

<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b>  <b>ENGINEERING AND COMPLIANCE DIVISION</b>  <b>APPLICATION PROCESSING AND CALCULATIONS</b>	PAGE 1	PAGES 4
	APPL. NO. PC 472973, 472976-81	DATE 9/12/2007
	PROCESSOR MFN	REVIEWER DR/HW

## PERMIT TO CONSTRUCT ANALYSIS

### FACILITY MAILING ADDRESS

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

(ID: 022911      NO<sub>x</sub> RECLAIM Cycle 2      -      TITLE V)

### EQUIPMENT LOCATION

SAME AS ABOVE

### EQUIPMENT DESCRIPTION

**APPLICATION NO.      472973      -      PERMIT TO CONSTRUCT**  
PROCESS 1: HEAT TREATING  
(D170)      FURNACE, NO. 703, CARLTON FORGE WORKS, CUSTOM BUILT,  
METAL FORGING, TWO ECLIPSE LOW NO<sub>x</sub> BURNERS, MODEL NO.  
FN0150, 3,000,000 BTU PER HOUR TOTAL, NATURAL GAS FIRED.

**APPLICATION NO.      472976      -      PERMIT TO CONSTRUCT**  
PROCESS 1: HEAT TREATING  
(D172)      FURNACE, NO. 704, CARLTON FORGE WORKS, CUSTOM BUILT,  
METAL FORGING, TWO ECLIPSE LOW NO<sub>x</sub> BURNERS, MODEL NO.  
FN0150, 3,000,000 BTU PER HOUR TOTAL, NATURAL GAS FIRED.

**APPLICATION NO.      472977      -      PERMIT TO CONSTRUCT**  
PROCESS 1: HEAT TREATING  
(D174)      FURNACE, NO. 705, CARLTON FORGE WORKS, CUSTOM BUILT,  
METAL FORGING, TWO ECLIPSE LOW NO<sub>x</sub> BURNERS, MODEL NO.  
FN0150, 3,000,000 BTU PER HOUR TOTAL, NATURAL GAS FIRED.

**APPLICATION NO.      472978      -      PERMIT TO CONSTRUCT**  
PROCESS 1: HEAT TREATING  
(D176)      FURNACE, NO. 706, CARLTON FORGE WORKS, CUSTOM BUILT,  
METAL FORGING, TWO ECLIPSE LOW NO<sub>x</sub> BURNERS, MODEL NO.  
FN0150, 3,000,000 BTU PER HOUR TOTAL, NATURAL GAS FIRED.

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**APPLICATION NO. 472979 - PERMIT TO CONSTRUCT**  
PROCESS 1: HEAT TREATING  
(D178) FURNACE, NO. 707, CARLTON FORGE WORKS, CUSTOM BUILT,  
METAL FORGING, TWO ECLIPSE LOW NO<sub>x</sub> BURNERS, MODEL NO.  
FN0150, 3,000,000 BTU PER HOUR TOTAL, NATURAL GAS FIRED.

**APPLICATION NO. 472980 - PERMIT TO CONSTRUCT**  
PROCESS 1: HEAT TREATING  
(D180) FURNACE, NO. 708, CARLTON FORGE WORKS, CUSTOM BUILT,  
METAL FORGING, TWO ECLIPSE LOW NO<sub>x</sub> BURNERS, MODEL NO.  
FN0150, 3,000,000 BTU PER HOUR TOTAL, NATURAL GAS FIRED.

**APPLICATION NO. 472981 - FACILITY PERMIT MODIFICATION**

**HISTORY**

Application Nos. 472973 and 472976-472980 were filed on August 31, 2007, for permits to construct under provisions of Rule 301(u)(1). Application No. 472981 was filed on August 31, 2007, for a RECLAIM/Title V Facility permit modification.

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. These six furnaces have a maximum heat input of 3.0 mmbtu/hr, whereas the typical furnace at CFW is 6.0 mmbtu/hr; 80% of the total furnaces owned by CFW are rated 6.0 mmbtu/hr or above.

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.

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### EVALUATION

**Given:**

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

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

Heat rating – 3.0 MMBTU/hr

Monthly Fuel limit – 1.37143 mmcf (applicant request)

Load factor – Average Load = 100%

Maximum Load = 100%

Operating Temperature – 1800°F (Average)

2150°F (Maximum)

NOx emissions – 50 ppmv @ 3% O<sub>2</sub> (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, SO<sub>x</sub>, CO and PM emissions from the 2006-2007 AER Program

- PM<sub>10</sub> = 1.0 PM, based on 1/30/92, Fred Del Rosario memo.

See attached sheet for criteria pollutant emission calculations.

### RULES COMPLIANCE

**RULE 212:** Compliance is expected. Public notice is not required. The emission increases associated with this permit to construct are below the daily maximum limits of R212 (g). There are no schools within 1000 ft of this facility.

**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% O<sub>2</sub>.

**RULE 431.1:** Compliance is expected. The furnace will be fired on natural gas with sulfur compounds (as H<sub>2</sub>S) less than 16 ppm.

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**REG XIII/XX:** BACT for a forging furnace is 50 ppmv @ 3% O<sub>2</sub> for NO<sub>x</sub> and natural gas combustion for SO<sub>x</sub>. As requested by the applicant, 50 ppmv shall be conditioned to this furnace as both its NO<sub>x</sub> BACT limit and for RECLAIM reporting purposes. NO<sub>x</sub> compliance shall be verified with required source test of furnace once constructed. See device condition D28.4

**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 <sub>x</sub> (lb/hr)	CO (lb/hr)	PM (lb/hr)
>2 <5	0.31	17.1	1.9
D170-D180	0.18	0.10	0.02

Carlton Forge Works is a NO<sub>x</sub> RECLAIM facility. They purchased 17,050 pounds of **NO<sub>x</sub> RTCs** on February 2, 2007; at most 1,053 pounds will be used by each of the proposed forging furnaces, device IDs D170-D180.

**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 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.

# Carlton Forge Works

# A/Ns 472973 & 472976-80

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 =	3,000,000	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	=	0.0200	lb/hr	0.3200	lb/day
NOx	=	0.1815	lb/hr	2.9040	lb/day
SO2	=	0.0017	lb/hr	0.0274	lb/day
CO	=	0.1000	lb/hr	1.6000	lb/day
PART	=	0.0214	lb/hr	0.3429	lb/day

## MAXIMUM EMISSIONS

RHC	=	0.0200	lb/hr	0.4800	lb/day
NOx	=	0.1815	lb/hr	4.3560	lb/day
SO2	=	0.0017	lb/hr	0.0411	lb/day
CO	=	0.1000	lb/hr	2.4000	lb/day
PART	=	0.0214	lb/hr	0.5143	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:** 472973, 472976-80  
**Fac:** Carlton Forge Works

Application deemed complete date: 09/06/07

### 2. Tier 2 Data

MET Factor	0.60
4 hr	0.92
6 or 7 hrs	0.67

### Dispersion Factors

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

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

Receptor	X/Q	X/Qmax
Residential	5.54	271.78
Commercial	12.5	577.9

### Adjustment and Intake Factors

	Afann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38





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Date: 09/06/07

**TIER 2 RESULTS**

**5. MICR**

MICR = CP (mg/(kg-day))<sup>-1</sup> \* Q (ton/yr) \* (X/Q) \* Afann \* Met \* DBR \* EVF \* 1.E-6 \* MP

Compound	Residential	Commercial
Acetaldehyde	5.17E-10	2.28E-10
Acrolein		
Benzene (including benzene from gasoline)	9.62E-09	4.24E-09
Ethyl benzene		
Formaldehyde	4.29E-08	1.89E-08
Hexane (n-)		
Naphthalene	4.33E-10	1.91E-10
PolyCyclic Aromatic Hydrocarbon (PAHs)	1.40E-07	3.02E-08
Ammonia		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
<b>Total</b>	<b>1.93E-07</b>	<b>5.38E-08</b>

Pass

Pass

No Cancer Burden, MICR<1.E=-6

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

## 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
Alimentary system (liver) - AL		4.45E-07
Bones and teeth - BN		
Cardiovascular system - CV		
Developmental - DEV	8.85E-06	2.43E-05
Endocrine system - END		4.45E-07
Eye	2.47E-01	4.74E-02
Hematopoietic system - HEM	7.21E-06	1.25E-05
Immune system - IMM	2.99E-03	
Kidney - KID		4.45E-07
Nervous system - NS	1.63E-06	2.76E-05
Reproductive system - REP	8.85E-06	
Respiratory system - RES	2.47E-01	5.59E-02
Skin		

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6a. Hazard Index Acute

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

HIA - Residential										
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Acetaldehyde										
Acrolein				1.10E-01					1.10E-01	
Benzene (including benzene			3.39E-06		3.39E-06	3.39E-06		3.39E-06		
Ethyl benzene										
Formaldehyde				1.40E-03		1.40E-03			1.40E-03	
Hexane (n-)										
Napthalene										
PolyCyclic Aromatic Hydroc										
Ammonia				4.37E-03					4.37E-03	
Toluene (methyl benzene)			7.68E-07	7.68E-07			7.68E-07	7.68E-07	7.68E-07	
Xylenes (isomers and mixtur				9.60E-07					9.60E-07	
<b>Total</b>			4.16E-06	1.16E-01	3.39E-06	1.41E-03	7.68E-07	4.16E-06	1.16E-01	

HIA - Commercial										
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Acetaldehyde				2.35E-01					2.35E-01	
Acrolein										
Benzene (including benzene			7.21E-06		7.21E-06	7.21E-06		7.21E-06		
Ethyl benzene										
Formaldehyde				2.99E-03		2.99E-03			2.99E-03	
Hexane (n-)										
Napthalene										
PolyCyclic Aromatic Hydroc										
Ammonia				9.29E-03					9.29E-03	
Toluene (methyl benzene)			1.63E-06	1.63E-06			1.63E-06	1.63E-06	1.63E-06	
Xylenes (isomers and mixtur				2.04E-06					2.04E-06	
<b>Total</b>			8.85E-06	2.47E-01	7.21E-06	2.99E-03	1.63E-06	8.85E-06	2.47E-01	

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												1.98E-05	
Acrolein						1.87E-02						1.87E-02	
Benzene (including benzene				5.53E-06									
Ethyl benzene	1.97E-07			1.97E-07	1.97E-07		5.53E-06			1.97E-07	5.53E-06		
Formaldehyde						2.35E-03						2.35E-03	
Hexane (n-)											3.73E-08		
Napthalene												1.38E-06	
PolyCyclic Aromatic Hydroc													
Ammonia												3.73E-03	
Toluene (methyl benzene)				5.06E-06							5.06E-06	5.06E-06	
Xylenes (isomers and mixtur											1.61E-06	1.61E-06	
<b>Total</b>	1.97E-07			1.08E-05	1.97E-07	2.10E-02	5.53E-06			1.97E-07	1.22E-05	2.48E-02	

A/N: 472973, 472976-80

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Compound	HIC - Commercial											SKIN	
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP		RESP
Acetaldehyde												4.47E-05	
Acrolein						4.21E-02						4.21E-02	
Benzene (including benzene				1.25E-05			1.25E-05				1.25E-05		
Ethyl benzene	4.45E-07			4.45E-07	4.45E-07				4.45E-07				
Formaldehyde						5.30E-03						5.30E-03	
Hexane (n-)										8.42E-08			
Napthalene												3.12E-06	
PolyCyclic Aromatic Hydroc													8.42E-03
Ammonia													1.14E-05
Toluene (methyl benzene)				1.14E-05						1.14E-05			1.14E-05
Xylenes (isomers and mixtur										3.64E-06			3.64E-06
<b>Total</b>	4.45E-07			2.43E-05	4.45E-07	4.74E-02	1.25E-05		4.45E-07	2.76E-05		5.59E-02	