NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review

Permit Issue Date: date, 2010

Region: Winston-Salem Regional Office
County: Guilford
NC Facility ID: 4101022
Inspector's Name: Stephen Moser
Date of Last Inspection: 02/17/2010
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): RF Micro Devices, Inc. - FAB 1, FAB 3 and Packaging

Facility Address:
RF Micro Devices, Inc. - FAB 1, FAB 3 and Packaging
7914 Piedmont Triad Parkway
Greensboro, NC 27409

SIC: 3674 / Semiconductors & Related Devices
NAICS: 334413 / Semiconductor and Related Device Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP:
NSPS:
NESHAP:
PSD:
PSD Avoidance:
NC Toxics:
112(r):
Other:

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Erich Burke Senior Environmental Engineer (336) 931-8042 7628 Thorndike Road Greensboro, NC 27409+9421	James Schonover Director of Facilities (336) 678-8087 7628 Thorndike Road Greensboro, NC 27409+9421	Erich Burke Senior Environmental Engineer (336) 931-8042 7628 Thorndike Road Greensboro, NC 27409+9421

Application Data

Application Number: 4101022.09A
Date Received: 10/29/2009
Application Type: Renewal
Application Schedule: TV-Renewal

Existing Permit Data
Existing Permit Number: 08409/T11
Existing Permit Issue Date: 06/20/2007
Existing Permit Expiration Date: 08/31/2010

Review Engineer: Mark Cuilla

Review Engineer's Signature:
Date: date, 2010

Comments / Recommendations:
Issue 08409/T12
Permit Issue Date: date, 2010
Permit Expiration Date: date, 2015

I. Purpose of Application

This permitting action is a renewal of an existing Title V permit pursuant to 2Q .0513. The existing Title V permit **(08409T11)** was issued on **June 20, 2007**, and is currently scheduled to expire on **August 31, 2010**. The renewal application was received on **October 29, 2009**, or at least nine months prior to the expiration date. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied.

II. Facility Description

The facility is a manufacturer of semiconductor devices used in wireless communication devices.

III. History/Background/Application Chronology

July 14, 2005 – Permit **08409T07** issued as a first time Title V permit.

November 18, 2005 – Permit **08409T08** issued as an administrative amendment to remove references to the boiler MACT.

November 30, 2005 – Permit **08409T09** issued as an administrative amendment to correct the annual reporting date contained in the General Conditions.

March 24, 2006 – Permit **08409T10** issued as a minor modification for the construction and operation of the two wafer dicing centers **(ID Nos. ESWD1 and ESWD2)**.

June 30, 2007 – Permit **08409T11** issued as a significant modification for the addition of MACT avoidance condition as well as other modifications to control scenarios, and TAP emission limits.

October 29, 2009 – Permit application **4101022.09A** received and deemed complete for processing.

November 19, 2009 – Received "Comments and Recommendations on Air Permit Application" document from WSRO (Steve Moser).

April 8, 2010 – Received and email from the Permittee requesting that the PSD avoidance condition for sulfur dioxide be modified. The Permittee notes that it is difficult to partition fuel usage between the large gensets and boilers. In addition, the emission factors for each are virtually identical. As such, the Permittee requests that the condition be modified to use the more restrictive emission factor for both types of units. This makes the calculations easier to manage. DAQ agrees with this proposed clean-up. See Section VI of this Document for a discussion of the modified language.

May 27, 2010 – DRAFT permit sent to Permittee and Regional Office for comment prior to public notice and EPA review.

date, 2010 – DRAFT permit sent to 30-day public notice and 45-day EPA review.

IV. Permit Modifications/Changes and ESM Discussion

The following table describes the modifications to the current permit as part of the renewal process.

Pages	Section	Description of Changes
Attachment	Insignificant activities	-amended permit revision number -clarified emergency generator applicability to area source MACT (40 CFR 63, Subpart ZZZZ)
Cover	-	-amended all dates and permit revision numbers
All	Header	-amended permit revision number
3-5	Equipment table	-added MACT designations where needed with asterisk language -removed references to "need not be operating" and replaced with asterisked language
6	2.1 A 2.1 A (table)	-clarified equipment description -clarified emission table where needed

Pages	Section	Description of Changes
7	2.1 A.1.a	-added ID numbers
	2.1 A.1.b	-corrected testing rule cross reference
	2.1 A.1.c	-added ID numbers and updated shell language
8	2.1 A.2.b	-corrected testing rule cross reference
	2.1 A.2.c.ii	-updated shell language
9	2.1 B.1.b	-corrected testing rule cross reference
	2.1 B.1.c	-added ID numbers
10	2.1 B.2.b	-corrected testing rule cross reference
	2.1 B.2.c.ii	-updated shell language
11	2.1 C (table)	-clarified emission table where needed
	2.1 D (table)	-clarified emission table where needed
12	2.1 D.1.b	-corrected testing rule cross reference
	2.1 D.1.c	-added ID numbers
	2.1 D.2.b	-corrected testing rule cross reference
	2.1 D.2.c	-added ID numbers
13	2.1 E	-combined old Sections 2.1 E and 2.1 F into one Section
	2.1 E (table)	-added MACT reference/clarified emission table where needed
	2.1 E.1.a	-added ID numbers
	2.1 E.1.b	-corrected testing rule cross reference
	2.1 E.1.c	-added ID numbers
	2.1 E.2.a	-added ID numbers
14	2.1 E.2.b	-corrected testing rule cross reference
	2.1 E.2.c	-added ID numbers
	2.1 E.3.b	-added ID numbers
	2.1 E.3.d	-added ID numbers
	2.1 E.3.e	-corrected testing rule cross reference
15	2.1 E.3.f	-added ID numbers
	2.1 E.3.g	-added ID numbers
	2.1 E.3.h	-added ID numbers
	2.1 E.3.i	-added ID numbers
16	2.1 F	-combined old Sections 2.1 G, H and I into one Section
	2.1 F (table)	-clarified emission table where needed
	2.1 F.1.a	-added ID numbers
	2.1 F.1.b	-corrected testing rule cross reference
	2.1 F.1.c	-added ID numbers
	2.1 F.2.a	-added ID numbers
	2.1 F.2.b	-corrected testing rule cross reference
17	2.1 F.2.c	-added ID numbers
	2.1 F.3.a	-added ID numbers
	2.1 F.3.b	-corrected testing rule cross reference
	2.1 F.3.c	-added ID numbers
	2.1 F.4.a	-added ID numbers
	2.1 F.4.b	-updated shell language
	2.1 F.4.d	-updated shell language
18	2.1 G	-renumbered Section (formerly Section 2.1 J)
	2.1 H	-renumbered Section (formerly Section 2.1 K)
19	2.1 H.1.b	-corrected testing rule cross reference
	2.1 H.2.a	-added ID numbers
	2.1 H.2.b	-corrected testing rule cross reference

Pages	Section	Description of Changes
19-20	2.1 H.2.c	-updated shell language
20	2.1 H.2.d 2.1 H.2.e 2.2 (table)	-updated shell language -updated shell language -clarified emission table where needed
21	2.2 A.1.a.v 2.2 A.1.a.vi 2.2 A.1.b.iv 2.2 A.1.b.v 2.2 A.1.c	-updated shell language -updated shell language -updated shell language -updated shell language -updated shell language
22	2.2 A.2 2.2 A.2.b 2.2 A.2.b.i 2.2 A.2.b.ii 2.2 A.2.b.iii 2.2 A.2.b.iv 2.2 A.2.c 2.2 A.2.d-e	-corrected rule citation -added ID numbers and updated shell language -added ID numbers and updated shell language -added ID numbers and updated shell language -added ID numbers and updated shell language -added ID numbers and updated shell language -corrected testing rule cross reference -removed unnecessary monitoring/recordkeeping/reporting requirements per WSRO inspection comments
23	2.2 A.3 2.2 A.3.b 2.2 A.3.d 2.2 A.4 2.2 A.4.b	-corrected rule citation -updated shell language -updated shell language -corrected rule citation -updated shell language
23-24	2.2 A.4.c	-modified PSD avoidance equation per Permittee request
24	2.2 A.4.d 2.2 A.5	-updated shell language -corrected rule citation
24-25	2.2 A.5.c (table)	-added CAS numbers
25	2.2 B 2.2 B (table)	-amended applicable equipment description -clarified table where needed
26	2.2 B.1.d	-updated shell language
27-37	General conditions	-updated shell conditions (v3.1)
Attachment	List of acronyms	-added acronyms for CAIR, NAA and RACT per current shell

Other than miscellaneous MACT designation additions to the emergency generators, there were no Emission Source Module modifications necessary as part of this permit renewal.

V. Regulatory Review

The facility is currently subject to the following regulations:

15A NCAC 2D .0503, Particulates from Fuel Burning Indirect Heat Exchangers
15A NCAC 2D .0515, Particulates from Miscellaneous Industrial Processes
15A NCAC 2D .0516, Sulfur Dioxide Emissions from Combustion Sources
15A NCAC 2D .0521, Control of Visible Emissions
15A NCAC 2D .0524, New Source Performance Standards (40 CFR 60, Subparts Dc and IIII)
15A NCAC 2D .0958, Work Practices for Sources of Volatile Organic Compounds
15A NCAC 2D .1100, Control of Toxic Air Pollutants
15A NCAC 2D .1806, Control and Prohibition of Odorous Emissions

15A NCAC 2Q .0317, Avoidance Conditions (for 15A NCAC 2D .0530, Prevention of Significant Deterioration and 15A NCAC 2D .1111, Maximum Achievable Control Technology)
15A NCAC 2Q .0711, Emission Rates Requiring a Permit

A regulatory review for these current permit conditions will not be included in this document. However, as part of this permit renewal, a reference to 15A NCAC 2D .1111, Maximum Achievable Control Technology (40 CFR 63, Subpart ZZZZ) has been added as discussed in Section VI of this Document.

VI. NSPS, NESHAPS/MACT, PSD, 112(r), CAM

NSPS – The Permittee is subject to the following New Source Performance Standards.

1. 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. This Subpart is applicable to manufacturers, owners, and operators of stationary compression ignition internal combustion engines. Specific requirements for owners and operators apply to those units that commence construction after **July 11, 2005** where those units were manufactured after **April 1, 2006**. The Permittee is permitted to operate three applicable emergency generators **(ID Nos. ESG34, ESG35, and ESGP)**. To ensure compliance, the Permittee is required to meet emission limits for hydrocarbons, nitrogen oxides, carbon monoxide, and particulate matter. In addition to these emissions limits, the Permittee is required to meet operational limits for sulfur content of the fuel oil fired in these sources. The sulfur content is a graduated limit starting on **October 1, 2007** and **October 1, 2010**. Specific monitoring/recordkeeping/reporting requirements are listed in the permit. This permit renewal does not affect this status.

2. 40 CFR 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. This Subpart applies to each steam generating unit for which construction, modification, or reconstruction is commenced after **June 9, 1989** and that has a maximum design heat input capacity of 29 megawatts (100 million Btu per hour) or less, but greater than or equal to 2.9 megawatts (10 million Btu per hour). The Permittee is permitted to operate three applicable boilers **(ID Nos. ESB31, ESB32, and ESB33)**. The Permittee is required to fire fuel oil with less than 0.5 percent by weight sulfur content. To ensure compliance, the Permittee is required to keep fuel supplier certifications with each shipment and record the amounts of fuel oil fired monthly. This permit renewal does not affect this status.

NESHAPS/MACT – The Permittee is subject to an avoidance condition limiting emissions of any single hazardous air pollutants (HAP) to less than 10 tons per year and any combination of HAPs to less than 25 tons per year from the three semiconductor manufacturing lines **(ID Nos. ESMAN1, ESMAN31, and ESMAN32)** and the six waste solvent tanks **(ID Nos. EST1 through EST3 and EST31 through EST33)**. To ensure compliance with these limits, the Permittee is required to maintain monthly records of each material emitted containing HAPs and report the highest and total quantities of individual and combined HAP emissions. This permit renewal does not affect this status.

By voluntarily taking this operational restriction to avoid applicability to MACT standards, the facility is classified as a Title III minor source (or area source). As such, the facility may be subject to applicable area source GACTs. A review of those currently promulgated Subparts indicates that the facility is subject to 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Internal Combustion Engines. Per 40 CFR 63.6590(c), *"an affected source that is new or reconstructed stationary RICE located at an area source must meet the requirements of this part by meeting the requirements of 40 CFR 60, Subpart IIII, for compression ignition engines or 40 CFR 60, Subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part."* As indicated above, the Permittee operates three NSPS-affected emergency generators **(ID Nos. ESG34, ESG35, and ESGP)**. These generators are subject to both the NSPS and MACT standards. Compliance with NSPS, Subpart IIII, ensures compliance with MACT Subpart ZZZZ. The applicability to this Subpart has been added to the renewed permit. It should be noted that as of this permit renewal, the emergency generators **(ID Nos. ESG35 and ESGP)** have not been installed at the facility. The NSPS/MACT requirements will apply upon startup of these sources when placed into operation.

The Permittee also operates the following non-NSPS applicable generators that need to be reviewed for area source GACT applicability under ZZZZ:
-One 100 kW No. 2 fuel oil-fired generator at Old Corp. **(ID No. I-FG1)**
-One 350 kW No. 2 fuel oil-fired generator at Old Corp. **(ID No. I-FG2)**
-One 100 kW No. 2 fuel oil-fired generator at Headquarters **(ID No. I-FG3)**
-One 2,200 kW No. 2 fuel oil-fired emergency generator at FAB1 **(ID No. ESG1)**
-One 500 kW No. 2 fuel oil-fired emergency generator at FAB1 **(ID No. G1)**
-One 2,200 kW No. 2 fuel oil-fired emergency generator at FAB3 **(ID No. ESG31)**
-One 2,200 kW No. 2 fuel oil-fired emergency generator at FAB3 **(ID No. ESG32)**
-One 2,200 kW No. 2 fuel oil-fired emergency generator at FAB3 **(ID No. ESG33)**

Under ZZZZ, an existing RICE at an area source is defined as one that commenced construction or reconstruction of the stationary RICE before June 12, 2006 [63.6590(a)(1)(iii)]. Also under the regulation, existing stationary residential, commercial, or institutional emergency stationary RICE located at area sources of HAP emissions do not have to meet the requirements of this Subpart and of Subpart A of this part and no initial notifications are necessary [63.6590(b)(3)]. The Permittee has confirmed that all of the above listed units are all existing and of emergency use. DAQ does not interpret 63.6590(b)(3) as an exemption to the MACT but rather a statement of "subject with no requirements." Therefore, the renewed permit has been modified to add asterisked language to each equipment description that reads:

> **** These existing emergency stationary RICE located at an area source of HAP emissions, do not have to meet the requirements of 40 CFR 63, Subpart ZZZZ and of Subpart A. No initial notifications are necessary. [63.6590(b)(3)]*

PSD – The facility is subject to two separate facility-wide PSD avoidance conditions.

The first limits emissions of volatile organic compounds to less than 250 tons per consecutive 12-month period. To ensure compliance with this requirement, the Permittee is required to calculate monthly VOC emissions by multiplying total amount of each type of VOC-containing material consumed by its VOC content. Specific recordkeeping and reporting requirements are included in the permit. This permit renewal does not affect this status.

The second limits emissions of sulfur dioxide to less than 250 tons per consecutive 12-month period. To ensure compliance with this requirement, the Permittee is required to track monthly fuel use and calculate monthly sulfur dioxide emissions with the established formula. Specific recordkeeping and reporting requirements are included in the permit. This permit renewal does not affect this status. However as noted above, the Permittee has requested that the monitoring conditions of this regulation be "cleaned up". Specifically, the current permit requires the Permittee to track fuel usage individually for the group of boilers and group of gensets. They note that it is difficult to partition the fuel usage this way and request that the equation be modified to group all sources under the higher of the two emission factors. DAQ agrees with this request. The following is the pre-and post-modification equation:

Current equation:

$X = [(Z_b \times 142S) + (Z_{g>600} \times 141.4S)]/2000$

Where X = emissions of sulfur dioxide in tons per month
Z_b = No. 2 fuel oil used in the boilers in thousands of gallons
$Z_{g>600}$ = No. 2 fuel oil used in generators with capacities greater than 600 Hp in thousands of gallons
S = sulfur content of the fuel in percent by weight

Modified equation:

$X = (Z \times 142S)/2000$

Where: X = emissions of sulfur dioxide in tons per month
Z = No. 2 fuel oil used in the boilers and generators in thousands gallons
S = sulfur content of fuel in percent by weight

112(r) – The facility is not subject to Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above the thresholds in the Rule. This permit renewal does not affect this status.

CAM – 40 CFR 64 requires that a continuous compliance assurance monitoring plan be developed for all equipment located at a major facility, that have pre-controlled emissions above the major source threshold, and use a control device to meet an applicable standard. The following table indicates the current emission source/control device relationships:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
FAB 1 SEMICONDUCTOR MANUFACTURING OPERATION			
ESMAN1	Semiconductor manufacturing line consisting of various organic and inorganic emission sources from processes including photolithography, metallization, etch and deposition, and testing at FAB1. Emissions are vented via the acid gas exhaust or the solvent exhaust. Acid gas exhaust is vented directly to scrubbers for control. ICP etching is either vented to the stirred tank control devices in series with the acid gas scrubbers or directly to the acid gas scrubbers. Solvent exhaust is uncontrolled.	CDEB1 CDEB2 And CD1 CD2	ICP etching vented to two parallel constant stirred tank particulate abatement devices *(need not be operating)* Acid gas exhaust system vented to two parallel cross flow packed bed acid gas scrubbers (75 gallons per minute minimum caustic solution injection each)
B9	Small tool parts bead blast system with integral cyclone	CDB9	One cartridge filter
FAB3 SEMICONDUCTOR MANUFACTURING OPERATION			
ESMAN31	Semiconductor manufacturing line consisting of various organic and inorganic emission sources from processes including photolithography, metallization, etch and deposition, and testing at FAB3. Emissions are vented via the acid gas exhaust or the solvent exhaust. Acid gas exhaust is vented directly to scrubbers for control. ICP etching is either vented to the stirred tank control devices in series with the acid gas scrubbers or directly to the acid gas scrubbers. Solvent exhaust is uncontrolled.	CDEB3 CDEB4 CDEB5 And CD31 CD32 And/or CD33	ICP etching vented to three parallel constant stirred tank particulate abatement devices *(need not be operating)* Acid gas exhaust system vented to two of three parallel cross flow packed bed acid gas scrubbers (160 gallons per minute minimum caustic solution injection each)
ESMAN32	Semiconductor manufacturing line consisting of various organic and inorganic emission sources from processes including photolithography, metallization, etch and deposition, and testing at FAB3. Emissions are vented via the acid gas exhaust or the solvent exhaust. Acid gas exhaust is vented directly to scrubbers for control. ICP etching is either vented to the stirred tank control devices in series with the acid gas scrubbers or directly to the acid gas scrubbers. Solvent exhaust is uncontrolled.	CDEB6 And CD31 CD32 And/or CD33	ICP etching vented to one constant stirred tank particulate abatement devices *(need not be operating)* Acid gas exhaust system vented to two of three parallel cross flow packed bed acid gas scrubbers (160 gallons per minute minimum caustic solution injection each)
B10	Small tool parts bead blast system with integral cyclone	CDB10	One cartridge filter

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
WAFER DICING CENTERS			
ESWD1	Wafer dicing center No. 1	CDWD1a or CDWD1c And CDWD1b and/or CDWD1d And CD1 and CD2	One of two fabric filters (maximum air-to-cloth ratio of 4.97 each) Either or both HEPA filters (maximum air-to-cloth ratio of 8.00 each) Two parallel packed bed acid gas scrubbers *(need not be operating)*
ESWD2	Wafer dicing center No. 2	CDWD2a or CDWD2c And CDWD2b and/or CDWD2d And CD31 CD32 And/or CD33	One fabric filter (maximum air-to-cloth ratio of 4.97) Either or both HEPA filters (maximum air-to-cloth ratio of 8.00 each) Two of three parallel packed bed acid gas scrubbers *(need not be operating)*

The following table indicates the regulations applicable to each emission source/control device relationship:

Emission Source ID No.	Control Device ID No.	Applicable Regulations	Pollutant
ESMAN1	CDEB1 CDEB2 And CD1 CD2	Source Specific Requirements: 15A NCAC 2D .0515 15A NCAC 2D .0521 Facility-wide Requirements: 15A NCAC 2D .0958 15A NCAC 2D .1100 15A NCAC 2Q .0317 15A NCAC 2Q .0711 15A NCAC 2Q .0317 15A NCAC 2D .1806	 Particulates Visible emissions Volatile organic compounds Toxic air pollutants Volatile organic compounds Toxic air pollutants Hazardous air pollutants Odors

Emission Source ID No.	Control Device ID No.	Applicable Regulations	Pollutant
B9	CDB9	Source Specific Requirements: 15A NCAC 2D .0515 15A NCAC 2D .0521 Facility-wide Requirements: 15A NCAC 2D .1100	 Particulates Visible emissions Toxic air pollutants
ESMAN31	CDEB3 CDEB4 CDEB5 And CD31 CD32 And/or CD33	Source Specific Requirements: 15A NCAC 2D .0515 15A NCAC 2D .0521 Facility-wide Requirements: 15A NCAC 2D .0958 15A NCAC 2D .1100 15A NCAC 2Q .0317 15A NCAC 2Q .0711 15A NCAC 2Q .0317 15A NCAC 2D .1806	 Particulates Visible emissions Volatile organic compounds Toxic air pollutants Volatile organic compounds Toxic air pollutants Hazardous air pollutants Odors
ESMAN32	CDEB6 And CD31 CD32 And/or CD33	Source Specific Requirements: 15A NCAC 2D .0515 15A NCAC 2D .0521 Facility-wide Requirements: 15A NCAC 2D .0958 15A NCAC 2D .1100 15A NCAC 2Q .0317 15A NCAC 2Q .0711 15A NCAC 2Q .0317 15A NCAC 2D .1806	 Particulates Visible emissions Volatile organic compounds Toxic air pollutants Volatile organic compounds Toxic air pollutants Hazardous air pollutants Odors
B10	CDB10	Source Specific Requirements: 15A NCAC 2D .0515 15A NCAC 2D .0521 Facility-wide Requirements: 15A NCAC 2D .1100	 Particulates Visible emissions Toxic air pollutants

Emission Source ID No.	Control Device ID No.	Applicable Regulations	Pollutant
ESWD1	CDWD1a or CDWD1c And CDWD1b and/or CDWD1d And CD1 and CD2	Source Specific Requirements: 15A NCAC 2D .0515 15A NCAC 2D .0521 Facility-wide Requirements: 15A NCAC 2D .1100 15A NCAC 2D .1806	 Particulates Visible emissions Toxic air pollutants Odors
ESWD2	CDWD2a or CDWD2c And CDWD2b and/or CDWD2d And CD31 CD32 And/or CD33	Source Specific Requirements: 15A NCAC 2D .0515 15A NCAC 2D .0521 Facility-wide Requirements: 15A NCAC 2D .1100 15A NCAC 2D .1806	 Particulates Visible emissions Toxic air pollutants Odors

The following discussion addresses each regulation and its CAM applicability determination:

1. 15A NCAC 2D .0515, Particulates from Miscellaneous Industrial Processes. A CAM demonstration for particulate matter (arsenic and beryllium emissions) is needed to verify the potential uncontrolled emissions from each of the above listed sources. The Permittee notes that total arsenic emissions are the sum of the OSHA arsenic (fugitives), ICPs (etched arsenic) and the bead blast systems. Beryllium emissions are expected from the bead blast operations. Parts that are contaminated with both arsenic and beryllium are bead blasted inside cabinets. These cabinets are exhausted to the atmosphere via cyclonic separators and cartridge air filters. Control efficiency is rated at 99.7% capture. The Permittee has placed a request of confidentiality on both the ICP etching and wafer dicing operations, therefore a detailed explanation of those emissions will not be contained in this Document. These confidential calculations will be kept in the Confidential Files. Emission calculations were reviewed for CAM applicability in support that CAM does not apply. Total estimated potential uncontrolled "particulate" emissions from the collection of these operations are 1.06 tons per year as indicated in the CAM applicability calculations (Appendix A of the renewal application). This is well below CAM thresholds.

2. 15A NCAC 2D .0521, Control of Visible Emissions. A CAM demonstration for visible emissions for this regulation is not needed as part of this permit renewal. Visible emissions are not a criteria pollutant.

3. 15A NCAC 2D .0958, Work Practices for Sources of Volatile Organic Compounds. A CAM demonstration for volatile organic compounds for this regulation is not needed as part of this permit renewal. 15A NCAC 2D .0614(a)(1) requires that a CAM analysis be completed for any emission source being controlled for which that emission source is subject to an emission limit or standard. The work practices described in this regulation do not meet the applicability statement of the rule; therefore CAM is not applicable to this regulation.

4. 15A NCAC 2D .1100, Control of Toxic Air Pollutants. A CAM demonstration for NC air toxics for this regulation is not needed as part of this permit renewal. NC air toxics are not a criteria pollutant.

5. 15A NCAC 2Q .0317, Avoidance Conditions (for 15A NCAC 2D .0530, Prevention of Significant Deterioration). A CAM demonstration for volatile organic compounds and sulfur dioxide for this regulation is not needed as part of this permit renewal. 15A NCAC 2D .0614(b)(1) identifies a list of emission limitations or standards in which CAM is not applicable." Specifically, Subparagraph (E) notes "an emission cap that is approved under the rules of this Subchapter and Subchapter 15A NCAC 2Q and incorporated in a permit issued under 15A NCAC 2D .0500". These PSD avoidance conditions are emission caps as described; therefore CAM is not applicable to this regulation.

6. 15A NCAC 2Q .0711, Emission Rates Requiring a Permit. A CAM demonstration for NC air toxics for this regulation is not needed as part of this permit renewal. NC air toxics are not a criteria pollutant.

7. 15A NCAC 2Q .0317, Avoidance Conditions (for 15A NCAC 2D .1111, Maximum Achievable Control Technology). A CAM demonstration for hazardous air pollutants for this regulation is not needed as part of this permit renewal. 15A NCAC 2D .0614(b)(1) identifies a list of emission limitations or standards in which CAM is not applicable." Specifically, Subparagraph (E) notes "an emission cap that is approved under the rules of this Subchapter and Subchapter 15A NCAC 2Q and incorporated in a permit issued under 15A NCAC 2D .0500". This MACT avoidance condition is an emission cap as described; therefore CAM is not applicable to this regulation.

8. 15A NCAC 2D .1806, Control and Prohibition of Odorous Emissions. A CAM demonstration for odorous emissions for this regulation is not needed as part of this permit renewal. Odor is not a criteria pollutant.

VII. Facility Wide Air Toxics

The Permittee is subject emission limits for chlorine, Xylene, chlorobenzene, and arsenic per 15A NCAC 2D .1100. These emission limits were established as a facility-wide worst case single stack modeling demonstration. To ensure compliance with these limits, the Permittee is required to comply with operating restrictions for his two wafer dicing centers **(ID Nos. ESWD1 and ESWD2)**. The operating restrictions describe the control requirements for these sources. In addition to the operating restrictions, the Permittee is required to conduct proper inspection and maintenance activities on the installed control devices. This permit renewal does not affect this status.

In addition to the modeled emission rates above, the Permittee has made a demonstration that the corresponding toxic permit emission rates (TPERs) in 15A NCAC 2Q .0711 for ammonia, beryllium, bromine, hydrogen chloride, hydrogen fluoride, nitric acid, phenol, and sulfuric acid are not being exceeded. Prior to any exceedance of these TPERS, the Permittee is responsible for obtaining a permit to emit the toxic air pollutant and for demonstrating compliance with 15A NCAC 2D .1100 for that pollutant. This permit renewal does not affect this status.

VIII. Facility Emissions Review

There is no change in emissions for this renewal.

The following table represents the latest years' emission inventories from the facility:

Pollutant(s)	2007 Actual Emissions (tpy)	2008 Actual Emissions (tpy)
CO	4.29	5.32
NO_x	11.71	13.94
PM_{10}	0.84	1.01
SO_2	0.96	1.02
VOC	199.99	154.47
Total HAPs/TAPs	8.5	5.0

IX. Stipulation Review

The facility was last inspected by Stephen Moser of the WSRO on **February 17, 2010**. Based on his inspection and review of data he found that the facility "appeared to be in compliance".

Mr. Moser did not note the following issues:

1. *"Permit condition 2.2 A.2.b.ii and 2.2 A.2.b.iv conflict with wafer dicing center description on Page 5 of the permit. Page 5 states that the packed bed acid gas scrubbers need not be operating. 2.2 A.2.b requires they be operating. This should be modified the next time the permit is opened to better reflect the equipment at the facility versus the description on Page 5 of the permit."*

   History of Wafer Dicing Centers:

   1. **Permit application 4101022.06A/Permit 08409T10/Issued March 24, 2006**.
      -A minor modification was processed by Fern Paterson for the construction and operation of two wafer dicing centers. These sources have the potential to emit particulate arsenic emissions. With the addition of the sources, particulate emissions are controlled by add-on control trains consisting of one fabric filter and one high efficiency particulate (HEPA) filter (one group each). These groupings are tied to existing ductwork upstream of acid gas scrubbers.
      -Operation of the acid gas scrubbers is not required to achieve compliance with any state or Federal air quality standards at the proposed wafer dicing centers. However, the Permittee shall be required to **vent** emissions from the wafer dicing operations through the existing stacks to demonstrate compliance with the state-enforceable acceptable ambient level (AAL) for arsenic pursuant to 15A NCAC 2D .1100 as modeled.
      -Allowable PM emissions per 15A NCAC 2D .0515 from the wafer cutting centers are estimated to be greater than 3 pounds per hour. Potential uncontrolled PM emissions from the sources are estimated to be well below 0.1 pounds per hour. The sources should be in compliance with the PM standard even without the use of the add-on control devices.

-The facility complies with a combined arsenic limit based on a facility-wide modeling demonstration.
-The Permittee did not include any assumed control of particulate arsenic emissions from the existing acid gas scrubbers as part of this permit application. The acid gas scrubbers need not be operated to achieve compliance with the TAP standards at the proposed wafer dicing centers. However, exhaust from the wafer dicing operations must be vented through acid gas scrubber stacks to be consistent with the demonstration of compliance with the arsenic AAL pursuant to 15A NCAC 2D .1100.

The permit has been modified to replace the notation "need not be operating" with the following:

** Emissions from the wafer dicing operations shall be vented through the acid gas scrubber stacks as described to demonstrate compliance with the state-enforceable only acceptable ambient level (AAL) for arsenic pursuant to 15A NCAC 2D .1100 as originally modeled. However, operation of the acid gas scrubbers is not required to achieve compliance with any state or federal air quality standard at the wafer dicing centers.

2. *"There seems to be an issue with the monitoring requirements of Section 2.2 A.2.d. Specifically, the ductwork inspection requirements are placed into permit to ensure that capture systems remain functional and emissions are not released upstream of a control device due to faulty systems such as ineffective hooding, etc. In the case of the wafer dicing operation, the wafer dicing occurs and is initially captured indoors. Contaminated air is transported outdoors to the bagfilter/HEPA system and all equipment is located indoors. After the HEPA, exhaust air enters the duct going to the large scrubbers. In other words, nothing dedicated solely to wafer dicing occurs outside. While it is true that the acid gas does eventually go outside, its inspection requirement has already been covered in Section 2.1 A.1.c. Permit condition 2.2 A.2.d is either redundant, or arguably not valid, since it deals entirely with indoor ductwork. It should be removed or modified when the permit is reissued."*

RCO agrees with this request because:
-the condition is State-enforceable only,
-Section 2.1 H.1 does not require federally enforceable specific inspection and maintenance requirements for these control devices, and
-Section 2.1 A.1 does require federally enforceable specific inspection and maintenance requirements for the control devices acting as release points for these sources.
Therefore, the requirements will be eliminated as part of this permit renewal.

X. Public Notice/EPA and Affected State(s) Review

Pursuant to 15A NCAC 2Q .0521, a notice of the DRAFT Title V Permit shall be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 2Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA. Also pursuant to 2Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice provided to the public under 2Q .0521 above. The State of Virginia and the Forsyth County Local Program are affected States/areas within 50 miles of this facility.

XI. Conclusions, Comments, and Recommendations

A professional engineer's seal was not required for this renewal.

A consistency determination was not required for this renewal.

WSRO recommends issuance of the permit and was sent a DRAFT permit prior to issuance (See Section III of this document for a discussion).

RCO concurs with WSRO's recommendation to issue the renewed air permit.