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**New Mexico**  
**ENVIRONMENT DEPARTMENT**

**Air Quality Bureau**  
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**RON CURRY**  
Secretary

CERTIFIED MAIL NO. 7009 2820 0001 4056 5674  
**RETURN RECEIPT REQUESTED**

Permittee:

Intel Corporation  
Mail Stop RR5-491  
4100 Sara Rd.  
Rio Rancho, NM 87124-1025

NSR Air Quality Permit No. 0325-M9-R23  
Rio Rancho Facility  
TEMPO No. 1103 - PRN20090004  
AIRS No. 35-043-0005

Company Official:

Frank Gallegos  
NM Site EH&S Manager

Agency Contact: Jay Stimmel

Mary Uhl  
Bureau Chief  
Air Quality Bureau

JAN 14 2010

Date of Issuance

This permit is not effective until the Department receives the permit fee of \$7280 as specified on the attached invoice. Please note that this permit fee is due regardless of the intended use or non-use of the permit or cancellation of the permit by the applicant or Department.

Air Quality Permit No. 0325-M9-R23 is issued by the Air Quality Bureau of the New Mexico Environment Department (Department) to Intel (Permittee) pursuant to the Air Quality Control Act (Act) and regulations adopted pursuant to the Act including Title 20, Chapter 2, Part 72 of the New Mexico Administrative Code (NMAC), (20.2.72 NMAC), Construction Permits and is enforceable pursuant to the Act and the air quality control regulations applicable to this source.

This permit authorizes the modification and operation of the Rio Rancho Facility (Facility). The function of the Facility is to manufacture semi-conductor chips for use in the computer industry. This Facility is located in Township 12 North, Range 2 East, Sections 31 and 32, in Rio Rancho, Sandoval County, New Mexico. The Universal Transverse Mercator (UTM) coordinates for this Facility are UTM E 349500 m, UTM N 3899500 m, and UTM zone 13. The physical address of the company is 4100 Sara Road.

This revision consists of a revision of the emission factors used to calculate the Facility's hazardous air pollutant (HAP) (Table 3) and volatile organic compound (VOC) emissions (Table Z).

This permit supersedes all portions of revisions 0325-M9-R20, issued April 16, 2009, through 0325-M9-R22, issued August 13, 2009 to Air Quality Permit No. 0325-M9 except the portion requiring compliance tests. Compliance test conditions from previous permits are still in effect, in addition to compliance test requirements contained in this permit.

The Department has reviewed the permit application for the proposed revision and has determined that the provisions of the Act and ambient air quality standards will be met. Conditions have been imposed in this permit to assure continued compliance. 20.2.72.210.D. NMAC, states that any term or condition imposed by the Department on a permit is enforceable to the same extent as a regulation of the Environmental Improvement Board.

Pursuant to 20.2.75.11 NMAC, the Department will assess an annual fee for this Facility. This regulation set the fee amount at \$1,500 through 2004 and requires it to be adjusted annually for the Consumer Price Index on January 1. The current fee amount is available by contacting the Department or can be found on the Department's website. The AQB will invoice the Permittee for the annual fee amount at the beginning of each calendar year. This fee does not apply to sources which are assessed an annual fee in accordance with 20.2.71 NMAC. For sources that satisfy the definition of "small business" in 20.2.75.7.F NMAC, this annual fee will be divided by two.

All fees shall be remitted in the form of a corporate check, certified check, or money order made payable to the "NM Environment Department, AQB" mailed to the address shown on the invoice and shall be accompanied by the remittance slip attached to the invoice.

Permit Conditions

- CONDITION 1. CONSTRUCTION AND OPERATION UNDER THIS PERMIT; NOTICE TO SUBSEQUENT OWNERS; ACCESS, POSTING OF PERMIT, CANCELLATION/REVOCATION, CONFIDENTIAL INFORMATION; APPEALS; AND PERMIT REOPENING**
- A. Intel shall construct and operate the Facility in compliance with the conditions of this Permit and is authorized to operate 24 hours per day, 7 days per week, and 52 weeks per year with the sources of air emissions listed in Attachment A. New or replacement sources may require a permit revision.
- B. Intel is allowed to make, without a permit revision or prior Department approval, physical or operational changes that are authorized or not prohibited by this Permit. This authorization includes changes in the processes or methods of operation, and changes in amount or type of materials or chemicals used, if:
- i. such changes do not cause Facility emissions to exceed the Plant Site Emission Limits (PSELs) or other applicable limits;
  - ii. such changes comply with all applicable requirements under the state and federal Acts, and with all conditions of this Permit;
  - iii. Intel keeps records and provides information to the Department concerning such changes as required by this Permit; and
  - iv. the Department can verify the emissions as described in this Permit.
- C. Use of HAPs other than those listed in Appendix X requires Department approval prior to use through the significant permit revision process under 20.2.72.219 NMAC, unless Intel demonstrates to the Department that use of such HAPs will not result in any emissions to the atmosphere.
- D. Prior Department approval through the significant permit revision process under 20.2.72.219 NMAC is required for total potential emissions of a toxic air pollutant in excess of the screening level (specified in pounds per hour) in 20.2.72.502 NMAC - Toxic Air Pollutants and Emissions.
- E. If at any time the Department determines that:
- i. a condition of this Permit contains a material mistake;
  - ii. the Department relied upon information determined to be inaccurate in establishing a condition of this Permit; or
  - iii. a condition of this Permit is not adequate to determine compliance with any applicable state or federal air quality requirement, including the conditions of this Permit;

the Department may reopen the Permit, correct the inadequacy and reissue the Permit. Proceedings to reopen and revise the Permit shall affect only those parts of the Permit for which cause to reopen exists. The Department shall notify Intel by certified mail at least thirty (30) days in advance of the date on which the Department intends to reopen the Permit. The Department shall provide public notice and allow public participation regarding the revised condition only, as required by 20.2.72.206 NMAC - Public Notice and Participation, before reissuing the reopened Permit. The Department may, based on stack testing or other credible evidence, require Intel to revise emission factors in accordance with Condition 1.G of this Permit.

- F. Addition, replacement, and reconfiguration of the tools and semiconductor production equipment is authorized under this Permit and does not require a permit revision or prior Department approval provided all other conditions of this Permit are met.
- G. Intel shall make any decrease or increase in an emission factor listed in Tables 1, 3, Y, or Z of this Permit through the technical permit revision process in 20.2.72.219 NMAC.
- H. Intel shall use records of fuel usage maintained during the year prior to issuance of this Permit, as necessary, to calculate the twelve (12) month rolling total emissions during the first year following issuance of this Permit.
- I. The Permit and conditions apply in the event of any change in control or ownership of the Facility. An administrative permit revision is required in such case. Intel shall notify the succeeding owner of the Permit and conditions and shall notify the Department of the change in ownership within fifteen (15) days of that change.
- J. The Department shall be given the right to enter the Facility at all reasonable times to verify the terms and conditions of this Permit. Intel, upon either a verbal or written request from an authorized representative of the Department, shall produce any records or information necessary to establish that the terms and conditions of this Permit are being met.
- K. A copy of this Permit shall be retained at the plant site at all times and shall be made available to Department personnel for inspection upon request.
- L. Any records, reports, or information that Intel claims if made public would divulge confidential business records or methods or processes entitled to protection as trade secrets of Intel shall be clearly marked as such in accordance with the provisions of 20.2.1 NMAC and be accompanied by a justification of the claim.
- M. The Department may revoke this Permit if the applicant or permittee has knowingly and willfully misrepresented a material fact in the application for the Permit. Revocation will be made in writing, and administrative appeal may be taken to the Secretary of the Department within thirty (30) days. Appeals will be handled in accordance with the Department's Rules Governing Appeals From Compliance Orders.

- N. 20.2.72.207 NMAC provides that any person who participated in a permitting action before the Department and who is adversely affected by such permitting action, may file a petition for hearing before the Environmental Improvement Board. The petition shall be made in writing to the Environmental Improvement Board within thirty (30) days from the date notice is given of the Department's action and shall specify the portions of the permitting action to which the petitioner objects, certify that a copy of the petition has been mailed or hand-delivered and attach a copy of the permitting action for which review is sought. Unless a timely request for hearing is made, the decision of the Department shall be final. The petition shall be copied simultaneously to the Department upon receipt of the appeal notice. If the petitioner is not the applicant or permittee, the petitioner shall mail or hand-deliver a copy of the petition to the applicant or permittee. The Department shall certify the administrative record to the board. Petitions for a hearing shall be sent to:

Secretary, New Mexico Environmental Improvement Board  
 1190 St. Francis Drive, Runnels Bldg. Rm. N2153  
 P.O. Box 5469  
 Santa Fe, New Mexico 87502

**CONDITION 2. COMBUSTION-GENERATED POLLUTANTS**

**A. Definition of Combustion-Generated Pollutants**

For purposes of this Permit, "combustion-generated pollutants" are the emissions of CO, NO<sub>x</sub>, SO<sub>2</sub>, TSP/PM<sub>10</sub>, and combustion-generated VOCs which are emitted by the Central Utility Building (CUB), Energy Center (EC), Recuperative Thermal Oxidizers (RTOs), Ammonia Treatment System and emergency generators as a byproduct of combustion within these emission units. "Nitrogen dioxide" or "NO<sub>2</sub>" or "NO<sub>x</sub>" means nitrogen dioxide as defined in 20.2.2 NMAC.

**B. Emissions Limits for Combustion-Generated Pollutants**

**i. Plant Site Emission Limits (PSELs) for NO<sub>x</sub> and CO**

The plant site emissions of NO<sub>x</sub> and CO shall not exceed the following limits:

Pollutant	Twelve (12) Month Rolling Total (tpy)
NO <sub>x</sub>	95.7
CO	94.7

The PSEL for total VOCs, which includes combustion-generated VOCs, is specified in Condition 4.B of this Permit.

**ii. Annual Emission Limits for TSP/PM<sub>10</sub>**

Total particulate matter emissions from the thermal oxidizers shall not exceed a twelve month rolling total of 14.2 tons.

iii. Hourly Emission Limits

The hourly emission rates shall not exceed the limits specified in Table CS.

C. Emissions of Combustion-Generated Pollutants

Emissions of combustion-generated pollutants do not pass through control equipment. Intel is limiting its potential to emit from these combustion sources to less than 100 tpy for each specified pollutant by restricting fuel usage and usage of particulate generating compounds.

i. Ammonia Treatment Plant

- a. The ammonia treatment plant shall combust only natural gas (see condition 2.C.v.).
- b. Intel shall operate the ammonia treatment plant in accordance with manufacturer's specifications. At all times the ammonia treatment plant is in operation, except during startup and cooldown periods, Intel shall maintain the temperature of the unit at a minimum of 525°F and a maximum of 650°F. Intel shall continuously record the temperatures using a continuous strip chart recorder or electronic equivalent. At any time the continuous recording mechanism is not operating, Intel shall record the temperatures not less than once per hour during the time the control unit is operating.

ii. 1250 BHP Boilers

- a. The twelve (12) 1250 boiler-horsepower boilers are subject to federal New Source Performance Standards (NSPS) contained in the Code of Federal Regulations (CFR), Title 40, Part 60, Subpart A - General Provisions, and Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, and Intel shall comply with the notification requirements in Subpart A and the specific requirements of Subpart Dc.
- b. The "boiler commission" or "boiler commission date" for each boiler shall be the date on which that boiler achieves the rate at which it will be operated under normal operating conditions or one hundred twenty (120) days from boiler startup, whichever is sooner.
- c. The maximum firing rate for each boiler shall not exceed 54 million Btu/hour for any single hour.
- d. The boilers shall combust only natural gas (see Condition 2.C.v.), except when circumstances beyond the control of Intel prohibit the use of natural gas (emergency situations) or when Intel tests the fuel

delivery system and emergency boiler operations. Under these circumstance, Intel may combust No. 2 diesel fuel (or equivalent fuel oil, i.e., fuel oil that has emissions equal to or less than No. 2 diesel fuel) in any of the boilers. Testing for the No. 2 diesel fuel delivery system and emergency boiler operation shall be limited to thirty (30) minutes monthly for each boiler.

- e. Intel shall meter each 1250 hp boiler for fuel usage using a meter with a design accuracy of  $\pm 1\%$ . The heat content of the fuel burned shall be based on information provided by the fuel supplier.
  - 1) The fuel meters shall be calibrated annually and the results submitted to the Department within thirty (30) days of the end of each calendar year.
- f. Intel shall identify and record the firing lever position of each operational boiler at least every 5 minutes. The minimum level of data capture for each boiler shall be 90% for each calendar year. This data shall be compiled to reflect the fraction of time that the 1250 BHP boilers are operated in each lever position. Annually, no later than March 15, Intel shall use this data to update the emission factors for the 1250 BHP boilers in Table 1, such that at that time the emission factors will be based on the most recent three years of operational data. This update of emission factors shall be accomplished by determining the average emission factor based on emission tests and fraction of time data for each lever position. For each lever position, the fraction of time that all boilers spend in that mode shall be multiplied by the highest emission factor of any boiler at that position. This derived number summed with the similarly derived numbers from all other lever positions will result in the average emission factor in Table 1. If Intel changes these emission factors, it shall do so in accordance with condition 1.G.

iii. Emergency Generators

- a. Testing of the diesel fuel delivery system and emergency generator operation shall be in accordance with the NFPA 110, Standard for Emergency and Standby Power Systems.
- b. Testing of the diesel fuel delivery system and fire pump operations shall be in accordance with NFPA 25, Standard for Inspection, Testing and Maintenance for Water-based Fire Protection Systems and insurance requirements.
- c. Intel shall not use the emergency generators for more than five hundred (500) hours each per year unless Intel obtains a permit revision allowing such use. For record-keeping requirements on emergency generator use, see Condition 8 of this Permit.

- iv. Intel shall operate and maintain all combustion equipment in accordance with the manufacturers' specifications. Intel shall maintain records of the maintenance performed on all combustion equipment and shall make this information available to the Department upon request.
- v. All natural gas used shall be pipeline quality, with no more than 0.25 grains of H<sub>2</sub>S per 100 scf of gas.

**D. Compliance Determinations for Combustion-Generated Pollutants**

**i. Calculation of Twelve (12) Month Rolling Total Emissions**

- a. Emissions of TSP/ PM<sub>10</sub>, NO<sub>x</sub>, CO, and combustion-generated VOCs shall be calculated by summing the total emissions over the most recent twelve (12) calendar months in accordance with the formula specified below.
- b. Emissions of NO<sub>x</sub>, CO, and combustion VOCs for the Facility shall be the sum of the emissions calculated monthly for each combustion unit in accordance with the following formula:

$$\text{Emissions} = (Q) \times (EF)$$

where:

Q = fuel usage (MMbtu/month for natural gas or 10<sup>3</sup> Gal/month for No. 2 fuel oil)

EF = emission factor for each emissions unit and fuel type for boilers and RTOs as specified in attached Table 1; for other emission units, emission factor obtained from the manufacturer and accepted by the Department, or specified in the most recent version of AP-42.

- c. Emissions of TSP/PM<sub>10</sub> from RTOs shall be the sum of the emissions calculated monthly in accordance with the following formula:

$$PM = Q \times EF$$

where:

PM = emissions of particulate matter

Q = mass of HMDS purchased plus beginning mass in stock minus ending mass in stock

EF = emission factor specified in Table Y, reflecting the portion of HMDS which is emitted as PM.

- ii. Hourly Emissions from Combustion Sources
  - a. Except for TSP emissions from RTOs, compliance with the hourly emission rates specified in 2.B.iii shall be determined from records of fuel usage and equipment maintenance, unless otherwise determined by stack testing approved by the Department.
  - b. Compliance with hourly emission rates of TSP from RTOs shall be determined from records of fuel usage, HMDS usage and equipment maintenance, unless otherwise determined by stack testing approved by the Department.
- iii. Emissions occurring as a result of fuel oil combustion shall be included in the determination of compliance with the allowable emission rates.

### CONDITION 3. DUCTING OF NON-COMBUSTION POLLUTANTS

- A. Intel may, without a permit revision or prior Department approval, replace, rebuild or reconfigure its air pollutant ducting system, but shall ensure that the pollutant ducting system is configured and maintained to convey Fab exhaust streams to the appropriate control device as specified in 3.B
- B. Except as provided in Condition 3.C, Intel shall ensure that each pollutant generated by the Facility is conveyed to the appropriate control device as follows:
  - i. Any Fab process exhaust stream which contains solvent VOCs (including organic HAPs) shall be ducted to a Recuperative Thermal Oxidizer (RTO) or Bead Activated Carbon system (BAC), except that process exhaust streams for which the only VOC component is ethylene glycol may be vented to acid gas scrubbers.
  - ii. Any Fab process exhaust stream which contains inorganic HAPs, except those for which the only HAP component is solid arsenic, shall be ducted to acid gas scrubbers.
  - iii. With approval from the Department, Intel may duct emissions to the atmosphere or to an exhaust system other than the system specified above. Intel shall submit to the Department a demonstration that such change in ducting would not increase overall emissions of any pollutant over that which would occur if the emissions were sent to the specified system, and shall make such revisions to the emission factors as appropriate in accordance with Condition 1.G. Such approved changes are within the scope of this Permit and shall not constitute a permit revision.
- C. Intel may vent emissions from wipe-down chemicals, such as isopropyl alcohol (IPA), used outside of process tools to the air or to general exhaust.

- D. Intel shall track the usage of all chemicals used in manufacturing to enable the accurate identification of the potential components of any exit exhaust stream.

**CONDITION 4. TOTAL EMISSIONS OF VOLATILE ORGANIC COMPOUNDS**

**A. Definition of Volatile Organic Compound**

A volatile organic compound (VOC) is an air contaminant that has been defined as a volatile organic compound pursuant to 40 CFR 51.100(s). Solvent VOCs include non-HAP solvents and organic HAPs.

**B. Plant Site Emission Limit (PSEL) for Volatile Organic Compounds.**

The plant site emissions of VOCs shall not exceed a twelve (12) month rolling total of 96.5 tons.

**C. Operation of Solvent VOC Emission Control Equipment (RTO and BAC Systems)**

- i. Intel shall operate a solvent VOC air pollution control unit (a recuperative thermal oxidizer or a bead activated carbon system) on each solvent VOC exhaust stack on a continuous twenty-four (24) hour per day basis, except for:
  - a) periods of start-up, shut-down, scheduled maintenance, and malfunction
  - b) in the event of the loss of the natural gas supply for thermal oxidizer units;
  - or c) during periods when solvent VOC's are not being emitted from a solvent exhaust stack being served by a control unit. The maximum duration of any single startup or cooldown period shall not exceed four (4) hours.
- ii. Intel shall maintain the control units in accordance with the manufacturer's recommendations, including replacements of bead activated carbon based on specific gravity measurements. Key spare parts for the control units, identified by the manufacturers of the units, shall be kept on site at all times. Intel shall record the date and time of each bead activated carbon unit charge replacement.
- iii. Intel shall not emit toxic metals listed pursuant to Section 112(b) of the Clean Air Act, 42 U.S.C. 7412(b) (i.e., the list of hazardous air pollutants) or halogenated compounds, used in the manufacturing process in a production operation, into the influent streams to a control unit.
- iv. Only natural gas shall be fired by the thermal oxidizers.
- v. Intel shall monitor fuel flow and heat content of the natural gas to each thermal oxidizer unit individually.
- vi. Intel shall operate each control unit in accordance with manufacturer's specifications. At all times a thermal oxidizer unit is in operation, except during startup and cooldown periods, Intel shall maintain the temperature of the Durr thermal oxidizers primary combustion chamber at a minimum of

1350°F, and a single hour average of at least 1360°F, plus or minus 10°F and the temperature of the Munters thermal oxidizers primary combustion chamber at a minimum of 1370°F, and a single hour average of at least 1385°F, plus or minus 15°F. At all times a bead activated carbon unit is in operation, except during startup, Intel shall maintain the desorption chamber temperature at a minimum of 300°F and the coolant return temperature at a maximum of 50°F. Intel shall continuously record the temperatures using a continuous strip chart recorder or electronic equivalent. At any time the continuous recording mechanism is not operating, Intel shall record the temperatures not less than once per hour during the time the control unit is operating.

- vii. Maintenance of each control unit shall be scheduled, to the extent possible, during periods when the production operation to which the control unit is connected is not in operation. No more than one (1) solvent VOC exhaust stack shall be uncontrolled because of scheduled maintenance of control units during the same time period.
- viii. Any future permit applications for a new VOC emission source at the Rio Rancho Facility shall include a thermal oxidizer, bead activated carbon system or other equivalent emissions control device, unless Intel demonstrates to the satisfaction of the Department that the VOC emissions increase or the toxicity of those emissions, or combination thereof, is not significant and the emissions will meet applicable federal and state requirements, including ambient air quality standards.
- ix. Intel shall notify the Department, as specified in Condition 9.A.vi, of any failure of any control unit to operate at the temperatures specified in Condition 4.C.vi, for any period of more than one hour in any twenty-four (24) hour period, except as provided in Conditions 4.C.i and 4.C.vi. In the event that the recording mechanism is not functioning, Intel shall report to the Department whenever two (2) or more hourly temperature readings fall below the temperatures specified in Condition 4.C.vi within a single twenty-four (24) hour period; and
- x. When an RTO or BAC is not in operation, Intel shall take steps to minimize VOC emissions, including but not limited to routing the affected solvent exhaust stream to the back-up unit, if the exhaust system is equipped with an operational unit.

#### D. Compliance Determinations for Volatile Organic Compounds

##### i. Calculation of Twelve (12) Month Rolling Total Emissions

The twelve (12) month rolling total emissions of VOCs shall be calculated by summing the total emissions over the most recent twelve (12) calendar months in accordance with Conditions 4.D.ii, iii, iv, and v.

- ii. Emissions from Storage Tanks  
VOC emissions from storage tanks shall be determined using the most current version of the EPA TANKS Program.

- iii. Emissions from Wipe-down Use

Any amount of VOC used outside of process tools for wipe-down shall be assumed to be emitted to the atmosphere.

- iv. Other VOC Emissions

- a. Liquid Chemical Baths

Emissions from the liquid chemical baths shall be calculated for each VOC using the standard evaporation rate equation recognized by EPA for use in compliance with Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the federal Act. This equation is:

$$W = MKAp/RT$$

where:

W = mass emissions of VOC

M = molecular weight

A = surface area

p = vapor pressure of liquid VOC at temperature T

R = ideal gas constant

T = temperature of liquid VOC

K = mass transfer coefficient, dependent upon air flow

- b. Process VOC gases and chemicals not used in chemical baths.

Emission of process gases and chemicals shall be calculated for each VOC in accordance with the following formula:

$$VOC_i = \text{Sum of } [(Q_i)(EF_i)]$$

where:

VOC<sub>i</sub> = mass of emissions of VOC<sub>i</sub>

Q<sub>i</sub> = mass of chemical i purchased plus beginning mass in stock minus ending mass in stock

EF<sub>i</sub> = emissions factor specified in Table Z, reflecting the portion of chemical i which is emitted as VOC<sub>i</sub>

- v. Emissions from Combustion Sources

VOC emissions from combustion sources shall be calculated as specified in Condition 2.D.i.

**CONDITION 5. HAZARDOUS AIR POLLUTANTS****A. Definition of Hazardous Air Pollutant**

A hazardous air pollutant (HAP) is an air contaminant that has been listed as a hazardous air pollutant pursuant to Section 112(b) of the federal Act. For purposes of this Permit, organic HAPs are also classified and regulated as VOCs.

**B. Emission Limits for Hazardous Air Pollutants**

The plant site emissions of HAPs as listed in Appendix X shall not exceed the limits specified in Table 2.

**C. Emission Controls for Hazardous Air Pollutants**

i. Condition 3 of this Permit establishes the requirements for ducting of HAPs to the proper control equipment. Condition 4.C of this Permit establishes the requirements for the operation and maintenance of the RTOs and BACs. Conditions 5.E, 7.C, 7.D, and 8.B (ii, iii and iv) of this Permit establish the requirements for testing, monitoring and recordkeeping for the RTO/BAC systems and acid gas scrubbers.

ii. Intel shall operate the acid gas scrubbers on a continuous twenty-four (24) hour per day basis except for periods of start-up, shut-down, scheduled maintenance, and malfunction or during periods when the Fab being served by the equipment is not operating.

**D. Compliance Determinations for Hazardous Air Pollutants****i. Calculation of Twelve (12) Month Rolling Total Emissions**

The twelve (12) month rolling total emission of HAPs shall be calculated by summing the total emissions over the most recent twelve (12) calendar months in accordance with Conditions 5.D.ii, iii, iv, and v.

**ii. Emissions from Storage Tanks**

HAP emissions from storage tanks shall be determined using the most current version of the EPA TANKS Program.

**iii. Emissions from Wipe-down Use**

Any amount of HAP used outside of process tools for wipe-down shall be assumed to be emitted to the atmosphere.

## iv. Emissions from Liquid Chemical Baths

Emissions from the liquid chemical baths shall be calculated for each HAP using the standard evaporation rate equation recognized by EPA for use in compliance with Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA), Section 112(r) of the federal Act and other applications. This equation is:

$$W = MKAp/RT$$

where:

W = mass emissions of HAP

M = molecular weight

A = surface area

p = vapor pressure of liquid HAP at temperature T

R = ideal gas constant

T = temperature of liquid HAP

K = mass transfer coefficient, dependent upon air flow

## v. Emissions of Process Gases and Chemicals Not Used in Chemical Baths (including arsenic and inorganic/organic process gases and chemicals)

Emission of process gases and chemicals shall be calculated for each HAP in accordance with the following formula:

$$HAP_i = \text{Sum of } [(Q_j)(EF_{ji})]$$

where:

HAP<sub>i</sub> = mass of emissions of HAP<sub>i</sub>

Q<sub>j</sub> = mass of chemical j purchased plus beginning mass in stock minus ending mass in stock, which contributes to formation of HAP<sub>i</sub>

EF<sub>ji</sub> = emissions factor reflecting the portion of chemical j which is emitted as HAP<sub>i</sub> (see Table 3)

## E. Verification of Emissions Calculations by Stack Testing

- i. Intel shall conduct initial stack testing for all HAPs for which emissions are calculated only by the evaporation rate equation specified in Condition 5.D.iv. During this testing Intel shall record the parameters used in the evaporation rate equation.
- ii. Intel shall conduct annual stack testing for all HAPs listed in Table 3 and in use at the time of testing.

- iii. Unless the Department approves otherwise, Intel shall conduct additional tests for HAPs if their emissions are calculated according to the equation in 5.D.v and one of the following circumstances exist: either the emission factor is already less than 1 and is being reduced, or the use of the HAP has just begun with an emission factor less than 1. Such tests shall be conducted within thirty (30) days of the change.
- iv. Initial and annual testing shall be performed as specified in Condition 7 of this Permit.
- v. The Department may require additional stack testing if the Department has reason to believe that the emissions of any HAPs subject to the annual testing requirement specified in this Condition has increased significantly.

#### CONDITION 6. TOXIC AIR POLLUTANTS

##### A. Definition of Toxic Air Pollutant

A Toxic Air Pollutant (TAP) is an air contaminant listed in 20.72.502 NMAC - Toxic Air Pollutants and Emissions.

##### B. Department Findings Regarding Toxic Air Pollutants

The Department finds that the permit application demonstrates that the total potential emissions of TAPs listed in the application do not exceed the screening levels (specified in pounds per hour) in 20.72.502. Therefore, the Department has determined that no ambient air quality modeling or emission limit is required for those TAPs.

- i. If at any time the Department has reason to believe that the total potential emissions of a TAP may exceed the applicable screening level (specified in pounds per hour) in 20.72.502 NMAC, the Department may require Intel to submit a demonstration of compliance with 20 NMAC 72 Subpart IV.
- ii. Demonstration of compliance with 20 NMAC 72 Subpart IV shall include:
  - a. a showing that the total potential emissions of the TAP are less than the screening level (specified in pounds per hour). The total potential emissions of the TAP shall be calculated in accordance with the methods of Condition 5.D of this Permit; and
  - b. if requested by the Department, stack testing using an EPA-approved or equivalent method approved by the Department.

**CONDITION 7. TESTING****A. General Requirements**

- i. Intel shall notify the Department's Program Manager, Compliance and Enforcement Section at least thirty (30) days prior to the test date, unless otherwise approved by the Department and allow a representative of the Department to be present at the test. Intel shall arrange a pretest meeting with the Department at least thirty (30) days prior to the test date, unless otherwise approved by the Department, and shall observe the following pre-testing and testing procedures:
  - a. Intel shall provide for the Department's approval a written test protocol at least one (1) week prior to the anticipated pre-test meeting date. The protocol shall describe the test methods to be used (including sampling methods and calibration procedures), shall list the equipment or devices to be tested (including sample locations), and shall describe data reduction procedures. Any variation from established sampling and analytical procedures or from Facility operating conditions shall be presented for Department approval.
  - b. The test protocol and compliance test report shall conform to the standard format specified by the Department. The most current version of the format may be obtained from the Enforcement and Compliance Section of the Air Quality Bureau.
  - c. Intel shall provide (a) sampling ports adequate for the test methods applicable to the Facility, (b) safe sampling platforms, (c) safe access to sampling platforms and (d) utilities for sampling and testing equipment. Sample ports of a size compatible with the test methods shall be located on the stack of each source to be tested in accordance with the provisions of 40 CFR 60, Appendix A, Method 1. Each stack shall be of sufficient height and diameter so that a representative test of the emissions can be performed in accordance with EPA Method 1.
  - d. During any boiler tests the fuel flow, firing rate, percent oxygen, and quadrant lever position shall be monitored and recorded. This information shall be included with the test report that is required to be furnished to the Department.
  - e. Where necessary to prevent cyclonic flow in the stacks, flow straighteners shall be installed.
  - f. The tests on combustion equipment shall be conducted at the loads specified by Department and contained in this condition.

- ii. The initial stack tests and the first set of annual stack tests shall be completed within one hundred eighty (180) days of the date of issuance of this Permit. All testing of HAPs emissions during the initial and annual test periods shall be started and completed within a period of sixty (60) continuous days. All tests of stacks within a Fab shall be completed prior to commencing tests in other Fabs unless tests of all stacks occur in other Fabs simultaneously.
- iii. Conditions from previous permits for initial compliance tests on new equipment such as boilers continue in effect until they are completed and are in addition to the compliance tests requirements contained in this Permit.
- iv. Alternative test methods, where authorized by this permit, shall conform to the requirements of 40 CFR 51.212.

**B. CUB/EC (Natural Gas Boilers) NO<sub>x</sub>, CO, and VOCs**

- i. On an annual basis following boiler maintenance turnaround, Intel shall test the emission profile of one (1) 1250 BHP boiler in either the CUB or EC. In addition, Intel shall test one (1) 1250 BHP boiler in either the CUB or EC at a single load setting. The Department shall identify the boilers and the single load setting to be tested under this condition.
- ii. During the next emission profile testing specified in Condition 7.B.i, Intel shall conduct testing to determine the VOC emission rate (in lb/MMBtu) of one 1250 BHP boiler.
- iii. At any time, the Department may test any of the 1250 BHP boilers to verify the validity of the boiler emission factors in Table 1.
- iv. If the Department has reason to believe that the emissions profile of any 1250 BHP boiler has changed, the Department may require Intel to conduct additional tests to determine whether the boiler emission factors specified in Table 1 have changed.
- v. Intel shall conduct tests in accordance with applicable EPA Reference Methods 1 through 4, Method 5 for particulate matter, Method 25A for VOCs, Method 7E for NO<sub>x</sub>, and Method 10 for CO contained in 40 CFR 60, Appendix A, and with the requirements of 40 CFR 60.8(f). The results of the NO<sub>x</sub> tests shall be expressed as nitrogen dioxide (NO<sub>2</sub>) using a molecular weight of 46 lb/lb-mole in all calculations (each ppm of NO/NO<sub>2</sub> is equivalent to  $1.194 \times 10^{-7}$  lb/scf).
- vi. For emissions profile testing for NO<sub>x</sub> and CO on the 1250 BHP boilers, Intel shall use Method 7E and 10, but the Department may allow a single one (1) hour test at each of the ten (10) load settings of those boilers.

- vii. Intel shall determine the oxygen (%O<sub>2</sub>) in the stack gas by using EPA Method 3 or 3A. Intel may determine the stack volume flow using an F factor, if approved by the Department, or by using the flow methods in 40 CFR 60, Appendix A.
- viii. If the Department finds, as a result of the profile testing of the 1250 BHP boilers specified in Condition 7.B.i through 7.B. vi of this Permit, that 1) the boiler emissions exceed the rates calculated by the boiler emission factors specified in Table 1 or 2) any emissions factor in the tested emissions profile exceeds the corresponding lever position value used in development of the average emission factor, the Department may require Intel to revise the boiler emission factors as described in 2.C.ii.f.
- ix. If the Department finds that the boiler emission rate from the single load test of the 1250 BHP boilers exceeds the corresponding lever position value used in development of the average emission factor, the Department may require Intel to revise the boiler emission factors as described in 2.C.ii.f.
- x. For each boiler, Intel shall provide a one-quarter (1/4) inch stainless steel sampling line adjacent to the sampling ports and extending down to within four (4) feet above ground level to provide access for future audits. The line shall extend into the stack a distance of 1/4 the stack diameter, but not less than one inch from the stack wall. The sampling line shall be maintained clear of blockage at all times. This line shall be installed no later than one hundred and eighty (180) days from the date of this Permit and shall be in place at the time of any required compliance tests.

### C. BAC/RTO

- i. Intel shall conduct annual tests of the exit exhaust streams of the RTO/BAC stacks as required in Condition 5.E for HAPs ducted to the RTO/BAC stacks. Intel shall use EPA Method 18 or, with the Department's approval, another appropriate method for these tests.
- ii. Intel shall operate and maintain an emissions testing system to measure the concentration of total hydrocarbons and VOCs and the air flow from each stack. Intel shall begin the operation of the emissions testing system no later than ninety (90) days following issuance of this Permit
  - a. The emissions testing system shall consist of a portable flame ionization detector (FID) and Fourier Transform Infra-Red Detector (FTIR) that measure total hydrocarbons and VOCs, a method for analyzing flue gas for O<sub>2</sub> and CO<sub>2</sub> concentrations for stack gas molecular weight determination, a method for determining stack gas moisture and a flow measurement device that measures stack air flow. The testing system shall measure the stack gas concentration of total hydrocarbons and VOCs (ppmv), O<sub>2</sub>, CO<sub>2</sub> and moisture content (%),

- and stack gas flow rate (acf). The FID, FTIR, O<sub>2</sub> and CO<sub>2</sub> analyzers, and flow meters shall be calibrated and maintained at a frequency and by a method specified by the manufacturer and approved by the Department. Intel shall inspect the testing system during each sampling interval at each stack to ensure that representative samples of the total hydrocarbons and VOC exhaust streams are being obtained and analyzed.
- b. Intel shall test one solvent exhaust stack at a time for at least three hundred thirty-six (336) hours each quarter. All solvent exhaust stacks shall be tested during each quarter.
  - c. Intel shall operate the FID for the entire time of the test period specified in 7.C.ii.b. above to measure total hydrocarbons from each solvent exhaust stack.
  - d. Intel shall measure O<sub>2</sub>, and CO<sub>2</sub> concentrations, moisture and stack gas flow rate and operate the FTIR in 8-hour increments at the start, mid-point, and end of the FID testing (24 hours total) for analysis of the VOC stack emissions.
  - e. After the first year of monitoring, NMED may direct Intel to decrease or discontinue the use of the FID and increase the use of the FTIR and measurements of O<sub>2</sub>, CO<sub>2</sub>, and stack gas flow rate if NMED determines the emissions testing system is not accurately measuring VOC emissions.
  - f. No later than thirty (30) days prior to the start of testing, Intel shall propose, for approval by the Department, standard procedures for operating, monitoring, and quality assurance for the testing system. The FID proposal shall conform to the requirements of 40 CFR 60.13 and 40 CFR 60 Appendix A, Method 25A. The FTIR proposal shall conform to the requirements of EPA Test Method 320 - Measurement of Vapor Phase Organic and Inorganic Emissions by Extractive Fourier Transform Infrared (FTIR) Spectroscopy, and Addendum to Test Method 320 - Protocol for the Use of Extractive Fourier Transform Infrared (FTIR) Spectrometry for the Analyses of Gaseous Emissions from Stationary Sources.
  - g. Intel shall conduct an initial certification of the testing system within ninety (90) days of the date of issuance of this Permit. The FID shall be certified in accordance with 40 CFR 60, Appendix A, Method 25A, and Appendix B, Performance Specification 8. The FTIR shall be certified in accordance with 40 CFR 63, Appendix A, Method 320, and Appendix B, Proposed Performance Specification 15. Intel shall conduct the certification of the flow meter in accordance with 40 CFR 60, Appendix A, Methods 1-4,

and Appendix B, Performance Specification 6. Intel shall re-certify the testing system at least every three (3) years from the date of initial certification or subsequent re-certification.

- h. Two (2) years after issuance of this Permit, Intel may submit a proposal to modify or discontinue the test requirements in Condition 7.C.ii (a through g). A proposal to modify the test requirements shall include a demonstration of the adequacy of the proposed testing for evaluating the validity of the VOC emissions calculations specified in Condition 4.D.iv. A proposal to discontinue the test requirements shall include methods to evaluate the validity of the VOC emissions calculations specified in Condition 4.D.iv. Intel shall obtain Department approval before implementing such proposed change or discontinuance in testing, but such change or discontinuance, if approved, is within the scope of this Permit and shall not constitute a Permit revision.

#### D. Acid Gas Scrubbers

- i. Intel shall conduct annual tests of the exit exhaust streams of acid gas scrubber stacks as required in Condition 5.E.ii for HAPs ducted to the acid gas scrubbers. All operational acid gas scrubber stacks shall be tested in each annual test period, except as specified in Condition 7.D.ii of this Permit.
- ii. After the completion of the first two annual tests, Intel may submit a statistically valid proposal for annual testing of less than all, but no less than one-third (1/3) of a random selection of the acid gas scrubber stacks. The proposal shall include a demonstration of the adequacy of the proposed sampling method for obtaining estimates of Facility emissions from the acid gas scrubber stacks. Intel shall obtain Department approval before implementing a change in testing, but such approved change is within the scope of this Permit and shall not constitute a permit revision.
- iii. For the tests required by Condition 7.D, Intel shall use EPA Compendium Method IP-9 or a FTIR for HCl and HF, EPA Method 26A for Cl<sub>2</sub>, or other methods approved by the Department. For all other HAPs, Intel shall use test methods approved by the Department. The duration of the test for each stack shall be no less than eight (8) continuous hours, unless otherwise approved by the Department. For these tests, Intel shall comply with the notification requirements specified in Condition 7.A.i.

#### E. Ammonia Treatment Plant

- i. Intel shall conduct initial compliance testing for NO<sub>x</sub> and CO in accordance with 20.2.72.213 NMAC.
- ii. Intel shall conduct initial compliance testing for NH<sub>3</sub>.

- iii. Initial compliance testing procedures.
  - a. The emissions testing shall consist of a Fourier Transform Infrared Detector (FTIR) that measures NO<sub>x</sub>, CO and NH<sub>3</sub>, a method for analyzing flue gas for O<sub>2</sub> and CO<sub>2</sub> concentrations for stack gas molecular weight determination, a method for determining stack gas moisture and a flow measurement device that measures stack air flow. Testing shall measure the stack gas concentration of NO<sub>x</sub>, CO and NH<sub>3</sub>, O<sub>2</sub>, CO<sub>2</sub> and moisture content (%), and stack gas flow rate (acf). The FTIR, O<sub>2</sub> and CO<sub>2</sub> analyzers, and flow device shall be calibrated and maintained at a frequency and by a method specified by the manufacturer and approved by the Department.
  - b. The compliance tests shall be conducted in accordance with the procedures defined in 40 CFR 60, Appendix A, Test Methods and further guided by EPA Test Method 320 - Measurement of Vapor Phase Organic and Inorganic Emissions by Extractive Fourier Transform Infrared (FTIR) Spectroscopy, and Addendum to Test Method 320 - Protocol for the Use of Extractive Fourier Transform Infrared (FTIR) Spectrometry for the Analyses of Gaseous Emissions from Stationary Sources.
  - c. The duration for each test run shall be 60 minutes and each performance test shall consist of three separate runs. For the purpose of determining compliance with an applicable emission limit, the arithmetic mean of results of the three runs shall apply.
- iv. Intel shall sample and test the ammonia removal catalyst and NO<sub>x</sub> removal catalyst every six months. The sampling and testing shall be conducted per manufacturer's recommendations. The catalyst sampling and testing is not subject to Specific Condition 7.A. Record-keeping requirements are identified in specific condition 8.B.v.c.

## CONDITION 8. RECORDKEEPING

### A. General

- i. Intel shall maintain records of changes in the processes or methods of operation, changes in the amount or type of materials and chemicals used, and physical changes to the Facility, sufficient to demonstrate that:
  - a. the emissions after the change do not exceed the PSEs or other applicable limits in this Permit;
  - b. the changes will not reduce the Department's ability to ensure compliance with this Permit; and

- c. the changes are within the scope of this Permit and applicable laws and regulations.
  - ii. Intel shall monitor and record all information used to complete compliance records and to perform emissions calculations.
  - iii. Intel shall keep records of the production level, expressed as percentage of full capacity, of each Fab. The records of any solvent exhaust stack test or acid gas scrubber exhaust stack test shall include the associated production level expressed as percentage of full capacity of that Fab.
  - iv. Intel shall maintain records documenting maintenance of combustion equipment in 2.C.iv and ducting of pollutants as required in Condition 3.
  - v. Intel shall keep records to support each parameter used to calculate emissions through the evaporation rate equation;
- B. Intel shall monitor and record the following information:
  - i. CUB/EC
    - a. annual natural gas fuel meter calibration reports;
    - b. hours of operation for each emergency generator;
    - c. calculations used to determine emission rates;
    - d. natural gas fuel flow and fuel heat content for each boiler;
    - e. records as required in Condition 2.C ii.a and 2.C.ii.f; and
    - f. records of the date, time, and nature of maintenance or repairs performed on the boilers.
  - ii. BAC/RTO
    - a. hours of the day and days of the week and month of solvent VOC air pollution control unit down time, scheduled and unscheduled maintenance as required in Condition 4.C.ix;
    - b. weekly record of pressure drop across RTOs;
    - c. specific gravity determinations made once every two (2) weeks on activated carbon of each BAC when in operation;
    - d. records of the date, time, and nature of maintenance or repairs performed on the solvent VOC air pollution control units;

- e. date and time of each bead activated carbon unit charge replacement;
  - f. hexamethyldisilazane (HMDS) purchase records and the records used to calculate the thermal oxidizer particulate emissions;
  - g. the date and time of the startup and shutdown of each RTO and BAC;
  - h. natural gas fuel flow and fuel heat content for each oxidizer; and
  - i. the operating temperatures required in 4.C.vi.
- iii. Solvent Exhaust Stack VOC Emissions Testing System
- a. records of the certifications and calibrations of the FID, FTIR, O<sub>2</sub> and CO<sub>2</sub> analyzers, and volume flow meters;
  - b. records of data capture and any breakdown of the testing system, the reasons for the breakdown, and the corrective measures taken; and
  - c. records of the information required in Condition 9.A.iii.e of the Permit.
- iv. Acid Gas Scrubbers
- a. maintenance and operational logs for the acid gas scrubbers; and
  - b. weekly checks made on the acid gas scrubber recirculation water flow rates (in gallons per minute), replacement of the packing, and visual checks of the packing and spray nozzles for plugging.
- v. Ammonia Treatment Plant
- a. Maintenance and operational logs for the ammonia treatment plant;
  - b. Air temperature, air flow, and air pressure;
  - c. Results of the semi-annual sampling of the catalytic material conducted per manufacturer's recommendations; and
  - d. Natural gas fuel flow and fuel heat content.
- vi. Toxic Air Pollutants
- Records of the estimated total potential emissions per Toxic Air Pollutant as calculated with the methods of Condition 5.D of this Permit.

- vii. Chemical Purchase, Usage, and Waste Disposal
  - a. for tanks storing solvent VOCs or HAPs, the tank dimensions, throughput and other information necessary to determine emissions from the storage tanks; and
  - b. the total monthly purchases and changes in stock of all chemicals used to calculate emissions including VOCs, HAPs, TAPs, and precursors of HAPs and TAPs.
- viii. Retention of Records - Intel shall maintain these records on-site for a minimum of five (5) years from the time of recording.

#### CONDITION 9. REPORTING

##### A. General Requirements

- i. Intel shall notify the Department in writing of:
  - a. the anticipated date of initial startup of each source, including each boiler, not less than thirty (30) days prior to the date;
  - b. the actual date of initial startup of each source within fifteen (15) days after the startup date;
  - c. the oxidizer and boiler serial number within fifteen (15) days after the initial startup date;
  - d. any change of operators, or location of the oxidizers within fifteen (15) days of such change;
  - e. any necessary update or correction no more than sixty (60) days after Intel knows or should have known of the condition necessitating the update or correction of the Permit;
  - f. any increases in emission factors as required in Condition 1.G; and
  - g. fuel meter calibrations as required in 2.C.ii.e.1.
- ii. The result of any partial or complete test conducted as a requirement of a condition of this Permit or conducted to demonstrate compliance with a condition of this Permit shall be submitted to the Department within thirty (30) days after the completion of the test. Two copies of any solvent exhaust test report shall be submitted to the Department. The results of testing required in condition 5.E.i shall include the parameters of the evaporation rate equation recorded during the test.

- iii. Intel shall submit a quarterly report to the Department, in hard copy and on diskette or other electronic media. The report shall be submitted to the Department within forty-five (45) days of the end of each calendar quarter. The report shall include a spread sheet containing:
  - a. the twelve (12) month rolling total emissions of NO<sub>x</sub>, CO, VOCs, individual and total HAP, and particulates from HMDS;
  - b. in quarterly reports for quarters in which the annual stack testing required under Condition 7.D of this Permit is performed, the calculated annual emissions of HAPs from the test data;
  - c. the fuel usage in scf for the ammonia treatment system, each boiler and RTO, and the heat content of the natural gas in units of btu/scf;
  - d. the hours of emergency generator use;
  - e. test results obtained for the period of testing using the solvent exhaust VOC testing system, including:
    - 1) the exhaust flow rate (in dry standard cubic feet per hour) and temperature (in degrees Fahrenheit); and
    - 2) for each solvent exhaust stack, the average total hydrocarbon and VOC concentrations (in parts per million volume, dry basis) and average emission rate of VOCs in pounds per hour;
  - f. each factor used in the equations used to calculate emissions including the parameters of the evaporation rate equation;
  - g. the average total potential emissions of TAPs in pounds per hour calculated for the quarter based on usage or the equation specified in Condition 6.B;
  - h. the total monthly purchases and changes in stock of all chemicals used to calculate emissions including VOCs, HAPs, TAPs, and precursors of HAPs and TAPs; and
  - i. production level expressed as percentage of full capacity of each source Fab associated with emissions test data.
- iv. All calculations shall be computed in accordance with Conditions 2, 4 and 5 and Tables 1, 3, Y, and Z of this Permit.
- v. Excess emissions shall be reported as required by 20.2.7 NMAC - Excess Emissions.

- vi. Intel shall notify the Department via email within ten (10) days after the equipment has returned to normal operation for equipment downtimes specified in 4.C.ix and 5.C.ii. Notification shall include the equipment ID, date and time the unit went down, date and time the unit returned to normal operation, total time the equipment was down, and the reason for the downtime. The reason shall be listed as either preventative maintenance (PM), corrective maintenance (CM) or a brief description of the malfunction.
- vii. All submittals required by this Permit shall be addressed to:

Program Manager, Compliance and Enforcement Section  
New Mexico Environment Department  
Air Quality Bureau  
1301 Siler Road, Building B  
Santa Fe, New Mexico 87507-3113

B. CUB/EC

Intel shall report to the Department any change to the boiler burner fuel distribution system, the burner, or the burner air distribution system of any boiler and the effect of such change on the boiler emissions.

**Table 1**  
**Emission Factors for Boilers, RTOs and Ammonia Treatment System**

	Emission Factors (EF)					EF Units	Basis for EF
	TSP/ PM10	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC		
1250 BHP Boilers Natural Gas	0.0045	0.6 lb/MMscf	0.04	0.0002	0.0027	TSP,NO <sub>x</sub> , CO,VOC- lb/MMbtu	Emission profile testing (NO <sub>x</sub> , CO); Mfr's data (TSP); AP42 (SO <sub>2</sub> )
1250 BHP Boilers #2 fuel oil	2	71	20	5	0.2	lb/10 <sup>3</sup> gal	AP-42, Table 1.3.2, Jan. 1995
Fab 11X Bridge & Fab 11X Fab RTOs	7.6 lb/MMscf	0.6 lb/MMscf	0.50	0.12	5.5 lb/MMscf	NO <sub>x</sub> ,CO - lb/MMbtu	Stack testing (NO <sub>x</sub> , CO); AP-42 (SO <sub>2</sub> , TSP, VOC)
Fab 11X Munters 1, Fab 11X Munters 2 & Fab 11X Munters 3 RTOs	7.6 lb/MMscf	0.6 lb/MMscf	100	84	5.5 lb/MMscf	NO <sub>x</sub> ,CO - lb/10 <sup>6</sup> scf	AP-42 (NO <sub>x</sub> *, CO*, SO <sub>2</sub> , TSP, VOC)
Ammonia Treatment System	7.6 lb/MMscf	0.6 lb/MMscf	0.06	0.03	5.5 lb/MMscf	NO <sub>x</sub> ,CO - lb/MMbtu	Mfg. data (NO <sub>x</sub> , CO); AP-42 (SO <sub>2</sub> , TSP, VOC)

\*AP-42 emission factors for NO<sub>x</sub> and CO shall be used for the Munters RTOs until the units have been tested and site specific emission factors are developed.

<b>Attachment A</b>		
<b>Air Emission Sources</b>		
<b><u>Boilers</u></b>		
<b>Source</b>	<b>Stack</b>	<b>Description</b>
blr-32-gd3-1	blr-32-gd3-1s	Boiler 1 - 1250 BHP
blr-32-gd3-2	blr-32-gd3-2s	Boiler 2 - 1250 BHP
blr-32-gd3-3	blr-32-gd3-3s	Boiler 3 - 1250 BHP
blr-32-gd3-4	blr-32-gd3-4s	Boiler 4 - 1250 BHP
blr-32-gd3-5	blr-32-gd3-5s	Boiler 5 - 1250 BHP
blr-32-gd3-6	blr-32-gd3-6s	Boiler 6 - 1250 BHP
blr-32-gd3-7	blr-32-gd3-7s	Boiler 7 - 1250 BHP
blr-32-gd3-8	blr-32-gd3-8s	Boiler 8 - 1250 BHP
blr-32-gd3-9	blr-32-gd3-9s	Boiler 9 - 1250 BHP
blr-32-gd3-10	blr-32-gd3-10s	Boiler 10 - 1250 BHP
ecs-boi-97	ecs-boi-97s	Boiler 9.7 - 1250 BHP
ecs-boi-98	ecs-boi-98s	Boiler 9.8 - 1250 BHP
<b><u>Thermal Oxidizers</u></b>		
<b>Source</b>	<b>Stack</b>	<b>Description</b>
voc-16-np2-1	voc-16-np2-1s	Fab 11X Bridge Thermal Oxidizer
voc-16-lt2-1	voc-16-lt2-1s	Fab 11X Fab Thermal Oxidizer
VOC138-1-120	VOC138-1-120-1s/VOC138-1-120-2s	Fab 11X Munters 1
VOC138-2-120	VOC138-2-120-1s/VOC138-2-120-2s	Fab 11X Munters 2
VOC138-3-120	VOC138-3-120-1s/VOC138-3-120-2s	Fab 11X Munters 3
<b><u>Other Sources</u></b>		
<b>Source</b>	<b>Stack</b>	<b>Description</b>
TBD	TBD	Ammonia Treatment System
<b><u>Acid Gas Scrubbers</u></b>		
<b>Source</b>	<b>Stack</b>	<b>Description</b>
sc-12-np2-1	sc-12-np2-1s	Fab 11XB Scrubber
sc-12-np2-2	sc-12-np2-2s	Fab 11XB Scrubber
sc-12-np2-3	sc-12-np2-3s	Fab 11XB Scrubber
sc-12-np2-4	sc-12-np2-4s	Fab 11XB Scrubber
sc-12-lt2-1	sc-12-lt2-1s	Fab 11XF Scrubber
sc-12-lt2-2	sc-12-lt2-2s	Fab 11XF Scrubber
sc-12-lt2-3	sc-12-lt2-3s	Fab 11XF Scrubber
sc-40-lt2-1	sc-40-lt2-1s/sc-40-lt2-2s	Fab 11XF Scrubber
sc-40-lt2-2	sc-40-lt2-1s/sc-40-lt2-2s	Fab 11XF Scrubber
sc-40-np2-1	sc-40-np2-1s	Fab 11XB Scrubber
sc-40-np2-2	sc-40-np2-2s	Fab 11XB Scrubber
sc-40-np2-3	sc-40-np2-3s	Fab 11XB Scrubber
sc-12-fb1-1	sc-12-fb1-1s	F11S Scrubber
sc-12-fb1-2	sc-12-fb1-2s	F11S Scrubber
sc-12-fb1-3	sc-12-fb1-3s	F11S Scrubber
sc-12-fb1-4	sc-12-fb1-4s	F11S Scrubber
sc-12-fb1-5	sc-12-fb1-5s	F11S Scrubber

<b>Attachment A (continued)</b>		
<b>Air Emission Sources</b>		
<b>Acid Gas Scrubbers</b>		
<b>Source</b>	<b>Stack</b>	<b>Description</b>
sc-12-fd1-3	sc-12-fd1-3s	F11S Scrubber
sc-12-fd1-6	sc-12-fd1-6s	F11S Scrubber
sc-12-cr1-1	sc-12-cr1-1s	C4 Scrubber
sc-12-cr1-2	sc-12-cr1-2s	C4 Scrubber
SC-12-GC1-1	SC-12-GC1-1s	CUB Scrubber
SC-40-GC1-1	SC-40-GC1-1s	CUB Scrubber
SC-12-GC1-2	SC-12-GC1-2s	CUB Scrubber
SC-40-GC1-2	SC-40-GC1-2s	CUB Scrubber
sc-12-cb1-2	sc-12-cb1-2s	F11N Scrubber
sc-12-cb1-3	sc-12-cb1-3s	F11N Scrubber
sc-12-cb1-4	sc-12-cb1-4s	F11N Scrubber
sc-12-cb1-5	sc-12-cb1-5s	F11N Scrubber
sc-12-cb1-6	sc-12-cb1-6s	F11N Scrubber
sc-12-cb1-7	sc-12-cb1-7s	F11N Scrubber
sc-12-cb1-8	sc-12-cb1-8s	F11N Scrubber
sc-12-bv1-1	sc-12-bv1-1s	F11N Scrubber
sc-12-bv1-2	sc-12-bv1-2s	F11N Scrubber
f9-scb-1.8	f9-scb-1.8s	F11W Scrubber
f9-scb-1.4	f9-scb-1.4s	F11W Scrubber
f9-scb-1.3	f9-scb-1.3s	F11W Scrubber
f9-scb-1.2	f9-scb-1.2s	F11W Scrubber
f9-scb-1.1	f9-scb-1.1s	F11W Scrubber
f9-sc-5-1-3	f9-sc-5-1-3s	F11W Scrubber
RRFB-SC142-1	RRFB-SC142-1s	F11S Scrubber
RRFB-SC142-2	RRFB-SC142-2s	F11S Scrubber
RRFB-SC142-3	RRFB-SC142-3s	F11S Scrubber
<b>Notes:</b>		
If equipment is replaced/relocated a new and unique number will be assigned as part of the required permitting process.		
Sources with negligible or no emissions such as emergency gas pad scrubbers, emergency generators, ventilation exhaust, etc. are not individually identified in this Attachment		

<b>Table CS</b>							
<b>Hourly Emission Limits for Combustion Sources</b>							
Sources	Stacks	Description	Fuel	TSP/ PM10 (lb/hr)	SO2 (lb/hr)	CO (lb/hr)	NO <sub>x</sub> (lb/hr)
blr-32-gd3-1 through blr-32-gd3-10	blr-32-gd3-1s through blr-32-gd3-10s	1250 BHP Boilers* (12 ea.)	natural gas	0.24	0.03	5.60	2.92
			#2 fuel oil	0.8	27.5	1.9	7.8
ecs-boi-97 ecs-boi-98	ecs-boi-97s ecs-boi-98s						
voc-16-np2-1 voc-16-lt2-1	voc-16-np2-1s voc-16-lt2-1s	RTOs** (Durr)	natural gas	4.5	0.002	0.6	1.0
VOC138-1-120	VOC138-1-120-1s/VOC138-1-120-2s	RTOs** (Munters)					
VOC138-2-120	VOC138-2-120-1s/VOC138-2-120-2s						
VOC138-3-120	VOC138-3-120-1s/VOC138-3-120-2s						
TBD	TBD	Ammonia Treatment System	natural gas	0.05	0.002	1.0	1.0
*For boilers, emission rates are for each stack.							
**There are a total of 5 RTOs and emission rates are for each unit.							
Note: TSP/PM10 limit for RTO includes emissions from fuel combustion and from conversion of HMDS to particulates.							

**Table 2**  
**Plant Site Emission Limits (PSELs) for HAPs<sup>1</sup>**

Pollutant	Twelve (12) Month Rolling Total PSEL (tpy)
Cresols	7.4
Hexachlorobenzene	0.5
Hexachlorobutadiene	3.9
Hexachlorocyclopentadiene	2.1
Phenol	1.5
Phosphine	7.9
Phosphorus	1.9
Phosgene	5.9
Arsenic Compounds	0.2
Cobalt Compounds	0.4
Chromium Compounds	0.2
Lead Compounds	0.2
Manganese Compounds	3.8
Mercury Compounds	0.5
Nickel Compounds	0.3
Selenium Compounds	3.8
Other Individual HAPs	9.0
All HAPs Combined	24.0

<sup>1</sup> PSELs for individual HAPs were determined by the following analysis. For those HAPs for which an Effects Screening Level (ESL) has been established by the Texas Natural Resource Conservation Commission, Intel performed an air quality analysis which assumed that the HAP would be emitted at the rate of nine (9) tons per year. Within the ESL list, HCL is the only chemical for which TNRCC deviates from the published ESL of 0.1 ug/m<sup>3</sup>. TNRCC uses this value in humid areas; TNRCC uses 0.4 ug/m<sup>3</sup> in dry areas. The 0.4 ug/m<sup>3</sup> value was appropriate for Intel's analysis. Intel analyzed the resulting ambient air concentrations at the property line and the nearest sensitive receptor using an EPA approved air dispersion screening model. Intel then evaluated whether the relevant ESL would be exceeded under such circumstances. If application of the screening model analysis indicated a potential for exceeding the relevant ESL, Intel had the option to use a more refined, EPA-approved analysis to evaluate the accuracy of the screening model. If Intel declined to perform this additional analysis, or if such analysis confirmed the results of the screening model, a special emissions limit was established for such HAP so that model-predicted concentrations of the HAP in the ambient air would not exceed the ESL.

**Table 3**  
**Emission Factors for HAPs<sup>1</sup>**

Pollutant	Chemical or Precursor	Emission Factor			
		G <sup>2</sup>	H <sup>2</sup>	I <sup>2</sup>	J <sup>2</sup>
<i>HF</i>					
SF6 to HF	Sulfur Hexafluoride (SF6)	0.0047	-	0.0009	-
CF4 to HF	Carbon Tetrafluoride (CF4)	0.0025	-	0.0037	-
CHF3 to HF	Trifluoromethane (CHF3)	0.0337	-	0.0114	-
NF3 to HF	Nitrogen Trifluoride (NF3)	0.0046	0.0047	0.0057	0.0046
WF6 to HF	Tungsten Hexafluoride (WF6)	0.0341	-	0.0341	-
C4F8 to HF	Octafluorocyclobutane (C4F8)	0.0255	-	0.0294	-
CH2F2 to HF	Difluoromethane (CH2F2)	0.0362	-	0.0248	-
C5F8 to HF	Octafluorocyclopentene (C5F8)	0.0343	-	0.0334	-
BF3 to HF	Boron Trifluoride (BF3)	0.0600	-	0.0600	-
HF to HF	Hydrogen Fluoride (HF)	-	0.1364	-	-
C4F6 to HF	Hexafluoro-1,3-butadiene (C4F6)	0.0508	-	0.0100	-
<i>HCl</i>					
Cl2 to HCl	Chlorine (Cl2)	0.0835	-	0.0500	-
DCE to HCl	Trans 1,2-Dichloroethene (DCE)	0.1004	-	0.1004	-
DCS to HCl	Dichlorosilane (DCS)	0.0002	-	0.0002	-
HCl	Hydrogen Chloride (HCl)	0.0017	-	0.0932	-
HCl	Hydrogen Chloride (HCl) VMB	0.0961	-	0.0961	-
HCl	Hydrogen Chloride (HCl) RFC	0.3100	-	0.3100	-
11AVD to HCl	11AVD	0.1021	-	0.1021	-
Cascade to HCl	Cascade	0.1021	-	0.1021	-
ACME to HCl	ACME	0.0024	-	0.1550	-
<i>Cl2</i>					
Cl2	Chlorine (Cl2)	0.2921	-	0.4372	-
DCE to Cl2	Trans 1,2-Dichloroethene (DCE)	0.0940	-	0.0940	-
DCS to Cl2	Dichlorosilane (DCS)	0.0000	0.0000	0.0000	0.0000
<i>Others</i>					
Titanium Tetrachloride	Titanium Tetrachloride	0.0000	0.0000	0.0000	0.0000
Ethylene Glycol	Ethylene Glycol	0.000005	0.000005	0.000005	0.000005
1,4 Dioxane	1,4 Dioxane	0.0000	0.0000	0.0000	0.0000
Cl2 to CCl4	Chlorine (Cl2)	0.0058	-	0.00001	-
Methanol (gensolve)	Methanol (abated)	-	0.0004	-	0.000004
AsH3	Arsine (AsH3)	0.0050	-	0.0050	-
PH3	Phosphine (PH3)	0.0050	-	0.0893	-
Diethylene Glycol Monoethyl Ether	Diethylene Glycol Monoethyl Ether	0.0000	-	0.0000	-
Bromoform <sup>3</sup>	Sodium Bromide – CUB	0.0605			
Bromoform <sup>3</sup>	Sodium Bromide – NEC	0.0096			
LCP Oxide Etch to NH <sub>3</sub> <sup>4</sup>	LCP Oxide Etch	0.0008	-	0.0008	-
LCP Oxide Etch to NO <sub>x</sub> <sup>5</sup>	LCP Oxide Etch	0.0005	-	0.0005	-
Any Other HAP Listed In Appendix X <sup>6</sup>		1			

## Notes:

<sup>1</sup> Emission factors take into account control efficiencies, where applicable. Chemicals having emission factors equal to zero (0.0) are either completely consumed in the process, are solid sources with negligible vapor pressures or have no detectable emissions during tool testing. Intel may revise the emission factors following Condition I.G. EFs for processes no longer in use have been removed from this table.

<sup>2</sup> G, H, I and J are unique processes.

<sup>3</sup> Site EF, not associated with a single process.

<sup>4</sup> NH<sub>3</sub> is not a HAP but will be reported with TAP emissions.

<sup>5</sup> NO<sub>x</sub> is not a HAP but will be reported with site NO<sub>x</sub> emissions.

<sup>6</sup> This category does not include those HAPs chemicals for which Intel uses the sink evaporation equation specified in Condition 5.D.iv to calculate emissions.

"-" Chemical not used on this technology.

**Appendix X - HAPs List**

CAS#	Chemical Name	CAS#	Chemical Name
75058	Acetonitrile	91203	Naphthalene
79107	Acrylic acid	98953	Nitrobenzene
62533	Aniline	92933	4-Nitrobiphenyl
71432	Benzene (including benzene from gasoline)	100027	4-Nitrophenol
75252	Bromoform	684935	N-Nitroso-N-methylurea
106990	1,3-Butadiene	108952	Phenol
56235	Carbon tetrachloride	75445	Phosgene
7782505	Chlorine	7803512	Phosphine
67663	Chloroform	7723140	Phosphorus
1319773	Cresols/Cresylic acid (isomers and mixture)	85449	Phthalic anhydride
95487	o-Cresol	1120714	1,3-Propane sultone
108394	m-Cresol	78875	Propylene dichloride
106445	p-Cresol	75569	Propylene oxide
106467	1,4-Dichlorobenzene(p)	100425	Styrene
121697	N,N-Diethyl aniline (N,N-Dimethylaniline)	96093	Styrene oxide
60117	Dimethyl aminoazobenzene	79345	1,1,2,2-Tetrachloroethane
131113	Dimethyl phthalate	7550450	Titanium tetrachloride
75003	Ethyl chloride (Chloroethane)	108883	Toluene
107062	Ethylene dichloride (1,2-Dichloroethane)	120821	1,2,4-Trichlorobenzene
107211	Ethylene glycol	79005	1,1,2-Trichloroethane
75218	Ethylene oxide	79016	Trichloroethylene
75343	Ethylidene dichloride (1,1-Dichloroethane)	121448	Triethylamine
50000	Formaldehyde	540841	2,2,4-Trimethylpentane
118741	Hexachlorobenzene	108054	Vinyl acetate
87683	Hexachlorobutadiene	75354	Vinylidene chloride
77474	Hexachlorocyclopentadiene	1330207	Xylenes (isomers and mixture)
67721	Hexachloroethane	95476	o-Xylenes
110543	Hexane	108383	m-Xylenes
7647010	Hydrochloric acid	106423	p-Xylenes
7664393	Hydrogen fluoride (Hydrofluoric acid)		Antimony Compounds
108316	Maleic anhydride		Arsenic Compounds
67561	Methanol		Chromium Compounds
74839	Methyl bromide (Bromomethane)		Cobalt Compounds
74873	Methyl chloride (Chloromethane)		Cyanide Compounds
71556	Methyl chloroform (1,1,1-Trichloroethane)		Glycol ethers
78933	Methyl ethyl ketone (2-Butanone)		Lead Compounds
74884	Methyl iodide (Iodomethane)		Manganese Compounds
108101	Methyl isobutyl ketone (Hexone)		Mercury Compounds
80626	Methyl methacrylate		Nickel Compounds
1634044	Methyl tert butyl ether		Polycyclic Organic Matter
75092	Methylene chloride (Dichloromethane)		Selenium Compounds

**Table Y**  
**Emission Factors for TSP/PM10**

Pollutant	Emissions Factor
HMDS	0.745

**Table Z**  
**Emission Factors for VOCs<sup>1</sup>**

Pollutant	Emission Factors			
	G <sup>2</sup>	H <sup>2</sup>	I <sup>2</sup>	J <sup>2</sup>
Bis(cyclohexylsulfonyl)diazomethane	0.0000	0.0000	0.0000	0.0000
Bis(tertbutylamino)silane	0.000005	0.000005	0.000005	0.000005
Carbon Monoxide <sup>3</sup>	1.0000	1.0000	0.2139	-
5-Chloro-2-methyl-4-isothiazolin 3-one	0.0000	-	0.0000	-
Cyclohexane-1,4-dimethanolmonovinylether	0.0000	0.0000	0.0000	0.0000
1,2-Cyclohexylenedinitrilotetraacetic acid	0.0000	-	0.0000	-
Cyclohexanone	0.0051	-	0.0029	-
Diethylene Glycol Monoethyl Ether	0.0000	-	0.0000	-
Diethyl Ketone	0.0026	-	0.0026	-
Dimethyldimethoxysilane (DMDMOS)	0.0153	-	0.0933	-
1,4 Dioxane	0.0000	0.0000	0.0000	0.0000
Ethanol	0.0150	-	0.0156	-
Ethanol (Polyimide)	0.0133	-	0.0133	-
Ethylene Glycol	0.000005	0.000005	0.000005	0.000005
2-Ethyl 1-Hexanol	0.000005	0.000005	0.000005	0.000005
Ethyl Lactate	0.0047	0.0135	0.0055	0.0135
Gamma-Butyrolactone	0.0071	-	0.0058	-
1-Heptanethiol	0.000005	0.000005	0.000005	0.000005
Hexafluoro-1,3-butadiene (C4F6)	0.1226	-	0.3263	-
Hexamethyldisilazane (HMDS)	0.0163	-	0.0171	-
Isoamyl Ether	-	-	0.0058	-
Isopropyl Alcohol (abated)	0.0062	0.0125	0.0057	0.0161
Isopropyl Alcohol (bottled)	0.9020	-	0.9020	-
Isopropyl Alcohol (SLAM)	0.0153	-	0.0167	-
Malonic Acid	0.0000	-	0.0000	-
Methanol (470)	-	0.0004	-	0.000004
Methyl Isobutyl Carbinol	-	-	0.0058	-
2-Methyl-4-isothiazolin 3-one	0.0000	-	0.0000	-
Methyl n-amyl ketone (2-Heptanone)	-	0.0135	-	0.0135
1-Methyl-2-pyrrolidinone (NMP)	0.0005	-	0.0005	-
1-Methyl-2-pyrrolidinone - (470)	-	0.0009	-	0.000004
n-Butanol	0.0049	-	0.0049	-
Octafluorocyclopentene (C5F8)	0.1472	-	0.1588	-
PDMAT	0.0092	-	0.0092	-
Propene (C3H6)	-	-	0.1883	-
Propylene Glycol Monomethyl Ether (PGME)	0.0058	0.0105	0.0167	0.0099
Propylene Glycol Monomethyl Ether Acetate (PGMEA)	0.0059	-	0.3513	-
Tetrakis(dimethylamino)titanium (TDMAT) to Diethyl Amine	0.0300	-	0.0300	-
Tetramethylsilane	0.0100	-	0.0100	-
Trans 1,2-Dichloroethene (DCE)	0.0000	-	0.0000	-
Triflic acid	0.0000	0.0000	0.0000	0.0000
Any Other VOC chemicals <sup>4</sup>			1	

## Notes:

<sup>1</sup> Emission factors take into account control efficiencies, where applicable. Chemicals having emission factors equal to zero (0.0) are either completely consumed in the process, are solid sources with negligible vapor pressures or have no detectable emissions during tool testing. Intel may revise the emission factors following Condition 1.G. EFs for processes no longer in use have been removed from this table.

<sup>2</sup> G, H, I and J are unique processes.

<sup>3</sup> Carbon Monoxide is not a VOC but will be reported with site CO emissions.

<sup>4</sup> This category does not include those VOC chemicals for which Intel will use the sink evaporation equation specified in Condition 4.D.iv.a to calculate emissions.

"- "Chemical not used on this technology.