*****Advanced Approvals*****

Intel Corporation, Aloha Oregon (Semiconductor Fabrication industry)
- broad class of changes, no new applicable requirement or MRR requirements

Process Description:
Emissions Monitoring Technique:
Emissions Calculation:
Pollutant Control Technique:

Process Description: The Intel flexible permit includes Advance-approvals, or "Pre-Approved Changes" for specific types of changes, additions, and process modifications. Permit language specifying this is given below. Any new emitting activities and any physical changes must be compatible with the Monitoring Requirements section of the permit.

Pre-Approved Changes

15. The permittee is approved to make physical changes, additions, or relocations of equipment (excluding Pollution Control Devices), or process modifications to the FAB Emission Unit without prior notification to the Department, provided the following conditions are met. Any proposed change not meeting the criteria of this condition shall be made in accordance with the requirements of Condition G6.

    a) Such changes do not result in emissions increases which exceed the relevant PSEL(s) or Synthetic Minor emission limitations of this permit. Emission increases resulting from changes approved under this condition shall be offset by:
       i) unused capacity within the relevant PSEL(s); **and/or**
       ii) emission reductions achieved through a documented pollution prevention program that demonstrates permanent emission reductions in an amount compatible with the respective offset.

    b) Such changes shall not violate or contradict any expressed permit condition within this permit.

    c) The FAB Emission Unit is composed of Fab 4, Fab 15 and 15.5. No new Fab facility shall be added to the FAB emission unit under this pre-approval condition.

    d) The physical changes and changes in method of operation approved under this condition shall not involve changes to existing Pollution Control Devices (PCD), cause a degradation in the performance of any PCD or result in the addition of a new PCD.

e) The physical changes and changes in method of operation approved under this condition do not involve the installation and/or startup of a new boiler with an input BTU rating of ≥ 10 million BTUs per hour.

f) Any new VOC emitting activities and any physical changes or changes in the method of operation of existing VOC emitting activities must comply with the RACT/TACT requirements specified in Condition 10.

g) Any new emitting activities and any physical changes or changes in the method of operation of existing emitting activities must be compatible with, subject to, and comply with, the Compliance monitoring requirements specified in Monitoring Requirements, Conditions 18 through 24.

Emissions Monitoring Technique and Emission Calculation:

General Performance And Emission Standards

4. Particulate emissions from any single air contaminant source shall not exceed 0.1 grains per standard cubic foot for "new sources" (sources installed, constructed, or modified after June 1, 1970). Particulate emissions are measured in accordance with Oregon Method 5 (combined front and back half particulate captures of sampling train).

6. Particulate emissions from any fuel burning source of air contaminant emissions shall not exceed an opacity equal to or greater than twenty percent (20%) for a period aggregating more than three (3) minutes in any one (1) hour, excluding uncombined water vapor.

Special Conditions

9. Boilers shall be limited to the combustion of natural gas or LPG fuels exclusively.

RACT/TACT Conditions

10. Reasonably Available Control Technology (RACT) Standards [OAR 340-22-104 (5)] and Typically Achievable Control Technology (TACT) Standards [OAR 340-028-0630] are as follows:

    a. Volatile Organic Compound emissions from the FAB emission unit, based on a weekly average, shall not exceed $2x10^{-4}$ pounds (lbs.) per square centimeter (cm^2) of wafer processed.

    b. The permittee shall comply with the specifications outlined below when operating solvent cleaning stations. Non-VOC solvents as defined in OAR 340-22-100 are exempt from the requirements of this section.

i. Each sink must operate with a freeboard ratio of at least 0.7, and have a visible fill line when uncovered solvent is in the sink. The freeboard ratio and visible fill line does not apply if the sink is covered while parts are immersed.

ii. Each sink must be equipped with a cover that is readily opened and closed, and a cover must be closed during idle periods if the sink contains any free standing solvents.

Synthetic Minor Limitations

11. The emission of VOCs on a plant site basis shall not exceed 97.7 tons in any twelve (12) consecutive month period. Compliance with this limitation shall be determined based upon a twelve (12) month rolling average.

12. The emission of any single hazardous air pollutant (HAP) (as defined in Table 1 of OAR 340-32-0130) on a plant site basis shall not exceed 9 tons in any twelve (12) consecutive month period. Compliance with this limitation shall be determined based upon a twelve (12) month rolling average.

13. The emission of any combination of HAPs (as defined in Table 1 of OAR 340-32-0130) on a plant site basis shall not exceed 24 tons per year. Compliance with this limitation shall be determined based upon a twelve (12) month rolling average.

Plant Site Emission Limits (PSEL)

14. Plant site emissions shall not exceed the following:

FAB Emission Unit:

a. VOC Emissions:

i. Emissions of Volatile Organic Compounds (VOC) shall not exceed 15 tons per month;

ii. Emissions of Volatile Organic Compounds (VOC) shall not exceed 95 tons per year. Compliance with this limitation shall be determined based upon a twelve (12) month rolling average.

BOILER Emission Unit:

b. PM/PM_{10}
   i. Emissions of PM/PM_{10} shall not exceed 1.0 tons per month;
   ii. Emissions of PM/PM_{10} shall not exceed 8.0 tons per year. Compliance with this limitation shall be determined based upon a twelve (12) month rolling average.

c. Sulfur Dioxide (SO_2)
   i. Emissions of SO_2 shall not exceed 0.3 tons per month;
   ii. Emissions of SO_2 shall not exceed 14.2 tons per year. Compliance with this limitation shall be determined based upon a twelve (12) month rolling average.

d. Nitrogen Oxides (NO_X)
   i. Emissions of NO_X shall not exceed 5.0 tons per month;
   ii. Emissions of NO_X shall not exceed 19.3 tons per year. Compliance with this limitation shall be determined based upon a twelve (12) month rolling average.

e. Carbon Monoxide (CO)
   i. Emissions of CO shall not exceed 4.9 tons per month;
   ii. Emissions of CO shall not exceed 39.1 tons per year. Compliance with this limitation shall be determined based upon a twelve (12) month rolling average.

f. Volatile Organic Compounds (VOC)
   i. Emissions of VOC shall not exceed 0.4 tons per month;
   ii. Emissions of VOC shall not exceed 2.7 tons per year. Compliance with this limitation shall be determined based upon a twelve (12) month rolling average.

Monitoring Requirements

18. The permittee shall effectively inspect and monitor the operation and maintenance of the plant and associated air contaminant controls and shall implement the procedures necessary to monitor and record the monitoring parameters of this section. A record of all such data shall be maintained for a minimum period of two years at the plant site for inspection by the authorized representatives of the Department.

19. The minimum monitoring requirements for Conditions 4 and 6 are specified as follows:

    a. The permittee shall be presumed to be in compliance with the 0.1 grain loading standard of Condition 4 as long as the boilers burn natural gas;

    b. The permittee shall be presumed to be in compliance with the 20% visible standard of Condition 6 as long as the boilers burn natural gas;

20. The permittee shall maintain a log, recording all written complaints or complaints received via telephone or in person that specifically refer to a complaint of odor or visible nuisance from the permitted facility. Said log shall also record permittee's actions to investigate, make a determination as to the validity of the complaint, and resolution of the problem.

21. The permittee shall demonstrate compliance with Condition 9 by monitoring and recording the quantity and type of fuel(s) other than natural gas (or LPG) used in the boilers on each occurrence.

22. The permittee shall determine compliance with the BOILER emission unit PSELs established in Condition 14 in accordance with the formula and procedures specified below (note: emission factors stated in the following table may be updated with Department approval or direction when improved factors are obtained):

    a. For each pollutant, on a monthly basis, the permittee shall demonstrate compliance with the monthly PSEL by calculating the actual emissions using the formula below. The emission factors in the table below shall be utilized for the calculation unless the Department approves a substitute factor:

        E = EF x P/2,000 where;

        E = pollutant emissions, ton/mo
        EF = PSEL Emission Factors, see Table below
        P = monthly natural gas usage (10^6 acf)

Emission Factors (lbs/10^6 acf)

Pollutant	PM_{10}	SO_2	NO_X	CO	VOC
Industrial Boilers	7.6	2.6	100	84	5.5
Low-NO_X Boilers	7.6	2.6	31.5	78.8	5.5
Retrofitted Boilers	7.6	2.6	100	78.8	5.5

    b. For each pollutant, on a rolling 12-month basis, the permittee shall demonstrate compliance with the 12-month PSEL by calculating the actual emissions using the formula below:

        E = EF x P/2,000 where;

        E = pollutant emissions, ton/12-months
        EF = PSEL Emission Factors, see Table below
        P = 12-month natural gas usage (10^6 acf)

    c. Monitor and record the amount of natural gas (or LPG) used in the BOILER emission unit on a monthly basis.

    d. Monitor and record the amount of natural gas (or LPG) used in NSPS Subpart Dc subject boilers on a daily basis. The permittee may begin performing this monitoring on a monthly basis upon receiving written approval from the EPA Administrator.

23. VOC and HAP emissions will be monitored by chemical mass balance; calculation - utilizing Department approved emission factors; or other method approved by the Department. Wet scrubber control efficiencies will be based on existing Intel stack testing results.

    a. When calculating emissions using emission factors (EF), VOC and/or HAP emissions are determined as follows: Emissions = lbs of VOC, HAP or HAP precursor used x EF [lbs of VOC or HAP emitted/lbs of VOC or HAP (precursor) used].

    b. When using chemical mass balance for determining VOC emissions, the representative VOC content of waste shall be measured by EPA Method 8015M GC/FID or other method approved by the Department.

    c. Alternate methods may be used for emissions calculations if demonstrated by the permittee to be equivalent to or more accurate than the above methods. An alternate method shall be reviewed and approved by the Department prior to use.

24. The permittee shall effectively inspect and monitor the operation and maintenance of the plant and associated air contaminant controls and shall implement the procedures necessary to monitor and record the following parameters. A record of all such data shall be maintained for a period of at least two years at the plant site for inspection by the authorized representatives of the Department.

Monitored Parameter	**Minimum Monitoring Frequency**
a. The quantity and type of VOC, HAP, and HAP pre-cursor used by weight.	Monthly
b. The quantity of solvent waste shipped off site, analyzed for VOC and HAP content (where used to calculate VOC emissions). Analysis shall be based upon a test method approved by the Department.	*Monthly *Monitoring of parameter is only required when parameter is used to calculate VOC or organic HAP emissions for purpose of determining compliance with permitted emission limit(s).
c. Total cm^2 of wafer processed.	Weekly
d. Perform a calculation of a Bi-monthly VOC emission factor (EF) derived from bi-monthly summations of monitored parameters in items a, b, and c as follows: $(EF) = (\text{VOC emissions})/\sum c_{\text{bi-monthly}}$	Bi-monthly
e. Calculate the weekly VOC emission from the weekly production (item c above) as follows: Weekly VOC emission = EF * (c)	Weekly

Monitored Parameter	Minimum Monitoring Frequency
f. Perform a weekly compliance determination with the RACT/TACT limitation of Condition 10 as follows: lbs VOC/cm^2 wafer = e/c	Weekly
g. Demonstration of compliance with Synthetic Minor Condition 11 by performing a rolling 12-month emission rate calculation of plant-wide VOC emissions.	Monthly
h. Demonstration of compliance with Synthetic Minor Condition 12 by performing a rolling 12-month emission rate calculation of plant-wide individual HAP emissions.	Monthly
i. Demonstration of compliance with Synthetic Minor Condition 13 by performing a rolling 12-month emission rate calculation of plant-wide aggregate HAP emissions.	Monthly
j. All operating and production parameters to be reported to the Department annually as required in Condition 25.	As Required
k. Excess emissions records as defined in OAR 340-28-1400 through 340-28-1440	Each Occurrence
l. A description of any maintenance to the air contaminant control system	Each Occurrence

Pollutant Control Technique: Reasonably Available Control Technology (RACT) Standards and Typically Achievable Control Technology (TACT) Standards are included in the Intel permit for VOC emissions and solvent cleaning stations. Specific requirements for RACT and TACT are provided in the Pollution Prevention section of this document.

Reporting Requirements

25. Pursuant to OAR 340-28-1140, the permittee shall submit semi-annual reports to the Department for the report periods January 1 through June 30 and July 1 through December 31. Reports shall be submitted as follows:

    a. The permittee shall submit to the Department by July 30 of each year the permit is in effect a letter stating the facility's compliance status with permit conditions for

the first six months of the calendar year. Any violations or exceedance shall be explained in detail including corrective actions taken.

b. The permittee shall submit to the Department by January 30 of each year the permit is in effect, two (2) copies of the following information. Unless otherwise stated, all information requested below is for the previous calendar year:

i. A letter stating the facility's compliance status with permit conditions for the second six months of the calendar year. Any violations or exceedances shall be explained in detail including corrective actions taken.

ii. The total amount of natural gas and or LPG (therms or million ft^3) combusted in the boilers.

iii. The amount and type of any fuels other than natural gas or LPG combusted in the boilers.

iv. A summary of compliance with the RACT/TACT limitation of Condition 10 for the previous calendar year. Include the highest calculated weekly emission rate that occurred in each calendar month. Calculations of emissions shall be based upon the method(s) and emission data in Condition 24.

v. A calculation of the highest monthly VOC emission rates for the FAB emission unit that occurred during the previous calendar year. Emissions shall be calculated using the calculation method(s) and emission data in Condition 23 and 24.

vi. A calculation of the highest monthly PM, SO_2, CO, NO_X and VOC emission rates for the BOILER emission unit that occurred during the previous calendar year. Emissions shall be calculated using the formula and emission factors in Condition 22.

vii. A calculation of the total PM, SO_2, CO, NO_X and VOC emission rates for the BOILER emission unit that occurred during the previous calendar year. Emissions shall be calculated using the formula and emission factors in Condition 22. Report to the Department any instance in which a 12-month rolling emission rate calculation for any of these pollutants exceeded the facility's 12-month rolling PSEL.

viii. Verification of compliance with Synthetic Minor Conditions 11, 12, and 13. Compliance shall be based upon the 12-month rolling emission rate calculations required by Condition 24. Report to the Department any instance in which a 12-month rolling emission rate calculation exceeded a Synthetic Minor limitation.

ix. A summary of all pollution prevention projects, physical changes, additions, and/or process modifications performed to offset emission increases, preapproved pursuant to Condition 15. In addition, the permittee shall identify and summarize any change with an associated emission increase of five (5) or more tons of VOC or one (1) or more tons of any HAP on a yearly basis.

x. A log of all planned and unplanned excess emissions in accordance with OAR 340-28-1440.

xi. Explain any permanent changes made in the plant process or production and not covered under ix. above, which would effect air contaminant emissions, and indicate when changes were made.

xii. List all major maintenance performed on air pollution equipment

Reports shall be sent to ODEQ Northwest Region, 2020 S.W. 4th Ave., Suite 400, Portland, Oregon 97201-5884 unless otherwise noted. The permit number must be prominently displayed on the report.

General Conditions And Disclaimers

G6. The permittee shall notify the Department in writing using a Departmental "Notice of Construction" form, or "Permit Application Form", and obtain approval in accordance with OAR 340-28-800 through 340-28-820 before:

a. Constructing or installing any new source of air contaminant emissions, including air pollution control equipment, or

b. Modifying or altering an existing source that may significantly affect the emission of air contaminants, or

c. Making any physical change which increases emissions, or

d. Changing the method of operation, the process, or the fuel use, or increasing the normal hours of operation to levels above those contained in the permit application and reflected in this permit and which result in increased emissions.