

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION APPLICATION PROCESSING AND CALCULATIONS	PAGE 1	PAGES 4
	APPL. NO. PC 481054-58.doc	DATE 5/20/2008
	PROCESSOR MFN	REVIEWER DR/HW

PERMIT TO CONSTRUCT ANALYSIS

FACILITY MAILING ADDRESS

CARLTON FORGE WORKS
7743 E. ADAMS STREET
PARAMOUNT, CA 90723

(ID: 022911 NOx RECLAIM Cycle 2 - TITLE V)

EQUIPMENT LOCATION

SAME AS ABOVE

EQUIPMENT DESCRIPTION

APPLICATION NO. 481055 - PERMIT TO CONSTRUCT

PROCESS 1: HEAT TREATING

(D182) FURNACE, NO. 432, CARLTON FORGE WORKS, CUSTOM BUILT, METAL FORGING, SIX ECLIPSE LOW NO_x BURNERS, MODEL NO. FN0100, 6,000,000 BTU PER HOUR TOTAL, NATURAL GAS FIRED.

APPLICATION NO. 481056 - PERMIT TO CONSTRUCT

PROCESS 1: HEAT TREATING

(D184) FURNACE, NO. 433, CARLTON FORGE WORKS, CUSTOM BUILT, METAL FORGING, SIX ECLIPSE LOW NO_x BURNERS, MODEL NO. FN0100, 6,000,000 BTU PER HOUR TOTAL, NATURAL GAS FIRED.

APPLICATION NO. 481057 - PERMIT TO CONSTRUCT

PROCESS 1: HEAT TREATING

(D186) FURNACE, NO. 434, CARLTON FORGE WORKS, CUSTOM BUILT, METAL FORGING, SIX ECLIPSE LOW NO_x BURNERS, MODEL NO. FN0100, 6,000,000 BTU PER HOUR TOTAL, NATURAL GAS FIRED.

APPLICATION NO. 481058 - PERMIT TO CONSTRUCT

PROCESS 1: HEAT TREATING

(D188) FURNACE, NO. 435, CARLTON FORGE WORKS, CUSTOM BUILT, METAL FORGING, SIX ECLIPSE LOW NO_x BURNERS, MODEL NO. FN0100, 6,000,000 BTU PER HOUR TOTAL, NATURAL GAS FIRED.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION APPLICATION PROCESSING AND CALCULATIONS	PAGE 2	PAGES 4
	APPL. NO. PC 481054-58.doc	DATE 5/20/2008
	PROCESSOR MFN	REVIEWER DR/HW

APPLICATION NO. 481054 - FACILITY PERMIT MODIFICATION

HISTORY

Application No. 481054 was filed on April 17, 2008, for a RECLAIM/Title V Facility permit modification. Application Nos. 481055-481058 were filed on April 17, 2008, for permits to construct under provisions of Rule 301(u)(1).

There was no compliance activity found in District records (CLASS computer database) for the past 2 years for Carlton Forge Works.

PROCESS DESCRIPTION

Carlton Forge Works (CFW) primarily forges billet from exotic metals to specific shapes and rolled rings, primarily for the aerospace industry.

The proposed furnaces will be used to forge ferrous and non-ferrous metals and will enable CFW to more efficiently process materials while reducing overall emissions.

The metal may be loaded into either a cold or hot furnace. After the temperature is completely soaked through, the metal is removed from the furnace for the forging process. There may be more than one heating cycle per day depending on the materials to be forged, quantity of pieces and forging temperature.

EVALUATION

Given:

Operating Schedule – 16 hrs/day, 6 days/wk, 50 weeks/yr (Typical)

24 hrs/day, 7 days/wk, 52 weeks/year (Maximum)

Heat rating – 6.0 MMBTU/hr

Monthly Fuel limit – 1.37143 mmcf (applicant request)

Load factor – Average Load = 100%

Maximum Load = 100%

Operating Temperature – 1750°F (Average)

2150°F (Maximum)

NOx emissions – 50 ppmv @ 3% O₂ (To be verified with a conditioned source test)

Consultant is requesting 50 ppmv be used for emission calculations and reporting purposes as allowed in R2012.

- HC, SOx, CO and PM emissions from the 2006-2007 AER Program

- PM₁₀ = 1.0 PM, based on 1/30/92, Fred Del Rosario memo.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION APPLICATION PROCESSING AND CALCULATIONS	PAGE 3	PAGES 4
	APPL. NO. PC 481054-58.doc	DATE 5/20/2008
	PROCESSOR MFN	REVIEWER DR/HW

See attached sheet for criteria pollutant emission calculations.

RULES COMPLIANCE

RULE 212: Public Notification

Paragraph 212 (c)(1) Requires a public notice for all new or modified permit units that may emit air contaminants located within 1,000 feet from the outer boundary of a school. According to the website geodistance.com the closest school, Lincoln Elementary School is beyond a 1200 feet from Carlton Forge Work's property line. A 30-Day Public Notice is not required under this paragraph.

Paragraph 212(c)(2) The equipment will not result in on-site emission increase exceeding the daily maximums as specified in the table in Rule 212(g). Therefore, a 30-day public notice period will not be required under this paragraph.

Paragraph 212(c)(3) Public notice will not be required under this paragraph. See Rule 1401 evaluation section.

RULE 401: Compliance is expected. Visible emissions are not expected from the proper operation of this equipment. There has been no visible emission citations associated with the operation of similar furnaces at this facility.

RULE 402: Compliance is expected. Nuisance is not expected with the proper operation and maintenance of this furnace. There is no record of any nuisance complaints or citations associated with forging furnaces at this facility.

RULE 404: The equipment is in compliance with this rule. Natural gas combustion is the only source of PM contaminants. The maximum expected PM concentration of 0.002 gr/dscf is well below the allowable limit of 0.17 gr/dscf (see Table 404(a)) for a furnace discharge of 1,300 dscfm.

RULE 407: Compliance is expected. CO is expected to be below 2000 ppm. Company has source test results on record for similar equipment with CO emissions averaging less than 50 ppm @ 3% O₂.

RULE 431.1: Compliance is expected. The furnace will be fired on natural gas with sulfur compounds (as H₂S) less than 16 ppm.

REG XIII/XX: BACT for a forging furnace is 50 ppmv @ 3% O₂ for NO_x and natural gas combustion for SO_x. As requested by the applicant, 50 ppmv shall be conditioned to this furnace as both its NO_x BACT limit and for RECLAIM reporting purposes. NO_x compliance shall be verified with required source test of furnace once constructed. See device condition D28.4

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION APPLICATION PROCESSING AND CALCULATIONS	PAGE 4	PAGES 4
	APPL. NO. PC 481054-58.doc	DATE 5/20/2008
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Modeling is met. Emission rates for the furnaces are below the screening level of Table A-1 of Rule 1303.

Heat Input (mmBtu/hr)	NO _x (lb/hr)	CO (lb/hr)	PM (lb/hr)
>5 - <10	0.47	25.9	2.8
D182-D188	0.36	0.20	0.04

Carlton Forge Works is a NO_x RECLAIM facility. They purchased 16,800 pounds of **NO_x RTCs** on January 30, 2008; at most 1,053 pounds will be used by each of the proposed forging furnaces, device IDs D182-D188.

Offsets are not required; all non-RECLAIM pollutants are below Table A of Rule 1304 (d).

REG XIV: Forging Furnaces are in compliance of Tier 2 analysis. See attached calculations sheets. District default toxic emission factors for natural gas combustion used as published in the 2006-2007 General Instruction Book for the Annual Emission Report Program.

REG XXX: This is a De Minimis Significant Permit Revision to the Title V permit. EPA 45-day review period is required.

RECOMMENDATION

Issue a Permit to Construct, for each furnace as described in this report and in the Facility Permit.

EMISSIONS FOR FIRING ON NATURAL GAS
(OVENS, FURNACES, HEATERS, ETC.)

Emission factors are from form B-1
Except NOx which is calculated from the ppm of NOx

Maximum Burner Rating in BTU/hr =	6,000,000	BTU/hr
Max conditioned fuel usage =	1,371,430	CF/mo
Previously conditioned fuel usage =	0	CF/mo
Average Operating Schedule =	16	hr/day
Maximum Operating Schedule =	24	hr/day
Expected emission of NOx=	50	ppm
Average Loading=	100.0%	
Maximum Loading =	100.0%	
Maximum operating days per month =	30	days

AVERAGE EMISSIONS

RHC =	0.0400	lb/hr	0.6400	lb/day
NOx =	0.3630	lb/hr	5.8080	lb/day
SO2 =	0.0034	lb/hr	0.0549	lb/day
CO =	0.2000	lb/hr	3.2000	lb/day
PART =	0.0429	lb/hr	0.6857	lb/day

MAXIMUM EMISSIONS

RHC =	0.0400	lb/hr	0.9600	lb/day
NOx =	0.3630	lb/hr	8.7120	lb/day
SO2 =	0.0034	lb/hr	0.0823	lb/day
CO =	0.2000	lb/hr	4.8000	lb/day
PART =	0.0429	lb/hr	1.0286	lb/day

Thirty day average emissions

RHC =	0	lb/dy	115	lb/yr
NOx =	2.93	lb/dy	1053	lb/yr
SO2 =	0	lb/dy	10	lb/yr
CO =	2	lb/dy	576	lb/yr
PART =	0	lb/dy	123	lb/yr

Monthly Emissions

RHC =	9.60	lb/mo
NOx =	87.77	lb/mo
SO2 =	0.82	lb/mo
CO =	48.00	lb/mo
PART =	10.29	lb/mo

TIER 2 SCREENING RISK ASSESSMENT

A/N: 481055-58
Fac: Carlton Forge Works

Application deemed complete date: 04/24/08

2. Tier 2 Data

MET Factor	0.63
4 hr	0.92
6 or 7 hrs	0.67

Dispersion Factors

2	3A & 3B For Chronic X/Q
6	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	3.162	271.78
Commercial	7.89	577.9

Adjustment and Intake Factors

	A _{fann}	DBR	EVF
Residential	1	302	0.96
Worker	2	149	0.38

A/N: 481055-58

Application deemed complete date: 04/24/08

TIER 2 RESULTS

5a. MICR

$MICR = CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) * Afann * Met * DBR * EVF * 1.E-6 * MP$

Compound	Residential	Commercial
Acetaldehyde	3.09E-10	3.01E-10
Acrolein		
Benzene (including benzene from gasoline)	5.75E-09	5.61E-09
Ethyl benzene		
Formaldehyde	2.57E-09	2.51E-09
Hexane (n-)		
Naphthalene	2.57E-10	2.51E-10
PolyCyclic Aromatic Hydrocarbon (PAHs)	8.34E-08	4.00E-08
Ammonia		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	9.23E-08	4.86E-08
	PASS	PASS

No Cancer Burden, MICR < 1.0E-6

5b. Cancer Burden	no
X/Q for one-in-a-million:	
Distance (meter)	
Area (km2):	
Population:	
Cancer Burden:	

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		2.94E-07	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV			Pass	Pass
Developmental - DEV	1.68E-05	1.61E-05	Pass	Pass
Endocrine system - END		2.94E-07	Pass	Pass
Eye	5.04E-02	3.12E-03	Pass	Pass
Hematopoietic system - HEM	1.36E-05	8.25E-06	Pass	Pass
Immune system - IMM	6.11E-04		Pass	Pass
Kidney - KID		2.94E-07	Pass	Pass
Nervous system - NS	3.27E-06	1.83E-05	Pass	Pass
Reproductive system - REP	1.68E-05		Pass	Pass
Respiratory system - RES	5.04E-02	4.14E-03	Pass	Pass
Skin			Pass	Pass

A/N: 481055-58

Application deemed complete date:

04/24/08

6a. Hazard Index Acute

HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

Compound	HIA - Residential									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Acetaldehyde				2.19E-02					2.19E-02	
Acrolein										
Benzene (including benzene from gasoline)			6.39E-06		6.39E-06	6.39E-06		6.39E-06		
Ethyl benzene										
Formaldehyde				2.81E-04		2.81E-04			2.81E-04	
Hexane (n-)										
Napthalene										
PolyCyclic Aromatic Hydrocarbon (PAHs)										
Ammonia				1.53E-03					1.53E-03	
Toluene (methyl benzene)			1.54E-06	1.54E-06			1.54E-06	1.54E-06	1.54E-06	
Xylenes (isomers and mixtures)				1.92E-06					1.92E-06	
Total			7.92E-06	2.37E-02	6.39E-06	2.87E-04	1.54E-06	7.92E-06	2.37E-02	

Compound	HIA - Commercial									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Acetaldehyde										
Acrolein				4.65E-02					4.65E-02	
Benzene (including benzene from gasoline)			1.36E-05		1.36E-05	1.36E-05		1.36E-05		
Ethyl benzene										
Formaldehyde				5.97E-04		5.97E-04			5.97E-04	
Hexane (n-)										
Napthalene										
PolyCyclic Aromatic Hydrocarbon (PAHs)										
Ammonia				3.25E-03					3.25E-03	
Toluene (methyl benzene)			3.27E-06	3.27E-06			3.27E-06	3.27E-06	3.27E-06	
Xylenes (isomers and mixtures)				4.08E-06					4.08E-06	
Total			1.68E-05	5.04E-02	1.36E-05	6.11E-04	3.27E-06	1.68E-05	5.04E-02	

6b. Hazard Index Chronic

$$HIC = [Q(\text{ton/yr}) * (X/Q) * MET * MP] / \text{Chronic REL}$$

Compound	HIC - Residential												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde												1.18E-05	
Acrolein						1.11E-03						1.11E-03	
Benzene (including benzene from gasoline)				3.31E-06			3.31E-06			3.31E-06			
Ethyl benzene	1.18E-07			1.18E-07	1.18E-07				1.18E-07				
Formaldehyde						1.41E-04						1.41E-04	
Hexane (n-)										2.23E-08			
Napthalene												8.22E-07	
PolyCyclic Aromatic Hydrocarbon (PAHs)												3.92E-04	
Ammonia												3.03E-06	
Toluene (methyl benzene)				3.03E-06						3.03E-06		3.03E-06	
Xylenes (isomers and mixtures)										9.66E-07		9.66E-07	
Total	1.18E-07			6.46E-06	1.18E-07	1.25E-03	3.31E-06		1.18E-07	7.33E-06		1.66E-03	

6b. Hazard Index Chronic (cont.)

A/N: 481055-58

Application deemed complete date: 04/24/08

Compound	HIC - Commercial												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde												2.96E-05	
Acrolein						2.77E-03						2.77E-03	
Benzene (including benzene from gasoline)				8.25E-06			8.25E-06			8.25E-06			
Ethyl benzene	2.94E-07			2.94E-07	2.94E-07				2.94E-07				
Formaldehyde						3.51E-04						3.51E-04	
Hexane (n-)										5.57E-08			
Napthalene												2.05E-06	
PolyCyclic Aromatic Hydrocarbon (PAHs)												9.77E-04	
Ammonia												7.57E-06	
Toluene (methyl benzene)				7.57E-06						7.57E-06		7.57E-06	
Xylenes (isomers and mixtures)										2.41E-06		2.41E-06	
Total	2.94E-07			1.61E-05	2.94E-07	3.12E-03	8.25E-06		2.94E-07	1.83E-05		4.14E-03	