

Attachment 4.8.4. Site Condition Report

1.0 INTRODUCTION

This technical note addresses the requirements for a Site Condition Report to be submitted as part of the application by AbbVie Ireland, NL B.V. for an Industrial Emissions (IE) licence.

A Soil and Water Baseline Assessment (ref. CD/18/10237WR01) has been completed in accordance with the European Commission guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on industrial emissions.

The Agency's 2017 *Licence Application Form Guidance* states that a baseline report may fulfil the requirements of the site condition report. As such, this assessment outlines where the reader can find the required information in the Baseline Assessment as well as including the current site condition regarding air and noise quality.

2.0 RELEVANT SECTIONS

2.1 Current Site Condition

The current condition of the AbbVie Ireland NL B.V. site located in Ballytivnan, Co. Sligo is covered in Sections 6.0 *Stage 5 – Environmental Setting* and 8.0 *Stage 7 – Site Investigation and Baseline Soil & Water Quality Assessment* of the Screening & Baseline report submitted as part of this application. In these sections summary details of the existing soil, ground and groundwater quality are discussed in relation to current quality standards. Details of all known pollution incidents onsite are also included within the above sections of the Baseline Report.

The potential for historical contamination at the site is addressed in Section 5 *Stage 4 – Site History*. The site was used as a nutrition feeding sets manufacturing facility under the ownership of Abbott Nutrition until May 2018. As with all previous industrial land uses there is potential for uncovered historical contamination. However, based on the soil and groundwater sampling outlined in Section 8.0 of the report, and the nature of the materials used on site in past operations, the risk of significant historical contamination is considered to be low – moderate.

Regional hydrology surrounding the Ballytivnan site is covered in Section 6.2 *Hydrology* of the Screening & Baseline Report. This includes details of all the major and minor surface water features in the area along with current quality status of these where applicable.

2.2 Comparison with First Site Condition Report

A site condition report has not been submitted previously. The site was used as a device manufacturing facility which manufactured nutrition feeding sets from the 1970s until May 2018 and the AbbVie Ireland medical devices facility was established in January 2013; however, an IE licence (or similar) has not previously been required for the site.

Biannual groundwater sampling has been carried out on the AbbVie site for the past 5 years by TMS Environmental Limited. The results of the recent rounds of sampling are provided in Section 8.0 *Stage 7 – Investigation, Baseline Soil & Water Quality Assessment*.

Soil sampling was taken as part of the site investigations carried out by IGSL in July 2018 on the subject site. The results of this investigation are presented in Section 6.3 *Soil, Geology & Hydrogeology* and Section 8.0 *Stage 7 – Investigation, Baseline Soil & Water Quality Assessment*.

2.3 Compliance with Groundwater Regulations

The Soil & Water Baseline report concluded that groundwater beneath the site is of generally good quality. Results of the recent groundwater sampling and comparison with Groundwater Regulations 2010, S.I. No. 9 of 2010 are included in Section 8 *Stage 7 – Site investigation, Baseline Soil & Water Quality Assessment* of the Baseline Report.

2.4 Soil

The Soil & Water Baseline report concluded (following onsite investigation) that the soil at the Ballytivnan site is relatively clean and there is no known contamination present. Results of baseline soil testing can be seen in Section 8 *Stage 7 – Site investigation, Baseline Soil & Water Quality Assessment* of the Baseline Report.

2.5 Noise

The proposed development will mostly take place within the building fabric of the existing AbbVie Ballytivnan Building. As the facility is not an IE licenced facility, a baseline noise survey was undertaken in April 2018 to determine the level of the existing noise emissions at the nearest noise sensitive locations (NSL's).

The facility is located at the Old Bundoran Road, Ballytivnan, Sligo. The site is deemed peri-urban and is situated between the M15 and N16 national roads. Approximately 1 km west of the site is the AbbVie Manorhamilton road facility (not part of this development).

The nearest Noise Sensitive Locations (NSL's) to the facility in question are the residential properties located to the west of the site boundary along the old Bundoran Road, isolated property situated to the north of the site and to the south of the site at the Glendallon housing estate.

Figure 1 illustrates the proposed site boundary in the context of the nearest noise sensitive locations.



Figure 1 Site Context and Noise Sensitive Locations

2.5.1 Existing Noise Environment

An environmental noise survey was conducted to quantify the existing noise environment in the vicinity of the site. The survey was conducted in general accordance with *ISO 1996: 2007: Acoustics — Description, measurement and assessment of environmental noise*.

Specific details are set out in the following sections. This detail has been provided in the Environmental Impact Assessment Report (EIAR) for the development that was submitted with the planning application and has been submitted to the Agency under Section 6 of this IE licence application.

Choice of Measurement locations

Four Noise Monitoring Locations (NML's) surrounding the site were selected for the noise survey; each of these locations are described in turn below.

NML 1 Situated to the south of the facility in the Glendallon housing estate close to NSL1.

NML 2 Situated to the west of the facility outside houses along the old Bundoran Road close NSL2.

NML 3 Situated to the north west of the facility, just off the old Bundoran Road at Shannon Eighter housing estate considered to be representative of background noise at NSL3.

NML 4 Situated outside NSL4 to the south of the site. This location is not considered to represent nearest sensitive locations therefore the number of measurements carried out at NSL4 were limited to obtain a snapshot of the typical noise levels at this location.

The position of each noise measurement location (NML) are also identified in Figure 2.



Figure 2 Noise Monitoring Locations

Survey Periods

Noise measurements were conducted over the course of three survey periods as follows:

- Daytime 10:30hrs to 14:30hrs on 11 April 2018;
- Evening 21:00hrs to 21:55hrs on 11 April 2018, and;
- Night-time 22:00hrs to 00:40hrs 11/12 April 2018.

The weather conditions during all survey periods were recorded as dry and calm.

Personnel and instrumentation

AWN conducted the noise measurements during all survey periods. The attended noise measurements were performed using a Brüel & Kjaer Type 2250 Sound Level Meter (SN. 2818080). Before and after the survey the instrument was check calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator (SN. 2263026).

Procedure

Measurements were conducted at each location on a cyclical basis. Sample periods for the noise measurements were 15 minutes during all periods. The results were noted onto a Survey Record Sheet immediately following each sample and were also saved to the instrument memory for post analysis where appropriate. Survey personnel noted all primary noise sources contributing to noise build-up.

Measurement Parameters

The survey results are presented in terms of the following three parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{AF90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise

L_{AF10} is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for road traffic noise.

The “A” suffix denotes that the sound levels have been “A-weighted” in order to account for the non-linear nature of human hearing. The “F” suffix denotes that the parameter has been measured with ‘Fast’ time-weighting applied. All sound levels in this report are expressed in terms of decibels (dB) relative to 2×10^{-5} Pascal (pa).

Results and Discussion

The baseline noise environment consists of noise from the existing AbbVie Ballytivnan facility in addition to other noise sources and facilities in the environment.

NML 1

The survey results for NML 1 are summarised in Table 1.

Period	Start Time	Measured Noise Levels (dB re. 2×10^{-5} Pa)		
		L _{Aeq,15-min}	L _{AF10}	L _{AF90}
Daytime	11:19	46	47	40
	12:25	51	51	40
Evening / Night-time	21:40	56	53	37
	22:39	38	40	35
	00:04	42	44	37

Table 1 Summary of Measured Noise Levels at NML 1

During daytime survey periods, steady plant noise from the existing AbbVie Ballytivnan facility was audible in the background throughout along with steady distant road traffic noise, intermittent noise from local anthropological sources were noted throughout the survey periods. Daytime noise levels were in the range of 46 to 51dB L_{Aeq} and 40dB L_{A90} .

During the evening and night-time survey periods, the main source of noise was steady plant noise from the existing AbbVie Ballytivnan facility audible in the background along with distant road traffic. During the first evening measurement the measured L_{Aeq} level was elevated due to the presence of a dog barking in the vicinity. Evening time noise levels were in the range of 38 to 56dB L_{Aeq} and 35 to 37dB L_{A90} . Night-time noise levels were 42dB L_{Aeq} and 37dB L_{A90} .

No significant source of vibration was noted during the survey periods.

NML 2

The survey results for NML 2 are summarised in Table 2.

Period	Start Time	Measured Noise Levels (dB re. 2×10^{-5} Pa)		
		$L_{Aeq,15-min}$	L_{AF10}	L_{AF90}
Daytime	10:58	63	65	48
	12:04	64	66	46
	13:08	64	69	45
Evening / Night-time	21:19	59	58	43
	22:19	56	47	43
	23:44	58	52	44

Table 2 Summary of Measured Noise Levels at NML2

During daytime survey periods, the ambient noise in the vicinity were dominated by intermittent road traffic movements along the Old Bundoran Road and intermittent activity from the AbbVie site, noise from truck movements and the use of reverse alarms. The background noise was dominated by steady noise from the existing AbbVie Ballytivnan facility. Daytime noise levels were in the range of 63 to 64dB L_{Aeq} and 45 to 48dB L_{A90} .

During the evening and night-time survey periods, the dominant source of noise was steady plant noise from the existing AbbVie Ballytivnan facility interrupted by intermittent road traffic movements along the Old Bundoran Road. Evening time noise levels were in the range of 56 to 59dB L_{Aeq} and 43dB L_{A90} . Night-time noise levels were 58dB L_{Aeq} and 44dB L_{A90} .

No significant source of vibration was noted during the survey periods.

NML 3

The survey results for NML 3 are summarised in Table 3.

Period	Start Time	Measured Noise Levels (dB re. 2×10^{-5} Pa)		
		L _{Aeq,15-min}	L _{AF10}	L _{AF90}
Daytime	10:36	52	56	42
	11:39	53	57	42
	12:49	50	54	41
Evening / Night-time	21:00	48	52	41
	22:00	44	42	40
	23:24	45	48	40

Table 3 Summary of Measured Noise Levels at NML3

During daytime survey periods, the ambient noise in the vicinity were dominated by intermittent road traffic movements along the Old Bundoran Road and birdsong. The background noise was dominated by steady and intermittent noise from the existing AbbVie Ballytivnan facility. Daytime noise levels were in the range of 50 to 53dB L_{Aeq} and 41 to 42dB L_{A90}.

During the evening and night-time survey periods, steady plant noise from the existing AbbVie Ballytivnan was audible facility interrupted by intermittent road traffic movements along the Old Bundoran Road and occasionally dogs barking in the area. Evening time noise levels were in the range of 44 to 48dB L_{Aeq} and 40 to 41dB L_{A90}. Night-time noise levels were 45dB L_{Aeq} and 40dB L_{A90}.

NML 4

The survey results for NML 4 are summarised in Table 4.

Period	Start Time	Measured Noise Levels (dB re. 2×10^{-5} Pa)		
		L _{Aeq,15-min}	L _{AF10}	L _{AF90}
Daytime	13:43	42	46	37
Night-time	23:02	39	42	32

Table 4 Summary of Measured Noise Levels at NML4

During daytime, the main sources of noise noted in the area were distant plant and road traffic noise. Occasional local noise from activity in and around the apartments. The measured daytime noise levels were 42dB L_{Aeq} and 37dB L_{A90}.

During the night time, the main sources of noise were the same noted during the daytime. The measured night time noise levels were 39dB L_{Aeq} and 32dB L_{A90}.

2.5.2 Noise Emission Limits

Reference has been made to the publication *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) 2016*, which is used to set operational noise limits from activities under the control of the EPA (manufacturing, industrial, waste management etc.). This document sets out a procedure for applying appropriate operational noise limits from this type of facility at the nearest noise sensitive receptors taking account of the background noise environment. Table 5 summarises the criteria applied, depending on the prevailing background noise environment.

Location	Day, dB L _{Ar,T} ¹ (07:00 to 19:00hrs)	Evening, dB L _{Ar,T} (19:00 to 23:00hrs)	Night, dB L _{Aeq,T} ² (23:00 to 07:00hrs)
Areas of Low Background Noise	45	40	35
All Other Areas	55	50	45

Table 5 Noise Emission Limits at Sensitive Locations for EPA Licence Sites

In order to establish whether the noise sensitive receptors in the vicinity of the site would be considered a 'low background noise' area, the noise levels measured during the environmental noise survey need to satisfy the following criteria:

- Arithmetic Average of L_{A90} During Daytime Period ≤40dB L_{A90}, and;
- Arithmetic Average of L_{A90} During Evening Period ≤35dB L_{A90}, and;
- Arithmetic Average of L_{A90} during Night-time Period ≤30dB L_{A90}.

On review of the noise survey results, the noise levels measured were above the criteria for a low background noise area. In this instance, the operational noise limits for Areas of Low Background Noise are not applicable for this development.

The following noise criteria are therefore appropriate for this development at the nearest noise sensitive locations:

Day (07:00 to 19:00hrs)	Evening (19:00 to 23:00hrs)	Night (23:00 to 07:00hrs)
55dB L _{Ar} (15mins)	50dB L _{Ar} (15mins)	45dB L _{Aeq} (15mins)

Table 6 Proposed Operational Noise Criteria

The noise limits stated above apply to all noise emissions from the AbbVie Ballytivnan facility. In this context this applies to an existing and proposed process plant as well as onsite mobile plant and intermittent activity.

As stated previously, up to two emergency diesel electricity generators proposed for the site. Section 4.4.1 of NG4 also contains the following comments in relation to emergency plant items:

"In some instances, licensed sites will have certain items of emergency equipment (e.g. standby generators) that will only operate in urgent situations (e.g. grid power failure). Depending upon the context, it may be deemed permissible for such items of equipment to give rise to exceedances in the noise criteria/limits during limited testing and emergency operation only. If such equipment is in regular use for any purposes other than intermittent testing, it is subject to the standard limit values for the site".

It is therefore considered that the proposed noise criterion of 55dB L_{Aeq,T} on these units is appropriate in emergency scenarios.

A follow up noise survey will be undertaken in 2019 following installation of the new plant.

¹ The Rated Noise Level, L_{Ar,T} is equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and/or impulsiveness of the sound

² During night time periods the L_{Aeq} parameter is applicable as no tonal or impulsive noise from the facility should be clearly audible or measurable at any NSL.

2.6 Air Quality

The AbbVie facility there are 3 no. existing Low Pressure Hot Water (LPHW) boilers which emit via a common flue. Under the proposed development, the facility will also have two new steam boiler stacks which will have a height of 17.4 m above ground level as well as 4 no. new LPHW boilers (which emit via a common flue) and a Domestic Hot Water (DHW) boiler. The two new larger boilers will operate in a standby/duty mode, with only one boiler in operation at any one time.

A number of smaller minor emission points are also in place across the site including vents, extracts and fume hoods. AbbVie Ireland has undertaken annual air monitoring of all the minor and potential air emission points since 2010. This information has been used to generate Attachment 7.4.2.

As outlined in the air modelling report appended to Attachment 7.1.3.2, air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality “Air Quality Monitoring Annual Report 2016”, details the range and scope of monitoring undertaken throughout Ireland.

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes. Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000 is defined as Zone D. In terms of air monitoring, Ballytivnan is categorised as Zone C due to its proximity to Sligo town.

NO₂ monitoring was carried out at the Zone C monitoring stations of Kilkenny, Portlaoise and Mullingar in 2016⁽¹²⁾. The NO₂ annual average in 2016 for the locations of Kilkenny and Portlaoise were 7 and 11 µg/m³ respectively. This is significantly lower than the annual average limit value of 40 µg/m³. The average results over the last five years at a range of Zone C locations suggests an upper average of no more than 13 µg/m³ as a background concentration as shown in Table 7. Based on the above information, a conservative estimate of the current background NO₂ concentration in the region of the AbbVie facility is 13 µg/m³.

Year	Kilkenny	Portlaoise	Mullingar
2012	4	-	7
2013	4	-	6
2014	5	16	4
2015	5	10	-
2016	7	11	-
Average	5.0	12.3	5.7

Table 7 Annual Average NO₂ Concentrations – Zone C⁽¹³⁾

In relation to the annual average background, the ambient background concentration was added directly to the process concentration with the short-term peaks assumed to have an ambient background concentration of twice the annual mean background concentration.

Continuous SO₂ monitoring was carried out at a number of Zone C locations over the period 2012 – 2016, Mullingar, Ennis and Portlaoise. Concentrations ranged from 1 – 5 µg/m³, with no exceedances of the daily limit value of 125 µg/m³ for the protection of human health. Long term annual average results suggest an upper limit of 3.4 µg/m³ as

a background concentration. Based on this EPA data a conservative estimate of the annual mean background SO₂ concentration in the region of the facility is 4 µg/m³.

SO₂ concentrations for the representative rural Zone C monitoring station at Ennis in 2017 were 14.63 µg/m³ for the 99.2nd%ile of 24-hour means. The 1-hour limit value for SO₂ (measured as a 99.7th%ile) was 31.65 µg/m³, which is significantly below the 350 µg/m³ limit value.

Year	Ennis	Portlaoise	Mullingar
2012	3	-	3
2013	3	-	3
2014	4	5	2
2015	3	1	-
2016	4	1	-
Average	3.4	2.3	2.7

Table 8 Annual Average SO₂ Concentrations – Zone C⁽¹³⁾

In relation to the annual averages, the ambient background concentration was added directly to the process concentration. However, in relation to the short-term peak concentration, concentrations due to emissions from elevated sources cannot be combined in the same way. Guidance from the UK DEFRA(13) and EPA(2) advises that for SO₂ an estimate of the maximum combined pollutant concentration can be obtained as shown below:

SO₂ - The 99.7th%ile of total 1-hour mean SO₂ is equal to the maximum of either A or B below:

- a) 99.7th%ile of hourly mean background SO₂ + (2 x annual mean process concentration SO₂)
- b) 99.7th%ile hourly mean process contribution SO₂ + (2 x annual mean background concentration SO₂)

SO₂ - The 99.2nd%ile of total 24-hour mean SO₂ is equal to the maximum of either C or D below:

- c) 99.2nd%ile of 24-hour mean background SO₂ + (2 x annual mean process concentration SO₂)
- d) 99.2nd%ile 24-hour mean process contribution SO₂ + (2 x annual mean background concentration SO₂)

2.6.1 Air Dispersion Modelling

Air dispersion modelling was carried out using the United States Environmental Protection Agency's regulatory model AERMOD (Version 16216r). The purpose of the modelling study was to determine whether the emissions from the AbbVie facility, Ballytivnan, Co. Sligo would lead to ambient concentrations which are in compliance with the relevant ambient air quality standards for NO₂ and SO₂.

Whilst the two new steam boilers will operate in a standby/duty mode, with only one boiler in operation at any one time, for the purposes of the modelling assessment both

boilers were modelled as running simultaneously as a conservative approach and to allow for any potential future need to increase capacity.

The existing LPHW boilers (3 no.) and proposed LPHW boilers (4 no.) which emit via a common flue (1 no. for existing, 1 no. for proposed) are all less than 1 MW, however, as advised under the Medium Combustion Plant Directive, when these emission points are aggregated they are greater than 1 MW and as such were included in the modelling assessment. These sources were modelled as one single emission point for the existing 3 no. LPHW boilers and one single emission point for the proposed 4 no. LPHW boilers. For the purposes of the assessment it has been assumed that all 7 of the LPHW boilers would be operating continuously, whereas in reality these operate in a standby/duty mode with only 5 in operation at any one time.

The other existing minor and potential emissions were not included in the air dispersion model as their emissions were deemed insignificant.

A cumulative assessment with the neighbouring AbbVie site was also undertaken. The relevant source parameters for the neighbouring AbbVie site (emission points A1-1, A1-2 and A2-1c) were based on actual monitoring data over the past two years.

The results indicate that the ambient ground level concentrations of nitrogen oxides (as NO₂) are below the annual mean and maximum 1-hour (measured as a 99.8th percentile) ambient air quality standards. Emissions from the facility lead to an ambient NO₂ concentration (including background) which is 24% of the maximum 1-hour limit (measured as a 99.8th percentile) and 38% of the annual mean limit at the worst-case off-site location for the worst-case years modelled (2014 and 2015).

The results indicate that the ambient ground level concentrations of sulphur dioxides (as SO₂) are below the 1-hour and 24-hour ambient air quality standards. Emissions from the facility lead to an ambient SO₂ concentration (including background) that is 21% of the maximum ambient 1-hour limit value (measured as a 99.7th percentile) and 23% of the 24-hour limit value (measured as a 99.2nd percentile) at the worst-case location off-site for the worst case years modelled (2013 and 2014).

The cumulative assessment with the neighbouring AbbVie facility also found results to be in compliance with the relevant ambient air quality limit values. Emissions from both facilities lead to an ambient NO₂ concentration (including background) which is 25% of the maximum ambient 1-hour limit value (measured as a 99.8th percentile) and 39% of the annual mean limit value at the worst-case off-site receptor for the worst-case years modelled (2014 and 2016). Emissions from both facilities lead to an ambient SO₂ concentration (including background) that is 25% of the maximum ambient 1-hour limit value (measured as a 99.7th percentile) and 23% of the 24-hour limit value (measured as a 99.2nd percentile) at the worst-case location off-site for the worst case years modelled (2013 and 2014).

Ambient levels of nitrogen oxides (as NO₂) and sulphur dioxide (SO₂) from the facility are well below the air quality limit values for the protection of human health and it is predicted that air emissions from the installation will not have a significant impact on the local environment

3.0 CONCLUSIONS

As stated in the Agency's 2017 *Licence Application Form Guidance*;

“If a baseline report is submitted as part of this applications this may also fulfil the requirements to describe the condition of the site”

The baseline report submitted with this application and the information included within this document fulfils this requirement.

*For inspection purposes only.
Consent of copyright owner required for any other use.*

4.0 REFERENCES

Environmental Impact Services (2018) Environmental Impact Assessment Report for Internal Works & Change in Activity at AbbVie Ireland, NL B.V Ballytivnan, Sligo; May 2018.

AWN Consulting (2018) Soil & Groundwater Baseline Report for AbbVie Ireland, NL B.V. Ballytivnan, Sligo. Ref. CD/18/10237WR01; August 2018.

*For inspection purposes only.
Consent of copyright owner required for any other use.*