

# TECHNICAL NOTE

Project **Abbvie Ballytivnan**

Subject **Response to RFI For IE Licence  
Technical Amendment**

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To whom it may concern,

This note has been prepared in response to a request for further information (RFI) from the EPA in respect of a request for a technical amendment to their IE licence (Reg. No. P1087-01) from Abbvie Ireland. This note responds to Item 2 of the RFI as detailed below:

*“Provide details to demonstrate that there will be no net increase in the maximum mass emissions from the installation provided for in the licence P1087-01.”*

It was requested as part of the technical amendment request for the IE licence to increase the volume flow rates from the two main emission points (boiler A1-1 and A1-2) on site. There was a discrepancy in the information provided at the time of the licence application and the actual boiler specifications differ somewhat to the licence specifications. Therefore, the technical amendment has been requested to correct this discrepancy.

Table 1 below details the existing licenced concentrations, flow rates and mass emission rates for NO<sub>x</sub> (as NO<sub>2</sub>) and SO<sub>2</sub> for the two main boiler emission points. Table 2 details the revised flow rates and mass emission rates at the corrected parameters as proposed in the technical amendment request. It is not proposed to change the pollutant concentrations.

Stack Reference	Max Volume Flow (Nm <sup>3</sup> /hr) Note 1	Nitrogen oxides (as NO <sub>2</sub> )		Sulphur dioxide (SO <sub>2</sub> )	
		NO <sub>2</sub> Concentration (mg/Nm <sup>3</sup> )	Mass Emission (g/s) <sup>Note 1</sup>	SO <sub>2</sub> Concentration (mg/Nm <sup>3</sup> )	Mass Emission (g/s) <sup>Note 1</sup>
A1-1	840	200	0.048	35	0.008
A1-2	840	200	0.048	35	0.008

Note 1 Reference conditions are 273.15K, 101.3Pa, 3% O<sub>2</sub> and dry gas.

**Table 1** Licenced Air Emission Parameters as per P1087-01

Stack Reference	Max Volume Flow (Nm <sup>3</sup> /hr) Note 1	Nitrogen oxides (as NO <sub>2</sub> )		Sulphur dioxide (SO <sub>2</sub> )	
		NO <sub>2</sub> Concentration (mg/Nm <sup>3</sup> )	Mass Emission (g/s) <sup>Note 1</sup>	SO <sub>2</sub> Concentration (mg/Nm <sup>3</sup> )	Mass Emission (g/s) <sup>Note 1</sup>
A1-1	2,575	200	0.143	35	0.025
A1-2	2,575	200	0.143	35	0.025

Note 1 Reference conditions are 273.15K, 101.3Pa, 3% O<sub>2</sub> and dry gas.

**Table 2** Proposed Revised Licence Air Emission Parameters as per Technical Amendment Request

As per Table 2 above, the mass emission rates from the boilers will increase as a result of the increased volume flow rate. However, detailed air dispersion modelling has been conducted at the revised parameters to ensure that all emissions from the facility are in compliance with the ambient air quality standards. A detailed air dispersion modelling report has been submitted with the technical amendment request. The results of the modelling assessment indicate that at the revised mass emission rates emissions of NO<sub>2</sub> and SO<sub>2</sub> from the Abbvie facility are in compliance with the relevant ambient air quality standards.

Emissions of NO<sub>2</sub> from the facility lead to an ambient NO<sub>2</sub> concentration (including background) which is 40% of the maximum 1-hour limit (measured as a 99.8<sup>th</sup> percentile) and 48% of the annual limit at the worst-case off-site location for the worst-case years modelled. In addition, emissions of SO<sub>2</sub> from the facility lead to an ambient SO<sub>2</sub> concentration (including background) that is 11% of the maximum ambient 1-hour limit value (measured as a 99.7<sup>th</sup> percentile) and 15% of the 24-hour limit value (measured as a 99.2<sup>nd</sup> percentile) at the worst-case location off-site for the worst-case years modelled.

The modelling assessment approach aimed to achieve compliance with the guidance outlined within the EPA AG4 *Guidance for Air Dispersion Modelling*<sup>(1)</sup> for the maximum permissible process contribution: *When modelling a facility, the uncertainty in the model should be considered. If the facility is operated continually at close to the maximum licenced mass emission rate (i.e. maximum concentration and maximum volume flow) the process contribution (PC) should be less than 75% of the ambient air quality standard and less than this where background levels account for a significant fraction of the ambient air quality standard based on the formula*:

$$\text{Maximum Allowable Process Contribution} = 0.75 * (AQS - BC)$$

This approach allows for inherent uncertainty in air dispersion modelling to be taken into account in order to avoid a risk of exceeding the air quality standards. The modelling assessment has aimed to achieve a process contribution that is less than 75% of the ambient air quality standard at licenced conditions.

Throughout the study a worst-case approach was taken. Which will most likely lead to an over-estimation of the levels that will arise in practice. The worst-case assumptions are outlined below:

- Maximum predicted concentrations were reported in the study, even if no residential receptors were near the location of this maximum;
- The effects of building downwash, due to on-site buildings, have been included in the model;
- All emission points were assumed to run continuously, every hour of the day, 365 days per year.

<sup>1</sup> EPA (2020) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)

Full details of the modelling assessment methodology and results are contained within the air dispersion modelling assessment report. While it is clear that the mass emissions of pollutants from the Abbvie facility will increase under the revised flow rate, dispersion modelling has shown that emissions from the facility are in compliance with the relevant ambient air quality standards and will not cause a significant impact on the local environment.

Kind regards,



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