STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
GOVERNOR

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Texas Instruments Incorporated
Cumberland County
South Portland, Maine
A-698-71-X-M (SM)

Departmental
Findings of Fact and Order
Air Emission License
Amendment #2

FINDINGS OF FACT

After review of the air emissions license minor revision application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., §344 and §590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Texas Instruments Incorporated (TI) was issued Air Emission License Renewal A-698-71-U-R on December 30, 2009, permitting the operation of emission sources associated with the semiconductor manufacturing facility located in South Portland, Maine. A minor revision (A-698-71-W-M) was subsequently issued on June 20, 2012 to limit the facility's potential to emit greenhouse gas (GHG) emissions below the major source threshold of 100,000 short tons per year CO_2e (carbon dioxide equivalent).

TI has submitted a minor revision request to adjust the allocation of short tons per year of CO_2e established for the combustion sources and the semiconductor manufacturing process sources in minor revision A-698-71-W-M. The total facility threshold of 99,999 short tons per year of CO_2e will not change, but the total combustion sources GHG limit will be reduced from 12,000 to 8,000 short tons per year of CO_2e and the total semiconductor manufacturing processes GHG limit will increase from 87,999 to 91,999 short tons per year of CO_2e (CO_2e from the semiconductor manufacturing processes does not include the fuel burning equipment).

The equipment addressed in this license is located at 5 Foden Road, South Portland, Maine.

B. Emission Equipment

This minor revision addresses greenhouse gas emissions from the semiconductor manufacturing processes and the fuel burning equipment at the TI facility.

C. Application Classification

TI's request to adjust the allocation of the CO_2e emission limits does not involve an increase in any regulated air emissions, including the facility-wide limit on GHG emissions, or changes to the emissions equipment. Therefore, the application is classified as a minor revision and has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 CMR 115 (as amended).

II. MINOR REVISION

A. Facility-Wide Greenhouse Gas Limits

TI has requested a revision to limit fuel burning equipment to 8,000 short tons of CO_2e per year and limit semiconductor manufacturing processes to 91,999 short tons of CO_2e per year. The facility-wide license greenhouse gas limit shall remain unchanged at 99,999 short tons of CO_2e per year, so the facility will continue to be classified as a minor source. This allocation changes the 12,000 and 87,999 short tons of CO_2e per year limit for fuel burning equipment and semiconductor manufacturing processes emissions, respectively, as set forth in the previous minor revision (A-698-71-W-M).

For the purposes of the annual limits, greenhouse gases are defined in 06-096 CMR 100 (as amended) as the following:

> "Greenhouse gases" means the aggregate group of the following gases: Carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

1. Fuel Burning Equipment

In order to meet the limit of 8,000 short tons of CO_2e per year from fuel burning equipment, TI has proposed revised fuel limits for the boilers and incineration unit from those currently licensed. For ease of recordkeeping, TI has proposed fuel limits of 674,800 gallons per year firing #2 fuel oil or 126,660,000 standard cubic feet (scf) per year firing natural gas, if only one of those types of fuel are used in the consecutive 12-month rolling total period (i.e.- only natural gas is used for all 12 months, or if only #2 fuel oil is used for all 12 months). With the fuel limit and the 500 hours/year operational limits on the diesel generators, the facility will be under 8,000 short tons of

CO_2e per year. If both types of fuels are fired in any 12-month period, then TI will need to calculate the CO_2e short tons from each fuel usage amount and calculate the fuel burning combined total. The combined total cannot exceed 8,000 short tons of CO_2e per year regardless of the fuel limits.

Recordkeeping shall include monthly and 12 month rolling totals of the fuel(s) fired. CO_2e emissions shall be calculated from the fuel fired, and the emission factors and global warming potentials in accordance with 40 CFR Part 98, *Mandatory Greenhouse Gas Reporting* and documented on a 12-month rolling total basis.

2. Process Equipment

TI has proposed a limit of 91,999 short tons of CO_2e per year from the semiconductor manufacturing processes.

TI has also proposed an aggregate fluorinated process gas usage limit of 150,000 pounds per year on a 12-month rolling total basis.

Recordkeeping shall include monthly and 12 month rolling totals of the fluorinated and nitrous oxide process gas usage from the semiconductor manufacturing operations. Average heel factors, previously established from weighing gas cylinders on (full) and off (empty), will be subtracted from procurement record usage amounts to estimate actual usage. CO_2e emissions shall be calculated from the estimated usage, and the emission factors and the global warming potentials in accordance with 40 CFR Part 98, Subpart I Emissions Calculator for 200 mm Fabs.

The Department approves TI's proposed revised greenhouse gas emission limit allocation and the license shall be revised accordingly.

B. Annual Emissions

Annual Emissions from the facility are decreased with the new fuel restrictions. Facility emissions from TI are based on the boilers' fuel limits, 500 hours/year operation for each generator, and 25 tons/year of VOC from process sources. TI shall be restricted to the following licensed annual emissions, based on a 12 month rolling total:

Total Licensed Annual Emissions for the Facility (tons/yr)
(used to calculate the annual license fee)

	PM	PM_{10}	SO_2	NO_x	CO	VOC
Boilers and VOC unit*	4.7	4.7	23.8	9.5	9.8	1.4
Generator 1	0.2	0.2	0.1	4.4	1.2	0.1
Generator 2	0.4	0.4	0.2	11.7	3.1	0.3
Generator 3	0.6	0.6	0.2	15.0	4.0	0.4
Generator 4	0.1	0.1	0.1	3.5	0.9	0.1
Generator 5	0.2	0.2	0.1	4.3	1.1	0.1
VOC process emissions						25
Total TPY	**6.2**	**6.2**	**24.5**	**48.4**	**20.1**	**27.4**

* Note: Boiler and VOC unit emissions were calculated using the worst-case from firing either 674,800 gallons/year of #2 fuel or 126,660,000 scf/year of natural gas (all but CO was based on oil firing; CO was based on natural gas firing).

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

Pollutant	Short Tons/Year
CO_2e from fuel burning equipment	8,000
CO_2e from the manufacturing process	91,999

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-698-71-X-M subject to the conditions found in Air Emission License A-698-71-U-R, in amendment A-698-71-W-M, and in the following conditions.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

SPECIFIC CONDITIONS

The following shall replace condition (16) in air emission license A-698-71-U-R (December 30, 2009) as amended in air emission license minor revision A-698-71-W-M (June 20, 2012):

(16) **Boilers 1, 2, 3, 4, and 5**

A. Boilers 1, 2, 3, 4, and 5 shall fire #2 fuel oil meeting the criteria of ASTM D396 or natural gas.
   1. Combined #2 fuel oil use in boilers 1, 2, 3, 4, and 5 shall not exceed 674,800 gallons/year based on a 12 month rolling total.
   2. Combined natural gas use in boilers 1, 2, 3, 4, and 5 (also including the VOC abatement unit) shall not exceed 126,660,000 scf/year based on a 12-month rolling total.
   3. Compliance shall be demonstrated by fuel records from the supplier showing the quantity and type of fuel delivered. Records of annual fuel use shall be kept on a monthly and 12-month rolling total basis.

   [06-096 CMR 115, BPT]

B. Emissions from each of the 29.3 MMBtu/hr boilers shall not exceed the following [06-096 CMR 115, BPT and air licenses A-698-71-A-T/N (June 3, 1997) and A-698-71-D-A (September 9, 1997)]:

Boilers 1, 2, 3, 4, and 5 Emission Limits (each)

	PM (lb/MMBtu)	**NO_X (lb/MMBtu)**
#2 fuel oil	0.1	0.2
Nat'l gas	0.01	0.07

	PM (lb/hr)	**PM_{10} (lb/hr)**	**SO_2 (lb/hr)**	**NO_X (lb/hr)**	**CO (lb/hr)**	**VOC (lb/hr)**
#2 fuel oil	2.93	2.93	14.76	5.86	2.05	0.88
Nat'l gas	0.29	0.29	0.29	2.05	4.40	0.59

C. Visible emissions from stack 1 (boilers 1, 2, and 3 common stack) and stack 2 (boilers 4 and 5 common stack) shall not exceed an opacity of 10% opacity on a six (6) minute block average basis, except for no more than two (2) six (6)

minute block averages in a continuous 3-hour period. [06-096 CMR 115, BPT]

D. Boilers 1, 2, 3, 4, and 5 are subject to Federal New Source Performance Standards, 40 CFR, Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*. TI shall comply with all requirements of 40 CFR Part 60, Subpart Dc including, but not limited to, the following:

1. TI shall record and maintain records of the total amount of fuel delivered each calendar month as allowed in 40 CFR Part 60, Subpart Dc, Section 60.48c g (3).
2. TI shall submit to EPA and the Department semi-annual reports. These reports shall include the calendar dates covered in the reporting period and records of fuel supplier certifications. The semi-annual reports are due within 30 days of the end of each 6-month period.
3. The following address for EPA shall be used for any reports or notifications required to be copied to them:

Compliance Clerk
USEPA Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

[40 CFR 60, Subpart Dc]

The following shall replace condition (25) in air emission license minor revision A-698-71-W-M (June 20, 2012):

(25) **Facility-Wide Greenhouse Gas Emissions**

A. The combined total greenhouse gas emissions from all stationary fuel combustion sources at TI shall be limited to 8,000 short tons of CO_2e per year as determined by fuel usage, and emission factors and global warming potentials in accordance with 40 CFR Part 98. TI shall maintain records documenting greenhouse gas emissions on a monthly and 12-month rolling total basis. For purposes of the short tons of CO_2e limits, greenhouse gases are defined in 06-096 CMR 100 (as amended).

i. If TI uses only #2 fuel oil or only natural gas in a 12-month rolling total period, the CO_2e short ton limits may be demonstrated through compliance with the fuel limits listed in Condition (16)(A).

ii. If TI uses both #2 fuel oil and natural gas in a 12-month rolling total period, the CO_2e short ton limit shall be demonstrated by calculating the CO_2e short tons from each fuel usage amount and the combined total, regardless of the maximum allowed fuel limits.

B. The combined total greenhouse gas emissions from the semiconductor manufacturing process at TI shall be limited to 91,999 short tons of CO_2e per year as determined by material usage, and emission factors and global warming potentials in accordance with 40 CFR Part 98, Subpart I Emissions Calculator for 200 mm Fabs. Average cylinder heel factors, previously established from weighing gas cylinders on (full) and off (empty), shall be subtracted from monthly procurement record usage amounts to estimate monthly usage. TI shall maintain records documenting greenhouse gas emissions on a monthly and 12-month rolling total basis. For purposes of the short tons of CO_2e limits, greenhouse gases are defined in 06-096 CMR 100 (as amended).

C. TI shall be limited to an aggregate fluorinated process gas usage of 150,000 pound per year on a 12-month rolling total.

DONE AND DATED IN AUGUSTA, MAINE THIS 10th DAY OF January , 2013.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for
PATRICIA W. AHO, COMMISSIONER

Filed
JAN 11 2013
State of Maine
Board of Environmental Protection

The term of this amendment shall be concurrent with the term of Air Emission License A-698-71-U-R.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: December 21, 2012
Date of application acceptance: December 21, 2012

Date filed with the Board of Environmental Protection:

This Order prepared by Kathleen E. Tarbuck, Bureau of Air Quality.