

Land at Ford Airfield. Response to Phlorum Odour Assessment Review and Southern Water Comments.

1. Introduction.

This Technical Note has been prepared by Hoare Lea with support of Air Pollution Services. It provides a brief commentary on the Phlorum report commissioned by Arun District Council (ADC) that reviews the quantitative odour assessment undertaken by Hoare Lea for the planning application (ref: REP-1010502-5A-20211019-Ford Airfield Odour-R7) for Land at Ford Airfield, Ford, West Sussex (F/4/20/OUT) (Phlorum, Odour Assessment Review, Land at Ford Airfield, Ford, West Sussex, November 2021, Report number 11050).

This note also comments on Southern Water's reasons for objecting to the planning application in their letter to ADC dated 24th November 2021 (Southern Water ref: PLAN-040929).

The professional experience of those producing this Technical Note is provided in Appendix 1.

2. Regulatory Standards and Guidance.

Phlorum agree that the appropriate standards and guidance have been used by Hoare Lea in the odour assessment. In particular, they agree that Wastewater Treatment Works (WwTW) are generally considered to be moderately offensive and therefore 3 OUE/m³ is the appropriate criterion for the assessment.

Southern Water have objected to the planning application (F/4/20/OUT) on the grounds that this is not an appropriate criterion. Hoare Lea and Phlorum both follow the assessment approach in the Institute of Air Quality Management (IAQM) guidance¹ which states that odours from WwTWs operating under normal conditions would be considered as moderately offensive. The criterion for moderately offensive odours is 3 OUE/m³. According to the Chartered Institute of Water and Environmental Management² complaints are unlikely to occur at or below this level, and exposure below this level is unlikely to constitute a significant detriment to amenity. The use of this criterion has been discussed and agreed with Fiona Fitzgerald, Senior Environmental Health Officer at ADC.

3. Assessment Methodology.

Phlorum also agree that the assessment methodologies used by Hoare Lea for assessing the impacts of Southern Water's WwTW are in general appropriate and commented that "*excellent practice*" was used with respect to the sensitivity test models.

Furthermore, the assessment of the odour from the Grundon Waste Transfer Station (WTS) is "*considered reasonable and appropriate*".

¹ Institute of Air Quality Management (2018) Guidance on the assessment of odour for planning – [online]
<http://www.iaqm.co.uk/text/guidance/odour-guidance-2014.pdf> (Last accessed: 30th November 2021)

² Chartered Institute of Water and Environmental Management, 2012, Position Policy Statement – Control of Odour .

4. Specific Responses.

4.1 WwTW Emissions Sampling.

The odour emissions sampling was undertaken during what is considered to be the 'optimum' odour sampling period, between April and September and this was completed in May 2021. This was agreed with Atkins, Southern Water's representatives and ADC as an appropriate time to undertake the sampling.

4.2 Sniff Tests.

The IAQM guidance recommends that sniff tests are undertaken over a minimum of three sample days, in conditions favourable to odour detection (i.e. when emissions are likely to be high and dispersion is likely to be low). Hoare Lea undertook tests on six days, i.e. more than the minimum requirement.

A number of factors can influence the choice of sample day. These include the forecast weather e.g. wind speed, precipitation, and temperature, and access to appropriate sampling areas.

The sniff testing was undertaken mainly in the north-western extent of the Application Site due to the south west wind direction on five of the six survey days.

The wind direction during Survey 3 was from the north north west. On this day the Ford Airfield Market and Car Boot Sale was open, allowing access to parts of the former runway which are normally inaccessible. The survey results suggest that under the wind conditions on this day there is unlikely to be odour complaints where the proposed residential properties will be located, i.e. beyond the former runway.

The IAQM assessment methodology is based on the average intensity of the odour over five minutes and the percentage of the time during the five minutes that the intensity is greater than 4 (i.e. the intensity when odour character is easily recognisable). This is set out in the IAQM guidance (Tables 15 and 16)¹ It thus takes account of the very short (5 seconds) individual tests results.

Hoare Lea's odour assessors were Matt Stoaling (Isopleth Ltd) and Charlotte Smith (Hoare Lea) and Phlorum noted that it would have been helpful for the assessor's odour acuity to be provided. Matt Stoaling undertook all six surveys and has above average sensitivity to n-butanol, the reference odour used in the standard odour acuity tests (BS EN 13725) but this does not exclude him from undertaking sniff tests. Charlotte Smith's odour acuity is in the average range. Charlotte Smith Senior Air Quality Consultant at Hoare Lea and Matt Edwards, Principal Consultant Air Quality & Emissions, at Atkins (Southern Water's representatives) accompanied Matt on the first survey. Matt Edwards did not raise any concerns regarding the sniff tests being undertaken when the wind direction was not towards the proposed residential areas. Matt Edwards' odour acuity is unknown, but he did not contribute to the recording of the sniff test results during Survey 1.

Phlorum correctly identified an error in the quantitative odour assessment (ref: REP-1010502-5A-20211019-Ford Airfield Odour-R7), in which it is stated that strong odours were detected at the three closest survey locations. The locations where the strong odours were detected during the sniff tests were not always closest to the WwTW and this is explained in more detail in section 5.3.

4.3 Modelling.

The modelling methodology was agreed with Atkins, Southern Water's representatives and ADC. Phlorum agree it is appropriate (see comments on the emissions sampling in section 4.1).

Phlorum's review identified that Table 5.5 of the Hoare Lea odour report was incorrect. The emission rates for the sludge import and the main works odour control units have been exchanged by mistake, and the correct emissions given in Table 5.3 have been used in the modelling.

4.4 Assessment.

The Phlorum review correctly notes that odour assessments should draw on a range of assessment techniques. The quantitative odour assessment (ref: REP-1010502-5A-20211019-Ford Airfield Odour-R7) used a combination of dispersion modelling, sniff tests and complaints data. Given the lack of residential receptors close to the WwTW, the very few odour complaints in recent years is not surprising but was therefore not particularly useful when determining the baseline odour environment. As such, the assessment was based on the sniff test surveys and the dispersion modelling results.

The sniff tests use a five minute snapshot of sequentially measured odour at a range of locations, whilst the modelling uses the maximum 98th percentile of one hour average odour concentrations over five years. Although, both methods give an estimate of exposure, they are expressed very differently and are not directly comparable.

According to the IAQM guidance¹, the main difference is that for modelling, a consensus has been reached on what levels correspond to annoyance effects; whereas for sensory tests (e.g. sniff tests) there is no consensus. For this reason, greater emphasis is placed on the modelled contours in the assessment.

Nevertheless, consideration has been given to the sniff tests results as described in section 5.3 below.

5. Points of Clarification.

5.1 Introduction.

The Phlorum report recommends clarifications regarding two issues:

- Why the odour contour extends further to the south than north-east; and
- How the sniff tests have been used to inform the masterplan and whether the cordon sanitaire around the WwTW has been defined solely based on the results of the dispersion model.

Furthermore, part of Southern Water's objection also noted *"an issue with sniff test results not aligning with the odour model"*.

Responses to the issues raised by both Phlorum and Southern Water are provided in the sections below.

5.2 Odour Contours.

The wind rose (Figure 5-1 of REP-1010502-5A-20211019-Ford Airfield Odour-R7) shows that south westerly winds are more common than northerly winds. The odour contours from the dispersion modelling (Drawings AQ 3 and AQ4 of REP-1010502-5A-20211019-Ford Airfield Odour-R6 Appendices) show the impact of the WwTW emissions are largely in the southerly direction.

Although the wind rose presented in Figure 5-1 of the quantitative odour assessment illustrates a strong wind component from the southwest, the northern component has a significantly higher frequency of low wind speeds. Low wind speeds cause the greatest odour effects since odours get dispersed quickly with higher wind speeds. The modelling, which uses the 98th percentile concentrations, thus aligns with the meteorological data, such that the odour contours show a larger extent to the south, where low wind speeds from the north will cause the greatest effect.

5.3 Sniff Test Results and Cordon Sanitaire.

Phlorum identified that the sniff tests shows moderate adverse impacts (assuming these impacts will be at highly sensitive receptors i.e. residential properties) up to approximately 325m from the main odour control unit which is considered to be the most odourous part of this particular WwTW. Substantial adverse impacts were also identified to occur but closer to the WwTW.

No substantial adverse impacts were recorded within the Ford Airfield Application Site boundary.

Part of the area to the northeast of the WwTW, where five of the six odour surveys were undertaken, is within the Ford Airfield Application Site boundary where employment is proposed. Workplaces are generally considered to be of medium sensitivity, with industrial areas having low sensitivity to odour. In this employment area the maximum odour exposure was medium, and therefore the odour impact, based on Table 16 of the IAQM guidance, is slight adverse.

Survey 3 was undertaken when the wind was blowing from the north north west and therefore across the WwTW towards the proposed residential areas of the Ford Airfield development. This survey shows that on the boundary of the residential area the maximum intensity of the odour was 3 (barely recognisable) and the odour exposure was negligible.

The maximum distance from the most odourous parts of the WwTW that any of the surveys showed a moderate or substantial adverse impact was 325m. In the area 325m south of the most odourous parts of the WwTW, no residential units are proposed within the Masterplan and this is within the 'cordon sanitaire' identified by the dispersion modelling.

The Masterplan for the Ford Airfield development was based broadly on the results of the dispersion modelling. No residential development is within 100m of WwTW to account for the fact that the dispersion model cannot account for calm weather conditions. In these conditions the odour will not generally disperse far from the source. In defining the location of the residential areas the Masterplan broadly follows, or is outside, the maximum $3 \text{ OUE}/\text{m}^3$ contour derived from the maximum 98th percentile concentration in each of the five years modelled.

The results of the sniff test surveys are therefore compatible with the dispersion modelling used to inform the Masterplan.

6. Conclusions.

Phlorum agree with the methodologies used in the assessment, including the use of the $3 \text{ OUE}/\text{m}^3$ contour. They have identified some minor reporting errors, which have been clarified in this note. We have responded to Phlorum's request for clarification on two points, which we trust will satisfy ADC.

Southern Water have objected to the planning application due to the use of the $3 \text{ OUE}/\text{m}^3$ criterion and the sniff tests not aligning with the odour model. These issues have also been addressed in this note. It shows the use of this criterion is consistent with industry guidance and in agreement with ADC and that the results of the sniff tests and the dispersion modelling are consistent.

Appendix 1 – Professional Experience.

Dr Claire Holman (Air Pollution Services), BSc (Hons) PhD CSci CEnv FIEEnvSc FIAQM

Dr Holman is a Director of Air Pollution Services, has nearly 40 years of experience of air quality and has advised national governments in Europe, Asia, and Africa, as well as the European Commission on a range of strategic air quality and climate change issues. Claire has contributed to the development of professional guidance, is a former chair of the Institute of Air Quality Management, has been a member of a government air quality review group, and advised the Department for Transport on their cleaner vehicles and fuels research programme. She is an experienced expert witness for planning and CPO inquiries and litigation.

Chris Rush (Hoare Lea), BSc (Hons), MSc, PG Dip Acoustics, CEnv, MIOA, MIEMA, MIEEnvSc, MIAQM

Chris is an Associate Director Air Quality Consultant with Hoare Lea. He is a Chartered Environmentalist, a Member of the Institute of Acoustics, a Full Member of the Institute of Environmental Management and Assessment, a Member of the Institution of Environmental Sciences and a Full Member of the Institute of Air Quality Management (IAQM).

He has a diverse portfolio of experience and has worked on a range of projects from initial site feasibility, through planning and development to construction and operation. Chris's expertise covers planning, noise and air quality, specifically in relation to residential developments, industrial fixed installations such as waste management centres and transportation environmental impact on developments including air traffic. Chris is involved in the testing and assessment of the impact of indoor air quality and how building design contributes to this. He also is a member of Chartered Institute of Building Services Engineers (CIBSE) Air Quality Working Group and a committee member of the IAQM.

Charlotte Smith (Hoare Lea), BSc (Hons), AMIEnvSc, MIAQM

Charlotte is a Senior Air Quality Consultant at Hoare Lea. She is an Associate Member of the Institution of Environmental Sciences and a Member of the Institute of Air Quality Management. She has worked on a range of projects across a number of industries including residential, educational, commercial and industrial for site feasibility studies, planning applications and Environmental Impact Assessments. She also has experience in qualitative odour studies and has been successfully tested for odour acuity. She also has experience in air quality monitoring at sites ranging from residential and educational facilities to large road network schemes. Charlotte's interests lie in the effects that pollution has on human health and wellbeing.