TITLE V

SFO

San Francisco International Airport

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BAY AREA AIR QUALITY MANAGEMENT DISTRICT

November 1, 2017

Mr. Wayne Kino
Director of Compliance and Enforcement
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Attn: Title V Reports

Subject: San Francisco International Airport (SFO) Facility #A 1784
Corrected Semi-annual Monitoring Report April 1, 2017 – September 30, 2017

Dear Mr. Kino:

Pursuant to Standard Condition F of the Title V Major Facility Review Permit for San Francisco International Airport (SFO) #A1784, SFO is submitting the subject report. During the process of submission to the District earlier this week of the Airport's Semi-annual Monitoring Report (Report) for the period April 1, 2017 – September 30, 2017, we have identified a correction that should be made to the Report to reflect an instance of noncompliance with the terms of the Title V permit. For this reason, we are submitting a corrected report (Corrected Report) that should replace the original report. The corrections are reflected in the Title V Deviation Reporting section of the Corrected Report.

If you have any questions, please contact Sam Mehta (Environmental Services Manager) at 650-821-7841, sam.mehta@flysfo.com or Libi Yap at 650-821-7730, liborio.yap@flysfo.com.

Very truly yours,

Ivar C. Satero
Airport Director

Enclosure

cc: Deborah Jordan, Director of the Air Division, US EPA, Region 9
Alona Davis, BAAQMD
Sam Mehta, Environmental Services Manager
Libi Yap, Mechanical Engineerin

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SAN FRANCISCO INTERNATIONAL AIRPORT

Major Facility Review Permit #A1784

Corrected April 1, 2017 – September 30, 2017 Semi-annual Monitoring Report

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2. **Visible Emission Evaluation report for Source S1Sludge Gas Burner Flare**
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4. **Central Plant Boilers Emission test Report by BEST Environmental Dated April 8, 2016**
5. **List and Compliance Status of the New Sources not included in Tables IV and VII of the Title V permit**

1. Compliance Statement

Facility: San Francisco International Airport
San Francisco, CA 94128

Facility ID: A1784

Reporting Period: April 1, 2017 to September 30, 2017

The compliance certification provided below is pursuant to the San Francisco International Airport Major Facility Review Permit Standard Condition G – Compliance Certification.

Certification by Responsible Official

Based upon information and belief formed after a reasonable inquiry, I as a Responsible Official of the above mentioned facility, certify that the information contained in this report is true, accurate and complete for the reporting period indicated above.

Signature

11/2/17
Date

Ivar C Satero
Type name

Airport Director
Title

2. Introduction

For the reporting purpose Tables VII-A through VII-J have been copied from the current facility permit and a column has been added to indicate compliance status, which is noted by the abbreviations explained in this paragraph. Abbreviation CC has been used to indicate that the source was in continuous compliance for the reporting period. Abbreviation NC has been used to indicate that the source was in non-compliance some time during the reporting period and is not indicative of continuous non-compliance. Furthermore any source that indicates non-compliance with any requirement does not necessarily mean that the source is not compliant at the time this report was prepared or submitted. Abbreviation Y has been used to indicate presumptive compliance where standard practices or the nature of the operation is expected to maintain the source in compliance or where the records do not exist because there was no observable emission. Abbreviation NA has been used where monitoring for compliance is not required and, therefore, is not applicable.

Notice of Violation:

None.

The San Francisco International Airport ("SFO" or "Airport") did not receive any Notices of Violation from the Bay Area Air Quality Management District ("BAAQMD" or "District") during this reporting period.

Title V Deviation Reporting:

(1) Source testing of S-14 and S-15 is delayed. SFO anticipates the test to be done in November 2017.

(2) The Airport took ownership of the engines listed below on April 13, 1995 from a tenant. On October 25, 2017 we found out that the diesel fire pumps were not included in our Title V permit. These pumps are located near Plot 40 in a pump house inside the Airfield. They serve as backups to the Airport's electric-driven pumps and part of Superbay Hangar's fire protection system. The engines are temporarily out of normal service pending renovation of the hangar and an upgrade of the protein foam fire protection system. The five diesel fire pumps information is as follows:

Equipment Tag	Make	Model	Serial Number	Rated BHP
Fire Pump 2	Cummins	NH-220-IF	759224	400
Fire Pump 4	Cummins	VT1710P635	713326-3	400
Fire Pump 5	Cummins	VT1710P635	713961-3	400
Fire Pump 6	Clarke	JX6HUFADFO	FPCO1056745	460
Fire Pump 7	Cummins	VT1710P635	713962-3	400

Airport staff is preparing required documentation to apply for a permit.

H2S Hydrogen Sulfide Monitoring:

Attachment 1 provides the results of weekly and monthly monitoring of the H2S for the Source S170. Under conditions of the permit, the hydrogen sulfide (H2S) content in the digester gas is not to exceed 2250 ppm. All results of the monitoring for this reporting period have been significantly below 2250 ppm.

Visible Emissions Evaluation:

The Visible Emission Evaluation Report for Source S-1 is included in **Attachment 2**.

Schedule of Compliance:

Please see tables below

3. Compliance Status Tables

a. APPLICABLE LIMITS & COMPLIANCE MONITORING REQUIREMENTS

This section has been included to summarize the applicable emission limits contained in Section IV, Source-Specific Applicable Requirements, of this permit. The following tables show the relationship between each emission limit and the associated compliance monitoring provisions, if any. The monitoring frequency column indicates whether periodic (P) or continuous (C) monitoring is required. For periodic monitoring, the frequency of the monitoring has also been shown using the following codes: annual (A), quarterly (Q), monthly (M), weekly (W), daily (D), or on an event basis (E). No monitoring (N) has been required if the current applicable rule or regulation does not require monitoring, and the operation is unlikely to deviate from the applicable emission limit based upon the nature of the operation.

Table VII – A
Applicable Limits and Compliance Monitoring Requirements
S1 – SLUDGE GAS BURNER (FLARE)

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Opacity	BAAQMD 6-1-301	Y		Ringelmann 1.0 for < 3 minutes in any hour	BAAQMD 6-1-401	P/E	Visible Emissions Check	CC
FP	BAAQMD 6-1-310	Y		0.15 gr/dscf	BAAQMD 6-1-401	P/E	Visible Emissions Check	CC
SO2	BAAQMD 9-1-301	Y		GLC[1] ≤0.5 ppm for 3 min or ≤ 0.25 ppm for 60 min or ≤ 0.05 ppm for 24 hours	None	N	NA	NA
SO2	BAAQMD 9-1-302	Y		SO2 shall not exceed 300 ppm (dry)	Condition # 18329, Parts 6 and 7	P/W	monitoring of digester gas hydrogen sulfide	NA

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – A
Applicable Limits and Compliance Monitoring Requirements
S1 – SLUDGE GAS BURNER (FLARE)

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
H2S	Condition # 18329 Part 6	Y		2,250 ppm	Condition # 18329, Parts 6 and 7	P/W (Weekly, or monthly monitoringa s allowed per VI, Permit Conditions, Condition #18329, No. 7)	Monitoring of digester gas hydrogen sulfide	CC
H_2S	BAAQMD 9-2-301	N		Property Line Ground Level Limits: $\leq$ 0.06 ppm, averaged over 3 minutes and $\leq$ 0.03 ppm, averaged over 60 minutes	BAAQMD 9-2-501 9-2-602	C	Area Monitoring	NA The District has not notified SFO that the monitoring is required
POC	BAAQMD 8-2-301	Y		15 lb/day and greater than 300 ppm total carbon	None	N	None	NA
Hours of Operation	Condition # 18329 Part 4	Y		At all times abating S170	BAAQMD Condition # 18329 Part 5	P/E	Records	Y

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – C
S8 – Reverse Airflow Auto-Track Spray Booth
S9 – Custom Air Auto Spray Booth

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17compliance status
Opacity	BAAQMD 6-1-301 SIP 6-301	Y		Ringelmann 1.0 for < 3 minutes in any hour	BAAQMD 6-1-401	P/E	Visible Emissions Check	Y
FP	BAAQMD 6-1-310 SIP 6-310	Y		0.15 gr/dscf	BAAQMD 6-1-401	P/E	Visible Emissions Check	Y
VOC	BAAQMD 8-19-302	Y		Air-Dried Coatings VOC ≤ 340 g/l (2.8 lb/gal)	BAAQMD 8-19-501	P/E	Records	CC
VOC	BAAQMD 8-19-312.2	Y		Specialty Coating High Gloss VOC ≤ 420 g/l (3.5 lb/gal);	BAAQMD 8-19-501	P/E	Records	CC
VOC	BAAQMD 8-19-312.3	Y		Specialty Coating Heat Resistant VOC ≤ 420 g/l (3.5 lb/gal);	BAAQMD 8-19-501	P/E	Records	CC
VOC	BAAQMD 8-19-312.4	Y		Specialty Coating High Performance Architectural VOC ≤ 420 g/l (3.5 lb/gal);	BAAQMD 8-19-501	P/E	Records	CC
VOC	BAAQMD 8-19-312.5	Y		Specialty Coating Metallic Topcoat VOC ≤ 420 g/l (3.5 lb/gal);	BAAQMD 8-19-501	P/E	Records	CC
VOC	BAAQMD 8-19-312.7	Y		Specialty Coating Pretreatment Wash Primer VOC ≤ 420 g/l (3.5 lb/gal);	BAAQMD 8-19-501	P/E	Records	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – C
S8 – Reverse Airflow Auto-Track Spray Booth
S9 – Custom Air Auto Spray Booth

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17compliance status
VOC	BAAQMD 8-19-312.8	Y		Specialty Coating Silicone Release VOC ≤ 420 g/l (3.5 lb/gal);	BAAQMD 8-19-501	P/E	Records	CC
VOC	BAAQMD 8-19-312.9	Y		Specialty Coating Solar Absorbant VOC ≤ 420 g/l (3.5 lb/gal);	BAAQMD 8-19-501	P/E	Records	CC
VOC	BAAQMD 8-19-312.12	Y		Specialty Coating Extreme Performance VOC ≤ 420 g/l (3.5 lb/gal);	BAAQMD 8-19-501	P/E	Records	CC
VOC	BAAQMD 8-19-312.13	Y		Specialty Coating High Temperature VOC ≤ 420 g/l (3.5 lb/gal);	BAAQMD 8-19-501	P/E	Records	CC

Table VII – C1
S8 – Reverse Airflow Auto-Track Spray Booth

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Through-put	Condition # 7502, Part 1	Y		Coating Usage ≤ 250 gals/yr	Condition # 7502, Part 3	P/A	Records	CC
Through-put	Condition # 7502, Part 2	Y		Net Clean-up Solvent Usage ≤ 125 gals/yr	Condition # 7502, Part 3	P/A	Records	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – C2
S9 – CUSTOM AIR AUTO SPRAY BOOTH

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Through-put	Condition # 7502, Part 4	Y		Coating Usage ≤ 250 gals/yr	Condition # 7502, Part 6	P/A	Records	CC
Through-put	Condition # 7502, Part 5	Y		Net Clean-up Solvent Usage ≤ 125 gals/yr	Condition # 7502, Part 6	P/A	Records	CC

Table VII – D
Applicable Limits and Compliance Monitoring Requirements
S14 – HIGH TEMPERATURE HOT WATER GENERATOR
S15 – HIGH TEMPERATURE HOT WATER GENERATOR
S16 – HIGH TEMPERATURE HOT WATER GENERATOR
S17 – HIGH TEMPERATURE HOT WATER GENERATOR

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
NOx	SIP 9-7-301.1	Y		30 ppmv @ 3%O2, dry, 3-hr average	None	N	None	NA
NOx (S14 and S15)	Condition # 24716, Part 1	Y		9 ppmv @ 3%O2, dry, 3-hr average	None	N	None	NA
NOx (S14 and S15)	Condition # 24716, Part 2	Y		100 ppmv @ 3%O2, dry, 3-hr average (fuel oil fired)	None	N	None	NA
NOx (S16 and S17)	Condition # 25080, Part 4	Y		9 ppmv @ 3%O2, dry, 3-hr average	Condition # 25080, Part 7	P/2 years	Source Test	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – D
Applicable Limits and Compliance Monitoring Requirements
S14 – HIGH TEMPERATURE HOT WATER GENERATOR
S15 – HIGH TEMPERATURE HOT WATER GENERATOR
S16 – HIGH TEMPERATURE HOT WATER GENERATOR
S17 – HIGH TEMPERATURE HOT WATER GENERATOR

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
NOx	BAAQMD 9-7-307.5	N		9 ppmv @ 3%O2, dry, 3-hr average	BAAQMD 9-7-403 9-7-506	P/A	Source Test	NC, Please see Title V Deviation Reporting
NOx (S14 and S15)	BAAQMD 9-7-113.2 SIP 9-7-305.1	Y		150 ppmv @ 3%O2, dry, 3-hr average	None	N	None	NA
NOx (S14 and S15)	BAAQMD 9-7-113.2 SIP 9-7-306.1	Y		150 ppmv @ 3%O2, dry, 3-hr average	None	N	None	NA
CO	SIP 9-7-301.2	Y		400 ppmv @ 3%O2, dry, 3-hr average	None	N	None	NA
CO	BAAQMD 9-7-307.5	N		400 ppmv @ 3%O2, dry, 3-hr average	BAAQMD 9-7-403 9-7-506	P/A	Source Test	NC, Please see Title V Deviation Reporting
CO	SIP 9-7-305.2	Y		400 ppmv @ 3%O2, dry, 3-hr average	None	N	None	NA
CO	SIP 9-7-306.2	Y		400 ppmv @ 3%O2, dry, 3-hr average	None	N	None	NA
CO (S14 and S15)	Condition # 24716, Part 1	Y		50 ppmv @ 3%O2, dry, 3-hr average	None	N	None	NA

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – D
Applicable Limits and Compliance Monitoring Requirements
S14 – HIGH TEMPERATURE HOT WATER GENERATOR
S15 – HIGH TEMPERATURE HOT WATER GENERATOR
S16 – HIGH TEMPERATURE HOT WATER GENERATOR
S17 – HIGH TEMPERATURE HOT WATER GENERATOR

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
CO (S14 and S15)	Condition # 24716, Part 2	Y		50 ppmv @ 3%O2, dry, 3-hr average (fuel oil fired)	None	N	None	NA
CO (S16 and S17)	Condition # 25080, Part 5	Y		50 ppmv @ 3%O2, dry, 3-hr average	Condition # 25080, Part 7	P/2 years	Source Test	NA
Opacity (S14 and S15)	BAAQMD 6-1-301 SIP 6-301	Y		Ringelmann 1.0 for < 3 minutes in any hour	Condition # 24716, Part 7	P/1000 gallons of Fuel Oil	Visible Emissions Check	NA
FP (S14 and S15)	BAAQMD 6-1-310.3 SIP 6-310.3	Y		0.15 gr/dscf at 6% O2	Condition # 24716, Part 7	P/1000 gallons of Fuel Oil	Visible Emissions Check	NA
SO2	BAAQMD 9-1-301	Y		GLC[1] ≤0.5 ppm for 3 min or ≤0.25 ppm for 60 min or ≤0.05 ppm for 24 hours	None	N	None	NA
SO2	BAAQMD 9-1-302	Y		SO2 shall not exceed 300 ppm (dry)	None	N	None	NA
SO2	BAAQMD 9-1-304	Y		Sulfur Content of Fuel Oil ≤ 0.5 wt%	Condition # 24716, Part 6	P/E	Fuel Oil Certification	Y
Heat Input (S14 and S15)	Condition # 24716, Part 3	Y		Natural Gas not to exceed 4,500,000 therms/Consecutive 12-months	Condition # 24716, Part 4	P/M	Records	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – D
Applicable Limits and Compliance Monitoring Requirements
S14 – HIGH TEMPERATURE HOT WATER GENERATOR
S15 – HIGH TEMPERATURE HOT WATER GENERATOR
S16 – HIGH TEMPERATURE HOT WATER GENERATOR
S17 – HIGH TEMPERATURE HOT WATER GENERATOR

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Heat Input (S16)	Condition # 25080, Part 2	Y		Natural Gas not to exceed 1,217,260 therms/Consecutive 12-months	Condition # 25080, Part 3	P/M	Records	CC
Heat Input (S17)	Condition # 25080, Part 2	Y		Natural Gas not to exceed 1,208,390 therms/Consecutive 12-months	Condition # 25080, Part 3	P/M	Records	CC
Total Heat Input (S14 through S17)	Condition # 25080, Part 2	Y		Natural Gas not to exceed 1,560 therms/hour	Condition # 25080, Part 3	P/M	Records	CC
Equip-ment Testing	BAAQMD 9-7-113.1 SIP 9-7-306.3	Y		Hours of Equipment Testing ≤ 48/yr	BAAQMD 9-7-503.3 & Condition # 18329 Part 6	P/E	Records	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – F
S100 -MUNICIPAL WASTEWATER TREATMENT PLANT; S110 - PRELIMINARY TREATMENT; S121 SEQUENTIAL BATCH REACTOR NO. 1; S122 SEQUENTIAL BATCH REACTOR NO. 2; S123 SEQUENTIAL BATCH REACTOR NO. 3; S131 INFLUENT FLOW EQUALIZATION BASIN NO. 1 (FORMERLY S120); S132 INFLUENT FLOW EQUALIZATION BASIN NO. 2 (FORMERLY S130); S133 EFFLUENT FLOW EQUALIZATION BASIN; S150 - (SLUDGE HANDLING PROCESSES)DISINFECTION; S160 - SLUDGE HANDLING PROCESSES; S161 WASTE HOLDING TANK (FORMERLY S140); S180 – RECLAMATION; S200 - INDUSTRIAL WASTEWATER PLANT; S210 - PRIMARY TREATMENT; S220 - FLOW EQUALIZATION; S230 - SECONDARY TREATMENT; S240 - SECONDARY CLARIFIERS; S250 – DISINFECTION; S260 - SLUDGE HANDLING PROCESSES

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Opacity	BAAQMD 6-1-301 SIP 6-301	Y		Ringelmann 1.0 for < 3 minutes in any hour	BAAQMD 6-1-401	P/E	Visible Emissions Check	Y
FP	BAAQMD 6-1-310 SIP 6-310	Y		0.15 gr/dscf	BAAQMD 6-1-401	P/E	Visible Emissions Check	Y
VOC	BAAQMD 8-2-301	Y		Emissions may not exceed 300 ppm total carbon, dry, and 15 lb/day/source	None	N	None	NA
Through-put	BAAQMD Condition # 18329 Part 1	Y		Industrial Wastewater Discharge < 1.7 E6 gal/day during November through May; < 1.2 E6 gal/day during June through October	BAAQMD Condition # 18329 Part 3	P/D & P/M	Records	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – F
S100 -Municipal Wastewater Treatment Plant; S110 - Preliminary Treatment; S121 Sequential Batch Reactor No. 1; S122 Sequential Batch Reactor No. 2; S123 Sequential Batch Reactor No. 3; S131 Influent Flow Equalization Basin No. 1 (formerly S120); S132 Influent Flow Equalization Basin No. 2 (formerly S130); S133 Effluent Flow Equalization Basin; S150 - (Sludge Handling Processes)Disinfection; S160 - Sludge Handling Processes; S161 Waste Holding Tank (formerly S140); S180 – Reclamation; S200 - Industrial Wastewater Plant; S210 - Primary Treatment; S220 - Flow Equalization; S230 - Secondary Treatment; S240 - Secondary Clarifiers; S250 – Disinfection; S260 - Sludge Handling Processes

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Through-put	BAAQMD Condition # 18329 Part 2	Y		Sanitary Sewer Discharge < 2.2 E6 gal/day	BAAQMD Condition # 18329 Part 3	P/D & P/M	Records	CC

Table VII – G
S170 - Anaerobic Digesters

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Opacity	BAAQMD 6-1-301 SIP 6-301	Y		Ringelmann 1.0 for < 3 minutes in any hour	BAAQMD 6-1-401	P/E	Visible Emissions Check	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – G
S170 - ANAEROBIC DIGESTERS

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
FP	BAAQMD 6-1-310 SIP 6-310	Y		0.15 gr/dscf	BAAQMD 6-1-401	P/E	Visible Emissions Check	Y
VOC	BAAQMD 8-2-301	Y		Emissions may not exceed 300 ppm total carbon, dry, and 15 lb/day/source	None	N	None	NA
Odors	BAAQMD 1-301	N		None	BAAQMD Condition # 18329 Part 5	P/E	Records	CC
H_2S	BAAQMD Regulation 9-2-301	N		0.06 ppm H2S over 3 min or 0.03 ppm H2S over 60 min	None	N	None	NA
Digester Gas Sulfur Content	BAAQMD Condition 18329 Part 6	Y		2,250 ppm	BAAQMD Condition 18329 Part 7	P/W (Weekly, or monthly monitoring as allowed per VI, Permit Conditions, Condition #18329, No. 7	Weekly digester gas testing	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – H
S270 - 1850 HP DIESEL FIELD LIGHTING GENERATOR #1

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Opacity	BAAQMD 6-1-303 SIP 6-303	Y		Ringelmann 2.0 for < 3 minutes in any hour	Condition # 18324, Part 1	P/1000 gal fuel oil	Visible Emissions Check	CC
FP	BAAQMD 6-1-310 SIP 6-310	Y		0.15 gr/dscf	Condition # 18324, Part 1	P/1000 gal fuel oil	Visible Emissions Check	CC
Diesel Particulate Matter	CCR, Title 17, Section 93115.6(b)(3)(A)(1)(a)	N		> 0.40 g/bhp-hr for 20 hour/year operating limit	None	N	None	NA
SO2	BAAQMD 9-1-301	Y		GLC[1] of 0.5 ppm for 3 min or 0.25 ppm for 60 min or 0.05 ppm for 24 hours	Condition # 18324, Part 4	P/E	Fuel Oil Certification	Y
SO2	BAAQMD 9-1-302	Y		SO2 shall not exceed 300 ppm (dry)	Condition # 18324, Part 4	P/E	Fuel Oil Certification	Y
SO2	BAAQMD 9-1-304	Y		Sulfur Content of Fuel Oil ≤ 0.5 wt%	Condition # 18324, Part 4	P/E	Fuel Oil Certification	Y
Emer-gency	BAAQMD 9-8-331.1 & Condition # 18324 Part 2b	N		Unlimited Emergency Operation	BAAMQD 9-8-530 & Condition # 18324 Part 3b	P/M	Records	CC
Reli-ability Related Activities	BAAQMD 9-8-331.3 & Condition # 18324 Part 2a	N		Hours of Reliability Related Activities ≤ 100/yr	BAAMQD 9-8-530 & Condition # 18324 Part 3b	P/M	Records	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII – H
S270 - 1850 HP DIESEL FIELD LIGHTING GENERATOR #1

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Reli-ability Related Activities	CCR, Title 17, Section 93115.6(b)(3)(A)(1)(a) & Condition 22820 Part 1	N		Hours of Reliability Related Activities ≤ 20/yr	BAAMQD 9-8-530 & Condition # 22820 Part 4	P/M	Records	CC

Table VII - I
S-29, S-290, S-320 THROUGH S-340 AND S-360 THROUGH S-550 EMERGENCY GENERATORS

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Opacity	BAAQMD 6-1-303 SIP 6-303	Y		Ringelmann 2.0 for < 3 minutes in any hour	Condition # 18666, Part 1	P/1000 gal fuel oil	Visible Emissions Check	CC
FP	BAAQMD 6-1-310 SIP 6-310	Y		0.15 gr/dscf	Condition # 18666, Part 1	P/1000 gal fuel oil	Visible Emissions Check	CC
Diesel Particulate Matter	CCR, Title 17, Section 93115.6(b)(3)(A)(1)(a)	N		> 0.40 g/bhp-hr for 20 hour/year operating limit	None	N	None	NA

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII - I
S-29, S-290, S-320 THROUGH S-340 AND S-360 THROUGH S-550 EMERGENCY GENERATORS

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
SO2	BAAQMD 9-1-301	Y		GLC[1] of 0.5 ppm for 3 min or 0.25 ppm for 60 min or 0.05 ppm for 24 hours	Condition # 18666, Part 4	P/E	Fuel Oil Certification	Y
SO2	BAAQMD 9-1-302	Y		SO2 shall not exceed 300 ppm (dry)	Condition # 18666, Part 4	P/E	Fuel Oil Certification	Y
SO2	BAAQMD 9-1-304	Y		Sulfur Content of Fuel Oil ≤ 0.5 wt%	Condition # 18666, Part 4	P/E	Fuel Oil Certification	Y
Emer-gency	BAAQMD 9-8-330.1 & Condition # 18666 Part 2b	N		Unlimited Emergency Operation	BAAMQD 9-8-530 & Condition # 18666 Part 3b	P/M	Records	CC
Reli-ability Related Activities	CCR, Title 17, Section 93115.6(b)(3)(A)(1)(a) & Condition 22820 Part 1	N		Hours of Reliability Related Activities ≤ 20/yr	BAAMQD 9-8-530 & Condition # 22820 Part 4	P/M	Records	CC
Reli-ability Related Activities	BAAQMD 9-8-330.3 & Condition # 18666 Part 2a	N		Hours of Reliability Related Activities ≤ 50/yr	BAAMQD 9-8-530 & Condition # 18666 Part 3b	P/M	Records	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII - J
S640 THROUGH S720 EMERGENCY GENERATORS

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
NMHC + NOx S680, S690, S700 and S710	CCR, Title 17, Section 93115.6(a)(3)(B)	N		4.8 g/bhp-hr	CCR, Title 17, Section 93115.10(a)(3)	P/E	Initial Report of Engine Emission Factors	CC
NMHC + NOx S680, S690, S700 and S710	40 CFR 60.4205(b)	Y		4.8 g/bhp-hr	40 CFR 60.4211(a)	C	Operate and maintain per mfg instructions	CC
CO S680, S690, S700 and S710	CCR, Title 17, Section 93115.6(a)(3)(B)	N		2.6 g/bhp-hr	CCR, Title 17, Section 93115.10(a)(3)	P/E	Initial Report of Engine Emission Factors	CC
CO S680, S690, S700 and S710	40 CFR 60.4205(b)	Y		2.6 g/bhp-hr	40 CFR 60.4211(a)	C	Operate and maintain per mfg instructions	CC
Opacity	BAAQMD 6-1-303 SIP 6-303	Y		Ringelmann 2.0 for < 3 minutes in any hour	BAAQMD 6-1-401	P/E	Visible Emissions Check	CC
PM S680, S690, S700 and S710	CCR, Title 17, Section 93115.6(a)(3)(B)	N		0.15 g/bhp-hr	CCR, Title 17, Section 93115.10(a)(3)	P/E	Initial Report of Engine Emission Factors	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII - J
S640 THROUGH S720 EMERGENCY GENERATORS

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
PM S680, S690, S700 and S710	40 CFR 60.4205(b)	Y		0.15 g/bhp-hr	40 CFR 60.4211(a)	C	Operate and maintain per mfg instructions	CC
FP	BAAQMD 6-1-310 SIP 6-310	Y		0.15 gr/dscf	None	N	None	NA
Diesel Particulate Matter	CCR, Title 17, Section 93115.6(b)(3)(A)(1)(a)	N		> 0.40 g/bhp-hr for 20 hour/year operating limit	None	N	None	NA
Diesel Particulate Matter	CCR, Title 17, Section 93115.6(b)(3)(A)(1)(b)	N		< 0.40 g/bhp-hr for 30 hour/year operating limit	None	N	None	NA
Diesel Particulate Matter	CCR, Title 17, Section 93115.6(b)(3)(A)(2)(b)	N		< 0.15 g/bhp-hr for 20 hour/year operating limit	None	N	None	NA
SO2	BAAQMD 9-1-301	Y		GLC[1] of 0.5 ppm for 3 min or 0.25 ppm for 60 min or 0.05 ppm for 24 hours	None	N	None	NA
SO2 S640	BAAQMD 9-1-301	Y		GLC[1] of 0.5 ppm for 3 min or 0.25 ppm for 60 min or 0.05 ppm for 24 hours	Condition # 22356, Part 1	P/E	Fuel Oil Certification	Y

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII - J
S640 THROUGH S720 EMERGENCY GENERATORS

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
SO2 S650	BAAQMD 9-1-301	Y		GLC[1] of 0.5 ppm for 3 min or 0.25 ppm for 60 min or 0.05 ppm for 24 hours	Condition # 22357, Part 1	P/E	Fuel Oil Certification	Y
SO2 S660	BAAQMD 9-1-301	Y		GLC[1] of 0.5 ppm for 3 min or 0.25 ppm for 60 min or 0.05 ppm for 24 hours	Condition # 22336, Part 1	P/E	Fuel Oil Certification	Y
SO2	BAAQMD 9-1-302	Y		SO2 shall not exceed 300 ppm (dry)	None	N	None	NA
SO2 S640	BAAQMD 9-1-302	Y		SO2 shall not exceed 300 ppm (dry)	Condition # 22356, Part 1	P/E	Fuel Oil Certification	Y
SO2 S650	BAAQMD 9-1-302	Y		SO2 shall not exceed 300 ppm (dry)	Condition # 22357, Part 1	P/E	Fuel Oil Certification	Y
SO2 S660	BAAQMD 9-1-302	Y		SO2 shall not exceed 300 ppm (dry)	Condition # 22336, Part 1	P/E	Fuel Oil Certification	Y
SO2	BAAQMD 9-1-304	Y		Sulfur Content of Fuel Oil ≤ 0.5 wt%	None	N	None	NA
SO2 S640	BAAQMD 9-1-304	Y		Sulfur Content of Fuel Oil ≤ 0.5 wt%	Condition # 22356, Part 1	P/E	Fuel Oil Certification	Y
SO2 S650	BAAQMD 9-1-304	Y		Sulfur Content of Fuel Oil ≤ 0.5 wt%	Condition # 22357, Part 1	P/E	Fuel Oil Certification	Y
SO2 S660	BAAQMD 9-1-304	Y		Sulfur Content of Fuel Oil ≤ 0.5 wt%	Condition # 22336, Part 1	P/E	Fuel Oil Certification	Y
SO2	CCR, Title 17, Section 93115.5	Y		Sulfur Content of Fuel Oil ≤ 0.05 wt% (CARB Diesel)	None	N	None	NA
SO2 S640	Condition # 22356, Part 1	Y		Sulfur Content of Fuel Oil ≤ 0.05 wt%	Condition # 22356, Part 1	P/E	Fuel Oil Certification	Y
SO2 S650	Condition # 22357, Part 1	Y		Sulfur Content of Fuel Oil ≤ 0.05 wt%	Condition # 22357, Part 1	P/E	Fuel Oil Certification	Y

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII - J
S640 THROUGH S720 EMERGENCY GENERATORS

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
SO2 S660	Condition # 22336, Part 1	Y		Sulfur Content of Fuel Oil ≤ 0.05 wt%	Condition # 22336, Part 1	P/E	Fuel Oil Certification	Y
SO2	40 CFR 60.4207(b)	Y		Use diesel fuel that meets 15 ppm sulfur content per 40 CFR 80.510(b) for nonroad diesel	None	N	N/A	NA
Emer-gency	BAAQMD 9-8-330.1	N		Unlimited Emergency Operation	BAAMQD 9-8-530	P/M	Records	CC
Emer-gency S640	Condition # 22356 Part 2	N		Unlimited Emergency Operation	Condition # 22356 Part 6	P/M	Records	CC
Emer-gency S650	Condition # 22357 Part 2	N		Unlimited Emergency Operation	Condition # 22357 Part 6	P/M	Records	CC
Emer-gency S660	Condition # 22336 Part 2	N		Unlimited Emergency Operation	Condition # 22336 Part 6	P/M	Records	CC
Emer-gency S680 S710	Condition # 22820 Part 2	N		Unlimited Emergency Operation	Condition # 22820 Part 4	P/M	Records	CC
Emer-gency S690 S700	Condition # 22825 Part 2	N		Unlimited Emergency Operation	Condition # 22825 Part 4	P/M	Records	CC
Emer-gency S670	Condition # 22850 Part 2	N		Unlimited Emergency Operation	Condition # 22850 Part 4	P/M	Records	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII - J
S640 THROUGH S720 EMERGENCY GENERATORS

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Reli-ability Related Activities S640	CCR, Title 17, Section 93115.6(b)(3)(A)(2)(b) & Condition # 22356 Part 2	N		Hours of Reliability Related Activities ≤ 50/yr	CCR, Title 17, Section 93115.10(g) & Condition # 22356 Part 6	P/M	Records	CC
Reli-ability Related Activities S650	CCR, Title 17, Section 93115.6(b)(3)(A)(1)(b) & Condition # 22357 Part 2	N		Hours of Reliability Related Activities ≤ 30/yr	CCR, Title 17, Section 93115.10(g) & Condition # 22357 Part 6	P/M	Records	CC
Reli-ability Related Activities S660	CCR, Title 17, Section 93115.6(b)(3)(A)(1)(b) & Condition # 22336 Part 2	N		Hours of Reliability Related Activities ≤ 30/yr	CCR, Title 17, Section 93115.10(g) & Condition # 22336 Part 6	P/M	Records	CC
Reli-ability Related Activities S670	CCR, Title 17, Section 93115.6(b)(3)(A)(2)(b) & Condition 22850 Part 1	N		Hours of Reliability Related Activities ≤ 50/yr	CCR, Title 17, Section 93115.10(g) & Condition # 22850 Part 4	P/M	Records	CC

VII. Applicable Limits and Compliance Monitoring Requirements

Table VII - J
S640 THROUGH S720 EMERGENCY GENERATORS

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type	4/1/17 through 9/30/17 compliance status
Reli-ability Related Activities S680 S710	CCR, Title 17, Section 93115.6(b)(3)(A)(1)(a) & Condition 22820 Part 1	N		Hours of Reliability Related Activities ≤ 20/yr	CCR, Title 17, Section 93115.10(g) & Condition # 22820 Part 4	P/M	Records	CC
Reli-ability Related Activities S690 S700	CCR, Title 17, Section 93115.6(b)(3)(A)(1)(b) & Condition 22825 Part 1	N		Hours of Reliability Related Activities ≤ 25/yr	CCR, Title 17, Section 93115.10(g) & Condition # 22825 Part 4	P/M	Records	CC

ATTACHMENT 1

Hydrogen Sulfide Monitoring for Anaerobic Digester gas – Source S-170

SAN FRANCISCO INTERNATIONAL AIRPORT

MEL LEONG TREATMENT PLANT (Sanitary Plant)

Bay Area Air Quality Management District - Permit for Facility # A1784

ANAEROBIC DIGESTER GAS

Hydrogen Sulfide Monitoring

Monitoring Type: Hydrogen Sulfide in Digester Gas

Limit: **H2S: 2250 ppm; when > 450PPM weekly measurements until< 450PPM for 3 Mo.**

Method: CMS Analyzer, Draeger, using
Hydrogen sulfide chips 2-50 ppm, 20-500 ppm, and 100-2500 ppm

Date	Time	Hydrogen Sulfide (ppm)	H2S Monitor	H2S chip Batch Lot	Analyst
4/3/2017	6:55	590	ARCE-0129	ARHJ-0261	RH/BZ
4/10/2017	11:50	400	ARCE-0129	ARHJ-0261	BZ/AL
4/19/2017	6:40	164	ARCE-0129	ARHJ-0261	BZ/AL
4/24/2017	16:55	129	ARUA-0137	ARHC-0481	BZ/AL
5/1/2017	9:00	7.8	ARUA-0137	ARHC-0481	BZ/AL
5/8/2017	7:05	170	ARUA-0137	ARHC-0481	RH/BZ
5/15/2017	13:38	153	ARCE-0129	ARHK-0491	BZ
5/23/2017	6:20	89	ARCE-0129	ARHK-0491	RH/BZ
5/30/2017	6:40	150	ARCE-0129	ARHK-0491	RH/BZ
6/5/2017	6:35	138	ARUA-0137	ARHK-0491	RH/BZ
6/16/2017	8:00	97	ARUA-0137	ARHK-0491	BZ
6/19/2017	8:05	82	ARCE-0129	ARHK-0491	BZ
6/28/2017	7:40	79	ARCE-0129	ARHK-0491	RH/BZ
7/3/2017	7:00	68	ARCE-0129	ARHK-0491	BZ
8/1/2017	8:30	81	ARCE-0129	ARHK-0491	RH/BZ
9/5/2017	7:55	83	ARCE-0129	ARHK-0491	BZ

ATTACHMENT 2

Visible Emission Report for Source S-1 Sludge Digester Gas Burner Flare

SAN FRANCISCO INTERNATIONAL AIRPORT

MEL LEONG TREATMENT PLANT (Sanitary Plant)

Bay Area Air Quality Management District - Permit for Facility # A1784

SLUDGE GAS BURNER FLARE

Opacity Monitoring

Monitoring Type: Visible Emissions Check

Monitoring Frequency: Periodic per event

Limit: Ringelmann 1.0 for < 3 minutes in any hour

Method: **Ringelmann Chart**

Date	Time	Ringelmann Chart Reading	Result	% Smoke Density	Analyst
4/3/2017	6:55	0	0	0	RH/BZ
4/10/2017	11:50	0	0	0	BZ/AL
4/19/2017	6:40	0	0	0	BZ/AL
4/24/2017	16:55	0	0	0	BZ/AL
5/1/2017	9:00	0	0	0	BZ/AL
5/8/2017	7:05	0	0	0	RH/BZ
5/15/2017	13:38	0	0	0	BZ
5/23/2017	6:20	0	0	0	RH/BZ
5/30/2017	6:40	0	0	0	RH/BZ
6/5/2017	6:35	0	0	0	RH/BZ
6/16/2017	8:00	0	0	0	BZ
6/19/2017	8:05	0	0	0	BZ
6/28/2017	7:40	0	0	0	RH/BZ
7/3/2017	7:00	0	0	0	BZ
8/1/2017	8:30	0	0	0	RH/BZ
9/5/2017	7:55	0	0	0	BZ

ATTACHMENT 3

Best Environmental Visible Emission Evaluation Report
February 3, 2017

SAN FRANCISCO I'NTL AIRPORT

Standby I.C. Engines Visible Emissions Evaluation Report
San Francisco, California

Test Date(s): January, 25th & 26th, 2017
Report Date: February 3, 2017

Prepared for:
San Francisco International Airport (SFO)
San Francisco, CA 94128
Attn: Abram Mission

Prepared by:
BEST ENVIRONMENTAL (BE)
339 Stealth Court
Livermore, CA 94551
Phone (925) 455-9474
Fax (925) 455-9479
E-Mail bestair@sbcglobal.net

For Submission To:
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

BEST ENVIRONMENTAL
339 Stealth Court
Livermore, California 94551
(925) 455-9474 FAX (925) 455-9479
E-Mail bestair@sbcglobal.net

February 3, 2017

San Francisco International Airport (SFO)
P.O. Box 8097
San Francisco, CA 94128

Attn.: Mr. Abram Mission

Subject: Compliance Visible Emissions Evaluation (VEE) of seven (7) diesel-fired standby I.C. engines located at the San Francisco International Airport.

Test Date: January, 25th & 26th, 2017.

Sampling Location: Emissions were observed from the engine stack outlets.

Sampling Personnel: Regan Best of Best Environmental (BE) performed the VEE's.

Process Description: SFO operates ~35 I.C. engines at various airport locations to provide emergency standby power.

Test Program: A single 30-minute visible emissions evaluation (VEE) test was performed on the engine outlets during startup and normal operation. Engine loads were provided from load banks.

Sampling Methods: The following source test method of the United State Environmental Protection Agency was used:

EPA Method 9	Visible Emissions Evaluation

Test Results: The source visible emissions were within permit limits (<20% opacity or 1 Ringelmann reading). During startup and load a brief burst of emissions was observed but usually was within limit within 3-4 minutes. Visible emissions usually then dropped to near zero after 4 minutes. A summary of the VEE's is shown below. Results are shown for the total evaluation period and the highest (24 reading) period.

Test Results Summary

Source I.D #	Source Description	KW Load	Highest Period	Average Results
S-270	Field Lighting #1	500	30.0%	13.8%
S-290	B/A G	900	13.5%	<5%
S-320	ITB-N1	No Load	6.5%	5%
S-330	ITB-N2	No Load	5.5%	5%
S-440	ITB-S1	1125	4.0%	<5%
S-450	ITB-S2	1125	7.3%	<5%
S-660	W. Q. C. P. #1	100	12.5%	10.5%

Comments: Field data sheet, digital images of the source outlets and Visible Emissions Certificate are appended to this report.

Visible emission readings were recorded in Ringlemann units (1-5) but are shown as percentages in the summary for ease of understanding.

S-320 and S-330 internal load banks were inoperable and the VEE was performed with no load on the engins.

The details and results contained within this report are to the best of BE's knowledge, an authentic and accurate representation of the test program. If this report is submitted for compliance purposes it should only be reproduced in its entirety. If you have any questions concerning this report or if Best Environmental can be of any further assistance, please contact me at (925) 455-9474 X 102.

Submitted by,

Regan Best
Source Test Manager

APPENDICES

APPENDIX A - FIELD DATA SHEETS

APPENDIX B - VEE CERTIFICATION

APPENDIX C – DIGITAL IMAGES

APPENDIX A
FIELD DATA SHEETS

Visible Emission Observation Form

1 of 1

COMPANY NAME	SFO
OBSERVATION DATE	1/26/17
START TIME	829
END TIME	0859
Street Address	
City	SF
State	CA
Zip	94128
Phone	650 821-7730
Source ID Number	S-000270
Process Equipment	Field Light, 49
Operating Mode	Normal ☐ Other ☐ 500kW 38%
Control Equipment:	—
Operating Mode	Normal ☐ Other ☐
Describe Emissions Point:	Stack Outlet
Height Above Ground Level	~35'
Height Relative To Observer	~30'
Distance from Observer	~80
Direction from Observer	W
Describe Emissions:	N/A - None present ☐
Emission Color:	NA ☐
Plume Type:	Continuous ☐ Fugitive ☐ Attached ☐ Detached ☐ NA ☒ Intermittent ☐
Water droplets present:	No ☒ Yes ☐
IF Water Droplet Plume:	Attached ☐ Detached ☐ NA ☒
Point in the plume at which opacity was observed:	NA ☒
Describe Plume Background: Start:	Sky
Stop:	" "
Background Color:	Blue
Sky Conditions:	Clear
Wind Speed: (mph)	0-3
Wind Direction:	E
Ambient Temp: (°F)	
Dew Point (°F)	
RH %	
Barometric Pressure (inches)	30.40
Wet bulb temp (°F) (calculated)	

Min ↓	Sec→ 0	15	30	45	Min ↓	Sec→ 0	15	30	45
1	0	0	5	14	31				
2	0	0	0	3	32				
3	3	2½	2½	2	33				
4	2	2	2	2	34				
5	1½	1½	1	1	35				
6	1	1	¾	¾	36				
7	¾	½	½	½	37				
8	½	½	½	½	38				
9	½	½	½	½	39				
10	½	½	½	½	40				
11	½	½	½	½	41				
12	½	½	½	½	42				
13	½	½	½	½	43				
14	½	½	½	½	44				
15	½	½	½	½	45				
16	½	½	½	½	46				
17	½	½	½	½	47				
18	½	½	½	½	48				
19	½	½	½	½	49				
20	½	½	½	½	50				
21	½	½	½	½	51				
22	½	½	½	½	52				
23	½	½	½	½	53				
24	½	½	½	½	54				
25	½	½	½	½	55				
26	½	½	½	½	56				
27	½	½	½	½	57				
28	½	½	½	½	58				
29	½	½	½	½	59				
30	½	½	½	½	60				

Observers Name: (Print) Regan Best

Observers Signature: Regan Best

Date: 1/26/17

Organization: Best Environmental

Certified By: CARB - ID# 1485 expires 4/17/17 Date: 10/6/16

Average Opacity for Highest Period 30 / 13.8

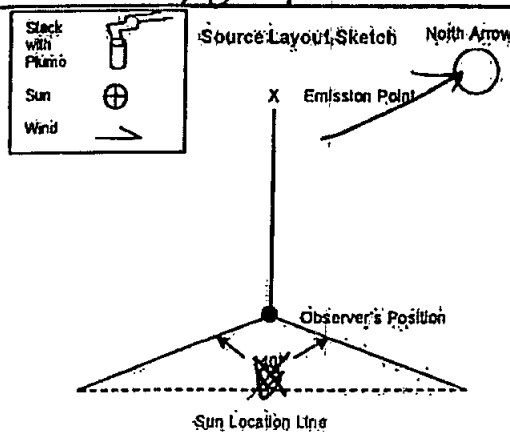
Number of readings above ½ % were 18

Range of Opacity Readings
Minimum: Maximum:

CONTINUED ON VEO Form Number #_____ of _____ or NA ☒

Additional Information:

Source Layout Sketch



A-2

Visible Emission Observation Form

1 of 1

COMPANY NAME	SFO
OBSERVATION DATE	1/25/17
START TIME	0825
END TIME	0855
Street Address	
City	SF
State	CA
Zip	94128
Phone	650 821-7730
Source ID Number	S-290
Process Equipment	BAO
Operating Mode	Normal ☐ Other ☒ gas/w
Control Equipment:	—
Operating Mode	Normal ☐ Other ☐
Describe Emissions Point:	Stack outlet
Height Above Ground Level	~100'
Height Relative To Observer	~5'
Distance from Observer	~50'
Direction from Observer	NW
Describe Emissions:	N/A - None present ☐
Emission Color:	NA ☐ Blk
Plume Type:	Continuous ☐ Fugitive ☐ Attached ☐ Detached ☐ NA ☒ Intermittent ☐
Water droplets present:	No ☒ Yes ☐
IF Water Droplet Plume:	Attached ☐ Detached ☐ NA ☒
Point in the plume at which opacity was observed:	NA ☒
Describe Plume Background: Start:	Bldg
Stop:	1' 1'
Background Color:	Grey
Sky Conditions: :	Clear
Wind Speed: (mph)	0-3
Wind Direction:	SW
Ambient Temp: (°F)	48
Dew Point (°F)	
RH %	80
Barometric Pressure (inches)	30.25
Wet bulb temp (°F) (calculated)	45

Sec→ / Min↓	0	15	30	45	Sec→ / Min↓	0	15	30	45
1	2	½	1½	1½	31				
2	1	1	1	1	32				
3	¾	¾	¾	¾	33				
4	½	½	½	¼	34				
5	¼	¼	¼	¼	35				
6	¼	¼	¼	¼	36				
7	¼	¼	¼	¼	37				
8	¼	¼	¼	¼	38				
9	¼	¼	0	0	39				
10	0	0	0	0	40				
11	0	0	0	0	41				
12	0	0	0	0	42				
13	0	0	0	0	43				
14	0	0	0	0	44				
15	0	0	0	0	45				
16	0	0	0	0	46				
17	0	0	0	0	47				
18	0	0	0	0	48				
19	0	0	0	0	49				
20	0	0	0	0	50				
21	¼	¼	¼	¼	51				
22	¼	¼	¼	¼	52				
23	¼	¼	¼	¼	53				
24	¼	¼	¼	¼	54				
25	¼	¼	¼	¼	55				
26	¼	¼	¼	¼	56				
27	¼	¼	¼	¼	57				
28	¼	¼	¼	¼	58				
29	¼	¼	¼	¼	59				
30	¼	¼	¼	¼	60				

Observers Name: (Print) Regan Best

Observers Signature: Regan Best

Date: 1/25/17

Organization: Best Environmental

Certified By: CARB - ID# 7865 expires 4/7/17 Date: 10/6/16

Average Opacity for Highest Period 1.5 / 2.5

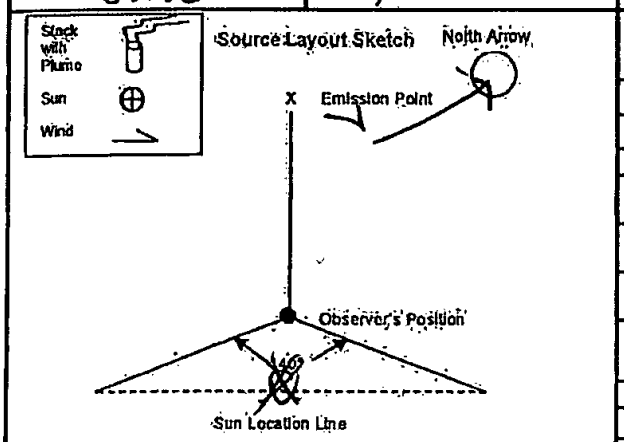
Number of readings above 2 % were 1.

Range of Opacity Readings Minimum: 0 Maximum: 2

CONTINUED ON VEO Form Number #____ of _____ or NA ☒

Additional Information:

7/3 load



Visible Emission Observation Form

1 of 1

COMPANY NAME	OBSERVATION DATE	START TIME	END TIME
SFO	1/25/17	0915	0946

Street Address

City	State	Zip
SF	CA	94128

Phone	Source ID Number
650 821-7730	S-320

Process Equipment	Operating Mode
FTBN-1	Normal ☐ Other ☒ No Load

Control Equipment:	Operating Mode
	Normal ☐ Other ☐

Describe Emissions Point: Stack

Height Above Ground Level	Height Relative To Observer
~125'	~5'

Distance from Observer	Direction from Observer
~20'	W

Describe Emissions: N/A - None present ☐

Emission Color: NA ☐	Plume Type: Continuous ☐ Fugitive ☐ Attached ☐ Detached ☐ NA ☐ Intermittent ☐
B/K	

Water droplets present: No ☒ Yes ☐	IF Water Droplet Plume: Attached ☐ Detached ☐ NA ☒

Point in the plume at which opacity was observed: NA ☒

Describe Plume Background:
Start: — Stop: —

Background Color:	Sky Conditions: :
Blue	Clear

Wind Speed: (mph)	Wind Direction:
0-2	W

Ambient Temp: (°F)	Dew Point (°F)	RH %
0		

Barometric Pressure (inches)	Wet bulb temp (°F) (calculated)
30.25	

Sec→ Min↓	0	15	30	45	Sec→ Min↓	0	15	30	45
1	2	4	4	4	31				
2	4	4	4	4	32				
3	4	4	4	4	33				
4	4	4	4	4	34				
5	4	4	4	4	35				
6	4	4	4	4	36				
7	4	4	4	4	37				
8	4	4	4	4	38				
9	4	4	4	4	39				
10	4	4	4	4	40				
11	4	4	4	4	41				
12	4	4	4	4	42				
13	4	4	4	4	43				
14	4	4	4	4	44				
15	4	4	4	4	45				
16	4	4	4	4	46				
17	4	4	4	4	47				
18	4	4	4	4	48				
19	4	4	4	4	49				
20	4	4	4	4	50				
21	4	4	4	4	51				
22	4	4	4	4	52				
23	4	4	4	4	53				
24	4	4	4	4	54				
25	4	4	4	4	55				
26	4	4	4	4	56				
27	4	4	4	4	57				
28	4	4	4	4	58				
29	4	4	4	4	59				
30	4	4	4	4	60				

Observers Name: (Print) Regan Best

Observers Signature: Regan Best

Date: 1/25/17

Organization: Best Environmental

Certified By: CARB - ID# 1480 expires 4/27/17 Date: 11/6/16

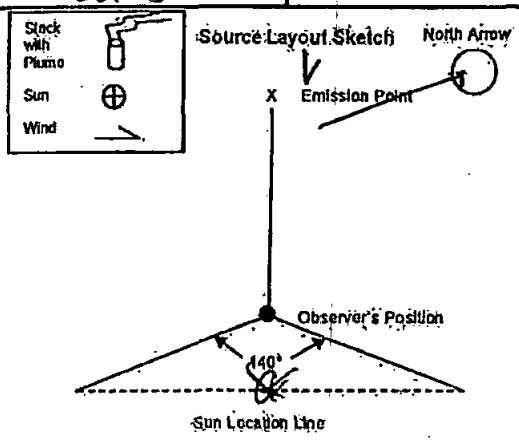
Average Opacity for Highest Period 6.5 / 4

Number of readings above 2 % were 1.

Range of Opacity Readings
Minimum: 4 Maximum: 2

CONTINUED ON VEO Form Number #____ of ____ or NA ☒

Additional Information:
NO LOAD



Visible Emission Observation Form

1 of 1

COMPANY NAME: SFO	OBSERVATION DATE: 1/25/17	START TIME: 0915	END TIME: 0945

Street Address:

City: SF | State: CA | Zip: 94128

Phone: 650 | Source ID Number: S-330

Process Equipment: ITB-N2 | Operating Mode: Normal ☐ Other ☐

Control Equipment: — | Operating Mode: Normal ☐ Other ☐

Describe Emissions Point: Stack Outlet

Height Above Ground Level: ~125' | Height Relative To Observer: ~5'

Distance from Observer: ~20' | Direction from Observer: W

Describe Emissions: N/A - None present ☐

Emission Color: BLK | NA ☐ | Plume Type: Continuous ☐ Fugitive ☐ Attached ☐ Detached ☐ NA ☑ Intermittent ☐

Water droplets present: No ☒ Yes ☐ | IF Water Droplet Plume: Attached ☐ Detached ☐ NA ☒

Point in the plume at which opacity was observed: NA ☒

Describe Plume Background: Start: Sky Stop: "

Background Color: Blue | Sky Conditions: Clear

Wind Speed: (mph): 0-2 | Wind Direction: S

Ambient Temp: (°F) | Dew Point (°F) | RH %

Barometric Pressure (inches): 30.25 | Wet bulb temp (°F) (calculated)

Sec→ / Min↓	0	15	30	45	Sec→ / Min↓	0	15	30	45
1	3	4	4	4	31				
2	4	4	4	4	32				
3	4	4	4	4	33				
4	4	4	4	4	34				
5	4	4	4	4	35				
6	4	4	4	4	36				
7	4	4	4	4	37				
8	4	4	4	4	38				
9	4	4	4	4	39				
10	4	4	4	4	40				
11	4	4	4	4	41				
12	4	4	4	4	42				
13	4	4	4	4	43				
14	4	4	4	4	44				
15	4	4	4	4	45				
16	4	4	4	4	46				
17	4	4	4	4	47				
18	4	4	4	4	48				
19	4	4	4	4	49				
20	4	4	4	4	50				
21	4	4	4	4	51				
22	4	4	4	4	52				
23	4	4	4	4	53				
24	4	4	4	4	54				
25	4	4	4	4	55				
26	4	4	4	4	56				
27	4	4	4	4	57				
28	4	4	4	4	58				
29	4	4	4	4	59				
30	4	4	4	4	60				

Observers Name: (Print) Regan Best

Observers Signature: Regan Best | Date: 1/25/17

Organization: Best Environmental

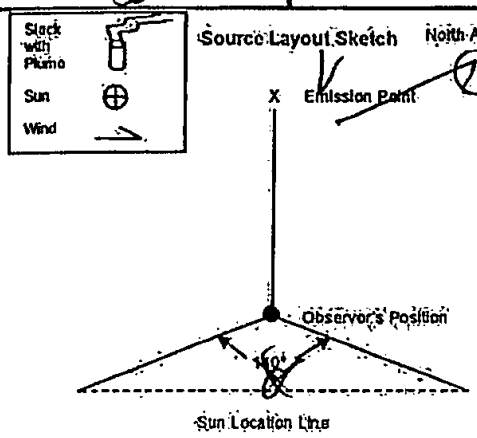
Certified By: CARB - ID# 788 expires 4/7/17 | Date: 10/6/16

Average Opacity for Highest Period 5 hrs 4 | Number of readings above 3 % were 1

Range of Opacity Readings Minimum: 4 Maximum: 3

CONTINUED ON VEO Form Number #_____ of _____ or NA ☒

Additional Information: NO LOAD



Visible Emission Observation Form

1 of 1

COMPANY NAME: SFO	OBSERVATION DATE: 1/25/17	START TIME: 1252	END TIME: 1322

Street Address:

City: SF | State: CA | Zip: 94128

Phone: 650 821-7738 | Source ID Number: S-440

Process Equipment: ITB S-1 | Operating Mode: Normal ☐ Other ☒ 1125 KW

Control Equipment: — | Operating Mode: Normal ☐ Other ☐

Describe Emissions Point: Stack Outlet

Height Above Ground Level: ~150' | Height Relative To Observer: ~5'

Distance from Observer: ~60' | Direction from Observer: West

Describe Emissions: N/A - None present ☐

Emission Color: BLK NA ☐ | Plume Type: Continuous ☐ Fugitive ☐ Attached ☐ Detached ☐ NA ☒ Intermittent ☐

Water droplets present: No ☒ Yes ☐ | IF Water Droplet Plume: Attached ☐ Detached ☐ NA ☒

Point in the plume at which opacity was observed: NA ☒

Describe Plume Background: Start: Sky Stop: "

Background Color: Blue/White | Sky Conditions: Clear

Wind Speed: (mph) 5-15 | Wind Direction: SW

Ambient Temp: (°F) | Dew Point (°F) | RH %

Barometric Pressure (inches) 30.20 | Wet bulb temp (°F) (calculated)

Sec→ / Min↓	0	15	30	45	Sec→ / Min↓	0	15	30	45
1	0	0	3	1	31				
2	1/2	1/2	0	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7	0	0	0	0	37				
8	0	0	0	0	38				
9	0	0	0	0	39				
10	0	0	0	0	40				
11	0	0	0	0	41				
12	0	0	0	0	42				
13	0	0	0	0	43				
14	0	0	0	0	44				
15	0	0	0	0	45				
16	0	0	0	0	46				
17	0	0	0	0	47				
18	0	0	0	0	48				
19	0	0	0	0	49				
20	0	0	0	0	50				
21	0	0	0	0	51				
22	0	0	0	0	52				
23	0	0	0	0	53				
24	0	0	0	0	54				
25	0	0	0	0	55				
26	0	0	0	0	56				
27	0	0	0	0	57				
28	0	0	0	0	58				
29	0	0	0	0	59				
30	0	0	0	0	60				

Observers Name: (Print) Regan Best

Observers Signature: Regan Best | Date: 1/25/17

Organization: Best Environmental

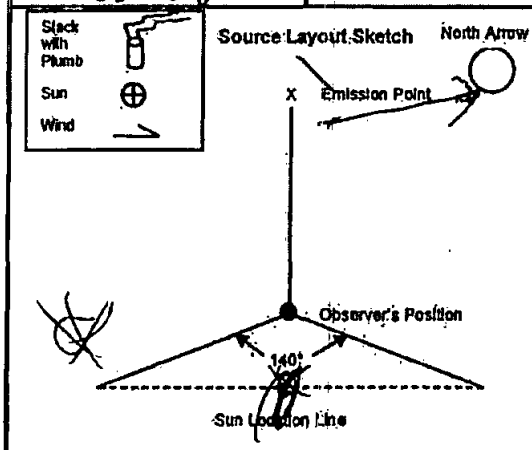
Certified By: CARB - ID# 11486 expires 4/7/17 | Date: 10/6/16

Average Opacity for Highest Period 4.0 <5 | Number of readings above 0 % were 2

Range of Opacity Readings Minimum: 0 Maximum: 3

CONTINUED ON VEO Form Number #____ of ____ or NA ☒

Additional Information: Sun location outside 120°



Visible Emission Observation Form

1 of 1

COMPANY NAME: SFO	OBSERVATION DATE: 1/25/17	START TIME: 1333	END TIME: 1403

Street Address:

City: SF | State: CA | Zip: 94128

Phone: 650841-7230 | Source ID Number: S-450

Process Equipment: ITB S-2 | Operating Mode: Normal ☐ Other ☒ 11.25 tpy

Control Equipment: — | Operating Mode: Normal ☐ Other ☐

Describe Emissions Point: Stack Outlet

Height Above Ground Level: ~150' | Height Relative To Observer: ~5'

Distance from Observer: ~60' | Direction from Observer: West

Describe Emissions: N/A - None present ☐

Emission Color: BLK NA ☐ | Plume Type: Continuous ☐ Fugitive ☐ Attached ☐ Detached ☐ NA ☒ Intermittent ☐

Water droplets present: No ☒ Yes ☐ | IF Water Droplet Plume: Attached ☐ Detached ☐ NA ☒

Point in the plume at which opacity was observed: NA ☒

Describe Plume Background: Start: Sky Stop: "

Background Color: Blue/white | Sky Conditions: : Clear

Wind Speed: (mph) 5-15 | Wind Direction: SW

Ambient Temp: (°F) | Dew Point (°F) | RH %

Barometric Pressure (inches) 30.20 | Wet bulb temp (°F) (calculated)

Sec→ / Min↓	0	15	30	45	Sec→ / Min↓	0	15	30	45
1	3	4	3	1	31				
2	1/2	1/2	1/4	0	32				
3	0	0	0	0	33				
4	0	0	0	0	34				
5	0	0	0	0	35				
6	0	0	0	0	36				
7	0	0	0	0	37				
8	0	0	0	0	38				
9	0	0	0	0	39				
10	0	0	0	0	40				
11	0	0	0	0	41				
12	0	0	0	0	42				
13	0	0	0	0	43				
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23	0	0	0	0	53				
24	0	0	0	0	54				
25	0	0	0	0	55				
26	0	0	0	0	56				
27	0	0	0	0	57				
28	0	0	0	0	58				
29	0	0	0	0	59				
30	0	0	0	0	60				

Observers Name: (Print) Regan Best

Observers Signature: Regan Best | Date: 1/25/17

Organization: Best Environmental

Certified By: CARB - ID# 14865 expires 4/7/17 | Date: 10/6/16

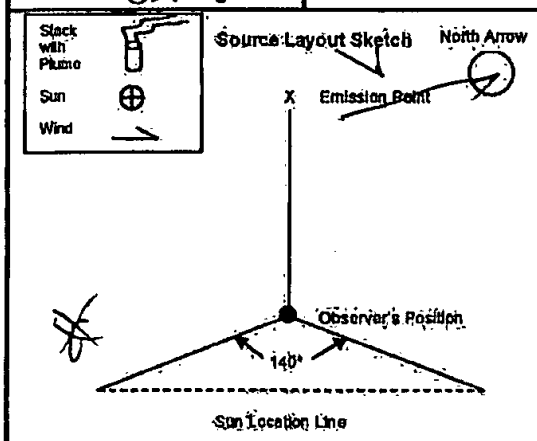
Average Opacity for Highest Period 3.3/25 | Number of readings above 1 % were 4

Range of Opacity Readings Minimum: 0 Maximum: 3

CONTINUED ON VEO Form Number #____ of ____ or NA ☒

Additional Information: Sun Location outside 120°

Source Layout Sketch



Visible Emission Observation Form

1 of 1

COMPANY NAME: SFO	OBSERVATION DATE: 1/26/17	START TIME: 0935	END TIME: 1005

Street Address:

City: SF | State: CA | Zip: 94128

Phone: 650 821-7730 | Source ID Number: S-660

Process Equipment: WSP #02 | Operating Mode: Normal ☐ Other ☐ 100% 100kW

Control Equipment: — | Operating Mode: Normal ☐ Other ☐

Describe Emissions Point: Stack Outlet

Height Above Ground Level: ~35' | Height Relative To Observer: ~30'

Distance from Observer: ~100' | Direction from Observer: W

Describe Emissions: N/A - None present ☐

Emission Color: NA ☐ B/K | Plume Type: Continuous ☐ Fugitive ☐ Attached ☐ Detached ☐ NA ☒ Intermittent ☐

Water droplets present: No ☒ Yes ☐ | IF Water Droplet Plume: Attached ☐ Detached ☐ NA ☒

Point in the plume at which opacity was observed: NA ☒

Describe Plume Background: Start: Sky Stop: " "

Background Color: Blue | Sky Conditions: Clear

Wind Speed: (mph) 0-3 | Wind Direction: E

Ambient Temp: (°F) | Dew Point (°F) | RH %

Barometric Pressure (inches) 30.40 | Wet bulb temp (°F) (calculated)

Sec→ / Min↓	0	15	30	45	Sec→ / Min↓	0	15	30	45
1	3	0	3	1	31				
2	1	4	4	1/2	32				
3	1/2	1/2	1/2	1/2	33				
4	1/2	1/2	1/2	1/2	34				
5	1/2	1/2	1/2	1/2	35				
6	1/2	1/2	1/2	1/2	36				
7	1/2	1/2	1/2	1/2	37				
8	1/2	1/2	1/2	1/2	38				
9	1/2	1/2	1/2	1/2	39				
10	1/2	1/2	1/2	1/2	40				
11	1/2	1/2	1/2	1/2	41				
12	1/2	1/2	1/2	1/2	42				
13	1/2	1/2	1/2	1/2	43				
14	1/2	1/2	1/2	1/2	44				
15	1/2	1/2	1/2	1/2	45				
16	1/2	1/2	1/2	1/2	46				
17	1/2	1/2	1/2	1/2	47				
18	1/2	1/2	1/2	1/2	48				
19	1/2	1/2	1/2	1/2	49				
20	1/2	1/2	1/2	1/2	50				
21	1/2	1/2	1/2	1/2	51				
22	1/2	1/2	1/2	1/2	52				
23	1/2	1/2	1/2	1/2	53				
24	1/2	1/2	1/2	1/2	54				
25	1/2	1/2	1/2	1/2	55				
26	1/2	1/2	1/2	1/2	56				
27	1/2	1/2	1/2	1/2	57				
28	1/2	1/2	1/2	1/2	58				
29	1/2	1/2	1/2	1/2	59				
30	1/2	1/2	1/2	1/2	60				

Observers Name: (Print) Regan Best

Observers Signature: Regan Best | Date: 1/26/17

Organization: Best Environmental

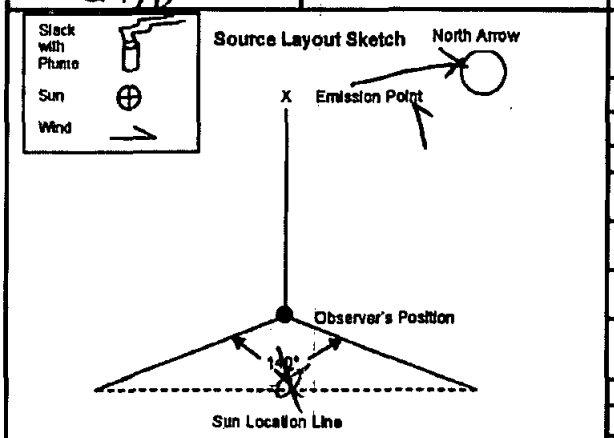
Certified By: CARB - ID# 17865 expires 5/17/17 | Date: 10/6/16

Average Opacity for Highest Period 105 / 10.5 | Number of readings above 1/2% were 6.

Range of Opacity Readings Minimum: Maximum:

CONTINUED ON VEO Form Number #____ of ____ or NA ☒

Additional Information:



APPENDIX B
VEE CERTIFICATION

REGAN BEST Student ID: 14865

is certified as a visible emission evaluator based on the score achieved and the criteria established by the U.S. EPA Reference Method 9.

Certification expires: 04/07/2017

10/06/2016

Certified Date

To verify this cert info, scan this QR code or visit https://ssl.arb.ca.gov/training/veeverification.php

Certified for: **100.1**

100.1 = Day

100.2 = Night

Average Deviation:

No Sun Glasses: White: Black:

Sun Glasses: White: 4.6 Black: 3.4

California Environmental Protection Agency

Air Resources Board

VISIBLE EMISSION EVALUATION PROGRAM

Information on future schedule and locations:

Day cert: www.arb.ca.gov/training/courses.php?course=100.1

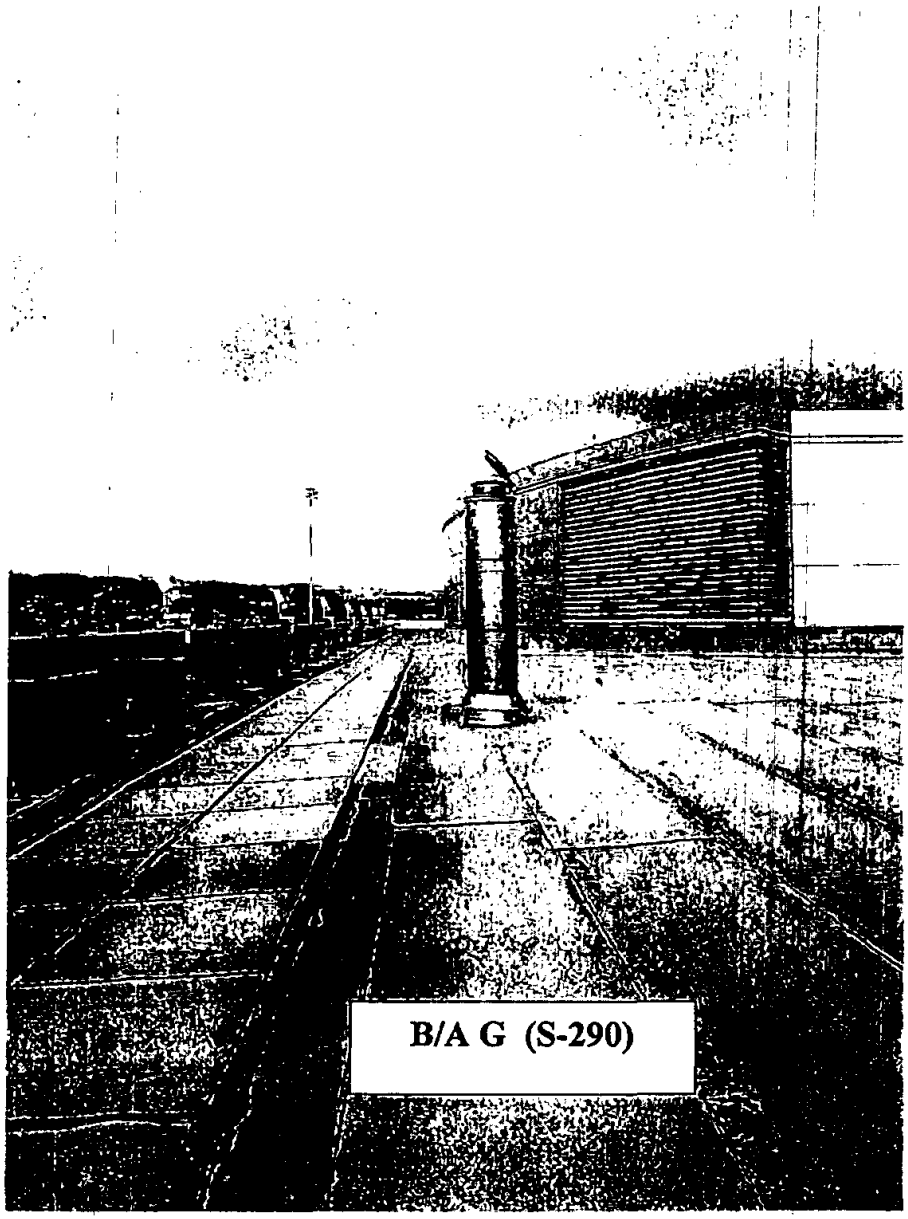
Night cert: www.arb.ca.gov/training/courses.php?course=100.2

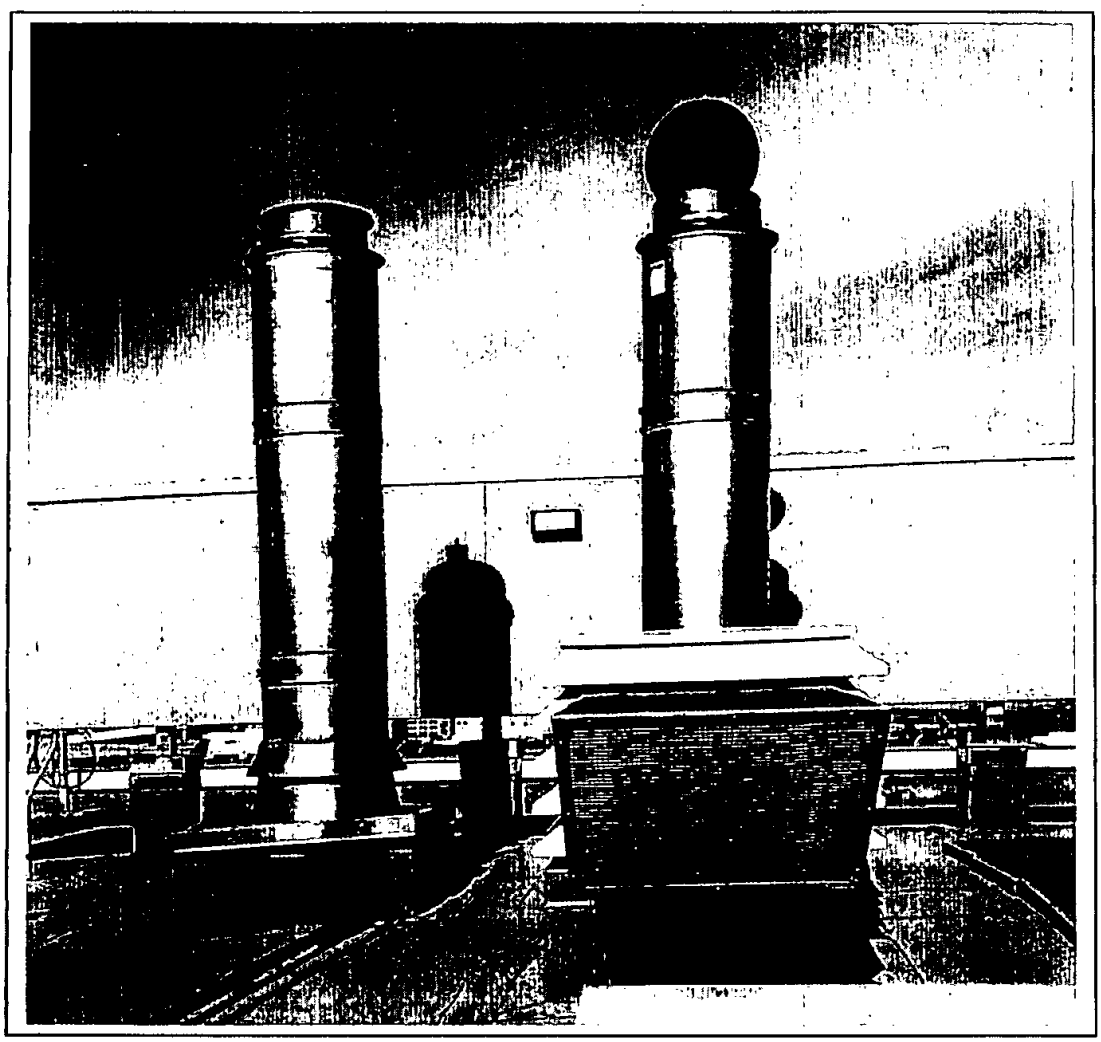
To verify cert info: https://ssl.arb.ca.gov/training/veeverification.php

ARB, Enforcement Division, Training Section
P.O. Box 2815, Sacramento, CA 95812
arbtrain@arb.ca.gov
(916) 322 - 3937

APPENDIX C
DIGITAL IMAGES

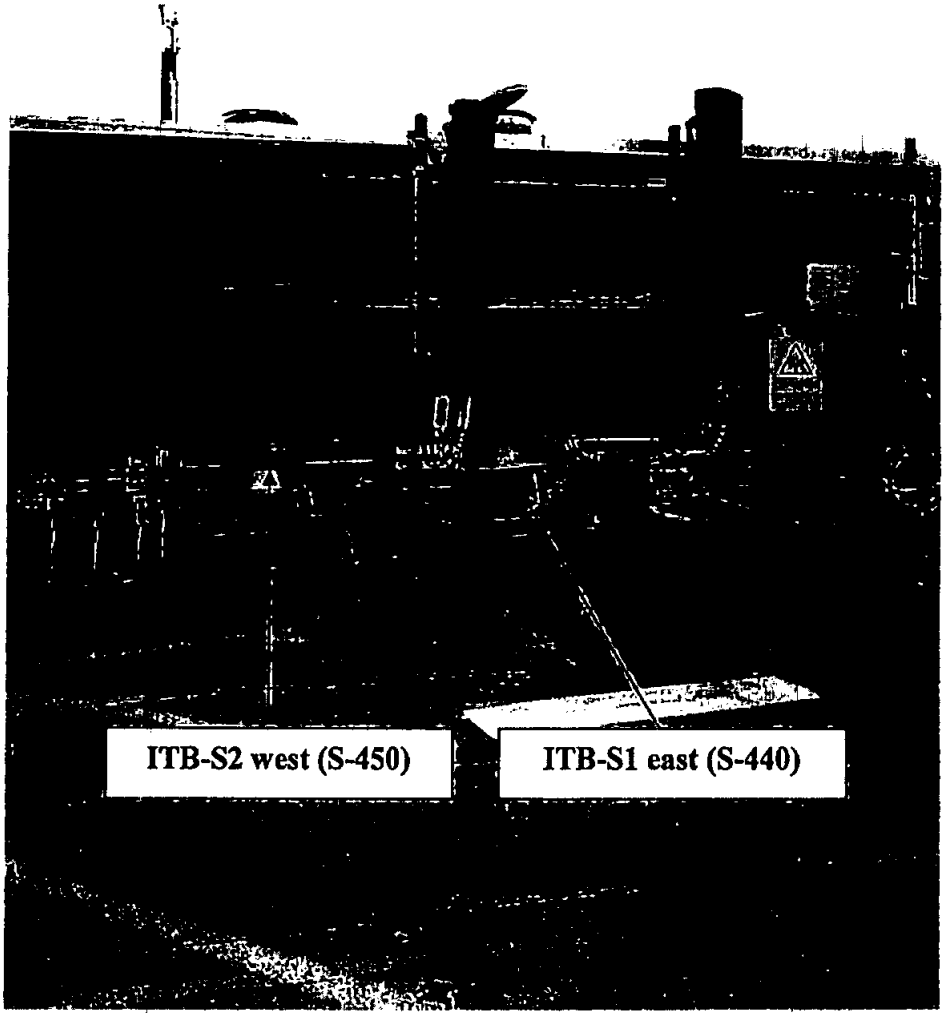
San Francisco International Airport
San Francisco, CA



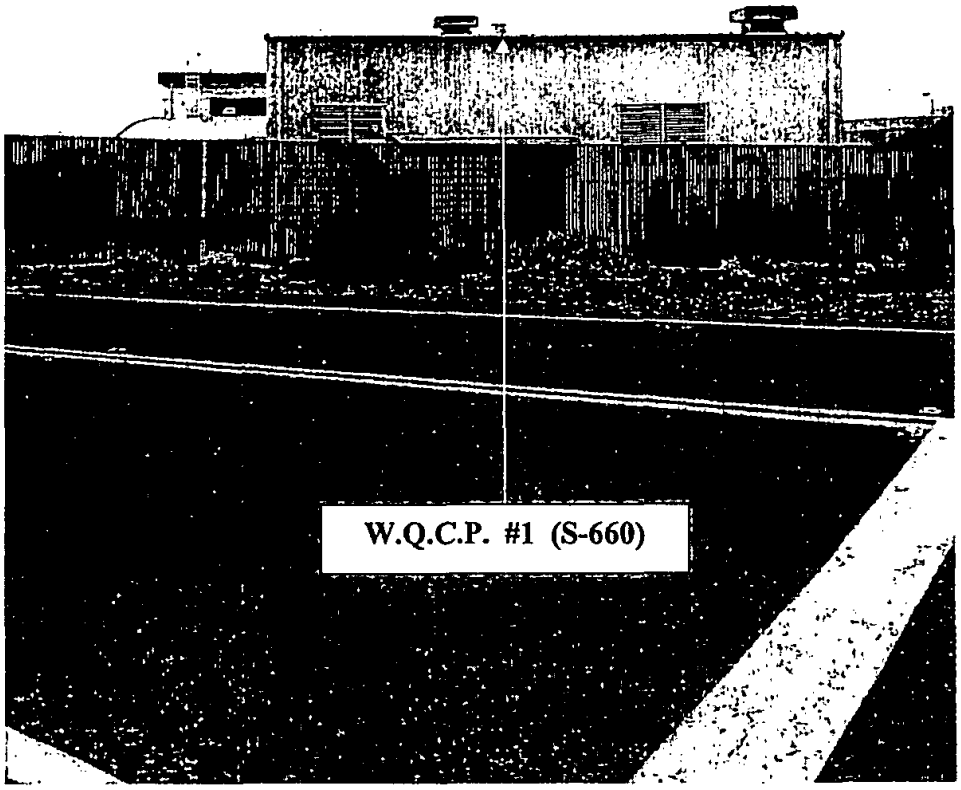


S-320 & S-330

San Francisco International Airport
San Francisco, CA



San Francisco International Airport
San Francisco, CA



ATTACHMENT 4

Central Plant Boilers Emission test Report by BEST Environmental
April 8, 2016

SAN FRANCISCO INTERNATIONAL AIRPORT (SFO)

San Francisco, CA

Compliance Emissions Test Report
#1 Space Heat Boiler (S-15)
#2 Space Heat Boiler (S-16)
#3 Space Heat Boiler (S-17)
#4 Space Heat Boiler (S-14)

NOx & CO Emissions Results

Test Date(s): March 17 & 18, 2016
Report Date: April 8, 2016

Performed and Reported by:

BEST ENVIRONMENTAL (BE)
339 Stealth Court
Livermore, CA 94551
Phone: (925) 455-9474
Fax: (925) 455-9479

Prepared For:

San Francisco International Airport (SFO)
CCSF Mech Maint
682 McDonnell Road
San Francisco, CA 94128
Attn: Martin Look

For Submittal To:

Bay Area Air Quality Management District (BAAQMD)
939 Ellis Street
San Francisco, CA 94109
Attn: Tim Underwood

REVIEW AND CERTIFICATION

Team Leader:

The work performed herein was conducted under my supervision, and I certify that the details and results contained within this report are to the best of my knowledge an authentic and accurate representation of the test program. If this report is submitted for compliance purposes it should only be reproduced in its entirety. If there are any questions concerning this report, please call the Team Leader or Reviewer at (925) 455-9474.

Jim McCormack
Project Manager

Reviewer:

I have reviewed this report for presentation and accuracy of content, and hereby certify that to the best of my knowledge the information is complete and correct.

Regan Best
Source Test Manager

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SECTION 1. INTRODUCTION

1.1. Test Purpose

Best Environmental was contracted by SFO to perform NOx & CO emissions testing on four natural gas fired boilers to comply with BAAQMD Permit to Operate (Plant # 1784 condition # 24716 & 25080). A copy of the Permit is included in the appendices.

1.2. Test Location

The testing was conducted on the 36" exhaust outlets of Boiler #1 (S-15) Boiler #2 (S-16), Boiler #3 (S-17) and Boiler #4 (S-14) located at San Francisco International Airport (SFO), San Francisco, California.

The boilers are used for space heat throughout the airport.

1.3. Test Date(s)

Testing was conducted on March 17 & 18, 2016

1.4. Pollutants Tested

The following emission parameters were measured:

Parameter	Monitoring & Analytical Protocols
NOx, CO & O_2	BAAQMD ST-13A, 6 & 14

1.5. Sampling and Observing Personnel

Sampling was performed by Jim McCormack of BEST ENVIRONMENTAL (BE).

Although the BAAQMD was notified of the testing, there were no representatives present on the day of testing.

1.6. Important Background Information

The last source test performed on boilers S-15 & S-14 was on April 9, 2015 and boilers S-16 & S-17 on April 10, 2015.

SECTION 2. SUMMARY OF RESULTS

2.1. Emission Results

Boiler 1 (S-15)

Parameter	Normal Load 3 Run Average	Allowable Emissions
NOx, ppm @ 3% O_2	7.82	**9**
CO, ppm @ 3% O_2	<2.17	**50**

Boiler 2 (S-16)

Parameter	Normal Load 3 Run Average	Allowable Emissions
NOx, ppm @ 3% O_2	7.92	**9**
CO, ppm @ 3% O_2	<2.10	**50**

Boiler 3 (S-17)

Parameter	Normal Load 3 Run Average	Allowable Emissions
NOx, ppm @ 3% O_2	7.07	**9**
CO, ppm @ 3% O_2	<2.17	**50**

Boiler 4 (S-14)

Parameter	Normal Load 3 Run Average	Allowable Emissions
NOx, ppm @ 3% O_2	6.87	**9**
CO, ppm @ 3% O_2	<2.14	**50**

A more extensive summary of the emissions is presented in Tables 1 thru 4 following the text.

2.2. Allowable Emissions

See Table 2.1 above. The test results show that the Boilers #1 thru #4 were with-in the emission limits.

2.3. Comments: Discussion of Quality Assurance and Errors

Quality assurance procedures listed in the above referenced test methods and referenced in the Source Test Plan were performed and documented. The QA/QC procedures are described in Section 4.3 of the report. Documentation of the QA/QC is provided in Appendix A & C.

SECTION 3. SOURCE OPERATION

3.1. Process Description

SFO operates four natural gas fired Space Heat Boilers, which are equipped with low NOx burners and Flue Gas Recirculation (FGR). The boilers are used to supply hot water and heat to the airport. The boiler number, source number and heat ratings are as follows:

Table 3.1: Boiler Identification

Boiler #	Source #	MMBtu/hr Rating
1	S-15	24 MMBtu/hr
2	S-16	30 MMBtu/hr
3	S-17	60 MMBtu/hr
4	S-14	42 MMBtu/hr

3.2. Process and control operating parameters during testing

Boiler load was determined from dedicated fuel meters on each boiler. Boiler loads for the testing were as follows:

Table 3.2: Boiler Loads

Boiler #	Average Load
1	~60%
2	~45%
3	~67%
4	~60%

3.3. Normal Operating Parameters

The boilers were operated in automatic mode.

3.4. Testing or Process interruptions and changes

There were no interruptions or procedure changes.

SECTION 4. SAMPLING AND ANALYSIS PROCEDURES

4.1. Port location

Emissions from each boiler were sampled through two 3-inch ports on the circular stack 90° apart. The ports were located >8 stack diameters downstream and > 2 stack diameters upstream from the nearest disturbance.

The dimensional cross section of the stacks are 36-inches (Area SQFT = 7.07)

4.2. Point description/Labeling – ports/stack

A traverse check was previously performed during the first run of each unit showing no stratification, therefore, the probe was designated a single point for the remainder of each test program.

4.3. Method description, equipment, sampling, analysis and QA/QC

Sampling and analytical procedures of the EPA Methods were followed as published in the "Quality Assurance Handbook for Air Pollution Measurement Systems" Volume III, US EPA 600/4-77-027b.

The following is an overview of the Testing Performed

Parameter	Boiler Load	Location	Method(s)	Duration	# of Runs
NO_x, CO & O_2	Normal	Exhaust	BAAQMD Methods ST-13A, 14 & 6	30 mins	12
Volumetric flow rate	Normal	Gas Meter	EPA Method 19	1 min	12

BAAQMD ST-13A, 14, 6 & 7 are all continuous monitoring techniques using instrumental analyzers. Sampling is performed by extracting exhaust flue gas from the stack, conditioning the sample and analyzing it by continuous monitoring gas analyzers in a CEM test van. The sampling system consists of a stainless steel sample probe, Teflon sample line, glass-fiber particulate filter, glass moisture-knockout condensers in ice, Teflon sample transfer tubing, diaphragm pump and a stainless steel/Teflon manifold and flow control/delivery system. A constant sample and calibration gas supply pressure of 5 PSI was provided to each analyzer to avoid pressure variable response differences. The entire sampling system was leak checked prior to and at the end of the sampling program. The sampling system is leak checked by blocking the sample probe and verifying that the manifold pressure dropped to zero psi.

The System is checked for instrument drift at the beginning and end of each run. Individual test run calibrations were performed internally and used the zero and mid or high calibration gases. The calibration gases were selected to fall approximately within the following instrument ranges; 80 to 90 percent for the high calibration, 40 to 60 percent for the mid range and zero. Zero and calibration drift values were determined for each test. Linearity was performed where mid gas were used.

Method 19 was used to determine stack gas volumetric flow rates using oxygen based F-factors. F-factors are ratios of combustion gas volumes generated from heat input. The heating value of the fuel in Btu per cubic foot is determined from analysis of the daily utility company (PG&E) fuel gas samples using ASTM D1946/3588 gas chromatography analytical procedures. A dedicated fuel gas meter monitors total fuel consumption for each source. The total cubic feet per hour of fuel multiplied times the Btu/cf provides million Btu per hour (MMBtu) heat input.

The heat input in MMBtu/hr is multiplied by the F-factor (DSCF/MMBtu) and adjusted for the measured oxygen content of the source to determine volumetric flow rate. The flow rates are used to determine emission rates. All BE calibration gases are EPA Protocol #1. The analyzer data recording system consists of BE's Data Acquisition System (DAS).

The following continuous monitoring analyzers were used:

Parameter	Make	Model	Principle
NO_x	CAI	600CLD	Chemiluminescence
CO	TECO	48C	GFC IR analyzer
O_2	CAI	601P	Paramagnetic

Table 1
NOx & CO Emissions Test Results
SFO
24 MMBtu/hr Boiler #1 (S-15)
Normal Operation

TEST	1	2	3	3 Run Average	LIMIT
Test Condition	Natural Gas	Natural Gas	Natural Gas		
Test Location	Outlet	Outlet	Outlet		
Test Date	3/18/2016	3/18/2016	3/18/2016		
Test Time	0723-0753	0804-0834	0844-0914		
Test Duration (mins)	30	30	30		
Standard Temp., °F	70	70	70		
Flow Rate,DSCFM (M-19)	2,677	2,643	2,674	2,665	
Load ,MMBtu/hr (M-19)	14.50	14.33	14.50	14.41	
O_2, %	4.41	4.39	4.39	4.40	
NOx, ppm	7.10	7.16	7.38	7.21	
NOx, ppm (@3% O_2)	7.71	7.76	8.00	**7.82**	**9**
NOx, lb/MMBtu	0.009	0.009	0.010	0.009	
CO, ppm	<2.00	<2.00	<2.00	<2.00	
CO, ppm (@3% O_2)	<2.17	<2.17	<2.17	**<2.17**	**50**
CO, lb/MMBtu	<0.002	<0.002	<0.002	<0.002	

WHERE:

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

O_2 = Oxygen

lbs/MMBtu = Pounds per Million Btu

ppm = Parts Per Million Concentration

Tstd. = Standard Temp.; °R = °F + 460

F_d = 8710 (EPA F Factor for Natural Gas)

CALCULATIONS:

3%O_2 correction = ppm of pollutant * 17.9 / (20.9 - %O_2)

lbs/MMBtu = F_d * MW * ppm * 2.59E-9 * 20.9 / (20.9 - %O_2)

Table 2
NOx & CO Emissions Test Results
SFO
30 MMBtu/hr Boiler #2 (S-16)
Normal Operation

TEST	1	2	3	3 Run Average	LIMIT
Test Condition	Natural Gas	Natural Gas	Natural Gas		
Test Location	Outlet	Outlet	Outlet		
Test Date	3/17/2016	3/17/2016	3/17/2016		
Test Time	0952-1022	1029-1059	1105-1135		
Test Duration (mins)	30	30	30		
Standard Temp., °F	70	70	70		
Flow Rate,DSCFM (M-19)	2,327	2,402	2,452	2,394	
Load ,MMBtu/hr (M-19)	12.99	13.44	13.71	13.58	
O_2, %	3.91	3.86	3.87	3.88	
NOx, ppm	7.45	7.56	7.59	7.54	
NOx, ppm (@3% O_2)	7.85	7.94	7.98	**7.92**	**9**
NOx, lb/MMBtu	0.010	0.010	0.010	0.010	
CO, ppm	<2.00	<2.00	<2.00	<2.00	
CO, ppm (@3% O_2)	<2.11	<2.10	<2.10	**<2.10**	**50**
CO, lb/MMBtu	<0.002	<0.002	<0.002	<0.002	

WHERE:

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

O_2 = Oxygen

lbs/MMBtu = Pounds per Million Btu

ppm = Parts Per Million Concentration

Tstd. = Standard Temp.; °R = °F + 460

F_d = 8710 (EPA F Factor for Natural Gas)

CALCULATIONS:

3%O_2 correction = ppm of pollutant * 17.9 / (20.9 - %O_2)

lbs/MMBtu = F_d * MW * ppm * 2.59E-9 * 20.9 / (20.9 - %O_2)

Table 3

NOx & CO Emissions Test Results

SFO

60 MMBtu/hr Boiler #3 (S-17)

Normal Operation

TEST	1	2	3	3 Run Average	LIMIT
Test Condition	Natural Gas	Natural Gas	Natural Gas		
Test Location	Outlet	Outlet	Outlet		
Test Date	3/17/2016	3/17/2016	3/17/2016		
Test Time	0736-0806	0812-0842	0849-0919		
Test Duration (mins)	30	30	30		
Standard Temp., °F	70	70	70		
Flow Rate,DSCFM (M-19)	7,512	7,504	7,387	7,468	
Load ,MMBtu/hr (M-19)	40.73	40.73	40.12	40.42	
O_2, %	4.39	4.37	4.36	4.37	
NOx, ppm	6.60	6.51	6.47	6.53	
NOx, ppm (@3% O_2)	7.16	7.05	7.00	**7.07**	**9**
NOx, lb/MMBtu	0.009	0.009	0.008	0.009	
CO, ppm	<2.00	<2.00	<2.00	<2.00	
CO, ppm (@3% O_2)	<2.17	<2.17	<2.16	**<2.17**	**50**
CO, lb/MMBtu	<0.002	<0.002	<0.002	<0.002	

WHERE:

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

O_2 = Oxygen

lbs/MMBtu = Pounds per Million Btu

ppm = Parts Per Million Concentration

Tstd. = Standard Temp.; °R = °F + 460

F_d = 8710 (EPA F Factor for Natural Gas)

CALCULATIONS:

3%O_2 correction = ppm of pollutant * 17.9 / (20.9 - %O_2)

lbs/MMBtu = F_d * MW * ppm * 2.59E-9 * 20.9 / (20.9 - %O_2)

Table 4
NOx & CO Emissions Test Results
SFO
42 MMBtu/hr Boiler #4 (S-14)
Normal Operation

TEST	1	2	3	3 Run Average	LIMIT
Test Condition	Natural Gas	Natural Gas	Natural Gas		
Test Location	Outlet	Outlet	Outlet		
Test Date	3/18/2016	3/18/2016	3/18/2016		
Test Time	0929-0959	1006-1036	1043-1113		
Test Duration (mins)	30	30	30		
Standard Temp., °F	70	70	70		
Flow Rate,DSCFM (M-19)	4,492	4,579	4,582	4,551	
Load ,MMBtu/hr (M-19)	24.70	25.17	25.17	25.17	
O_2, %	4.15	4.16	4.17	4.16	
NOx, ppm	6.36	6.44	6.47	6.42	
NOx, ppm (@3% O_2)	6.80	6.88	6.93	**6.87**	**9**
NOx, lb/MMBtu	0.008	0.008	0.008	0.008	
CO, ppm	<2.00	<2.00	<2.00	<2.00	
CO, ppm (@3% O_2)	<2.14	<2.14	<2.14	**<2.14**	**50**
CO, lb/MMBtu	<0.002	<0.002	<0.002	<0.002	

WHERE:

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

O_2 = Oxygen

lbs/MMBtu = Pounds per Million Btu

ppm = Parts Per Million Concentration

Tstd. = Standard Temp.; °R = °F + 460

F_d = 8710 (EPA F Factor for Natural Gas)

CALCULATIONS:

3%O_2 correction = ppm of pollutant * 17.9 / (20.9 - %O_2)

lbs/MMBtu = F_d * MW * ppm * 2.59E-9 * 20.9 / (20.9 - %O_2)

APPENDICES

APPENDIX A - CALCULATIONS & NOMENCLATURE

APPENDIX B - FIELD DATA SHEETS

APPENDIX C - CALIBRATION GAS CERTIFICATES

APPENDIX D – STACK DIAGRAMS

APPENDIX E - SAMPLING SYSTEM DIAGRAMS

APPENDIX F – SOURCE TEST NOTIFICATION

APPENDIX G – PERMIT TO OPERATE
OR
AUTHORITY TO CONSTRUCT

Standard Abbreviations for Reports

Unit	Abbreviation	Unit	Abbreviation
billion	G	microgram	µg
Brake horsepower	bhp	milligram	mg
Brake horsepower hour	bhp-hr	milliliter	ml
British Thermal Unit	Btu	million	MM
capture efficiency	CE	minute	min
destruction efficiency	DE	Molecular Weight	M
Dry Standard Cubic Feet	DSCF	nanogram	ng
Dry Standard Cubic Feet per Minute	DSCFM	Parts per Billion	ppb
Dry Standard Cubic Meter	DSCM	Parts per Million	ppm
Dry Standard Cubic Meter per Minute	DSCMM	pennyweight per firkin	pw/fkn
grains per dry standard cubic foot	gr/DSCF	pound	lb
gram	g	pounds per hour	lbs/hr
grams per Brake horsepower hour	g/bhp-hr	pounds per million Btu	lbs/MMBtu
kilowatt	kW	second	sec
liter	l	Specific Volume, ft^3/lb-mole	SV
Megawatts	MW	Thousand	k
meter	m	watt	W

Common Conversions / Calculations / Constants

1 gram = 15.432 grains

1 pound = 7000 grains

grams per pound = 453.6

bhp = 1.411 * Engine kW, (where Engine kW = Generator kW output / 0.95) @ 95% efficiency

g/bhp-hr = 453*ppm*(MW / (385E6))* 0.00848 * f-factor * (20.9 / (20.9-O_2)); **CARB**

g/bhp-hr = lbs/hr * 453.6 / bhp

2.59E-9 = Conversion factor for ppm to lbs/scf; **EPA 40CFR60.45**

Correction Multiplier for Standard Temperature = (460 + $T_{std.}$ °F) / 528

dscf / MMBTU = 8710 for Natural gas; **EPA Method 19**

Btu/ft^3 = 1040 for Natural Gas; **EPA Method 19**

lb/hr Part. Emission Rate = 0.00857 * gr/dscf * dscfm; **EPA Method 5**

lbs/hr = ppm / SV x dscfm x M * 60; **CARB Method 100; where SV ≈ $385E^6$ @ 68°F or ≈ $379E^6$ @ 60°F or ≈ $386E^6$ @ 70°F.**

Correction to 12% CO_2 = gr/dscf * 12% / stack CO_2%; **EPA Method 5**

Correction to 3% O_2 = ppm * 17.9 / (20.9 - stack O_2 %); **CARB Method 100**

Correction to 15% O_2 = ppm * 5.9 / (20.9 - stack O_2 %); **CARB Method 100**

dscfm = Gas Fd * MMBtu/min * 20.9 / (20.9 - stack O_2 %); **EPA Method 19**

lb/MMBtu = Fd * M * ppm * 2.59E-9 * 20.9 / (20.9 - stack O_2 %); **EPA Method 19**

Standard Temperatures by District

EPA	68 °F	NSAPCD - Northern Sonoma	68 °F
CARB	68 °F	PCAPCD - Placer	68 °F
BAAQMD - Bay Area	70 °F	SLOCAPCD - San Luis Obispo	60 °F
SJVUAPCD - San Joaquin	60 °F	SMAQMD - Sacramento	68°F de facto
SCAQMD - South Coast	60 °F	SCAQMD - Shasta County	68 °F
MBUAPCD - Monterey Bay	68 °F	YSAPCD - Yolo-Solano	68 °F
FRAQMD – Feather River	68 °F	AADBAPC – Amador County	68 °F

CEM BIAS CORRECTION SUMMARY

Facility:	SFO	Barometric:	30.00
Unit:	24 MMBtu/hr Boiler #1 (S-15)	Leak Check:	OK
Condition:	Normal Operation	Strat. Check:	OK
Date:	03/18/16	Personnel:	JMc

	O_2		NOx	CO					
Analyzer	601P		600CLD	48C					
Range	10		25	100					r
Units, ppm or %	%		ppm	ppm					
Span Gas Value	8.55		23.1	90.2					Ccal
Run 1	0.01		-0.10	0.12					zero (initial), Cib
	8.55		22.96	90.21					cal (initial), Cib
0723-0753	4.41		7.05	-0.48					TEST AVG, Cavg
	0.00		-0.04	-0.34					zero (final), Cfb
	8.54		23.09	87.69					cal (final), Cfb
	-0.13%		0.25%	-0.46%					% zero drift
	-0.11%		0.53%	-2.52%					% cal drift
	4.41		**7.10**	**-0.38**					**Cgas**
Run 2	0.00		-0.04	-0.34					zero (initial), Cib
	8.54		23.09	87.69					cal (initial), Cib
0804-0834	4.38		7.08	-0.87					TEST AVG, Cavg
	-0.02		-0.14	-0.60					zero (final), Cfb
	8.55		22.93	86.42					cal (final), Cfb
	-0.24%		-0.41%	-0.26%					% zero drift
	0.06%		-0.64%	-1.28%					% cal drift
	4.39		**7.16**	**-0.41**					**Cgas**
Run 3	-0.02		-0.14	-0.60					zero (initial), Cib
	8.55		22.93	86.42					cal (initial), Cib
0844-0914	4.37		7.22	-1.03					TEST AVG, Cavg
	-0.04		-0.15	-0.68					zero (final), Cfb
	8.53		22.83	86.16					cal (final), Cfb
	-0.21%		-0.03%	-0.08%					% zero drift
	-0.19%		-0.41%	-0.26%					% cal drift
	4.39		**7.38**	**-0.40**					**Cgas**
AVERAGES	**4.40**		**7.21**	**-0.40**					**TEST AVG**

Pollutant Concentration (Cgas) = (Cavg - Co) x Ccal / (Cbcal- Co)
Zero and Calibration Drift = 100 x (Cfb - Cib) / r
Bias = 100 x (Cfb - Ca) / r

Co = (Cib + Cfb) / 2 for zero gas
Cbcal = (Cib + Cfb) / 2 for cal gas

STACK GAS FLOW RATE DETERMINATION -- FUEL USAGE
EPA Method 19

Facility: SFO
Unit: 24 MMBtu/hr Boiler #1 (S-15)
Condition:
Date: 3/18/2016

	Run 1	Run 2	Run 3	
Time:	0723-0753	0804-0834	0844-0914	
# cubic feet/rev	100	100	100	ft^3
# of seconds/rev	42.50	43.00	42.50	seconds
Gas Line Pressure(PSIG)	9.60	9.60	9.60	PSI Gauge
Gas Line Pressure(PSIA)	24.3	24.3	24.3	PSI Absolute
Gross Calorific Value @ 68°F	1040	1040	1040	Btu / ft^3
Stack Oxygen	4.41	4.39	4.39	%
Gas Fd-Factor @ 68°F	8710	8710	8710	DSCF/MMBtu
Gas Temperature (°F)	70	70	70	°F
Standard Temperature (°F)	70	70	70	°F
Realtime Fuel Rate (CFM)	141.18	139.53	141.18	CFM
Corrected Fuel Rate (SCFM) @ 68°F	232.5	229.8	232.5	SCFM
Fuel Flow Rate (SCFH) @68°F	13,950	13,787	13,950	SCFH
Fuel Flow Rate (SCFH) @60°F	13,738	13,578	13,738	SCFH
Million Btu per minute	0.242	0.239	0.242	MMBtu/min
Heat Input (MMBtu/hour)	14.51	14.34	14.51	MMBtu/Hr
Stack Gas Flow Rate	**2,677**	**2,643**	**2,674**	**DSCFM**

WHERE:

Gas Fd-Factor = Fuel conversion factor (ratio of combustion gas volumes to heat inputs)
MMBtu = Million Btu

CALCULATIONS:

SCFM = CFM * 528 * (gas line PSIA) / 14.7 / (gas °F + 460)
MMBtu/min = (SCFM * Btu/ft^3) / 1,000,000
DSCFM = Gas Fd-Factor * MMBtu/min * 20.95 / (20.95 - stack oxygen%)
SCFH = SCFM * 60
Heat Input = MMBtu/min * 60

CEM BIAS CORRECTION SUMMARY

Facility:	SFO	Barometric:	30.00
Unit:	30 MMBtu/hr Boiler #2 (S-16)	Leak Check:	OK
Condition:	Normal Operation	Strat. Check:	OK
Date:	03/17/16	Personnel:	JMc

	O_2		NOx	CO					
Analyzer	601P		600CLD	48C					
Range	10		25	100					r
Units, ppm or %	%		ppm	ppm					
Span Gas Value	8.55		23.06	90.20					Ccal
Run 1	0.02		0.00	0.11					zero (initial), Cib
	8.54		23.08	90.22					cal (initial), Cib
0952-1022	3.91		7.44	-0.06					TEST AVG, Cavg
	0.02		-0.01	0.02					zero (final), Cfb
	8.54		22.97	89.84					cal (final), Cfb
	-0.02%		-0.06%	-0.10%					% zero drift
	0.04%		-0.44%	-0.38%					% cal drift
	3.91		**7.45**	**-0.13**					**Cgas**
Run 2	0.02		-0.01	0.02					zero (initial), Cib
	8.54		22.97	89.84					cal (initial), Cib
1029-1059	3.87		7.52	-0.32					TEST AVG, Cavg
	0.02		-0.01	-0.07					zero (final), Cfb
	8.54		22.94	89.48					cal (final), Cfb
	-0.05%		0.01%	-0.09%					% zero drift
	-0.06%		-0.14%	-0.36%					% cal drift
	3.86		**7.56**	**-0.30**					**Cgas**
Run 3	0.02		-0.01	-0.07					zero (initial), Cib
	8.54		22.94	89.48					cal (initial), Cib
1105-1135	3.86		7.55	-0.36					TEST AVG, Cavg
	0.00		-0.02	-0.09					zero (final), Cfb
	8.52		22.99	89.43					cal (final), Cfb
	-0.2%		0.0%	0.0%					% zero drift
	-0.2%		0.2%	0.0%					% cal drift
	3.87		**7.59**	**-0.28**					**Cgas**
AVERAGES	**3.88**		**7.54**	**-0.24**					**TEST AVG**

Pollutant Concentration (Cgas) = (Cavg - Co) x Ccal / (Cbcal- Co)
Zero and Calibration Drift = 100 x (Cfb - Cib) / r
Bias = 100 x (Cfb - Ca) / r

Co = (Cib + Cfb) / 2 for zero gas
Cbcal = (Cib + Cfb) / 2 for cal gas

STACK GAS FLOW RATE DETERMINATION -- FUEL USAGE
EPA Method 19

Facility: SFO
Unit: 30 MMBtu/hr Boiler #2 (S-16)
Condition: Normal Operation
Date: 3/17/2016

	Run 1	Run 2	Run 3	
Time:	0952-1022	1029-1059	1105-1135	
# cubic feet/rev	100	100	100	ft^3
# of seconds/rev	51.75	50.00	49.00	seconds
Gas Line Pressure(PSIG)	11.80	11.80	11.80	PSI Gauge
Gas Line Pressure(PSIA)	26.50	26.50	26.50	PSI Absolute
Gross Calorific Value @ 68°F	1040	1040	1040	Btu / ft^3
Stack Oxygen	3.91	3.86	3.87	%
Gas Fd-Factor @ 68°F	8710	8710	8710	DSCF/MMBtu
Gas Temperature (°F)	70	70	70	°F
Standard Temperature (°F)	70	70	70	°F
Realtime Fuel Rate (CFM)	115.94	120.00	122.45	CFM
Corrected Fuel Rate (SCFM) @ 68°F	208.2	215.5	219.9	SCFM
Fuel Flow Rate (SCFH) @68°F	12,493	12,931	13,195	SCFH
Fuel Flow Rate (SCFH) @60°F	12,304	12,735	12,995	SCFH
Million Btu per minute	0.217	0.224	0.229	MMBtu/min
Heat Input (MMBtu/hour)	12.99	13.45	13.72	MMBtu/Hr
Stack Gas Flow Rate	**2,327**	**2,402**	**2,452**	**DSCFM**

WHERE:

Gas Fd-Factor = Fuel conversion factor (ratio of combustion gas volumes to heat inputs)
MMBtu = Million Btu

CALCULATIONS:

SCFM = CFM * 528 * (gas line PSIA) / 14.7 / (gas °F + 460)
MMBtu/min = (SCFM * Btu/ft^3) / 1,000,000
DSCFM = Gas Fd-Factor * MMBtu/min * 20.95 / (20.95 - stack oxygen%)
SCFH = SCFM * 60
Heat Input = MMBtu/min * 60

CEM BIAS CORRECTION SUMMARY

Facility:	SFO	Barometric:	30.00
Unit:	60 MMBtu/hr Boiler #3 (S-17)	Leak Check:	OK
Condition:	Normal Operation	Strat. Check:	OK
Date:	03/17/16	Personnel:	JMc

	O_2		NOx	CO					
Analyzer	601P		600CLD	48C					
Range	10		25	100					r
Units, ppm or %	%		ppm	ppm					
Span Gas Value	8.55		23.06	90.20					Ccal
Run 1	0.02		-0.03	0.13					zero (initial), Cib
	8.54		23.07	90.07					cal (initial), Cib
0736-0806	4.39		6.60	-0.60					TEST AVG, Cavg
	0.01		0.02	-0.07					zero (final), Cfb
	8.55		23.10	89.34					cal (final), Cfb
	-0.12%		0.16%	-0.21%					% zero drift
	0.08%		0.12%	-0.73%					% cal drift
	4.39		**6.60**	**-0.63**					**Cgas**
Run 2	0.01		0.02	-0.07					zero (initial), Cib
	8.55		23.10	89.34					cal (initial), Cib
0812-0842	4.37		6.50	-0.79					TEST AVG, Cavg
	-0.01		-0.02	-0.24					zero (final), Cfb
	8.54		22.95	88.51					cal (final), Cfb
	-0.18%		-0.14%	-0.17%					% zero drift
	-0.06%		-0.61%	-0.83%					% cal drift
	4.37		**6.51**	**-0.64**					**Cgas**
Run 3	-0.01		-0.02	-0.24					zero (initial), Cib
	8.54		22.95	88.51					cal (initial), Cib
0849-0919	4.36		6.40	-0.93					TEST AVG, Cavg
	-0.01		-0.05	-0.39					zero (final), Cfb
	8.58		22.86	87.76					cal (final), Cfb
	-0.03%		-0.12%	-0.14%					% zero drift
	0.39%		-0.37%	-0.76%					% cal drift
	4.36		**6.47**	**-0.62**					**Cgas**
AVERAGES	**4.37**		**6.53**	**-0.63**					**TEST AVG**

Pollutant Concentration (Cgas) = (Cavg - Co) x Ccal / (Cbcal- Co)
Zero and Calibration Drift = 100 x (Cfb - Cib) / r
Bias = 100 x (Cfb - Ca) / r

Co = (Cib + Cfb) / 2 for zero gas
Cbcal = (Cib + Cfb) / 2 for cal gas

STACK GAS FLOW RATE DETERMINATION -- FUEL USAGE
EPA Method 19

Facility: SFO
Unit: 60 MMBtu/hr Boiler #3 (S-17)
Condition: Normal Operation
Date: 3/17/2016

	Run 1	Run 2	Run 3	
Time:	0736-0806	0812-0842	0849-0919	
# cubic feet/rev	100	100	100	ft^3
# of seconds/rev	16.50	16.50	16.75	seconds
Gas Line Pressure(PSIG)	11.80	11.80	11.80	PSI Gauge
Gas Line Pressure(PSIA)	26.50	26.50	26.50	PSI Absolute
Gross Calorific Value @ 68°F	1040	1040	1040	Btu / ft^3
Stack Oxygen	4.39	4.37	4.36	%
Gas Fd-Factor @ 68°F	8710	8710	8710	DSCF/MMBtu
Gas Temperature (°F)	70	70	70	°F
Standard Temperature (°F)	70	70	70	°F
Realtime Fuel Rate (CFM)	363.64	363.64	358.21	CFM
Corrected Fuel Rate (SCFM) @ 68°F	653.1	653.1	643.3	SCFM
Fuel Flow Rate (SCFH) @68°F	39,184	39,184	38,599	SCFH
Fuel Flow Rate (SCFH) @60°F	38,590	38,590	38,014	SCFH
Million Btu per minute	0.679	0.679	0.669	MMBtu/min
Heat Input (MMBtu/hour)	40.75	40.75	40.14	MMBtu/Hr
Stack Gas Flow Rate	**7,512**	**7,504**	**7,387**	**DSCFM**

WHERE:

Gas Fd-Factor = Fuel conversion factor (ratio of combustion gas volumes to heat inputs)
MMBtu = Million Btu

CALCULATIONS:

SCFM = CFM * 528 * (gas line PSIA) / 14.7 / (gas °F + 460)
MMBtu/min = (SCFM * Btu/ft^3) / 1,000,000
DSCFM = Gas Fd-Factor * MMBtu/min * 20.95 / (20.95 - stack oxygen%)
SCFH = SCFM * 60
Heat Input = MMBtu/min * 60

CEM BIAS CORRECTION SUMMARY

Facility:	SFO	Barometric:	30.00
Unit:	42 MMBtu/hr Boiler #4 (S-14)	Leak Check:	OK
Condition:	Normal Operation	Strat. Check:	OK
Date:	03/18/16	Personnel:	JMc

	O_2		NOx	CO					
Analyzer	601P		600CLD	48C					
Range	10		25	100					r
Units, ppm or %	%		ppm	ppm					
Span Gas Value	8.55		23.06	90.20					Ccal
Run 1	-0.04		-0.15	-0.68					zero (initial), Cib
	8.53		22.83	86.16					cal (initial), Cib
0929-0959	4.12		6.22	-1.29					TEST AVG, Cavg
	-0.05		-0.13	-0.68					zero (final), Cfb
	8.53		23.01	86.00					cal (final), Cfb
	-0.03%		0.06%	0.00%					% zero drift
	-0.01%		0.72%	-0.16%					% cal drift
	4.15		**6.36**	**-0.63**					**Cgas**
Run 2	-0.05		-0.13	-0.68					zero (initial), Cib
	8.53		23.01	86.00					cal (initial), Cib
1006-1036	4.12		6.29	-1.39					TEST AVG, Cavg
	-0.06		-0.14	-0.78					zero (final), Cfb
	8.52		22.78	85.60					cal (final), Cfb
	-0.11%		-0.03%	-0.10%					% zero drift
	-0.04%		-0.91%	-0.40%					% cal drift
	4.16		**6.44**	**-0.69**					**Cgas**
Run 3	-0.06		-0.14	-0.78					zero (initial), Cib
	8.52		22.78	85.60					cal (initial), Cib
1043-1113	4.12		6.31	-1.46					TEST AVG, Cavg
	-0.07		-0.13	-0.79					zero (final), Cfb
	8.51		22.85	85.35					cal (final), Cfb
	-0.08%		0.04%	-0.01%					% zero drift
	-0.11%		0.27%	-0.25%					% cal drift
	4.17		**6.47**	**-0.71**					**Cgas**
AVERAGES	**4.16**		**6.42**	**-0.68**					**TEST AVG**

Pollutant Concentration (Cgas) = (Cavg - Co) x Ccal / (Cbcal- Co)
Zero and Calibration Drift = 100 x (Cfb - Cib) / r
Bias = 100 x (Cfb - Ca) / r

Co = (Cib + Cfb) / 2 for zero gas
Cbcal = (Cib + Cfb) / 2 for cal gas

STACK GAS FLOW RATE DETERMINATION -- FUEL USAGE
EPA Method 19

Facility: SFO
Unit: 42 MMBtu/hr Boiler #4 (S-14)
Condition: Normal Operation
Date: 3/18/2016

	Run 1	Run 2	Run 3	
Time:	0929-0959	1006-1036	1043-1113	
# cubic feet/rev	100	100	100	ft^3
# of seconds/rev	27.00	26.50	26.50	seconds
Gas Line Pressure(PSIG)	11.60	11.60	11.60	PSI Gauge
Gas Line Pressure(PSIA)	26.30	26.30	26.30	PSI Absolute
Gross Calorific Value @ 68°F	1040	1040	1040	Btu / ft^3
Stack Oxygen	4.15	4.16	4.17	%
Gas Fd-Factor @ 68°F	8710	8710	8710	DSCF/MMBtu
Gas Temperature (°F)	70	70	70	°F
Standard Temperature (°F)	70	70	70	°F
Realtime Fuel Rate (CFM)	222.22	226.42	226.42	CFM
Corrected Fuel Rate (SCFM) @ 68°F	396.1	403.6	403.6	SCFM
Fuel Flow Rate (SCFH) @68°F	23,765	24,213	24,213	SCFH
Fuel Flow Rate (SCFH) @60°F	23,405	23,846	23,846	SCFH
Million Btu per minute	0.412	0.420	0.420	MMBtu/min
Heat Input (MMBtu/hour)	24.72	25.18	25.18	MMBtu/Hr
Stack Gas Flow Rate	**4,492**	**4,579**	**4,582**	**DSCFM**

WHERE:

Gas Fd-Factor = Fuel conversion factor (ratio of combustion gas volumes to heat inputs)
MMBtu = Million Btu

CALCULATIONS:

SCFM = CFM * 528 * (gas line PSIA) / 14.7 / (gas °F + 460)
MMBtu/min = (SCFM * Btu/ft^3) / 1,000,000
DSCFM = Gas Fd-Factor * MMBtu/min * 20.95 / (20.95 - stack oxygen%)
SCFH = SCFM * 60
Heat Input = MMBtu/min * 60

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	1	Date:	03/18/16
Location:	24 MMBtu/hr Boiler #1 (S-15)	Barometric:	30.00	Leak ✓ :	OK
Observers:		Personnel:	JMc	Strat. ✓ :	OK
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
	Time									Comments:
	7:23	4.45		6.94	-0.32					
	7:24	4.43		7.02	-0.27					Unit #
	7:25	4.46		6.96	-0.32					
	7:26	4.43		6.95	-0.23					
	7:27	4.41		7.03	-0.18					Operating Conditions
	7:28	4.39		7.05	-0.36					
	7:29	4.40		7.05	-0.42					
	7:30	4.43		6.98	-0.38					Fuel
	7:31	4.44		6.93	-0.30					
	7:32	4.40		7.06	-0.46					
	7:33	4.41		7.06	-0.50					
	7:34	4.43		7.03	-0.47					
	7:35	4.39		7.12	-0.47					
	7:36	4.38		7.11	-0.45					
	7:37	4.41		7.07	-0.41					
	7:38	4.44		7.02	-0.37					
	7:39	4.39		7.07	-0.55					
	7:40	4.38		7.06	-0.67					
	7:41	4.38		7.10	-0.60					
	7:42	4.40		7.09	-0.55					
	7:43	4.40		7.08	-0.60					
	7:44	4.41		7.02	-0.50					
	7:45	4.42		7.04	-0.54					
	7:46	4.38		7.12	-0.58					
	7:47	4.39		7.11	-0.60					
	7:48	4.42		7.08	-0.62					
	7:49	4.42		7.08	-0.68					
	7:50	4.43		7.06	-0.67					
	7:51	4.38		7.04	-0.69					
	7:52	4.42		7.06	-0.62					
ZERO I	7:14	0.01		-0.10	0.12					
SPAN I	7:18	8.55		22.96	90.21					
Average		4.41		7.05	-0.48					
ZERO f	7:54	0.00		-0.04	-0.34					
SPAN f	7:59	8.54		23.09	87.69					
Zero Drift %		-0.13%		0.25%	-0.46%					
Span Drift %		-0.11%		0.53%	-2.52%					
Corr. Avg.		4.41		7.10	-0.38					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]

Zero Drift % = 100 * (Zf - Zi)/Intrument Range

Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	2	Date:	03/18/16
Location:	24 MMBtu/hr Boiler #1 (S-15)	Barometric:	30.00	Leak ✓ :	*OK*
Observers:		Personnel:	JMc	Strat.✓ :	*OK*
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
Time										Comments:
	8:04	4.38		7.09	-0.75					
	8:05	4.38		7.12	-0.77					[redacted]
	8:06	4.37		7.12	-0.78					
	8:07	4.41		6.99	-0.78					
	8:08	4.37		7.08	-0.81					[redacted]
	8:09	4.38		7.04	-0.83					
	8:10	4.35		7.15	-0.83					
	8:11	4.39		7.04	-0.79					[redacted]
	8:12	4.41		7.00	-0.80					
[redacted]	*8:13*	4.40		6.99	-0.85					
	8:14	4.40		7.01	-0.77					
	8:15	4.37		7.08	-0.80					
	8:16	4.35		7.12	-0.89					
	8:17	4.35		7.13	-0.90					
	8:18	4.38		7.08	-0.91					
	8:19	4.36		7.09	-0.94					
	8:20	4.37		7.12	-0.99					
	8:21	4.38		7.04	-0.91					
	8:22	4.42		6.97	-0.89					
[redacted]	*8:23*	4.41		6.99	-0.87					
	8:24	4.38		7.08	-0.79					
	8:25	4.39		7.01	-0.89					
	8:26	4.40		7.07	-0.84					
	8:27	4.39		7.05	-0.91					
	8:28	4.37		7.12	-0.98					
	8:29	4.32		7.21	-0.96					
	8:30	4.32		7.28	-0.99					
	8:31	4.39		7.17	-0.91					
	8:32	4.40		7.11	-0.99					
[redacted]	*8:33*	4.39		7.10	-0.99					
ZERO I	*7:54*	*0.00*		*-0.04*	*-0.34*					
SPAN I	*7:59*	*8.54*		*23.09*	*87.69*					
Average		*4.38*		*7.08*	*-0.87*					
ZERO f	*8:35*	*-0.02*		*-0.14*	*-0.60*					
SPAN f	*8:40*	*8.55*		*22.93*	*86.42*					
Zero Drift %		*-0.24%*		*-0.41%*	*-0.26%*					
Span Drift %		*0.06%*		*-0.64%*	*-1.28%*					
Corr. Avg.		*4.39*		*7.16*	*-0.41*					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]

Zero Drift % = 100 * (Zf - Zi)/Intrument Range

Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	3	Date:	03/18/16
Location:	24 MMBtu/hr Boiler #1 (S-15)	Barometric:	30.00	Leak ✓ :	OK
Observers:		Personnel:	JMc	Strat. ✓ :	OK
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
Time										Comments:
	8:44	4.33		7.29	-1.05					
	8:45	4.38		7.19	-1.06					Unit #
	8:46	4.39		7.11	-1.08					
	8:47	4.38		7.14	-0.96					
	8:48	4.35		7.25	-0.94					Operating Conditions
	8:49	4.35		7.28	-1.09					
	8:50	4.34		7.29	-1.12					
	8:51	4.36		7.20	-1.06					Fuel
	8:52	4.36		7.18	-1.07					
	8:53	4.39		7.05	-1.09					
	8:54	4.39		7.09	-1.08					
	8:55	4.37		7.09	-1.04					
	8:56	4.38		7.21	-0.95					
	8:57	4.37		7.30	-0.99					
	8:58	4.35		7.40	-1.09					
	8:59	4.38		7.34	-1.03					
	9:00	4.38		7.25	-0.99					
	9:01	4.36		7.29	-1.01					
	9:02	4.33		7.38	-1.05					
	9:03	4.37		7.36	-1.04					
	9:04	4.35		7.38	-1.00					
	9:05	4.41		7.22	-0.97					
	9:06	4.34		7.30	-0.99					
	9:07	4.36		7.19	-0.97					
	9:08	4.40		7.16	-1.06					
	9:09	4.37		7.17	-0.99					
	9:10	4.40		7.10	-1.07					
	9:11	4.40		7.07	-0.99					
	9:12	4.36		7.18	-0.99					
	9:13	4.34		7.20	-0.97					
ZERO I	8:35	-0.02		-0.14	-0.60					
SPAN I	8:40	8.55		22.93	86.42					
Average		4.37		7.22	-1.03					
ZERO f	9:16	-0.04		-0.15	-0.68					
SPAN f	9:20	8.53		22.83	86.16					
Zero Drift %		-0.21%		-0.03%	-0.08%					
Span Drift %		-0.19%		-0.41%	-0.26%					
Corr. Avg.		4.39		7.38	-0.40					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]
Zero Drift % = 100 * (Zf - Zi)/Intrument Range
Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	1	Date:	03/17/16
Location:	30 MMBtu/hr Boiler #2 (S-16)	Barometric:	30.00	Leak ✓ :	OK
Observers:		Personnel:	JMc	Strat. ✓ :	OK
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
Time										Comments:
	9:52	3.74		7.54	0.25					
	9:53	3.84		7.43	-0.07					[redacted]
	9:54	3.99		7.18	0.15					
	9:55	3.92		7.31	0.20					
	9:56	3.92		7.36	-0.05					[redacted]
	9:57	3.94		7.35	0.30					
	9:58	4.01		7.22	0.49					
	9:59	3.96		7.32	0.34					[redacted]
	10:00	4.04		7.27	0.40					
[redacted]	10:01	4.03		7.33	0.02					
	10:02	4.01		7.36	0.03					
	10:03	3.90		7.59	-0.16					
	10:04	3.91		7.56	-0.16					
	10:05	3.91		7.58	-0.29					
	10:06	3.87		7.60	-0.20					
	10:07	3.91		7.52	0.06					
	10:08	3.91		7.54	-0.13					
	10:09	3.95		7.44	-0.15					
	10:10	3.99		7.43	-0.25					
[redacted]	10:11	3.87		7.58	-0.16					
	10:12	3.88		7.50	-0.24					
	10:13	3.90		7.45	-0.04					
	10:14	3.90		7.49	0.00					
	10:15	3.85		7.55	-0.17					
	10:16	3.81		7.58	-0.39					
	10:17	3.85		7.49	-0.38					
	10:18	3.93		7.35	-0.02					
	10:19	3.89		7.45	-0.29					
	10:20	3.90		7.40	-0.38					
[redacted]	10:21	3.89		7.46	-0.48					
ZERO I	9:28	0.02		0.00	0.11					
SPAN I	9:31	8.54		23.08	90.22					
Average		3.91		7.44	-0.06					
ZERO f	10:23	0.02		-0.01	0.02					
SPAN f	10:26	8.54		22.97	89.84					
Zero Drift %		-0.02%		-0.06%	-0.10%					
Span Drift %		0.04%		-0.44%	-0.38%					
Corr. Avg.		3.91		7.45	-0.13					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]

Zero Drift % = 100 * (Zf - Zi)/Intrument Range

Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	2	Date:	03/17/16
Location:	30 MMBtu/hr Boiler #2 (S-16)	Barometric:	30.00	Leak ✓ :	*OK*
Observers:		Personnel:	JMc	Strat. ✓ :	*OK*
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
Time										Comments:
	10:29	3.86		7.61	-0.34					
	10:30	3.91		7.53	-0.27					*Unit #*
	10:31	3.94		7.45	-0.34					
	10:32	3.81		7.74	-0.36					
	10:33	3.84		7.69	-0.37					*Operating Conditions*
	10:34	3.95		7.49	-0.08					
	10:35	3.96		7.42	-0.02					
	10:36	3.87		7.54	-0.24					*Fuel*
	10:37	3.91		7.45	0.25					
	10:38	3.89		7.50	-0.08					
	10:39	3.85		7.54	-0.35					
	10:40	3.89		7.47	-0.49					
	10:41	3.81		7.62	-0.42					
	10:42	3.83		7.58	-0.39					
	10:43	3.79		7.67	-0.42					
	10:44	3.82		7.58	-0.47					
	10:45	3.84		7.56	-0.39					
	10:46	3.91		7.42	-0.40					
	10:47	3.82		7.58	-0.48					
	10:48	3.83		7.54	-0.42					
	10:49	3.88		7.42	-0.47					
	10:50	3.93		7.38	-0.34					
	10:51	3.92		7.37	-0.22					
	10:52	3.83		7.54	-0.48					
	10:53	3.89		7.43	-0.38					
	10:54	3.83		7.55	-0.32					
	10:55	3.81		7.54	-0.43					
	10:56	3.83		7.52	-0.42					
	10:57	3.91		7.36	-0.21					
	10:58	3.86		7.48	-0.37					
ZERO I	*10:23*	*0.02*		*-0.01*	*0.02*					
SPAN I	*10:26*	*8.54*		*22.97*	*89.84*					
Average		*3.87*		*7.52*	*-0.32*					
ZERO f	*11:00*	*0.02*		*-0.01*	*-0.07*					
SPAN f	*11:02*	*8.54*		*22.94*	*89.48*					
Zero Drift %		*-0.05%*		*0.01%*	*-0.09%*					
Span Drift %		*-0.06%*		*-0.14%*	*-0.36%*					
Corr. Avg.		*3.86*		*7.56*	*-0.30*					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]

Zero Drift % = 100 * (Zf - Zi)/Intrument Range

Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	3	Date:	03/17/16
Location:	30 MMBtu/hr Boiler #2 (S-16)	Barometric:	30.00	Leak ✓ :	OK
Observers:		Personnel:	JMc	Strat. ✓ :	OK
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
Time										Comments:
	11:05	3.85		7.49	-0.44					
	11:06	3.89		7.43	-0.23					Unit 6
	11:07	3.81		7.54	-0.24					
	11:08	3.87		7.43	-0.42					
	11:09	3.86		7.46	-0.35					Operating Condition
	11:10	3.85		7.49	-0.30					
	11:11	3.86		7.43	-0.24					
	11:12	3.94		7.32	-0.31					Fuel
	11:13	3.94		7.34	-0.07					
	11:14	3.86		7.53	-0.34					
	11:15	3.84		7.56	-0.27					
	11:16	3.92		7.47	-0.29					
	11:17	3.92		7.43	-0.34					
	11:18	3.88		7.53	-0.44					
	11:19	3.81		7.68	-0.51					
	11:20	3.83		7.68	-0.43					
	11:21	3.89		7.53	-0.41					
	11:22	3.85		7.55	-0.37					
	11:23	3.88		7.55	-0.17					
	11:24	3.86		7.66	-0.29					
	11:25	3.79		7.74	-0.46					
	11:26	3.86		7.61	-0.56					
	11:27	3.86		7.64	-0.52					
	11:28	3.88		7.59	-0.49					
	11:29	3.86		7.61	-0.39					
	11:30	3.87		7.60	-0.45					
	11:31	3.86		7.62	-0.24					
	11:32	3.87		7.60	-0.37					
	11:33	3.79		7.77	-0.34					
	11:34	3.84		7.69	-0.46					
ZERO I	11:00	0.02		-0.01	-0.07					
SPAN I	11:02	8.54		22.94	89.48					
Average		3.86		7.55	-0.36					
ZERO f	11:37	0.00		-0.02	-0.09					
SPAN f	11:39	8.52		22.99	89.43					
Zero Drift %		-0.16%		-0.04%	-0.02%					
Span Drift %		-0.17%		0.21%	-0.05%					
Corr. Avg.		3.87		7.59	-0.28					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]

Zero Drift % = 100 * (Zf - Zi)/Intrument Range

Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	1	Date:	03/17/16
Location:	60 MMBtu/hr Boiler #3 (S-17)	Barometric:	30.00	Leak ✓ :	OK
Observers:		Personnel:	JMc	Strat. ✓ :	OK
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
Time										Comments:
	7:36	4.39		6.70	-0.48					
	7:37	4.40		6.65	-0.47					Unit #
	7:38	4.38		6.71	-0.48					
	7:39	4.39		6.70	-0.47					
	7:40	4.39		6.68	-0.54					Operating Conditions
	7:41	4.40		6.66	-0.58					
	7:42	4.39		6.65	-0.58					
	7:43	4.39		6.66	-0.57					Fuel
	7:44	4.40		6.66	-0.57					
	7:45	4.41		6.60	-0.58					
	7:46	4.39		6.64	-0.58					
	7:47	4.41		6.61	-0.58					
	7:48	4.41		6.57	-0.57					
	7:49	4.40		6.60	-0.58					
	7:50	4.38		6.61	-0.57					
	7:51	4.42		6.54	-0.58					
	7:52	4.37		6.64	-0.57					
	7:53	4.38		6.61	-0.57					
	7:54	4.40		6.54	-0.67					
	7:55	4.41		6.51	-0.66					
	7:56	4.39		6.58	-0.66					
	7:57	4.38		6.61	-0.68					
	7:58	4.39		6.56	-0.68					
	7:59	4.40		6.54	-0.66					
	8:00	4.38		6.56	-0.68					
	8:01	4.37		6.58	-0.68					
	8:02	4.39		6.54	-0.67					
	8:03	4.39		6.54	-0.67					
	8:04	4.39		6.55	-0.67					
	8:05	4.38		6.55	-0.68					
ZERO I	7:25	0.02		-0.03	0.13					
SPAN I	7:32	8.54		23.07	90.07					
Average		4.39		6.60	-0.60					
ZERO f	8:07	0.01		0.02	-0.07					
SPAN f	8:09	8.55		23.10	89.34					
Zero Drift %		-0.12%		0.16%	-0.21%					
Span Drift %		0.08%		0.12%	-0.73%					
Corr. Avg.		4.39		6.60	-0.63					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]

Zero Drift % = 100 * (Zf - Zi)/Intrument Range

Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	2	Date:	03/17/16
Location:	60 MMBtu/hr Boiler #3 (S-17)	Barometric:	30.00	Leak ✓ :	OK
Observers:		Personnel:	JMc	Strat. ✓ :	OK
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
	Time									Comments:
	8:12	4.37		6.57	-0.72					
	8:13	4.37		6.53	-0.74					Unit [redacted]
	8:14	4.37		6.56	-0.74					
	8:15	4.38		6.53	-0.77					
	8:16	4.37		6.54	-0.77					Operating Conditions
	8:17	4.38		6.49	-0.78					
	8:18	4.38		6.53	-0.78					
	8:19	4.36		6.54	-0.77					Fuel [redacted]
	8:20	4.38		6.51	-0.77					
[redacted]	8:21	4.38		6.53	-0.78					
	8:22	4.37		6.53	-0.77					
	8:23	4.36		6.52	-0.79					
	8:24	4.38		6.48	-0.77					
	8:25	4.36		6.53	-0.77					
	8:26	4.37		6.51	-0.77					
	8:27	4.36		6.52	-0.77					
	8:28	4.35		6.54	-0.78					
	8:29	4.35		6.53	-0.78					
	8:30	4.39		6.46	-0.77					
[redacted]	8:31	4.35		6.53	-0.77					
	8:32	4.36		6.49	-0.78					
	8:33	4.38		6.43	-0.78					
	8:34	4.38		6.42	-0.78					
	8:35	4.36		6.47	-0.82					
	8:36	4.37		6.47	-0.86					
	8:37	4.36		6.47	-0.88					
	8:38	4.36		6.45	-0.88					
	8:39	4.36		6.45	-0.88					
	8:40	4.37		6.42	-0.87					
[redacted]	8:41	4.37		6.44	-0.86					
ZERO I	8:07	0.01		0.02	-0.07					
SPAN I	8:09	8.55		23.10	89.34					
Average		4.37		6.50	-0.79					
ZERO f	8:43	-0.01		-0.02	-0.24					
SPAN f	8:46	8.54		22.95	88.51					
Zero Drift %		-0.18%		-0.14%	-0.17%					
Span Drift %		-0.06%		-0.61%	-0.83%					
Corr. Avg.		4.37		6.51	-0.64					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]

Zero Drift % = 100 * (Zf - Zi)/Intrument Range

Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	3	Date:	03/17/16
Location:	60 MMBtu/hr Boiler #3 (S-17)	Barometric:	30.00	Leak ✓ :	OK
Observers:		Personnel:	JMc	Strat.✓ :	OK
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
Time										Comments:
	8:49	4.37		6.41	-0.87					
	8:50	4.35		6.44	-0.88					Unit #
	8:51	4.36		6.41	-0.88					
	8:52	4.35		6.43	-0.89					
	8:53	4.36		6.42	-0.88					Operating Conditions
	8:54	4.36		6.42	-0.88					
	8:55	4.37		6.37	-0.88					
	8:56	4.36		6.40	-0.87					Fuel
	8:57	4.35		6.42	-0.88					
	8:58	4.36		6.41	-0.88					
	8:59	4.38		6.37	-0.87					
	9:00	4.38		6.34	-0.87					
	9:01	4.36		6.40	-0.88					
	9:02	4.35		6.42	-0.89					
	9:03	4.36		6.41	-0.89					
	9:04	4.34		6.43	-0.94					
	9:05	4.36		6.39	-0.95					
	9:06	4.35		6.41	-0.95					
	9:07	4.35		6.44	-0.93					
	9:08	4.34		6.44	-0.97					
	9:09	4.35		6.40	-0.99					
	9:10	4.36		6.38	-0.97					
	9:11	4.37		6.36	-0.98					
	9:12	4.35		6.40	-0.98					
	9:13	4.37		6.36	-0.99					
	9:14	4.38		6.32	-0.99					
	9:15	4.36		6.38	-0.98					
	9:16	4.37		6.36	-0.98					
	9:17	4.36		6.39	-0.98					
	9:18	4.36		6.40	-0.99					
ZERO I	8:43	-0.01		-0.02	-0.24					
SPAN I	8:46	8.54		22.95	88.51					
Average		4.36		6.40	-0.93					
ZERO f	9:22	-0.01		-0.05	-0.39					
SPAN f	9:25	8.58		22.86	87.76					
Zero Drift %		-0.03%		-0.12%	-0.14%					
Span Drift %		0.39%		-0.37%	-0.76%					
Corr. Avg.		4.36		6.47	-0.62					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]
Zero Drift % = 100 * (Zf - Zi)/Intrument Range
Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	1	Date:	03/18/16
Location:	42 MMBtu/hr Boiler #4 (S-14)	Barometric:	30.00	Leak ✓ :	OK
Observers:		Personnel:	JMc	Strat. ✓ :	OK
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
Time										Comments:
	9:29	4.13		6.10	-1.29					
	9:30	4.13		6.17	-1.29					Unit
	9:31	4.14		6.15	-1.29					
	9:32	4.10		6.17	-1.29					
	9:33	4.12		6.18	-1.29					Operating Conditions
	9:34	4.10		6.27	-1.29					
	9:35	4.11		6.26	-1.29					
	9:36	4.13		6.19	-1.29					End
	9:37	4.12		6.19	-1.30					
	9:38	4.14		6.21	-1.31					
	9:39	4.14		6.24	-1.31					
	9:40	4.14		6.26	-1.29					
	9:41	4.12		6.31	-1.23					
	9:42	4.12		6.25	-1.29					
	9:43	4.13		6.23	-1.31					
	9:44	4.13		6.24	-1.29					
	9:45	4.12		6.23	-1.29					
	9:46	4.12		6.16	-1.29					
	9:47	4.10		6.21	-1.29					
	9:48	4.11		6.22	-1.29					
	9:49	4.10		6.29	-1.30					
	9:50	4.10		6.30	-1.29					
	9:51	4.12		6.28	-1.28					
	9:52	4.11		6.29	-1.28					
	9:53	4.12		6.24	-1.29					
	9:54	4.10		6.23	-1.31					
	9:55	4.12		6.25	-1.29					
	9:56	4.13		6.15	-1.34					
	9:57	4.13		6.13	-1.24					
	9:58	4.12		6.17	-1.29					
ZERO I	9:16	-0.04		-0.15	-0.68					
SPAN I	9:20	8.53		22.83	86.16					
Average		4.12		6.22	-1.29					
ZERO f	10:00	-0.05		-0.13	-0.68					
SPAN f	10:03	8.53		23.01	86.00					
Zero Drift %		-0.03%		0.06%	0.00%					
Span Drift %		-0.01%		0.72%	-0.16%					
Corr. Avg.		4.15		6.36	-0.63					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]
Zero Drift % = 100 * (Zf - Zi)/Intrument Range
Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	2	Date:	03/18/16
Location:	42 MMBtu/hr Boiler #4 (S-14)	Barometric:	30.00	Leak ✓ :	OK
Observers:		Personnel:	JMc	Strat.✓ :	OK
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
Time										Comments:
	10:06	4.13		6.31	-1.39					
	10:07	4.11		6.33	-1.37					Unit #
	10:08	4.13		6.24	-1.39					
	10:09	4.13		6.26	-1.38					
	10:10	4.11		6.31	-1.39					Operating Conditions
	10:11	4.12		6.27	-1.39					
	10:12	4.14		6.16	-1.39					
	10:13	4.13		6.22	-1.39					Fuel
	10:14	4.13		6.29	-1.39					
	10:15	4.13		6.27	-1.39					
	10:16	4.11		6.29	-1.39					
	10:17	4.13		6.21	-1.39					
	10:18	4.13		6.28	-1.39					
	10:19	4.11		6.30	-1.39					
	10:20	4.12		6.25	-1.39					
	10:21	4.11		6.31	-1.39					
	10:22	4.12		6.43	-1.39					
	10:23	4.12		6.46	-1.39					
	10:24	4.10		6.43	-1.39					
	10:25	4.13		6.33	-1.39					
	10:26	4.12		6.30	-1.39					
	10:27	4.12		6.30	-1.41					
	10:28	4.11		6.30	-1.38					
	10:29	4.13		6.23	-1.39					
	10:30	4.12		6.29	-1.39					
	10:31	4.11		6.29	-1.39					
	10:32	4.12		6.26	-1.40					
	10:33	4.12		6.30	-1.39					
	10:34	4.12		6.29	-1.39					
	10:35	4.13		6.28	-1.40					
ZERO I	10:00	-0.05		-0.13	-0.68					
SPAN I	10:03	8.53		23.01	86.00					
Average		4.12		6.29	-1.39					
ZERO f	10:37	-0.06		-0.14	-0.78					
SPAN f	10:40	8.52		22.78	85.60					
Zero Drift %		-0.11%		-0.03%	-0.10%					
Span Drift %		-0.04%		-0.91%	-0.40%					
Corr. Avg.		4.16		6.44	-0.69					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]
Zero Drift % = 100 * (Zf - Zi)/Intrument Range
Span Drift % = 100 * (Sf - Si)/Instrument Range

DAS CONTINUOUS EMISSIONS MONITORING DATA SHEET

Facility:	SFO	Run #:	3	Date:	03/18/16
Location:	42 MMBtu/hr Boiler #4 (S-14)	Barometric:	30.00	Leak ✓ :	OK
Observers:		Personnel:	JMc	Strat. ✓ :	OK
Expected Run Time =	30 min	Std. Temp:	70		

Cylinder #s: O2/CO CC58588 NOx CC432205

Analyte		O2		NOx	CO					
Analyzer		601P		600CLD	48C					
Range		10		25	100					
Span Value		8.55		23.06	90.20					
Time										Comments:
	10:43	4.12		6.30	-1.42					
	10:44	4.13		6.27	-1.46					Unit
	10:45	4.13		6.22	-1.42					
	10:46	4.13		6.19	-1.38					
	10:47	4.14		6.20	-1.39					Operating Conditions
	10:48	4.11		6.21	-1.46					
	10:49	4.10		6.23	-1.43					
	10:50	4.13		6.22	-1.39					Fuel
	10:51	4.12		6.35	-1.39					
	10:52	4.14		6.30	-1.44					
	10:53	4.13		6.32	-1.47					
	10:54	4.13		6.30	-1.50					
	10:55	4.11		6.34	-1.45					
	10:56	4.12		6.31	-1.48					
	10:57	4.11		6.32	-1.50					
	10:58	4.12		6.31	-1.47					
	10:59	4.12		6.33	-1.45					
	11:00	4.11		6.36	-1.46					
	11:01	4.13		6.33	-1.47					
	11:02	4.14		6.34	-1.49					
	11:03	4.15		6.27	-1.48					
	11:04	4.12		6.36	-1.49					
	11:05	4.12		6.35	-1.49					
	11:06	4.13		6.35	-1.50					
	11:07	4.12		6.35	-1.50					
	11:08	4.12		6.38	-1.49					
	11:09	4.12		6.39	-1.49					
	11:10	4.14		6.33	-1.50					
	11:11	4.14		6.29	-1.49					
	11:12	4.11		6.35	-1.48					
ZERO I	10:37	-0.06		-0.14	-0.78					
SPAN I	10:40	8.52		22.78	85.60					
Average		4.12		6.31	-1.46					
ZERO f	11:14	-0.07		-0.13	-0.79					
SPAN f	11:17	8.51		22.85	85.35					
Zero Drift %		-0.08%		0.04%	-0.01%					
Span Drift %		-0.11%		0.27%	-0.25%					
Corr. Avg.		4.17		6.47	-0.71					

Corrected Average = [Test Avg. - ((Zi+Zf) / 2)] * Span Gas Value / [((Si+Sf) / 2)-((Zi+Zf) / 2)]
Zero Drift % = 100 * (Zf - Zi)/Intrument Range
Span Drift % = 100 * (Sf - Si)/Instrument Range

Process Notes

Facility: SFO
Unit: —
Data Recorded By: Jm

Date: 3-17 + 18 - 2016
Condition: Normal Operation
Barometric: 30.00

Parameters → Time ↓	PSIG	°F Temp	SCF / CF	DATE		
Boiler #1		Stacks	[redacted]			
Run 1	9.6	70	42.5/100	3-18-16		
Run 2	9.6	70	43.0/100	"		
Run 3	9.6	70	42.5/100	"		
Boiler #2						
Run 1	11.8	70	51.75/100	3-17-16		
Run 2	11.8	70	50.0/100	"		
Run 3	11.8	70	49.0/100	"		
Boiler #3						
Run 1	11.8	70	16.5/100	"		
Run 2	11.8	70	16.5/100	"		
Run 3	11.8	70	16.75/100	"		
Boiler #4						
Run 1	11.6	70	27.0/100	3-18-16		
Run 2	11.6	70	26.5/100	"		
Run 3	11.6	70	26.5/100	"		

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22014

DocNumber: 000069385

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE PITTSBURG CA
1930 LOVERIDGE RD
PITTSBURG CA 945650

Praxair Order Number: 27822869
Customer P. O. Number: 05003301
Customer Reference Number:-

Fill Date: 7/17/2014
Part Number: NI CD12.5CO3EAS
Lot Number: 109419801
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu. ft

Certified Concentration:

Expiration Date:		7/21/2022	NIST Traceable
Cylinder Number:		CC58588	Analytical Uncertainty:
12.4	%	CARBON DIOXIDE	± 0.3 %
90.2	ppm	CARBON MONOXIDE	± 0.6 %
8.55	%	OXYGEN	± 1.1 %
	Balance	NITROGEN	

Certification Information: *Certification Date:* 7/21/2014 *Term:* 96 Months *Expiration Date:* 7/21/2022

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

CO and O2 responses have been corrected for CO2 interference.

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON DIOXIDE

Requested Concentration: 12.5 %
Certified Concentration: 12.4 %
Instrument Used: Horiba VIA-510 S/N 2807014
Analytical Method: NDIR
Last Multipoint Calibration: 7/9/2014

Reference Standard Type: GMIS
Ref Std Cylinder # : CC207040
Ref. Std. Conc: 9.99%
Ref. Std. Traceable to SRM # : 1674b
SRM Sample # 7-H-07
SRM Cylinder # : FF10631

First Analysis Data: Date: 7/21/2014

Z:	0	R:	10	C:	12.42	Conc:	12.412
R:	9.99	Z:	0	C:	12.42	Conc:	12.412
Z:	0	C:	12.42	R:	10	Conc:	12.412

UOM: % Mean Test Assay: 12.412 %

Second Analysis Data: Date:

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % Mean Test Assay: 0 %

2. Component: CARBON MONOXIDE

Requested Concentration: 90 ppm
Certified Concentration: 90.2 ppm
Instrument Used: Horiba VIA-510, S/N 577172043
Analytical Method: NDIR
Last Multipoint Calibration: 7/3/2014

Reference Standard Type: GMIS
Ref. Std. Cylinder # : EB0020670
Ref. Std. Conc: 99.82 ppm
Ref. Std. Traceable to SRM # : 1679c
SRM Sample # : 3-J-30
SRM Cylinder # : CAL017865

First Analysis Data: Date: 7/21/2014

Z:	0	R:	99.8	C:	90.2	Conc:	90.218
R:	99.8	Z:	0	C:	90.2	Conc:	90.218
Z:	0	C:	90.2	R:	99.8	Conc:	90.218

UOM: ppm Mean Test Assay: 90.218 ppm

Second Analysis Data: Date:

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: ppm Mean Test Assay: 0 ppm

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

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22014

DocNumber: 000069385

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

3. Component: OXYGEN

Requested Concentration: 8 5 %
Certified Concentration: 8 55 %
Instrument Used: OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 6/23/2014

Reference Standard Type: GMIS
Ref Std. Cylinder # CC240893
Ref Std Conc: 10 00%
Ref. Std. Traceable to SRM # : 2658a
SRM Sample # : 72-28-B
SRM Cylinder # : CLM-006896

First Analysis Data: Date: 7/21/2014

Z:	0	R:	10	C:	8 54	Conc:	8.543
R:	10	Z:	0	C:	8 55	Conc:	8 553
Z:	0	C:	8.54	R:	9.99	Conc:	8 543

UOM: % Mean Test Assay: 8 546 %

Second Analysis Data: Date:

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % Mean Test Assay: 0 %

Analyzed by: Ying Yu

Certified by: Jack Fu (Jack Fu)

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

Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Airgas Specialty Gases
525 North Industrial Loop Road
Tooele, UT 84074
435-241-5662 Fax: 435-241-5664
Airgas.com

Part Number:	E02NI99E15AC0Q1	Reference Number:	153-124539274-1
Cylinder Number:	CC432205	Cylinder Volume:	144.3 CF
Laboratory:	ASG - Tooele - UT	Cylinder Pressure:	2015 PSIG
PGVP Number:	B72016	Valve Outlet:	660
Gas Code:	NO,NOX,BALN	Certification Date:	Feb 23, 2016

Expiration Date: Feb 23, 2019

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. 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 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	23.00 PPM	23.06 PPM	G1	+/- 1.4% NIST Traceable	02/16/2016, 02/23/2016
NITRIC OXIDE	23.00 PPM	22.85 PPM	G1	+/- 0.7% NIST Traceable	02/16/2016, 02/23/2016
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	1	CC344691	20.23 PPM NITRIC OXIDE/NITROGEN	0.19	Apr 27, 2018
NTRM	1	CC344691-NOX	20.28 PPM NOx/NITROGEN	0.9	Apr 27, 2018

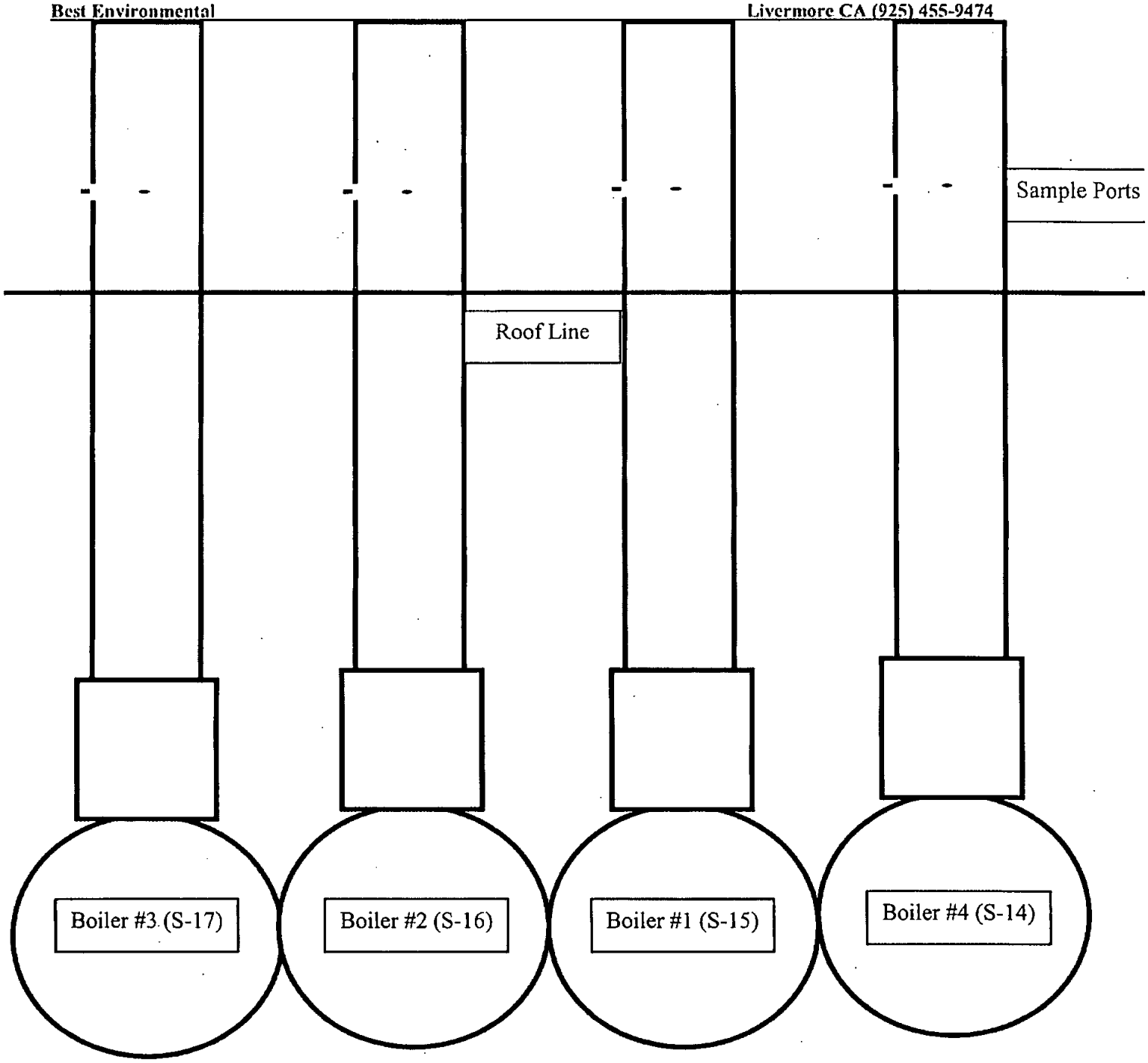
ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Thermo 42i-LS 1123749327 NO	Chemiluminescence (Mason)	Feb 11, 2016
Thermo 42i-LS 1123749327 NOx	Chemiluminescence (Mason)	Feb 11, 2016

Triad Data Available Upon Request

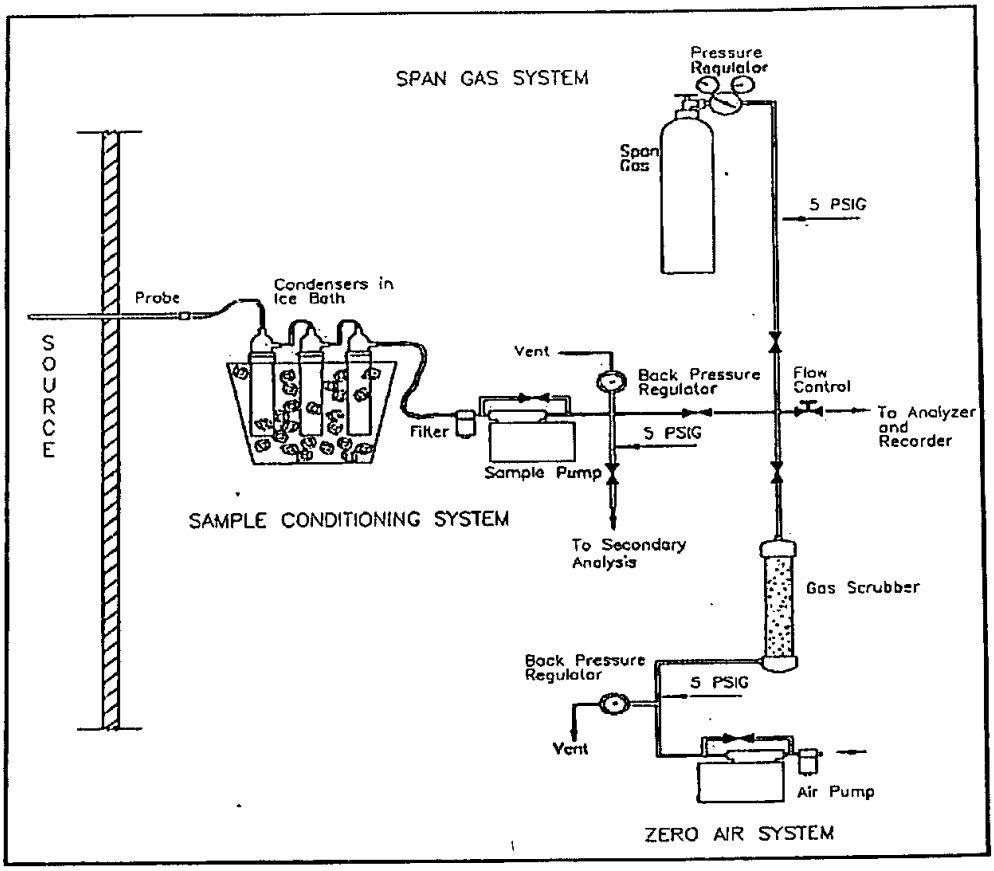
Approved for Release

C-4



FACILITY	**SFO**	Unit Identification	**Boilers 1 thru 4**
Stack Diameter	**36 "**	Dia. Downstream from disturbance	**> 4**
# of Ports	**2**	Dia. Upstream from disturbance	**> 2**
Port I.D.	**3"**		
Port Length	**3"**		

BAAQMD CEM Sampling System



APPENDIX F
SOURCE TEST NOTIFICATION

Submit by Email

Source Test Notification--abbreviated format

MST- 4092

Site number	1784
Plant Name	San Francisco International Airport
Plant contact name	Abram Mission
Plant contact phone	650-821-7788
Testing company	Best Environmental
Testing company contact name	Regan Best
Testig company contact phone	925 455-9474 x 102
Purpose of testing (ie compliance, RATA, FAT, permit condition ID no., etc.)	Compliance

Source(s) and/or abatement device(s) being tested [S-/A-]

S-14	S-15	S-16	S-17		

Description of source(s) and/or abatement device(s)

40 MMBtu/hr Boiler	25 MMBtu/hr Boiler	25 MMBtu/hr Boiler	50 MMBtu/hr Boiler		

Parameters being measured

- [x] NOx
- [x] CO
- [ ] SOx
- [ ] NMOC
- [ ] VOC
- [ ] POC
- [ ] HC Speciation/Other
- [ ] Filterable PM
- [ ] PM10, 2.5, 1.0
- [ ] Condensable PM
- [x] Other

Other: O2, Outlet Flow

Methods to be used (ie EPA method nos., CARB method nos., BAAQMD ST-nos.

- ( ) EPA 7 ( ) ARB 7 (•) ST-13A ( ) NA
- ( ) EPA 10 ( ) ARB 10 (•) ST-6 ( ) NA
- [ ] EPA 6 [ ] EPA 8 [ ] ARB100 [ ] ST-19A
- [ ] EPA 18 [ ] EPA 25A [ ] TO-14A [ ] ST-7
- [ ] EPA 5 [ ] EPA 201 [ ] EPA 202

Other Methods: BAAQMD ST-14, EPA Method 19

Planned deviations from standard protocols:

Test Dates: March 17 & 18, 2016

F-2

Best Environmental

From: "Tim Underwood" <tunderwood@baaqmd.gov>
Date: Wednesday, March 09, 2016 10:29 AM
To: "Jessica Ortiz" <bestair@sbcglobal.net>
Cc: <abram.mission@flysfo.com>
Subject: NST-4092: SFO 4 Blrs_data.xml

NST-4092 has been assigned the pending 3/17-3/18 work referenced below.

From: Jessica Ortiz [mailto:bestair@sbcglobal.net]
Sent: Tuesday, March 08, 2016 2:30 PM
To: Tim Underwood
Cc: abram.mission@flysfo.com
Subject: SFO 4 Blrs_data.xml

Hi Tim,

Attached is the notification for SFO.

If you have any questions please feel free to call.

With Regards,

Jessica Ortiz
Best Environmental
925/455-9474 x 100
http://www.bestenvironmentalonline.com/

This message is confidential and may be legally privileged. Only the addressees and their agents may use, copy or disclose it. If you have received the message in error, please delete it and advise the sender by reply e-mail. We apologize for the inconvenience. Thank you very much.

APPENDIX G
PERMIT TO OPERATE
OR
AUTHORITY TO CONSTRUCT

VI. Permit Conditions

The owner/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:

a. Whenever there is a school sponsored activity (if the engine is located on school grounds)
b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.

"School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, athletic field, or other areas of school property but does not include unimproved school property. [Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection(e)(2)(A)(1)] or (e)(2)(B)(2)]

Condition # 24638

1. Within 90 days of startup of emergency standby diesel generator sets (S-680 and S-710), the owner /operator shall shut down and surrender the operating permits for Boarding Area D Generators (S-310 and S-370). [Basis: Regulations 2-2-302 and 2-2-410]

Condition # 24716

S14 – High Temperature Hot Water Generator
S15 – High Temperature Hot Water Generator

1. When firing with natural gas, the owner/operator shall not exceed the following* emissions limits of NOx and CO, in ppmdv at 3% O2:

	NOx	CO
S-14	9	50
S-15	9	50

*The NOx limit is the more stringent of the two.
[Basis: BACT]

VI. Permit Conditions

2. When firing with fuel oil, the owner/operator shall not exceed the following NOx and CO emissions in ppmdv at 3% O2:

	NOx	CO
S-14	100	50
S-15	100	50

[Basis: BACT]

3. When firing with natural gas, the owner/operator shall not allow the total combined heat input of S-14, and S- 15 to exceed 4,500,000 therms in any consecutive 12-month period. [Basis: Cumulative Increase]

4. The owner/operator shall record the combined usage of each fuel and total the monthly records for each fuel every rolling 12-month period. Records shall be kept at least 5 years from the date of entry and made available to the District staff upon request. [Basis: Cumulative Increase]

5. Deleted. (S-13 removed from service 5/19/11)

6. The owner/operator shall keep the certification records for the sulfur content of the fuel oil by the vendor. [Basis: Regulation 2-6-409.2]

7. The owner/operator shall check for visible emissions after the combined usage of 1000 gallons of fuel oil. The visible emissions check shall take place during daylight hours, while the equipment is operating. If any visible emissions are detected, the operator shall take corrective action within one week, and check for visible emissions after corrective action is taken. If no visible emissions are detected, the operator shall continue to check for visible emissions at the same frequency. All incidents of visible emissions monitoring and any resulting corrective actions shall be recorded in a District approved log and kept for a 5 years from the date of entry. [Basis: Regulation 2-6-409.2]

8. Deleted. (S-7 removed from service 5/10/10)

9. Deleted. (S-11 removed from service 6/7/08)

VI. Permit Conditions

Condition # 25080

S16 – High Temperature Hot Water Generator
S17 – High Temperature Hot Water Generator

1. The owner/operator shall fire exclusively natural gas fuel at sources S-16 and S-17. (basis: Cumulative Increase)

2. The owner/operator shall not exceed the total heat input of 1,217,260 therms at source S-16 and 1,208,390 therms at source S-17 during any consecutive 12 month period. Total heat input to sources S-14, S-15, S-16 and S-17 shall not exceed 1,560 therms per hour. (basis: Cumulative Increase)

3. To determine compliance with the part 2, the owner/operator of S-16 and S-17 shall install a dedicated non-resettable totalizing natural gas meters for each source and shall maintain the monthly records of natural gas consumption in a District approved log. These logs shall be kept for at least 5 years and shall be made available to the District upon request. (basis: Cumulative Increase)

4. The owner/operator of each source S-16 and S-17 shall not allow NOx emissions, calculated as NO2, at the stack outlets to exceed 9 ppmvd @ 3% oxygen while operating at 25% to 100% full load range. (basis: Cumulative Increase, BACT)

5. The owner/operator of each source S-16 and S-17 shall not allow CO emissions at the stack outlets to exceed 50 ppmvd @ 3% oxygen while operating at 25% to 100% full load range. (basis: Cumulative Increase, BACT)

6. (A/C startup source test condition deleted.)

7. The owner/operator of S-16 and S-17 shall perform a District approved source test once every two years to demonstrate compliance with Parts 4 and 5, and the results of these tests shall be submitted to the District's Source Test Section for review and disposition. (basis: Cumulative Increase, BACT, Regulation 2-1-403)

ATTACHMENT 5

List and Compliance Status of the New Sources not included in Tables IV and VII of the Title V permit

Source No.	Description	Conditions	April1, 2017 through September 30, 2017 Compliance Status
730	BAE A: Emergency Standby Generator	22850	CC
740	Bldg. 632: Emergency Standby Generator	22850	CC
750	BAE B: Emergency Standby Generator	22850	CC
1001	60 S McDonnell Emergency Standby Generator	22834	CC
1002	60 S McDonnell Emergency Standby Generator	22834	CC
1003	60 S McDonnell Emergency Standby Generator	22834	CC
1004	60 S McDonnell Emergency Standby Generator	22834	CC
1010	1057 N access Rd Emergency Standby Generator	22850	CC
3	Firehouse #3 Emergency Standby Generator	100072, 100073	CC