

SIMPLE
AIR CONTAMINANT DISCHARGE PERMIT

Department of Environmental Quality
Northwest Region
2020 SW 4th Avenue, #400
Portland, Oregon 97201
(503) 229-5554

This permit is being issued in accordance with the provisions of ORS 468A.040 and based on the land use compatibility findings included in the permit record.

ISSUED TO:

BCC RPI Hillsboro LLC
25300 NW Evergreen Road
Hillsboro, Oregon 97124

INFORMATION RELIED UPON:

Application No.: 022053
Date Received: 01/02/2007

PLANT SITE LOCATION:

Oregon Technology Center
25300 NW Evergreen Road
Hillsboro, Oregon 97124

LAND USE COMPATIBILITY FINDING:

Approving Authority: City of Hillsboro
Approval Date: 12/11/1995

ISSUED BY THE DEPARTMENT OF ENVIRONMENTAL QUALITY

Ed Druback, Northwest Region Air Quality Manager

Dated

Source(s) Permitted to Discharge Air Contaminants (OAR 340-216-0020):

Table 1 Code	Source Description	SIC
Part B, 75	Polycrystalline silicon wafer manufacturing facility	3674

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1.0 GENERAL EMISSION STANDARDS AND LIMITS

- 1.1. Visible Emissions** The permittee must comply with the following visible emission limits, as applicable:
- a. Emissions from any air contaminant source other than fuel burning equipment must not equal or exceed 20% opacity for a period aggregating more than 30 seconds in any one hour.
 - b. Emissions from fuel burning equipment must not equal or exceed 20% opacity for a period aggregating more than 3 minutes in any one hour.
- 1.2. Particulate Matter Emissions** The permittee must comply with the following particulate matter emission limits, as applicable:
- a. Particulate matter emissions from any fuel burning equipment must not exceed 0.1 grains per standard cubic foot, corrected to 12% CO₂ or 50% excess air.
 - b. Particulate matter emissions from any air contaminant source other than fuel burning equipment and fugitive emission sources must not exceed 0.1 grains per standard cubic foot.
- 1.3. Fugitive Emissions** The permittee must take reasonable precautions to prevent fugitive dust emissions by:
- a. Treating vehicular traffic areas of the plant site under the control of the permittee.
 - b. Operating all air contaminant-generating processes so that fugitive type dust associated with the operation will be adequately controlled at all times.
 - c. Storing collected materials from air pollution control equipment in a covered container or other method equally effective in preventing the material from becoming airborne during storage and transfer.
- 1.4. Particulate Matter Fallout** The permittee must not cause or permit the emission of any particulate matter larger than 250 microns in size at sufficient duration or quantity, as to create an observable deposition upon the real property of another person. The Department will verify that the deposition exists and will notify the permittee that the deposition must be controlled.
- 1.5. Nuisance and Odors** The permittee must not cause or allow air contaminants from any source to cause a nuisance. Nuisance conditions will be verified by Department personnel.

1.6. Fuels and Fuel Sulfur Content

The permittee must not use any fuel other than natural gas, propane, butane, or ASTM grade fuel oils.

- a. Fuel oils must not contain more than:
 - i. 0.3% sulfur by weight for ASTM Grade 1 distillate oil;
 - ii. 0.5% sulfur by weight for ASTM Grade 2 distillate oil;

2.0 OPERATION AND MAINTENANCE REQUIREMENTS

2.1. Work practices

Pollution control equipment must be properly maintained, and must be operating whenever emissions are generated by associated plant processes.

NOx wet scrubbers must be operated to achieve a NOx removal efficiency of at least 90%, or a maximum NOx outlet concentration of 40 ppm by volume

The VOC control device must be operated to achieve a VOC destruction efficiency of 90%

3.0 PLANT SITE EMISSION LIMITS

3.1. Plant Site Emission Limits (PSEL)

Plant site emissions must not exceed the following:

Pollutant	Limit	Units
PM	24	tons per year
PM ₁₀	14	tons per year
SO ₂	39	tons per year
NO _x	39	tons per year
CO	99	tons per year
VOC	39	tons per year

3.2. Annual Period

The annual plant site emissions limits apply to any 12-consecutive calendar month period.

4.0 COMPLIANCE DEMONSTRATION

- 4.1. Monitoring Requirements** The permittee must monitor the operation and maintenance of the plant and associated air contaminant control devices as follows:
- a. Monthly VOC usage, including type quantity and VOC content
 - b. NOx wet scrubbers operating parameters - continuously:
 - scrubber liquor oxidation-reduction potential
 - scrubber liquor pH
 - c. VOC abatement unit operating parameters - continuously:
 - pressure drop across the adsorber section
 - adsorber regenerator air temperature
 - catalytic oxidizer bed inlet temperature
 - catalytic oxidizer outlet bed temperature
 - d. Monthly natural gas fuel usage in each boiler
 - e. Annual distillate fuel usage in emergency generators and water pumps.

- 4.2. PSEL Compliance Monitoring** Compliance with the PSEL is determined for each 12-consecutive calendar month period based on the following calculation for each pollutant:

$$E = \Sigma(EF \times P)/2000 \text{ lbs}$$

where,

$$\begin{aligned} E &= \text{pollutant emissions (ton/yr);} \\ EF &= \text{pollutant emission factor (see condition 11.0);} \\ P &= \text{process production (see condition 12.0)} \end{aligned}$$

- 4.3. Emission Factors** The permittee must use the default emission factors provided in condition 11.0 for calculating pollutant emissions, unless alternative emission factors are approved by the Department. The permittee may request or the Department may require using alternative emission factors provided they are based on actual test data or other documentation (e.g., AP-42 compilation of emission factors) that has been reviewed and approved by the Department.
- 4.4. Mass Balance without controls** Annual VOC emissions for each 12 consecutive calendar month period are calculated by the following formula:

$$E_{\text{VOC-A}} = \frac{[\Sigma(C_X * D_X * K_X) - W]}{\text{pounds}} \times 1 \text{ ton/2000}$$

Where,

E_{VOC-A} = Annual VOC emissions in tons
C = Material usage for the period in gallons
D = Material density in pounds per gallon
K = VOC concentration expressed as a decimal
X = Subscript X represents a specific material
W = Weight of VOC shipped offsite

- 4.5. Mass Balance with controls** Annual VOC emissions for each 12 consecutive calendar month period are calculated by the following formula:

$$E_{VOC-A} = \frac{[\sum(C_X * D_X * K_X)(1 - CE * DE)] - W}{1 \text{ ton}/2000 \text{ pounds}}$$

Where,

E_{VOC-A} = Annual VOC emissions in tons
C = Material usage for the period in gallons
D = Material density in pounds per gallon
K = VOC concentration expressed as a decimal
X = Subscript X represents a specific material
CE = VOC capture efficiency expressed as a decimal
DE = Destruction efficiency
W = Weight of VOC shipped offsite

5.0 SPECIAL CONDITIONS

- 5.1. Special conditions** Before restarting the manufacturing process, the permittee must ensure that this permit properly covers the proposed operation. The permittee must notify the Department within 7 days of restarting the manufacturing process.

6.0 RECORDKEEPING REQUIREMENTS

- 6.1. Operation and Maintenance** The permittee must maintain the following records related to the operation and maintenance of the plant and associated air contaminant control devices:
- a. Description of any repairs to the air contaminant control

system

- b. VOC usage, including type quantity and VOC content
- c. NOx wet scrubbers operating parameters:
 - scrubber liquor oxidation-reduction potential
 - scrubber liquor pH
- d. VOC abatement unit operating parameters:
 - pressure drop across the adsorber section
 - adsorber regenerator air temperature
 - catalytic oxidizer bed inlet temperature
 - catalytic oxidizer outlet bed temperature
- e. Monthly natural gas fuel usage in each boiler
- f. Annual distillate fuel usage in emergency generators and water pumps.

6.2. Excess Emissions The permittee must maintain records of excess emissions as defined in OAR 340-214-0300 through 340-214-0340 (recorded on occurrence). Typically, excess emissions are caused by process upsets, startups, shutdowns, or scheduled maintenance. In many cases, excess emissions are evident when visible emissions are greater than 20% opacity for 3 minutes or more in any 60-minute period. If there is an ongoing excess emission caused by an upset or breakdown, the permittee must cease operation of the equipment or facility no later than 48 hours after the beginning of the excess emissions, unless continued operation is approved by the Department in accordance with OAR 340-214-0330(4).

6.3. Complaint Log The permittee must maintain a log of all written complaints and complaints received via telephone that specifically refer to air pollution concerns associated to the permitted facility. The log must include a record of the permittee's actions to investigate the validity of each complaint and a record of actions taken for complaint resolution.

6.4. Retention of Records Unless otherwise specified, all records must be maintained on site for a period of two (2) years and made available to the Department upon request.

7.0 REPORTING REQUIREMENTS

7.1. Excess Emissions The permittee must notify the Department of excess emissions events if the excess emission is of a nature that could endanger public health.

- a. Such notice must be provided as soon as possible, but never more than one hour after becoming aware of the problem. Notice must be made to the regional office identified in Condition 8.4 by e-mail, telephone, facsimile, or in person.
- b. If the excess emissions occur during non-business hours, the permittee must notify the Department by calling the Oregon Emergency Response System (OERS). The current number is 1-800-452-0311.
- c. The permittee must also submit follow-up reports when required by the Department.

7.2. Annual Report

For each year this permit is in effect, the permittee must submit to the Department by **February 15** two (2) copies of the following information for the previous calendar year:

- a. Operating parameters:
 - i. Quantity of natural gas burned in each boiler
 - ii. Quantity of fuel oil burned in each generator
 - iii. Quantity of Wafers processed
- b. A summary of annual pollutant emissions determined each month in accordance with Condition 4.0.
- c. Records of all planned and unplanned excess emissions events.
- d. Summary of complaints relating to air quality received by permittee during the year.
- e. List permanent changes made in plant process, production levels, and pollution control equipment which affected air contaminant emissions.
- f. List major maintenance performed on pollution control equipment.

7.3. Notice of Change of Ownership or Company Name

The permittee must notify the Department in writing using a Departmental "Permit Application Form" within 60 days after the following:

- a. Legal change of the name of the company as registered with the Corporations Division of the State of Oregon; or
- b. Sale or exchange of the activity or facility.

- 7.4. Construction or Modification Notices** The permittee must notify the Department in writing using a Departmental “Notice of Construction Form,” or “Permit Application Form,” and obtain approval in accordance with OAR 340-210-0205 through 340-210-0250 before:
- a. Constructing, installing, or establishing a new stationary source that will cause an increase in any regulated pollutant emissions;
 - b. Making any physical change or change in operation of an existing stationary source that will cause an increase, on an hourly basis at full production, in any regulated pollutant emissions; or
 - c. Constructing or modifying any air pollution control equipment.
- 7.5. Where to Send Reports and Notices** The reports, with the permit number prominently displayed, must be sent to the Permit Coordinator for the region where the source is located as identified in Condition 8.3.

8.0 ADMINISTRATIVE REQUIREMENTS

- 8.1. Permit Renewal Application** The completed application package for renewal of this permit is due on 11/01/2011. Two (2) copies of the application must be submitted to the DEQ Permit Coordinator listed in condition 8.3
- 8.2. Permit Modifications** Application for a modification of this permit must be submitted not less than **60** days prior to the source modification. A special activity fee must be submitted with an application for the permit modification. The fees and two (2) copies of the application must be submitted to the Business Office of the Department.
- 8.3. Permit Coordinator Addresses** All reports, notices, and applications should be directed to the Permit Coordinator:
- Department of Environmental Quality
Northwest Region
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
Telephone: (503) 229-5582
- 8.4. Department Contacts** Information about air quality permits and the Department’s regulations may be obtained from the DEQ web page at www.deq.state.or.us. All inquiries about this permit should be directed to the regional office:
- Department of Environmental Quality

Portland Office
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
Telephone: (503) 229-5554

9.0 FEES

- 9.1. Annual Compliance Fee** The Annual Fee specified in OAR 340-216-0020, Table 2, Part 2 for a Simple ACDP is due on **December 1** of each year this permit is in effect. An invoice indicating the amount, as determined by Department regulations, will be mailed prior to the above date.
- 9.2. Change of Ownership or Company Name Fee** The non-technical permit modification fee specified in OAR 340-216-0020, Table 2, Part 3(a) is due with an application for changing the ownership or the name of the company.
- 9.3. Special Activity Fees** The special activity fees specified in OAR 340-216-0020, Table 2, Part 3 (b through i) are due with an application to modify the permit.
- 9.4. Where to Submit Fees** Fees must be submitted to:
Department of Environmental Quality
Business Office
811 SW Sixth Avenue
Portland, Oregon 97204-1390

10.0 GENERAL CONDITIONS AND DISCLAIMERS

- 10.1. Permitted Activities** This permit allows the permittee to discharge air contaminants from processes and activities related to the air contaminant source(s) listed on the first page of this permit until this permit expires, is modified, or is revoked.
- 10.2. Other Regulations** In addition to the specific requirements listed in this permit, the permittee must comply with all other legal requirements enforceable by the Department.
- 10.3. Conflicting Conditions** In any instance in which there is an apparent conflict relative to conditions in this permit, the most stringent conditions apply.
- 10.4. Masking of Emissions** The permittee must not cause or permit the installation of any device or use any means designed to mask the emissions of an air contaminant that causes or is likely to cause detriment to health,

safety, or welfare of any person or otherwise violate any other regulation or requirement.

- 10.5. Department Access** The permittee must allow the Department’s representatives access to the plant site and pertinent records at all reasonable times for the purposes of performing inspections, surveys, collecting samples, obtaining data, reviewing and copying air contaminant emissions discharge records and conducting all necessary functions related to this permit in accordance with ORS 468-095.
- 10.6. Permit Availability** The permittee must have a copy of the permit available at the facility at all times.
- 10.7. Open Burning** The permittee may not conduct any open burning except as allowed by OAR 340 Division 264.
- 10.8. Asbestos** The permittee must comply with the asbestos abatement requirements in OAR 340, Division 248 for all activities involving asbestos-containing materials, including, but not limit to, demolition, renovation, repair, construction, and maintenance.
- 10.9. Property Rights** The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.
- 10.10. Termination, Revocation, or Modification** The Department may modify or revoke this permit pursuant to OAR 340-216-0082 and 340-216-0084.

11.0 EMISSION FACTORS

Emissions device or activity	Pollutant	Emission Factor (EF)	EF units	EF reference
Two 300 hp Boilers 153.8 mmCF/yr combined	PM/PM10	10	Lbs/mmCF	Manufacturer
	NOx	35	Lbs/mmCF	Manufacturer
	SO2	3.8	Lbs/mmCF	DEQ
	CO	37	Lbs/mmCF	AP42,1.4-2
	VOC	2.8	Lbs/mmCF	AP42,1.4-3

Emissions device or activity	Pollutant	Emission Factor (EF)	EF units	EF reference
Two 500 hp Boilers 256.4 mmCF/yr combined	PM/PM10	10	Lbs/mmCF	Manufacturer
	NOx	35	Lbs/mmCF	Manufacturer
	SO2	3.8	Lbs/mmCF	DEQ
	CO	37	Lbs/mmCF	AP42,1.4-2
	VOC	2.8	Lbs/mmCF	AP42,1.4-3
Process emissions	PM/PM10	8	Lbs/1000 wafers	Eng. Est.
	NOx	9	Lbs/100 gal acid	Eng. Est.
	VOC	24.8	Lbs/100 gal VOC containing material	Mass balance

12.0 PROCESS/PRODUCTION RECORDS

Emissions device or activity	Process or production parameter	Frequency
VOC containing materials	Gallons, weight, VOC %	Monthly
Mixed acids	Gallons	Monthly
Wafer production	Number of wafers	Monthly
Natural gas burned in each boiler	Million cubic feet	Monthly

13.0 ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

ACDP	Air Contaminant Discharge Permit	NSR	New Source Review
ASTM	American Society for Testing and Materials	O ₂	oxygen
AQMA	Air Quality Maintenance Area	OAR	Oregon Administrative Rules
calendar year	The 12-month period beginning January 1st and ending December 31st	ORS	Oregon Revised Statutes
CFR	Code of Federal Regulations	O&M	operation and maintenance
CO	carbon monoxide	Pb	lead
DEQ	Oregon Department of Environmental Quality	PCD	pollution control device
dscf	dry standard cubic foot	PM	particulate matter
EPA	US Environmental Protection Agency	PM ₁₀	particulate matter less than 10 microns in size
FCAA	Federal Clean Air Act	ppm	part per million
gal	gallon(s)	PSD	Prevention of Significant Deterioration
gr/dscf	grains per dry standard cubic foot	PSEL	Plant Site Emission Limit
HAP	Hazardous Air Pollutant as defined by OAR 340-244-0040	PTE	Potential to Emit
I&M	inspection and maintenance	RACT	Reasonably Available Control Technology
lb	pound(s)	scf	standard cubic foot
MMBtu	million British thermal units	SER	Significant Emission Rate
NA	not applicable	SIC	Standard Industrial Code
NESHAP	National Emissions Standards for Hazardous Air Pollutants	SIP	State Implementation Plan
NO _x	nitrogen oxides	SO ₂	sulfur dioxide
NSPS	New Source Performance Standard	Special Control Area	as defined in OAR 340-204-0070
		VE	visible emissions
		VOC	volatile organic compound
		year	A period consisting of any 12-consecutive calendar months

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