

An Bord Pleanála Oral Hearing

Irish Water

Greater Dublin Drainage

Response to Air Quality and Odour Questions

Air Quality, Odour and Climate

Dr. Imelda Shanahan (28th March 2019)



**GDD Oral Hearing
Response to Air Quality and Odour Questions
Dr Imelda Shanahan**

Response to Inspector's Questions

- (1) The Inspector asked a number of questions which are addressed in the following sections.

St Francis Hospice Impact Assessment

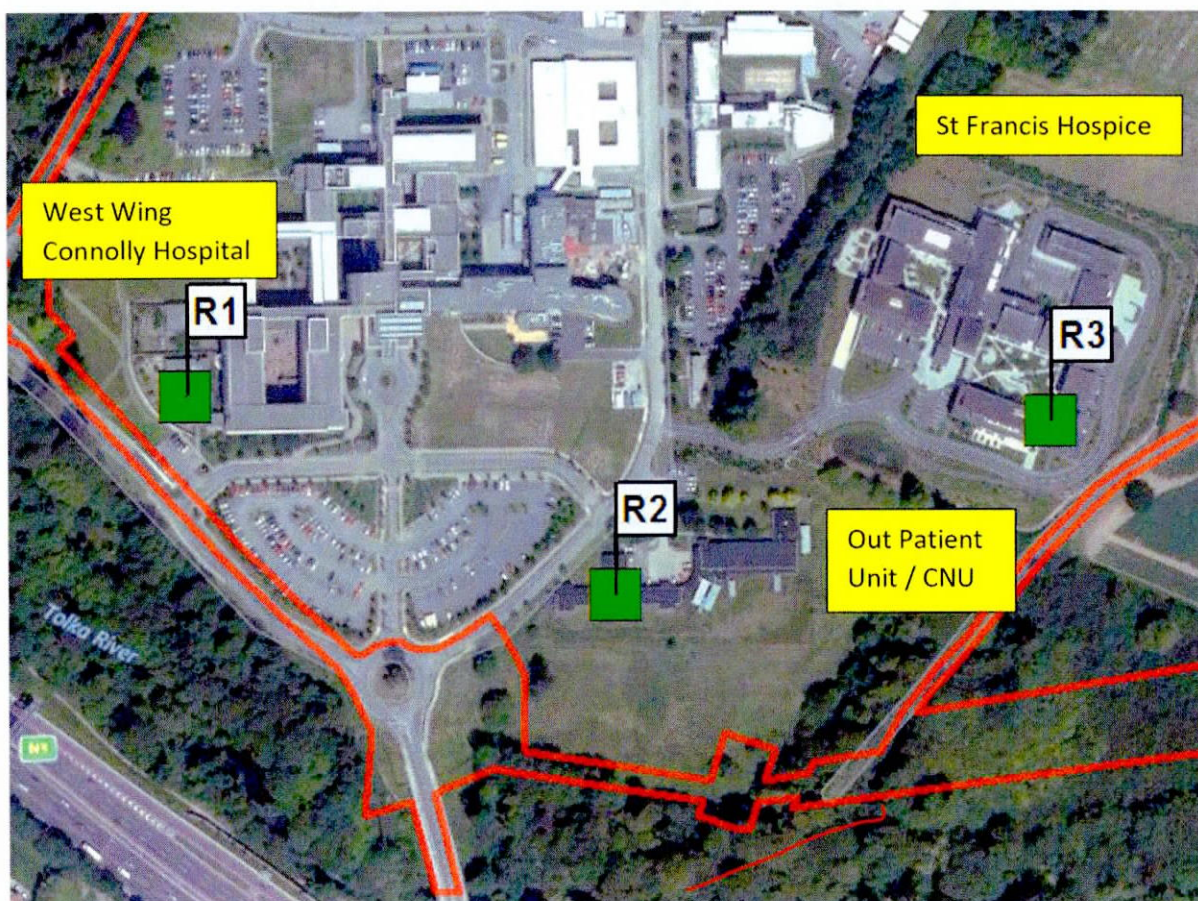
- (2) The Inspector has requested that information be provided about the assessment of impact on St Francis Hospice. An extract from Figure 14.4 is shown below to indicate where the Hospice is relative to Connolly Hospital and the elements of the proposed Project.
- (3) The construction phase air quality impact on St Francis Hospice is assessed in section 14.5.1 and section 14.5.2 of the EIAR. Air quality monitoring for baseline assessment was carried out at the Hospice (Tables 14.7 and 14.8, AQ1) and this sensitive receptor was included as R3 in the impact assessment. The main potential construction phase impact is dust and particulate matter as identified in the EIAR. The receptor sensitivity in the immediate vicinity of the proposed Abbotstown pumping station site is high because of the proximity of residential receptors, Connolly Hospital and St. Francis' Hospice.
- (4) All construction works on the grounds of and in the immediate vicinity of Connolly Hospital and St. Francis' Hospice will be carried out in accordance with the requirements of the *National Guidelines for the Prevention of Nosocomial Aspergillosis During Construction/Renovation Activities* (Health Protection Surveillance Centre 2018). These Guidelines note that the fundamental requirements in respect of eliminating Aspergillus infection from construction works is, first, to minimise the dust generated during construction and, second, to prevent dust infiltration into patient care areas.
- (5) The construction phase impact assessment for the Hospice found that there is predicted to be a short-term Slight adverse impact on the closest receptors during the Construction Phase. There will be no lasting impact and the short-term impact will be managed by means of an effective Construction Environmental Management Plan (CEMP) incorporating the mitigation measures outlined in Section 14.8. The CEMP will include a specific Dust Minimisation Plan which will ensure that dust impacts are prevented or minimised during the Construction Phase of the Proposed Project.
- (6) The Operational Phase impact assessment for Connolly Hospital and St Francis Hospice is presented in section 14.6 of the EIAR. This assessment found that all predicted impacts are significantly lower than the levels permissible by the relevant Air Quality Standards and assessment criteria adopted for the project.
- (7) Specifically for odour, the assessment was focused on demonstrating that odour emissions from the proposed Abbotstown Pumping Station would not cause odour nuisance. This criterion was applied at the site boundary and as an additional check, the predicted impact at the Hospital and the Hospice, and at other sensitive receptors, was also assessed. The maximum potential impact at the closest Hospice location is presented in Table 14.38 where it is clear that the predictions are significantly lower than any of the Air Quality Standards or Guidelines referenced in the EIAR. Additional information is presented in Appendix 14.5 and is discussed further below.

Odour Impact Assessment

- (8) Odour impacts are evaluated by comparison of predicted impacts with performance standards, expressed as the air quality standards that must be achieved at the site boundary which means that the highest possible levels of protection, including a margin of safety, have been factored into the design of the facility.
- (9) Section 14.2.3 of Volume 3 Part A of the EIAR sets out the approach that was followed in the selection of the appropriate standards for the Proposed Project. As noted in the EIAR, and in my earlier Witness Statement, the most stringent assessment target of 1.5OU_E/m³ as a 98th percentile of one hour averaging

**GDD Oral Hearing
Response to Air Quality and Odour Questions
Dr Imelda Shanahan**

periods is selected as the most appropriate assessment criterion for the proposed Project. The assessment criterion is based on ensuring that odours that would be classified as a nuisance would not occur outside the site boundary for more than 2% of the time in any one year or 175 hours spread across a year. This is referred to as the 98-percentile since 175 hours represents 2% of a calendar year.



- (10) The odour impact assessment for the Operation Phase of the proposed project was discussed in detail in Section 14.6 of the EIAR. The discussion focused on evaluating the impact of potential odour emissions from the proposed Pumping Station at Abbottstown, the Dubber Odour Control Unit and the proposed Wastewater Treatment Plant (WwTP). This assessment is based on the use of a computer dispersion model which predicts how the odour emissions will be released and dispersed in the atmosphere and the Model predictions are compared with the assessment criterion of $1.5\text{OU}_\text{E}/\text{m}^3$ as a 98th percentile of one hour averaging periods.
- (11) Appendix 14.5 presents the detailed dispersion Modelling predictions that are discussed in Section 14.6 of the EIAR. The assessment findings demonstrated that for all normal operating scenarios, the predicted impacts would be significantly lower than the assessment criterion. This means that for **at least** 98 percent of the time, nuisance odour associated with any element of the proposed Project will not be detectable at the boundary of the facility or at any sensitive receptor outside the site boundary. The risk of detecting nuisance odours is higher close to the odour sources at the site boundary and diminishes as the distance from the sources increases. It is noted that the closest sensitive receptors to the proposed WwTP are 300m away from the site boundary.
- (12) The assessment further showed that even if the odour emissions are more than twice the level which the Odour Control Units are designed to achieve, nuisance odour associated with any element of the proposed

**GDD Oral Hearing
Response to Air Quality and Odour Questions
Dr Imelda Shanahan**

Project will not be detectable at the boundary of the facility or at any sensitive receptor outside the site boundary. This is clearly a very significant margin of safety in the assessment.

- (13) Appendix 14.5 also presents modelling predictions for the 99.5th percentile which demonstrate that nuisance odour associated with any element of the proposed Project will not be detectable at the boundary of the facility or at any sensitive receptor outside the site boundary for more than 44 hours in any one year; in fact, the Model showed that the percentage of time that nuisance odours could be detected beyond the site boundary is substantially lower than 44 hours in any one year but the impact predictions are specifically included in the EIAR as the Model predictions for that particular time interval. Specifically at Abbottstown, nuisance odours would not be detectable at any sensitive receptor, including the Hospice, for more than 0.01% of the time, and most likely even less frequently.
- (14) The performance standard against which the potential odour impact is being assessed is the 98-percentile which means that nuisance odours will not be detected at the site boundary or at any sensitive receptor for more than 175 hours in any year. This does not mean that nuisance odours would occur for that amount of time. The Standard recognises that it is possible that nuisance odours might be detectable at the site boundary under certain weather conditions. The 98-percentile Standard takes account of even the most adverse weather conditions that could affect the dispersion of odours and which could result in a situation whereby odours might disperse poorly even though the Odour Control Units performance continues to be as designed and fully effective.
- (15) The dispersion of odour from emission sources is affected by atmospheric stability. There are six categories of atmospheric stability normally used for this type of study which range from very unstable (A) to stable (F). The most common type of stability category encountered in the area is neutral (D) stability which is representative of the conditions normally encountered in Ireland and is associated with cloudy, rainy or windy weather. Dispersion of pollutants is poorest under stable atmospheric conditions (categories E and F, normally experienced during the night), and present for less than 6% of the time in the area. These types of conditions might lead to poorer dispersion and then perhaps nuisance odours could be detected close to the sites. The detailed modelling predictions show that even under these maximum adverse meteorological conditions, nuisance odours will not be detectable at the closest sensitive receptors to any of the project elements ie Abbottstown, Dubber or Clonsagh. Nuisance odours might be detectable close to the site boundary for short periods but as noted above, this will not exceed 0.5 percent of the time which equates to less than 44 hours in one year. The weather conditions which could lead to detectable odours at the site boundary normally occur at night time and occur for less than 6% of the time in any year.
- (16) The Inspector asked how many exceedances there might be during summer afternoons. The meteorological conditions that could lead to poor dispersion occur mainly at night, occasionally early morning and almost never on sunny summer afternoons. Warm sunny weather favours good atmospheric mixing and dispersion which means that the risk of detecting nuisance odours during such fine weather is negligible.
- (17) It is important to note that the Odour Control Units are designed to meet the required performance and that this performance does not change in a way that would lead to nuisance odours being detected beyond the site boundary. It is only adverse weather conditions associated with poorer dispersion that might lead to detectable nuisance odours beyond the site boundary for short periods of time. If those weather conditions do not arise, then nuisance odours wont be detectable beyond the site boundary or at sensitive receptors at a distance from the site boundary.
- (18) As noted in my earlier Statement, to ensure that there will be no odour nuisance at or beyond the site boundary, a number of factors must be considered as follows:
- (a) The target performance criterion for odour;

**GDD Oral Hearing
Response to Air Quality and Odour Questions
Dr Imelda Shanahan**

- (b) Effective containment and capture of odours;
 - (c) The selection of appropriate odour control systems; and
 - (d) Monitoring and maintenance to ensure ongoing effective operation and achievement of the specified performance targets.
- (19) The critical factor for the proposed Project locations, including Abbottstown, the Orbital Sewer, Dubber and the WwTP, is that full containment and capture of odours is a feature of the design. The design of the proposed Project ensures that odours are contained, captured and treated effectively and efficiently, with significant margins of safety, so it is possible to conclude that nuisance odours will not be released at levels that would lead to detectable nuisance at the boundaries of the sites or at sensitive receptor locations.