EVALUATION REPORT FOR PERMIT TO CONSTRUCT

Applicant's Name: FOAM FABRICATORS Facility ID: 012876

Mailing Address: 1810 SOUTH SANTA FE AVENUE
COMPTON, CALIFORNIA 90221-5319

Equipment Location: SAME

EQUIPMENT DESCRIPTION

Appl. No. 536804

Modification to the existing boiler (P/O G14734 A/N: 502401), by:

The Removal of:
- 12.247 MMBtu Burner

And the Addition of:
- 12.553 MMBtu Ultra Low NOx Burner

BOILER, CLEAVER BROOKS, FIRE TUBE TYPE, MODEL NO. CB-17000-300-150, SERIAL NO. OL-097448, ~~**12,247,000 BTU PER HOUR, NATURAL GAS FIRED,**~~ WITH A ~~**CLEAVER BROOKS, CB-17000-300-150**~~ LOW NOX BURNER, ***WEBSTER, MODEL NO. HDRMB 13G-300-LMV51-NFPA85, 12.553 MMBTU/HR, NATURAL GAS FIRED,*** ~~**WITH**~~ ***AND*** A FLUE GAS RECIRCULATION SYSTEM.

After these modifications, the permit will be read as follows:

BOILER, CLEAVER BROOKS, FIRE TUBE TYPE, MODEL NO. CB-17000-300-150, SERIAL NO. OL-097448, WITH A LOW NOX BURNER, WEBSTER, MODEL NO. HDRMB 13G-300-LMV51-NFPA85, 12.553 MMBTU/HR, NATURAL GAS FIRED, AND A FLUE GAS RECIRCULATION SYSTEM.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
   [RULE 204]

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
   [RULE 204]

3. THIS EQUIPMENT SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF RULE 1146.
[RULE 1146]

4. THIS EQUIPMENT SHALL EMIT NO MORE THAN 9 PPM OF OXIDES OF NITROGEN (NOX), CALCULATED AS NO_2, AND NO MORE THAN 50 PPM OF CARBON MONOXIDE (CO), ALL MEASURED BY VOLUME ON A DRY BASIS AT 3% O_2.
[Rule 1146; Rule 1303 (a)(1)-BACT]

5. THE TOTAL AMOUNT OF NATURAL GAS CONSUMED SHALL NOT EXCEED 4,800,240 STANDARD CUBIC FEET DURING EACH CALENDAR MONTH.
[RULE 1303(b)(2)-OFFSET]

6. THE OPERATOR SHALL INSTALL AND MAINTAIN IN SERVICE A NON-RESETTABLE TOTALIZING FUEL METER FOR THE FUEL BEING SUPPLIED TO THIS EQUIPMENT.
[RULE 1303(b)(2)-OFFSET; 40 CFR 60.48c(g)(2)]

7. THE OPERATOR SHALL MAINTAIN ADEQUATE RECORDS TO VERIFY COMPLIANCE WITH CONDITION NO. 5, ABOVE. THE RECORDS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

   A. MONTHLY NATURAL GAS METER READING
   B. MONTHLY NATURAL GAS CONSUMPTION IN STANDARD CUBIC FEET (SCF)
   C. TIME AND DATE OF THE GAS METER READING
   D. THE NAME OF THE PERSON RECORDING THE DATA

   ALL RECORDS SHALL BE MAINTAINED FOR A PERIOD OF FIVE (5) YEARS AND MADE AVAILABLE TO THE EXECUTIVE OFFICER OR HIS REPRESENTATIVE UPON REQUEST.

   [Rule 1303(b)(2)-OFFSET; Rule 3004(a)(4)-Periodic Monitoring]

8. THE OPERATOR SHALL RECORD AND MAINTAIN RECORDS OF THE AMOUNT OF NATURAL GAS CONSUMED DURING EACH CALENDAR MONTH. ALL RECORDS SHALL BE MAINTAINED FOR A PERIOD FOR TWO (2) YEARS AND MADE AVAILABLE TO THE EXECUTIVE OFFICER OR HIS REPRESENTATIVE UPON REQUEST.
[40 CFR 60.48c(g)(2)]

Periodic Monitoring:

9. THE OWNER OR OPERATOR OF THIS EQUIPMENT SHALL CONDUCT SOURCE TESTS UNDER THE FOLLOWING CONDITIONS:

A. THE SOURCE TESTS SHALL BE CONDUCTED NO LATER THAN 180 DAYS AFTER THE INITIAL START-UP OF THIS EQUIPMENT UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT.

B. THE SOURCE TESTS SHALL BE CONDUCTED ONCE EVERY THREE YEARS.

C. THE SOURCE TESTS SHALL BE CONDUCTED TO VERIFY COMPLIANCE WITH THE NOX AND CO EMISSION LIMITS SPECIFIED IN CONDITION NO. 3, ABOVE.

D. SOURCE TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH SCAQMD METHOD 100.1.

E. THE TESTS SHALL BE CONDUCTED WHILE THE BOILER IS OPERATING AT MAXIMUM, MINIMUM AND NORMAL FIRING RATES. THE SAMPLING TIMES SHALL BE AT LEAST 15 CONSECUTIVE MINUTES FOR MAXIMUM AND MINIMUM LOADS AND AT LEAST 30 CONSECUTIVE MINUTES FOR NORMAL OPERATING LOAD.

F. TWO COMPLETE COPIES OF THE SOURCE TEST REPORTS SHALL BE SUBMITTED TO THE DISTRICT (ADDRESSED TO SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, ATTN: STEPHEN JIANG, P.O. BOX 4941, DIAMOND BAR, CA 91765) WITHIN 45 DAYS AFTER THE SOURCE TESTING DATE. THE SOURCE TEST REPORT SHALL INCLUDE, BUT MAY NOT BE LIMITED TO, EMISSIONS RATE IN POUNDS PER HOUR AND CONCENTRATION IN PPMV AT THE OUTLET OF THE BOILER.

G. A TESTING LABORATORY CERTIFIED BY THE CALIFORNIA AIR RESOURCES BOARD IN THE REQUIRED TEST METHODS FOR CRITERIA POLLUTANTS TO BE MEASURED, AND IN COMPLIANCE WITH DISTRICT RULE 304 (NO CONFLICT OF INTEREST) SHALL CONDUCT THE TEST.

H. SAMPLING FACILITIES SHALL COMPLY WITH THE DISTRICT GUIDELINES FOR CONSTRUCTION OF SAMPLING AND TESTING FACILITIES, PURSUANT TO RULE 217.

[RULE 1146; RULE 1303(a)(1)-BACT]

Emissions And Requirements:

10. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

CO: 2000 PPM, RULE 407
CO: 400 PPM, RULE 1146
NOX: 9 PPM, RULE 1146
PM: 0.1 GR/SCF, RULE 409
PM: RULE 404, SEE APPENDIX B FOR EMISSION LIMITS.

Appl. No. 536808 – Minor Title V Facility Permit Revision

Revision of Title V Facility Permit per Rule 301(m)(7).

BACKGROUND/HISTORY

Foam Fabricators manufactures expanded polystyrene (EPS) foam products at its facility in Compton, California. Foam Fabricators currently operates polystyrene foam expansion/molding systems and one boiler. The VOC emissions from the polystyrene foam expansion/molding systems are controlled by a regenerative thermal oxidizer.

Foam Fabricators facility type:

RECLAIM		Title V
SOx	NOx	
No	No	Yes

Foam Fabricators is a Title V facility. The existing Title V Permit for the facility will expire on August 24, 2016.

On May 15, 2012, Foam Fabricators submitted the following permit applications:

Appl. No.	Type	Previous P/O	Equipment	Fee Sch.	Expedited?
536804	Modification	G14734	12.553 MMBtu/hr Boiler	Sch. C	Yes
536808	Plan	N/A	N/A	Title V Rev.	N/A

Appl. No. 536804 is submitted to replace the burner per approved Rule 1146 Compliance Plan for Foam Fabricators (see attached AQMD approval letter dated June 9, 2011, plan application no. 517166). According to the approved Rule 1146 Compliance Plan, Foam Fabricators shall come into compliance with NOx emission limit of 9 ppm or less on or before January 1, 2013. No emission increase is expected.

Appl. No. 536808 is submitted as a plan application for the minor revision of the Title V permit as specified in Rule 301.

PROCESS DESCRIPTION

This boiler is used to generate steam/heat for the EPS shape molding process. The boiler currently is equipped with one Cleaver Brooks Low NOx burner and a flue gas recirculation system.

The Cleaver Brooks Fire Tube boiler will be retrofitted with new Webster HDRMB burner. The new Webster HDRMB burner utilizes the rapid mix burner technology to achieve Ultra Low NOx Emissions (sub 9 PPM). The manufacturer guarantees the following emissions while firing natural gas fuel:

- < 9 PPM NOx corrected to 3% O_2 across the entire firing range.
- < 50PPM CO across the entire firing range.

EMISSION CALCULATIONS

PRE-MODIFICATION (EXISTING BOILER) EMISSIONS

Emission Factors

$$\text{Emission}_{\text{ROG,SOX,PM10}}\ (\text{lb/MMBtu}) = EF_{ROG,SOX,PM10}\left(\frac{lb}{MMscf}\right) x \frac{1MMscf}{1050MMBtu}$$

$$\text{Emission}_{\text{NOX, CO}}(\text{lb/MMBtu}) = \frac{MW\ x\ N_{@\ 3\%O_2}\ x\ ppm}{H}$$

Where: H= Heating value of fuel (Btu/lb) (for natural gas= 23,440 btu/lb)
$N_{@3\%O2}$= 0.618 mole of dry gas per lb of natural gas.
MW= Molecular weight (lb/lb-mole)

Emission Factor Summary - Natural Gas

Pollutant	Emission Factor (from manufacturer) ppmV @ 3% O2	Emission Factor (AQMD Default) lb/mmscf	Emission Factor (for this report) lb/MMBtu
VOC	-	5.5	0.00524
SOx	-	0.6	0.000571
PM10	-	7.6	0.00724
NOx	30	-	0.0364
CO	400	-	0.2953

AQMD Default emission factors for a natural gas fired boiler were taken from "General Instruction Book for the AQMD 2006-2007 Annual Emission Reporting Program", Appendix A- Table 1):

Operating Schedule: 24 hrs/day; 7 days/week; 52 weeks/yr
Exist. Boiler Rating: 12.247 MMBtu/hr
Natural Gas Usage Limit: 160,008 scf/day

Emission Summary for the Pre-Modification Boiler

		Hourly (lb/hr)	Daily (lb/day)	Annually (lb/yr)	30 day ave. (lb/day)
R1=R2	**VOC**	0.0642	0.88	320.34	0.89
R1=R2	**SOx**	0.00700	0.10	34.95	0.10
R1=R2	**PM10**	0.0886	1.22	442.65	1.23
R1=R2	**NOX**	0.4456	6.11	2,225.06	6.18
R1=R2	**CO**	3.616	49.61	18,058.48	50.16

POST-MODIFICATION (NEW BURNER BOILER) EMISSIONS

Emission Factor Summary - Natural Gas

Pollutant	Emission Factor (from manufacturer) ppmV @ 3% O2	Emission Factor (AQMD Default) lb/mmscf	Emission Factor (for this report) lb/MMBtu
VOC	-	5.5	0.00524
SOx	-	0.6	0.000571
PM10	-	7.6	0.00724
NOx	9	-	0.0109
CO	50	-	0.0369

Operating Schedule: 24 hrs/day; 7 days/week; 52 weeks/yr
New Burner Rating: 12.553 MMBtu/hr
Natural Gas Usage Limit: 4,800,240 scf/mo

Emission Summary for the Post-Modification Boiler

		Hourly (lb/hr)	Daily (lb/day)	Annually (lb/yr)	30 day ave. (lb/day)
R1=R2	**VOC**	0.0658	1.58	316.82	0.88
R1=R2	**SOx**	0.00717	0.17	34.56	0.10
R1=R2	**PM10**	0.0909	2.18	437.78	1.22
R1=R2	**NOX**	0.1370	3.29	660.18	1.83
R1=R2	**CO**	0.463	11.12	2,232.50	6.20

EMISSION CHANGE

VOC: 0.88 lb/day – 0.89 lb/day = -0.01 lb/day ..... **Reduction**
SOx: 0.10 lb/day – 0.10 lb/day = 0lb/day ..... **No Change**
PM10: 1.22 lb/day – 1.23 lb/day = -0.01 lb/day ..... **Reduction**
NOx: 1.83 lb/day – 6.18 lb/day = -4.35 lb/day ..... **Reduction**
CO: 6.20 lb/day – 50.16 lb/day = -43.96 lb/day ..... **Reduction**

EMISSION SUMMARY

		Hourly (lb/hr)	Daily (lb/day)	Annually (lb/yr)	30 day ave. (lb/day)	30 day NSR (lb/day)
R1=R2	VOC	0.0658	1.58	316.82	0.88	1
R1=R2	SOx	0.00717	0.17	34.56	0.10	0
R1=R2	PM10	0.0909	2.18	437.78	1.22	1
R1=R2	NOX	0.1370	3.29	660.18	1.83	2
R1=R2	CO	0.463	11.12	2,232.50	6.20	6

Hourly (lbs/hr) = (Emission Factor, lbs/MMBtu) (12.553 MMBtu/hr)
Daily (lbs/day) = (Hourly, lbs/hr) (24 hrs/day)
30 day-ave. = (Emission Factor, lbs/MMBtu) (1,050 MMBtu/MMscf) (Monthly Limit, MMscf/mo) / (30day/mo)
Annually (lbs/yr) = (30 day-ave) (30 day/mo) (12 mo/yr)

RULE 407 CALCULATIONS:

$$\text{SOX (ppm)} = \frac{R_1}{\frac{Q(btu/hr)}{H(btu/lb)} \times MW \times N_{@3\%O_2}}$$

Where : Q= maximum, rated input (Btu/hr)=10,206,000 Btu/hr
H= Heating value of fuel (Btu/lb) (for natural gas= 23,440 btu/lb)
$N_{@3\%O2}$= 0.618 mole of dry gas per lb of fuel.

$$SO_X \text{ (ppm)} = \frac{0.00717\,lb/hr}{\frac{12{,}553{,}000\,btu/hr}{23{,}440\,btu/lb} \times 64\frac{lb}{mol} \times 0.618\frac{mol}{lb}} = 0.34\,ppm$$

RULE 409 CALCULATIONS:

AQMD Default PM_{10} emission factor = 7.6 lb/mmscf

PM_{10} Concentration = (7.6 lb/mmscf) (7,000 grains/lb) / (1,000,000 scf/mmscf)
= 0.0532 grains/ft^3

RULES AND REGULATIONS EVALUATION

40 CFR Subpart Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

§ 60.40c Applicability and delegation of authority.

The subject boiler is rated at 12.553 MMBtu/hr (between 10 and 100 MMBtu/hr) and first applied for a permit on 3/24/1998 (after June 9, 1989); thus, this boiler is subject to this rule.

§ 60.48c Reporting and recordkeeping requirements.

(g)(2) – The operator shall record and maintain records of the amount of fuel combusted during each calendar month. A permit condition is added to the permit, compliance is achieved.

(i) – All records required under this rule shall be maintained by the owner or operator of the affected facility for a period of two years following the date of such record. A permit condition is added to the permit, compliance is achieved.

Rule 212: **Standards for Approving Permits** – The facility is not located within 1,000 feet of a K-12 school (a map is attached). In addition, no emission increase is associated with the administrative change application. A Public Notice is not required.

Rule 401: **Visible Emissions** – Compliance is expected from well maintained and properly operated equipment.

Rule 402: **Public Nuisance** – With proper operation and maintenance, the equipment is not likely to create a public nuisance.

Rule 1146: **Emissions of NO_x from Industrial, Institutional, and Commercial Boilers:**

The new boiler burner is rated at 12.553 MMBtu/hr; thus, it is a Group III unit.

(c)(1)(A) limits the NOx emissions from this boiler at 30 ppmv @ 3% O_2. The manufacturer guarantees the unit will achieve 9 ppmv NO_x @ 3% O_2, which is lower than the 30 ppmv NO_x requirements of the rule. Compliance is expected.

(c)(1)(I) limits the NOx emissions from this boiler at 9 ppmv @ 3% O_2 after January 1, 2013. The manufacturer guarantees the unit will achieve 9 ppmv NO_x @ 3% O_2. Compliance is expected.

(c)(4) limits the CO emissions from this boiler at 400 ppmv @ 3% O_2. The manufacturer guarantees the unit will achieve 50 ppmv CO @ 3% O_2. Compliance is expected.

(d)(6) requires this boiler to be tested for NOx emissions once every three years.

(d)(9) requires this boiler to be tested for CO emissions once every three years.

A source test will be performed to verify compliance with this rule.

Rule 1303: BACT

Following are BACT guidelines for the boiler:

	Criteria Pollutants				
Subcategory/ Rating/Size	**VOC**	**NO_X**	**SO_X**	**CO**	**PM_{10}**
Natural Gas or Propane Fired, < 20 MMBtu/HR		≤ 12 ppmv dry corrected to 3% O_2 (10-20-2000)	Natural Gas (10-20-2000)	≤50 ppmv for firetube type, ≤ 100 ppmv for watertube type, dry corrected to 3% O2 (04-10-98)	Natural Gas (04-10-98)

NOx emissions - The manufacturer guarantees the unit will achieve 9 ppmv NO_x @ 3% O_2. Compliance with BACT is expected.

CO emissions – The boiler is a fire-tube type. The manufacturer guarantees the unit will achieve 50 ppmv CO @ 3% O_2. Compliance with BACT is expected.

A source test will be performed to verify compliance with this rule.

Rule 1303(b)(1): Modeling: The NOx, CO and PM10 emissions from this equipment are below the rule limits (specified in the table A1). Therefore, no further screening analysis is required.

	Actual emission for the boiler (lb/hr)	Allowable Emission (lb/hr)
NOx	0.137	0.86
CO	0.463	47.3
PM10	0.091	5.2

Rule 1303(b)(2): Offsets: Offsets are not required for this facility since the criteria contaminant emissions will not exceed the limits in table A (rule 1304(d))

	VOC (lb/day)	PM10 (lb/day)	NOX (lb/day)	CO (lb/day)	SOX (lb/day)
Current NSR (PTE)	**153**	**1**	**9**	**50**	**0**
536804 – Boiler Burner Replacement	**-0.01**	**-0.01**	**-4.35**	**-43.96**	**+0**
Total PTE	**152.99**	**0.99**	**5.65**	**6.04**	**0**
Threshold limit	**22**	**22**	**22**	**159**	**22**
Offset required	**0**	**0**	**0**	**0**	**0**

Reg XXX: Title V Permit

Foam Fabricators (Facility ID: 12876) is a Title V facility. The current Title V Permit for the facility will expire on August 24, 2016.

Application no. 536804 is to replace the burner per approved Rule 1146 Compliance Plan for Foam Fabricators (see attached AQMD approval letter dated June 9, 2011, plan application no. 517166). According to the approved Rule 1146 Compliance Plan, Foam Fabricators shall come into compliance with NOx emission limit of 9 ppm or less on or

before January 1, 2013. No emission increase is expected for this application. Therefore, application no. 536804 is considered Minor Permit Revisions of Title V Facility Permit and it is subject to a 45-day EPA review prior to final revision of the Title V Facility Permit (Application No. 536808).

CONCLUSION AND RECOMMENDATIONS

Based on this evaluation, it is expected that the subject equipment will be operated in compliance with all applicable District Rules and Regulations. The Permit to Construct is recommended to be issued.