pre SB	9.92	10.10	19.92
O2	1	09:13:13	09:13:25	Zero	Post SB	0.00	0.00	19.92
O2	1	09:11:11	09:11:23	Mid	Post SB	9.96	10.10	19.92
O2	2	10:42:05	10:42:18	Zero	Post SB	0.00	0.00	19.92
O2	2	10:38:53	10:39:05	Mid	Post SB	9.92	10.10	19.92
O2	3	13:18:13	13:18:25	Zero	Post SB	0.00	0.00	19.92
O2	3	13:14:57	13:15:09	Mid	Post SB	9.80	10.10	19.92
CO2	1	06:46:50	06:47:02	Zero	Local	0.00	0.00	19.71
CO2	1	06:45:40	06:45:46	Mid	Local	10.00	10.08	19.71
CO2	1	06:44:32	06:44:42	High	Local	19.40	19.71	19.71
CO2	1	07:50:08	07:50:20	Zero	Pre SB	0.10	0.00	19.71
CO2	1	07:59:53	08:00:06	Mid	Pre SB	10.00	10.08	19.71
CO2	1	09:13:25	09:13:38	Zero	Post SB	0.20	0.00	19.71
CO2	1	09:11:08	09:11:20	Mid	Post SB	10.00	10.08	19.71
CO2	2	10:42:30	10:42:39	Zero	Post SB	0.30	0.00	19.71
CO2	2	10:38:47	10:38:59	Mid	Post SB	10.00	10.08	19.71
CO2	3	13:18:16	13:18:28	Zero	Post SB	0.40	0.00	19.71
CO2	3	13:14:45	13:14:57	Mid	Post SB	10.04	10.08	19.71
NOx	1	06:53:47	06:53:59	Zero	Local	0.00	0.00	101.6
NOx	1	06:51:30	06:51:42	Mid	Local	50.50	50.30	101.6
NOx	1	06:48:49	06:48:52	High	Local	102.00	101.60	101.6
NOx	1	07:59:53	08:00:06	Zero	Pre SB	0.00	0.00	101.6
NOx	1	07:49:46	07:49:59	Mid	Pre SB	49.70	50.30	101.6
NOx	1	09:11:54	09:12:37	Zero	Post SB	0.30	0.00	101.6
NOx	1	09:14:17	09:14:23	Mid	Post SB	50.50	50.30	101.6
NOx	2	10:40:00	10:40:12	Zero	Post SB	0.50	0.00	101.6
NOx	2	10:42:21	10:42:33	Mid	Post SB	50.30	50.30	101.6
NOx	3	13:15:31	13:15:31	Zero	Post SB	1.50	0.00	101.6
NOx	3	13:18:19	13:18:40	Mid	Post SB	52.17	50.30	101.6
CO	1	06:52:52	06:53:01	Zero	Local	0.00	0.00	101
CO	1	06:50:23	06:50:32	Mid	Local	52.00	50.70	101
CO	1	06:46:56	06:47:02	High	Local	102.00	101.00	101
CO	1	07:59:53	08:00:06	Zero	Pre SB	0.00	0.00	101
CO	1	07:49:28	07:49:40	Mid	Pre SB	51.80	50.70	101
CO	1	09:11:05	09:11:17	Zero	Post SB	0.00	0.00	101
CO	1	09:13:16	09:13:29	Mid	Post SB	51.60	50.70	101
CO	2	10:38:56	10:39:08	Zero	Post SB	0.00	0.00	101
CO	2	10:42:08	10:42:15	Mid	Post SB	51.67	50.70	101
CO	3	13:14:48	13:15:00	Zero	Post SB	0.00	0.00	101
CO	3	13:18:19	13:18:46	Mid	Post SB	52.00	50.70	101
SO2	1	06:53:26	06:53:38	Zero	Local	0.40	0.00	101
SO2	1	06:50:26	06:50:32	Mid	Local	49.80	50.50	101
SO2	1	06:48:06	06:48:12	High	Local	99.73	101.00	101
SO2	1	08:00:03	08:00:15	Zero	Pre SB	0.48	0.00	101
SO2	1	07:50:05	07:50:17	Mid	Pre SB	48.12	50.50	101
SO2	1	09:11:17	09:11:29	Zero	Post SB	0.44	0.00	101
SO2	1	09:15:18	09:15:31	Mid	Post SB	47.88	50.50	101
SO2	2	10:40:40	10:41:23	Zero	Post SB	0.50	0.00	101
SO2	2	10:44:01	10:44:32	Mid	Post SB	47.08	50.50	101

Channel	Test #	Start Time	Stop Time	Z/M/H	Local/Sys Bias	Actual Value	Cylinder Value	Span
SO2	3	13:14:51	13:15:03	Zero	Post SB	0.08	0.00	101
SO2	3	13:20:36	13:20:45	Mid	Post SB	47.70	50.50	101



CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Airgas Specialty Gases
12722 S. Wentworth Avenue
Chicago, IL 60628
1-773-785-3000
FAX: 1-773-785-1928
www.airgas.com

Part Number: E03NI80E15A0138 Reference Number: 54-124195104-7A
Cylinder Number: CC157271 Cylinder Volume: 151 Cu.Ft.
Laboratory: ASG - Chicago - IL Cylinder Pressure: 2015 PSIG
Analysis Date: Oct 27, 2009 Valve Outlet: 590

Expiration Date: Oct 27, 2012

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	10.00 %	10.08 %	G1	+/- 1% NIST Traceable
OXYGEN	10.00 %	10.10 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/CO2	1	CC59142	13.78% CARBON DIOXIDE/	Oct 02, 2012
NTRM/O2	82658	SG9168259BAL	16.04% OXYGEN/	Jan 01, 2010

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
HORIBA 510	NDIR	Oct 21, 2009
HORIBA MPA-510	Paramagnetic	Oct 21, 2009

Triad Data Available Upon Request

Notes:

QA Approval

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI60E15A0286	Reference Number:	54-124192363-4
Cylinder Number:	CC141864	Cylinder Volume:	160 Cu.Ft.
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
Analysis Date:	Sep 30, 2009	Valve Outlet:	590

Expiration Date: Sep 30, 2012

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	20.00 %	19.71 %	G1	+/- 1% NIST Traceable
OXYGEN	20.00 %	19.92 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/O2	60608	CC206109	22.51% OXYGEN/NITROGEN	May 01, 2010
NTRM/CO2	40604	XC034327B	19.84% CARBON DIOXIDE/	May 15, 2012

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
HORIBA 510	NDIR	Sep 21, 2009
HORIBA MPA-510	Paramagnetic	Sep 21, 2009

Triad Data Available Upon Request

Notes:

[Signature]

QA Approval

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6141 EASTON ROAD, BLDG 1, PLUMSTEADVILLE, PA 18949-0310 Phone: 800-331-4953 Fax: 215-766-7226

RATA CLASS**Dual-Analyzed Calibration Standard****CERTIFICATE OF ACCURACY: Interference Free™ Multi-Component EPA Protocol Gas****Assay Laboratory**AIR LIQUIDE AMERICA SPECIALTY GASES LLC
6141 EASTON ROAD, BLDG 1
PLUMSTEADVILLE, PA 18949-0310P.O. No.: 2122
Project No.: 01 -85913 -003**Customer**EAGLE MOUNTAIN SCIENTIFIC, INC.
PO# 2122
321 PERRY HIGHWAY
HARMONY PA 16037**ANALYTICAL INFORMATION**

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: AAL069259**Certification Date:** 08Apr2009**Exp. Date:** 08Apr2011**Cylinder Pressure***:** 1948 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
CARBON MONOXIDE	50.7 PPM	+/- 1%	Direct NIST and VSL
NITRIC OXIDE	50.3 PPM	+/- 1%	Direct NIST and VSL
SULFUR DIOXIDE *	50.5 PPM	+/- 1%	Direct NIST and VSL
NITROGEN - OXYGEN FREE	 BALANCE		
TOTAL OXIDES OF NITROGEN	50.3 PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1678	15Dec2011	KAL004165	48.60 PPM	CARBON MONOXIDE
NTRM 1683	02Oct2009	KAL003321	46.90 PPM	NITRIC OXIDE
NTRM 1693	01Nov2010	ALM051307	50.18 PPM	SULFUR DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR//000928781	28Mar2009	FTIR
FTIR//000928781	20Mar2009	FTIR
FTIR//000928781	02Apr2009	FTIR

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis**CARBON MONOXIDE**Date: 01Apr2009 Response Unit: PPM
Z1=-0.03183 R1=48.58154 T1=50.68313
R2=48.58512 Z2=-0.00716 T2=50.68901
Z3=0.01870 T3=50.78954 R3=48.60031
Avg. Concentration: 50.73 PPM**NITRIC OXIDE**Date: 01Apr2009 Response Unit: PPM
Z1=0.01095 R1=46.81323 T1=50.30337
R2=46.95287 Z2=0.12056 T2=50.36391
Z3=0.13123 T3=50.38811 R3=47.02173
Avg. Concentration: 50.33 PPM**SULFUR DIOXIDE ***Date: 01Apr2009 Response Unit: PPM
Z1=-0.02590 R1=49.94677 T1=50.33088
R2=50.05985 Z2=0.00741 T2=50.36814
Z3=0.01718 T3=50.38833 R3=50.06639
Avg. Concentration: 50.52 PPM**Second Triad Analysis**Date: 08Apr2009 Response Unit: PPM
Z1=-0.03830 R1=48.64174 T1=50.64989
R2=48.64931 Z2=-0.03121 T2=50.65695
Z3=0.01865 T3=50.66987 R3=48.66211
Avg. Concentration: 50.61 PPMDate: 08Apr2009 Response Unit: PPM
Z1=-0.01626 R1=46.84305 T1=50.18754
R2=46.87084 Z2=0.01283 T2=50.20565
Z3=0.07652 T3=50.39058 R3=46.90634
Avg. Concentration: 50.29 PPMDate: 08Apr2009 Response Unit: PPM
Z1=0.01824 R1=50.12163 T1=50.46391
R2=50.12783 Z2=0.02996 T2=50.48233
Z3=0.03282 T3=50.52658 R3=50.13297
Avg. Concentration: 50.54 PPM**Calibration Curve**Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99998E-1
Constants: A=0.00000E+0
B=9.52510E-1 C=4.22000E-4
D=0.00000E+0 E=0.00000E+0Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99998E-1
Constants: A=0.00000E+0
B=9.90848E-1 C=1.97000E-4
D=0.00000E+0 E=0.00000E+0Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99999E-1
Constants: A=0.00000E+0
B=1.00065E+0 C=1.10000E-5
D=0.00000E+0 E=0.00000E+0**QUALITY ASSURANCE**

APPROVED BY: Michael A. Kuhns

902630 Metro
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CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04NI99E15A0568 Reference Number: 54-124173526-8
Cylinder Number: CC175979 Cylinder Volume: 144 Cu.Ft.
Laboratory: ASG - Chicago - IL Cylinder Pressure: 2015 PSIG
Analysis Date: Apr 14, 2009 Valve Outlet: 660

Expiration Date: Apr 14, 2011

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	100.0 PPM	101.0 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	100.0 PPM	101.6 PPM	G1	+/- 1% NIST Traceable
SULFUR DIOXIDE	100.0 PPM	101.0 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

Total oxides of nitrogen

101.9 PPM

For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/NO	2786	CC220043	95.96PPM NITRIC OXIDE/NITROGEN	Sep 01, 2010
NTRM/CO	09060521	CC280705	98.88PPM CARBON MONOXIDE/	Feb 11, 2013
NTRM/SO2	10509	SG9196968BAL	173.0PPM SULFUR DIOXIDE/	May 01, 2011

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet Nexus	FTIR	Apr 06, 2009
Nicolet Nexus	FTIR	Apr 06, 2009
Thermo 6700	FTIR	Apr 06, 2009

Triad Data Available Upon Request

Notes:

Ant Heint

QA Approval

NOx Converter Efficiency Test

40 CFR Part 60, Method 20, Section 5.6.1 - Tedlar Bag

NOx Highest Peak (ppm)

NOx End of Test (ppm)

2 / 1 / 2010

▼

Date

5 : 40 : 00 PM

▲

▼

Start Time

6 : 10 : 00 PM

▲

▼

End Time

Directions: Fill a Tedlar bag with the mid value NOx and the 20% O2 about 50/50. Connect the bag immediately to the NOx analyzer directly in the back for 30 minutes.

NOx Converter Efficiency

< 2% Allowed

Or Alternate Method

EPA Alternate Document ALT-013 - NO2 Protocol 1 Bottle

51.16

NOx Bottle Value (ppm)

48.1

3 / 17 / 2010

▼

Date

2 : 04 : 00 PM

▲

▼

Start Time

2 : 04 : 59 PM

▲

▼

End Time

Directions: Introduce NO2 Protocol 1 calibration gas directly into the analyzer in NOx mode. Gas must be between 40 to 60 ppm.

94.02

Pass

NOx Converter Efficiency

>= 90% Allowed

Clear

NO2 Gas

Valve

4

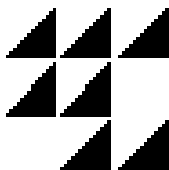
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Print

Exit

Appendix F

Test Plan



**METROPOLITAN COUNCIL ENVIRONMENTAL SERVICES TEST PLAN
SOURCE EMISSION INFORMATION COLLECTION REQUEST (ICR) SEWAGE
SLUDGE INCINERATORS AT THE MCES METRO PLANT**

Date Test Plan Written (/revised): 1/31/2010
Scheduled Test Dates: (See Part VI, Item No.3)

PART I. GENERAL INFORMATION

1. Emission Facility: Metropolitan Council Environmental Services
Metropolitan Wastewater Treatment Plant

Correspondence To:..... Mary Gail Scott
Environmental Compliance Manager
390 Robert St N
St. Paul, Minnesota 55101-1805
Phone: (651) 602-1073 Fax: (651) 602-1130
Email: marygail.scott@metc.state.mn.us
2. Facility Contact Person:..... David Quast, Principal Engineer
Metropolitan Wastewater Treatment Plant
2400 Childs Road
St. Paul, MN 55106-6724
Phone: (651) 602-8297 Fax: (651) 602-8846
Email: david.quast@metc.state.mn.us
3. MPCA File/Permit Number: Facility I.D. # 12300053-005, AQ file No. 879
4. Reason for Tests: EPA Section 114 ICR request
5. Sources to be tested: E.U. 035, Incinerator No. 1, see Figure 1.
E.U. 036, Incinerator No. 2, see Figure 2.
E.U. 037, Incinerator No. 3, see Figure 3.
6. Physical Location of Source:..... Stationary sources located at:
Metropolitan Wastewater Treatment Plant
2400 Childs Road
St. Paul, MN 55106-6724
7. Testing Company:..... Eagle Mountain Scientific
8905 Autumn Oaks Drive, Suite 2
Rockford, MN 55373
Phone: (763) 477-4462
Fax: (763) 477-5991
Contact: Brian Durkop
bdurkop@eagle-msi.com

PART II. TESTING REQUIREMENTS

1. Pollutants to be tested by request of EPA Sewage Sludge Incineration Information Collection Request.

Pollutant	Test Methods	Length of Test Run (3 each)	Target Reported Units of Measure
SO ₂	EPA Method 6C	60 minutes	ppmdv @ 7% O ₂
NO _x	EPA Method 7E	60 minutes	ppmdv @ 7% O ₂
CO	EPA Method 10	60 minutes	ppmdv @ 7% O ₂
D/F, PCB*, PAH **	EPA Method 23 with CARB 429 analysis	240 minutes or 4.0 m ³	ng/dscm @ 7% O ₂ ug/dscm @ 7% O ₂
PM 2.5	OTM 27	240 minutes	lb/dry ton
PM condensable	OTM 28	240 minutes	lb/dry ton

* 12 PCB congeners, isotope dilution mass spectrometry combined with high resolution GC

** High resolution GCMS

Proximate and Ultimate fuel analysis samples shall be taken and for each run

PART III. OPERATING CONDITIONS

1. General operating parameters for each emission point to be tested:

Emission Units 035 - 037	Process Equipment Description: Three identical Fluidized Bed Reactors (FBRs) were installed in 2004. The pollution control trains consist of carbon injection, a high temperature fabric filter baghouse, a venturi scrubber and a high efficiency wet electrostatic precipitator. The loading capacities are 130 dry tons per day. The FBRs normally fire natural gas as an auxiliary fuel but are capable of utilizing No. 2 fuel oil.
	Process Rates/Operating Conditions During Test: Sludge Feed Rate: 2.0 – 5.4 dry tons/hr Natural Gas Consumption: 0-10,000 cu ft/hr
	Control Equipment Description: Each FBR is equipped with a carbon injector, high temp fabric filter, venturi scrubber and wet electro static precipitator.
	Control Equipment Operating Parameters During Test: Carbon Injection Injection Rate 1 - 10 lbs./hr Injection Temperature 350 ° F Baghouse Pressure drop 1 – 10 in WC Wet Scrubber Ring Jet ΔP 10 – 30 in WC pH of absorber 4 - 7 Packed tower Water Flow rate 450 – 800 gpm Venturi Water flow rate 40 - 300 gpm Wet Electrostatic Precipitator Secondary voltage 20 – 60 kW

2. Auxiliary Fuel Description: The FBRs will utilize natural gas as an auxiliary fuel if needed.
3. Normal range of process or operating rates for each emission unit:

Emission Units	Normal Range of Process or Operating Rates
EU 035 - 037	2.0 – 5.4 dry tons per hour.

4. Description of how process equipment will be monitored:

Emission Units	Process Equipment Description	Description of Process Monitoring During Testing
EU 035 - 037	Wet sludge feed rate	Wet Cake flow measuring system, plant computer
	Dry sludge feed	Sample and calculation
	Fuel usage	Meter, plant computer
	Reactor bed temp.	Thermocouple, plant computer.
	Reactor exit gas temp.	Thermocouple, plant computer.
	Reactor off gas Oxygen	Meter, plant computer

5. Description of how air pollution control equipment will be monitored:

Emission Units	Control Equipment Description	Description of Control Equipment Monitoring During Testing
EU 035 - 037	Carbon injector (lb./hr)	Screw feeder load cell
	Baghouse pressure drop (in WC)	Pressure transmitters
	Venturi water rate (gpm)	Meter
	Venturi pressure drop (in WC)	Pressure transmitters
	WESP voltage (secondary kV)	Meter

6. Testing schedule.
A proposed test schedule is listed below. It is a tentative schedule, subject to change regarding the availability of specific emission points, or other unavoidable delays due to weather, unscheduled maintenance, etc.

Test Date	Emission Unit	Testing Method
February 5, 2010	-	Setup
February 8, 2010	Unit 1	EPA 6C, 7E, 10, 23, OTM-27/28
February 9, 2010	Unit 1 and 2	EPA 6C, 7E, 10, 23, OTM-27/28
February 10, 2010	Unit 2	EPA 6C, 7E, 10, 23, OTM-27/28
February 11, 2010	Unit 3	EPA 6C, 7E, 10, OTM-27/28
February 12, 2010	Unit 3	OTM-27/28

Note: See Attached Detailed Schedule (See Figure 4)

PART IV. TEST METHODS

The table presented in Part II of this test plan outlines the test methodology that will be used by the stack-testing vendor. Further details on test methods to be conducted on each unit are provided below.

- EPA Method 1 for the location of sampling ports and points, once before testing.
- EPA Method 2 for velocity and volumetric flow rate. One measurement concurrently with each test run for every pollutant.
- EPA Method 3A for gas analysis. One integrated sample taken concurrently with each test run for every pollutant.
- EPA Method 4 for the determination of moisture in the flue gases. One test run concurrently with each test run for every pollutant.
- OTM-027 and OTM-028, for the determination of particulate matter less than 2.5 microns and including total condensable particulate. Three, four-hour runs are required. Total particulate matter will be determined by including the cyclone catch in a separate analysis. Total particulate, particulate matter less than 2.5 microns, condensable organics (back-half) and inorganic condensable (back-half) shall be reported in gr/dscf and mg/dsm³ corrected to 7% O₂. Oxygen or carbon dioxide diluent shall be obtained simultaneously with each pollutant run.
- EPA Method 23 for Dioxin/Furans, PCB's and PAH. Three, four-hour runs are required or 4 dsm³ of sample collected. Diluent concentrations shall be obtained simultaneously with each Method 23 test run. Total tetra through octa dibenzo-p-dioxins and dibenzofuran and Electronic Reporting Tool Version 3 listed semi-volatile and PCB compounds shall be reported in ng/dsm³ corrected to 7% O₂.

Figure 1

Stack Information (Metropolitan Council, Met Council, FBR 1, Stack)

feet

inches

Stack Diameter

36

Area

7.07

ft2

Points per Diameter

Diameter

36

inches

Port Depth

inches

Eff Diameter

inches

☒ Circular Stack

☐ Square Stack

Applicable Regulation

☒ 40 CFR Part 75

☐ 40 CFR Part 60

☐ Both

Gas Points

☒ Stratification Failed or Not Conducted

☐ No Stratification

☐ Stratification Unknown

☐ 12 Pt Strat Test Passed <= 5%

☐ 12 Pt Strat Test Passed <= 10%

☐ 6 Pt Strat Test Passed <= 5%

☐ 3 Pt Strat Test Passed <= 5%

NOTE: Select a measurement line that passed through the center of the duct in a direction through the stratification.

Moisture Points

☐ Moisture RATA

☐ Convert Wet to Dry

☒ Flow Only

Particulate and Flow Points

Distance Upstream from Flow Disturbance (A)

111.6

Inches

Distance Downstream from Flow Disturbance (B)

615.6

Inches

of Ports

2

☒ Particulate

☐ PM-10

☐ Flow

A

B

Gas RATA Points

Long Measurement Line

Stratification Points

Point 1

6.01

Inches

Point 2

18

Inches

Point 3

29.99

Inches

Point 1

Inches

Point 2

Inches

Point 3

Inches

Point 4

Inches

Point 5

Inches

Point 6

Inches

Point 7

Inches

Point 8

Inches

Point 9

Inches

Point 10

Inches

Point 11

Inches

Point 12

Inches

Moisture Points

Single Point

Single point allowed for MW determination.

Point 1

40

Inches

Particulate and Flow Points

Number of Points

12

Duct Diameters A

3.1

Duct Diameters B

17.1

Point 1

1.58

Inches

Point 2

5.26

Inches

Point 3

10.66

Inches

Point 4

25.34

Inches

Point 5

30.74

Inches

Point 6

34.42

Inches

Point 7

Inches

Point 8

Inches

Point 9

Inches

Point 10

Inches

Point 11

Inches

Point 12

Inches

Clear

Print

Exit

Figure 2

Stack Information (Metropolitan Council, Met Council, FBR 2, Stack)

feet

inches

Stack Diameter

36

Area

7.07

ft2

Points per Diameter

Diameter

36

inches

Port Depth

inches

Eff Diameter

inches

☒ Circular Stack

☐ Square Stack

Applicable Regulation

☒ 40 CFR Part 75

☐ 40 CFR Part 60

☐ Both

Gas Points

☒ Stratification Failed or Not Conducted

☐ No Stratification

☐ Stratification Unknown

☐ 12 Pt Strat Test Passed <= 5%

☐ 12 Pt Strat Test Passed <= 10%

☐ 6 Pt Strat Test Passed <= 5%

☐ 3 Pt Strat Test Passed <= 5%

NOTE: Select a measurement line that passed through the center of the duct in a direction through the stratification.

Moisture Points

☐ Moisture RATA

☐ Convert Wet to Dry

☒ Flow Only

Particulate and Flow Points

Distance Upstream from Flow Disturbance (A)

111.6

Inches

A

Distance Downstream from Flow Disturbance (B)

615.6

Inches

B

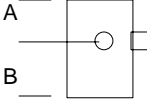
of Ports

2

☒ Particulate

☐ PM-10

☐ Flow



Gas RATA Points

Long Measurement Line

Stratification Points

Point 1

6.01

Inches

Point 1

Inches

Point 2

18

Inches

Point 2

Inches

Point 3

29.99

Inches

Point 3

Inches

Point 4

Inches

Point 5

Inches

Point 6

Inches

Point 7

Inches

Point 8

Inches

Point 9

Inches

Point 10

Inches

Point 11

Inches

Point 12

Inches

Moisture Points

Single Point

Single point allowed for MW determination.

Point 1

40

Inches

Particulate and Flow Points

Number of Points

12

Duct Diameters A

3.1

Duct Diameters B

17.1

Point 1

1.58

Inches

Point 7

Inches

Point 2

5.26

Inches

Point 8

Inches

Point 3

10.66

Inches

Point 9

Inches

Point 4

25.34

Inches

Point 10

Inches

Point 5

30.74

Inches

Point 11

Inches

Point 6

34.42

Inches

Point 12

Inches

Clear

Print

Exit

Figure 3

Stack Information (Metropolitan Council, Met Council, FBR 3, Stack)

feet

inches

Stack Diameter

36

Area

7.07

ft2

Points per Diameter

Diameter

36

inches

Port Depth

inches

Eff Diameter

inches

☒ Circular Stack

☐ Square Stack

Applicable Regulation

☒ 40 CFR Part 75

☐ 40 CFR Part 60

☐ Both

Gas Points

☒ Stratification Failed or Not Conducted

☐ No Stratification

☐ Stratification Unknown

☐ 12 Pt Strat Test Passed <= 5%

☐ 12 Pt Strat Test Passed <= 10%

☐ 6 Pt Strat Test Passed <= 5%

☐ 3 Pt Strat Test Passed <= 5%

NOTE: Select a measurement line that passed through the center of the duct in a direction through the stratification.

Moisture Points

☐ Moisture RATA

☐ Convert Wet to Dry

☒ Flow Only

Particulate and Flow Points

Distance Upstream from Flow Disturbance (A)

111.6

Inches

Distance Downstream from Flow Disturbance (B)

615.6

Inches

of Ports

2

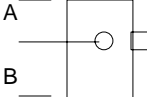
☒ Particulate

☐ PM-10

☐ Flow

A

B



Gas RATA Points

Long Measurement Line

Stratification Points

Point 1

6.01

Inches

Point 1

Inches

Point 2

18

Inches

Point 2

Inches

Point 3

29.99

Inches

Point 3

Inches

Point 4

Inches

Point 5

Inches

Point 6

Inches

Point 7

Inches

Point 8

Inches

Point 9

Inches

Point 10

Inches

Point 11

Inches

Point 12

Inches

Moisture Points

Single Point

Single point allowed for MW determination.

Point 1

40

Inches

Particulate and Flow Points

Number of Points

12

Duct Diameters A

3.1

Duct Diameters B

17.1

Point 1

1.58

Inches

Point 7

Inches

Point 2

5.26

Inches

Point 8

Inches

Point 3

10.66

Inches

Point 9

Inches

Point 4

25.34

Inches

Point 10

Inches

Point 5

30.74

Inches

Point 11

Inches

Point 6

34.42

Inches

Point 12

Inches

Clear

Print

Exit

Figure 4

Day	Monday	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00
Unit	FBI 1	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45
Port A	Dioxin/PAH				R1					R2									
	CEMS				R1														
	PM2.5						R1					R2							
Port B	Dioxin/PAH						R1					R2							
	CEMS									R2									
	PM2.5				R1					R2									

Day	Tuesday	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00
Unit	FBI 1/2	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45
Port A	Dioxin				R3					R1									
	CEMS				R3					R1									
	PM2.5						R3					R1							
Port B	Dioxin						R3					R1							
	CEMS																		
	PM2.5				R3					R1									

Day	Wednesday	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00
Unit	FBI 2	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45
Port A	Dioxin/PAH				R2					R3									
	CEMS				R2														
	PM2.5						R2					R3							
Port B	Dioxin/PAH						R2					R3							
	CEMS									R3									
	PM2.5				R2					R3									

Day	Thursday	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00
Unit	FBI 3	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45
Port A	CEMS				R1					R2									
	PM2.5						R1					R2							
Port B	CEMS						R1					R2							
	PM2.5				R1					R2									

Day	Friday	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00
Unit	FBI 3	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45	00 15 30 45
Port A	CEMS				R3														
	PM2.5						R3												
Port B	CEMS						R3												
	PM2.5				R3														

Test Plan

Metropolitan Wastewater Treatment Plant Test Plan

Facility Information:

Metropolitan Wastewater Treatment Plant		
2400 Childs Road		
St. Paul	MN	55106
Contact: David Quast		
Phone: 651-602-8297		
Fax: 651-602-8846		
Email: david.quast@metc.state.mn.us		

Testing Company:

Eagle Mountain Scientific, Inc.		
8905 Autumn Oaks Drive, Suite 2		
Rockford	MN	55373
Contact: Brian Durkop		
Phone: 763-477-4462		
Fax: 763-477-5991		
Email: bdurkop@eagle-msi.com		

Industry NAICS: 221320 **AFS #:** 2712300053 **FRS #:** 110000573941

Air Permit Number:

12300053-005

Permitted Source ID/Name:

EU035, EU03 Fluidized Bed Incinerators

Permitted Maximum Process Rate:

5.4 dry tons/hr

Max. Normal Operation Process Rate:

2.0-5.4 dry tons/hr

Target Process Test Rate

2.0-5.4 dry tons/hr

SCC / Description 50100506 Waste Disposal - Solid Waste Disposal - Government - Other Incineration - Sludge

1. What is the specific purpose for the proposed testing?

EPA Section 114 ICR Request

2. List all state and federal regulations that apply to the proposed testing:

Regulation Description	Compound	Limit	Unit
		0	
		0	

3. Will the test results be used for other regulatory purposes (e.g., emission inventories, permit applications, etc.) beyond that stated above? If yes, explain.

--

4a. Enter the process data to be documented during testing.

Process Parameter	Units	Target Value	Comments
Dry Sludge Feed Rate	Dry Tons/hr	3.7	2.0-5.4 dry tons/hr
Reactor Off Gas Oxygen	%		
Natural Gas Consumption	cu ft/hr	5000	0-10000
Wet Sludge Feed	Wet Tons/hr		
Reactor Bed Temperature	F		
Reactor Exit Gas Temperature	F		

4b. Enter the process lab data to be documented during testing.

Analysis Required	Units	Comments

Test Plan

Metropolitan Wastewater Treatment Plant Test Plan

GCV	Btu/lb Dry	
Moisture	%	
Ash	% Dry	
Volatile Matter	% Dry	
Fixed Carbon	% Dry	
Carbon	% Dry	
Hydrogen	% Dry	
Nitrogen	% Dry	
Sulfur	% Dry	
Oxygen	% Dry	
Ash	% As Recv	
Volatile Matter	% As Recv	
Fixed Carbon	% As Recv	
Carbon	% As Recv	
Hydrogen	% As Recv	
Nitrogen	% As Recv	
Sulfur	% As Recv	
Oxygen	% As Recv	
GCV	Btu/lb, As Recv	

5a. Please give a brief description of the source (including control equipment) and attach source or process flow diagram:

Three identical Fluidized Bed Reactors (FBRs) were installed in 2004. The pollution control trains consist of carbon injection, a high temperature fabric filter baghouse, a venturi scrubber and a high efficiency wet electrostatic precipitator. The loading capacities are 130 dry tons per day. The FBRs normally fire natural gas as an auxiliary fuel but are capable of utilizing No. 2 fuel oil.

Each FBR is equipped with a carbon injector, high temp fabric filter, venturi scrubber and wet electro static precipitator.

5b. Control Devices:

Control Device Name
CARBON INJECTION RATE
CARBON INJECTION TEMPERATURE
BAGHOUSE PRESSURE DROP
WET SCRUBBER RING JET DP
WET SCRUBBER ph OF ABSORBER
WET SCRUBBER PACKED TOWER FLOW RATE
WET SCRUBBER VENTURI WATER FLOW RATE
WET ELECTROSTATIC PRECIPITATOR SECONDARY VOLTAGE

6. Please enter sampling location information.

Location	Round Duct Diam.	Rect. Duct Length /Width		Equiv. Diam	Distance from upstream dist.	Distance from downstream dist.	Number of Traverse Ports	Min.Travers Points
FBR 1	36	0	0	0	111.6	615.6	2	12
FBR 2	36	0	0	0	111.6	615.6	2	12

Test Plan
Metropolitan Wastewater Treatment Plant Test Plan

FBR 3	36	0	0	0	111.6	615.6	2	12
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7. Please provide the following information for each test parameter.

Location	Target Parameter	Test Method	Number of Test Runs	Test Run Duration	Sample Points	Comments
FBR 1	Carbon Monoxide	Method 10	3	60	0	
FBR 2	Carbon Monoxide	Method 10	3	60	0	
FBR 3	Carbon Monoxide	Method 10	3	60	0	
FBR 1	Sulfur Dioxide	Method 6C	3	60	0	
FBR 2	Sulfur Dioxide	Method 6C	3	60	0	
FBR 3	Sulfur Dioxide	Method 6C	3	60	0	
FBR 1	Nitrogen oxides (NOx)	Method 7E	3	60	0	
FBR 2	Nitrogen oxides (NOx)	Method 7E	3	60	0	
FBR 3	Nitrogen oxides (NOx)	Method 7E	3	60	0	
FBR 1	Total PM2.5	OTM - 27/28	3	240	0	lb/dry ton
FBR 2	Total PM2.5	OTM - 27/28	3	240	0	lb/dry ton
FBR 3	Total PM2.5	OTM - 27/28	3	240	0	lb/dry ton
FBR 1	Total Dioxins	Method 23	3	240	0	
FBR 1	Total Furans	Method 23	3	240	0	
FBR 2	Total Dioxins	Method 23	3	240	0	
FBR 2	Total Furans	Method 23	3	240	0	
FBR 1	Total PCBs	Method 23	3	240	0	
FBR 2	Total PCBs	Method 23	3	240	0	
FBR 1	2-Methylnaphthalene	Method 23	3	240	0	
FBR 1	Acenaphthene**	Method 23	3	240	0	
FBR 1	Acenaphthylene**	Method 23	3	240	0	
FBR 1	Anthracene**	Method 23	3	240	0	
FBR 1	Benzo(a)anthracene*	Method 23	3	240	0	
FBR 1	Benzo(a)pyrene*	Method 23	3	240	0	
FBR 1	Benzo(b)fluoranthene*	Method 23	3	240	0	
FBR 1	Benzo(e)pyrene	Method 23	3	240	0	
FBR 1	Benzo(ghi)perylene**	Method 23	3	240	0	
FBR 1	Benzo(k)fluoranthene*	Method 23	3	240	0	
FBR 1	Chrysene*	Method 23	3	240	0	
FBR 1	Dibenz(a,h)anthracene*	Method 23	3	240	0	
FBR 1	Fluoranthene**	Method 23	3	240	0	
FBR 1	Fluorene**	Method 23	3	240	0	
FBR 1	Indeno(1,2,3-cd)pyrene*	Method 23	3	240	0	
FBR 1	Naphthalene**	Method 23	3	240	0	
FBR 1	Perylene	Method 23	3	240	0	
FBR 1	Phenanthrene**	Method 23	3	240	0	
FBR 1	Pyrene**	Method 23	3	240	0	

Test Plan

Metropolitan Wastewater Treatment Plant Test Plan

FBR 2	2-Methylnaphthalene	Method 23	3	240	0	
FBR 2	Acenaphthene**	Method 23	3	240	0	
FBR 2	Acenaphthylene**	Method 23	3	240	0	
FBR 2	Anthracene**	Method 23	3	240	0	
FBR 2	Benzo(a)anthracene*	Method 23	3	240	0	
FBR 2	Benzo(a)pyrene*	Method 23	3	240	0	
FBR 2	Benzo(b)fluoranthene*	Method 23	3	240	0	
FBR 2	Benzo(e)pyrene	Method 23	3	240	0	
FBR 2	Benzo(ghi)perylene**	Method 23	3	240	0	
FBR 2	Benzo(k)fluoranthene*	Method 23	3	240	0	
FBR 2	Chrysene*	Method 23	3	240	0	
FBR 2	Dibenz(a,h)anthracene*	Method 23	3	240	0	
FBR 2	Fluoranthene**	Method 23	3	240	0	
FBR 2	Fluorene**	Method 23	3	240	0	
FBR 2	Indeno(1,2,3-cd)pyrene*	Method 23	3	240	0	
FBR 2	Naphthalene**	Method 23	3	240	0	
FBR 2	Perylene	Method 23	3	240	0	
FBR 2	Phenanthrene**	Method 23	3	240	0	
FBR 2	Pyrene**	Method 23	3	240	0	

7b. Please select the Emissions / Concentrations for each location.

Location	Test Method	Emissions / Concentrations	Corrected Analyte	Corrected Percent
FBR 1	Method 10	ppm corrected	O2	7
FBR 2	Method 10	ppm corrected	O2	7
FBR 3	Method 10	ppm corrected	O2	7
FBR 1	Method 6C	ppm corrected	O2	7
FBR 2	Method 6C	ppm corrected	O2	7
FBR 3	Method 6C	ppm corrected	O2	7
FBR 1	Method 7E	ppm corrected	O2	7
FBR 2	Method 7E	ppm corrected	O2	7
FBR 3	Method 7E	ppm corrected	O2	7
FBR 1	Method 23	ng/dscm corrected	O2	7
FBR 2	Method 23	ng/dscm corrected	O2	7
FBR 1	Method 23	ug/dscm corrected	O2	7
FBR 2	Method 23	ug/dscm corrected	O2	7

8. Describe below or attach complete documentation of all modifications and/or deviations to the applicable test methods. If alternative methods requested, attach documentation of request

☐ Yes ☒ No

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9. Does the proposed sampling location meet the minimum EPA Method 1 criteria for acceptable measurement sites? Please list below or attach the supporting documentation.

☒ Yes ☐ No

Sampling location is the same for all three units. See attached for description.

10. Has absence of cyclonic flow been verified per EPA Method 1 (Section 2.4)? If no, absence of cyclonic flow must be verified prior to testing. If yes, please attach supporting documentation.

☐ Yes ☒ No

11. Select the method that will determine the oxygen concentration :

M3A-instrumental

12. Do any of the proposed test methods require analysis of EPA audit samples? If yes, notify Regional Office at least 45 days prior to testing to allow for audit sample preparation and shipment.

☐ Yes ☒ No

13. Has all testing equipment been calibrated within the past year? If no, please explain.

☒ Yes ☐ No

14. Will all calibration gases be certified by EPA Traceability Protocol procedures? If No, describe certification procedure below.

☒ Yes ☐ No ☐ N/A

15. Is a dilution system (via EPA Method 205) proposed?

☐ Yes ☒ No ☐ N/A

16. If applicable, list the expected calibration gas concentrations for all proposed instrumental test methods. Include as much information as is known at this time.

17. What is the proposed test schedule?

Setup- February 5, 2010
Testing on FBI units 1-3 will occur the week of February 8-12, 2010

18. Additional comments:

Total PM 2.5 reporting units will be lb/ton dry sludge burned

19. Required Personal Protection Equipment:

Hard Hat, Steel Toed Boots, Safety Glasses with Side Shield

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Permitted Facility Representative

Date

Name:

Title:

Company:

Sign Date:

Testing Company Representative

Date

Name:

Title:

Company:

Sign Date: