



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

**Departmental
Findings of Fact and Order
Air Emission License
Amendment #1**

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.

TI has requested a minor revision to the air emission license to limit the facility's potential to emit greenhouse gas emissions below the major source threshold of 100,000 short tons per year CO₂e (carbon dioxide equivalent), allocated as a 12,000 short tons of CO₂e per year limit from fuel burning equipment and a 87,999 short tons of CO₂e per year limit from semiconductor manufacturing processes (CO₂e from the semiconductor manufacturing processes does not include the fuel burning equipment).

This minor revision also includes the removal of Boiler 7 (1.8 MMBtu/hr, natural gas fired) from the license. The unit has been decommissioned and removed from the site.

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.

C. Application Classification

TI's request to limit greenhouse gas emissions below major source thresholds does not involve an increase in licensed 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 facility-wide license greenhouse gas limit of 99,999 short tons of CO₂e per year to remain a minor source, with a limit of 12,000 short tons of CO₂e per year from fuel burning equipment and a limit of 87,999 short tons of CO₂e per year from the semiconductor manufacturing processes. 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 12,000 short tons of CO₂e 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 1,000,000 gallons per year firing #2 fuel oil or 190,000,000 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 12,000 short tons of CO₂e per year. If both types of fuels are fired in any 12-month period, then TI will need to calculate the CO₂e short tons from each fuel usage amount and calculate the fuel burning combined total. The combined total cannot exceed 12,000 short tons of CO₂e per year regardless of the fuel limits. This is a reduction from the current license, in which the limits of 2,350,000 gallon per year of #2 fuel oil and 750,000,000 scf per year of natural gas were both included to determine total criteria pollutant tons per year for any 12 month period.

Recordkeeping shall include monthly and 12 month rolling totals of the fuel(s) fired. CO₂e 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 87,999 short tons of CO₂e per year from the semiconductor manufacturing processes.

TI has also proposed an aggregate fluorinated and nitrous oxide process gas usage limit of 80,300 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. CO₂e 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 greenhouse gas emission limits and the license shall be revised accordingly.

B. Annual Emissions

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*	7.0	7.0	35.3	14.0	14.7	2.1
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	8.5	8.5	36.0	52.9	25.0	28.1

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- * Note: Boiler and VOC unit emissions were calculated using the worst-case from 1,000,000 gallon #2 fuel and 190,000,000 scf/year 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 ₂ e from fuel burning equipment	12,000
CO ₂ e from the manufacturing process	87,999

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-W-M subject to the conditions found in Air Emission License A-698-71-U-R 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

Condition (17) of air emission license A-698-71-U-R, addressing Boiler 7, shall be removed.

The following shall replace condition (16) in air emission license A-698-71-U-R:

(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 1,000,000 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 190,000,000 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)	PM₁₀ (lb/hr)	SO₂ (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 is a new condition:

(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 12,000 short tons of CO₂e 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 CO₂e 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 CO₂e 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 CO₂e short ton limit shall be demonstrated by calculating the CO₂e 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 87,999 short tons of CO₂e 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

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short tons of CO₂e limits, greenhouse gases are defined in 06-096 CMR 100 (as amended).

- C. TI shall be limited to an aggregate fluorinated and nitrous oxide process gas usage of 80,300 pound per year on a 12-month rolling total.

DONE AND DATED IN AUGUSTA, MAINE THIS 20th DAY OF June, 2012.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Melanie Aho for
PATRICIA W. AHO, COMMISSIONER

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: May 17, 2012

Date of application acceptance: May 17, 2012

Date filed with the Board of Environmental Protection:

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

