

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING AND COMPLIANCE

APPLICATION PROCESSING AND CALCULATION

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PERMIT TO CONSTRUCT EVALUATION

Applicant name: Frito-Lay North America, Inc. (FACILITY ID# 346)

Mailing address: 9535 Archibald Ave.
Rancho Cucamonga, CA 91730

Equipment Location: 9535 Archibald Ave.
Rancho Cucamonga, CA 91730

EQUIPMENT DESCRIPTIONS:

A/N 500033

MODIFICATION TO A:

FRYER, (D65), AC HORN, NATURAL GAS, CORN CHIP, 3.9 MMBTU/HR BY VENTING THIS EQUIPMENT TO A REGENERATIVE THERMAL OXIDIZER

A/N 500034

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. REGENERATIVE THERMAL OXIDIZER, (C153), ADWEST TECHNOLOGIES, MODEL NO. RETOX 1.5 RT095, 22'-0 3/4" L. X 7'-11 1/2" W. X 10'-0" H., NATURAL GAS-FIRED, WITH MAXON KINEDIZER LE, MODEL 1.5 MOD, 433,500 BTU PER HOUR BURNER, LOW NOX, WITH A 3 HP COMBUSTION BLOWER, AND NATURAL GAS INJECTION SYSTEM, 225,000 BTU/HR, AND 2 HEAT EXCHANGER BEDS, WITH A TOTAL OF 3,300 LBS OF CERAMIC MEDIA.
2. ONE PRE-FILTER, (C154), 304 STAINLESS STEEL, 3.9 SQ. FEET SURFACE AREA.
3. EXHAUST SYSTEM WITH A 20 H.P EXHAUST BLOWER VENTING ONE DEEP FAT FRYER.

A/N 500035

Title V/RECLAIM Permit Revision

PERMIT CONDITIONS: (SEE PROPOSED PERMIT)

BACKGROUND:

Frito-Lay is a RECLAIM and Title V facility. Permits to Construct for the deep fat fryer (D65) and mist eliminator (C66) were issued on 02/08/1996 with an estimated 95%

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control efficiency. In July 2008, the facility conducted a source test on their Corn Chip Line. Test results revealed approximately 42% control efficiency for PM10 and 25% control efficiency for VOC. On April 10, 2009, the district denied Frito-Lay's application for a Permit to Operate the Corn Chip Line and the associated control (A/N's 309750 and 310520). The denial letter cited Rule 1303 (a) (1) regarding BACT requirements and Rule 1303 (b) (2) regarding offset requirements for VOC and PM10 as the basis for denial of the Permit to Operate. Frito-Lay has committed to install a Regenerative Thermal Oxidizer (RTO) and replace the oil mist eliminator with another pre-filter. Under the Order for Abatement, Frito-Lay will continue to operate the corn chip line with the existing oil mist eliminator until the RTO and filter are permitted and installed.

On 06/26/09 in response to the denial, A/N 500033 was submitted for a modification to the basic equipment that was under the denied permit in order to install an approved APC system venting the equipment. The basic equipment under the denied permit consists of a Deep Fat Fryer (D65) operating under the Corn Chip Line (Section H: Process 1, System 4).

A/N 500034 is the Permit to Construct application for the Regenerative Thermal Oxidizer with pre-filter system intended to control 98% of VOC emissions and 95% of PM10 fryer emissions.

A/N 500035 is the Reclaim/Title Permit Revision.

PROCESS DESCRIPTION:

The corn chips move continuously through the cooking oil on a conveyor. Emissions will be vented through a Regenerative Thermal Oxidizer with a pre-filter system to control 98% of VOC emissions and 95% of PM10 fryer emissions. The fryer itself will not be modified. It is entirely enclosed except for a small opening at the inlet and outlet to allow chips to enter and exit. A fan draws emissions through the fryer stack, however, it will be replaced with the RTO process fan. The fryer exhaust stack will be welded air tight to the RTO inlet to provide emissions capture.

EMMISSION EVALUATION:

APPLICATION NO. 500033

ESTIMATED EMISSIONS POST MODIFICATION-- DEEP FAT FRYER (D65)

1. Products of Combustion

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Default emission factors are as follows (Information from "General Instruction Book for the AQMD 2007-2008 Annual Emission Reporting Program", Appendix A):

ROG: 7 lb/mmscf

NOx: 130 lb/mmscf

SOx: .83 lb/mmscf

CO: 35 lb/mmscf

PM10: 7.5 lb/mmscf

Uncontrolled = Controlled

ROG = .027 lb/hr = **.648 lb/day**

NOX = .507 lb/hr = **12.168 lb/day**

SOX = .002 lb/hr = **.048 lb/day**

CO = .137 lb/hr = **3.288 lb/day**

PM10 = .029 lb/hr = **.696 lb/day**

2. Process Emissions (ESTIMATED FROM July 2008 Source Tests)

Uncontrolled PM10 Emission Rate = .6408 lbs/hr = 15.38 lbs/day

PM10 Efficiency (Proposed) = 95%

Controlled PM 10 Emission Rate = .032 lbs/hr = 0.77 lbs/day

Uncontrolled VOC Emission Rate = 1.22 lbs/hr = 29.28 lbs/day

VOC Efficiency = 98%

Controlled VOC Emission Rate = .024 lbs/hr = 0.59 lbs/day

The estimated emission calculations are based on the uncontrolled source tests conducted on 07/22/08 & 07/23/08 at a throughput rate of 1,150 lbs/hr. The estimated calculations assume the uncontrolled PM10 emission rate and uncontrolled VOC emission rate for the fryer will be similar to the future source test. To accurately compare the difference in emissions allowed under the permit condition, the above emission calculations are adjusted to estimate the throughput rate of 1,250 lbs/hr by multiplying an adjustment factor of 1.087 (1,250/1,150) as follows:

Uncontrolled PM10 Emission Rate = .6965 lbs/hr = **16.72 lbs/day**

Controlled PM 10 Emission Rate = .035 lbs/hr = **0.84 lbs/day**

Uncontrolled VOC Emission Rate = 1.33 lbs/hr = **31.83 lbs/day**

Controlled VOC Emission Rate = .027 lbs/hr = **0.64 lbs/day**

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APPLICATION NO. 500034

The RTO is equipped with one low NO_x burner. It takes one hour maximum to get the ceramic bed up to temperature (1500 degrees F). Due to the efficient heat recovery in the ceramic bed, it is anticipated that once the ceramic bed reaches the operating temperature, the heat from the oxidation of the VOCs from the fryer operation maintains the bed temperature. However, for the calculation purposes, it is assumed that BTU input from the burner is at 100% of the maximum rating.

1. Products of Combustion (RTO burner)

Operating Hours: 1 hour/day, 7 days/wk, 52 wks/year

Burner Rating: 433,500 Btu/hr

NO_x Emissions: 30 ppm @ 3% O₂ (Will be verified by Source Test)

Default emission factors are as follows (Information from "General Instruction Book for the AQMD 2007-2008 Annual Emission Reporting Program", Appendix A):

ROG: 7 lb/mmscf

SO_x: .83 lb/mmscf

CO: 35 lb/mmscf

PM₁₀: 7.5 lb/mmscf

ROG = .0029 lb/hr = .0029 lb/day

NO_x = .0157 lb/hr = .0157 lb/daySO_x = .0002 lb/hr = .0002 lb/day

CO = .0145 lb/hr = .0145 lb/day

PM₁₀ = .0031 lb/hr = .0031 lb/day**Total Emissions – ESTIMATED POST MODIFICATION (lbs/day)**

	ROG	SOX	NOX	CO	PM10
A/N 500033	1.238	0.048	12.168	3.288	1.536
A/N 500034	.0029	.0002	.0157	.0145	.0031

CHANGE IN EMISSIONS (PRE-MOD VS ESTIMATED POST-MOD; lbs/day)

	ROG	SOX	NOX	CO	PM10
PRE-MOD	1.238	0.048	12.168	3.288	1.536
Estimated POST-MOD	1.241	0.0482	12.184	3.303	1.539
CHANGE	+0.003	+0.0002	+0.016	+0.015	+0.003

RULES EVALUATION:

Rule 212 - Standard for Approving Permits

Paragraph 212(c)(1): Requires a public notice for all new or modified permit units that may emit air contaminants located within 1,000 feet from the outer boundary of a school. According to the website geodistance.com the nearest school, Rancho Cucamonga Middle School, is approximately 4,805 feet from the property line. A 30-Day Public Notice is not required under this paragraph.

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

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

Rule 401- Visible Emission: No visible emission is expected if the equipment is well maintained and properly operated. Therefore, compliance is expected.

Rule 402- Nuisance: Frito-Lay North America Inc. was never issued any Notice of Violations. In addition, in the last 10 years there were no complaints in the District Compliance CLASS data base alleging Frito-Lay North America, Inc. of any nuisances. Compliance with this rule is expected.

Rule 404 – Based on the calculations, PM concentration from this equipment is expected to comply within the limit indicated in Table 404(a). Compliance with this rule expected.

Equipment	Exhaust Flow Rate (cfm)	Rule Limits (grain/ft³)	Actual Emissions
Corn Chip Line (D65)	1,250	.173	.003

Rule 405 – Based on the calculations, PM discharge rate from this equipment is well below the rule limit. Compliance with this rule expected.

Equipment	Process Rate (lb/hr)	Rule Limits (lbs/hr)	Actual Emissions
Corn Chip Line (D65)	1,250	2.7	.035

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Reg XIII and Rule 2005 – New Source Review:

REG XIII -BACT: 10/05/1990 Rev.1 - BACT Guideline Requirements for the Fryer – Deep Fat:

Subcategory/Rating/ Size	Criteria Pollutants				
	VOC	NOX	SOX	CO	PM10
≥ 2 MM Btu/hr	Afterburner (≥ 0.3 Sec. Retention Time at ≥ 1400 °F)	Natural Gas	Natural Gas		Natural Gas with Afterburner (≥ 0.3 Sec. Retention Time at ≥ 1400 °F)

As specified in the above BACT guideline dated 04/05/1990, an afterburner (> 0.3 second retention time at > 1,400 °F) has been achieved-in-practice as BACT for VOC and PM10 emissions from deep fat fryers. The district issued a letter denying the Permit to Operate for the deep fat fryer since it did not meet BACT requirements, therefore the facility committed to modify their deep fat fryer by adding a Regenerative Afterburner unit to meet BACT requirements.

Low-NOx burners are required as BACT for afterburners when the NOx emissions will be greater than one pound/day. The afterburner is equipped with a Low-Nox burner even though the emissions are not greater than one pound.

Reg XIII -Modeling: Modeling is not required as the PM10 emissions are .064 lbs/hr which is less than the .41 lb/hr specified in the appendix A of Rule 1303.

Reg XIII -Offsets: The basic equipment was originally issued a Permit to Construct in 1996, however, because of recent source tests and District Reg XIII requirements the project was denied a Permit to Operate. Subsequently, applications were submitted for modification by addition of an approved APC system venting the basic equipment. There is no increase in fryer emissions based on total calculated emissions (Post Modification). The afterburner APC system will result in an increase of NOx, but less than 0.5 lbs/day. CO is an attainment pollutant that does not require offsets.

Rule 2005: The afterburner will result in a slight increase in NOx emissions of less than 0.5 lbs/day. The facility holds enough RTC to offset NOx emissions from the RTO.

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Rule 1401- New Source Review of Toxic Air Contaminants: Toxic air contaminants emitted from natural gas usage will be minimal. Emissions expected to be less than the screening levels.

Reg XXX - Title V Permits: Applications for De minimis Significant Permit Revisions require EPA 45-day review.

CONCLUSIONS AND RECOMMENDATIONS:

Based on the evaluation contained herein, the subject equipment is expected to comply with all of the applicable District's rules and regulations (specifically BACT and Offset requirements); therefore, I recommend the Permits to Construct for the deep fat fryer (D65) and APC system (C153, C154).