San Joaquin Valley Air Pollution Control District
Authority to Construct
Application Review
Poultry Broiler Houses

Facility Name:	Foster Farms, Davis Ranch	Date:	January 30, 2006
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Application #s:	C-5440-1-1, -4-0, & -5-0		
Project #:	C-1051352		
Deemed Complete:	January 1, 2006		

I. Proposal

The primary business of Foster Farms, Davis Ranch is the production of broiler chickens to provide meat for human consumption. Foster Farms, Davis Ranch has requested Authority to Construct (ATC) permits for the addition of 24 new mechanically ventilated broiler houses for 794,880 birds (33,120 birds/house) and two identical diesel-fired emergency IC engines to the existing 640,000 bird broiler operation at 8365 East Davis Ave. in Laton, CA (see appendix A for current draft permit C-5440-1-0).

Since the addition of the new mechanically ventilated broiler houses will result in VOC and NH_3 emissions exceeding the Best Available Control Technology (BACT) threshold of 2.0 lb/day for each house, BACT is required for VOC and NH_3 emissions from the new houses.

Additionally, the project triggers the public notice requirements of District Rule 2201. Therefore, the preliminary decision for the project will be submitted to the California Air Resources Board (CARB), a public notice will be published in a local newspaper of general circulation in the county of the project, and a 30-day public comment period will be completed prior to issuance of the ATCs.

II. Applicable Rules

Rule 2010	Permits Required (12/17/92)
Rule 2201	New and Modified Stationary Source Review Rule (12/15/05)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 4101	Visible Emissions (2/17/05)
Rule 4102	Nuisance (12/17/92)
Rule 4201	Particulate Matter Concentration (12/17/92)
Rule 4550	Conservation Management Practices (CMP) (8/19/04)

Rule 4701 Stationary Internal Combustion Engines – Phase 1 (8/21/03)
Rule 4702 Stationary Internal Combustion Engines – Phase 2 (6/16/05)
Rule 4801 Sulfur Compounds (12/17/92)
CH&SC 41700 Health Risk Assessment
CH&SC 42301.6 School Notice
Title 17 CCR, Section 93115 - Airborne Toxic Control Measure (ATCM) for Stationary Compression-Ignition (CI) Engines
Senate Bill 700 (SB 700)
California Environmental Quality ACT (CEQA)

III. Project Location

The facility is located at 8365 East Davis Ave. in Laton, CA. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

Broilers are produced to meet specific requirements of the customer, which can be a retail grocery store, fast-food chain, or an institutional buyer. The process of raising broiler chickens in the proposed houses is similar to the practices at modern broiler ranches. The production cycle of broilers is divided into two phases: brooding and grow-out. The brooding phase begins when freshly hatched chicks from local hatcheries are delivered by truck and placed in a heated section of a broiler house known as the brood chamber. The brood chamber of the house is maintained above 90 °F for newly hatched chicks. At this site, about 33,120 chicks will be released into each house at the beginning of each grow-out period. The chicks will be placed on fresh litter in the front half of the house opposite the tunnel-ventilation fans for 10 days. During the birds' first few weeks of growth, the temperature is gradually decreased. Once the birds need floor space, the remaining half of the house is opened and the chicks are fed out to market weight. After completion of the grow-out phase the broilers are transported by truck to a nearby processing plant. Typically, all of the houses within a ranch complex will be populated with chicks, and depopulated with mature birds within the same few days.

All broiler chickens in the house are the same age and will be removed from the house at the same time. Typically, about 4.5 to 5 percent of the broilers in a house will die (mortality) during the grow-out cycle. Mortality must be removed from each house at least daily during the grow-out cycle to prevent the spread of disease. The length of the grow-out phase for the broiler chickens is approximately 45 days, resulting in an average weight of 4.5 to 5.5 pounds. Broiler houses will be empty of chickens for approximately 10 days between flocks to allow for cleaning and maintenance. This results in a cycle time of about 55 days per flock. Typically, six flocks per year are grown in each broiler house.

Broiler Housing

Broilers are raised in either totally or partially enclosed housing with a compacted soil floor covered with dry bedding. The broiler houses at this site will be constructed with earthen floors, wood framing, and corrugated metal roofing and siding. The ceiling and walls will be insulated. Each house will be 460 feet long and 54 feet wide. As stated above, about 33,120 chicks will be released into each house at the beginning of each grow-out period. The birds will

be able to move about freely in the heated front section of the house. As the birds grow and require less heat, the other half of the house is opened to allow them to have more space. Water and feed will be provided to the birds throughout the grow-out period. Propane heaters and evaporative cooling pads are utilized to control temperature within the broiler houses.

In poultry houses, ventilation is used to remove moisture and ammonia from the houses during the winter season and to remove excess heat and ammonia from the houses during the summer season. Partially enclosed housing structures have open sidewalls with curtains that are opened and closed to control the house ventilation rate. At this site, all of the houses will be totally enclosed. In totally enclosed housing, mechanical ventilation is used. Mechanical ventilation is typically provided by an induced draft or negative-pressure system. An induced draft system pulls fresh air into the house from one end and exhausts on the other. A negative-pressure system draws fresh air into the house from side vents and out through the exhaust fan. Totally enclosed mechanically ventilated housing is known as tunnel-type housing or environmental housing.

The proposed houses will have an advanced environmental control system that uses thermostats, sensors, and timers to more effectively control their exhaust fans. Environmental conditions (e.g. temperature, humidity, ventilation, lighting) within the proposed houses will be controlled by a computer system. The ranch staff will also monitor the conditions within the houses at least twice daily.

Broiler Manure Management

All broiler chickens are raised unconfined within the houses on dry bedding (litter). Litter can be sawdust, wood shavings, rice hulls, chopped straw, peanut hulls, or other products, depending on availability and cost. Foster Farms, Davis Ranch typically uses rice hulls for litter. Manure that is excreted by birds has a high water content. The main function of the litter is to absorb the moisture excreted by the birds.

Two kinds of manure are removed from broiler houses: litter and cake. Litter is a mixture of bedding and manure. Cake is a compacted and concentrated mixture of manure and litter that usually builds up on the surface of the litter around waterers and feeders, where much of the manure is deposited. Moisture from manure and waterers binds the mixture of litter and manure together forming cake. Broiler houses are partially cleaned between each flock to remove cake. The remaining litter may be “top dressed” with an inch or so of new bedding material.

Typically, the litter (bedding and manure) is only completely cleaned from broiler houses every one to three years after at least 6 flocks, with a trend towards performing complete clean-outs less than annually. Litter in the proposed houses will be completely cleaned out twice a year after only 3 flocks have been raised on the litter. At Foster Farms, Davis Ranch used litter is completely cleaned out of the brood chamber and moved to the other half of the house before chicks are placed. In the proposed houses, chicks will always be placed on fresh litter in the brood chamber. After complete clean-outs and brood chamber clean-outs, the removed litter is replaced with fresh litter. When the broiler house is completely cleaned out, the litter is typically removed with a front-end loader. When the house is cleaned, the equipment (including slats) is removed from the house to allow a front-end loader to push all of the manure to the center section of the house. Then the front-end loader places the mixture of

manure and litter into a spreader for land application. A thorough cleaning after each flock removes pathogens that could be transferred to the next flock. After removal of all organic matter, the house is disinfected.

Emergency IC Engines

The emergency engines power electric generators. The electric generators are necessary to prevent catastrophic loss of broilers by maintaining ventilation in the enclosed broiler houses during power failures. Other than emergency operation, each engine may be operated up to 100 hours per year for maintenance and testing purposes.

V. Equipment Listing

Broiler Houses

24 new mechanically ventilated broiler houses for 794,880 birds (33,120 birds/house) (354 total combined hp)

Each House
One 460' L X 54' W mechanically ventilated broiler house with capacity for 33,120 birds
Ten 52" tunnel ventilation exhaust fans (1 hp each)
One 48" exhaust fan (1 hp)
One 36" exhaust fan (¾ hp)
Six 24" circulating fans (½ hp each)
14.75 total electric hp

Pre-Project Equipment Description:

C-5440-1-0: 640,000 BROILER HEN RANCH INCLUDING 640,000 BROILERS, CONSISTING OF 24 MECHANICALLY VENTILATED BROILER HOUSES, INCLUDING ELECTRIC FANS TOTALING 240 HP

Proposed Modification:

C-5440-1-1: MODIFICATION OF 640,000 BROILER HEN RANCH, CONSISTING OF 24 MECHANICALLY VENTILATED BROILER HOUSES, INCLUDING ELECTRIC FANS TOTALING 240 HP: ADD 794,880 BROILERS AND 24 MECHANICALLY VENTILATED BROILER HOUSES

Post Project Equipment Description:

C-5440-1-1: 1,434,880 BROILER HEN RANCH, CONSISTING OF 48 MECHANICALLY VENTILATED BROILER HOUSES, INCLUDING ELECTRIC FANS TOTALING 594 HP

Emergency IC Engines

C-5440-4-0: 455 BHP DETROIT DIESEL MODEL 12.7 DTA DIESEL-FIRED AGRICULTURAL EMERGENCY STANDBY IC ENGINE POWERING AN ELECTRICAL GENERATOR

C-5440-5-0: 455 BHP DETROIT DIESEL MODEL 12.7 DTA DIESEL-FIRED AGRICULTURAL EMERGENCY STANDBY IC ENGINE POWERING AN ELECTRICAL GENERATOR

VI. Emission Control Technology Evaluation

Broiler Houses

The principal pollutants emitted from broiler houses are Volatile Organic Compounds (VOC) and ammonia (NH_3). Particulate matter (PM) is also emitted through the ventilation system. Factors that affect emissions from broiler houses include the moisture content of the litter; the pH; the ventilation rate; the temperature; and the amount of manure and length of the time the manure is present in the broiler house.

The ventilation rate affects the amount of ammonia, VOC, and particulate matter carried out of the broiler house. During the growth of the flock, continuous airflow removes ammonia and other gases and reduces the moisture content of freshly excreted manure. The constant volatilization and removal of ammonia from the broiler houses results in lower nitrogen content of the litter.

Gaseous emissions from the broiler houses will be minimized by management practices such as: use of computer-controlled environmental broiler houses; use of evaporative cooling pads as opposed to misting systems; feeding the birds in accordance with NRC or other District approved guidelines to minimize nutrient excretion; complete litter removal at least twice per year, and removal of all mortality from the houses twice per day.

Emergency IC Engines

The engines are equipped with:

- [X] Turbocharger
- [X] Intercooler/aftercooler
- [ ] Injection timing retard (or equivalent per District Policy SSP-1805, dated 8/14/1996)
- [X] Positive Crankcase Ventilation (PCV) or 90% efficient control device
- [ ] This engine is required to be, and is UL certified
- [ ] Catalytic particulate filter
- [ ] Low (0.05%) sulfur diesel
- [X] Very Low (0.0015%) sulfur diesel

The emission control devices/technologies and their effect on diesel engine emissions detailed below are from *Non-catalytic NO_x Control of Stationary Diesel Engines*, by Don Koeberlein, CARB.

The turbocharger reduces the NO_x emission rate from the engine by approximately 10% by increasing the efficiency and promoting more complete burning of the fuel.

The intercooler/aftercooler functions in conjunction with the turbocharger to reduce the inlet air temperature. By reducing the inlet air temperature, the peak combustion temperature is lowered, which reduces the formation of thermal NO_x. NO_x emissions are reduced by approximately 15% with this control technology.

The PCV system reduces crankcase VOC and PM_{10} emissions by at least 90% over an uncontrolled crankcase vent.

The use of very low-sulfur diesel fuel (0.0015% by weight sulfur maximum) reduces SO_x emissions by over 99% from standard diesel fuel.

VII. General Calculations

A. Assumptions

Broiler Houses

Potential to Emit will be calculated based on the maximum number of broilers at the ranch.
50% of total particulate matter emitted from the house is PM_{10}

Operating schedule:	24 hours/day
Length of broiler growout cycle:	55 days (6.7 cycles per year)
Max. number of birds per house:	33,120 birds/house
Min. broiler house ventillation rate:	2,700 cfm (new chicks on a cold night; per applicant)
Max. broiler house ventillation rate:	212,000 cfm (mature birds on a hot day; per applicant)

Emergency IC Engines

Emergency operating schedule for each engine:	24 hours/day
Non-emergency operating schedule for each engine:	100 hours/year
Density of diesel fuel:	7.1 lb/gal
EPA F-factor (adjusted to 60 °F):	9,051 dscf/MMBtu
Fuel heating value:	137,000 Btu/gal
BHP to Btu/hr conversion:	2,542.5 Btu/bhp-hr
Thermal efficiency of engine:	commonly ≈ 35%
PM_{10} fraction of diesel exhaust:	0.96 (CARB, 1988)

B. Emission Factors

Broiler Houses

Broiler Emission Factors		
	(lb/bird-yr)	Source
PM_{10}	0.02	R.E. Lacey[1]
VOC	0.025	CARB Source Test Results for California Broiler Houses[2]
NH_3	0.0958	CARB Source Test Results for California Broiler Houses[2]

[1] "Particulate Matter and Ammonia Emission Factors for tunnel-Ventilated broiler houses in the Southern US", R.E. Lacey, J.S. Redwine, C.B Parnell, Jr.

[2] "Quantification of Gaseous Emissions from California Broiler Production Houses" - Source tests were conducted on mechanically ventilated broiler houses during the spring and fall of 2004. The participants in the project include the following: AIRx Testing; California Air Resources Board; California Department of Food and Agriculture; California Poultry Federation; Foster Farms; & University of California, Davis - Animal Science

Emergency IC Engines

Diesel-fired IC Engine Emission Factors (C-5440-4-0 & -5-0)		
	g/hp·hr	Source
NO_X	4.3	ARB/EPA Certification (see Appendix B)
SO_X	0.0051	Mass Balance Equation Below
PM_{10}	0.14	ARB/EPA Certification
CO	0.6	Engine Manufacturer
VOC	0.27	ARB/EPA Certification[3]

$$\frac{0.000015\ lb-S}{lb-fuel}\times\frac{7.1\,lb-fuel}{gallon}\times\frac{2\,lb-SO_2}{1\,lb-S}\times\frac{1\,gal}{137,000\ Btu}\times\frac{1\,bhp\,input}{0.35\,bhp\,out}\times\frac{2,542.5\,Btu}{hp\cdot hr}\times\frac{453.6\,g}{lb}=0.0051\ \frac{g-SO_X}{bhp-hr}$$

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Broiler Houses

Pre-Project Potential to Emit (PE1) for the broiler houses (PTO C-5440-1-0) will be calculated below based on the maximum number of birds that can be housed.

$PE1_{PM10}$ = (640,000 Broilers x 0.02 lb-PM_{10}/bird-year)
= 12,800 lb-PM_{10}/year

$PE1_{PM10}$ = (12,800 lb-PM_{10}/year) ÷ (365 day/year)
= 35.1 lb-PM_{10}/day

$PE1_{VOC}$ = (640,000 Broilers x 0.025 lb-VOC/bird-year)
= 16,000 lb-VOC/year

$PE1_{VOC}$ = (16,000 lb-VOC/year) ÷ (365 day/year)
= 43.8 lb-VOC/day

$PE1_{NH3}$ = (640,000 Broilers x 0.0958 lb-NH_3/bird-year)
= 61,312 lb-NH_3/year

$PE1_{NH3}$ = (61,312 lb-NH_3/year) ÷ (365 day/year)
= 168.0 lb-NH_3/day

[3] The VOC emission factor was calculated based on the ratio of VOC to (NO_X + VOC) in EPA's Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition, April 2004, Page 16 (document ID EPA420-P-04-009). http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2004/420p04009.pdf

Pre-Project Potential to Emit (PE1) C-5440-1-0		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO_X	0	0
SO_X	0	0
PM_{10}	35.1	12,800
CO	0	0
VOC	43.8	16,000
NH_3	168.0	61,312

Emergency IC Engines

Since the IC Engines are new emissions units, PE1 = 0 for all criteria pollutants for each engine.

2. Post Project Potential to Emit (PE2)

Broiler Houses

Post-Project Potential to Emit (PE2) for the broiler houses (PTO C-5440-1-1) will be calculated below based on the maximum number of birds that can be housed.

$PE1_{PM10}$ = (1,434,880 Broilers x 0.02 lb-PM_{10}/bird-year)
= 28,698 lb-PM_{10}/year

$PE1_{PM10}$ = (28,698 lb-PM_{10}/year) ÷ (365 day/year)
= 78.6 lb-PM_{10}/day

$PE1_{VOC}$ = (1,434,880 Broilers x 0.025 lb-VOC/bird-year)
= 35,872 lb-VOC/year

$PE1_{VOC}$ = (35,872 lb-VOC/year) ÷ (365 day/year)
= 98.3 lb-VOC/day

$PE1_{NH3}$ = (1,434,880 Broilers x 0.0958 lb-NH_3/bird-year)
= 137,462 lb-NH_3/year

$PE1_{NH3}$ = (137,462 lb-NH_3/year) ÷ (365 day/year)
= 376.6 lb-NH_3/day

Post-Project Potential to Emit (PE2) C-5440-1-1		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO_X	0	0
SO_X	0	0
PM_{10}	78.6	28,698
CO	0	0
VOC	98.3	35,872
NH_3	376.6	137,462

Emergency IC Engines

The daily and annual PE2 for each IC engine are calculated as follows:

IC Engines (C-5440-4-0 & -5-0) Daily Post-Project Emissions					
Pollutant	Emissions Factor (g/bhp-hr)	Rating (bhp)	Daily Hours of Operation (hrs/day)	Conversion (g/lb)	PE2 Total (lb/day)
NO_x	4.3	455	24	453.6	103.5
SO_x	0.0051	455	24	453.6	0.1
PM_{10}	0.14	455	24	453.6	3.4
CO	0.6	455	24	453.6	14.4
VOC	0.27	455	24	453.6	6.5

IC Engines (C-5440-4-0 & -5-0) Annual Post-Project Emissions					
Pollutant	Emissions Factor (g/bhp-hr)	Rating (bhp)	Annual Hours of Operation (hrs/yr)	Conversion (g/lb)	PE2 Total (lb/yr)
NO_x	4.3	455	100	453.6	431
SO_x	0.0051	455	100	453.6	1
PM_{10}	0.14	455	100	453.6	14
CO	0.6	455	100	453.6	60
VOC	0.27	455	100	453.6	27

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to Section 4.9 of District Rule 2201, the Pre-Project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Pre-Project Stationary Source Potential to Emit [SSPE1] (lb/year)						
	NO_X	SO_X	PM_{10}	CO	VOC	NH_3
C-5440-1-0 (24 Broiler Houses)	0	0	12,800	0	16,000	61,312
C-5440-2-0 (Emergency IC Engine)	739	70	37	225	84	0
C-5440-3-0 (Emergency IC Engine)	739	70	37	225	84	0
Pre Project SSPE (SSPE1)	1,478	140	12,874	450	16,168	61,312

4. Post Project Stationary Source Potential to Emit (SSPE2)

Pursuant to Section 4.10 of District Rule 2201, the Post Project Stationary Source Potential to Emit (SSPE2) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Post Project Stationary Source Potential to Emit [SSPE2] (lb/year)						
	NO_X	SO_X	PM_{10}	CO	VOC	NH_3
C-5440-1-1 (48 Broiler Houses)	0	0	28,698	0	35,872	137,462
C-5440-2-0 (Emergency IC Engine)	739	70	37	225	84	0
C-5440-3-0 (Emergency IC Engine)	739	70	37	225	84	0
C-5440-4-0 (Emergency IC Engine)	431	1	14	60	27	0
C-5440-5-0 (Emergency IC Engine)	431	1	14	60	27	0
Post Project SSPE (SSPE2)	2,340	142	28,800	570	36,094	137,462

5. Major Source Determination

Pursuant to Section 3.25 of District Rule 2201, a major source is a stationary source with post-project emissions or a Post Project Stationary Source Potential to Emit (SSPE2), equal to or exceeding one or more of the following threshold values. However, Section 3.25.2 states, "for the purposes of determining major source status, the SSPE2 shall not include the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

Major Source Determination (lb/year)					
	NO_X	SO_X	PM_{10}	CO	VOC
Pre-Project SSPE (SSPE1)	1,478	140	12,874	450	16,168
Post Project SSPE (SSPE2)	2,340	142	28,800	570	36,094
Major Source Threshold	50,000	140,000	140,000	200,000	50,000
Major Source?	No	No	No	No	No

As seen in the table above, the facility is not an existing Major Source and also is not becoming a Major Source as a result of this project.

6. Baseline Emissions (BE)

The BE calculation (in lbs/year) is performed pollutant-by-pollutant for each unit within the project, to calculate the QNEC and if applicable, to determine the amount of offsets required.

BE = Pre-project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to Section 3.23

As shown in Section VII.C.5 above, the facility is not a Major Source for any affected pollutant. Therefore Baseline Emissions (BE) are equal to the Pre-Project Potential to Emit (PE1).

Broiler Houses (C-5440-1-0):

Baseline Emissions [BE] (lb/year) C-5440-1-0						
	NO_X	SO_X	PM_{10}	CO	VOC	NH_3
C-5440-1-0	0	0	12,800	0	16,000	61,312

Emergency IC Engines (C-5440-4-0 & -5-0):

Since the engine are new emissions units, BE = PE1 = 0 for all affected pollutants for each engine.

7. Contemporaneous Increase in Permitted Emissions (CIPE) & Title I Modification

A Major Modification occurs if the Post-Project Stationary Source Potential to Emit (SSPE2) exceeds the Major Source Thresholds (as defined in Rule 2201) and the Contemporaneous Increase in Permitted Emissions (CIPE), is equal to or greater than one or more of the following threshold values:

a. For an existing non-Major Source which becomes a Major Source:

Major Modification CIPE Thresholds	
Pollutant	CIPE (lb/year)
NO_X	50,000
SO_X	140,000
PM_{10}	140,000
CO	200,000
VOC	50,000

b. For an existing Major Source:

Major Modification CIPE Thresholds	
Pollutant	CIPE (lb/year)
NO_X	50,000
SO_X	30,000
PM_{10}	30,000
CO	100,000
VOC	50,000

Calculating the CIPE is required for existing Major Sources to determine if the current project has emissions increases above Title I Modification thresholds or is required for existing non-Major Sources becoming Major Sources, to determine if the current project has emissions increases above Major Source thresholds.

Section 3.39 of District Rule 2201 defines a Title I Modification as "the same as a Major Modification." District Policy APR 1125 *(currently in draft form)* defines a Major Modification as "*any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act*."

As discussed in Section VII.C.5 above, the facility is not a Major Source for any criteria pollutant; therefore according to District Policy APR 1125 *(currently in draft form)*, CIPE calculations are not necessary and the project does not constitute a Title I Modification.

8. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in Appendix C.

VIII. Compliance

Rule 1070 Inspections

This rule applies to any source operation, which emits or may emit air contaminants.

This rule allows the District to perform inspections for the purpose of obtaining information necessary to determine whether air pollution sources are in compliance with applicable rules and regulations. The rule also allows the District to require record keeping, to make inspections and to conduct tests of air pollution sources. Therefore, the following conditions will be listed on Permit C-5440-1-1 to ensure compliance:

{3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]

{3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]

Rule 2010 Permits Required

The provisions of this rule apply to any person who plans to or does operate, construct, alter, or replace any source operation, which may emit air contaminants or may reduce the emission of air contaminants.

Pursuant to Section 4.0, a written permit shall be obtained from the APCO. No Permit to Operate shall be granted either by the APCO or the Hearing Board for any source operation described in Section 3.0, constructed or installed without authorization as required by Section 3.0 until the information required is presented to the APCO and such source operation is altered, if necessary, and made to conform to the standards set forth in Rule 2070 (Standards for Granting Applications) and elsewhere in these rules and regulations.

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis for the following*:

a. Any new emissions unit with a potential to emit exceeding two pounds per day,
b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
d. Any new or modified emissions unit, in a stationary source project, which results in a Title I Modification.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units – PE > 2 lb/day

As seen in Section VII.C.2 of this evaluation, the applicant is proposing to install 12 new mechanically ventilated broiler houses and one new diesel-fired IC engine at the existing broiler ranch complex.

Broiler Houses

Each individual broiler house has operates independently and has separate exhaust ventilation; therefore, each house is a distinct emissions unit. As shown in the table below, each of the proposed new broiler houses will result in a PE of 2.3 lb/day for VOC and 8.7 lb/day for NH_3. Therefore, BACT is triggered for VOC and NH_3 emissions.

BACT Applicability for New Broiler House for 33,120 Birds				
Pollutant	Daily Emissions for unit (lb/day)	BACT Threshold (lb/day)	SSPE2 (lb/yr)	BACT Triggered?
NO_x	0.0	> 2.0	n/a	No
SO_x	0.0	> 2.0	n/a	No
PM_{10}	1.8	> 2.0	n/a	No
CO	0.0	> 2.0 and SSPE2 ≥ 200,000 lb/yr	0	No
VOC	2.3	> 2.0	n/a	Yes
NH_3	8.7	> 2.0	n/a	Yes

Emergency IC Engines

The IC engines are new emissions units. As shown in the table below, BACT is triggered for NO_x, SO_x, PM_{10}, and VOC emissions from each engine in this project. However, BACT is not triggered for CO since the SSPE2 for CO is not greater than 200,000 lbs/year, as demonstrated in Section VII.C.5 of this document.

BACT Applicability for New Emergency IC Engines (C-5440-4-0 & -5-0)				
Pollutant	Daily Emissions for unit (lb/day)	BACT Threshold (lb/day)	SSPE2 (lb/yr)	BACT Triggered?
NO_x	103.5	> 2.0	n/a	Yes
SO_x	0.1	> 2.0	n/a	Yes*
PM_{10}	3.4	> 2.0	n/a	Yes
CO	14.4	> 2.0 and SSPE2 ≥ 200,000 lb/yr	60	No
VOC	6.5	> 2.0	n/a	Yes
NH_3	0	> 2.0	n/a	No

*The use of low sulfur (0.05%) diesel fuel would have caused the 2 lb/day BACT threshold to be surpassed; therefore very low-sulfur (0.0015%) diesel fuel is required

b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore BACT is not triggered.

c. Modification of emissions units – AIPE > 2 lb/day

There are no modified emissions units associated with this project; therefore BACT is not triggered.

d. Title I Modification

As discussed in Section VII.C.7 above, this project does not constitute a Title I Modification; therefore BACT is not triggered.

2. BACT Guideline

Broiler Houses

The SJVUAPCD BACT Clearinghouse did not contain a BACT guideline for this category of source. Therefore, a new BACT analysis was performed for project C-1051505 to evaluate BACT for new broiler houses. (See Appendix D)

Emergency IC Engines

BACT Guideline 3.1.3, 1st quarter 2006, applies to the diesel-fired emergency IC engines greater than 400 horsepower. [Emergency Diesel I.C. Engine ≥ 400 hp] (See Appendix E)

3. Top-Down BACT Analysis

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Broiler Houses

Pursuant to the attached Top-Down BACT Analysis (see Appendix D), BACT has been satisfied with the following:

VOC: Completely enclosed mechanically ventilated broiler housing with evaporative cooling pads, mixing fans, and a computer control system using thermostats, sensors, and timers to control environmental conditions; all birds fed in accordance with NRC or other District-approved guidelines; houses completely cleaned out at least twice per year; and all mortality removed from houses twice per day

NH_3: Completely enclosed mechanically ventilated broiler housing with evaporative cooling pads, mixing fans, and a computer control system using thermostats, sensors, and timers to control environmental conditions; all birds fed in accordance with NRC or other District-approved guidelines; houses completely cleaned out at least twice per year; and all mortality removed from houses twice per day

The following conditions will be listed on the ATC to ensure compliance:

- All broiler houses located at Davis Ranch shall be completely enclosed, mechanically-ventilated houses with environmental climate controls. [District Rule 2201]
- All birds housed at Davis Ranch #1 and Davis Ranch #2 shall be fed in accordance with the National Research Council (NRC) guidelines. [District Rule 2201]
- All broiler houses shall be inspected for mortality at least twice per day. Mortality shall be removed for proper disposal immediately after detection. [District Rules 2201]

Emergency IC Engines

Pursuant to the attached Top-Down BACT Analysis (see Appendix F), BACT has been satisfied with the following:

NO_x: Certified NO_x emissions of 6.9 g/hp·hr or less
SO_x: The use of very low-sulfur diesel (0.0015% by weight)
PM_{10}: PM_{10} emissions of 0.1 g/bhp-hr or less
VOC: Positive crankcase ventilation

The following conditions will be listed on ATCs C-5440-4-0 & -5-0 to ensure compliance:

- Emissions from this IC engine shall not exceed any of the following limits: 4.3 g-NOx/bhp-hr, 0.6 g-CO/bhp-hr, or 0.27 g-VOC/bhp-hr. [District Rule 2201 and 17 CCR 93115]
- Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight shall be used. [District Rules 2201 and 4801 and 17 CCR 93115]
- The PM10 emissions rate shall not exceed 0.14 g/hp-hr based on US EPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102 and 17 CCR 93115]
- {1897} This engine shall be equipped with either a positive crankcase ventilation (PCV) system that recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90% control efficiency. [District Rule 2201]

B. Offsets

Sources that are subject to federal NSR are required to offset the emissions they increase by providing emission reductions. This is generally done with emission reduction credits, or ERCs. There are strict federal requirements for ERCs that can be used to offset emissions increases under NSR. The emission reductions must be (1) real, (2) permanent, (3) quantifiable, (4) enforceable, and (5) surplus. Over time, EPA policies and court determinations have established fairly rigorous definitions and tests for each of these terms.

For certain agricultural operations, it is difficult to demonstrate that emission reductions are real, permanent, quantifiable, enforceable, and surplus – *as those terms are defined by EPA and case law.* Under SB 700, the air districts are prohibited from requiring offsets for sources for which the above demonstration cannot be made. These sources may include, for example, crop farm fugitive dust, agricultural burning, and non-equipment operations at CAFs. When it becomes possible to demonstrate that emissions (increases and reductions) are real, permanent, quantifiable, enforceable, and surplus, ERCs may be granted and offsets required. A program to allow this would have to include a regulation that is approved by EPA and incorporated into the State Implementation Plan (SIP). Such regulations specify appropriate quantification methodologies, and other provisions that ensure the reduction meet all the applicable tests, and the regulatory process allows for public review and comment.

To date, California air districts have not succeeded in gaining EPA approval to issue ERCs for agricultural activities. This has been the case even for reductions from on-the-farm equipment that is similar to traditional stationary sources. Therefore, ERCs will not be granted, nor will offsets be required for agricultural sources until the District has adopted the needed regulations, and EPA has approved those regulations and incorporated them into the SIP.

C. Public Notification

1. Applicability

Public noticing is required for:
a. Any new Major Source, which is a new facility that is also a Major Source,
b. Title I Modifications,
c. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
d. Any project which results in the offset thresholds being surpassed, and/or
e. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

a. New Major Source

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

b. Title I Modification

As demonstrated in VII.C.7, this project does not constitute a Title I Modification; therefore, public noticing for Title I Modification purposes is not required.

c. PE > 100 lb/day

Broiler Houses

The PE2 for each new broiler unit is compared to the daily PE Public Notice thresholds in the following table:

PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO_X	0.0	100 lb/day	No
SO_X	0.0	100 lb/day	No
PM_{10}	1.8	100 lb/day	No
CO	0.0	100 lb/day	No
VOC	2.3	100 lb/day	No
NH_3	8.7	100 lb/day	No

Therefore, public noticing for PE > 100 lb/day purposes is not required for the new broiler houses.

Emergency IC Engines

The PE2 for the IC engines is compared to the daily PE Public Notice thresholds in the following table:

PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO_X	103.5	100 lb/day	Yes
SO_X	0.1	100 lb/day	No
PM_{10}	3.4	100 lb/day	No
CO	14.4	100 lb/day	No
VOC	6.5	100 lb/day	No
NH_3	0	100 lb/day	No

Therefore, public noticing for PE > 100 lb/day purposes is required for the IC engines.

d. Offset Threshold

The following table compares the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.

Offset Threshold				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO_X	1,478	2,340	20,000 lb/year	No
SO_X	140	142	54,750 lb/year	No
PM_{10}	12,874	28,800	29,200 lb/year	Yes
CO	450	570	200,000 lb/year	No
VOC	16,168	36,094	20,000 lb/year	No
NH_3	61,312	137,462	NA	No

As detailed above, offset threshold was surpassed for VOC with this project; therefore public noticing is required for surpassing the VOC offset threshold.

e. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a Stationary Source Increase in Permitted Emissions (SSIPE) of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE is calculated as the Post Project Stationary Source Potential to Emit (SSPE2) minus the Pre-Project Stationary Source Potential to Emit (SSPE1), i.e. SSIPE = SSPE2 – SSPE1. The values for SSPE2 and SSPE1 are calculated according to Rule 2201, Sections 4.9 and 4.10, respectively.

The SSIPE is compared to the SSIPE Public Notice thresholds in the following table:

Stationary Source Increase in Permitted Emissions [SSIPE] – Public Notice					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO_x	2,340	1,478	862	20,000 lb/year	No
SO_x	142	140	2	20,000 lb/year	No
PM_{10}	28,800	12,874	15,926	20,000 lb/year	No
CO	570	450	120	20,000 lb/year	No
VOC	36,094	16,168	19,926	20,000 lb/year	No
NH_3	137,462	61,312	76,150	20,000 lb/year	Yes

As demonstrated above, the SSIPE for NH_3 was greater than 20,000 lb/year; therefore public noticing for SSIPE purposes is required.

2. Public Notice Action

As discussed above, public noticing is required for this project for NO_X emissions from each IC engine in excess of 100 lb/day, facility-wide VOC emissions surpassing the offset threshold, and a SSIPE greater than 20,000 lb/year for NH_3 emissions. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATCs in this project.

D. Daily Emission Limits (DELs)

Daily Emissions Limitations (DELs) and other enforceable conditions are required by Section 3.17 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. Per Sections 3.17.1 and 3.17.2, the DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

Broiler Houses (C-5440-1-1)

For the broiler ranch, the DEL is satisfied based on the number of broilers at the ranch. The number of broilers is listed in the permit equipment description (Permit C-5440-1-1).

The following condition will be added to limit the number of birds added to the ranch:

- Each broiler house located at Davis Ranch #1 and Davis Ranch #2 shall not house nor be constructed to house more than 33,120 birds. [District Rule 2201]

Emergency IC Engines (C-5440-4-0 & -5-0)

For these emergency IC engines, the DELs are stated in the form of emission factors, the maximum engine horsepower rating, and the maximum operational time of 24 hours per day.

The following conditions will be listed on the ATCs C-5440-4-0 & -5-0 to ensure compliance:

- Emissions from this IC engine shall not exceed any of the following limits: 4.3 g-NOx/bhp-hr, 0.6 g-CO/bhp-hr, or 0.27 g-VOC/bhp-hr. [District Rule 2201 and 17 CCR 93115]
- Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight shall be used. [District Rules 2201 and 4801 and 17 CCR 93115]
- The PM10 emissions rate shall not exceed 0.14 g/hp-hr based on US EPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102 and 17 CCR 93115]

E. Compliance Assurance

1. Source Testing

Pursuant to District Policy APR 1705, source testing is not required to demonstrate compliance with Rule 2201.

2. Monitoring

No monitoring is required to demonstrate compliance with Rule 2201.

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. Therefore, the following conditions will be listed on the ATCs to ensure compliance:

Broiler Houses (C-5440-1-1)

- Permittee shall maintain records of: (1) the number of broilers in each house during each growout period; (2) the date that each growout period begins; (3) the nutritional analysis of the broiler feed; (4) date that litter is completely removed from houses; (5) and a log of inspections and repairs performed on the water lines and ventilation equipment at Davis Ranch #1 and Davis Ranch #2. [District Rules 1070 and 2201] N

Emergency IC Engines (C-5440-4-0 & -5-0)

- The permittee shall maintain records of hours of emergency and non-emergency operation. Records shall include the date, the number of hours of operation, the purpose of the operation (e.g., load testing, weekly testing, rolling blackout, general area power outage, etc.), the type and sulfur content of the fuel used, and records of operational characteristics monitoring. Such records shall be retained on-site for a period of at least five years and made available for District inspection upon request. [District Rules 2201, 4701, and 4702]

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis

Section 4.14.2 of this Rule requires that an ambient air quality analysis (AAQA) be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The Technical Services Division of the SJVAPCD conducted the required analysis.

The proposed location is in an attainment area for NO_X, CO, and SO_X. Modeling results indicated that the proposed equipment will not cause a violation of an air quality standard for NO_X, CO, or SO_X.

The proposed location is in a non-attainment area for PM_{10}. Modeling results indicated that the calculated increase in the ambient PM_{10} concentration due to the proposed equipment will exceed the EPA significance level as given in 40 CFR Part 51.165 (b)(2).

Section 4.14.2 of District Rule 2201 states:

> Emissions from a new or modified Stationary Source shall not cause or make worse the violation of an Ambient Air Quality Standard. In making this determination, the APCO shall take into account the increases in minor and secondary source emissions as well as the mitigation of emissions through offsets obtained pursuant to this rule….

To mitigate potential adverse affects to Ambient Air Quality, Foster Farms has proposed to provide sufficient PM_{10} Emission Reduction Credits (ERCs) to fully offset the PM_{10} emission increases from the project. The amount of offsets needed to fully mitigate the emission increases shall be multiplied by the appropriate Distance Offset Ratio in accordance with District Rule 2201 to determine the final quantity of offsets required. Since the PM_{10} emissions from this project will be fully mitigated, this project is not expected to cause or make worse a violation of an air quality standard. The facility is required to identify the source of the ERCs prior to issuance of the ATCs.

The following condition will be placed on the ATC for construction of the new broiler houses (C-5440-1-1) and the ATCs for installation of the emergency IC engines (C-5440-4-0 & -5-0) to ensure that adequate offsets are surrendered prior to operating the units approved in this project:

> {1957} Prior to operating equipment authorized under this Authority to Construct, permittee shall surrender PM10 emission reduction credits for the following quantities of emissions: 1st quarter – 3,982 lb, 2nd quarter - 3,982 lb, 3rd quarter - 3,982 lb, and fourth quarter - 3,982 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 12/15/05). [District Rule 2201]

Rule 2520 Federally Mandated Operating Permits

Since this facility's potential emissions do not exceed any major source thresholds of Rule 2201, this facility is not a major source, and Rule 2520 does not apply.

Rule 4101 Visible Emissions

Per Section 5.0, no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour which is as dark as or darker than Ringelmann 1 (or 20% opacity).

Broiler Houses (C-5440-1-1)

Pursuant to Section 4.12, emissions subject to or specifically exempt from Regulation VIII (Fugitive PM_{10} Prohibitions) are considered to be exempt.

Pursuant to District Rule 8081, Section 4.1, on-field agricultural sources are exempt from the requirements of Regulation VIII.

An on-field agricultural source is defined in Rule 8011, Section 3.35 as the following:

- Activities conducted solely for the purpose of preparing land for the growing of crops or ***the raising of fowl or animals***, such as brush or timber clearing, grubbing, scraping, ground excavation, land leveling, grading, turning under stalks, disking, or tilling;

Therefore, the broiler houses are exempt from the requirements of Regulation VIII and Rule 4101.

Emergency IC Engine (C-5440-4-0 & -5-0)

The following condition will be listed on the ATCs to ensure compliance:

> {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

Rule 4102 Nuisance

Section 4.0 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, compliance with this rule is expected.

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – Risk Management Policy for Permitting New and Modified Sources specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

An HRA is not required for a project with a total facility prioritization score of less than one. According to the Technical Services Memo for this project (Appendix F), the total facility prioritization score including this project was greater than one. Therefore, a health risk assessment was required to determine the short-term acute and long-term chronic exposure from this project.

The cancer risk for this project is shown below:

HRA Summary					
Categories	**Broiler Houses**	**Diesel ICE (Unit 4-0)**	**Diesel ICE (Unit 5-0)**	**Project Totals**	**Facility Totals**
Prioritization Score	16.6	NA[1]	NA[1]	16.6	16.6
Acute Hazard Index	0.4	N/A[2]	N/A[2]	0.4	0.4
Chronic Hazard Index	0.01	N/A[2]	N/A[2]	0.01	0.01
Maximum Individual Cancer Risk (10^{-6})	5.82*	1.86	1.86	9.54	9.54
T-BACT Required?	No	Yes	Yes		
Special Permit Conditions?	No	Yes	Yes		

1 Prioritization for this unit was not conducted since it has been determined that all diesel-fired IC engines will result in a prioritization score greater than 1.0.

2 Acute and Chronic Hazard Indices were not calculated since there is not risk factor or the risk factor is so low that it has been determined to be insignificant for this type of unit.

* Risk represents total risk for 24 Broiler houses, since TBACT is unit for unit each broiler house will not trigger TBACT since each has a risk of 2.4E-7.

Discussion of T-BACT

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT not required for the broiler houses. However, T-BACT is required for the IC engines because the HRA indicates that the risk is above the District's thresholds for triggering T-BACT requirements.

For each emergency engine T-BACT is triggered for PM_{10}. T-BACT is satisfied with BACT for PM_{10}, as discussed in Appendix E, which is PM_{10} emissions from these engines of 0.1 g/bhp-hr or less. The engines involved with this project have a PM_{10} emissions factor of 0.14 g/bhp-hr, as presented previously in Section VII.B. Any engine model included in the ARB or EPA diesel engine certification lists and identified as having a PM_{10} emission rate of 0.149 grams/bhp-hr or less, based on ISO 8178 test procedure, shall be deemed to meet the 0.1 grams/bhp-hr requirement. Therefore, compliance with the District's Risk Management Policy is expected.

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification not have acute or chronic indices, or a cancer risk greater than the District's significance levels (i.e. acute and/or chronic indices greater than 1 and a cancer risk greater than 10 in a million). As outlined by the HRA Summary in Appendix F of this report, the emissions increases for this project was determined to be less than significant.

The following conditions will be listed on the ATCs for the IC engines (C-5440-4-0 & -5-0) to ensure compliance:

- {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap, roof overhang, or any other obstruction. [District Rule 4102]

- The PM10 emissions rate shall not exceed 0.14 g/hp-hr based on US EPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102 and 17 CCR 93115] N

Rule 4201 Particulate Matter Concentration

Section 3.1 prohibits discharge of dust, fumes, or total particulate matter into the atmosphere from any single source operation in excess of 0.1 grain per dry standard cubic foot.

Broiler Houses (C-5440-1-1)

Particulate matter concentration from the broiler houses is not expected to applicable limit as demonstrated below:

PM Conc. (gr/scf) = (PM emission rate) x (7,000 gr/lb) / (Air flow rate) x (60 min/hr) x (24 hr/day)

PM emission rate for each house (Assuming 50% of PM is PM_{10})
= 1.8 lb-PM_{10}/day x 2 lb-PM/1 lb-PM_{10} (Assuming 50% of PM is PM_{10})
= 3.6 lb-PM/day

Minimum house ventilation rate = 2,700 scfm

PM Conc. (gr/scf) = [(3.6 lb/day) x (7,000 gr/lb)] ÷ [(2,700 ft^3/min) x (60 min/hr) x (24 hr/day)]

PM Conc. = 0.006 gr/scf < 0. 1 gr/scf

As shown above, PM emissions concentration is below the applicable limit. Therefore, compliance with the requirements of this rule is expected.

Emergency IC Engines (C-5440-4-0 & -5-0)

Particulate matter emissions from the engines will be less than or equal to the rule limit of 0.1 grain per cubic foot of gas at dry standard conditions as shown by the following:

$$0.14 \quad \frac{g-PM_{10}}{bhp-hr} \times \frac{1g-PM}{0.96\,g-PM_{10}} \times \frac{1\,bhp-hr}{2{,}542.5\,Btu} \times \frac{10^6\,Btu}{9{,}051\,dscf} \times \frac{0.35\,Btu_{out}}{1\,Btu_{in}} \times \frac{15.43\,grain}{g} = \quad 0.0342 \quad \frac{grain-PM}{dscf}$$

Since 0.0342 grain-PM/dscf is ≤ to 0.1 grain per dscf, compliance with Rule 4201 is expected.

The following condition will be listed on the ATCs to ensure compliance:

- {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Rule 4550 Conservation Management Practices (CMP)

This rule applies to agricultural operation sites located within the San Joaquin Valley Air Basin. The purpose of this rule is to limit fugitive dust emissions from agricultural operation sites.

Pursuant to Section 5.1, effective on and after July 1, 2004, an owner/operator shall implement the applicable CMPs selected pursuant to Section 6.2 for each agricultural operation site.

Pursuant to Section 5.2, an owner/operator shall prepare and submit a CMP application for each agricultural operation site to the APCO for approval.

The facility received District approval for its CMP plan on August 29, 2005. Continued compliance with the requirements of District Rule 4550 is expected.

Rule 4701 Internal Combustion Engines – Phase 1

The purpose of this rule is to limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC) from internal combustion engines. Except as provided in Section 4.0, the provisions of this rule apply to any internal combustion engine, rated greater than 50 bhp, that requires a Permit to Operate (PTO).

There are two diesel-fired IC engines involved with this project. Pursuant to Section 2.0 of District Rule 4701, these engines are subject to District Rule 4701 - *Internal Combustion Engines – Phase 1*. In addition, the engines are also subject to District Rule 4702 - *Internal Combustion Engines – Phase 2.*

Since the emissions limits of District Rule 4702 and all other requirements are equivalent or more stringent than District Rule 4701 requirements, compliance with 4702 rule requirements will satisfy requirements of District Rule 4701.

Therefore, the IC engines comply with District Rule 4701 requirements and no further discussion is required.

Rule 4702 Internal Combustion Engines – Phase 2

The purpose of this rule is to limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC) from internal combustion engines.

This rule applies to any internal combustion engine with a rated brake horsepower greater than 50 horsepower.

Pursuant to Section 4.2, except for the requirements of Sections 5.7 and 6.2.3, the requirements of this rule shall not apply to an internal combustion engine that meets the following condition:

> An emergency standby engine as defined in Section 3.0 of this rule, and provided that it is operated with a nonresettable elapsed operating time meter. In lieu of a nonresettable time meter, the owner of an emergency engine may use an alternative device, method, or technique, in determining operating time provided that the alternative is approved by the APCO. The owner of the engine shall properly maintain and operate the time meter or alternative device in accordance with the manufacturer's instructions.

Section 3.15 defines an "Emergency Standby Engine" as an internal combustion engine which operates as a temporary replacement for primary mechanical or electrical power during an unscheduled outage caused by sudden and reasonably unforeseen natural disasters or

sudden and reasonably unforeseen events beyond the control of the operator. An engine shall be considered to be an emergency standby engine if it is used only for the following purposes: (1) periodic maintenance, periodic readiness testing, or readiness testing during and after repair work; (2) unscheduled outages, or to supply power while maintenance is performed or repairs are made to the primary power supply; and (3) if it is limited to operate 100 hours or less per calendar year for non-emergency purposes. An engine shall not be considered to be an emergency standby engine if it is used: (1) to reduce the demand for electrical power when normal electrical power line service has not failed, or (2) to produce power for the utility electrical distribution system, or (3) in conjunction with a voluntary utility demand reduction program or interruptible power contract.

Therefore, the emergency standby IC engines involved with this project will only have to meet the requirements of Sections 5.7 and 6.2.3 of this Rule.

Section 5.7 of this Rule requires that the owner of an emergency standby engine shall comply with the requirements specified in Section 5.7.2 through Section 5.7.5 below:

1) Properly operate and maintain each engine as recommended by the engine manufacturer or emission control system supplier.

2) Monitor the operational characteristics of each engine as recommended by the engine manufacturer or emission control system supplier.

3) Install and operate a nonresettable elapsed operating time meter. In lieu of installing a nonresettable time meter, the owner of an engine may use an alternative device, method, or technique, in determining operating time provided that the alternative is approved by the APCO and is allowed by Permit-to-Operate or Stationary Equipment Registration condition. The owner of the engine shall properly maintain and operate the time meter or alternative device in accordance with the manufacturer's instructions.

Therefore, the following conditions will be listed the ATCs for the IC engines (C-5440-4-0 & -5-0) to ensure compliance:

- This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]
- During periods of maintenance, testing, and required regulatory purposes, the permittee shall monitor the operational characteristics of the engine as recommended by the manufacturer or emissions control system supplier (e.g. oil pressure, exhaust gas temperature, etc.). [District Rule 4702]
- This engine shall be equipped with an operational nonresettable elapsed time meter or other APCO approved alternative. [District Rule 4702]
- This engine shall be operated only for maintenance, testing, and required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 100 hours per year. [District Rules 2201, 4701, and 4702]

Section 6.2.3 requires that an owner claiming an exemption under Section 4.2 or Section 4.3 shall maintain annual operating records. This information shall be retained for at least five years, shall be readily available, and submitted to the APCO upon request and at the end of each calendar year in a manner and form approved by the APCO. Therefore, the following condition (previously proposed) will be listed on ATCs for the IC engines (C-5440-4-0 & -5-0) to ensure compliance:

- The permittee shall maintain records of hours of emergency and non-emergency operation. Records shall include the date, the number of hours of operation, the purpose of the operation (e.g., load testing, weekly testing, rolling blackout, general area power outage, etc.), the type of fuel used, and records of operational characteristics monitoring. Such records shall be retained on-site for a period of at least five years and made available for District inspection upon request. [District Rules 4701 and 4702]

Rule 4801 Sulfur Compounds

Rule 4801 requires that sulfur compound emissions (as SO_2) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions for the IC engines (C-5440-4-0 & -5-0) are calculated as follows:

Volume SO_2 = (n x R x T) ÷ P
n = moles SO_2
T (standard temperature) = 60 $^{\circ}$F or 520 $^{\circ}$R
R (universal gas constant) = $\frac{10.73\,\text{psi}\cdot\text{ft}^3}{\text{lb}\cdot\text{mol}\cdot{}^{\circ}\text{R}}$

$$\frac{0.000015\ lb-S}{lb-fuel}\times\frac{7.1\text{ lb}}{\text{gal}}\times\frac{64\text{ lb}-SO_2}{32\text{ lb}-S}\times\frac{1\text{ MMBtu}}{9{,}051\text{ scf}}\times\frac{1\text{ gal}}{0.137\text{ MMBtu}}\times\frac{\text{lb}-\text{mol}}{64\text{ lb}-SO_2}\times\frac{10.73\text{ psi}-\text{ft}^3}{\text{lb}-\text{mol}-{}^{\circ}\text{R}}\times\frac{520{}^{\circ}\text{R}}{14.7\text{ psi}}\times 1{,}000{,}000 = \quad 1.0\text{ ppmv}$$

Since 1.0 ppmv is ≤ 2,000 ppmv, this engine is expected to comply with Rule 4801. Therefore, the following condition (previously proposed) will be listed on the ATCs to ensure compliance:

- Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight shall be used. [District Rules 2201 and 4801 and 17 CCR 93115]

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

Title 17 California Code of Regulations (CCR), Section 93115 - Airborne Toxic Control Measure (ATCM) for Stationary Compression-Ignition (CI) Engines

Fuel and Fuel Additive Requirements:

This regulation stipulates that as of January 1, 2006 no owner or operator of a new stationary compression ignition (CI) engine or an in-use emergency standby stationary diesel-fueled CI engine shall not fuel the engine with any fuel unless the fuel is one of the following:

1. CARB Diesel Fuel, or
2. An alternative diesel fuel that meets the requirements of the Verification Procedure, or
3. An alternative fuel, or
4. CARB Diesel Fuel used with fuel additives that meets the requirements of the Verification Procedure, or
5. Any combination of the preceding fuels.

The following condition (previously proposed) will be listed on ATCs C-5440-4-0 & -5-0 to ensure compliance:

- Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight shall be used. [District Rules 2201 and 4801 and 17 CCR 93115]

Particulate Matter, VOC + NO_x, and CO Exhaust Emissions Standards:

Title 17 CCR, Section 93115, (e)(2)(E)(1) stipulates that new agricultural stationary diesel-fueled CI engines (> 50 bhp), used in generator set applications shall emit no more than 0.15 g-PM/bhp-hr and shall meet the VOC, NO_x, and CO standards for off-road engines of the same model year and maximum rated power as specified in the Off-Road Compression-Ignition Engine Standards (Title 13 CCR, Section 2423) or the Tier 1 standards for an off-road engine if no standards have been established for an off-road engine of the same model year and maximum rated power. The engines involved with this project are certified 2005 model engine (Engine Family 4DDXL12.7VGD). As shown in the table below, the engines comply with the applicable standards of Title 13 CCR, Section 2423.

Exhaust Emissions Standards							
Source	Maximum Rated Power	Model Year	NO_x	VOC	NO_x + VOC	CO	PM
Title 13 CCR, §2423	301.7 – 603.4 bhp (225 - 450 kW)	1996-2001 (Tier 1)	6.9 g/bhp-hr (9.2 g/kW-hr)	1.0 g/bhp-hr (1.3 g/kW-hr)	--	8.5 g/bhp-hr (11.4 g/kW-hr)	0.40 g/bhp-hr (0.54 g/kW-hr)
Title 13 CCR, §2423	301.7 – 603.4 bhp (225 - 450 kW)	2001-2005 (Tier 2)	--	--	4.8 g/bhp-hr (6.4 g/kW-hr)	2.6 g/bhp-hr (3.5 g/kW-hr)	0.15 g/bhp-hr (0.20 g/kW-hr)
Title 13 CCR, §2423	301.7 – 603.4 bhp (225 - 450 kW)	2006 and later (Tier 3)	--	--	3.0 g/bhp-hr (4.0 g/kW-hr)	2.6 g/bhp-hr (3.5 g/kW-hr)	--
Detroit Diesel 12.7 DTA	455 bhp	2005	--	--	4.3 g/bhp-hr (5.8 g/kW-hr)	0.6 g/bhp-hr (0.8 g/kW-hr)	0.14 g/bhp-hr (0.18 g/kW-hr)
		Meets Standard?	N/A	N/A	Yes	Yes	Yes

The following conditions (previously proposed) will be listed on ATCs C-5440-4-0 & -5-0 to ensure compliance:

- Emissions from this IC engine shall not exceed any of the following limits: 4.3 g-NOx/bhp-hr, 0.6 g-CO/bhp-hr, or 0.27 g-VOC/bhp-hr. [District Rule 2201 and 17 CCR 93115]
- The PM10 emissions rate shall not exceed 0.14 g/hp-hr based on US EPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102 and 17 CCR 93115]

Right of the District to Establish More Stringent Standards:

This regulation also stipulates that the District:

1. May establish more stringent diesel PM, NO_x + VOC, VOC, NO_x, and CO emission rate standards; and
2. May establish more stringent limits on hours of maintenance and testing on a site-specific basis; and
3. Shall determine an appropriate limit on the number of hours of operation for demonstrating compliance with other District rules and initial start-up testing

The District has not established more stringent standards at this time. Therefore, the standards previously established in this Section will be utilized.

California Senate Bill 700 (SB 700)

Foster Farms, Davis Ranch is an agricultural operation that raises broiler chickens to provide meat for human consumption. Pursuant to Senate Bill (SB) 700, all agriculture operations, including Confined Animal Facilities (CAF), with emissions greater than ½ the major source emissions threshold levels (12.5 ton/year of NO_X or VOC), are required to obtain a District permit.

The existing 640,000 bird broiler ranch complex operation does not have emissions exceeding the 12.5 ton-VOC/year threshold. However, after completion of the project, the 1,434,880 bird broiler ranch complex will have emissions exceeding the 12.5 ton-VOC/year and will be classified as a large CAF by the California Air Resources Board (ARB). Since the facility's emissions will exceed 12.5 ton-VOC/year, a District permit is required. The facility submitted an application for a District Permit to Operate (PTO) on July 21, 2004 (project C-1042617). The permit application was not processed because the latest emissions information from CARB indicated that emissions from the existing broiler ranch complex were less than 12.5 ton-VOC/year. The previously submitted application will be processed and in-house permits to operate for the existing operation will be issued in conjunction with this project to accurately reflect baseline emissions at the facility. Since the facility has submitted a PTO application for the existing operation and an ATC application for the expansion, compliance with the requirements of SB 700 is expected.

California Environmental Quality Act (CEQA)

The purposes of CEQA include but are not limited to the following: development and maintenance of a high-quality environment for the people of the State of California that is healthful and pleasing to the senses and intellect of man; protection, rehabilitation, and enhancement of the environmental quality of the state; ensuring that the people of the state are provided with clean air and water; prevention the elimination of fish or wildlife species due to man's activities; ensuring the long-term protection of the environment; and ensuring that governmental agencies at all levels to develop standards and procedures necessary to protect environmental quality.

As a public agency with discretionary powers, the District has a responsibility to determine the significance of environmental impacts and ensure that the requirements of CEQA are satisfied.

The project is located in Fresno County. Fresno County has an ordinance covering new poultry ranches and modifications to existing ranches (The Ordinance Code of the County of Fresno, Part VII – Land Use Regulation and Planning, Section 868 – Regulations for the Siting and Operation of Poultry Facilities). CEQA was addressed generically during the development of this ordinance. Fresno County has determined that the approval of projects that comply with this ordinance is a ministerial act of a public agency and therefore exempt from CEQA.

Although, the Fresno County Department of Public Works and Planning has determined that the project complies with Section 868, Part VII of the Ordinance Code of the County of Fresno and approved the project, the District must also give approval and issue the necessary air permits for the project. As can be seen from Section VIII of this evaluation - Rule 2201, the increase in emissions for each affected pollutant is less than the new source review offset thresholds of District Rule 2201, which are also the District's CEQA significance thresholds. There is no significant adverse impact to the environment as a result of the project. Therefore, the proposed expansion is eligible for a negative declaration to comply with CEQA requirements. The appropriate negative declaration documents will be filed with Fresno County and notice of the negative declaration will be published in a local newspaper of general circulation in Fresno County prior to issuance of the ATCs

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Pending successful adoption of Negative Declaration and successful completion of the NSR Public Noticing period, issue Authorities to Construct C-5440-1-1, -4-0, and -5-0 subject to the permit conditions on the attached draft Authorities to Construct in Appendix G.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
C-5440-1-1	3020-01-F	594 total electric hp	$520.00
C-5440-4-0	3020-10-D	455 bhp IC Engine	$410.00
C-5440-5-0	3020-10-D	455 bhp IC Engine	$410.00

Appendixes

A: Current draft PTO C-5440-1-0
B: Engine Manufacturer's Emission Sheet and ARB Certification
C: Quarterly Net Emissions Change
D: Broiler House BACT Guideline and BACT Analysis
E: IC Engine BACT Guideline and BACT Analysis
F. HRA Summary
G: Draft ATCs

APPENDIX A
Draft PTO C-5440-1-0

APPENDIX B

Engine Manufacturer's Emission Sheet and ARB Certification

APPENDIX C
Quarterly Net Emissions Change

Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

QNEC = PE2 - BE, where:

QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.
PE2 = Post Project Potential to Emit for each emissions unit, lb/qtr.
BE = Baseline Emissions (per Rule 2201) for each emissions unit, lb/qtr.

Using the values in Sections VII.C.2 and VII.C.6 in the evaluation above, $PE2_{quarterly}$ and $BE_{quarterly}$ can be calculated as follows:

$PE2_{quarterly} = PE2_{annual} \div 4$ quarters/year

$BE_{quarterly} = BE_{annual} \div 4$ quarters/year

Broiler Houses (C-5440-1-1)

Quarterly PE1 (C-5440-1-0)		
Pollutant	PE2 Total (lb/yr)	Quarterly PE2 (lb/qtr)
NO_x	0	0.0
SO_x	0	0.0
PM_{10}	12,800	3,200.0
CO	0	0.0
VOC	16,000	4,000.0
NH_3	61,312	15,328.0

Quarterly PE2 (C-5440-1-1)		
Pollutant	PE2 Total (lb/yr)	Quarterly BE (lb/qtr)
NO_x	0	0.0
SO_x	0	0.0
PM_{10}	28,698	7,174.5
CO	0	0.0
VOC	35,872	8,968.0
NH_3	137,462	34,365.5

Quarterly NEC [QNEC] (C-5440-1-1)			
	PE2 (lb/qtr)	BE (lb/qtr)	NEC (lb/qtr)
NO_X	0.0	0.0	0
SO_X	0.0	0.0	0
PM_{10}	7,174.5	3,200.0	3,974.5
CO	0.0	0.0	0
VOC	8,968	4,000.0	4,968
NH_3	34,365.5	15,328.0	19,037.5

Emergency IC Engine (C-5440-4-0)

Quarterly PE1 (C-5440-4-0)		
Pollutant	PE2 Total (lb/yr)	Quarterly BE (lb/qtr)
NO_x	0	0.0
SO_x	0	0.0
PM_{10}	0	0.0
CO	0	0.0
VOC	0	0.0
NH_3	0	0

Quarterly PE2 (C-5440-4-0)		
Pollutant	PE2 Total (lb/yr)	Quarterly PE2 (lb/qtr)
NO_x	431	107.8
SO_x	1	0.3
PM_{10}	14	3.5
CO	60	15.0
VOC	27	6.8
NH_3	0	0

Quarterly NEC [QNEC] (C-5440-4-0)			
	PE2 (lb/qtr)	BE (lb/qtr)	NEC (lb/qtr)
NO_X	107.8	0.0	107.8
SO_X	0.3	0.0	0.3
PM_{10}	3.5	0.0	3.5
CO	15.0	0.0	15.0
VOC	6.8	0.0	6.8
NH_3	0	0	0

Emergency IC Engine (C-5440-5-0)

Quarterly PE1 (C-5440-5-0)		
Pollutant	PE2 Total (lb/yr)	Quarterly BE (lb/qtr)
NO_x	0	0.0
SO_x	0	0.0
PM_{10}	0	0.0
CO	0	0.0
VOC	0	0.0
NH_3	0	0

Quarterly PE2 (C-5440-5-0)		
Pollutant	PE2 Total (lb/yr)	Quarterly PE2 (lb/qtr)
NO_x	431	107.8
SO_x	1	0.3
PM_{10}	14	3.5
CO	60	15.0
VOC	27	6.8
NH_3	0	0

Quarterly NEC [QNEC] (C-5440-5-0)			
	PE2 (lb/qtr)	BE (lb/qtr)	NEC (lb/qtr)
NO_X	107.8	0.0	107.8
SO_X	0.3	0.0	0.3
PM_{10}	3.5	0.0	3.5
CO	15.0	0.0	15.0
VOC	6.8	0.0	6.8
NH_3	0	0	0

APPENDIX D
Broiler House BACT Guideline and BACT Analysis

BACT Guideline

Best Available Control Technology (BACT) Guideline X-XX*

1st Quarter 2006

Emission Unit: Broiler House ≥ 29,000 birds/house

Emission Unit: Broiler House

House Size: ≥ 29,000 birds/house

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	19% control - 1. Completely enclosed mechanically ventilated broiler housing with evaporative cooling pads, mixing fans, and a computer control system using thermostats, sensors, and timers to control environmental conditions; all birds fed in accordance with NRC or other District-approved guidelines; houses completely cleaned out at least twice per year; and all mortality removed from houses twice per day OR 2. Acidifying litter amendments; all birds fed in accordance with NRC or other District-approved guidelines; and all mortality removed from houses twice per day	1. 98% control (Capture and Thermal Incineration) 2. 95% control (Capture and Catalytic Incineration) 3. 95% control (Capture and Carbon Adsorption) 4. 80% control (Capture and Biofiltration)	
NH_3	55% control – 1. Completely enclosed mechanically ventilated broiler housing with evaporative cooling pads, mixing fans, and a computer control system using thermostats, sensors, and timers to control environmental conditions; all birds fed in accordance with NRC or other District-approved guidelines; houses completely cleaned out at least twice per year; and all mortality removed from houses twice per day OR 2. Acidifying litter amendments; all birds fed in accordance with NRC or other District-approved guidelines; and all mortality removed from houses twice per day	80% control (Capture and Biofiltration)	

BACT Analysis

Top Down BACT Analysis for Broiler Houses

1. BACT Analysis for VOC Emissions:

The SJVUAPCD BACT Clearinghouse does not contain a BACT guideline for this category of source. Therefore, a new BACT analysis has been performed to evaluate BACT for the proposed broiler houses.

a. Step 1 - Identify all control technologies

The control technology options include:

1) Emissions from Broiler House controlled by Carbon Adsorption
2) Emissions from Broiler House controlled by Thermal Incineration
3) Emissions from Broiler House controlled by Catalytic Incineration
4) Emissions from Broiler House controlled by a Biofilter capable of achieving 80% control
5) Animals fed in accordance with National Research Counsel (NRC) or other District accepted guidelines utilizing routine nutritional analysis for rations
6) Broiler House Construction and Management Practices
    1. Insulated & mechanically ventilated poultry house +
    2. Mortality removed twice per day +
    3. Evaporative cooling pads to regulate house temperature +
    4. Mixing Fans
7) Usage of probiotics
8) Acidifying Litter Amendments

b. Step 2 - Eliminate options

Option 7 (use of probiotics) will be eliminated from consideration at this time. Although this method shows some promise, more research is needed to verify the emission reductions. Probiotics are living organisms and their ability to inhibit emissions is likely to be affected by many variables. These variables have not yet been identified to an extant that would ensure that emissions would be decreased in cases in which probiotics are used.

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

Control technologies for VOC:

VOC Emission Control Technology Rankings		
Rank	Control Efficiency	Status
1) Thermal Incineration	98% [4]	Technologically Feasible
2) Catalytic Incineration	95% [5]	Technologically Feasible
3) Carbon Adsorption	95% [6]	Technologically Feasible
4) Biofiltration	80% [7]	Technologically Feasible
5) Broiler House Construction and Litter Management Practices	15%[8]	Achieved in Practice
6) Acidifying Litter Amendments	15%[9]	Technologically Feasible
7) Animals fed in accordance with National Research Counsel (NRC) or other District accepted guidelines utilizing routine nutritional analysis for rations	5%[10]	Achieved in Practice

d. Step 4 - Cost Effectiveness Analysis

Thermal & Catalytic Incineration:

The following cost analysis demonstrates that the cost of natural gas alone, not including any capital costs, causes catalytic incineration to exceed the District VOC cost effective threshold. The temperature required for catalytic incineration is 600 °F. The temperature required for thermal incineration is 1,400 °F. Since the fuel requirements and fuel cost for thermal incineration are greater than catalytic incineration, the following analysis also demonstrates that thermal incineration would not be cost effective.

Broiler House Air Flow Rate

In order to effectively calculate the costs of this control option, the broiler house airflow rate must be determined. According to the applicant, the broiler house airflow rate can range from 2,700 cfm (new chicks on a cold night) to 212,000 cfm (mature birds on a hot day). Typical flow rates are 70,000 cfm in the spring and fall, 100,000 cfm in the summer, and 40,000 cfm in the winter. For more conservative calculations, an average airflow rate of 40,000 cfm will be assumed for the broiler houses.

[4] OAQPS Control Cost Manual, 4th Edition, EPA 450/3-90-006, January 1990, page 3-8.
[5] EPA-456/R-95-003, Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams, Control Technology Center, May 1995, section 2.1, Catalytic Incineration, pages 13-16. The 95% value used is based upon EPA permit No. 23GS-93-OT-1 for 3M Company in St. Paul for an ARI, Econ-Abator catalytic oxidizer, Emission Point No. 2.
[6] EPA-456/R-95-003, Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams, Control Technology Center, May 1995, Section 3, Adsorption, pages 45 - 46.
[7] According to the SCAQMD Rule 1133.2 final staff report (page 18) "Technology Assessment Report states a well designed, well operated, and well-maintained biofilter is capable of achieving 80% destruction efficiency for VOC and NH_3."
[8] Estimate based on the ability of the computer-controlled, enclosed, mechanically ventilated broiler house to maintain lower litter moisture, which inhibits microbial action leading to VOC emissions.
[9] Study on PLT (Mitloehner) – VOC reductions may be the result of the ability of lower pH to inhibit microbial action leading to emissions
[10] Assuming that undigested protein in bird excrement, which emits VOCs during decomposition, can be reduced by feeding with NRC guidelines.

Fuel Requirement:

The gas leaving the broiler house is principally air, with a volumetric specific heat of 0.0194 Btu/scf - °F under standard conditions.

Natural Gas Requirement = (flow)(Cp_{Air})(ΔT)(1-HEF)

Where:

Flow (Q) = exhaust flow rate of VOC broiler house exhaust: 40,000 ft^3/hr
Cp_{Air} = specific heat of air: 0.0194 Btu/scf - °F
ΔT = increase in the temperature of the contaminated air stream required for catalytic oxidation to occur (It will be assumed that the air stream would increase in temperature from 100 °F to 600 °F.)
HEF = heat exchanger factor: 0.7

Natural Gas Requirement = (40,000 scf/hr)(0.0194 Btu/scf - °F)(600 °F - 100 °F)(1-0.7)
= **116,400 Btu/hr**

Fuel Cost for Incinerator:

The cost for natural gas shall be based upon on an average taken from May 2005 to October 2005 from the Energy Information Administration (EIA) Website: http://tonto.eia.doe.gov/dnav/ng/ng_sum_lsum_dcu_SCA_m.htm

Average Cost for natural gas = $10.27/MMBtu

The oxidizer is assumed to operate 24 hours per day and 300 days per year.

The fuel costs to operate the incinerator are calculated as follows:

116,400 Btu/hr x 1 MMBtu/10^6 Btu x 24 hr/day x 300 day/year x $10.27/MMBtu =
= $8,607/house-year

VOC Emission Reductions for Thermal Incineration

Annual VOC Emission Reductions for the each broiler house are calculated as follows:

[VOC EF (lb/bird-year)] [Number of birds/house] [Thermal Incinerator Control Efficiency] = (0.025 lb-VOC/bird-year) (33,120 bird/house) (0.98) = 811.4 lb-VOC/house-year

Industry Standard VOC Emission Reductions

The California Air Resources Board (CARB) has performed a source test on the Foster Farms Broiler operation that resulted in a VOC emission factor of 0.025 lb-VOC/bird-year. Foster Farms is constructing enclosed computer-controlled broiler houses. Both humidity and water usage are monitored in the houses. Industry standard does not have computer monitoring systems, reuses litter for a longer period, and removes mortality once per day. Since the management practices exceed the industry standard and all birds are fed in accordance with NRC guidelines, the emission factor is

considered lower than industry standard and must be increased to industry standard for cost analysis purposes.

Feeding the broilers in accordance with National Research Counsel (NRC) guidelines minimizes undigested protein and other undigested nutrients in the broiler litter, which emit VOCs upon decomposition. Therefore, feeding the broilers in accordance with NRC guidelines is assumed to provide 5% control efficiency.

The CARB test results demonstrated that Foster Farms current management practices result in very low VOC emissions. In fact, test results showed that no VOCs were emitted from the litter when birds were not present in the houses. These management practices will be conservatively assigned a control efficiency of 15%, though the actual control efficiency may be higher.

The combined control efficiency of feeding in accordance with NRC guidelines and Foster Farms management practices is calculated as follows:

$$1-[(1-0.05) \times (1-0.15)] \tilde{} \ 19\%$$

The VOC emission reduction calculated above (811.4 lb-VOC/house-year) will be adjusted up 19% by dividing by 1-0.19 (0.81) in order to arrive at the industry standard emission reductions.

The industry standard VOC emission reductions for the broiler house, which must be used for cost analysis purposes, are calculated as follows:

Industry Standard VOC Emission Reductions = (811.4 lb-VOC/house-year) (1/0.81)
= 1,002 lb-VOC/house-year

Cost of VOC Emission Reductions

Cost of reductions = ($8,607/year-house)/((1,002 lb-VOC/year)(1 ton/2000 lb))
= **$17,180/ton of VOC reduced**

As shown above, the natural gas cost alone for thermal or catalytic incineration would cause the cost of the VOC reductions to be greater than the $5,000/ton cost effectiveness threshold of the District BACT policy. The equipment is therefore not cost effective and is being removed from consideration at this time.

Carbon Adsorption:

Carbon adsorption occurs when air that contains contaminants is blown through a carbon unit and the pollutants are adsorbed onto the surface in the variously sized pours in the activated carbon unit.

Two main areas of cost are the cost of the device itself, and the operating cost of the carbon adsorption system.

The following cost analysis demonstrates that the cost of activated carbon alone, not including any other costs, causes carbon adsorption to exceed the District cost effective

threshold. Treated activated carbon can control both VOC and ammonia emissions. Although this technology can control both pollutants, a cost effective threshold has not been established for ammonia. Therefore, only achieved-in-practice options will be considered for ammonia at this time and a multi-pollutant cost effective analysis for VOC and ammonia will not be performed.

VOC Emission Reductions for Carbon Adsorption

Annual VOC Emission Reductions for the each broiler house are calculated as follows:

[VOC EF (lb/bird-year)] [Number of birds/house] [Carbon Adsorption Control Efficiency] = (0.025 lb-VOC/bird-year) (33,120 bird/house) (0.95) = 786.6 lb-VOC/house-year

Adjusted to industry standard = 786.6 lb-VOC/house-year x (1/0.81)
= 971 lb-VOC/house-year

Amount of Activated Carbon Required for VOC Control

Carbon can adsorb 20% of it's weight in VOCs.[11]

Carbon required = (971 lb-VOC/year) x 1 lb-Carbon/0.2 lb-VOC
= 4,855 lb-carbon/year

Cost for Activated Carbon for VOC Control:

Assuming a price for carbon of $1.00/lb*

*Note: from GEAR 12 - Motor Vehicle and Mobile Equipment Coating Operations: Actual cost estimate was $2.00/lb. An amount of $1.00/lb was assumed to be conservative.

Carbon cost = 4,855 lb-carbon/yr x $1.00/lb = **$4,855/house-year**

Cost of VOC Emission Reductions

Cost of reductions = ($4,855/house-year)/((971 lb-VOC/yr)(1 ton/2000 lb))
= **$10,000/ton of VOC reduced**

As shown above, the cost of the activated carbon alone for carbon adsorption would cause the cost of the VOC reductions to be greater than the $5,000/ton cost effectiveness threshold of the District BACT policy. Therefore, this option is not cost effective and is being removed from consideration at this time.

Biofiltration:

Biofiltration is a method of reducing pollutants in which exhaust air that contains contaminants is blown through a media (e.g., soil, compost, wood chips) that supports a microbial population. The microbes utilize the pollutants such as VOCs and ammonia as nutrients and oxidize the compounds as they pass through the filter.

[11] District GEAR 9 - Soil Remediation Project Utilizing an Activated Carbon System

The following cost analysis demonstrates that the cost of biofiltration exceeds the District cost effective threshold. Biofiltration can control both VOC and ammonia emissions. Although, this technology can control both pollutants, a cost effective threshold has not been established for ammonia. Therefore, only achieved-in-practice options will be considered for ammonia at this time and a multi-pollutant cost effective analysis for VOC and ammonia will not be performed.

Cost of Biofiltration

The cost estimate for a biofiltration system is taken from the University of Minnesota Extension Service Biosystems and Agricultural Engineering Update "Biofilter Design Information" (March 2004). The cost is largely dependent on the airflow rate that the filter must handle. The University of Minnesota publication states "Biofilters used to treat ventilating air exhausted from a livestock building should be sized to treat the maximum ventilation rate, which is typically the warm weather rate, of the building." According to the applicant, the broiler house airflow rate can range from 2,700 cfm (new chicks on a cold night) to 212,000 cfm (mature birds on a hot day). The maximum airflow rate for the house is calculated as follows:

Maximum Airflow Rate	
10 fans @ 26,800 cfm	= 268,000 cfm
1 fan @ 18,300 cfm	= 18,300 cfm
1 fan @ 9,000 cfm	= 9,000 cfm
Total	= 295,300 cfm

As shown above, the maximum airflow rate for each house is about 295,300 cfm. However, for more conservative calculations a maximum airflow rate of 212,000 will be assumed for this cost analysis.

Capital Cost of Biofiltration

The cost of the biofilter includes the costs of the fans, media, ductwork, plenum, and labor. The University of Minnesota publication gives a capital cost between $150 and $250 per 1,000 cfm. An average cost of $200 per 1,000 cfm will be assumed for this cost analysis.

The capital cost of the biofilter is calculated as follows:

$200/1,000 cfm x 212,000 cfm = $42,400

Pursuant to District Policy APR 1305, section X (11/09/99), the cost for the purchase of the biofilter will be spread over the expected life of the system using the capital recovery equation. Although, the biofilter media (e.g., soil, compost, wood chips) must be replaced after 3-5 years, this does not constitute a significant cost of the system. Therefore, the expected life of the system (fans, media, ductwork, plenum, etc) is estimated at 10 years. A 10% interest rate is assumed in the equation and the assumption will be made that the equipment has no salvage value at the end of the ten-year cycle.

$A = [P \times i(I+1)^n]/[(I+1)^n-1]$

Where: A = Annual Cost
P = Present Value
I = Interest Rate (10%)
N = Equipment Life (10 years)

$A = [\$42,400 \times 0.1(1.1)^{10}]/[(1.1)^{10}-1]$
= $6,900/year

VOC Emission Reductions for Biofiltration

Annual VOC Emission Reductions for the each broiler house are calculated as follows:

[VOC EF (lb/bird-year)] [Number of birds/house] [Biofilter Control Efficiency]
= (0.025 lb-VOC/bird-year) (33,120 bird/house) (0.80) = 662.4 lb-VOC/house-year

Adjusted to industry standard = 662.4 lb-VOC/house-year x (1/0.81)
= 818 lb-VOC/house-year

Cost of VOC Emission Reductions

Cost of reductions = ($6,900/house-year)/((818 lb-VOC/yr)(1 ton/2000 lb))
= **$16,870/ton of VOC reduced**

As shown above, the capital cost alone for a biofilter would cause the cost of the VOC reductions to be greater than the $5,000/ton cost effectiveness threshold of the District BACT policy. Therefore, this option is not cost effective and is being removed from consideration at this time.

The facility is proposing completely enclosed mechanically ventilated broiler housing with evaporative cooling pads, mixing fans, and a computer control system using thermostats, sensors, and timers to control environmental conditions (e.g. temperature, humidity, ventilation) within the houses. The facility is also proposing to feed all birds in accordance with National Research Counsel (NRC) or other District-approved guidelines and to remove all mortality from houses twice per day. The majority of larger poultry operations in California maintain the birds in mechanically ventilated houses with about 20,000 birds in each house.[12] Since there is not a more effective control option, no further cost analysis is required.

[12] Page 15 of the California Environmental Protection Agency Air Resources Board, Staff Report: Initial Statement of Reasons for Rulemaking Public Hearing to Consider the Large Confined Animal Facility Definition (May 6, 2005): http://www.arb.ca.gov/regact/lcaf05/isor.pdf

e. Step 5 - Select BACT

BACT for VOC for this operation is determined to be completely enclosed mechanically ventilated broiler housing with evaporative cooling pads, mixing fans, and a computer control system using thermostats, sensors, and timers to control environmental conditions (e.g. temperature, humidity, ventilation) within the houses; feeding all birds in accordance with National Research Counsel (NRC) or other District-approved guidelines; and removal of all mortality from houses twice per day.[13]

[13] Total control efficiency of management practices and feeding with NRC guidelines = 1-[(1-0.15) x (1-0.05)] = 19%

2. BACT Analysis for NH_3 Emissions:

The SJVUAPCD BACT Clearinghouse does not contain a BACT guideline for this category of source. Therefore, a new BACT analysis has been performed to evaluate BACT for the proposed broiler houses.

a. Step 1 - Identify all control technologies

The control technology options include:

1) Emissions from Broiler House controlled by Carbon Adsorption
2) Emissions from Broiler House controlled by Thermal Incineration
3) Emissions from Broiler House controlled by Catalytic Incineration
4) Emissions from Broiler House controlled by a Biofilter capable of achieving 80% control
5) Animals fed in accordance with National Research Counsel (NRC) or other District accepted guidelines utilizing routine nutritional analysis for rations
6) Broiler House Construction and Management Practices
    1. Insulated & mechanically ventilated poultry house +
    2. Mortality removed twice per day +
    3. Evaporative cooling pads to regulate house temperature +
    4. Mixing Fans
7) Acidifying Litter Amendments

b. Step 2 - Eliminate options

Option 1 (Emissions from Broiler House controlled by Carbon Adsorption) will be eliminated from consideration at this time. Although this option is technologically feasible, no uses of carbon adsorption to control broiler house ammonia emissions were identified. Since a cost effective threshold has not been established for ammonia, only achieved-in-practice options will be considered for ammonia at this time.

Option 2 (Emissions from Broiler House controlled by Thermal Incineration) and Option 3 (Emissions from Broiler House controlled by Catalytic Incineration) will be eliminated from consideration at this time. Although these options are technologically feasible, no uses of thermal or catalytic incineration to control broiler house ammonia emissions were identified. Since a cost effective threshold has not been established for ammonia, only achieved-in-practice options will be considered for ammonia at this time. It should also be noted that incineration is an oxidation process. The most likely byproduct of the oxidation of ammonia would be NO_X. The following equation demonstrates the likely reaction:

$$NH_3 + 2.5O_2 \rightarrow NO_2 + 3H_2O$$

The molecular weights of NH_3 and NO_2 are 17 and 46, respectively; therefore, for every pound of ammonia eliminated there is potential to produce up to 2.7 pounds of NO_X (a precursor for ozone, and according to modeling results, a more significant precursor of PM_{10} and $PM_{2.5}$ than NH_3). This is an additional reason to eliminate incineration as a control for ammonia.

Option 4 (Emissions from Broiler House controlled by a Biofilter) will be eliminated from consideration at this time. Biofiltration is widely used to control emissions from enclosed buildings where pigs are raised and have been used in Minnesota to control emissions from enclosed cow housing areas and composting facilities. At West Virginia University in 2003, a bench scale biofilter for 33 birds was evaluated for removal of ammonia from poultry house exhaust. The biofilter provided 95% control of ammonia emissions.[14] However, biofilters have not yet been used for poultry facilities on a large scale and although this option is technologically feasible, no uses of biofiltration to control broiler house ammonia emissions were identified. Since a cost effective threshold has not been established for ammonia, only achieved-in-practice options will be considered for ammonia at this time.

c. Step 3 - Rank remaining options by control effectiveness

Control technologies for NH_3:

Acidifying Litter Amendments

The ammonia emission reductions caused by the usage of acidifying litter amendments are usually reported in terms ppmv inside the broiler house. Although these litter amendments have consistently shown significant reductions in ppmv levels in the house (50% reductions in average ppmv level over the grow-out period), it may not be possible to directly correlate these reductions to pounds of ammonia emitted since the house ventilation rate constantly changes.

Arkansas research has shown that alum application rates of 130-260 lb per ton of litter reduced ammonia-N emissions from 28 lb per ton of litter to less than 1 lb per ton of litter over the grow-out period (96.4% control).[15] However, this may be the result of an atypically high application rate.[15]

Brewer (1988) estimated that the total nitrogen release over the grow-out period from a poultry house with 20,000 broilers was 296 kg (as NH_3) for an untreated house and 131 kg (as NH_3) for an alum-treated house (55.7% control). It is estimated that there are about 6.7 grow-out cycles per year (used to develop CARB emission factor). The resulting emission factor for an alum-treated house is calculated as follows:

(131 kg-NH_3/growout-house) x (2.2 lb/kg) x (6.7 growout/year) ÷ (20,000 bird/house)
= 0.0965 lb-NH_3/bird-year

Moore states that a typical poultry house will lose about two tons of nitrogen each year as ammonia but an alum-treated house will only lose about 1,000 lb of nitrogen as ammonia (75% control).[16] The resulting emission factor for an alum-treated house is calculated as follows:

[14] http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12602826&dopt=Abstract

[15] Alabama Cooperative Extension, Agronomy Series – Alum in Poultry Litter (May, 2005)
[16] U.S. Water News Online – Aluminum Sulfate found to reduce ammonia, phosphorus in Poultry litter (February 2002)

(1,000 lb-NH_3/house-year) ÷ (20,000 bird/house) **= 0.05 lb-NH_3/bird-year**

Mcward and Taylor found similar ammonia emission reductions when comparing acidic, granular litter amendments such as sodium bisulfate, alum, and Poultry Guard.[17]

The emission reductions for acidifying litter amendments will be conservatively estimated at 0.0965 lb-NH_3/bird-year and 50% control

In California Pataloona Poultry [(707) 763-1904], located in Pataloona, CA, and Central Coast Fryer [(209) 634-3421], located in Denair, CA, both use an acidifying litter amendment (PLT) in their broiler operations to minimize ammonia emissions from the broiler houses.

Broiler House Construction and Foster Farms Management Practice

The California Air Resources Board (CARB) has performed a source test on the Foster Farms Broiler operation that resulted in an ammonia emission factor of 0.0958 lb-NH_3/bird-year. This emission factor falls within the range of emission factor estimates when acidifying litter amendments are used. Therefore, the two options will be considered equivalent.

NH_3 Emission Control Technology Rankings		
Rank	Control Efficiency	Status
1) Acidifying Litter Amendments	50%	Achieved in Practice
2) Broiler House Construction and Foster Farms Management Practices	50%	Achieved in Practice
3) Animals fed in accordance with National Research Counsel (NRC) or other District accepted guidelines utilizing routine nutritional analysis for rations	10%[18]	Achieved in Practice

d. Step 4 - Cost Effectiveness Analysis

All of the above options are achieved-in-practice; therefore a cost analysis is not required.

The facility is proposing completely enclosed mechanically ventilated broiler housing with evaporative cooling pads, mixing fans, and a computer control system using thermostats, sensors, and timers to control environmental conditions (e.g. temperature, humidity, ventilation) within the houses. The facility is also proposing to feed all birds in accordance with National Research Counsel (NRC) or other District-approved guidelines and to remove all mortality from houses twice per day. These practices are currently employed by Foster Farms at other ranches and will continue to be practiced

[17] McWard, G. W. and D. R. Taylor, Acidified Clay Litter Amendment, Journal of Applied Poultry Research (2000)
[18] Assuming that nitrogen excretion, which leads to ammonia volatization, can be reduced by 10% by feeding with NRC guidelines

in the proposed houses. Since there is not a more effective control option, no cost analysis is required.

e. Step 5 - Select BACT

BACT for NH_3 for this operation is determined to be completely enclosed mechanically ventilated broiler housing with evaporative cooling pads, mixing fans, and a computer control system using thermostats, sensors, and timers to control environmental conditions (e.g. temperature, humidity, ventilation) within the houses; feeding all birds in accordance with National Research Counsel (NRC) or other District-approved guidelines; and removal of all mortality from houses twice per day. [19]

[19] Total control efficiency of management practices and feeding with NRC guidelines = 1-[(1-0.50) x (1-0.10)] = 55%

APPENDIX E
IC Engine BACT Guideline and BACT Analysis

BACT Guideline

Best Available Control Technology (BACT) Guideline 3.1.3*

Last Update: June 30, 2001

Emission Unit: Emergency Diesel I.C. Engine ≥ 400 hp

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
NO_x	Certified emissions of 6.9 g/bhp-hr or less		
VOC	Positive crankcase ventilation		
PM_{10}	0.1 grams/bhp-hr (if TBACT is triggered) 0.4 grams/bhp-hr (if TBACT is not triggered)		
SO_x	Low-sulfur diesel fuel (500 ppmw sulfur or less) or Very Low-sulfur diesel fuel (15 ppmw sulfur or less), where available.		
CO	2.0 grams/brake horsepower-hour	≤ 1.4 grams/bhp-hr	

1. Any engine model included in the ARB or EPA diesel engine certification lists and identified as having a PM10 emission rate of 0.149 grams/bhp-hr or less, based on ISO 8178 test procedure, shall be deemed to meet the 0.1 grams/bhp-hr requirement.
2. A site-specific Health Risk Analysis is used to determine if TBACT is triggered. (Clarification added 05/07/01)

BACT Analysis

Top Down BACT Analysis for the Emergency IC Engine

Oxides of nitrogen (NO_x) are generated from the high temperature combustion of the diesel fuel. A majority of the NO_x emissions are formed from the high temperature reaction of nitrogen and oxygen in the inlet air. The rest of the NO_x emissions are formed from the reaction of fuel-bound nitrogen with oxygen in the inlet air.

1. BACT Analysis for NO_x Emissions:

a. Step 1 - Identify all control technologies

The SJVUAPCD BACT Clearinghouse guideline 3.1.3, 1st quarter 2006, identifies achieved in practice BACT for NO_x emissions from emergency diesel IC engines (= 400 hp) as follows:

8) Certified emissions of 6.9 g-NO_x/bhp-hr or less.

No technologically feasible alternatives or control alternatives identified as alternate basic equipment for this class and category of source are listed.

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

No ranking needs to be done because the applicant has proposed the achieved in practice option.

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed the only control achieved in practice in the ranking list from Step 3. Therefore, per SJVUAPCD BACT policy, the cost effectiveness analysis is not required.

e. Step 5 - Select BACT

BACT for NO_x emissions from these emergency diesel IC engines is having certified emissions of 6.9 g-NO_x/hp-hr or less.

2. BACT Analysis for SO_x Emissions:

Oxides of sulfur (SO_x) emissions occur from the combustion of the sulfur which is present in the diesel fuel.

a. Step 1 - Identify all control technologies

The SJVUAPCD BACT Clearinghouse guideline 3.1.3, 1st quarter 2006, identifies achieved in practice BACT for SO_x emissions from emergency diesel IC engines (= 400 hp) as follows:

1) Low-sulfur diesel fuel (0.05% by weight or less) or very low-sulfur (0.0015% by weight), where available. Note: The District has determined very low sulfur diesel fuel to be available everywhere in the District.

No technologically feasible alternatives or control alternatives identified as alternate basic equipment for this class and category of source are listed.

The use of low sulfur (0.05%) diesel fuel would have caused the 2 lb/day BACT threshold to be surpassed. The District has determined that very low-sulfur diesel fuel is available for use; therefore very low-sulfur (0.0015%) diesel fuel is required for this IC engine installation.

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

No ranking needs to be done because the applicant has proposed the achieved in practice option.

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed the only control achieved in practice in the ranking list from Step 3. Therefore, per SJVUAPCD BACT policy, the cost effectiveness analysis is not required.

e. Step 5 - Select BACT

BACT for SO_x emissions from these emergency diesel IC engines (= 400 hp) is using very low-sulfur diesel (0.0015% by weight).

3. BACT Analysis for PM_{10} Emissions:

Particulate matter (PM_{10}) emissions occur from the reaction of various elements in the diesel fuel including fuel sulfur.

a. Step 1 - Identify all control technologies

The SJVUAPCD BACT Clearinghouse guideline 3.1.3, 1st quarter 2006, identifies achieved in practice BACT for PM_{10} emissions from emergency diesel IC engines = 400 hp) as follows:

1) Certified emissions of 0.1 g-PM_{10}/bhp-hr or less since T-BACT is triggered for the engine proposed in this project.

No technologically feasible alternatives or control alternatives identified as alternate basic equipment for this class and category of source are listed.

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

No ranking needs to be done because the applicant has proposed the achieved in practice option.

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed the only control achieved in practice in the ranking list from Step 3. Therefore, per SJVUAPCD BACT policy, the cost effectiveness analysis is not required.

e. Step 5 - Select BACT

BACT for PM_{10} emissions from these emergency diesel IC engines (= 400 hp) is having certified emissions not exceeding 0.1 g-PM_{10}/bhp-hr.

Pursuant to the BACT Guideline, any engine model included in the ARB or EPA diesel engine certification lists and identified as having a PM_{10} emission rate of 0.149 grams/bhp-hr or less, based on ISO 8178 test procedure, shall be deemed to meet the 0.1 grams/bhp-hr requirement

4. BACT Analysis for VOC Emissions:

Volatile organic compounds (VOC) are emitted from the crankcase of the engine as a result of piston ring blow-by.

a. Step 1 - Identify all control technologies

The SJVUAPCD BACT Clearinghouse guideline 3.1.3, 1st quarter 2006, identifies achieved in practice BACT for VOC emissions from emergency diesel IC engines = 400 hp) as follows:

1) Positive crankcase ventilation.

No technologically feasible alternatives or control alternatives identified as alternate basic equipment for this class and category of source are listed.

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

No ranking needs to be done because the applicant has proposed the achieved in practice option.

d. Step 4 - Cost effectiveness analysis

The applicant has proposed the only control achieved in practice in the ranking list from Step 3. Therefore, per SJVUAPCD BACT policy, the cost effectiveness analysis is not required.

e. Step 5 - Select BACT

BACT for VOC emissions from these emergency diesel IC engines (= 400 hp) is having positive crankcase ventilation.

APPENDIX F
HRA Summary

APPENDIX G
Draft ATCs