Examination of the Basingstoke and Deane Local Plan (2011 to 2029)

MF16 – Policy SS3.9: East of Basingstoke - Response to Mr Lytle's Paper on Bioaerosols

1. Introduction

1.1 This statement is the response made by Basingstoke and Deane Borough Council to concerns raised by Mr Lytle, a local resident, during the hearing session on the 15 October to discuss the suitability of draft allocation SS3.9: East of Basingstoke. Concerns focused on potential health risks that may be posed by exposure to bioaerosols as a result of the proximity of the proposed allocation to the Chineham sewage treatment works. The note has principally been produced by Rhys Gilbert, Principal Environmental Health Officer. Appendix one of this note outlines Mr Gilbert's relevant experience and qualifications, as requested at the hearing session.

1.2 The council is the regulating body for various environmental and public health matters. This would include any concerns relating to odour releases and bioaerosols release from the Chineham sewage treatment works. In this regulatory capacity, when assessing and determining risks posed to health by various scenarios, reliance is placed on nationally published guidance relating to that particular subject area, to form a judgement on what the particular risk to public health might be. Such guidance is usually published by DEFRA, the Environment Agency (EA) and other authoritative national sources, such as Public Health England (PHE), formerly the Health Protection Agency. In the absence of any published guidance on bioaerosols risks from sewage treatment works, the council has also sought advice from PHE and the EA, and their advice is summarised later in this note.

2 Evidence submitted by Mr Lytle

2.1 The summary paper provided by Mr Lytle appears to be a compilation of extracts from the medical article referred to and submitted separately, titled *Emission of bacteria and fungi in the air from wastewater treatment plants – a review by Ewa Korzeniewska*. Ewa Koreniewska's article is a reflection of the author's interpretation and opinion of the sources they have reviewed and referenced. It does not provide authoritative advice to UK regulators on the public health significance of bioaerosols associated with sewage treatment works and cannot be treated as such.

2.2 An extensive list of sources is referenced in this article and the council has not attempted to scrutinise these nor the author's interpretation of them. As indicated above, in matters that may give rise to public health concerns within the sphere of Environmental Health, the council would rely on nationally published guidance from an authoritative source to support professional opinion on issues that may present risks to public health. Where there is no such published guidance, the council would seek advice directly from PHE, EA and/or DEFRA.

2.3 However, in relation to the article, the council would make one observation in relation to the discussion in the section of the article titled *'Bioaerosols and Human Health Risk'*.

2.4 In regard to the "Human Health Risk", the article does not appear to tackle the actual risk posed by the subject which it reviews. Rather, it reviews the plausibility that bacteria, fungi etc. might escape in wastewater aerosol form, having been agitated in its liquid wastewater form, and outlines that these pollutants can, in themselves, give rise to ill-health if ingested or inhaled. While research is referenced which indicates that airborne pollutants present a route for infection etc., the article focuses on the plausibility of a pollutant (bacteria, virus or spores) causing ill health, rather than the likelihood or possibility of it happening in a given set of circumstances. The known medical effects of contact with such pollutants, appears to be what is relied upon as presenting the case for the 'risk'. There is no discussion relating to any scale of likelihood nor the factors that may affect likelihood of infection.

2.5 These are key considerations in evaluating the extent of any risk. In the absence of such discussion in this article, considerable caution should be given to applying the findings presented to the sewage treatment works at Chineham, and the perceived risk to the health of those who would reside in the locality (SS3.9) inferred by Mr Lytle's submission. Also, it should be noted that there are no known health effects on the existing population of Chineham arising from living in the locality of a sewage treatment works. If there were increased episodes (above the average) of gastroenteritis or other illnesses, any trend would be identified by the epidemiological monitoring undertaken by PHE for this region.

3. Advice from Public Health England and the Environment Agency

3.1 Advice on bioaerosols is available on the PHE website and can be accessed via the following link:

http://webarchive.nationalarchives.gov.uk/20140714084352/http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/Bioaerosols/BioaerosolsQandA

3.2 In summary, the advice focuses exclusively on the risks arising from bioaerosols at industrial composting sites rather than sewage treatment works. No such advice is available for the operation of sewage treatment works.

3.3 In discussing this issue directly with PHE, they have stated the following:

'Public health concerns regarding bioaerosols are generally associated with composting facilities. However, as stated in the review article [Krozeniewska et al, 2011], sewage treatment works do have the potential to emit bioaerosols. It is important to note that bioaerosols are ubiquitous in the environment, being found both indoors and outdoors, and background concentrations can vary greatly by location and over time. Due to the ubiquitous and variable nature of bioaerosols, there is considerable uncertainty about the health risks to resident living close to these types of waste treatment sites. Bioaerosol generation will

be dependent on the type, capacity and activities of the sewage treatment plant; and any potential exposure to local residents on environmental circumstances such as topography, weather conditions and variable background concentrations. Therefore, any exposure assessment will be difficult to monitor or model'.

3.4 They go on to state the following:

'We would refer to our advice regarding the health risks to people living in proximity to composting sites. The management of risks from bioaerosols has been to ensure that dwellings are sufficiently far away to ensure that bioaerosol concentrations are reduced to levels where high exposure is unlikely to happen. For composting sites, the current view from the Environment Agency is that bioaerosol activities decline rapidly within the first 100m and disperse to background levels within 250 metres. Current evidence suggests that communities further than 250 metres away from composting sites are unlikely to be exposed to significant levels of bioaerosols. Odours may travel further off-site and people living further than 250 metres away may experience unpleasant odours'.

3.5 The available advice from PHE dismisses the link between the prevalence of odour equating to the prevalence of bioaerosols and the implied risk to health referred by Mr Lytle's argument. The odours from composting sites (or sewage treatment works) are not caused by the bioaerosol organisms themselves. The odours from sewage treatment works are typically made up of gases consisting of ammonia, hydrogen sulphide and other sulphide containing compounds. These do not pose any risk of infection. Please see page 23 of the document referred to in paragraph 4.4 for further information and the web link referenced in paragraph 3.1

3.6 The advice provided by the EA confirms that a permit is in place at the sewage treatment works for the discharge of treated effluent to the River Loddon. This governs the microbiological and chemical quality of the discharge to the Loddon. The permit does not include conditions/restrictions in relation to activities of processing and treating the waste and any wider environmental impacts that arise from its operations. In situations where there were concerns and evidenced problems, the local authority would have jurisdiction and investigate accordingly.

4. <u>UK published guidance on bioaerosols</u>

4.1 In relation to authoritative published advice and guidance available in the UK, the council's enquiries have not led to any sources which highlight specific health concerns from bioaerosols arising from sewage treatment works. Whilst there is published guidance for intensive rearing of poultry and pigs and industrial composting operations, this would appear to be the extent of industrial/waste activities for which there is UK published advice on the risks that may be posed by bioaerosols.

4.2 The EA clarify this in the document below. It states which industrial/waste activities require planning permission and an environmental permit and identifies the pollution risks associated with particular activities. Appendix 1 of the document highlights local risk factors for certain permitted activities and highlights those where bioaerosols would be of concern. Sewage treatment works is not an activity where bioaerosols are highlighted as a pollution concern.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297009/LIT_7260_bba627.pdf

4.3 A total of 4 research papers are available from the EA which refer to bioaerosols, but none of these relate to sewage treatment works.

https://www.gov.uk/government/publications?keywords=bioaerosol&publication_filter_option=all&topics%5B%5D=all&departments%5B%5D=environment-agency&official_document_status=all&world_locations%5B%5D=all&from_date=&to_date=

4.4 DEFRA have published guidance on the assessment of odour and noise from sewage treatment works, but no reference is made to bioaerosols nor is this linked to odour issues.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69223/pb11833-sewageodour-cop.pdf

5. Conclusion

5.1 Published guidance is available for specific industrial/waste activities where bioaerosols are a relevant health consideration for those living near such activities, namely; intensive pig and poultry rearing and industrial composting. As is clear, sewage treatment works is not one of these activities and there is no nationally agreed guidance in relation to bioaerosols arising from the operation of waste water sewage treatment plants.

5.2 PHE have highlighted that public health concerns regarding bioaerosols are generally associated with industrial composting facilities and although sewage treatment works do have the potential to emit bioaerosols no advice is given of an equivalent concern existing for sewage treatment works.

5.3 The council do not dispute the plausibility of bioaerosols being generated by sewage treatment works. However the plausibility of the risk posed by bioaerosols would not appear to be supported by any current national guidance.Advice published by the EA is explicit on those industrial and waste activities where bioaerosols must be considered. This does not include sewage treatment works, and in the council's opinion, this is a positive statement on the absence of a demonstrable risk posed by bioaerosols arising from sewage treatment works.

5.4 PHE confirm that concentrations of bioaerosols from composting facilities (which are ubiquitous in the environment) return to background concentrations within a distance of 250m from source. Whilst no direct link is made between the relevance of this information to the operation of the sewage treatment works, due to the large capacity of SS3.9 in relation to its predicted yield, it should be noted that there is flexibility within the site allocation to consider the location of uses at a distance of 250m or more, within the wider site. The council considers this to be a highly precautionary approach.

5.5 In closing, it is clear from the advice that is available from PHE, that any odours arising from sewage treatment (or composting) do not constitute any risk to health in terms of bacterial or other infection. Any incidence of odour associated in these situations arises from the release of gases and not bioaerosols (bacterial, viruses and mould spores etc.). As such, there is no basis to extrapolate a hypothetical risk to health posed by bioaerosols on the basis of odour in the air.

Appendix 1 - Experience and Qualifications

Statement by Rhys Gilbert, Principal Environmental Health Officer

I have 12 years' experience as an Environmental Health Officer, 6 of which have been here at Basingstoke. I am also a member of the Chartered Institute of Environmental Health (CIEH). My day to day role involves the supervision of the Environmental Protection team who primarily perform a technical advisory role in respect of planning applications, and regulatory role in respect of a breadth of environmental and public health related matters. As an Environmental Health Officer I hold a degree in Environmental Health and am professionally qualified (CIEH). This is the requisite qualification for an Environmental Health Officer. I also hold a diploma in Acoustics and Noise Control. None of these are medical qualifications, and as a local authority, we do not conduct medical or epidemiological research.