

5. STATEMENT ON ODOUR ISSUES BY GRAEME BLACKLOCK

Relevant Experience

- 5.01 My name is Graeme Blacklock. I am a Technical Director of SLR Consulting Limited (SLR) and Head of the European Air Quality team. I hold a Bachelor of Science Degree with Honours in Environmental Science from the Manchester Metropolitan University. I also hold a Master of Science Degree from the University of Manchester in Pollution and Environmental Control. I am a Member of the Institute of Air Quality Management ('IAQM') and a Member of the Institution of Environmental Sciences ('IES'). I have been a practicing air quality specialist for over 14-years as a consulting scientist. During this time I have provided air quality including odour services to a range of industry sectors and clients, including the property development sector. I have undertaken numerous (>30) odour assessment studies for a wide range of issues, including those for the assessment odour associated with wastewater treatment works (WwTW).
- 5.02 These assessments have been used for planning applications, environmental impact assessments (EIAs), and resolution of odour complaint and nuisance issues for private companies. I have provided air quality and odour expert witness services to the property development sector, and in relation to air quality constraints upon proposed residential uses resulting from encroachment to a WwTW.
- 5.03 I have visited the appeal site and surrounding area on a number of occasions, including an instance when I undertook a period of site-specific odour monitoring at the Bolton on Dearne WwTW.

Scope of Evidence

- 5.04 The fourth reason for refusal states:

"The development would be in conflict with policy CSP40 'Pollution Control and Protection, paragraph 109 of the NPPF and draft allocation policy H3 of the Publication Version of the Local Plan, site AC26, in that plots 202 to 208 would be very close or within the current "odour stand-off" and would be within 50m of a

combined sewer outfall and the Bolton-upon-Deerne Waste Water Treatment Works (WWTW) boundary. Insufficient up to date evidence has been provided that these properties would not be detrimentally affected by odour. The proposal fails to make provision for a suitable landscaping buffer between the houses and the WWTW contrary to CSP40 and CSP29.”

5.05 I will provide evidence to demonstrate that the assessment of odour impacts at the appeal site resulting from the operation of the Bolton on Dearne WwTW was appropriate, and sufficient to predict that the appeal site would not be detrimentally affected by odour.

Infrastructure Referred to in Reason for Refusal

5.06 The Bolton on Dearne WwTW, operated by Yorkshire Water Services (YWS) is a combined system, conveying both foul sewage flows and surface water by gravity to the plant for treatment. A combined sewer outfall / pumping station is located to the north of the appeal site, approximately 50m from the boundary at the closest point. The appeal site is located approximately 50m from the boundary of the WwTW at the closest point. The catchment flows are predominantly from residential areas, with some light industrial and commercial inputs. Once wastewater has been treated within the WwTW, it is discharged to the River Don.

5.07 The WwTW comprises the following treatment stages:

- inlet works and associated plant – where the sewage arrives and is screened to remove larger solids;
- primary settlement tanks (PST) – where the sewage passes slowly through the settlement tanks where further solids are removed as sludge;
- percolating filters – secondary treatment involving an aerobic treatment process where the sewage passes through large tanks containing a solid media covered in bacteria which breaks down the sewage in the presence of oxygen;
- final tanks – the treated water passes through final settlement tanks where residual sludge is removed before discharge;

- storm tanks – for retention of stormwater flows which are held on site prior to returning to the inlet works; and
- sludge holding tanks and process – sludge produced by the various processes is thickened and then removed from site. This process is odour controlled.

5.08 Each of the treatment stages has the potential to generate odour. However, not all parts of a process are likely to be the cause of significant odours. The potential for odours are greater for some parts of the WwTW treatment process than for others. Those elements of the WwTW that deal with sludge (which are odour controlled) have a far greater propensity for creating malodours than elements such as, for example, the percolating filters where any odour is likely to be inoffensive.

5.09 As part of the formal consultation response to Barnsley Metropolitan District Council (BMDC), YWS indicated that *“it is their intention to undertake a complete refurbishment of the WwTW and in all likelihood this will involve chasing the technology that is used”*. Improvement measures are understood to be required due to the aged nature of the asset, and requirements to achieve new and more stringent discharge consents. However, to date no plans are available showing the exact location of any new treatment sources of the WwTW.

Grounds of Appeal

5.10 The grounds of appeal respond to the wording of the reason for refusal.

5.11 Furthermore, the grounds of appeal responds to the following formal consultation response and objection provided by YWS, which was presented within the appeal application Committee Report:

- *“Proximity of plot numbers 203 – 2010 to the Waste Water Treatment Works;*
- *Proximity to a combined sewer overflow (CSO) located just outside the north east boundary of the WWTW and approximately 30m from the nearest proposed houses;*

- *Concerns that amenity of plots 202 – 206 could be affected by a rising main that passes near to the gardens of those plots;*
- *YW also state that it is their intention to undertake a complete refurbishment of the WWTW and in all likelihood this will involve changing the technology that is used;*
- *Consequently they consider that a new odour assessment should have been carried out to inform the proposed position of the houses. They are also concerned that the odour assessment submitted with the application was carried out in 2012 and a new survey should have been carried out in any case; and*
- *In the opinion of Yorkshire Water a substantial landscaping buffer located between the houses and the WWTW should form part of the plans.”*

5.12 The grounds of appeal are:

- The standard operation of the Bolton on Dearne WwTW would not give rise to detrimental odour impacts at any plot numbers of the appeal site. An Odour Constraints Assessment was presented to BMDC with the appeal application. This was undertaken to the written agreement of YWS, and the assessment demonstrated that there would be no unacceptable impacts at the appeal site. The same Odour Constraints Assessment was accepted by YWS and Council officers for the adjacent Phase 2 Gleeson residential scheme.
- The claim *‘insufficient up to date evidence has been provided’* is irrelevant and has no bearing on the results and conclusions of the Odour Constraints Assessment, which is demonstrated below. Whilst odour generation will vary over time, the magnitude of odour generation and emission is related to the quality of the incoming effluent and the area / number of treatment stages which have the potential to generate odour. Since the period of site-specific odour monitoring which informed the Odour Constraints Assessment, no amendments to the WWTW layout has changed which would increase the level of odour generation. Furthermore, the Odour Constraints Assessment applied a series of worst-case assumptions to provide confidence in the modelling predictions.
- Existing residential dwellings are located in closer proximity to the combined sewer overflow pumping station than the dwellings of the proposed appeal site –

existing dwellings are located approximately 26m from the pumping station, in comparison to approximately 50m for proposed dwellings of the appeal site. Furthermore, existing dwellings are located in closer proximity or at the same stand-off to the rising main, in comparison to the dwellings of the proposed appeal site.

- The development is consistent with the NPPF, the PPG, other national guidance, and the Barnsley Core Strategy.

Main Issues

- 5.13 The main issues in this appeal are considered to be: Would the proposed development likely be detrimentally affected by odour from the standard operation of the Bolton on Dearne WwTW; and does the lack of 'up to date evidence' compromise the validity of the Odour Constraints Assessment?
- 5.14 The fourth reason for refusal is considered to be of no substance given the extensive assessment work undertaken in support of the planning application. The appeal site layout has been developed to ensure that the risk of significant detrimental impacts to residential amenity as a result of odorous emissions from the standard operation of the Bolton on Dearne WwTW, is very low.
- 5.15 This approach was as agreed for the adjacent residential development (Gleeson's Phase 2 scheme) to which the appeal site was designed based upon the agreed approach with the Local Planning Authority and YWS. The validity of this assessment was not disputed by the Council or YWS.
- 5.16 In order to assess the potential for odours from the standard operation of the Bolton on Dearne WwTW to impact on the amenity of the appeal site, a detailed Odour Constraints Assessment was undertaken. This Odour Constraints Assessment was undertaken in accordance with guidance issued by the Department of the Environment Food and Rural Affairs (DEFRA), the Environment Agency (EA) and the Institute of Air Quality Management (IAQM) and such assessments predict the potential odour exposure at receptors by using atmospheric dispersion modelling of odorous emission in terms of the European Odour Unit (ou_E/m^3). Predicted exposure levels are calculated for the 98th percentile of hourly averages, and compared against

a criterion of $C_{98\ 1\text{-hour}}\ 5.0\text{ou}_E/\text{m}^3$ plus 10m which was agreed by YWS and the Planning Authority.

5.17 Such models are not intended to be perfect simulations but to allow the potential significance of any effects to be clarified to inform the regulatory process on a transparent and consistent basis. Therefore, whilst each site will have its own site-specific influences (from odour generation, meteorology etc.) the following measures were applied to ensure that the influence of these site-specific factors did not compromise the reliability of the assessment, and to provide further confidence in the modelled predictions:

- derivation of 'worst-case' emission rates calculated from a period of 'summer' site specific odour monitoring at the Bolton on Dearne WwTW. These emission rates were applied to the assessment with no seasonal variation, which would overestimate odour generation during other seasonal periods as these are associated with lower emission rates due to the dilution effect caused by storm water. Furthermore, discrete treatment stages of the WwTW are designed to operate in parallel so that sources only operate on demand (i.e. matching the volume of incoming effluent which requires treatment). The Odour Constraints Assessment assumed that all discrete treatment stages of the WwTW were operating concurrently to reflect maximum potential odour generation and emission. Whilst this assumption provides confidence in the modelling predictions, it is likely to overestimate odour generation and emission during periods of low inflow into the WwTW.
- to assess the influence of differing meteorological conditions, 5-years' of hourly meteorological data were assessed in accordance with odour assessment guidance. In order to provide confidence in the modelling predictions, the appeal site layout was defined based upon the required stand-off from the Bolton on Dearne WwTW and maximum modelled odour contour from the individual worst-case modelled metrological year.

5.18 The results of the dispersion modelling have been presented in the form of illustrations of the predicted odour impact as isopleths (contours of concentration) for the criteria selected enabling determination of impact at any locations within the study area. The contours are presented as a $C_{98\ 1\text{-hour}}\ 5.0\text{ou}_E/\text{m}^3$ concentrations whereby any locations within the contour shaded area is predicted through the dispersion modelling to

witness potential exposure in excess of the applied odour criterion. Conversely, any location outside of the contour shaded area is below a concentration indicative of odours which would result in complaints. Reference should be made to **Appendix 21** for a presentation of the contours predicted through the Odour Constraints Assessment dispersion modelling study. The contours are presented as an average of the modelled 5-year meteorological dataset (Figure AQ1) and the maximum modelled individual meteorological year (Figure AQ2).

5.19 The results of this Odour Constraints Assessment indicate that sufficient dispersion would occur to ensure that the resultant odour exposure levels at the appeal site would be below $C_{98\ 1\text{-hour}}\ 5.0\text{ou}_E/\text{m}^3$. To relate this predicted exposure level to an individual's perception of an odour is highly complex, however the following guidelines are typically applied by the EA and others:

- $1\ \text{ou}_E/\text{m}^3$ is termed the odour threshold (at which level 50% of people with an average sense of smell would be able to detect the difference between this odour concentration and a sample of odour-free air);
- ou_E/m^3 is the threshold of recognition;
- **$5\ \text{ou}_E/\text{m}^3$ is termed a faint odour; and**
- $10\ \text{ou}_E/\text{m}^3$ is described as a distinct recognisable odour

5.20 Discussion with YWS indicates that it is currently proposed to upgrade the Bolton on Dearne WwTW during 2017, in order to achieve required discharge consents (i.e. water quality prior to discharge from site). Whilst no plans are currently available to illustrate the sizings or specific location of the proposed improvements, the WwTW treatment stages to be commissioned are considered to be of a reduced area and odour generation potential than those existing treatment stages. Moreover, new treatment stages would offer betterment in the process in terms of improved removal of biological matter (i.e. sludges) from the wastewater during the treatment process, resulting in a better quality of effluent through the process and reduction in odorous potential.

- 5.21 YWS would have a duty of care to ensure that these proposed new treatment stages would not result in potential odour impacts at existing receptors. This includes committed developments, including Phase 2 of the Bolton on Dearne residential scheme adjacent to the appeal site, which was granted planning on the basis of the submitted and agreed Odour Constraints Assessment.
- 5.22 Furthermore, Freedom of Information (Fol) requests submitted to BMDC indicates that no odour complaints from the operation of the Bolton on Dearne WwTW have been received from the surrounding existing community. This established baseline indicates that the level of odour generation from the site has remained relatively consistent, given that no increase in odour complaints has been documented. The results of the Odour Constraints Assessment mirror indicate that complaints would not occur, based upon the agreed odour criterion.
- 5.23 It is therefore considered that the Odour Constraints Assessment robustly demonstrates that the appeal site is highly unlikely to be *detrimentally affected by odour* as a result of the standard operation of the Bolton on Dearne WwTW.
- 5.24 The submitted Odour Constraints Assessment pre-dates the IAQM 'guidance on the assessment of odour for planning' document. However, it is noted that the assessment was undertaken under the broad principles of this guidance. In accordance with the IAQM guidance, the predicted odour impact at the Appeal Site is as follows:
- Slight, adverse for locations of potential residential development (high sensitivity) where the predicted odour exposure is between $C_{98, 1\text{-hour}} 30u_E/m^3$ to $50u_E/m^3$; and
 - Negligible for locations of potential residential development (high sensitivity) where the predicted odour exposure is less than $C_{98, 1\text{-hour}} 30u_E/m^3$;
- 5.25 The predicted effect is 'not significant' at all considered receptors, in accordance with the IAQM guidance.

Landscape Buffer

- 5.26 The Appellant proposes an amendment to the appeal site, to include a landscaping buffer (please refer to **Appendix 1**) between the south-western corner of the scheme and the WwTW site boundary. This landscaping buffer will act as a visual screen

between the appeal site and the boundary, in accordance with CSP29 of the Barnsley Core Strategy.

Proximity to Combined Sewer Outfall and Rising Main

- 5.27 The '*combined sewer outfall*' referenced within the reason for refusal relates to a pumping station located off Lowfield Road. This pumping station is a confluence of the combined sewer and surface water sewer, prior to direction to the Bolton on Dearne WwTW for treatment. This pumping station has the potential to generate odour, specifically due to the turbulent nature of the effluent at the confluence.
- 5.28 However, existing residential dwellings are located in closer proximity to the pumping station than the dwellings of the proposed appeal site – existing dwellings are located approximately 26m from the pumping station, in comparison to approximately 50m for proposed dwellings of the appeal site.
- 5.29 A rising main has been referenced by YWS as a concern over the amenity of plots 202 – 206 of the appeal site is understood to be an underground sewer main under pressure and therefore is required to be a closed loop system to maintain the pressure within the system. The rising main immediately borders the appeal site to the east and south, and transfers effluent from the combined sewer outfall pumping station to the WwTW. There may be associated vents for pressure relief; however, any associated odour would be very localised.
- 5.30 Notwithstanding, it is noted that existing residential dwellings are located in a similar / closer proximity to the rising main than the dwellings of the proposed appeal site – existing dwellings on Crane Well View and at Lowfield Lodge are located adjacent to the rising main (approximately 10m).
- 5.31 FOI requests made to BMDC indicate that no odour complaints have been received in the last 3-years from the existing community surrounding the WwTW, including that of the combined sewer outfall pumping station, and rising main.
- 5.32 It is therefore considered that as existing receptors, which are located in closer proximity than that of the appeal site, are not affected by odour from the combined sewer outfall / pumping station, the appeal site is highly unlikely to be *detrimentally affected by odour* as a result of the operation of the combined sewer outfall pumping station, and rising main.

Summary and Conclusion

- 5.33 The results of the Odour Constraints Assessment undertaken demonstrates that odour generated by the Bolton on Dearne WwTW would not result in potential exposure in excess of the applied odour criterion at the appeal site. It is noted that the Odour Constraints Assessment was undertaken to the written agreement of YWS and accepted for an adjacent consented residential development.
- 5.34 Therefore, on this basis, the assessment has indicated that the appeal site would not be *detrimentally affected by odour* as stated by BMDC in the reason for refusal. I therefore conclude that odour conditions on the appeal site would be within guidelines where annoyance would be considered to be unlikely.